Cutting Tools

2025 SOLID 2026

TURNING / ROTATING / SOLID

KORLOY

2025▸2026
KORLOY SOLID TOOLS

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SAFETY GUIDE OF CARBIDE PRODUCTS

KORLOY Inc. is continuously trying to develop safer and higher quality products
Please be aware of the safety guidelines below prior to using KORLOY Inc. products

---

* It is generally accepted that the proper handling of cemented carbide tools requires awareness of safety as noted above. For more information, please contact us.
* KORLOY does not accept any responsibility for any accident caused by inappropriate use, abuse of tools, or changes to the products.

1 PL (Product Liability)

In accordance with the PL (Product Liability) law, we have attached a WARNING label on the case of KORLOY products.
There is no warning on the surface of the tools. Please read this safety guidelines before using carbide tools and provide safety education to all users.

2 Basic characteristics of CEMENTED CARBIDE tools

Cemented carbide tools are made of carbides, nitrides, carbonitrides, oxides of Tungsten (W), Titanium (Ti), Alluninyum (Al), Silicon (Si), Tantalum (Ta), Boron (B) etc.
and metal component like Cobalt (Co), Nickel (Ni), Chrom (Cr), Molybdenum (Mo) as binder. Cemented carbides tools have high hardness and specific gravity.
Generally there's no smell but according to usage and treatment, appreance and color could be changed

3 Precaution for CEMENTED CARBIDE tools

1) Cemented carbides are extremely hard and brittle at the same time. Impact shock or excessive clamping power could cause fracture or breaking of the tool.
2) Cemented carbides have large specific gravity, thus they require special attention as a heavy material when you handle big sizes or large quantities.
3) Cemented carbides have different thermal expansion coefficient with steel and ferrous materials. Shrink fit or swell fit products may cause trouble if they are used at undesirable conditions like extremly high or low temperatures.
4) There are several cemented carbide products having sharp cutting edges.Be careful not to handle the tools with bare hands which may cause cuts or injury, especially when removing the tools from the case, do not touch the cutting edge and be careful not to drop it.
5) Storing carbide tools in a corrosive atmosphere may cause erosion which can reduce toughness.
6) Please refer to the catalouge safety guidance prior to handling the tools.
7) Do not abuse tools under inappropriate conditions.

4 Precaution for machining (grinding, welding, EDM) of CEMENTED CARBIDE tools

1) Surface condition can affect the toughness of the tool, so it is recommended to use a diamond grinding wheel.
2) Grinding of cemented carbide creates mist and dust. It contains harmful compositions like Cobalt (Co), thus it is recommended to use a mask, mist collection, and other protective facilities. If the dust gets in your skin or eye, rinse immeditely with continously running water.
3) In case of grinding with coolant, coolant contains harmful metal components which cause environmental problems. Handle the coolant according to the manufacturer's recommendations.
4) Check for cracks after re-grinding carbide tool and reuse.
5) Marking with laser or electric pen may cause cracks on the carbide tool. The crack can shortened tool life.
6) EDM of carbide may cause residual cracks on the carbide tool, so if necessary , remove the crack with a grinding process.
7) Brazing of carbide tools at extremly high or low temperatures compare with the melting point of brazing materials may cause loosening or breakage.
8) Overheating a oil base coolant may cause a fire or flames, thus be prepared for fire prevention.

5 METALCUTTING SAFETY

	DANGEROUS FACTOR
Cutting tools	• Sharp cutting edge of cutting tools may cut your bare-hand
	• Inappropriate conditions or usage may cause fragmentation and expel parts of tools which may cause injury
	• Severe load on tool and premature wear of cutting edge may bring excessive cutting force on tool, causing fracture of the tool and may cause injury
	• Chips evacuated during cutting are hot and sharp and maycause burns and cuts
	• Touching the workpiece immediately after cutting may cause burns
	• Be aware of sparks, fire, or explosion of hot chips generated during the cutting operation
	• In case of high RPM machining, vibration and chattering may occur due to the improper balance of the machine
	• Touching a burr remaining on the workpiece with a bare-hand may cause a cut
	• Loose clamping of the workpiece may cause the tool to fracture and result in damage to the cutter body and possible injury
	• Tools are operated to right-hand direction normally • Left-hand direction operation can cause fracture of tool and body damage
Indexable tools	• Loose clamping of inserts and parts may result in ejection of the tool during cutting and may cause serious injury
	• Over loaded clamping of inserts by a lever (such as a pipe) may cause dangerous fracturing of parts and inserts
	• In case of high speed machining, parts and inserts can be forced out by centrifugal force
Rotating tools	• Since cutter has sharp cutting edges touching with a bare-hand may cause a cut
	• It is dangerous to use glove with rotating machine • Contact with body or clothes is dangerous with rotating parts
	• Vibration generated by balancing trouble may cause a fracture and ejection of the tool which may cause serious injury
	• In case of drilling, the uncut bottom core can fly out of the part with high speed and cause serious injury
	• The edges of small diameter drill are sharp and easy to break
Brazed tools	• Fragmentation and ejection of brazed carbide tip may cause injury
ETC	• There's a possibility of breaking the carbide tip after several brazing
	• Abusing may cause fragmentation of tool and is very dangerous

	SAFETY COUNTERPLAN
Cutting tools	• Use gloves when pulling out the insert from the case or mounting it on the machine
	• Use glasses or safety cover for your safety • Use the tools within the recommended range • Please refer to catalogue and safety guidelines first
	• Use glasses or safety cover for your safety • Change the tool as required before excessive wear or fracture
	• Use glasses or safety cover for your safety • Stop machining and put safety glove on and use a hook tool to remove chips
	• Use gloves or safety cover for your safety
	• Do not use at the place where having explosive materials • Prepare for fire extinguishments
	• Use glasses or safety cover for your safety • Check first if there's any chattering, vibration or strange noises prior to your main cutting operation
	• Do not touch the burr with bare-hand · Use gloves or safety cover for your safety
	• Clamp the workpiece tightly
	• Do not use left-hand direction without notice • Check the package of product to check the availability of left-hand operation
Indexable tools	• Check the clamping of inserts and parts prior to machining,and use original parts only
	• Do not use lever inappropriately
	• Use within recommended condition · Use glasses or safety cover for your safety
Rotating tools	• Use gloves or safety cover for your safety
	• Do not wear gloves when you work with rotating machine • Keep your body and clothes away from rotating machine
	• RPM should be controled within recommended condition • Check the balance of rotating part periodically
	• Use gloves or safety cover for your safety
	• Concentrate on safety regulation in using tools. • Use glove or safety cover for your safety.
Brazed tools	• Check the brazed tip before using • Do not use at high temperature cutting condition
ETC	• Do not use brazing a tip that has been brazed several times
	• Stick to safety regulations and guidelines

INTRODUCTION OF HOMEPAGE

1) Get on the homepage through the internet.

» **http://www.korloy.com** (KORLOY Homepage)

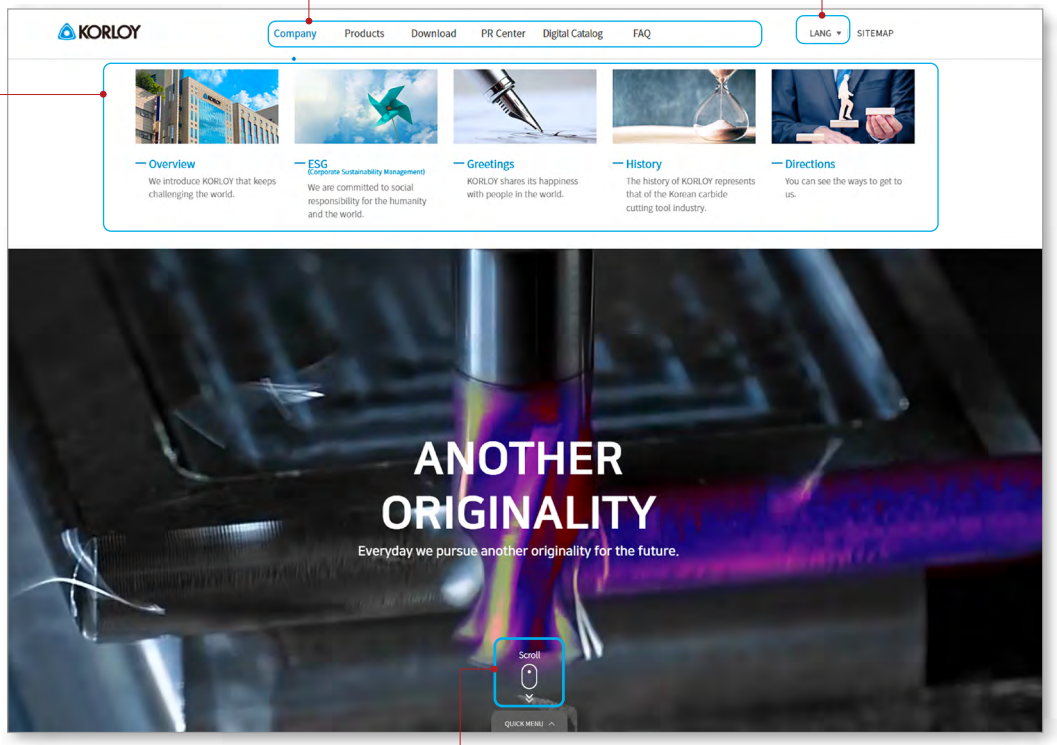
2) Choose a category and click that.

Main screen guide

Searching whole categories
Searchable wanted items

Selection by each language
Moving on to the site in each language

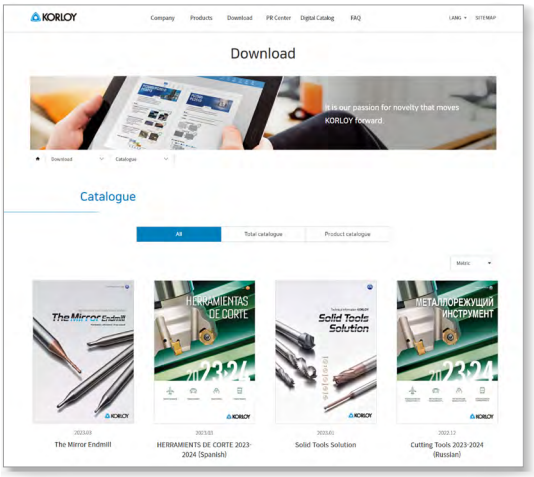
Detailed screen
Selecting detailed screen by each category



Quick menu
Checkable product information and KORLOY news quickly by scrolling the mouse

Search the necessary materials in the detailed search screen.

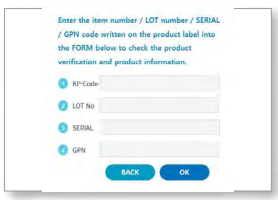
» Downloading technical materials



Downloading technical materials:
Downloading and searching by sections of various technical materials are available

» Shortcut to KOMS

» Shortcut to genuine product certification



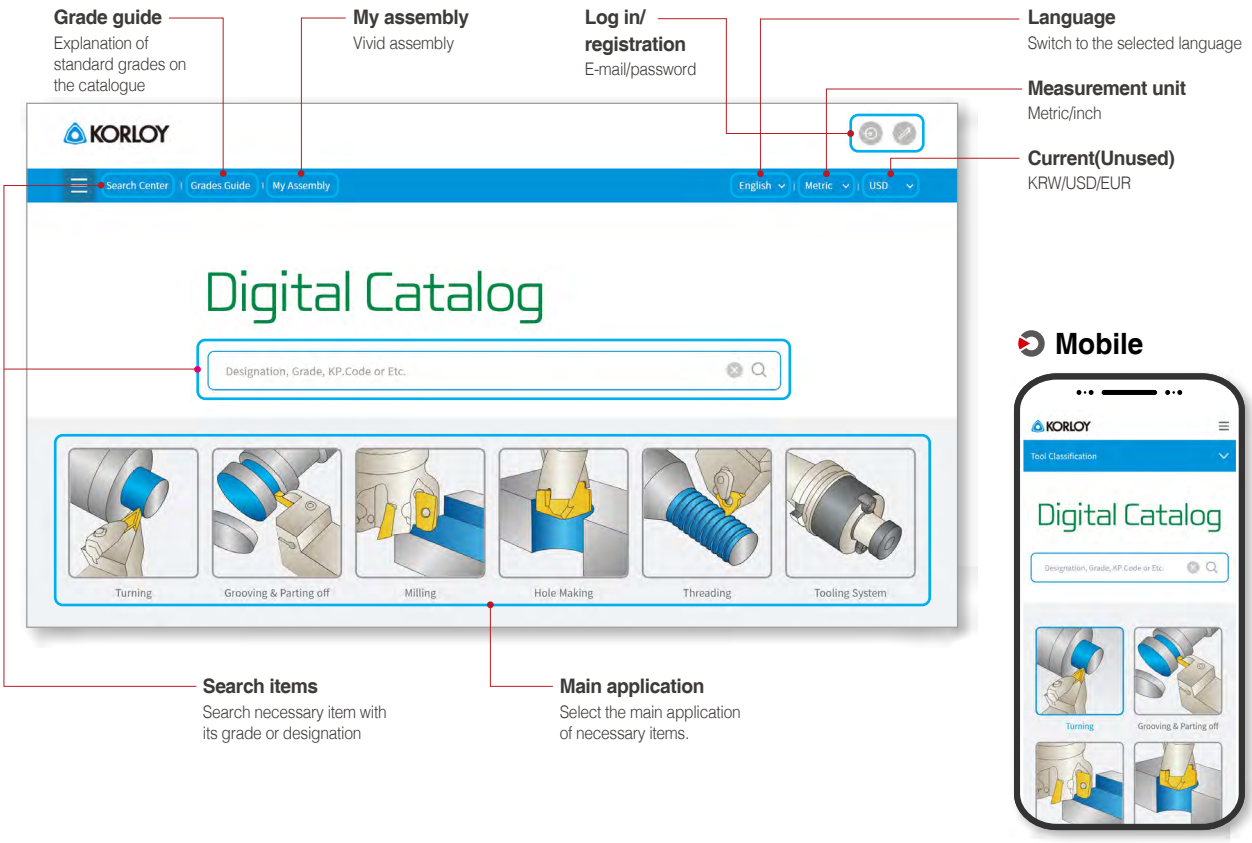
INTRODUCTION OF DIGITAL CATALOG

1) Connect to the digital catalogue on PC or mobile

» https://catalog.korloy.com

2) Guideline for main screen

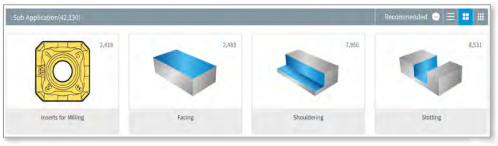
PC



Mobile

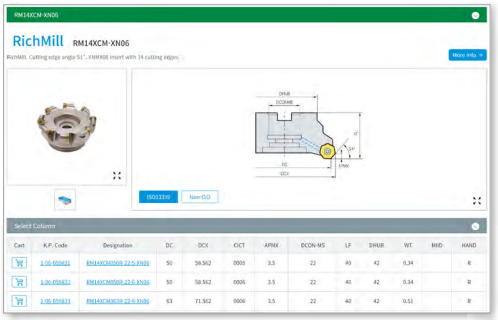
Details

» Sub application

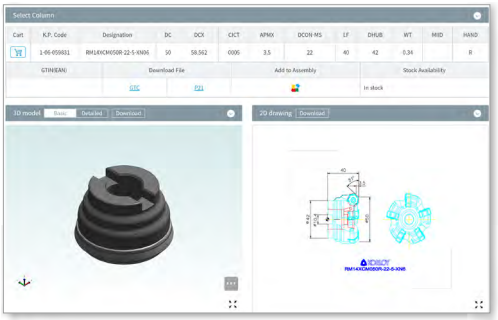


» Item group

» Item



» Item data, 2/3D modeling, etc.



INTRODUCTION OF ONLINE EXHIBITION

1) Get on the online exhibition hall on the PC or mobile.

» https://www.korloy.com/ko/prcenter/media_list.do#online

2) Main screen guide

① **Mini map** | Move the wanted hall

② **Information desk** | Introduction in Korean/English

③ **Side menu** | Searchable wanted sections

④ **Product names / Explanation** | In Korean/English

⑤ **Video** | Item promotion video

⑥ **Tech news** | Checking tech news

⑦ **Detailed information of product** | Checking the information of product and promotion video

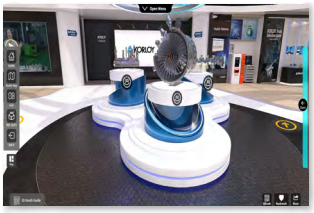
⑧ **3D modeling** | Checking 3D modeling view

* **Connectable on mobile**

Detailed screen

» **New product hall**

» **Industry hall**



» **Tooling guide**

» **History hall**

» **Smart factory**

» **Poster**

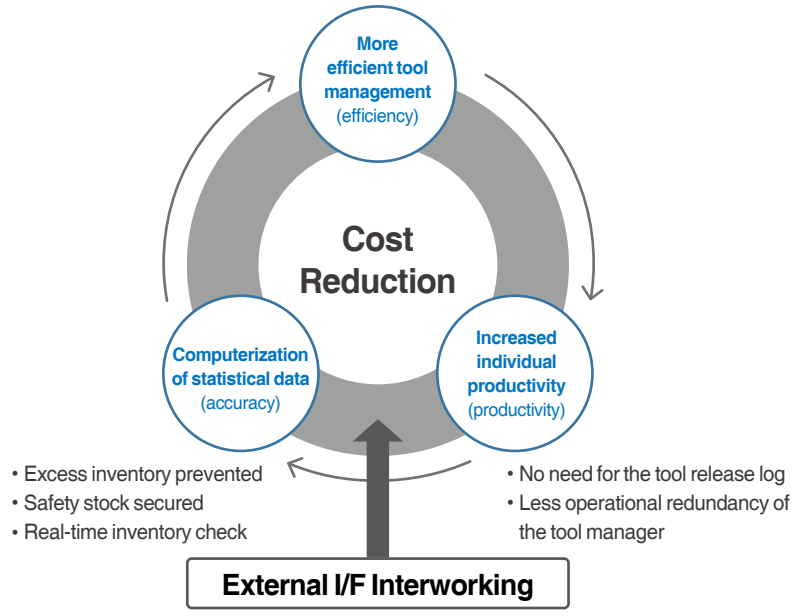
INTRODUCTION OF TOOL KEEPER

TOOL KEEPER

Tool Keeper is a smart tool management system that manages the stock status of all varieties of tools without a pause at manufacturing sites, leading the 4th industrial revolution

Feature

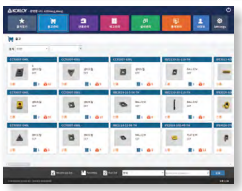
- Monthly performance data search (quantity/sum)
- Warehousing history and status search
- Computerization of statistical data (application history, etc.)



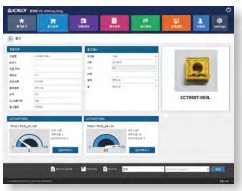
Smarter than ever (software : V3)

» Tool Keeper program

- Log-in : FIngerprint scan, multilingual interface

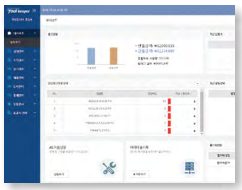


- Initial dashbord for the charted status of main materials

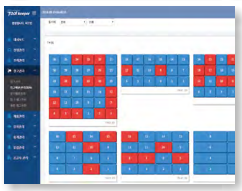


- The image for each product can be added

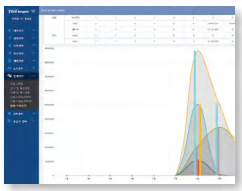
» Management program



- Initial dashbord for the charted status of main materials



- Notification available for safety stock and order management



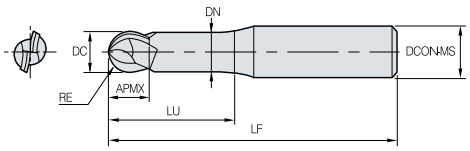
- Downloadable and manageable statistics

Benefits when using our server

- Easy to release with the smart application
- Automatic backup & recovery
- Monthly report subscription

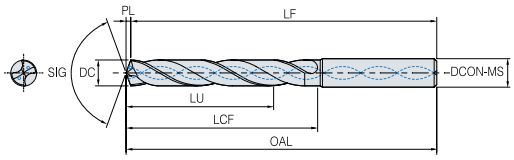
ISO13399 GLOSSARY

Endmill



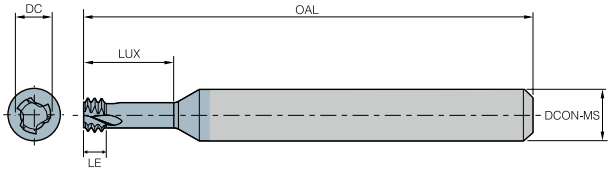
ISO13399 Property Symbols	Property Name
AP	Axial depth
APMX	Depth of cut maximum
BHTA	Body half taper angle
CA	Collision Angle
CHW	Corner chamfer width
DC	Cutting diameter
DCON-MS	Connection diameter machine side
DCX	Cutting diameter maximum
DN	Neck diameter
FHA	Flute helix angle
KCH	Corner chamfer
L	Length
LF	Functional length
LS	Shank length
LU	Usable length (max. recommended)
LUX	Usable length maximum
NOF	Flute count
OAL	Overall length
PSIR	Tool lead angle
RE	Corner radius
WT	Weight of item

Drill, Reamer



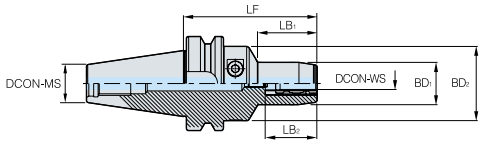
ISO13399 Property Symbols	Property Name
CW	Cutting width
DC	Cutting diameter
DCN	Cutting diameter minimum
DCON-MS	Contact surface diameter machine side
L	Cutting edge length
LCF	Length chip flute
LF	Functional length
LH	Head length
LS	Shank length
LU	Usable length (max. recommended)
NOF	Flute count
OAL	Overall length
PL	Point length
SDL	Step diameter length
SIG	Point angle
ULDR	Usable length diameter ratio
WT	Weight of item

Solid Threading Endmill



ISO13399 Property Symbols	Property Name
APMX	Depth of cut maximum
BSG	Basic standard group
CZCMS	Connection size code machine side
DC	Cutting diameter
DCN	Cutting diameter minimum
DCON-MS	Connection diameter machine side
DCX	Cutting diameter maximum
DN	Neck diameter
LE	Effective length
LF	Functional length
LS	Shank length
LU	Usable length (max. recommended)
LUX	Usable length maximum
NOF	Flute count
NT	Tooth count
OAL	Overall length
PHD	Premachined hole diameter
PL	Point length
SIG	Point angle
TCDMM	Shank diameter tolerance
TCTR	Thread tolerance class
TD	Thread diameter
TDZ	Thread diameter size
THCHT	Threading chamfer type
THFT	Form type
THL	Thread length
TP	Thread pitch
TPI	Threads per inch

Tooling System



ISO13399 Property Symbols	Property Name
ADJ	Adjust Screw
BD	Body diameter
DCON-MS	Contact surface diameter machine side
DCON-WS	Contact surface diameter workpiece side
LB	Body length
LF	Functional length
LSC	Clamping length
OAL	Overall length
RADW	Radial body width
RPMX	Rotational speed maximum
SSL	Set Screw sength
SSZ	Set Screw Size
TDZ	Thread diameter size
WT	Weight of item

Super Endmill

Optimal Endmill for Ni Based super alloy HRSA :
Inconel718, Hastelloy, waspalloy and etc.

Endmills series for difficult-to-cut materials (HRSA and Ti)

Super Endmill *For HRSA For Ti*

» Machining HRSA and Ti components like engine, turbine and etc. used in aerospace and power generation industries

» Optimal for difficult-to-cut materials machining due to reduced cutting heat and enhanced chip evacuation

See page : B17

High precision mold manufacture solution

The Mirror Endmill

PCD Ball Endmill

» For polishing of high precision workpiece and high hardness mold

» Optimal surface finish by PCD ball Endmill with no edge

cBN Ball Endmill

» For ultra-fine and mirror-like workpiece and mold with over HRC60 machining

» Higher productivity and surface finish in high speed cutting

See page : B22

The Mirror Endmill

Suitable for high hardness (higher than HRC60) mold & die super precision cutting

Better wear resistance of tool due to applying the optimal grade for PCD, cBN

For high hardness

H-Star Endmill

» Ultra-fine substrate increases cutting edge strength of tools

» The new coating layer applied provides hardness and a high temperature oxidation resistance of cutting edge in high speed machining

» Optimally designed cutting edge for high speed machining ensures stable machinability

See page : B24

H-Star Endmill

Suitable for high speed machining of hardened workpieces (HRC50~63)

The line-up of long neck, rib, taper neck, etc. is available for using in machining with various shapes

For mold & die

U-Star Endmill

» U-Star Endmill is available for a wide cutting range: roughing, medium cutting and finishing of molds and dies, and for various cutting methods of curved and inclined surfaces, special shapes, etc.

» High toughness substrate actualizes chipping resistance and hardness in machining

» The new coating technology ensures oxidation resistance and high cutting edge strength

See page : B92

U-Star Endmill

U-Star Endmill is suitable for machining medium hardness workpieces (HRC30~50) made of alloy steel, carbon steel, die steel, etc.

Full line-up available with various shapes like miniature type, taper neck, ball type, etc.

For low hardness

G-Star Endmill

» Excellent Rake angle and Cutting edge considered the characteristics of workpiece

» Improved chipping resistance and enhanced machinability by using high toughness materials

» TiAlN coating for enhanced oxidation resistance and chipping resistance

See page : B175

G-Star Endmill

Suitable for low hardness steel (H_RC10~30); alloy steel, carbon steel, Pre-hardened, hardened steel etc.

General purpose suitable for rough machining, finishing and curved and sloped surfaces

Highly efficient roughing endmill series

R+ Endmill

» Cost-saving cutting edge design for highly efficient roughing applications

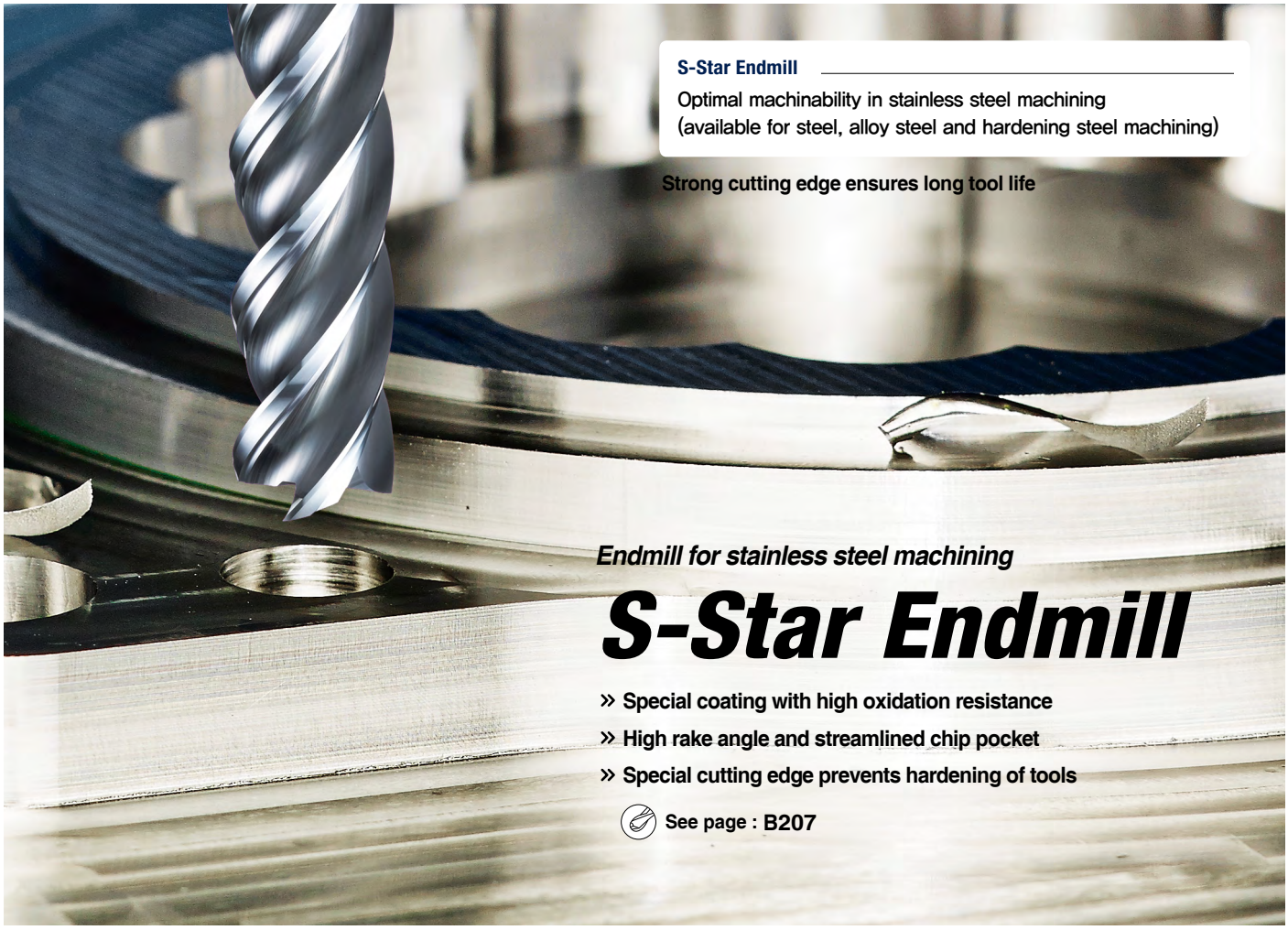
» Reduced cutting load due to both differential pitch and unequal helix formation

See page : B200

R+ Endmill

Blade design ideal for roughing

High machining efficiency due to the special design for medium to rough cutting



S-Star Endmill

Optimal machinability in stainless steel machining
(available for steel, alloy steel and hardening steel machining)

Strong cutting edge ensures long tool life

Endmill for stainless steel machining

S-Star Endmill

» Special coating with high oxidation resistance
» High rake angle and streamlined chip pocket
» Special cutting edge prevents hardening of tools

See page : B207

Endmill for aluminum machining

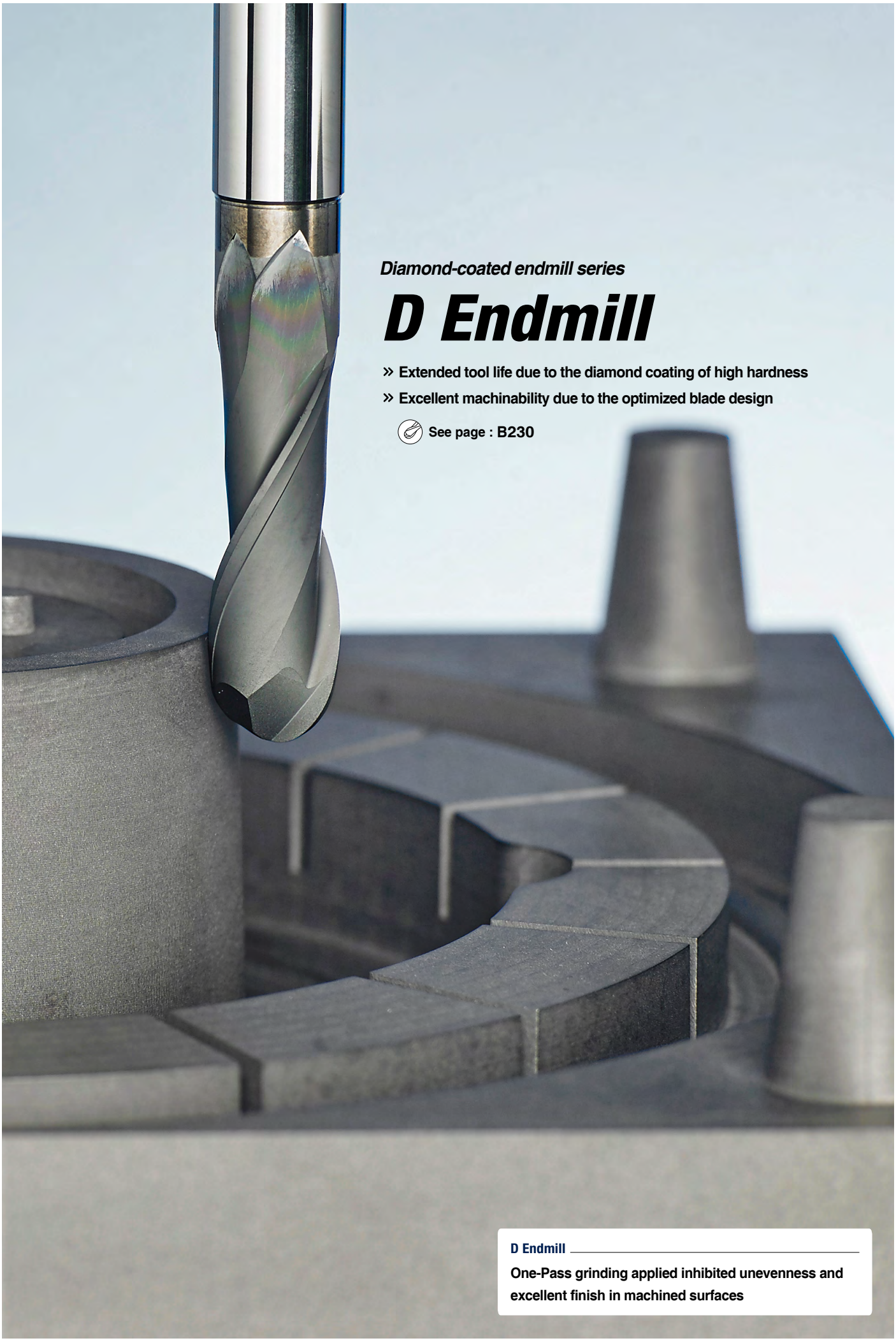
A-Star Endmill

» Applying double relief angle (High productivity due to higher rigidity of cutting edge)
» Realizing sharp edge (sharp cutting edge available for roughing and finishing)
» Effectively evacuates chips even at high feeds using U-shaped flutes

See page : B219

A-Star Endmill

Exclusive U-shaped flute design



Diamond-coated endmill series

D Endmill

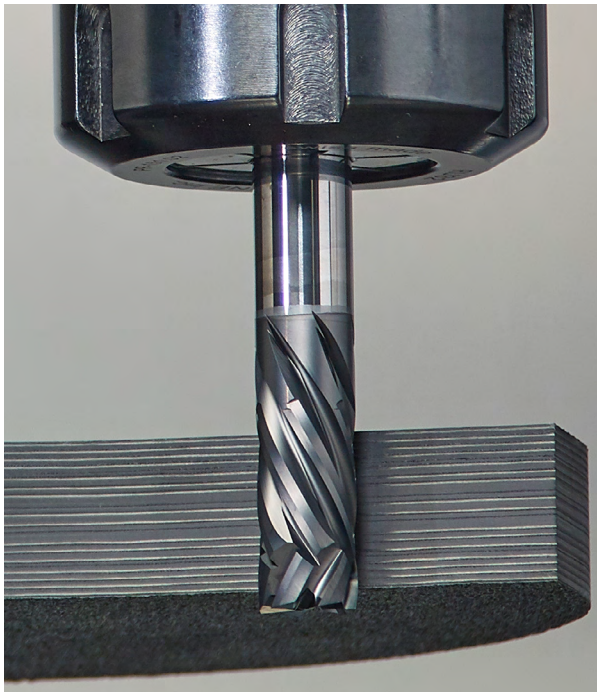
» Extended tool life due to the diamond coating of high hardness

» Excellent machinability due to the optimized blade design

See page : B230

D Endmill

One-Pass grinding applied inhibited unevenness and excellent finish in machined surfaces



Router endmill series for machining composite materials

Composite Router Endmill

» Blade design to inhibit delamination and burrs

» Boosted productivity due to highly efficient machining

See page : B239

Composite Router Endmill

Nano-crystalline diamond coating for excellent tool life

Router Endmill optimized for machining composite materials (CFRP, GFRP, etc.)

Endmill series for dental prostheses made of zirconia, titanium, Co-Cr, wax, PMMA, etc.

T Endmill

» Inhibited unevenness and excellent finish in machined surfaces due to the optimized cutting edge design

» Specialized tool shape for each machine type

See page : B243

T Endmill

Customized tools for various machine applications for dental prostheses

Optimized cutting performance by matching a proper grade with each type of dental prostheses

Highly efficient hole machining for various workpieces including automotive components

MSD Plus

» Highly efficient hole machining for various workpiece types such as automotive components

» Wider chip pockets for smooth chip evacuation

See page : C6

MSD Plus

Improved wear resistance by the new grade PC325U

MLD Plus

Improved wear resistance by the new grade PC315G

The hole machining tool for high precision and high quality

MLD Plus

» Additional guide margins for stable machinability

See page : C29

For hole machining of inconel and titanium

MSD Plus-S

» Stable machinability with the optimized blade design and chip pockets

» Extended tool life due to excellent high temp resistance to chipping

See page : C11

MSD Plus-S

Specialized for heat-resistant alloys used in aerospace, energy, power generation and automotive industries

Improved productivity and wear resistance due to stable machinability

The hole machining tool optimized for CFRP

MSD Plus for CFRP

» Reduced burrs and excellent hole quality in CFRP machining by the high rake cutting edges

See page : C20

MSD Plus for CFRP

Strong wear resistance by the new diamond-coated grade ND2100

The hole machining tool for wide applications including ramped, curved and flat surfaces

MSFD

» High-quality drilling availability in ramped surfaces by 180° point angle

See page : C22

MSFD

Improved resistance to chipping and welding, and reduced burrs by edge honing and chamfering

Universal drill applied with DIN standard

P-Star Drill

» High toughness substrate enabling a high speed and high feed machining

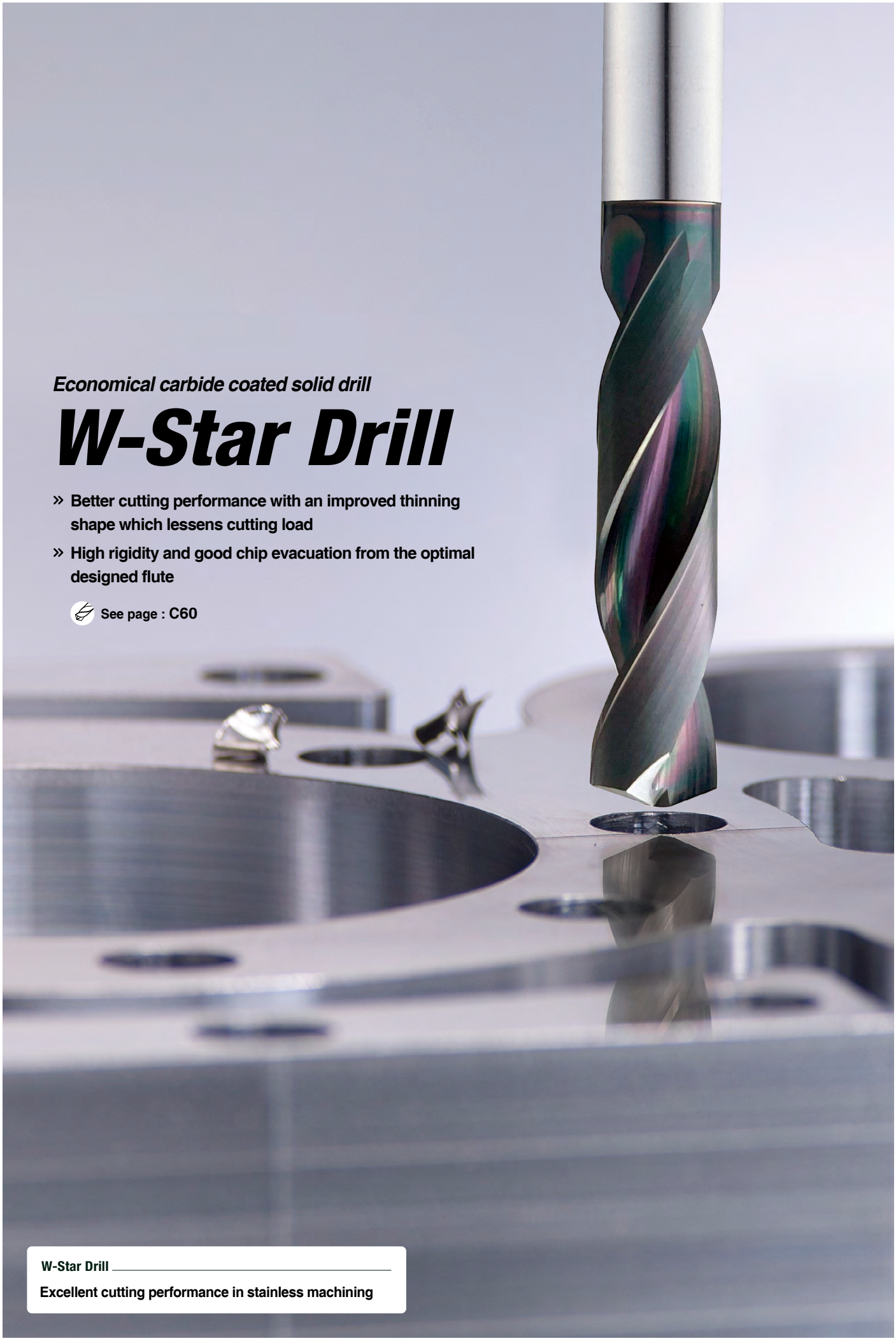
» The new coating strengthens surface hardness and thermal stability

» Internal coolant series of P-Star Drill actualizes high machinability and reduces frictional heat

See page : C33

P-Star Drill

Drill applied with DIN standard is suitable for high speed machining (~HRC50).



Economical carbide coated solid drill

W-Star Drill

» Better cutting performance with an improved thinning shape which lessens cutting load

» High rigidity and good chip evacuation from the optimal designed flute

See page : C60

W-Star Drill

Excellent cutting performance in stainless machining

Carbide solid drill for non-ferrous metals and mild steel machining

SSD-N

» Stable machining for high productivity

See page : C65

SSD-N

Available for various workpieces such as mild steel and non-ferrous metals

PCD Drill

PCD Drill for highly efficient machining

PCD Drill for high precision machining

PCD Drill

» High functional drill for machining in various cutting applications
- Cone type drill
- Sandwich type drill

» Realizing excellent precision and surface finish

See page : C69

Various counter sinks for high efficient machining

Counter Sink

» Unequal division and unequal lead applied for a high efficiency machining

» Improved machinability actualizes high precision and stable machining

» The new coating layer ensures stable machinability and extended tool life

See page : C78

Counter Sink

Carbide / HSS counter sink with fast and stable performance

GRADES

KORLOY's new grades are designed with optimal substrate for each application and are PVD coated for high temperature, high hardness and oxidation resistance, or CVD coated for high tempeure and wear resistance. Additionally, the improved post-coating treatment provides superior surface finishes to ensure the highest levels of quality and productivity

Technical information for GRADES

KORLOY Grade Index

A28 KORLOY Grade Index
A29 Grade System

Solid Tools Grades

A30 Solid Endmill Grade Selections
A32 Solid Endmill Grades
A33 Solid Drill Grade Selections
A34 Solid Drill Grades
A35 Diamond Coated Grades
A36 DLC Coated Grades
A37 PCD Insert Grades

KORLOY Grade Index

Grade index

Workpiece	Coated	Grades	ISO						Solid	Drills
			P	M	K	S	N	H		
			Steel	Stainless steel	Cast iron	HRSA	Non-ferrous	Hardened		
Uncoated	PVD	PC210C					N10-N20		•	
		PC215G	P15-P30	M15-M25	K15-K30					•
		PC303W	P05-P15	M05-M15	K05-K15				•	
		PC305H	P05-P15	M05-M15	K05-K15			H05-H15	•	
		PC315G	P15-P30	M15-M25	K15-K30					•
		PC315W	P15-P30	M15-M25	K15-K30	S15-S25	N15-N25		•	
		PC325		M15-M25		S15-S25			•	
		PC320W	P20-P35	M20-M30	K20-K35	S20-S30	N15-N25			•
		PC325T		M20-M30		S15-S25				•
		PC325U	P20-P35	M20-M30	K20-K35					•
		PC2510				S05-S15			•	
		SL		M20-M30		S15-S25			•	
		UL		M20-M30		S15-S25			•	
	Non coated	FA1	P10-P20		K10-K20		N10-N20			•
		FG2	P05-P25	M05-M25	K05-K25		N05-N25	H15-H30		•
		H01					N10-N20		•	
		H05S					N10-N20		•	
Dia coated	CVD	ND2100					N01-N10		•	•
		ND3000					N01-N05		•	
PCD	Non coated	DP90					N01-N20		•	•
		DP150					N05-N25		•	•
		DP200					N10-N30		•	•

Selection system

Workpiece		ISO	Application range
P	Steel	P01	
		P10	PC303W, PC305H, FA1, FG2
		P20	PC215G, PC315G, PC315W, PC320W, PC325U
		P30	
		P40	
M	Stainless steel	M01	
		M10	PC303W, PC305H, FG2
		M20	PC215G, PC315G, PC315W, PC325, PC320W, PC325T, PC325U, SL, UL
		M30	
K	Cast iron	K01	
		K10	PC303W, PC305H, FA1, FG2
		K20	PC215G, PC315G, PC315W, PC320W, PC325U
		K30	
		K40	
S	HRSA	S01	
		S10	PC2510
		S20	PC315W, PC325, PC320W, PC325T, SL, UL
		S30	
N	Non-ferrous	N01	ND2100, ND3000, DP90
		N10	PC210C, FA1, FG2, H01, H05S, DP150, DP200
		N20	PC315W, PC320W
		N30	
H	Hardened	H01	
		H10	PC305H
		H20	FG2
		H30	

Grade System

Cutting tool

Solid endmills	P M K	Steel	PC305H	PC303W	PC315W	PC325	
	S	Heat resistant alloy	SL	UL	PC2510	PC325	
	H	Hardened steel	PC305H				
	N	Non-ferrous metal	ND3000	ND2100	PC210C	H01	H05S
Solid drills	P M K	Steel	PC325U	PC215G	PC315G	PC320W	
	S	Heat resistant alloy	PC325T				
	N	Non-ferrous metal	FG2	FA1	ND2100		
PCD	N	Non-ferrous metal	DP90	DP150	DP200		

Solid Endmill Selection system

Workpiece		ISO	Application range
P	Steel	P01	
		P10	PC305H, PC303W
		P20	PC315W, PC320
		P30	
		P40	
M	Stainless steel	M01	
		M10	PC305H, PC303W
		M20	PC315W, PC320, PC325
		M30	
K	Cast iron	K01	
		K10	PC305H, PC303W
		K20	PC315W, PC320
		K30	
		K40	
S	HRSA	S01	
		S10	PC2510
		S20	SL, UL, PC325
		S30	
N	Non-ferrous	N01	ND3000, ND2100
		N05	
		N10	H01, H05S, PC210C
		N20	
H	Hardened	H01	
		H10	PC305H
		H20	

Solid Drill Selection system

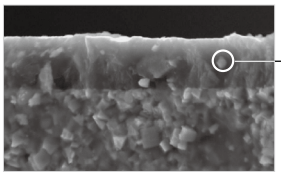
Workpiece		ISO	Application range
P	Steel	P01	
		P10	
		P20	PC215G, PC315G, PC325U, PC320W
		P30	
M	Stainless steel	M01	
		M10	
		M20	PC215G, PC315G, PC320W, PC325U
		M30	
K	Cast iron	K01	
		K10	
		K20	PC215G, PC315G, PC320W, PC325U
		K30	
N	Non-ferrous	N01	ND2100
		N10	FG2, FA1
		N20	
S	HRSA	S10	
		S20	PC325T

Solid Endmill Grade Selections

SL

- Applied high lubrication coating and special surface treatment technology

Features

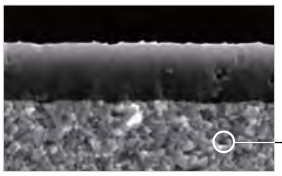


Exceptional wear resistance resulting from extremely hard coating layers

UL

- Enhanced chip control and welding resistance by exclusive lubrication coating technology

Features

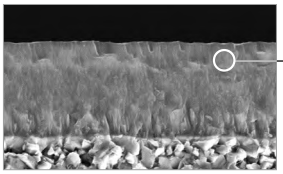


High chipping resistance substrate

PC305H

- Enhanced wear resistance and stability from frictional heat due to high hardness substrate and high hardness coating

Features

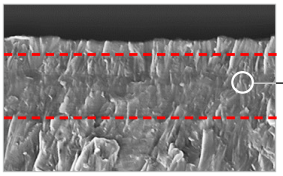


Applied layer of AlTiSiN series

PC303W / PC315W

- Increased wear and oxidation resistance due to multi layer
- Enhanced lubrication with Cr containing
- Stable cutting under frictional heat

Features

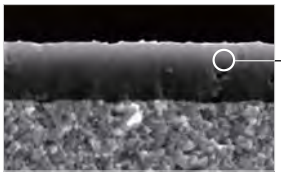


Applied layer of New AlCrN series coating

PC325

- Applied Multi layers
- Increased lubrication due to Cr content
- Enhanced stability against frictional heat
- Secured wear resistance due to thicker coating layer

Features



AlCrN Layer

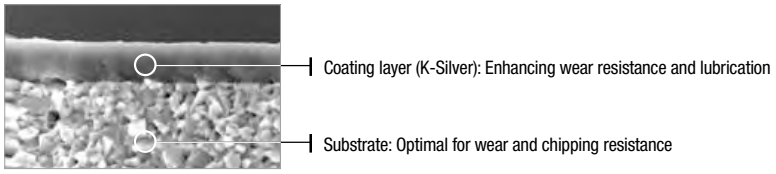
The layer by each size applied

Solid Endmill Grade Selections

PC210C

- Superior lubricity, wear resistance & chipping resistance due to the K-Sliver coating layer and optimal substrate
- Optimal for copper and non-ferrous metal machining
- Long tool life and good surface roughness for copper based electrode machining

Features

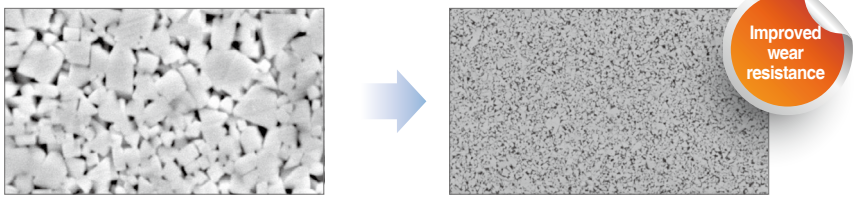


PC2510

- The coating post treatment technology increasing surface finish applied
- Stabilized toughness, ideal for interrupted cutting of high hardened steel and wet cutting accompanied by massive thermal shock

Features

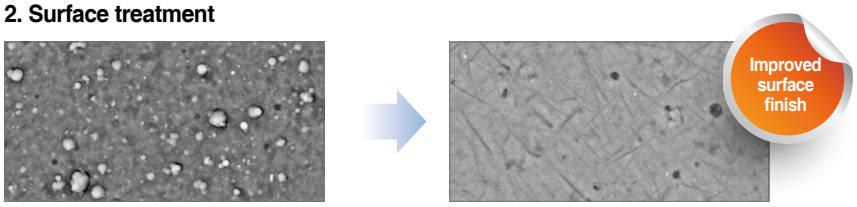
1. Ultra fine substrate with high toughness



[Fine grade] **[Ultra fine grade]**

▶ High toughness and high wear resistance material is optimized for thermal shock focusing on the cutting edge in Titanium cutting

2. Surface treatment



[Normal coating] **[After surface treatment]**

▶ Applying coating post treatment technology enhances surface finish

Solid Endmill Grades

Grade information for each product

Item	Uncoated		HSS	
	Coated	Uncoated	Coated	Uncoated
Super Endmill	SL, UL	-	-	-
The Mirror Endmill	-	PCD, cBN	-	-
H-Star Endmill	PC305H	-	-	-
U-Star Endmill	PC303W, PC315W	-	-	-
R+ Endmill	PC10T, PC20T, PC30T, PC40T	FN30T	HC10T, HC20T, HC30T	HN20T, HN30T
S-Star Endmill	PC325	-	-	-
A-Star Endmill	-	H05S	-	-
D Endmill	ND3000	-	-	-
Composite Router Endmill	ND2100	-	-	-
T Endmill	PC2510, ND3000	H01	-	-
C-Max	PC210C	-	-	-
PCD Endmill	-	DP200	-	-

The features of Coated grades

Workpiece	ISO	Features
SL	M20 ~ M30, S15 ~ S25	• Exclusive Endmill for Inconel • Coating layer with oxidation resistance and high hardness • Reducing fracture on cutting edge and enhancing wear resistance
UL	M20 ~ M30, S15 ~ S25	• Enhanced chip control and welding resistance by exclusive lubrication coating technology • HIgh chipping resistance substrate
PC305H	P05 ~ P15, M05 ~ M15 K05 ~ K15, H05 ~ H15	• Grade with higher Si, enhanced wear resistance and stability from frictional heat due to applying the new AlTiSiN series layer
PC303W	P05 ~ P15, M05 ~ M15, K05 ~ K15	• Increased wear resistance and oxidation resistance by multi layer • Enhanced lubrication with Cr containing and stable cutting through frictional heat resistance increase
PC315W	P15 ~ P30, M15 ~ M25, K15 ~ K35 S15 ~ S25, N15 ~ N25	
PC325	M15 ~ M25, S15 ~ S25	• For low/medium speed machining of stainless steel and heat resistant alloy • New film applied with excellent welding/oxidation resistance • Excellent wear/welding resistance in high speed machining due to the combination of ultra fine substrate and coating
ND3000	N01 ~ N05	• For electrode machining of graphite at medium to high speeds • Dia. coating layer with high wear resistance and lubrication
ND2100	N01 ~ N10	• For composite materials • Diamond-coated layers with excellent adhesion
PC210C	N10 ~ N20	• Medium to high speed cutting of copper and copper electrode • Medium to high speed cutting of acrylic materials • K-Silver coating with excellent lubrication and wear and chipping resistant substrate

Features of KORLOY endmills

Item	Use	Features
Super Endmill	HRSA/Ti	• High lubricated coating and special surface treatment Improved welding and chipping resistance and machining stability due to surface treatment technology
The Mirror Endmill	High hardness (~HRC65)	• Suitable for high hardness (higher than HRC60) die mold super precision cutting • Better wear resistance of tool due to applying the optimal grade for PCD, cBN
H-Star Endmill	High speed and high hardness(HRC50~63)	• Suitable for high speed machining of hardened workpieces • Available for various shapes of workpiece as long-neck
U-Star Endmill	General cutting(HRC30~55)	• Suitable for general machining with high performance • For various workpiece machining (carbon steel, alloy steel, cast iron, pre-hardened, etc.)
G-Star Endmill	General cutting(HRC10~30)	• For general machining with high performance and high quality • For various workpiece machining (carbon steel, alloy steel, cast iron, pre-hardened, etc.)
R+ Endmill	Roughing	• High efficient roughing endmill for medium to rough cutting • Excellent machining efficiency thanks to the high efficient roughing edge design • Reduced cutting force thanks to specifically designed corners, and irregular flute spacing and lead angle
S-Star Endmill	Stainless steel	• Sharp cutting edge and high rake angle with streamline chip pocket shows good cutting performance in stainless steel machining where work hardening is a problem
A-Star Endmill	Non-ferrous metal, Aluminum	• Suitable for high speed machining in aluminum and other non-ferrous materials • Can accomplish excellent surface finishing, superior chip removal in high feed rate
D Endmil	Graphite, Ceramics	• Diamond-coated endmill for graphite and ceramic • Excellent wear resistance thanks to the diamond coating of high hardness and high purity • Optimized for high speed and heavy duty cutting thanks to the strong grip of coating • Excellent cutting performance and finish thanks to the optimized blade design of high rake
Composite Router Endmil	Composite materials	• Router endmill for machining composite materials (CFRP & GFRP) • Minimized machining defects thanks to its design to prevent flaking, peeling off and burrs • Excellent resistance to wear and flaking thanks to the nano-crystalline diamond coating of high hardness and high purity
T Endmill	Dental, metal, wax, Zirconia	• Endmill for dental prostheses made of zirconia, titanium, Co-Cr, wax, PMMA, and glass ceramic • Custom-made tools for each type of milling machines for dental purpose
C-Max	Cooper, Copper alloy	• Ideallysuited for machining copper, brass, bronze, and non-ferrous materials thanks to the optimized combination between K-Silver coating with excellent • lubrication and resistance to wear and chipping, and the dedicated substrate
PCD Endmill	Non-ferrous, High speed	• Longer tool life and good surface roughness • Reducing burrs at non-ferrous metals machining

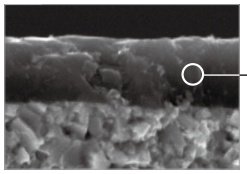
Solid Drill Grade Selections

Grades for Mach Solid Drill (MSD)

PC325U

- Special surface treatment provides improved lubrication and reduced cutting loads
- Stable tool life thanks to increased welding resistance

Features



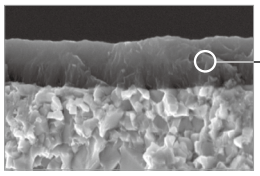
Increased welding resistance in medium to high speed cutting due to highly lubricative coating layers
Increased wear resistance in carbon steel machining

Grades for Mach Solid Drill (MSD)

PC325T

- Good wear resistance in HRSA machining at high temperature
- Good surface finish reduces friction resistance and increases chip evacuation

Features



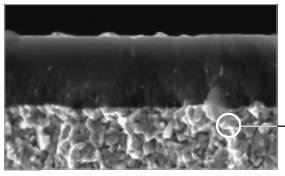
High heat and oxide resistance increase tool life.
Good surface finish coating high quality in machining.

Grades for Mach Solid Drill (MSD)

PC215G / PC315G

- Improved wear resistance due to the ultra fine substrate
- Reduced friction resistance and smooth chip flow due to improved coating lubrication

Features



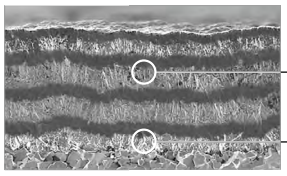
Exceptional wear resistance due to the ultrafine substrate

Grade for composite materials

ND2100

- Improved surface finish and wear resistance due to the control technology of nano-crystalline diamond particles
- Improved flaking resistance due to the substrate that is specialized for diamond coatings
- High quality and high precision machining availability thanks to sharp edges
- Excellent tool life when machining composite materials

Features



Multi-layer coating technology

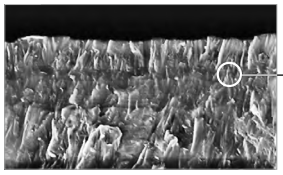
High adherence coating technology

Economical carbide coated solid drill grade

PC320W

- Improved chip evacuation with enhanced flute lubrication
- Enhanced wear resistance and oxidation resistance by multi-layer coating

Features



New AlCrN coating

Solid Drill Grades

Grade information for each product

Item	Grade	
	Coated	Uncoated
MSD Plus	PC325U	FG2
MSD Plus-S	PC325T	-
MLD Plus	PC215G, PC315G	FG2
MSD Plus for CFRP	ND2100	-
MSFD	PC325U	-
W-Star Drill	PC320W	-
SSD-N	-	FA1, FG2

The features of PVD coated grades

Workpiece	ISO	Features
PC325U	P20 ~ P35, M20 ~ M30, K20 ~ K35	• Universal grade for machining steel, cast iron, stainless steel, etc. • Stable cutting performance with excellent wear/chipping resistance • Increased welding resistance due to lubricative new coating at medium to high speed
PC325T	M20 ~ M30, S15 ~ S25	• Good wear resistance realizes HRSA machining at high temperature • Good wear and chipping resistance ensure stable machinability
PC215G	P15 ~ P30, M15 ~ M25, K15 ~ K30	• Universal grade for machining steel, cast iron, etc. • Stable cutting performance with excellent wear/chipping resistance
PC315G	P15 ~ P30, M15 ~ M25, K15 ~ K30	• Universal grade for machining steel, cast iron, stainless steel, etc. • Stable cutting performance with excellent wear/chipping resistance • Increased welding resistance due to lubricative new coating at medium to high speed
ND2100	N01 ~ N10	• For machining composite materials • Diamond-coated layers with excellent adhesion
PC320W	S20 ~ S30, P20 ~ P35,M20 ~ M30 K20 ~ K35, N15 ~ N25	• Improved chip evacuation with enhanced flute lubrication • Enhanced wear resistance and oxidation resistance by multi-layer coating
FG2	P05 ~ P25, M05 ~ M25, K05 ~ K25 N05 ~ N25, H15 ~ H30	• Increased wear/chipping resistance with the use of ultra fine substrate
FA1	P10 ~ P20, K10 ~ K20, N10 ~ N20	

Features of KORLOY drills

Index	Features
MSD Plus	• Increased welding resistance in medium to high speed cutting due to highly lubricative coating layers • Increased wear resistance in carbon steel machining • Reduced friction resistance around corners and flutes
MSD Plus-S	• Exclusive for HRSA grooving with good wear resistance at high temperature and chipping resistance • New coating layer with good surface finish reduces frictional resistance and increases chip evacuation • Preventing chipping on the cutting edge and fracture of tool ensures high productivity
MLD Plus	• Higher rigidity due to straight-edge design • Smooth chip flow due to wider chip pockets and improved surface finish on flutes • Double margin system for stable machinability
MSD Plus for CFRP	• The best tool for hole making of CFRP workpieces • Excellent wear resistance due to the diamond-coated grade • Reduced burr creation in CFRP machining due to high rake cutting edges
MSFD	• High quality hole making capability with 180° point angle • Improved anti-chipping and welding resistance by edge honing and chamfering • Minimized creation of burrs compared to general drills
P-Star Drill	• The optimal international standard for high speed machining with ~HRC50 • Enhanced surface hardness and heat resistance with new coating implementation
W-Star Drill	• Better cutting performance with an improved thinning shape which lessens cutting load • High rigidity and good chip evacuation from the optimal designed flute • Excellent cutting performance in stainless machining
SSD-N	• Stable drilling for high productivity • Available for various workpieces such as mild steel and non-ferrous metals

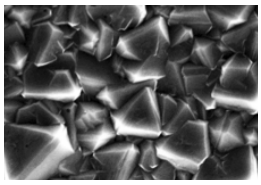
Diamond Coated Grades

Grade for graphite and ceramic

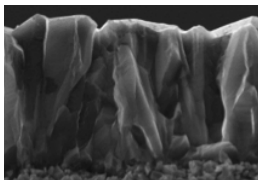
ND3000

- SP3-crystalline diamond coatings of high purity and high hardness
- Improved adhesion between coated layers and the substrate that is specialized for diamond coatings
- Excellent tool life when machining graphite and ceramic

Features



Surface of ND3000



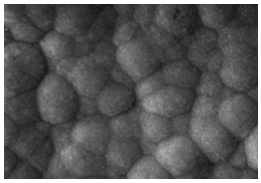
Cross section of ND3000's coated layers

Grade for composite materials

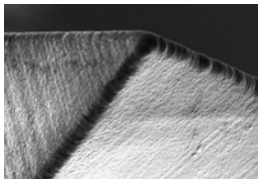
ND2100

- Improved surface finish and wear resistance due to the control technology of nano-crystalline diamond particles
- Improved flaking resistance due to the substrate that is specialized for diamond coatings
- High quality and high precision machining availability thanks to sharp edges
- Excellent tool life when machining composite materials

Features

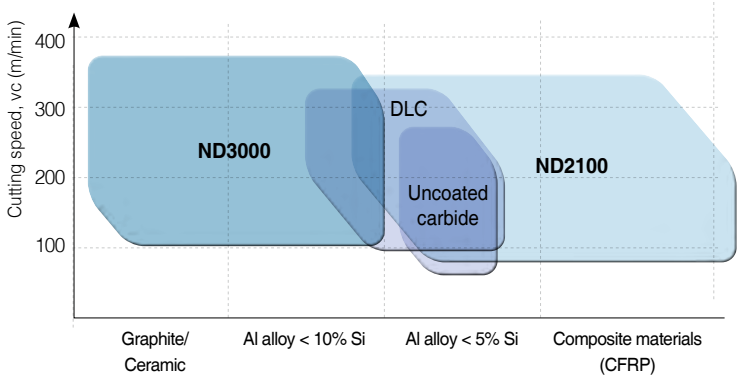


Surface of ND2100



Sharp edges of ND2100

Application range



Selection system

Workpiece			Grade	ISO	Application range
N	Non-ferrous	Graphite/ Ceramic	**ND3000**	N01	ND3000
		Al alloy	**ND3000 ND2100**	N05	ND2100
		Composite materials	**ND2100**	N10	

The features of diamond coated grades

Grade	ISO	Features
ND3000	N01 ~ N05	• For continuous roughing of graphite, ceramic, and Al alloy at high speeds • Exceptional cutting performance due to high resistance to wear and flaking • High hardness diamond coatings of high purity SP3-crystalline structure
ND2100	N05 ~ N10	• For continuous finishing of composite materials and Al alloy at high speeds • Stable machinability due to durable sharp edges • Nano-crystalline diamond coatings under particle control

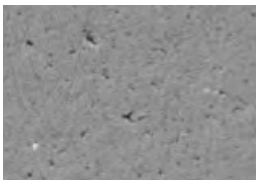
DLC Coated Grades

DLC-Coated Inserts for Non-Ferrous Metals

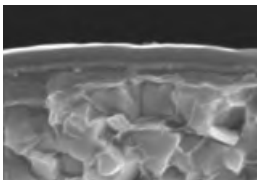
PD1005 / PD1010

- High hardness and low friction DLC coating technology
- Lubrication and maximized wear resistance increases machinability and machining quality
- Optimal substrate for each workpiece ensures stable and long tool life
- For non-ferrous metals such as aluminum, Al-Si alloy, copper and etc. machining

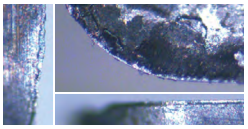
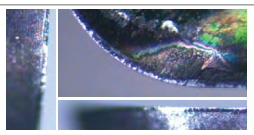
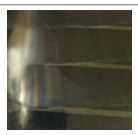
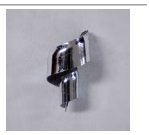
Features



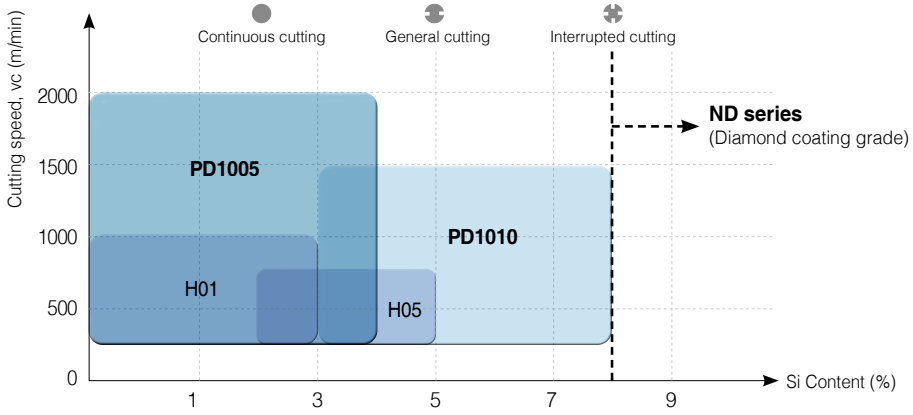
Smooth coating surface



Hard DLC coating

Grades	Wear resistance and Welding resistance	Surface finish	Chip curl
Uncoated (Non coated)			
DLC (PD1010)			

Application range



Selection system

Workpiece			Grade	ISO	Application range
N	Non-ferrous	Aluminum and copper (Soft non-ferrous metals)	PD1005	N05	
		Aluminum alloy	PD1005 PD1010	N10	PD1005
		Al-Si alloy (Hardened non-ferrous metals)	PD1010	N15	PD1010

The features of DLC coating grades

Grade	ISO	Features
PD1005	N05	• For high speed and continuous machining of Aluminum and copper • High wear and welding resistance realize good machinability • High performance of DLC coating with high hardness and low friction
PD1010	N10	• For medium to high and interrupted machining of aluminum alloy and Al-Si alloy • Stable tool life due to substrate with chipping resistance • High performance DLC coating with high hardness and low friction

PCD Insert Grades

Features

KORLOY PCD products are manufactured by using high quality PCD tips under ultra high temperatures and pressure. The PCD tip is welded on the qualified KORLOY carbide insert KORLOY high quality PCD products meet a wide range of application needs in turning, milling, and endmills.

- Excellent tool life for aluminum alloy and copper alloy
- Excellent tool life for ceramic, high-silicon aluminum and rock or stone
- Excellent tool life for rubber, carbon, graphite and wood

PCD Grades

Grade	Features	Application	Grain size(㎛)	Hardness(Hv)	TRS(kgf/mm2)
DP90	Coarse diamond grain has been used to get excellent wear resistance enough to machine cemented-carbide, high Si aluminum alloy	Cemented carbide Ceramic roughing High Si aluminum alloy Rock, Stone	25 ~ 30	50 ~ 65	≒ 1.10
DP150	By use of fine diamond grain having good bonding property, it is suitable for machining of non-ferrous metal, graphite	High Si aluminum alloy Copper, Bronze alloy Rubber, Wood, Carbon	5 ~ 10	50 ~ 60	≒ 1.95
DP200	By use of ultra fine diamond grain, it is possible to make sharp cutting edge. Thus it is appropriate grade to machine non-ferrous material	Plastic Wood Precise finishing of aluminum	~ 2	45 ~ 55	≒ 2.45

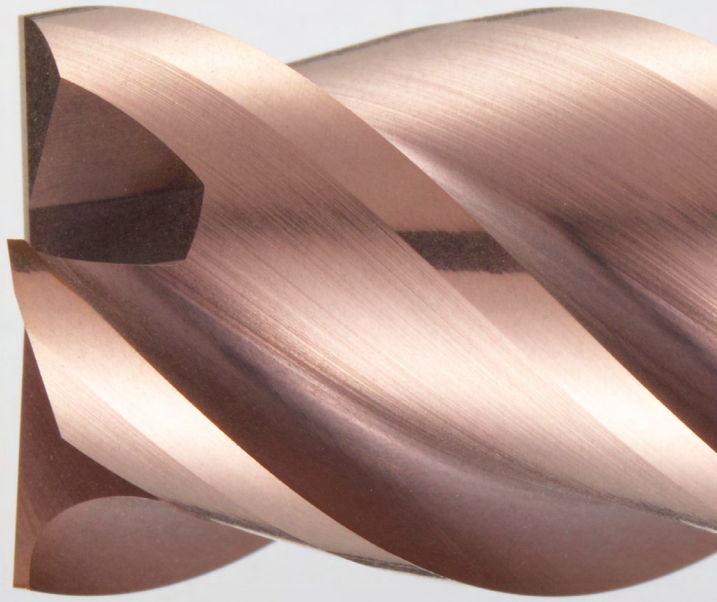
Recommended cutting condition

Workpiece	Cutting speed (m/min)	Feed (mm/rev)	Depth of cut (mm)	Recommended grade	
				1st	2nd
Aluminum alloy (4%~8%Si)	1000 ~ 3000	0.1 ~ 0.6	~ 3	DP150	DP200
Aluminum alloy (9%~14%Si)	600 ~ 2500	0.1 ~ 0.5	~ 3	DP150	DP200
Aluminum alloy (15%~18%Si)	300 ~ 700	0.1 ~ 0.4	~ 3	DP150	DP200
Copper, Bronze alloy	~ 1000	0.05 ~ 0.2	~ 3	DP150	DP200
Reinforced plastic	~ 1000	0.1 ~ 0.3	~ 2	DP150	DP200
Wood	~ 4000	0.1 ~ 0.4	-	DP150	DP200
Cemented carbide	10 ~ 30	~ 0.2	~ 0.5	DP90	DP150

PART 3

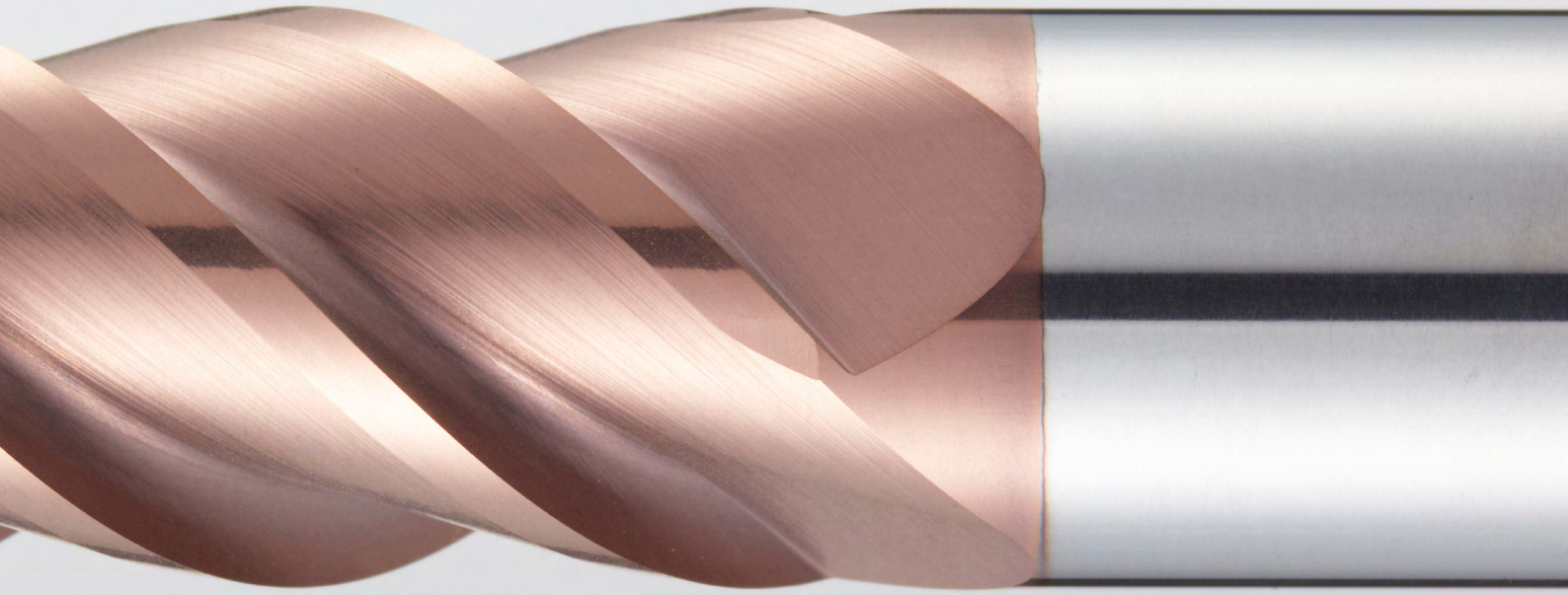
ENDMILLS

**Korloy Endmills, with New technology and our technical know-how,
are the best for increasing productivity and machinability**



Technical information for ENDMILLS

B3 **Code system**
B5 **KORLOY Endmill**
B11 **Endmill selection guide**
B13 **Super Endmill for HRSA** [for difficult-to-cut materials HRSA]
B17 **Super Endmill for Ti** [for difficult-to-cut materials Ti]
B22 **The Mirror Endmill** [for high precision mold manufacture]
B24 **H-Star Endmill** [for high hardness steel(HRC50~63)]
B92 **U-Star Endmill** [for medium hardness steel(HRC30~50)]
B175 **G-Star Endmill** [for low hardness steel(HRC10~30)]
B200 **R+ Endmill** [for high efficient roughing]
B207 **S-Star Endmill** [for stainless steel]
B219 **A-Star Endmill** [for aluminum]
B230 **D Endmill** [for graphite]
B239 **Composite Router Endmill** [for composite materials]
B243 **T Endmill** [for dental prostheses]
B262 **C-Max** [for copper based electrode]
B266 **PCD Endmill** [for non-ferrous metals]
B267 **Special Order Form for Endmills**



D B E 2 040 - 050 -

1	2	3	4	5	6
Series	Type	Endmill	No. of flutes	Cutting dia.	Overall length

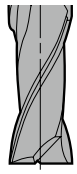
1 Series

D B E 2 040-050-R T-V N S

Z, IP, ZP	: Endmill for general usage	FM	: High feed Endmill
P	: High speed/ hardness Endmill	SSEA, AP	: Aluminum Endmill
C	: Copper, Copper alloy Endmill	SP	: Stainless Endmill
D	: Graphite, Non-Ferrous Endmill	CC	: Composite Router Endmill
V	: Variable Endmill	T	: Dental Endmill

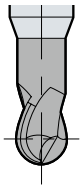
2 Type

D B E 2 040-050-R T-V N S



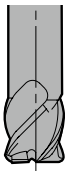
Flat type

F



Ball type

B



Radius type

R

3 Endmill

D B E 2 040-050-R T-V N S

4 No. of flutes

D B E 2 040-050-R T-V N S

2 Flutes

2

3 Flutes

3

4 Flutes

4

6 Flutes

6

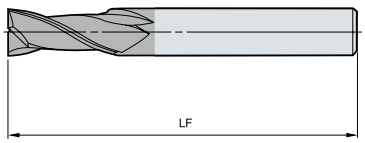
5 Cutting dia

D B E 2 040-050-R T-V N S

Cutting dia	
Notation	DC(mm)
040	Ø4.0
060	Ø6.0
080	Ø8.0
100	Ø10.0

6 Overall length

D B E 2 040-050-R T-V N S



Overall length	
Notation	LF(mm)
050	50
080	80
100	100

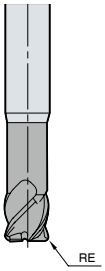
※ The above code system is not applied for SSEA (Aluminum Endmill) and ZSE (Brazing Endmill)

R02 T00 - V05 N12 S06

7 Corner radius | 8 Taper angle | 9 Flute length | 10 Neck length | 11 Shank diameter

7 Corner radius

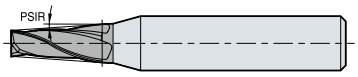
D B E 2 040 - 050 - **R** T - V N S



Corner radius	
Notation	RE(mm)
R02	r 0.2
R05	r 0.5
R10	r 1.0
R15	r 1.5

8 Taper angle

D B E 2 040 - 050 - R **T** - V N S

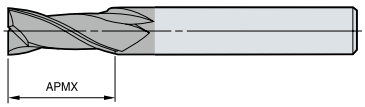


PSIR(BHTA) : Taper Angle

Taper Angle	
Notation	PSIR(BHTA)
T10	1°
T15	1.5°
T20	2°

9 Flute length

D B E 2 040 - 050 - R T - **V** N S

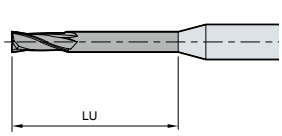


Taper length	
Notation	APMX(mm)
V05	5
V10	10
V15	15

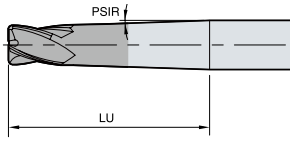
※ This code system is also for special endmills

10 Neck length

D B E 2 040 - 050 - R T - V **N** S



Long Neck



Taper Long Neck

LU (mm) : Neck Length

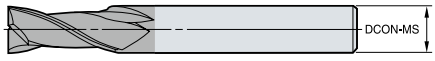
Long	
Notation	LU(mm)
N05	5
N08	8
N10	10
N12	12

PSIR(BHTA) : Taper Angle

Taper long neck	
Notation	LU + PSIR(mm)
N0510	5+1°
N0815	8+1.5°
N1020	10+2°
N1225	12+2.5°

11 Shank diameter

D B E 2 040 - 050 - R T - V N **S**



Shank diameter	
Notation	DCON-MS
S06	Ø6
S08	Ø8
S10	Ø10
S12	Ø12
S16	Ø16

Type	Used	Shape	Designation	Figure	Coated	No. of flute	Size (DC) Min	Size (DC) Max	Workpiece P Steel	Workpiece M Stainless steel	Workpiece K Cast iron	Workpiece N Non-ferrous metal	Workpiece S Heat resistant alloy, Titanium alloy	Workpiece H Hardened steel	page
Super Endmill	HRSA	Flat	SFES		SL	4	3.0	20.0					◎		B14
		Radius	SRES		SL	4	3.0	20.0					◎		B15
	Ti/STS	Flat	SFET		UL	4	3.0	20.0		◎			◎		B18
		Radius	SRET		UL	4	3.0	20.0		◎			◎		B19
		Ball	SBET		UL	2	4.0	12.0		◎			◎		B20
			SBET		UL	4	4.0	12.0		◎			◎		B21
The Mirror Endmill	High precision mold manufacture	Ball	PCD-MBE		-	-	0.3	2.0	◎					◎	B22
			cBN-MBE		-	2	0.4	2.0						◎	B23
		Radius	cBN-MRE		-	2	0.4	2.0						◎	B23
H-Star Endmill	High speed, High hardness	Flat	ESE702		AlTiN	2	0.1	20.0	○				○	◎	B26
			ESE712		AlTiN	2	1.0	6.0	○				○	◎	B27
			ESE704		AlTiN	4	1.0	20.0	○				○	◎	B28
			ESE714		AlTiN	4	1.0	12.0	○				○	◎	B29
			ESE724(6)		AlTiN	4/6	1.0	12.0	○				○	◎	B30
			ESE744		AlTiN	4	1.0	12.0	○				○	◎	B31
			ESE716		AlTiN	6	6.0	20.0	○				○	◎	B32
			ESRE712		AlTiN	2	0.1	12.0	○				○	◎	B33
			ESRE714		AlTiN	4	0.5	12.0	○				○	◎	B36
			ESXE704		AlTiN	4	1.0	12.0	○				○	◎	B38
			ESXE714		AlTiN	4	2.0	12.0	○				○	◎	B38
			ESLNS20		AlTiN	2	0.1	5.0	○				○	◎	B39
			ESLNS40		AlTiN	4	1.0	5.0	○				○	◎	B43
		Radius	ESR702		AlTiN	2	1.0	12.0	○				○	◎	B45
			ESR732		AlTiN	2	1.0	12.0	○				○	◎	B48
			ESR704		AlTiN	4	1.0	12.0	○				○	◎	B49
			ESR714		AlTiN	4	3.0	12.0	○				○	◎	B51
			ESR724		AlTiN	4	6.0	12.0	○				○	◎	B51
			ESR734		AlTiN	4	1.0	12.0	○				○	◎	B52
			ESR706		AlTiN	6	6.0	12.0	○				○	◎	B53

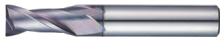
◎ : Excellent ○ : Good

Type	Used	Shape	Designation	Figure	Coated	No. of flute	Size (DC) Min	Size (DC) Max	Workpiece P Steel	Workpiece M Stainless steel	Workpiece K Cast iron	Workpiece N Non-ferrous metal	Workpiece S Heat resistant alloy, Titanium alloy	Workpiece H Hardened steel	page
H-Star Endmill	High speed, High hardness	Radius	ESR736		AlTiN	6	6.0	12.0	○				○	◎	B53
			ESRR712		AlTiN	2	0.2	16.0	○				○	◎	B54
			ESRR714		AlTiN	4	0.5	20.0	○				○	◎	B60
			ESXR704		AlTiN	4	2.0	12.0	○				○	◎	B67
			ESLNR20		AlTiN	2	0.2	3.0	○				○	◎	B68
			ESTNR20		AlTiN	2	0.2	3.0	○				○	◎	B72
		High feed	ESPM4		AlTiN	4	3.0	12.0	○				○	◎	B74
		Ball	ESB702		AlTiN	2	0.1	12.0	○				○	◎	B75
			ESB712		AlTiN	2	1.0	12.0	○				○	◎	B76
			ESB703		AlTiN	3	2.0	12.0	○				○	◎	B77
			ESB734		AlTiN	4	2.0	10.0	○				○	◎	B77
			ESRB712		AlTiN	2	0.1	12.0	○				○	◎	B78
			ESLNB20		AlTiN	2	0.1	5.0	○				○	◎	B83
			ESTNB20		AlTiN	2	0.2	10.0	○				○	◎	B87
			ESTNB30		AlTiN	3	2.0	5.0	○				○	◎	B91
U-Star Endmill	General	Flat	UE502		AlCrN	2	0.1	25.0	◎	○	○			○	B94
			UE512		AlCrN	2	0.1	12.0	◎	○	○			○	B96
			UE522		AlCrN	2	1.0	25.0	◎	○	○			○	B99
			UXE502		AlCrN	2	0.1	20.0	◎	○	○			○	B101
			UE504H		AlCrN	4	1.0	20.0	◎	○	○			○	B103
			UE514		AlCrN	4	1.0	12.0	◎	○	○			○	B104
			UE524		AlCrN	4	1.0	25.0	◎	○	○			○	B106
			ULE504		AlCrN	4	3.0	16.0	◎	○	○			○	B108
			UE504		AlCrN	4	0.8	25.0	◎	○	○			○	B109
			UXE504		AlCrN	4	1.0	20.0	◎	○	○			○	B110
			UE506		AlCrN	6	6.0	20.0	◎	○	○			○	B111
			UTE502		AlCrN	2	0.3	10.0	◎	○	○			○	B112
			UTE504		AlCrN	4	0.8	10.0	◎	○	○			○	B114

◎ : Excellent ○ : Good

Type	Used	Shape	Designation	Figure	Coated	No. of flute	Size (DC) Min	Size (DC) Max	Workpiece P Steel	Workpiece M Stainless steel	Workpiece K Cast iron	Workpiece N Non-ferrous metal	Workpiece S Heat resistant alloy, Titanium alloy	Workpiece H Hardened steel	page
U-Star Endmill	General	Radius	UR502		AlCrN	2	0.2	20.0	◎	○	○			○	B117
			UR512		AlCrN	2	0.2	20.0	◎	○	○			○	B120
			UR542		AlCrN	2	0.2	4.0	◎	○	○			○	B126
			UR504		AlCrN	4	3.0	20.0	◎	○	○			○	B132
			UR544		AlCrN	4	1.0	4.0	◎	○	○			○	B133
			UXR504		AlCrN	4	1.0	20.0	◎	○	○			○	B137
			UXR514		AlCrN	4	1.0	20.0	◎	○	○			○	B140
			UR506		AlCrN	6	6.0	20.0	◎	○	○			○	B145
			UDR503		AlCrN	3	6.0	20.0	◎	○	○			○	B146
			USPM4		AlCrN	4	1.0	20.0	◎	○	○			○	B147
			UTR504		AlCrN	4	0.8	2.5	◎	○	○			○	B148
		Ball	UB502		AlCrN	2	1.0	25.0	◎	○	○			○	B152
			UB502P		AlCrN	2	0.1	12.0	◎	○	○			○	B154
			UB512		AlCrN	2	0.1	12.0	◎	○	○			○	B155
			UB512S6		AlCrN	2	0.5	2.0	◎	○	○			○	B159
			UB532		AlCrN	2	3.0	12.0	◎	○	○			○	B160
			UB542		AlCrN	2	0.1	12.0	◎	○	○			○	B161
			USB502		AlCrN	2	3.0	20.0	◎	○	○			○	B168
			UB503		AlCrN	3	1.0	12.0	◎	○	○			○	B169
			UB504		AlCrN	4	1.0	12.0	◎	○	○			○	B169
			UTB502		AlCrN	2	0.3	2.0	◎	○	○			○	B170
		Roughing	UF50		AlCrN	3~5	3.0	25.0	◎	○	○			○	B171
			UF51		AlCrN	3~5	3.0	25.0	◎	○	○			○	B172
			UF51H		AlCrN	3~5	3.0	25.0	◎	○	○			○	B173
G-Star Endmill	General	Ball	DB312		AlTiN	2	1.0	20.0	◎	○	◎		○		B177
			DB342		AlTiN	2	1.0	12.0	◎	○	◎		○		B178
		Flat	TX202		AlTiN	2	1.0	20.0	◎	○	◎		○		B179
			TX204		AlTiN	4	1.0	20.0	◎	○	◎		○		B180

◎ : Excellent ○ : Good

Type	Used	Shape	Designation	Figure	Coated	No. of flute	Size (DC) Min	Size (DC) Max	Workpiece P Steel	Workpiece M Stainless steel	Workpiece K Cast iron	Workpiece N Non-ferrous metal	Workpiece S Heat resistant alloy, Titanium alloy	Workpiece H Hardened steel	page
G-Star Endmill	General	Flat	TX222		AlTiN	2	3.0	20.0	◎	○	◎		○		B181
			TX224		AlTiN	4	3.0	20.0	◎	○	◎		○		B182
			TX302		AlTiN	2	1.0	20.0	◎	○	◎		○		B183
			TX304		AlTiN	4	1.0	20.0	◎	○	◎		○		B184
			TX304H		AlTiN	4	3.0	20.0	◎	○	◎		○		B185
		Ball	TXB202		AlTiN	2	1.0	20.0	◎	○	◎		○		B186
			TXB204		AlTiN	4	2.0	20.0	◎	○	◎		○		B187
			TXB222		AlTiN	2	3.0	20.0	◎	○	◎		○		B188
			TXB232		AlTiN	2	3.0	20.0	◎	○	◎		○		B189
			TXB302		AlTiN	2	1.0	20.0	◎	○	◎		○		B190
			TXB304		AlTiN	4	1.0	20.0	◎	○	◎		○		B191
		Flat	ZE302P		AlTiN	2	1.0	20.0	◎	○	◎		○		B192
			ZE304P		AlTiN	4	1.0	20.0	◎	○	◎		○		B193
			ZE322		AlTiN	2	3.0	20.0	◎	○	◎		○		B194
			ZE324		AlTiN	4	3.0	20.0	◎	○	◎		○		B195
		Radius	ZR304H		AlTiN	4	3.0	12.0	◎	○	◎		○		B196
			ZR322		AlTiN	2	3.0	12.0	◎	○	◎		○		B197
		Radius	ZR324		AlTiN	4	3.0	12.0	◎	○	◎		○		B198
			ZR324H		AlTiN	4	6.0	12.0	◎	○	◎		○		B199
R+ Endmill	Aluminum	Roughing	RPAE		Carbide, Non	3	6.0	25.0				◎			B202
	General		RPE-FP-H		Carbide, TiAlN	4	5.0	20.0	◎	○	◎		○		B202
			RPLE-FP-H		Carbide, TiAlN	4	5.0	20.0	◎	○	◎		○		B203
			RPE-XG		Carbide, TiAlN	4	5.0	20.0	◎	○	◎		○		B203
			RPE-FP-L		Carbide, TiAlN	4	5.0	20.0	◎	○	◎		○		B204
			RPE-RG		Carbide, TiAlCrN	4	5.0	20.0	◎	○	◎		○		B204
			RPE-RG		HSS, TiAlN	4	6.0	20.0	◎	○	◎		○		B205
			RPE-FF		HSS, TiAlN	4	6.0	20.0	◎	○	◎		○		B205
			RPE-FP		HSS, TiAlN	4	6.0	20.0	◎	○	◎		○		B206
			RPE-RG		HSS, TiCN HSS, TiN	4	6.0	50.0	◎	○	◎		○		B206

◎ : Excellent ○ : Good

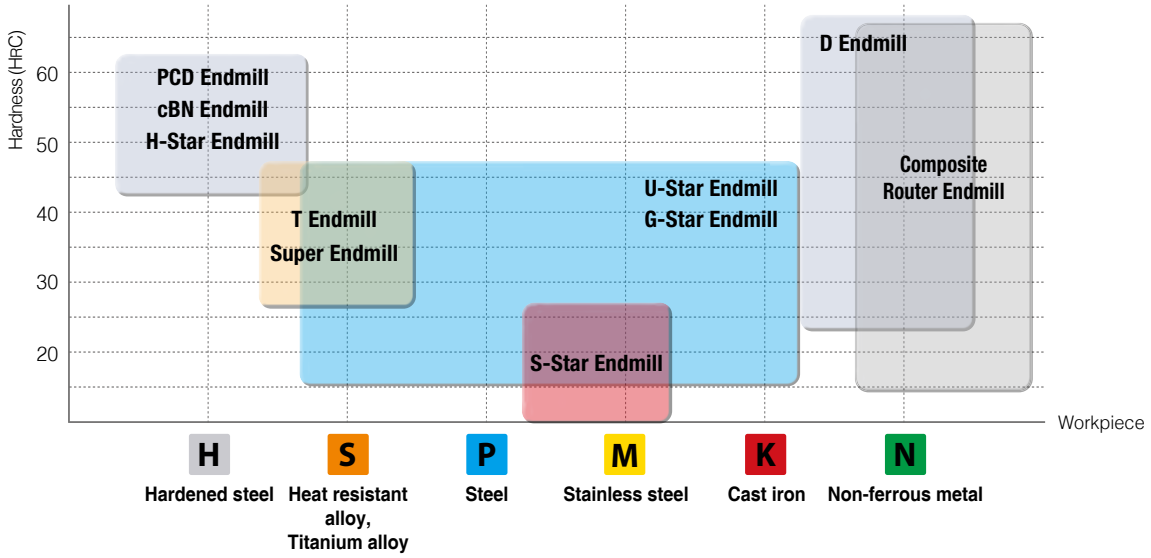
Type	Used	Shape	Designation	Figure	Coated	No. of flute	Size (DC) Min	Size (DC) Max	Workpiece P Steel	Workpiece M Stainless steel	Workpiece K Cast iron	Workpiece N Non-ferrous metal	Workpiece S Heat resistant alloy, Titanium alloy	Workpiece H Hardened steel	page
S-Star Endmill	STS	Flat	SPFE2000		AlCrN	2	1.0	20.0	○	◎			○		B208
			SPFE3000		AlCrN	3	1.0	20.0	○	◎			○		B209
			SPFE4000		AlCrN	4	1.0	20.0	○	◎			○		B210
			SPFE6000		AlCrN	6	6.0	20.0	○	◎			○		B211
		Radius	SPRE4000		AlCrN	4	1.0	20.0	○	◎			○		B212
			SPRE5000		AlCrN	5	6.0	20.0	○	◎			○		B214
			SPRE7000		AlCrN	7	6.0	20.0	○	◎			○		B215
		Ball	SPBE2000		AlCrN	2	1.0	12.0	○	◎			○		B216
			SPBE4000		AlCrN	4	3.0	20.0	○	◎			○		B217
		Roughing	SPXE3000 SPXE4000 SPXE5000		AlCrN	3~5	3.0	20.0	○	◎			○		B218
A-Star Endmill	Aluminum	Flat	APFE		Non	2	2.5	20.0	○			◎			B220
					Non	3	2.5	20.0	○			◎			B220
		Middle Flat	APMFE		Non	2	3.0	20.0	○			◎			B221
					Non	3	3.0	20.0	○			◎			B221
		Long Flat	APLFE		Non	2	3.0	20.0	○			◎			B222
					Non	3	3.0	20.0	○			◎			B222
		Ball	APBE		Non	2	1.0	12.0	○			◎			B223
		Short Flat	AFE		Non	3	1.0	20.0	○			◎			B224
		Flat			Non	3	1.0	20.0	○			◎			B225
		Long Flat			Non	3	1.0	20.0	○			◎			B226
		Roughing	APRE		Non	3	4.0	25.0	○			◎			B228
		Wave Roughing	RPAE		Carbide, Non	3	6.0	25.0				◎			B229
D Endmill	Graphite, Ceramics	Flat	DFE		Diamond	2	1.0	12.0				◎			B231
					Diamond	4	2.0	12.0				◎			B232
		Radius	DRE		Diamond	2	0.5	3.0				◎			B233
					Diamond	4	2.0	12.0				◎			B234
		Ball	DBE		Diamond	2	0.6	12.0				◎			B236
					Diamond	4	2.0	12.0				◎			B238

◎ : Excellent ○ : Good

Type	Used	Shape	Designation	Figure	Coated	No. of flute	Size (DC) Min	Size (DC) Max	Workpiece P Steel	Workpiece M Stainless steel	Workpiece K Cast iron	Workpiece N Non-ferrous metal	Workpiece S Heat resistant alloy, Titanium alloy	Workpiece H Hardened steel	page
Composite Router Endmill	Composite CFRP, GFRP	Flat	CCDR		Diamond	4	6.0	8.0				◎			B240
					Diamond	6	10.0	12.0				◎			B240
			CCHR		Diamond	4	6.0	8.0				◎			B240
					Diamond	6	10.0	12.0				◎			B240
			CCR		Diamond	2	4.0	12.0				◎			B241
			CCLR		Diamond	4	4.0	12.0				◎			B241
			CCRR		Diamond	6	6.0	8.0				◎			B242
					Diamond	8	10.0	12.0				◎			B242
T Endmill	Dental, Zirconia	Ball	TZBE		Diamond	2	0.6	3.0				◎			B243
	Dental, Metal		TTBE		Diamond	2	0.6	3.0					◎		B243
	Dental, Wax		TWBE		-	2	0.6	3.0				◎			B243
C-Max	Cooper, Cooper alloy	Flat	CFE2000		CrN	2	1	12	○			◎			B262
		Long Flat	CFNE2000		CrN	2	0.5	4	○			◎			B263
		Ball	CBE2000		CrN	2	1	12	○			◎			B264
		Long Ball	CBNE2000		CrN	2	0.5	4	○			◎			B264
		Radius	CRE2000		CrN	2	2	12	○			◎			B265
		Long Radius	CRNE2000		CrN	2	1	4	○			◎			B265
PCD Endmill	Non-ferrous, High speed	Flat	PDE		-	1	4.6	6.0				◎			B266
					-	2	6.0	12.0				◎			B266

◎ : Excellent ○ : Good

Application range



Tool selection guideline by functions

● 1st recommended ◑ 2nd recommended ○ Not recommended

Type	No. of flute	Precis finishing	Finishing	Roughing	Slotting	Plunging	Copying	Trochoidal milling
Flat/ Radius	2 flutes	○	○	◑	●	●	○	○
	3 flutes	○	◑	◑	●	◑	○	○
	4 flutes	●	●	●	●	○	○	●
	6 flutes or over	●	●	○	○	○	○	●
Ball	2 flutes	○	○	○	●	○	●	○
	4 flutes	○	○	○	◑	○	●	○

- It is recommended to choose the shortest length tool in every application as possible.
- Stable machining actualizes long tool life and enhanced surface finish.

Line-up and features

Workpiece	Used	Product name	Type	No. of tooth	Diameter (Range)	Picture / No. of standard items	Features
H	High hardness (~HRC65)	The Mirror Endmill (PCD)	B	-	0.3~2	6 Items	• Optimal surface finish by PCD ball Endmill with no edge • Nano-level surface finish due to its ultra-fine Endmill
H	High hardness (~HRC65)	The Mirror Endmill (cBN)	B	2	0.4~2	9 Items	• Higher productivity and surface finish in high speed cutting • Stable tool life and surface from high precision Endmill
H	High hardness (HRC50~63)	H-Star Endmill	F B R	2~6	1.0~20	3,007 Items	• Suitable for high speed machining of hardened work-pieces (HRC50~63) • Improved initial chipping resistance and good wear resistance with optimized edge treatment for high hardness steel cutting
P K	Hardness (HRC30~50)	U-Star Endmill	F B R	2~6	0.1~25	4,585 Items	• Suitable for machining medium hardness workpieces (HRC30~50) made of alloy steel, carbon steel, die steel, etc.
P K	General (~HRC30)	G-Star Endmill	F B R	2~4	1.0~20	456 Items	• For general machining with high performance and high quality • For various workpiece machining (carbon steel, alloy steel, cast iron, pre-hardened, etc.)
M	Stainless steel	S-Star Endmill	F B R R	2~7	1.0~20	218 Items	• Optimal performance in stainless machining • Enhanced oxidation resistance
S	HRSA	Super Endmill	F R	4	3.0~20	162 Items	• Endmill for HRSA machining • Optimal for machining of Ni based HRSA such as Inconel, Hastelloy, Waspaloy, etc.
S	Titanium	Super Endmill	F R	2/4	1.0~20	64 Items	• Endmill for titanium and stainless steel cutting • Longer tool life : high toughness substrate and high lubrication coating layer
N	Non-ferrous metal, Aluminum	A-Star Endmill	F B R	2~3	1.0~20	187 Items	• Effective chip evacuation in high feed machining with U-shape • Double relief angle (stronger cutting edge)
N	Composite materials	Composite Router Endmill	F	2~8	4.0~12	44 Items	• Router for composite material machining • High performance due to Nano-Crystalline dia-coating
N	Graphite, Ceramics	D Endmill	F B R	2~4	0.6~12	280 Items	• Longer tool life due to high hardness dia-coating • Applying one-pass grinding and good surface finish
N	Dental, metal, wax, Zirconia	T Endmill	B	2	0.6~3	214 Items	• Endmill for machining materials for dental prosthesis, Zirconia, Titanium, Co-Cr, Wax, PMMA, etc. • Applicable to dental milling machine and various materi-als for stooping flutes
N	Copper, Copper alloy	C-Max Endmill	F B R	2	0.5~12	94 Items	• Application of K-Silver Coating(wear resistance, chipping resistance) • Optimal for copper and non-ferrous metal machining
For general machining with special function	Roughing	R+ Endmill	R	2~4	5.0~25	204 Items	• Endmill with a shape minimizing cutting load for roughing

Endmill for Ni series HRSA machining (Inconel, Hasteloy, Waspaloy and etc.)

Super Endmill for HRSA

• Super Endmill For HRSA increases cutting performance and cutting stability applying positive rake angle and irregular flute spacing. Also, the new coating layer with high hardness controls fracture in cutting edge and ensures long tool life for HRSA machining by its increased wear resistance.

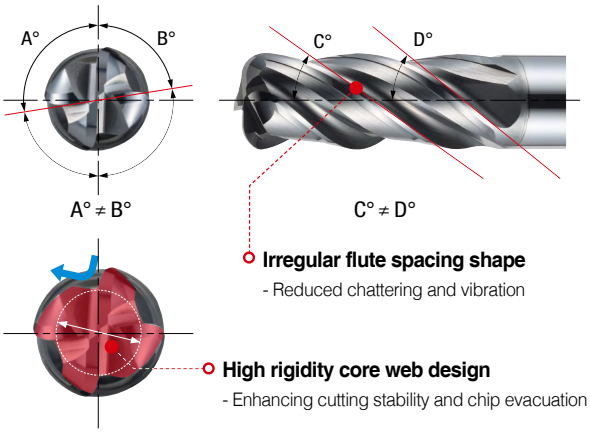
Code system

S	RE	S	4	120	-	080	-	R30
Super Endmill	**Type**	**Workpiece**	**No. of flute**	**Tool diameter**		**Overall length**		**Corner R**
	FE: Flat RE: Radius BE: Ball	S: Super alloy • Inconel718 • Waspaloy • Hastelloy T: Titanium/STS	4: 4 flutes	120: Ø12.0mm		080: 80mm		R30: 3.0mm

Features

- **Aerospace and generation industries:** Exclusive Endmill series for HRSA workpieces engine, turbine parts and etc.
- **Sharp cutting edge:** Reducing cutting load and suppression of work hardening
- **Longer tool life:** High toughness substrate and new grade with high wear resistance applied

SRES4000 (Radius)



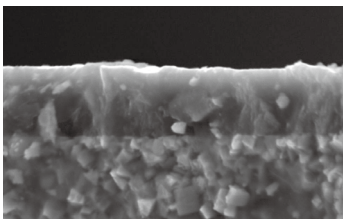
Irregular flute spacing shape
- Reduced chattering and vibration

High rigidity core web design
- Enhancing cutting stability and chip evacuation

SFES4000 (Flat)

Corner gash land shape
- Prevent fracture on the corner edge

Grade features



SL Coated (Super Lubricating coating)

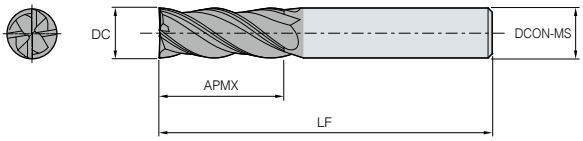
- **Applying high lubrication coating and special surface treatment technology**
  - Increased welding resistance, chipping resistance and cutting stability by surface treatment technology

SFES4000

Flat

4 | H·A 35°/38° | h6 shank | SL Coated

DC	Tolerance
Ø3 ~ Ø6	0.00 ~ -0.015
Ø8 ~ Ø20	0.00 ~ -0.020



(mm)

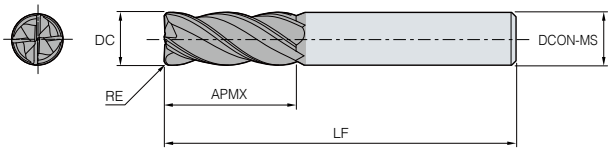
Designation		DC	DCON-MS	APMX	LF
SFES	4030-050	3	6	8	50
	4040-050	4	6	10	50
	4050-060	5	6	15	60
	4060-060	6	6	15	60
	4080-070	8	8	20	70
	4100-075	10	10	25	75
	4120-080	12	12	30	80
	4140-090	14	14	35	90
	4160-100	16	16	42	100
	4200-100	20	20	48	100

SRES4000

Radius

4 | H·A 35°/38° | h6 shank | SL Coated | RE ±0.01

DC	Tolerance
Ø3 ~ Ø6	0.00 ~ -0.015
Ø8 ~ Ø20	0.00 ~ -0.020



(mm)

Designation		DC	DCON-MS	APMX	LF	RE
SRES	4030-055-R02	3	6	8	55	0.2
	4030-055-R03	3	6	8	55	0.3
	4030-055-R05	3	6	8	55	0.5
	4040-055-R02	4	6	10	55	0.2
	4040-055-R03	4	6	10	55	0.3
	4040-055-R05	4	6	10	55	0.5
	4040-070-R02	4	6	10	70	0.2
	4040-070-R03	4	6	10	70	0.3
	4040-070-R05	4	6	10	70	0.5
	4050-055-R02	5	6	15	55	0.2
	4050-055-R03	5	6	15	55	0.3
	4050-055-R05	5	6	15	55	0.5
	4050-090-R02	5	6	15	90	0.2
	4050-090-R03	5	6	15	90	0.3
	4050-090-R05	5	6	15	90	0.5
	4060-060-R03	6	6	15	60	0.3
	4060-060-R05	6	6	15	60	0.5
	4060-060-R08	6	6	15	60	0.8
	4060-060-R10	6	6	15	60	1
	4060-060-R15	6	6	15	60	1.5
	4060-060-R20	6	6	15	60	2
	4060-090-R03	6	6	15	90	0.3
	4060-090-R05	6	6	15	90	0.5
	4060-090-R08	6	6	15	90	0.8
	4060-090-R10	6	6	15	90	1
	4060-090-R15	6	6	15	90	1.5
	4060-090-R20	6	6	15	90	2
	4080-070-R03	8	8	20	70	0.3
	4080-070-R05	8	8	20	70	0.5
	4080-070-R08	8	8	20	70	0.8
	4080-070-R10	8	8	20	70	1
	4080-070-R15	8	8	20	70	1.5
	4080-070-R20	8	8	20	70	2
	4080-070-R25	8	8	20	70	2.5
	4080-070-R30	8	8	20	70	3
	4080-100-R03	8	8	20	100	0.3
	4080-100-R05	8	8	20	100	0.5
	4080-100-R08	8	8	20	100	0.8
	4080-100-R10	8	8	20	100	1
	4080-100-R15	8	8	20	100	1.5
	4080-100-R20	8	8	20	100	2
	4080-100-R25	8	8	20	100	2.5

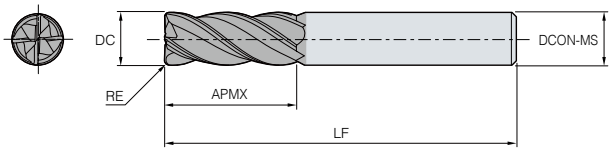
Designation		DC	DCON-MS	APMX	LF	RE
SRES	4080-100-R30	8	8	20	100	3
	4100-075-R03	10	10	25	75	0.3
	4100-075-R05	10	10	25	75	0.5
	4100-075-R08	10	10	25	75	0.8
	4100-075-R10	10	10	25	75	1
	4100-075-R15	10	10	25	75	1.5
	4100-075-R20	10	10	25	75	2
	4100-075-R25	10	10	25	75	2.5
	4100-075-R30	10	10	25	75	3
	4100-100-R03	10	10	25	100	0.3
	4100-100-R05	10	10	25	100	0.5
	4100-100-R08	10	10	25	100	0.8
	4100-100-R10	10	10	25	100	1
	4100-100-R15	10	10	25	100	1.5
	4100-100-R20	10	10	25	100	2
	4100-100-R25	10	10	25	100	2.5
	4100-100-R30	10	10	25	100	3
	4120-080-R05	12	12	30	80	0.5
	4120-080-R08	12	12	30	80	0.8
	4120-080-R10	12	12	30	80	1
	4120-080-R15	12	12	30	80	1.5
	4120-080-R20	12	12	30	80	2
	4120-080-R25	12	12	30	80	2.5
	4120-080-R30	12	12	30	80	3
	4120-080-R35	12	12	30	80	3.5
	4120-080-R40	12	12	30	80	4
	4120-110-R05	12	12	30	110	0.5
	4120-110-R08	12	12	30	110	0.8
	4120-110-R10	12	12	30	110	1
	4120-110-R15	12	12	30	110	1.5
	4120-110-R20	12	12	30	110	2
	4120-110-R25	12	12	30	110	2.5
	4120-110-R30	12	12	30	110	3
	4120-110-R35	12	12	30	110	3.5
	4120-110-R40	12	12	30	110	4
	4140-090-R05	14	14	35	90	0.5
	4140-090-R08	14	14	35	90	0.8
	4140-090-R10	14	14	35	90	1
	4140-090-R15	14	14	35	90	1.5
	4140-090-R20	14	14	35	90	2
	4140-090-R30	14	14	35	90	3
	4140-150-R05	14	14	35	150	0.5

SRES4000

Radius

4 | H·A 35°/38° | h6 shank | SL Coated | RE ±0.01

DC	Tolerance
Ø3 ~ Ø6	0.00 ~ -0.015
Ø8 ~ Ø20	0.00 ~ -0.020



(mm)

Designation		DC	DCON-MS	APMX	LF	RE
SRES	4140-150-R08	14	14	35	150	0.8
	4140-150-R10	14	14	35	150	1
	4140-150-R15	14	14	35	150	1.5
	4140-150-R20	14	14	35	150	2
	4140-150-R30	14	14	35	150	3
	4160-100-R05	16	16	42	100	0.5
	4160-100-R08	16	16	42	100	0.8
	4160-100-R10	16	16	42	100	1
	4160-100-R15	16	16	42	100	1.5
	4160-100-R20	16	16	42	100	2
	4160-100-R25	16	16	42	100	2.5
	4160-100-R30	16	16	42	100	3
	4160-100-R35	16	16	42	100	3.5
	4160-100-R40	16	16	42	100	4
	4160-100-R50	16	16	42	100	5
	4160-100-R60	16	16	42	100	6
	4160-150-R05	16	16	42	150	0.5
	4160-150-R08	16	16	42	150	0.8
	4160-150-R10	16	16	42	150	1
	4160-150-R15	16	16	42	150	1.5
	4160-150-R20	16	16	42	150	2
	4160-150-R25	16	16	42	150	2.5
	4160-150-R30	16	16	42	150	3
	4160-150-R35	16	16	42	150	3.5
	4160-150-R40	16	16	42	150	4
	4160-150-R50	16	16	42	150	5
	4160-150-R60	16	16	42	150	6
	4180-100-R05	18	20	45	100	0.5
	4180-100-R08	18	20	45	100	0.8
	4180-100-R10	18	20	45	100	1

Designation		DC	DCON-MS	APMX	LF	RE
SRES	4180-100-R15	18	20	45	100	1.5
	4180-100-R20	18	20	45	100	2
	4180-100-R30	18	20	45	100	3
	4180-150-R05	18	20	45	150	0.5
	4180-150-R08	18	20	45	150	0.8
	4180-150-R10	18	20	45	150	1
	4180-150-R15	18	20	45	150	1.5
	4180-150-R20	18	20	45	150	2
	4180-150-R30	18	20	45	150	3
	4200-100-R05	20	20	48	100	0.5
	4200-100-R10	20	20	48	100	1
	4200-100-R15	20	20	48	100	1.5
	4200-100-R20	20	20	48	100	2
	4200-100-R25	20	20	48	100	2.5
	4200-100-R30	20	20	48	100	3
	4200-100-R35	20	20	48	100	3.5
	4200-100-R40	20	20	48	100	4
	4200-100-R50	20	20	48	100	5
	4200-100-R60	20	20	48	100	6
	4200-150-R05	20	20	48	150	0.5
	4200-150-R10	20	20	48	150	1
	4200-150-R15	20	20	48	150	1.5
	4200-150-R20	20	20	48	150	2
	4200-150-R25	20	20	48	150	2.5
	4200-150-R30	20	20	48	150	3
	4200-150-R35	20	20	48	150	3.5
	4200-150-R40	20	20	48	150	4
	4200-150-R50	20	20	48	150	5
	4200-150-R60	20	20	48	150	6

Endmills series for difficult-to-cut materials

Super Endmill for Ti

• With its optimal edge structure for Titanium machining and enlarged chip pocket in flutes design, Super Endmill For Ti reduces cutting load and cutting heat and it improves chip evacuation. In addition, applying high toughness substrate and high lubrication coating layer minimizing irregular tool fracture and welding ensure maximized tool life.

Code system

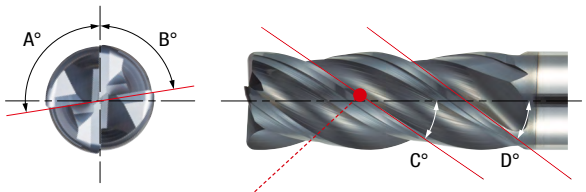
S	RE	T	4	120	-	080	-	R30
Super Endmill	**Type**	**Workpiece**	**No. of flute**	**Tool diameter**		**Overall length**		**Corner R**
	FE: Flat RE: Radius BE: Ball	S: Super alloy • Inconel718 • Waspaloy • Hastelloy T: Titanium/STS	4: 4 flutes	120: Ø12.0mm		080: 80mm		R30: 3.0mm

Features

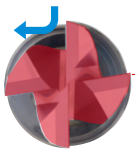
• Endmill for titanium and stainless steel cutting

• **Longer tool life :** high toughness substrate and high lubrication coating layer

SFET (Flat) / SRET (Radius)

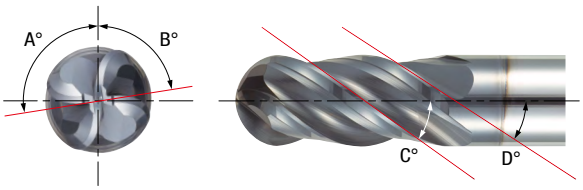


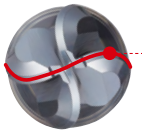
Irregular flute spacing shape
- Reduced chattering and vibration



Large chip pocket and streamlined flute design
- Good chip evacuation

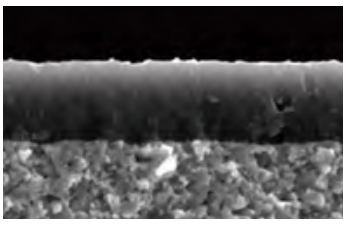
SBET (Ball)





S-curve cutting edge
- Reduced cutting load

Grade features



UL Coated (Ultra Lubricating coating)

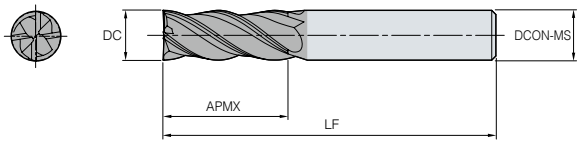
• Enhanced chip control and welding resistance by exclusive lubrication coating technology
• High chipping resistance substrate

SFET4000

Flat

4 | H·A 35°/38° | h6 shank | UL Coated

DC	Tolerance
Ø3 ~ Ø6	0.00 ~ -0.015
Ø8 ~ Ø20	0.00 ~ -0.020



(mm)

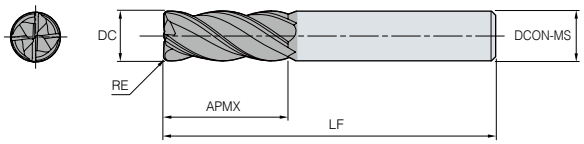
Designation		DC	DCON-MS	APMX	LF
SFET	4030-050	3	6	8	50
	4040-050	4	6	10	50
	4050-060	5	6	15	60
	4060-060	6	6	15	60
	4080-070	8	8	20	70
	4100-075	10	10	25	75
	4120-080	12	12	30	80
	4160-100	16	16	42	100
	4200-100	20	20	48	100

SRET4000

Radius

4 | H·A 35°/38° | h6 shank | UL Coated | RE ±0.01

DC	Tolerance
Ø3 ~ Ø6	0.00 ~ -0.015
Ø8 ~ Ø20	0.00 ~ -0.020



(mm)

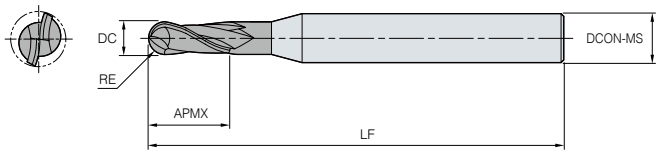
Designation		DC	DCON-MS	APMX	LF	RE
SRET	4030-050-R02	3	6	8	50	0.2
	4030-050-R05	3	6	8	50	0.5
	4040-050-R02	4	6	10	50	0.2
	4040-050-R05	4	6	10	50	0.5
	4050-060-R02	5	6	15	60	0.2
	4050-060-R05	5	6	15	60	0.5
	4050-060-R10	5	6	15	60	1
	4060-060-R03	6	6	15	60	0.3
	4060-060-R05	6	6	15	60	0.5
	4060-060-R10	6	6	15	60	1
	4080-070-R03	8	6	20	70	0.3
	4080-070-R05	8	8	20	70	0.5
	4080-070-R10	8	8	20	70	1
	4100-075-R03	10	8	25	75	0.3
	4100-075-R05	10	8	25	75	0.5
	4100-075-R10	10	10	25	75	1
	4100-075-R15	10	10	25	75	1.5
	4100-075-R20	10	10	25	75	2
	4120-080-R05	12	12	30	80	0.5
	4120-080-R10	12	12	30	80	1
	4120-080-R15	12	16	30	80	1.5
	4120-080-R20	12	16	30	80	2
	4120-080-R25	12	16	30	80	2.5
	4120-080-R30	12	16	30	80	3
	4160-100-R05	16	20	42	100	0.5
	4160-100-R10	16	20	42	100	1
	4200-100-R05	20	20	48	100	0.5
	4200-100-R10	20	20	48	100	1

SBET2000

Ball

2 | H·A 30° | h6 shank | UL Coated | RE ±0.01

DC	Tolerance
Ø4 ~ Ø6	0.00 ~ -0.015
Ø8 ~ Ø12	0.00 ~ -0.020



(mm)

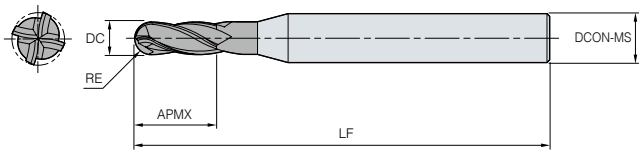
Designation		DC	DCON-MS	APMX	LF	RE
SBET	2040-050	4	6	8	50	2
	2040-070	4	6	8	70	2
	2050-060	5	6	12	60	2.5
	2050-080	5	6	12	80	2.5
	2060-060	6	6	12	60	3
	2060-090	6	6	12	90	3
	2080-070	8	8	16	70	4
	2080-100	8	8	16	100	4
	2100-075	10	10	20	75	5
	2100-100	10	10	20	100	5
	2120-080	12	12	25	80	6
	2120-100	12	12	25	100	6

SBET4000

Ball

4 | H·A 38°/40° | UL Coated | RE ±0.01

DC	Tolerance
Ø4 ~ Ø6	0.00 ~ -0.015
Ø8 ~ Ø12	0.00 ~ -0.020



(mm)

Designation		DC	DCON-MS	APMX	LF	RE
SBET	4040-050	4	6	8	50	2
	4040-070	4	6	8	70	2
	4050-060	5	6	12	60	2.5
	4050-080	5	6	12	80	2.5
	4060-060	6	6	12	60	3
	4060-090	6	6	12	90	3
	4080-070	8	8	16	70	4
	4080-100	8	8	16	100	4
	4100-075	10	10	20	75	5
	4100-100	10	10	20	100	5
	4120-080	12	12	25	80	6
	4120-100	12	12	25	100	6

High precision mold manufacture solution

The Mirror Endmill

- Suitable for high hardness (higher than HRC60) die mold super precision cutting
- Enhanced wear resistance from applying the optimal grade for PCD, cBN

PCD Endmill

For polishing of high precision workpiece and high hardness mold

- Optimal surface finish by PCD ball Endmill with no edge
- Nano-level surface finish due to its ultra-fine Endmill
- Enhanced wear resistance from applying the optimal grade for PCD

cBN Endmill (Ball)

For ultra-fine and mirror-like workpiece and mold with over HRC60 machining

- Higher productivity and surface finish in high speed cutting
- Enhanced wear resistance due to the optimal cBN grade
- Longer tool life by shape with strong cutting edge
- Stable tool life and surface from high precision Endmill

cBN Endmill (Radius)

For medium cutting of high precision workpiece and mold machining above HRC60

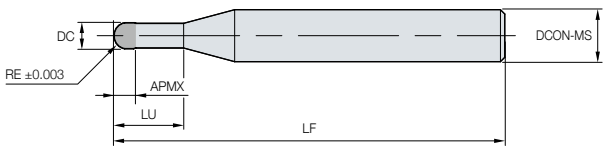
- Higher productivity in high speed machining
- Better wear resistance of tool due to applying the optimal grade for cBN
- Good surface finish through connecting smooth cutting edge and body
- Long tool life from strong cutting edge

PCD-MBE

Ball

h3 shank

DC	Tolerance
Ø0.3 ~ Ø2	0 ~ -0.008mm



(mm)

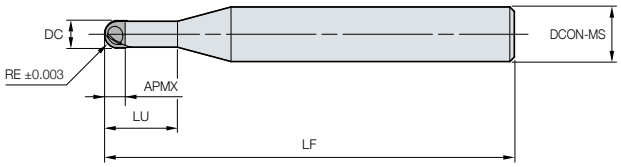
	Designation	DC	DCON-MS	APMX	LU	LF	RE
PCD-MBE	0003-048-N007S04	0.3	4	0.15	0.75	48	0.15
	0004-048-N010S04	0.4	4	0.2	1	48	0.2
	0006-048-N015S04	0.6	4	0.3	1.5	48	0.3
	0010-048-N025S04	1	4	0.5	2.5	48	0.5
	0015-048-N040S04	1.5	4	0.75	4	48	0.75
	0020-048-N050S04	2	4	1	5	48	1

cBN-MBE2000

Ball

2 | H·A 0° | h4 shank

DC	Tolerance
Ø0.4 ~ Ø2	0 ~ -0.008mm



(mm)

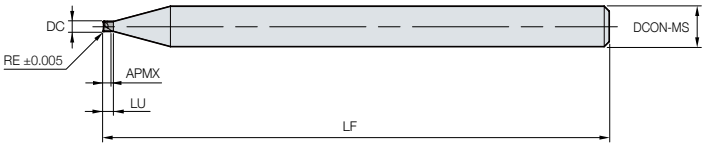
	Designation	DC	DCON-MS	APMX	LU	LF	RE
cBN-MBE	2004-050-N005S04	0.4	4	0.33	0.5	50	0.2
	2004-050-N010S04	0.4	4	0.33	1	50	0.2
	2005-050-N010S04	0.5	4	0.38	1	50	0.25
	2006-050-N015S04	0.6	4	0.5	1.5	50	0.3
	2008-050-N020S04	0.8	4	0.6	2	50	0.4
	2010-050-N025S04	1	4	0.7	2.5	50	0.5
	2012-050-N030S04	1.2	4	0.8	3	50	0.6
	2015-050-N040S04	1.5	4	1	4	50	0.75
	2020-050-N050S04	2	4	1.2	5	50	1

cBN-MRE2000

Radius

2 | H·A 0° | h4 shank

DC	Tolerance
Ø0.4 ~ Ø2	0 ~ -0.008mm



(mm)

	Designation	DC	DCON-MS	APMX	LU	LF	RE
cBN-MRE	2004-050-R005-N005S04	0.4	4	0.24	0.5	50	0.05
	2004-050-R005-N010S04	0.4	4	0.24	1	50	0.05
	2004-050-R010-N005S04	0.4	4	0.24	0.5	50	0.1
	2004-050-R010-N010S04	0.4	4	0.24	1	50	0.1
	2005-050-R005-N005S04	0.5	4	0.3	0.5	50	0.05
	2005-050-R005-N010S04	0.5	4	0.3	1	50	0.05
	2005-050-R010-N005S04	0.5	4	0.3	0.5	50	0.1
	2005-050-R010-N010S04	0.5	4	0.3	1	50	0.1
	2010-050-R010-N010S04	1	4	0.7	1	50	0.1
	2010-050-R010-N020S04	1	4	0.7	2	50	0.1
	2010-050-R010-N030S04	1	4	0.7	3	50	0.1
	2010-050-R010-N040S04	1	4	0.7	5	50	0.1
	2010-050-R020-N010S04	1	4	0.7	1	50	0.2
	2010-050-R020-N020S04	1	4	0.7	2	50	0.2
	2015-050-R010-N030S04	1.5	4	0.85	3	50	0.1
	2015-050-R010-N045S04	1.5	4	0.85	4.5	50	0.1
	2015-050-R010-N075S04	1.5	4	0.85	7.5	50	0.1
	2015-050-R020-N045S04	1.5	4	0.85	4.5	50	0.2
	2020-050-R010-N040S04	2	4	0.85	4	50	0.1
	2020-050-R010-N060S04	2	4	0.85	6	50	0.1
	2020-050-R010-N100S04	2	4	0.85	10	50	0.1
	2020-050-R020-N040S04	2	4	0.85	4	50	0.2
	2020-050-R020-N060S04	2	4	0.85	6	50	0.2
	2020-050-R020-N100S04	2	4	0.85	10	50	0.2

※ In case longer flute length than 0.85mm with Ø1.5~ 2.0 is necessary, it could be order made by 1.2mm.

For high hardness (HRC50~63)

H-Star Endmill

- **High hardness coating layer** - Ensuring stable cutting from high Si content, increased wear resistance and frictional heat resistance due to applying a new AlTiSiN series coating layer
- **High hardness substrate** - Containing ultra-fine WC + Co 9% and expanded general application range by maximizing cutting edge feature
- **Edge treatment** - Increased chipping resistance in the beginning of high hardness steel cutting and enhanced wear resistance lead to stable cutting

Code system

ES	R	70	4	100	15	32	-	10
H-Star Endmill	Type	Length, Shank type	No. of flute	Tool dia.	Corner R	Effective		Shank dia.

Type
- B: Ball
- E: Flat
- R: Radius
- XE: Flat (irregular flute spacing)
- XR: Radius (irregular flute spacing)
- PM: Power mill
- RB: Rib ball
- RE: Rib flat
- RR: Rib radius
- LNB: Long neck ball
- TNB: Taper neck ball
- LNS: Long neck flat
- LNR: Long neck radius

Length, Shank type
- 70: Neck
- 71: Straight, neck
- 72: Long shank neck
- 73: Long shank
- 74: Helix 35°

No. of flute
- 2: 2 flutes
- 3: 3 flutes
- 4: 4 flutes
- 6: 6 flutes

Tool dia.
- 010: Ø1.0mm
- 060: Ø6.0mm
- 065: Ø6.5mm
- 100: Ø10.0mm

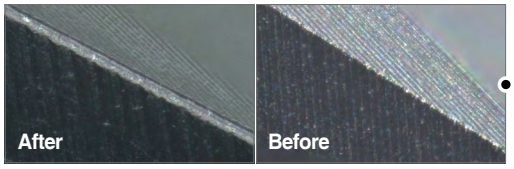
Corner R
- 05: 0.5mm
- 15: 1.5mm
- 20: 2.0mm

Effective
- 10: 10mm
- 12: 12mm
- 32: 32mm

Shank dia.
- 06: Ø6.0mm
- 10: Ø10.0mm
- 12: Ø12.0mm

Features

- **Edge treatment**

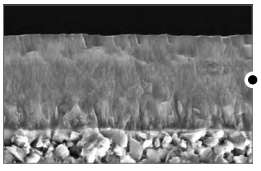


- Enhancing chipping resistance in the beginning of high hardness steel cutting
- Increased wear resistance and stable cutting performance

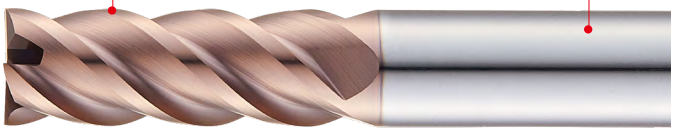
- **High hardness substrate**

- Ultra-fine WC + Co 9%
- Expanded general application range by maximizing cutting edge feature

- **High hardness coating layer (PC305H)**



- High Si content
- Enhanced wear resistance
- Stable cutting through frictional heat resistance increase



Line-up

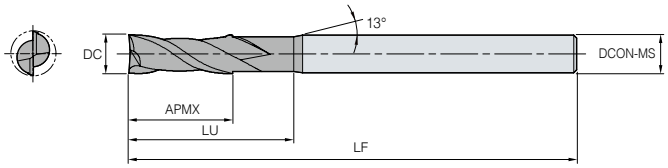
Designation	Appearance	Type	Tolerance	Irregular flute spacing	page
ESE702		2 flutes neck type flat Endmill	Ø0.1 ~ 20.0		B26
ESE712		2 flutes flat Endmill	Ø1.0 ~ 12.0		B27
ESE704		4 flutes neck type flat Endmill	Ø1.0 ~ 20.0		B28
ESE714		4 flutes high helix flat Endmill	Ø1.0 ~ 12.0		B29
ESE724(6)		4&6 flutes neck type flat Endmill	Ø1.0 ~ 12.0		B30
ESE744		4 flutes high helix flat Endmill	Ø1.0 ~ 12.0		B31
ESE716		6 flutes high helix flat Endmill	Ø6.0 ~ 20.0		B32
ESRE712		2 flutes rib neck type flat Endmill	Ø0.1 ~ 12.0		B33~B35
ESRE714		4 flutes rib flat Endmill	Ø0.5 ~ 12.0		B36~B37
ESXE704		4 flutes neck type flat Endmill	Ø1.0 ~ 12.0	●	B38
ESXE714		4 flutes flat Endmill	Ø2.0 ~ 12.0	●	B38
ESLNS20		2 flutes long neck type flat Endmill	Ø0.1 ~ 5.0		B39~B42
ESLNS40		4 flutes long neck type flat Endmill	Ø1.0 ~ 5.0		B43~B44
ESR702		2 flutes neck type radius Endmill	Ø1.0 ~ 12.0		B45~B47
ESR732		2 flutes long shank radius Endmill	Ø1.0 ~ 12.0		B48
ESR704		4 flutes neck type radius Endmill	Ø1.0 ~ 12.0		B49~B50
ESR714		4 flutes radius Endmill	Ø3.0 ~ 12.0		B51
ESR724		4 flutes neck type radius Endmill	Ø6.0 ~ 12.0		B51
ESR734		4 flutes long shank radius Endmill	Ø1.0 ~ 12.0		B52
ESR706		6 flutes neck type radius Endmill	Ø6.0 ~ 12.0		B53
ESR736		6 flutes radius Endmill	Ø6.0 ~ 12.0		B53
ESRR712		2 flutes rib radius Endmill	Ø0.2 ~ 16.0		B54~B59
ESRR714		4 flutes rib radius Endmill	Ø0.5 ~ 20.0		B60~B66
ESXR704		4 flutes neck type radius Endmill	Ø1.0 ~ 12.0	●	B67
ESLNR20		2 flutes long radius Endmill	Ø0.2 ~ 3.0		B68~B71
ESTNR20		2 flutes tapered neck type radius Endmill	Ø0.2 ~ 3.0		B72~B73
ESPM4		4 flutes neck type radius Endmill	Ø3.0 ~ 12.0		B74
ESB702		2 flutes neck type ball Endmill	Ø0.1 ~ 12.0		B75
ESB712		2 flutes ball Endmill	Ø1.0 ~ 12.0		B76
ESB703		3 flutes neck type ball Endmill	Ø2.0 ~ 12.0		B77
ESB734		4 flutes 15° helix ball Endmill	Ø2.0 ~ 10.0		B78
ESRB712		2 flutes rib ball Endmill	Ø0.1 ~ 12.0		B79~B82
ESLNB20		2 flutes long neck type ball Endmill	Ø0.1 ~ 5.0		B83~B86
ESTNB20		2 flutes tapered neck type ball Endmill	Ø0.2 ~ 10.0		B87~B90
ESTNB30		3 flutes tapered neck type ball Endmill	Ø2.0 ~ 5.0		B91

ESE702

2 flutes neck type flat

CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø20	0.000 ~ -0.015



(mm)

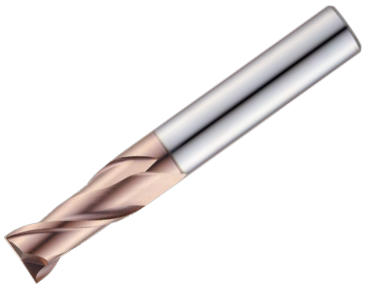
	Designation	DC	DCON-MS	APMX	LU	LF
ESE	702001	0.1	4	0.2	-	40
	702002	0.2	4	0.4	-	40
	702003	0.3	4	0.5	-	40
	702004	0.4	4	0.7	-	40
	702005	0.5	4	1	-	40
	702006	0.6	4	1.2	-	40
	702007	0.7	4	1.4	-	40
	702008	0.8	4	1.6	-	40
	702009	0.9	4	2	-	40
	702010	1	6	1.5	-	40
	702010S4	1	4	1.5	-	40
	702015	1.5	6	2.2	-	40
	702020	2	6	3	6	40
	702020S4	2	4	3	6	40
	702025	2.5	6	4	6	40
	702030	3	6	4	7	45
	702035	3.5	6	6	9	45
	702040	4	6	6	9	45
	702045	4.5	6	6	10	45
	702050	5	6	6	11	50
	702060	6	6	7	14	50
	702080	8	8	9	18	60
	702100	10	10	12	25	75
	702120	12	12	15	30	75
	702160	16	16	18	38	90
	702200	20	20	24	45	100

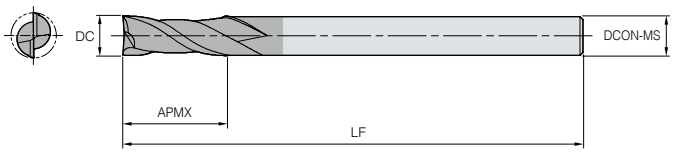
ESE712

2 flutes flat

CARBIDE | 2 | H·A 35° | Grade PC305H | h5 shank

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015





(mm)

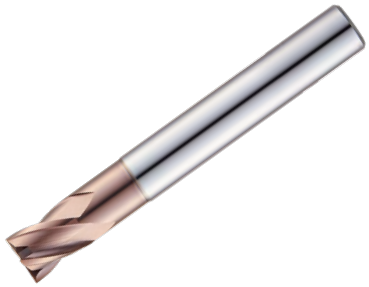
Designation		DC	DCON-MS	APMX	LF
ESE	712010	1	6	3	40
	712010-02	1	6	2	40
	712010-02S4	1	4	2	40
	712010-04	1	6	4	40
	712012	1.2	6	3	40
	712015	1.5	6	4	40
	712015S4	1.5	4	4	40
	712015-06	1.5	6	6	40
	712015-08	1.5	6	8	40
	712020	2	6	5	40
	712020S4	2	4	5	40
	712020-08	2	6	8	40
	712020-10	2	6	10	50
	712025	2.5	6	6	40
	712025S4	2.5	4	6	40
	712030	3	6	8	45
	712030S4	3	4	8	45
	712030-10	3	6	10	50
	712030-12	3	6	12	50
	712035	3.5	6	10	45
	712040	4	6	10	45
	712040S4	4	4	10	45
	712040-12	4	6	12	50
	712040-16	4	6	16	60
	712045	4.5	6	11	45
	712050	5	6	13	50
	712055	5.5	6	13	50
	712060	6	6	13	50
	712060-15	6	6	15	60
	712065	6.5	8	16	60
	712070	7	8	18	60
	712080	8	8	19	60
	712100	10	10	22	70
	712100-25	10	10	25	70
	712120	12	12	26	75
	712120-30	12	12	30	75

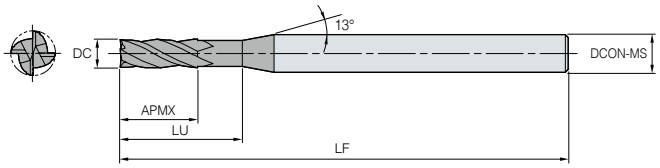
ESE704

4 flutes neck type flat

CARBIDE | 4 | H·A 30° | Grade PC305H | h5 shank

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø20	0.000 ~ -0.015





(mm)

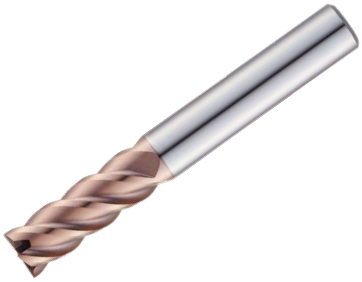
	Designation	DC	DCON-MS	APMX	LU	LF
ESE	704010	1	6	1.5	-	40
	704010S4	1	4	1.5	-	40
	704015	1.5	6	2.2	-	40
	704015S4	1.5	4	2.2	-	40
	704020	2	6	3	6	40
	704020S4	2	4	3	6	40
	704025	2.5	6	4	6	40
	704025S4	2.5	4	4	6	40
	704030	3	6	4	7	45
	704030S4	3	4	4	7	45
	704035	3.5	6	5	9	45
	704040	4	6	5	9	45
	704040S4	4	4	5	9	45
	704045	4.5	6	6	10	45
	704050	5	6	6	11	50
	704060	6	6	7	14	50
	704080	8	8	9	18	60
	704100	10	10	12	25	75
	704120	12	12	15	30	75
	704160	16	16	18	38	90
	704200	20	20	24	45	100

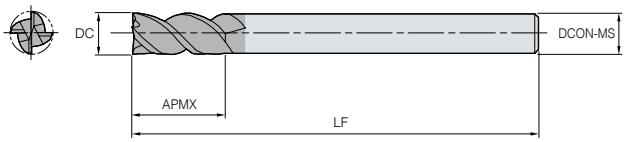
ESE714

4 flutes high helix flat

CARBIDE | 4 | H·A 45° | Grade PC305H | h5 shank

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015





(mm)

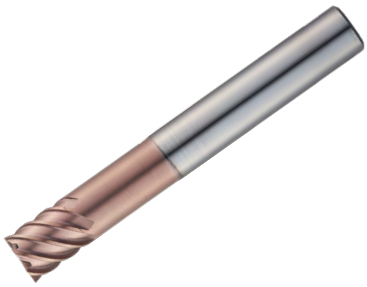
Designation		DC	DCON-MS	APMX	LF
ESE	714010	1	6	2.5	40
	714010S4	1	4	2.5	40
	714012	1.2	6	3	40
	714015	1.5	6	4	40
	714015S4	1.5	4	4	40
	714020	2	6	5	40
	714020S4	2	4	5	40
	714025	2.5	6	6	40
	714025S4	2.5	4	6	40
	714030	3	6	8	45
	714030S4	3	4	8	45
	714035	3.5	6	9	45
	714040	4	6	10	45
	714040S4	4	4	10	45
	714050	5	6	13	50
	714060	6	6	13	50
	714060-15	6	6	15	60
	714060-15L	6	6	15	90
	714080	8	8	19	60
	714080L	8	8	19	100
	714100	10	10	22	70
	714100-25	10	10	25	70
	714100-25L	10	10	25	100
	714120	12	12	26	75
	714120-30	12	12	30	80
	714120-30L	12	12	30	100

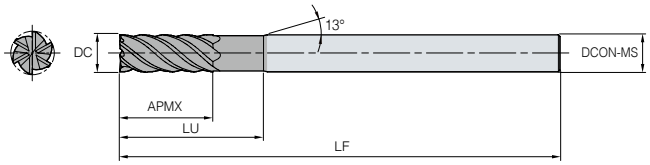
ESE724(6)

4&6 flutes neck type flat

CARBIDE | 4 | 6 | H·A 45° | H·A 60° | Grade PC305H | h5 shank

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015





(mm)

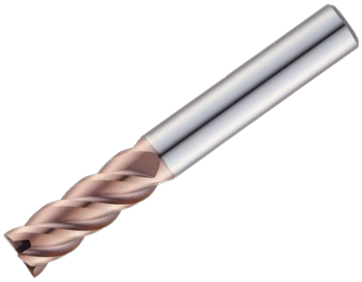
Designation		DC	DCON-MS	APMX	LU	LF	NOF
ESE	724010	1	6	1.5	5	45	4
	724015	1.5	6	2.2	6	45	4
	724020	2	6	3	8	45	4
	724030	3	6	4	9	50	4
	724040	4	6	5	12	50	4
	724040S4L	4	4	5	12	75	4
	724050	5	6	6	15	50	4
	726060	6	6	7	20	60	6
	726080	8	8	9	25	70	6
	726100	10	10	12	32	75	6
	726120	12	12	15	38	80	6

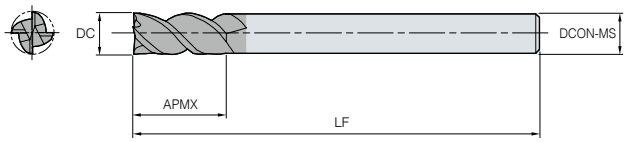
ESE744

4 flutes flat

CARBIDE | 4 | H·A 35° | Grade PC305H | h5 shank

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015





(mm)

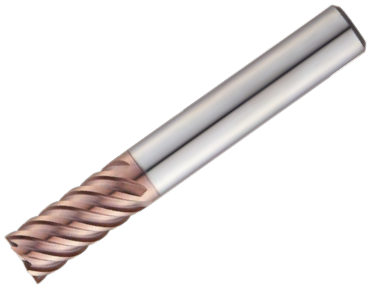
	Designation	DC	DCON-MS	APMX	LF
ESE	744010S3	1	3	2.5	40
	744010S4	1	4	2.5	40
	744010	1	6	2.5	40
	744012S3	1.2	3	3	40
	744012S4	1.2	4	3	40
	744015S3	1.5	3	4	40
	744015S4	1.5	4	4	40
	744015	1.5	6	4	40
	744020S3	2	3	6	40
	744020S4	2	4	6	40
	744020	2	6	6	40
	744025S3	2.5	3	8	45
	744025S4	2.5	4	8	45
	744025	2.5	6	8	45
	744030S3	3	3	8	50
	744030S4	3	4	8	45
	744030	3	6	8	45
	744035	3.5	6	10	45
	744040S4	4	4	11	45
	744040	4	6	11	45
	744045	4.5	6	11	45
	744050	5	6	13	50
	744055	5.5	6	13	50
	744060	6	6	13	50
	744080	8	8	19	60
	744100	10	10	22	70
	744120	12	12	26	75

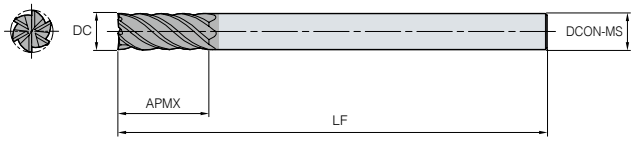
ESE716

6 flutes high helix flat

CARBIDE | 6 | H·A 50° | Grade PC305H | h5 shank

DC	Tolerance
Ø6	0.000 ~ -0.012
Ø8 ~ Ø20	0.000 ~ -0.015





(mm)

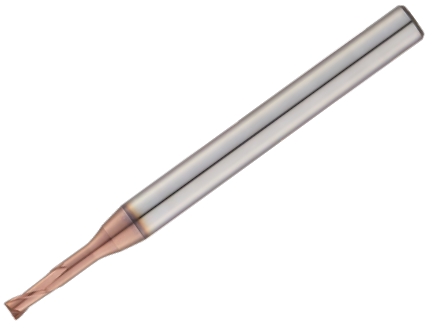
Designation		DC	DCON-MS	APMX	LF
ESE	716060	6	6	13	50
	716080	8	8	18	60
	716100	10	10	22	70
	716120	12	12	26	75
	716160	16	16	35	90
	716200	20	20	44	100

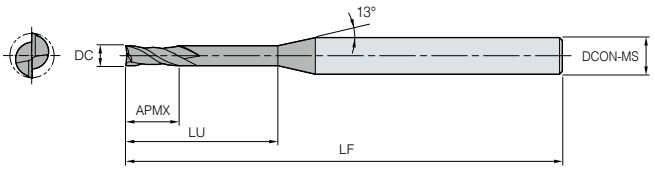
ESRE712

2 flutes rib neck type flat

CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015





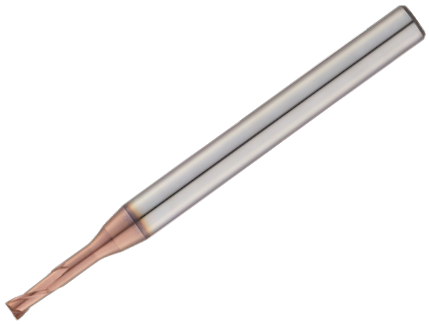
(mm)

Designation		DC	DCON-MS	APMX	LU	LF
ESRE	712001003	0.1	4	0.15	0.3	40
	712001005	0.1	4	0.15	0.5	40
	71200101	0.1	4	0.15	1	40
	712002005	0.2	4	0.3	0.5	40
	712002015	0.2	4	0.3	1.5	40
	71200201	0.2	4	0.3	1	40
	71200202	0.2	4	0.3	2	40
	712003015	0.3	4	0.5	1.5	40
	71200301	0.3	4	0.5	1	40
	712003025	0.3	4	0.5	2.5	40
	71200302	0.3	4	0.5	2	40
	71200303	0.3	4	0.5	3	40
	71200304	0.3	4	0.5	4	40
	71200305	0.3	4	0.5	5	40
	712004015	0.4	4	0.6	1.5	40
	71200401	0.4	4	0.6	1	40
	712004025	0.4	4	0.6	2.5	40
	71200402	0.4	4	0.6	2	40
	71200403	0.4	4	0.6	3	40
	71200404	0.4	4	0.6	4	40
	71200405	0.4	4	0.6	5	40
	71200406	0.4	4	0.6	6	40
	71200408	0.4	4	0.6	8	40
	71200410	0.5	4	0.6	10	40
	712005015	0.5	4	0.7	1.5	45
	71200501	0.5	4	0.7	1	45
	712005025	0.5	4	0.7	2.5	45
	71200502	0.5	4	0.7	2	45
	71200503	0.5	4	0.7	3	45
	71200504	0.5	4	0.7	4	45
	71200505	0.5	4	0.7	5	45
	71200506	0.5	4	0.7	6	45
	71200508	0.5	4	0.7	8	45
	71200510	0.5	4	0.7	10	45
	71200512	0.5	4	0.7	12	45
	71200514	0.5	4	0.7	14	45
	71200516	0.5	4	0.7	16	45
	71200602	0.6	4	0.9	2	45

Designation		DC	DCON-MS	APMX	LU	LF
ESRE	71200603	0.6	4	0.9	3	45
	71200604	0.6	4	0.9	4	45
	71200605	0.6	4	0.9	5	45
	71200606	0.6	4	0.9	6	45
	71200608	0.6	4	0.9	8	45
	71200610	0.6	4	0.9	10	45
	71200612	0.6	4	0.9	12	45
	71200614	0.6	4	0.9	14	45
	71200616	0.6	4	0.9	16	45
	71200702	0.7	4	1.2	2	45
	71200704	0.7	4	1.2	4	45
	71200706	0.7	4	1.2	6	45
	71200708	0.7	4	1.2	8	45
	71200710	0.7	4	1.2	10	45
	71200712	0.7	4	1.2	12	45
	71200802	0.8	4	1.2	2	45
	71200803	0.8	4	1.2	3	45
	71200804	0.8	4	1.2	4	45
	71200805	0.8	4	1.2	5	45
	71200806	0.8	4	1.2	6	45
	71200808	0.8	4	1.2	8	45
	71200810	0.8	4	1.2	10	45
	71200812	0.8	4	1.2	12	45
	71200814	0.8	4	1.2	14	45
	71200816	0.8	4	1.2	16	45
	71200820	0.8	4	1.2	20	50
	71200906	0.9	4	1.3	6	45
	71200908	0.9	4	1.3	8	45
	71200910	0.9	4	1.3	10	45
	71201002	1	4	1.5	2	50
	71201003	1	4	1.5	3	50
	71201004	1	4	1.5	4	50
	71201005	1	4	1.5	5	50
	71201006	1	4	1.5	6	50
	71201007	1	4	1.5	7	50
	71201008	1	4	1.5	8	50
	71201010	1	4	1.5	10	50
	71201012	1	4	1.5	12	50

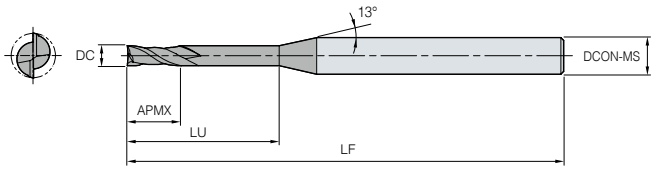
ESRE712

2 flutes rib neck type flat



CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



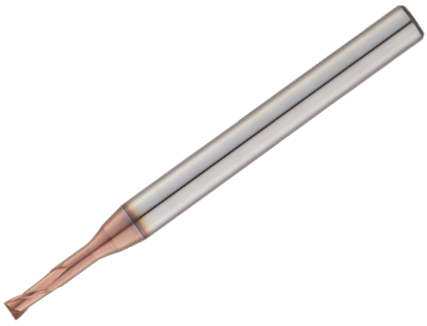
(mm)

Designation		DC	DCON-MS	APMX	LU	LF
ESRE	71201014	1	4	1.5	14	50
	71201016	1	4	1.5	16	50
	71201018	1	4	1.5	18	50
	71201020	1	4	1.5	20	50
	71201022	1	4	1.5	22	60
	71201026	1	4	1.5	26	60
	71201030	1	4	1.5	30	70
	71201040	1	4	1.5	40	80
	71201050	1	4	1.5	50	100
	71201204	1.2	4	1.8	4	50
	71201206	1.2	4	1.8	6	50
	71201208	1.2	4	1.8	8	50
	71201210	1.2	4	1.8	10	50
	71201212	1.2	4	1.8	12	50
	71201214	1.2	4	1.8	14	50
	71201216	1.2	4	1.8	16	50
	71201220	1.2	4	1.8	20	50
	71201226	1.2	4	1.8	26	60
	71201230	1.2	4	1.8	30	70
	71201406	1.4	4	2.1	6	50
	71201408	1.4	4	2.1	8	50
	71201410	1.4	4	2.1	10	50
	71201414	1.4	4	2.1	14	50
	71201416	1.4	4	2.1	16	50
	71201420	1.4	4	2.1	20	50
	71201504	1.5	4	2.3	4	50
	71201505	1.5	4	2.3	5	50
	71201506	1.5	4	2.3	6	50
	71201507	1.5	4	2.3	7	50
	71201508	1.5	4	2.3	8	50
	71201510	1.5	4	2.3	10	50
	71201512	1.5	4	2.3	12	50
	71201514	1.5	4	2.3	14	50
	71201516	1.5	4	2.3	16	50
	71201518	1.5	4	2.3	18	50
	71201520	1.5	4	2.3	20	50
	71201522	1.5	4	2.3	22	60
	71201526	1.5	4	2.3	26	60

Designation		DC	DCON-MS	APMX	LU	LF
ESRE	71201530	1.5	4	2.3	30	70
	71201608	1.6	4	2.3	8	50
	71201610	1.6	4	2.3	10	50
	71201612	1.6	4	2.3	12	50
	71201616	1.6	4	2.3	16	50
	71201620	1.6	4	2.3	20	50
	71201808	1.8	4	2.7	8	50
	71201810	1.8	4	2.7	10	50
	71201812	1.8	4	2.7	12	50
	71201816	1.8	4	2.7	16	50
	71201820	1.8	4	2.7	20	50
	71202006	2	4	3	6	50
	71202008	2	4	3	8	50
	71202010	2	4	3	10	50
	71202012	2	4	3	12	50
	71202014	2	4	3	14	50
	71202016	2	4	3	16	50
	71202018	2	4	3	18	50
	71202020	2	4	3	20	50
	71202022	2	4	3	22	60
	71202026	2	4	3	26	60
	71202030	2	4	3	30	70
	71202035	2	4	3	35	70
	71202040	2	4	3	40	80
	71202045	2	4	3	45	90
	71202050	2	4	3	50	100
	71202060	2	4	3	60	110
	71202508	2.5	4	4	8	50
	71202510	2.5	4	4	10	50
	71202512	2.5	4	4	12	50
	71202514	2.5	4	4	14	50
	71202516	2.5	4	4	16	50
	71202518	2.5	4	4	18	50
	71202520	2.5	4	4	20	50
	71202522	2.5	4	4	22	60
	71202526	2.5	4	4	26	60
	71202530	2.5	4	4	30	70
	71202535	2.5	4	4	35	70

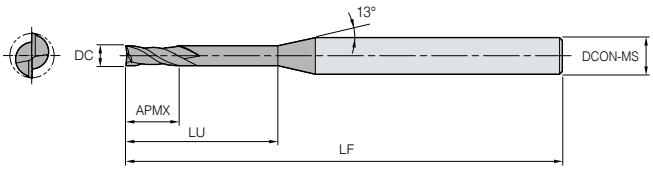
ESRE712

2 flutes rib neck type flat



CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



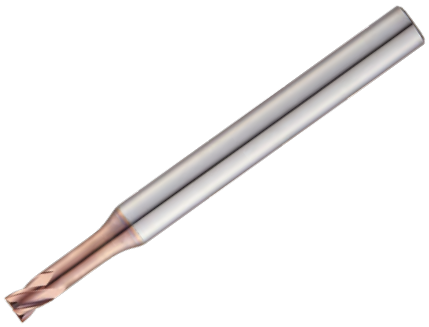
(mm)

Designation		DC	DCON-MS	APMX	LU	LF
ESRE	71202540	2.5	4	4	40	80
	71202545	2.5	4	4	45	90
	71202550	2.5	4	4	50	100
	71203006	3	6	4.5	6	50
	71203008	3	6	4.5	8	50
	71203010	3	6	4.5	10	50
	71203012	3	6	4.5	12	50
	71203014	3	6	4.5	14	60
	71203016	3	6	4.5	16	60
	71203018	3	6	4.5	18	60
	71203020	3	6	4.5	20	60
	71203022	3	6	4.5	22	65
	71203026	3	6	4.5	26	65
	71203030	3	6	4.5	30	70
	71203035	3	6	4.5	35	70
	71203040	3	6	4.5	40	80
	71203045	3	6	4.5	45	90
	71203050	3	6	4.5	50	100
	71203060	3	6	4.5	60	100
	71204008	4	6	6	8	50
	71204010	4	6	6	10	50
	71204012	4	6	6	12	50
	71204014	4	6	6	14	60
	71204016	4	6	6	16	60
	71204018	4	6	6	18	60
	71204020	4	6	6	20	60
	71204022	4	6	6	22	65
	71204026	4	6	6	26	65

Designation		DC	DCON-MS	APMX	LU	LF
ESRE	71204030	4	6	6	30	70
	71204035	4	6	6	35	70
	71204040	4	6	6	40	80
	71204045	4	6	6	45	90
	71204050	4	6	6	50	100
	71204060	4	6	6	60	100
	71205016	5	6	8	16	60
	71205020	5	6	8	20	60
	71205026	5	6	8	26	65
	71205030	5	6	8	30	70
	71205035	5	6	8	35	75
	71205040	5	6	8	40	80
	71205050	5	6	8	50	90
	71205060	5	6	8	60	100
	71206015	6	6	9	15	60
	71206020	6	6	9	20	60
	71206030	6	6	9	30	70
	71206032	6	6	9	32	90
	71208025	8	8	12	25	70
	71208030	8	8	12	30	80
	71208042	8	8	12	42	100
	71210030	10	10	15	30	75
	71210035	10	10	15	35	80
	71210045	10	10	15	45	100
	71212035	12	12	20	35	80
	71212040	12	12	20	40	90
	71212050	12	12	20	50	110

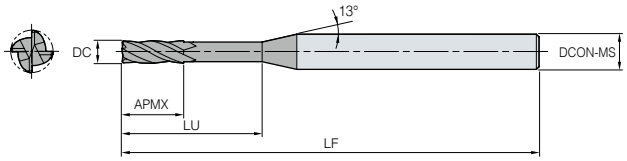
ESRE714

4 flutes rib flat



CARBIDE | 4 | H·A 30° | Grade PC305H | h5 shank

DC	Tolerance
Ø0.5 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LF
ESRE	71400501	0.5	4	0.5	1	40
	71400502	0.5	4	0.5	2	40
	71400503	0.5	4	0.5	3	45
	71400504	0.5	4	0.5	4	45
	71400505	0.5	4	0.5	5	45
	71400506	0.5	4	0.5	6	45
	71400508	0.5	4	0.5	8	45
	71400510	0.5	4	0.5	10	50
	71400601	0.6	4	0.6	1	45
	71400602	0.6	4	0.6	2	45
	71400603	0.6	4	0.6	3	45
	71400604	0.6	4	0.6	4	45
	71400605	0.6	4	0.6	5	45
	71400606	0.6	4	0.6	6	45
	71400608	0.6	4	0.6	8	45
	71400610	0.6	4	0.6	10	50
	71400612	0.6	4	0.6	12	50
	71400702	0.7	4	0.7	2	45
	71400704	0.7	4	0.7	4	45
	71400706	0.7	4	0.7	6	45
	71400708	0.7	4	0.7	8	45
	71400710	0.7	4	0.7	10	50
	71400801	0.8	4	0.8	1	40
	71400802	0.8	4	0.8	2	40
	71400803	0.8	4	0.8	3	40
	71400804	0.8	4	0.8	4	40
	71400805	0.8	4	0.8	5	40
	71400806	0.8	4	0.8	6	40
	71400808	0.8	4	0.8	8	40
	71400810	0.8	4	0.8	10	50
	71400812	0.8	4	0.8	12	50
	71400816	0.8	4	0.8	16	50
	71401002	1	4	1	2	45
	71401003	1	4	1	3	45
	71401004	1	4	1	4	45
	71401006	1	4	1	6	45
	71401008	1	4	1	8	45
	71401010	1	4	1	10	50
	71401012	1	4	1	12	50
	71401014	1	4	1	14	50

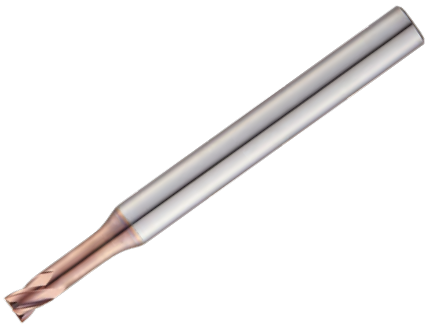
Designation		DC	DCON-MS	APMX	LU	LF
ESRE	71401016	1	4	1	16	50
	71401018	1	4	1	18	60
	71401020	1	4	1	20	60
	71401204	1.2	4	1.2	4	45
	71401206	1.2	4	1.2	6	45
	71401208	1.2	4	1.2	8	45
	71401210	1.2	4	1.2	10	50
	71401212	1.2	4	1.2	12	50
	71401216	1.2	4	1.2	16	50
	71401218	1.2	4	1.2	18	60
	71401220	1.2	4	1.2	20	60
	71401406	1.4	4	1.4	6	45
	71401408	1.4	4	1.4	8	45
	71401410	1.4	4	1.4	10	50
	71401412	1.4	4	1.4	12	50
	71401414	1.4	4	1.4	14	50
	71401416	1.4	4	1.4	16	50
	71401504	1.5	4	1.5	4	45
	71401506	1.5	4	1.5	6	45
	71401508	1.5	4	1.5	8	45
	71401510	1.5	4	1.5	10	50
	71401512	1.5	4	1.5	12	50
	71401516	1.5	4	1.5	16	50
	71401518	1.5	4	1.5	18	60
	71401520	1.5	4	1.5	20	60
	71401525	1.5	4	1.5	25	60
	71401530	1.5	4	1.5	30	70
	71401606	1.6	4	1.6	6	45
	71401608	1.6	4	1.6	8	45
	71401610	1.6	4	1.6	10	50
	71401612	1.6	4	1.6	12	50
	71401614	1.6	4	1.6	14	50
	71401616	1.6	4	1.6	16	50
	71401618	1.6	4	1.6	18	60
	71401620	1.6	4	1.6	20	60
	71401625	1.6	4	1.6	25	70
	71401806	1.8	4	1.8	6	45
	71401808	1.8	4	1.8	8	45
	71401810	1.8	4	1.8	10	50
	71401812	1.8	4	1.8	12	50

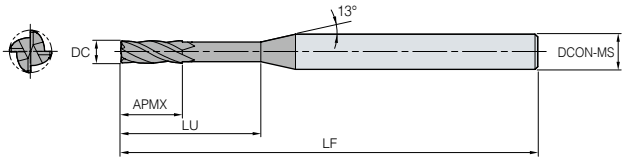
ESRE714

4 flutes rib flat

CARBIDE | 4 | H·A 30° | Grade PC305H | h5 shank

DC	Tolerance
Ø0.5 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015





(mm)

Designation		DC	DCON-MS	APMX	LU	LF
ESRE	71401816	1.8	4	1.8	16	50
	71401820	1.8	4	1.8	20	60
	71401825	1.8	4	1.8	25	70
	71402004	2	4	2	4	45
	71402006	2	4	2	6	45
	71402008	2	4	2	8	45
	71402010	2	4	2	10	50
	71402012	2	4	2	12	50
	71402014	2	4	2	14	50
	71402016	2	4	2	16	50
	71402018	2	4	2	18	50
	71402020	2	4	2	20	50
	71402022	2	4	2	22	60
	71402025	2	4	2	25	60
	71402030	2	4	2	30	70
	71402510	2.5	4	2.5	10	50
	71402512	2.5	4	2.5	12	50
	71402516	2.5	4	2.5	16	50
	71402520	2.5	4	2.5	20	50
	71402525	2.5	4	2.5	25	60
	71402530	2.5	4	2.5	30	70
	71403006	3	6	3	6	45
	71403008	3	6	3	8	45
	71403010	3	6	3	10	50
	71403012	3	6	3	12	50
	71403016	3	6	3	16	55
	71403020	3	6	3	20	60
	71403025	3	6	3	25	65
	71403030	3	6	3	30	70
	71403035	3	6	3	35	75
	71403040	3	6	3	40	80
	71403045	3	6	3	45	90
	71403050	3	6	3	50	100
	71403060	3	6	3	60	110
	71403512	3.5	6	3.5	12	50
	71403516	3.5	6	3.5	16	55
	71403520	3.5	6	3.5	20	60
	71403525	3.5	6	3.5	25	65
	71403530	3.5	6	3.5	30	70
	71403535	3.5	6	3.5	35	75

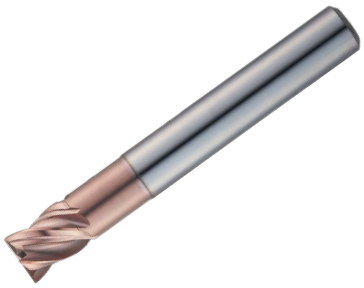
Designation		DC	DCON-MS	APMX	LU	LF
ESRE	71403540	3.5	6	3.5	40	80
	71404006	4	6	4	6	50
	71404008	4	6	4	8	50
	71404010	4	6	4	10	50
	71404012	4	6	4	12	50
	71404016	4	6	4	16	55
	71404020	4	6	4	20	60
	71404025	4	6	4	25	65
	71404030	4	6	4	30	70
	71404040	4	6	4	40	80
	71404045	4	6	4	45	90
	71404050	4	6	4	50	100
	71404060	4	6	4	60	110
	71404512	4.5	6	4.5	12	50
	71404516	4.5	6	4.5	16	55
	71404520	4.5	6	4.5	20	60
	71404525	4.5	6	4.5	25	65
	71404530	4.5	6	4.5	30	70
	71404540	4.5	6	4.5	40	80
	71405016	5	6	5	16	60
	71405020	5	6	5	20	60
	71405025	5	6	5	25	65
	71405030	5	6	5	30	70
	71405040	5	6	5	40	80
	71405050	5	6	5	50	100
	71405060	5	6	5	60	110
	71406020	6	6	6	20	60
	71406030	6	6	6	30	75
	71406040	6	6	6	40	80
	71406050	6	6	6	50	90
	71406060	6	6	6	60	100
	71408025	8	8	12	25	65
	71408040	8	8	12	40	100
	71408050	8	8	12	50	110
	71410030	10	10	15	30	70
	71410050	10	10	15	50	100
	71410060	10	10	15	60	120
	71412040	12	12	18	40	80
	71412060	12	12	18	60	110
	71412070	12	12	18	70	130

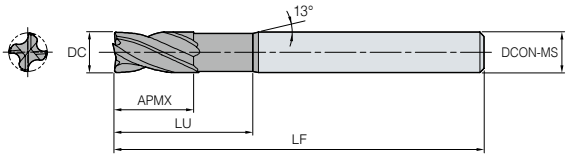
ESXE704

4 flutes neck type flat

CARBIDE | 4 | H·A Multi | Grade PC305H | h5 shank

DC	Tolerance
ALL	0.000 ~ -0.020





(mm)

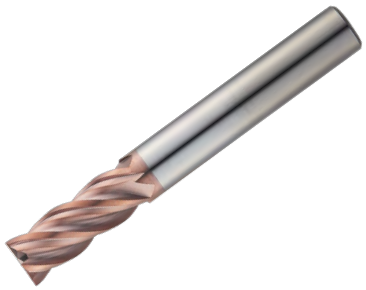
Designation		DC	DCON-MS	APMX	LU	LF
ESXE	704010	1	4	1.5	4	45
	704020	2	4	3	6	45
	704030	3	6	4	7	45
	704040	4	6	5	9	45
	704060	6	6	7	14	50
	704080	8	8	9	18	60
	704100	10	10	12	25	75
	704120	12	12	15	30	75

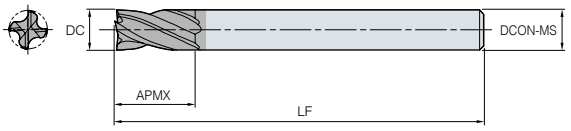
ESXE714

4 flutes flat

CARBIDE | 4 | H·A Multi | Grade PC305H | h5 shank

DC	Tolerance
ALL	0.000 ~ -0.020





(mm)

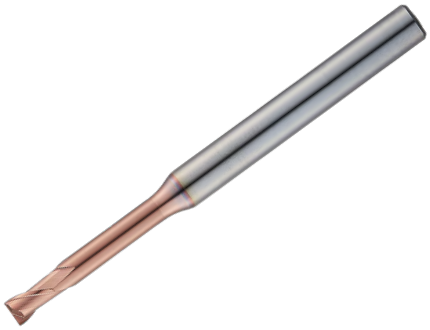
Designation		DC	DCON-MS	APMX	LF
ESXE	714020	2	4	5	45
	714030	3	6	8	45
	714040	4	6	10	45
	714040S4	4	4	10	45
	714060	6	6	16	50
	714080	8	8	20	60
	714100	10	10	25	75
	714120	12	12	35	85

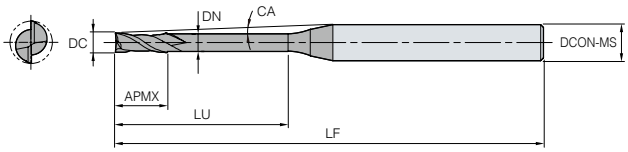
ESLNS20

2 flutes long neck type flat

CARBIDE | 2 | H·A 45° | Grade PC305H | h5 shank

DC	Tolerance
ALL	0.000 ~ -0.012





(mm)

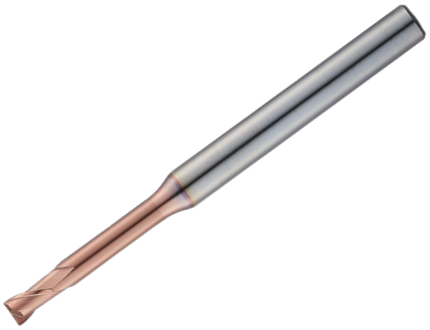
	Designation	DC	DCON-MS	APMX	LU	LF	DN	CA	Effective length by inclination angle				
									0.5°	1°	1.5°	2°	3°
ESLNS	2001-0.3	0.1	4	0.15	0.3	45	0.08	11.6	0.4	0.4	0.5	0.5	0.5
	2001-0.5	0.1	4	0.15	0.5	45	0.08	11.4	0.6	0.7	0.7	0.7	0.8
	2001-1	0.1	4	0.15	1	45	0.08	10.9	1.2	1.2	1.2	1.3	1.4
	2002-0.5	0.2	4	0.3	0.5	50	0.17	11.3	1.2	1.3	1.5	1.7	2
	2002-1	0.2	4	0.3	1	50	0.17	10.8	1.7	1.9	2.2	2.4	2.7
	2002-1.5	0.2	4	0.3	1.5	50	0.17	10.3	2.3	2.5	2.8	3	3.4
	2003-1	0.3	4	0.45	1	50	0.27	10.8	1.7	1.9	2.2	2.4	2.7
	2003-1.5	0.3	4	0.45	1.5	50	0.27	10.3	2.3	2.5	2.8	3	3.4
	2003-2	0.3	4	0.45	2	50	0.27	9.8	2.8	3.1	3.4	3.6	4.1
	2003-2.5	0.3	4	0.45	2.5	50	0.27	9.4	3.4	3.7	4	4.3	4.7
	2003-3	0.3	4	0.45	3	50	0.27	9	3.9	4.3	4.6	4.9	5.4
	2004-1	0.4	4	0.6	1	50	0.37	10.7	1.7	1.9	2.2	2.4	2.7
	2004-1.5	0.4	4	0.6	1.5	50	0.37	10.2	2.3	2.5	2.8	3	3.4
	2004-2	0.4	4	0.6	2	50	0.37	9.7	2.8	3.1	3.4	3.6	4.1
	2004-2.5	0.4	4	0.6	2.5	50	0.37	9.3	3.4	3.7	4	4.3	4.7
	2004-3	0.4	4	0.6	3	50	0.37	8.9	3.9	4.3	4.6	4.9	5.4
	2004-3.5	0.4	4	0.6	3.5	50	0.37	8.6	4.5	4.9	5.2	5.5	6
	2004-4	0.4	4	0.6	4	50	0.37	8.2	5	5.4	5.8	6.1	6.6
	2004-5	0.4	4	0.6	5	50	0.37	7.6	6.1	6.6	6.9	7.3	7.8
	2004-6	0.4	4	0.6	6	50	0.37	7.1	7.2	7.7	8.1	8.4	9
	2005-1	0.5	4	0.75	1	50	0.47	10.7	1.7	1.9	2.2	2.4	2.7
	2005-1.5	0.5	4	0.75	1.5	50	0.47	10.2	2.3	2.5	2.8	3	3.4
	2005-2	0.5	4	0.75	2	50	0.47	9.7	2.8	3.1	3.4	3.6	4.1
	2005-2.5	0.5	4	0.75	2.5	50	0.47	9.3	3.4	3.7	4	4.3	4.7
	2005-3	0.5	4	0.75	3	50	0.47	8.9	3.9	4.3	4.6	4.9	5.4
	2005-4	0.5	4	0.75	4	50	0.47	8.1	5	5.4	5.8	6.1	6.6
	2005-5	0.5	4	0.75	5	50	0.47	7.5	6.1	6.6	6.9	7.3	7.8
	2005-6	0.5	4	0.75	6	50	0.47	7	7.2	7.7	8.1	8.4	9
	2005-8	0.5	4	0.75	8	50	0.47	6.2	9.3	9.9	10.3	10.7	11.4
	2006-2	0.6	4	0.9	2	50	0.57	9.6	2.8	3.1	3.4	3.6	4.1
	2006-4	0.6	4	0.9	4	50	0.57	6.9	7.2	7.7	8.1	8.4	9
	2006-6	0.6	4	0.9	6	50	0.57	6.1	9.3	9.9	10.3	10.7	11.4
	2006-8	0.6	4	0.9	8	50	0.57	5.4	11.5	12.1	12.6	13	13.7
	2006-10	0.6	4	0.9	10	50	0.57	9.6	2.8	3.1	3.4	3.6	4.1
	2007-2	0.7	4	1.05	2	50	0.67	8	5	5.4	5.8	6.1	6.6
	2007-4	0.7	4	1.05	4	50	0.67	6.9	7.2	7.7	8.1	8.4	9
	2007-6	0.7	4	1.05	6	50	0.67	6	9.3	9.9	10.3	10.7	11.4
	2007-8	0.7	4	1.05	8	50	0.67	5.3	11.5	12.1	12.6	13	13.7
	2007-10	0.7	4	1.2	10	50	0.77	7.9	5	5.4	5.8	6.1	6.6
	2008-4	0.8	4	1.2	4	50	0.77	6.8	7.2	7.7	8.1	8.4	9

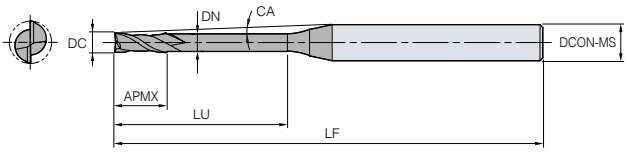
ESLNS20

2 flutes long neck type flat

CARBIDE | 2 | H·A 45° | Grade PC305H | h5 shank

DC	Tolerance
ALL	0.000 ~ -0.012



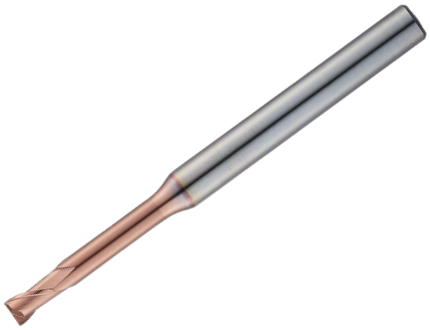


(mm)

	Designation	DC	DCON-MS	APMX	LU	LF	DN	CA	Effective length by inclination angle				
									0.5°	1°	1.5°	2°	3°
ESLNS	2008-6	0.8	4	1.2	6	50	0.77	5.9	9.3	9.9	10.3	10.7	11.4
	2008-8	0.8	4	1.2	8	50	0.77	5.2	11.5	12.1	12.6	13	13.7
	2008-10	0.8	4	1.2	10	50	0.77	4.7	13.6	14.2	14.8	15.2	16
	2008-12	0.8	4	1.2	12	55	0.77	6.7	7.2	7.7	8.1	8.4	9.1
	2009-6	0.9	4	1.35	6	50	0.86	5.8	9.4	9.9	10.4	10.7	11.4
	2009-8	0.9	4	1.35	8	50	0.86	5.1	11.5	12.1	12.6	13	13.7
	2009-10	0.9	4	1.35	10	55	0.86	4.6	13.6	14.3	14.8	15.2	16
	2009-12	0.9	4	1.35	12	55	0.86	9.4	2.9	3.2	3.4	3.7	4.1
	2010-2	1	4	1.5	2	50	0.96	7.7	5.1	5.5	5.8	6.1	6.6
	2010-4	1	4	1.5	4	50	0.96	6.6	7.2	7.7	8.1	8.4	9.1
	2010-6	1	4	1.5	6	50	0.96	5.7	9.4	9.9	10.4	10.7	11.4
	2010-8	1	4	1.5	8	50	0.96	5	11.5	12.1	12.6	13	13.7
	2010-10	1	4	1.5	10	55	0.96	4.5	13.6	14.3	14.8	15.2	16
	2010-12	1	4	1.5	12	55	0.96	4.1	15.7	16.4	17	17.4	18.7
	2010-14	1	4	1.5	14	60	0.96	3.8	17.8	18.6	19.1	19.6	21.3
	2010-16	1	4	1.5	16	60	0.96	3.2	22	22.8	23.5	24	26.6
	2010-20	1	4	1.5	20	60	0.96	6.3	7.3	7.7	8.1	8.5	9.1
	2012-6	1.2	4	1.8	6	50	1.15	5.5	9.4	9.9	10.4	10.8	11.4
	2012-8	1.2	4	1.8	8	50	1.15	4.8	11.5	12.1	12.6	13	13.7
	2012-10	1.2	4	1.8	10	50	1.15	11.5	12.1	12.6	13	13.7	16
	2012-12	1.2	4	1.8	12	55	1.15	4.3	13.6	14.3	14.8	15.2	16
	2012-16	1.2	4	1.8	16	55	1.15	3.6	17.8	18.6	19.2	19.7	21.3
	2014-6	1.4	4	2.1	6	50	1.34	6.1	7.3	7.8	8.1	8.5	9.1
	2014-8	1.4	4	2.1	8	50	1.34	5.3	9.4	10	10.4	10.8	11.5
	2014-10	1.4	4	2.1	10	50	1.34	4.6	11.6	12.1	12.6	13	13.8
	2014-12	1.4	4	2.1	12	55	1.34	4.1	13.7	14.3	14.8	15.3	16.1
	2014-14	1.4	4	2.1	14	55	1.34	3.7	15.8	16.5	17	17.5	18.7
	2014-16	1.4	4	2.1	16	55	1.34	3.4	17.9	18.6	19.2	19.7	21.4
	2015-4	1.5	4	2.25	4	50	1.44	7.2	5.2	5.5	5.9	6.2	6.7
	2015-6	1.5	4	2.25	6	50	1.44	6	7.3	7.8	8.1	8.5	9.1
	2015-8	1.5	4	2.25	8	50	1.44	5.1	9.4	10	10.4	10.8	11.5
	2015-10	1.5	4	2.25	10	50	1.44	4.5	11.6	12.1	12.6	13	13.8
	2015-12	1.5	4	2.25	12	55	1.44	4	13.7	14.3	14.8	15.3	16.1
	2015-14	1.5	4	2.25	14	55	1.44	3.6	15.8	16.5	17	17.5	18.7
	2015-16	1.5	4	2.25	16	55	1.44	3.3	17.9	18.6	19.2	19.7	-
	2015-18	1.5	4	2.25	18	60	1.44	3	20	20.7	21.3	21.9	-
	2015-20	1.5	4	2.25	20	60	1.44	2.8	22	22.9	23.5	24.1	-
	2015-25	1.5	4	2.25	25	65	1.44	2.4	27.3	28.1	28.8	30	-
	2016-6	1.6	4	2.4	6	50	1.54	5.9	7.3	7.8	8.1	8.5	9.1
	2016-8	1.6	4	2.4	8	50	1.54	5	9.4	10	10.4	10.8	11.5

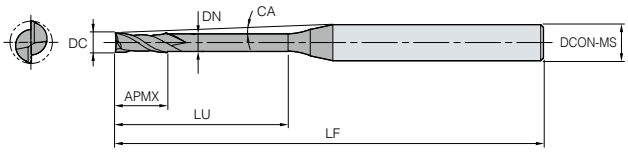
ESLNS20

2 flutes long neck type flat



CARBIDE | 2 | H·A 45° | Grade PC305H | h5 shank

DC	Tolerance
ALL	0.000 ~ -0.012



(mm)

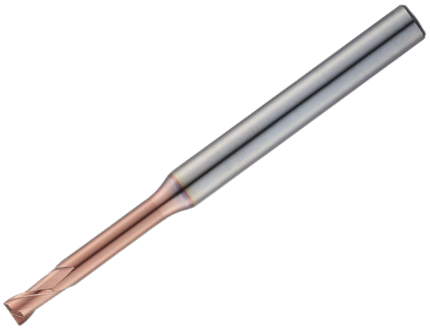
	Designation	DC	DCON-MS	APMX	LU	LF	DN	CA	Effective length by inclination angle				
									0.5°	1°	1.5°	2°	3°
ESLNS	2016-10	1.6	4	2.4	10	50	1.54	4.4	11.6	12.1	12.6	13	13.8
	2016-12	1.6	4	2.4	12	55	1.54	3.9	13.7	14.3	14.8	15.3	16.1
	2016-14	1.6	4	2.4	14	55	1.54	3.5	15.8	16.5	17	17.5	18.7
	2016-16	1.6	4	2.4	16	55	1.54	3.2	17.9	18.6	19.2	19.7	21.4
	2016-18	1.6	4	2.4	18	60	1.54	2.9	20	20.7	21.3	21.9	-
	2016-20	1.6	4	2.4	20	60	1.54	2.7	22	22.9	23.5	24.1	-
	2018-6	1.8	4	2.7	6	50	1.73	5.6	7.4	7.8	8.2	8.5	9.1
	2018-8	1.8	4	2.7	8	50	1.73	4.8	9.5	10	10.4	10.8	11.5
	2018-10	1.8	4	2.7	10	50	1.73	4.2	11.6	12.2	12.6	13	13.8
	2018-12	1.8	4	2.7	12	55	1.73	3.7	13.7	14.3	14.8	15.3	16.1
	2018-14	1.8	4	2.7	14	55	1.73	3.3	15.8	16.5	17	17.5	18.8
	2018-16	1.8	4	2.7	16	55	1.73	3	17.9	18.6	19.2	19.7	-
	2018-18	1.8	4	2.7	18	60	1.73	2.7	20	20.7	21.3	21.9	-
	2018-20	1.8	4	2.7	20	60	1.73	2.5	22.1	22.9	23.5	24.1	-
	2020-4	2	4	3	4	50	1.92	6.5	5.3	5.6	5.9	6.2	6.7
	2020-6	2	4	3	6	50	1.92	5.3	7.4	7.8	8.2	8.5	9.1
	2020-8	2	4	3	8	50	1.92	4.5	9.5	10	10.4	10.8	11.5
	2020-10	2	4	3	10	50	1.92	3.9	11.6	12.2	12.7	13.1	13.8
	2020-12	2	4	3	12	55	1.92	3.4	13.7	14.3	14.9	15.3	16.1
	2020-14	2	4	3	14	55	1.92	3.1	15.8	16.5	17	17.5	18.8
	2020-16	2	4	3	16	55	1.92	2.8	17.9	18.6	19.2	19.7	-
	2020-18	2	4	3	18	60	1.92	2.6	20	20.8	21.4	21.9	-
	2020-20	2	4	3	20	60	1.92	2.4	22.1	22.9	23.5	24.1	-
	2020-25	2	4	3	25	65	1.92	2	27.3	28.2	28.9	-	-
	2020-30	2	4	3	30	70	1.92	1.7	32.5	33.4	34.4	-	-
	2025-8	2.5	4	3.75	8	50	2.4	3.7	9.6	10.1	10.5	10.9	11.5
	2025-10	2.5	4	3.75	10	50	2.4	3.1	11.7	12.2	12.7	13.1	13.8
	2025-12	2.5	4	3.75	12	55	2.4	2.7	13.8	14.4	14.9	15.3	-
	2025-14	2.5	4	3.75	14	55	2.4	2.4	15.9	16.5	17.1	17.5	-
	2025-16	2.5	4	3.75	16	55	2.4	2.2	18	18.7	19.2	19.7	-
	2025-18	2.5	4	3.75	18	55	2.4	2	20.1	20.8	21.4	-	-
	2025-20	2.5	4	3.75	20	60	2.4	1.8	22.1	22.9	23.5	-	-
	2025-25	2.5	4	3.75	25	60	2.4	1.5	27.3	28.2	-	-	-
	2025-30	2.5	4	3.75	30	70	2.4	1.3	32.6	33.5	-	-	-
	2030-8	3	6	4.5	8	55	2.88	5.6	9.6	10.1	10.5	10.9	11.5
	2030-10	3	6	4.5	10	55	2.88	5	11.7	12.3	12.7	13.1	13.8
	2030-12	3	6	4.5	12	60	2.88	4.5	13.8	14.4	14.9	15.4	16.3
	2030-14	3	6	4.5	14	60	2.88	4.1	15.9	16.6	17.1	17.6	18.9
	2030-16	3	6	4.5	16	60	2.88	3.7	18	18.7	19.3	19.8	21.6
	2030-18	3	6	4.5	18	60	2.88	3.4	20.1	20.8	21.4	21.9	24.2

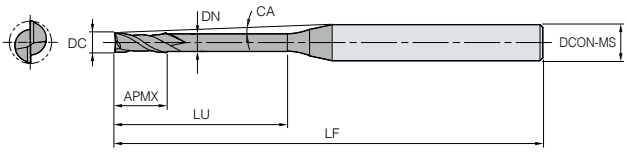
ESLNS20

2 flutes long neck type flat

CARBIDE | 2 | H·A 45° | Grade PC305H | h5 shank

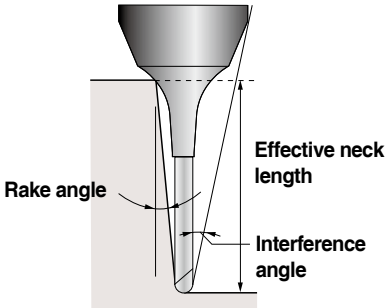
DC	Tolerance
ALL	0.000 ~ -0.012

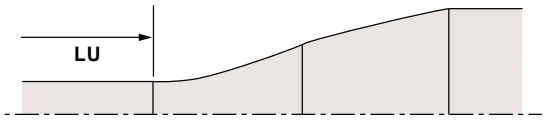




(mm)

	Designation	DC	DCON-MS	APMX	LU	LF	DN	CA	Effective length by inclination angle				
									0.5°	1°	1.5°	2°	3°
ESLNS	2030-20	3	6	4.5	20	65	2.88	3.2	22.2	23	23.6	24.2	26.9
	2030-25	3	6	4.5	25	70	2.88	2.7	27.4	28.2	28.9	30.2	-
	2030-30	3	6	4.5	30	75	2.88	2.4	32.6	33.5	34.5	36.2	-
	2030-35	3	6	4.5	35	80	2.88	2.1	37.7	38.7	40.2	42.2	-
	2030-40	3	6	4.5	40	90	2.88	1.9	42.9	43.9	45.9	-	-
	2040-12	4	6	6	12	60	3.85	3.4	13.9	14.5	15	15.4	16.3
	2040-16	4	6	6	16	60	3.85	2.8	18.1	18.8	19.3	19.8	-
	2040-20	4	6	6	20	70	3.85	2.3	22.3	23	23.6	24.3	-
	2040-25	4	6	6	25	70	3.85	2	27.4	28.3	28.9	-	-
	2040-30	4	6	6	30	80	3.85	1.7	32.6	33.5	34.6	-	-
	2040-35	4	6	6	35	80	3.85	1.5	37.8	38.8	-	-	-
	2040-40	4	6	6	40	90	3.85	1.3	42.9	44	-	-	-
	2040-45	4	6	6	45	90	3.85	1.2	48.1	49.4	-	-	-
	2040-50	4	6	6	50	100	3.85	1.1	53.2	54.8	-	-	-
	2050-16	5	6	7.5	16	60	4.85	1.5	18.1	18.8	-	-	-
	2050-20	5	6	7.5	20	60	4.85	1.3	22.3	23	-	-	-
	2050-25	5	6	7.5	25	70	4.85	1.1	27.4	28.3	-	-	-
	2050-30	5	6	7.5	30	70	4.85	0.9	32.6	-	-	-	-
	2050-35	5	6	7.5	35	80	4.85	0.8	37.8	-	-	-	-
	2050-40	5	6	7.5	40	90	4.85	0.7	42.9	-	-	-	-
	2050-50	5	6	7.5	50	100	4.85	0.6	53.2	-	-	-	-

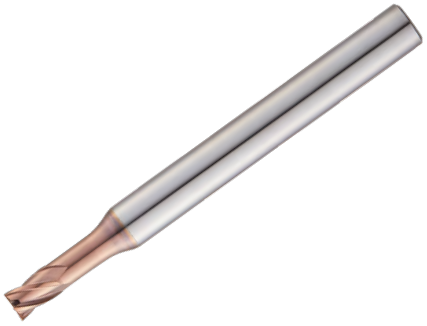




※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required.

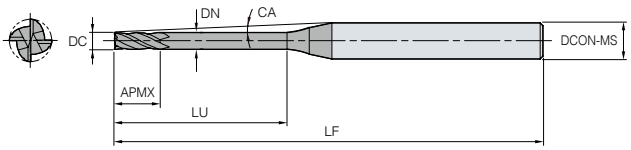
ESLNS40

4 flutes long neck type flat



CARBIDE | 4 | H·A 30° | Grade PC305H | h5 shank

DC	Tolerance
ALL	0.000 ~ -0.012

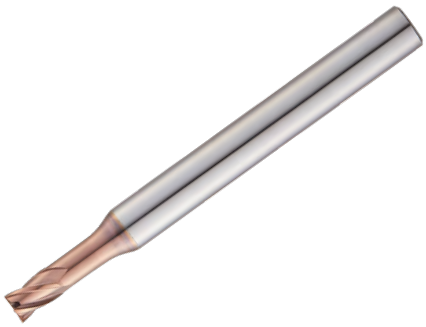


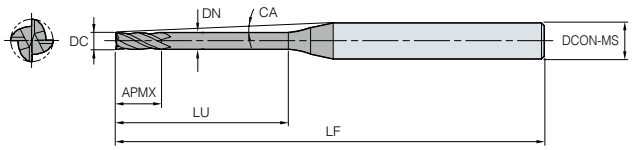
(mm)

	Designation	DC	DCON-MS	APMX	LU	LF	DN	CA	Effective length by inclination angle				
									0.5°	1°	1.5°	2°	3°
ESLNS	4010-4	1	4	1.5	4	50	0.96	7.7	5.1	5.5	5.8	6.1	6.6
	4010-6	1	4	1.5	6	50	0.96	6.6	7.2	7.7	8.1	8.4	9.1
	4010-8	1	4	1.5	8	50	0.96	5.7	9.4	9.9	10.4	10.7	11.4
	4010-10	1	4	1.5	10	50	0.96	5	11.5	12.1	12.6	13	13.7
	4015-4	1.5	4	2.25	4	50	1.44	7.2	5.2	5.5	5.9	6.2	6.7
	4015-6	1.5	4	2.25	6	50	1.44	6	7.3	7.8	8.1	8.5	9.1
	4015-8	1.5	4	2.25	8	50	1.44	5.1	9.4	10	10.4	10.8	11.5
	4015-10	1.5	4	2.25	10	50	1.44	4.5	11.6	12.1	12.6	13	13.8
	4015-12	1.5	4	2.25	12	55	1.44	4	13.7	14.3	14.8	15.3	16.1
	4015-14	1.5	4	2.25	14	55	1.44	3.6	15.8	16.5	17	17.5	18.7
	4015-16	1.5	4	2.25	16	55	1.44	3.3	17.9	18.6	19.2	19.7	-
	4015-18	1.5	4	2.25	18	60	1.44	3	20	20.7	21.3	21.9	-
	4015-20	1.5	4	2.25	20	60	1.44	2.8	22	22.9	23.5	24.1	-
	4015-25	1.5	4	2.25	25	65	1.44	2.4	27.3	28.1	28.8	30	-
	4020-4	2	4	3	4	50	1.92	6.5	5.3	5.6	5.9	6.2	6.7
	4020-6	2	4	3	6	50	1.92	5.3	7.4	7.8	8.2	8.5	9.1
	4020-8	2	4	3	8	50	1.92	4.5	9.5	10	10.4	10.8	11.5
	4020-10	2	4	3	10	50	1.92	3.9	11.6	12.2	12.7	13.1	13.8
	4020-12	2	4	3	12	55	1.92	3.4	13.7	14.3	14.9	15.3	16.1
	4020-14	2	4	3	14	55	1.92	3.1	15.8	16.5	17	17.5	18.8
	4020-16	2	4	3	16	55	1.92	2.8	17.9	18.6	19.2	19.7	-
	4020-18	2	4	3	18	60	1.92	2.6	20	20.8	21.4	21.9	-
	4020-20	2	4	3	20	60	1.92	2.4	22.1	22.9	23.5	24.1	-
	4020-25	2	4	3	25	65	1.92	2	27.3	28.2	28.9	-	-
	4020-30	2	4	3	30	70	1.92	1.7	32.5	33.4	34.4	-	-
	4025-8	2.5	4	3.75	8	50	2.4	3.7	9.6	10.1	10.5	10.9	11.5
	4025-10	2.5	4	3.75	10	50	2.4	3.1	11.7	12.2	12.7	13.1	13.8
	4025-12	2.5	4	3.75	12	55	2.4	2.7	13.8	14.4	14.9	15.3	-
	4025-14	2.5	4	3.75	14	55	2.4	2.4	15.9	16.5	17.1	17.5	-
	4025-16	2.5	4	3.75	16	55	2.4	2.2	18	18.7	19.2	19.7	-
	4025-18	2.5	4	3.75	18	60	2.4	2	20.1	20.8	21.4	-	-
	4025-20	2.5	4	3.75	20	60	2.4	1.8	22.1	22.9	23.5	-	-
	4025-25	2.5	4	3.75	25	65	2.4	1.5	27.3	28.2	-	-	-
	4025-30	2.5	4	3.75	30	70	2.4	1.3	32.6	33.5	-	-	-
	4030-8	3	6	4.5	8	55	2.88	5.6	9.6	10.1	10.5	10.9	11.5
	4030-10	3	6	4.5	10	55	2.88	5	11.7	12.3	12.7	13.1	13.8

ESLNS40

4 flutes long neck type flat





DC	Tolerance
ALL	0.000 ~ -0.012

(mm)

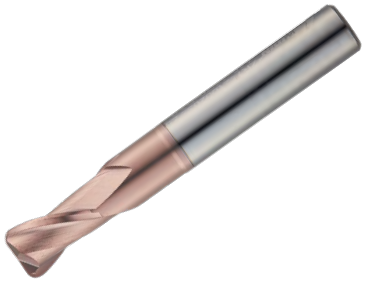
	Designation	DC	DCON-MS	APMX	LU	LF	DN	CA	Effective length by inclination angle				
									0.5°	1°	1.5°	2°	3°
ESLNS	4030-12	3	6	4.5	12	60	2.88	4.5	13.8	14.4	14.9	15.4	16.3
	4030-14	3	6	4.5	14	60	2.88	4.1	15.9	16.6	17.1	17.6	18.9
	4030-16	3	6	4.5	16	60	2.88	3.7	18	18.7	19.3	19.8	21.6
	4030-18	3	6	4.5	18	60	2.88	3.4	20.1	20.8	21.4	21.9	24.2
	4030-20	3	6	4.5	20	65	2.88	3.2	22.2	23	23.6	24.2	26.9
	4030-25	3	6	4.5	25	70	2.88	2.7	27.4	28.2	28.9	30.2	-
	4030-30	3	6	4.5	30	75	2.88	2.4	32.6	33.5	34.5	36.2	-
	4030-35	3	6	4.5	35	80	2.88	2.1	37.7	38.7	40.2	42.2	-
	4030-40	3	6	4.5	40	90	2.88	1.9	42.9	43.9	45.9	-	-
	4040-12	4	6	6	12	60	3.85	3.4	13.9	14.5	15	15.4	16.3
	4040-16	4	6	6	16	60	3.85	2.8	18.1	18.8	19.3	19.8	-
	4040-20	4	6	6	20	70	3.85	2.3	22.3	23	23.6	24.3	-
	4040-25	4	6	6	25	70	3.85	2	27.4	28.3	28.9	-	-
	4040-30	4	6	6	30	80	3.85	1.7	32.6	33.5	34.6	-	-
	4040-35	4	6	6	35	80	3.85	1.5	37.8	38.8	-	-	-
	4040-40	4	6	6	40	90	3.85	1.3	42.9	44	-	-	-
	4040-45	4	6	6	45	90	3.85	1.2	48.1	49.4	-	-	-
	4040-50	4	6	6	50	100	3.85	1.1	53.2	54.8	-	-	-
	4050-16	5	6	7.5	16	60	4.85	1.5	18.1	18.8	-	-	-
	4050-20	5	6	7.5	20	60	4.85	1.3	22.3	23	-	-	-
	4050-25	5	6	7.5	25	70	4.85	1.1	27.4	28.3	-	-	-
	4050-30	5	6	7.5	30	70	4.85	0.9	32.6	-	-	-	-
	4050-35	5	6	7.5	35	80	4.85	0.8	37.8	-	-	-	-
	4050-40	5	6	7.5	40	90	4.85	0.7	42.9	-	-	-	-
	4050-50	5	6	7.5	50	100	4.85	0.6	53.2	-	-	-	-

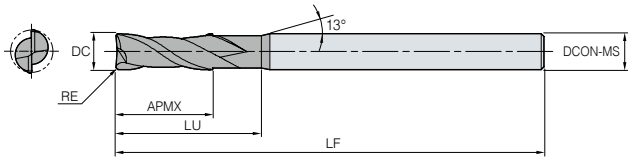
ESR702

2 flutes neck type radius

CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015





(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESR	70201000503S4	1	4	1.5	3	50	0.05
	70201000504S4	1	4	1.5	4	50	0.05
	70201000506S4	1	4	1.5	6	50	0.05
	70201000508S4	1	4	1.5	8	50	0.05
	70201000510S4	1	4	1.5	10	50	0.05
	7020100103S4	1	4	1.5	3	50	0.1
	7020100104	1	6	1.5	4	50	0.1
	7020100104S4	1	4	1.5	4	50	0.1
	7020100106	1	6	1.5	6	50	0.1
	7020100106S4	1	4	1.5	6	50	0.1
	7020100108S4	1	4	1.5	8	50	0.1
	7020100110S4	1	4	1.5	10	50	0.1
	7020100203S4	1	4	1.5	3	50	0.2
	7020100204	1	6	1.5	4	50	0.2
	7020100204S4	1	4	1.5	4	50	0.2
	7020100206	1	6	1.5	6	50	0.2
	7020100206S4	1	4	1.5	6	50	0.2
	7020100208S4	1	4	1.5	8	50	0.2
	7020100210	1	6	1.5	10	50	0.2
	7020100210S4	1	4	1.5	10	50	0.2
	7020100212	1	6	1.5	12	50	0.2
	7020100303S4	1	4	1.5	3	50	0.3
	7020100304S4	1	4	1.5	4	50	0.3
	7020100306S4	1	4	1.5	6	50	0.3
	7020100308S4	1	4	1.5	8	50	0.3
	7020100310S4	1	4	1.5	10	50	0.3
	7020120208	1.2	6	2	8	50	0.2
	7020120212	1.2	6	2	12	50	0.2
	70201500504S4	1.5	4	2.5	4	50	0.05
	70201500506S4	1.5	4	2.5	6	50	0.05
	70201500508S4	1.5	4	2.5	8	50	0.05
	70201500510S4	1.5	4	2.5	10	50	0.05
	70201500512S4	1.5	4	2.5	12	50	0.05
	7020150104S4	1.5	4	2.5	4	50	0.1
	7020150106S4	1.5	4	2.5	6	50	0.1
	7020150108S4	1.5	4	2.5	8	50	0.1
	7020150110S4	1.5	4	2.5	10	50	0.1
	7020150112S4	1.5	4	2.5	12	50	0.1
	7020150204	1.5	6	2.5	4	50	0.2

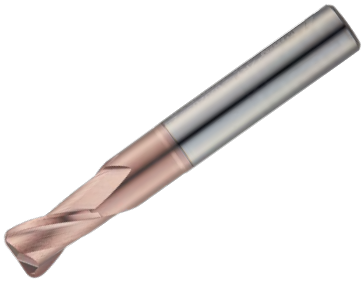
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESR	7020150204S4	1.5	4	2.5	4	50	0.2
	7020150206	1.5	6	2.5	6	50	0.2
	7020150206S4	1.5	4	2.5	6	50	0.2
	7020150208	1.5	6	2.5	8	50	0.2
	7020150208S4	1.5	4	2.5	8	50	0.2
	7020150210	1.5	6	2.5	10	50	0.2
	7020150210S4	1.5	4	2.5	10	50	0.2
	7020150212S4	1.5	4	2.5	12	50	0.2
	7020150215	1.5	6	2.5	15	50	0.2
	7020150304S4	1.5	4	2.5	4	50	0.3
	7020150306S4	1.5	4	2.5	6	50	0.3
	7020150308S4	1.5	4	2.5	8	50	0.3
	7020150310S4	1.5	4	2.5	10	50	0.3
	7020150312S4	1.5	4	2.5	12	50	0.3
	7020150504S4	1.5	4	2.5	4	50	0.5
	7020150506S4	1.5	4	2.5	6	50	0.5
	7020150508S4	1.5	4	2.5	8	50	0.5
	7020150510S4	1.5	4	2.5	10	50	0.5
	7020150512S4	1.5	4	2.5	12	50	0.5
	7020200106S4	2	4	3	6	50	0.1
	7020200108	2	6	3	8	50	0.1
	7020200108S4	2	4	3	8	50	0.1
	7020200110S4	2	4	3	10	50	0.1
	7020200112	2	6	3	12	50	0.1
	7020200112S4	2	4	3	12	50	0.1
	7020200116S4	2	4	3	16	50	0.1
	7020200120S4	2	4	3	20	50	0.1
	7020200206	2	6	3	6	50	0.2
	7020200206S4	2	4	3	6	50	0.2
	7020200208S4	2	4	3	8	50	0.2
	7020200209	2	6	3	9	50	0.2
	7020200210S4	2	4	3	10	50	0.2
	7020200212S4	2	4	3	12	50	0.2
	7020200216	2	6	3	16	50	0.2
	7020200216S4	2	4	3	16	50	0.2
	7020200220S4	2	4	3	20	50	0.2
	7020200306	2	6	3	6	50	0.3
	7020200306S4	2	4	3	6	50	0.3
	7020200308S4	2	4	3	8	50	0.3

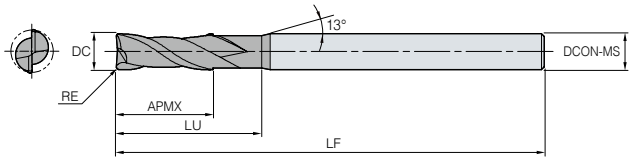
ESR702

2 flutes neck type radius

CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015





(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESR	7020200310S4	2	4	3	10	50	0.3
	7020200312S4	2	4	3	12	50	0.3
	7020200316S4	2	4	3	16	50	0.3
	7020200320S4	2	4	3	20	50	0.3
	7020200506	2	6	3	6	50	0.5
	7020200506S4	2	4	3	6	50	0.5
	7020200508S4	2	4	3	8	50	0.5
	7020200509	2	6	3	9	50	0.5
	7020200510S4	2	4	3	10	50	0.5
	7020200512	2	6	3	12	50	0.5
	7020200512S4	2	4	3	12	50	0.5
	7020200516	2	6	3	16	50	0.5
	7020200516S4	2	4	3	16	50	0.5
	7020200520S4	2	4	3	20	50	0.5
	7020250208S4	2.5	4	3.5	8	50	0.2
	7020250210S4	2.5	4	3.5	10	50	0.2
	7020250212S4	2.5	4	3.5	12	50	0.2
	7020250216S4	2.5	4	3.5	16	50	0.2
	7020250308S4	2.5	4	3.5	8	50	0.3
	7020250310S4	2.5	4	3.5	10	50	0.3
	7020250312S4	2.5	4	3.5	12	50	0.3
	7020250316S4	2.5	4	3.5	16	50	0.3
	7020250508S4	2.5	4	3.5	8	50	0.5
	7020250510S4	2.5	4	3.5	10	50	0.5
	7020250512S4	2.5	4	3.5	12	50	0.5
	7020250516S4	2.5	4	3.5	16	50	0.5
	7020300108	3	6	4.5	8	55	0.1
	7020300110	3	6	4.5	10	55	0.1
	7020300112	3	6	4.5	12	55	0.1
	7020300116	3	6	4.5	16	55	0.1
	7020300120	3	6	4.5	20	60	0.1
	7020300208	3	6	4.5	8	55	0.2
	7020300209	3	6	4.5	9	55	0.2
	7020300210	3	6	4.5	10	55	0.2
	7020300212	3	6	4.5	12	55	0.2
	7020300216	3	6	4.5	16	55	0.2
	7020300208	3	6	4.5	8	55	0.2
	7020300209	3	6	4.5	9	55	0.2
	7020300210	3	6	4.5	10	55	0.2

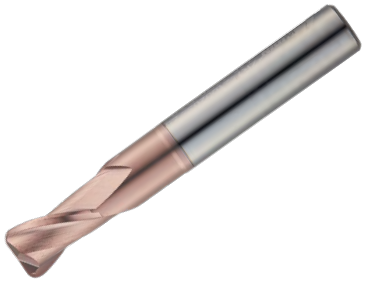
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESR	7020300212	3	6	4.5	12	55	0.2
	7020300216	3	6	4.5	16	55	0.2
	7020300220	3	6	4.5	20	60	0.2
	7020300308	3	6	4.5	8	55	0.3
	7020300309	3	6	4.5	9	55	0.3
	7020300310	3	6	4.5	10	55	0.3
	7020300312	3	6	4.5	12	55	0.3
	7020300314	3	6	4.5	14	55	0.3
	7020300316	3	6	4.5	16	55	0.3
	7020300320	3	6	4.5	20	60	0.3
	7020300508	3	6	4.5	8	55	0.5
	7020300509	3	6	4.5	9	55	0.5
	7020300510	3	6	4.5	10	55	0.5
	7020300512	3	6	4.5	12	55	0.5
	7020300516	3	6	4.5	16	55	0.5
	7020300520	3	6	4.5	20	60	0.5
	7020301008	3	6	4.5	8	55	1
	7020301010	3	6	4.5	10	55	1
	7020301012	3	6	4.5	12	55	1
	7020301016	3	6	4.5	16	55	1
	7020301020	3	6	4.5	20	60	1
	7020301025	3	6	4.5	25	60	1
	7020400110	4	6	6	10	55	0.1
	7020400112	4	6	6	12	55	0.1
	7020400116	4	6	6	16	55	0.1
	7020400120	4	6	6	20	60	0.1
	7020400125	4	6	6	25	60	0.1
	7020400210	4	6	6	10	55	0.2
	7020400212	4	6	6	12	55	0.2
	7020400216	4	6	6	16	55	0.2
	7020400220	4	6	6	20	60	0.2
	7020400225	4	6	6	25	60	0.2
	7020400310	4	6	6	10	55	0.3
	7020400312	4	6	6	12	55	0.3
	7020400316	4	6	6	16	55	0.3
	7020400320	4	6	6	20	60	0.3
	7020400325	4	6	6	25	60	0.3
	7020400510	4	6	6	10	55	0.5
	7020400512	4	6	6	12	55	0.5

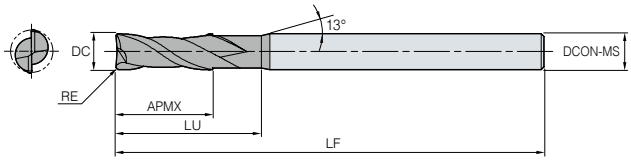
ESR702

2 flutes neck type radius

CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015





(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESR	7020400516	4	6	6	16	55	0.5
	7020400520	4	6	6	20	60	0.5
	7020400525	4	6	6	25	60	0.5
	7020400530	4	6	6	30	70	0.5
	7020401010	4	6	6	10	55	1
	7020401012	4	6	6	12	55	1
	7020401016	4	6	6	16	55	1
	7020401020	4	6	6	20	60	1
	7020401025	4	6	6	25	60	1
	7020401030	4	6	6	30	70	1
	7020500318	5	6	8	18	60	0.3
	7020600220	6	6	9	20	60	0.2
	7020600320	6	6	9	20	60	0.3
	7020600520	6	6	9	20	60	0.5
	7020601020	6	6	9	20	60	1
	7020601520	6	6	9	20	60	1.5
	7020602020	6	6	9	20	60	2

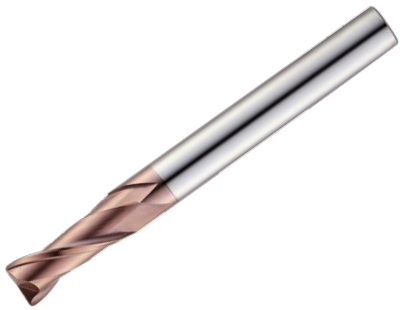
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESR	7020800225	8	8	12	25	60	0.2
	7020800325	8	8	12	25	60	0.3
	7020800525	8	8	12	25	60	0.5
	7020801025	8	8	12	25	60	1
	7020801525	8	8	12	25	60	1.5
	7021000232	10	10	15	32	70	0.2
	7021000332	10	10	15	32	70	0.3
	7021000532	10	10	15	32	70	0.5
	7021001032	10	10	15	32	70	1
	7021001532	10	10	15	32	70	1.5
	7021002032	10	10	15	32	70	2
	7021200338	12	12	18	38	80	0.3
	7021200538	12	12	18	38	80	0.5
	7021201038	12	12	18	38	80	1
	7021201538	12	12	18	38	80	1.5
	7021202038	12	12	18	38	80	2

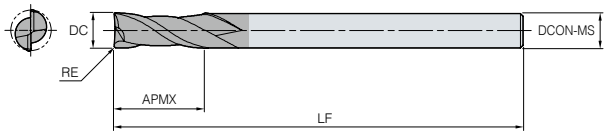
ESR732

2 flutes long shank radius

CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015





(mm)

Designation		DC	DCON-MS	APMX	LF	RE
ESR	73201001	1	6	2	50	0.1
	73201002	1	6	2	50	0.2
	73201003	1	6	2	50	0.3
	73201501	1.5	6	3	50	0.1
	73201502	1.5	6	3	50	0.2
	73201503	1.5	6	3	50	0.3
	73201505	1.5	6	3	50	0.5
	73202001	2	6	5	50	0.1
	73202002	2	6	5	50	0.2
	73202003	2	6	5	50	0.3
	73202005	2	6	5	50	0.5
	73202501	2.5	6	7	60	0.1
	73202502	2.5	6	7	60	0.2
	73202503	2.5	6	7	60	0.3
	73202505	2.5	6	7	60	0.5
	73203001	3	6	8	60	0.1
	73203002	3	6	8	60	0.2
	73203003	3	6	8	60	0.3
	73203005	3	6	8	60	0.5
	73204001	4	6	10	70	0.1
	73204002	4	6	10	70	0.2
	73204003	4	6	10	70	0.3
	73204005	4	6	10	70	0.5
	73204010	4	6	10	70	1
	73205001	5	6	13	80	0.1

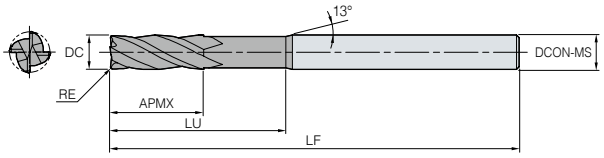
Designation		DC	DCON-MS	APMX	LF	RE
ESR	73205002	5	6	13	80	0.2
	73205003	5	6	13	80	0.3
	73205005	5	6	13	80	0.5
	73205010	5	6	13	80	1
	73206001	6	6	15	90	0.1
	73206002	6	6	15	90	0.2
	73206003	6	6	15	90	0.3
	73206005	6	6	15	90	0.5
	73206010	6	6	15	90	1
	73208001	8	8	20	100	0.1
	73208002	8	8	20	100	0.2
	73208003	8	8	20	100	0.3
	73208005	8	8	20	100	0.5
	73208010	8	8	20	100	1
	73208020	8	8	20	100	2
	73210002	10	10	25	100	0.2
	73210003	10	10	25	100	0.3
	73210005	10	10	25	100	0.5
	73210010	10	10	25	100	1
	73210020	10	10	25	100	2
	73212002	12	12	30	110	0.2
	73212003	12	12	30	110	0.3
	73212005	12	12	30	110	0.5
	73212010	12	12	30	110	1
	73212020	12	12	30	110	2

ESR704

4 flutes neck type radius

CARBIDE | 4 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESR	7040100103S4	1	4	2	3	50	0.1
	7040100104S4	1	4	2	4	50	0.1
	7040100106S4	1	4	2	6	50	0.1
	7040100203S4	1	4	2	3	50	0.2
	7040100204S4	1	4	2	4	50	0.2
	7040100206S4	1	4	2	6	50	0.2
	7040100303S4	1	4	2	3	50	0.3
	7040100304S4	1	4	2	4	50	0.3
	7040100306S4	1	4	2	6	50	0.3
	7040150104S4	1.5	4	2.5	4	50	0.1
	7040150106S4	1.5	4	2.5	6	50	0.1
	7040150204S4	1.5	4	2.5	4	50	0.2
	7040150206S4	1.5	4	2.5	6	50	0.2
	7040150304S4	1.5	4	2.5	4	50	0.3
	7040150306S4	1.5	4	2.5	6	50	0.3
	7040200106S4	2	4	3	6	50	0.1
	7040200108S4	2	4	3	8	50	0.1
	7040200206S4	2	4	3	6	50	0.2
	7040200208	2	6	3	8	50	0.2
	7040200208S4	2	4	3	8	50	0.2
	7040200210	2	6	3	10	50	0.2
	7040200212	2	6	3	12	50	0.2
	7040200306S4	2	4	3	6	50	0.3
	7040200308S4	2	4	3	8	50	0.3
	7040200506S4	2	4	3	6	50	0.5
	7040200508S4	2	4	3	8	50	0.5
	7040250106S4	2.5	4	3.5	6	50	0.1
	7040300108	3	6	4	8	55	0.1
	7040300110	3	6	4	10	55	0.1
	7040300112	3	6	4	12	55	0.1
	7040300116	3	6	4	16	55	0.1
	7040300120	3	6	4	20	60	0.1
	7040300208	3	6	4	8	55	0.2
	7040300210	3	6	4	10	55	0.2
	7040300212	3	6	4	12	55	0.2
	7040300216	3	6	4	16	55	0.2

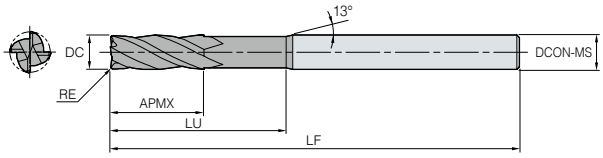
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESR	7040300220	3	6	4	20	60	0.2
	7040300308	3	6	4	8	55	0.3
	7040300309	3	6	4	9	55	0.3
	7040300310	3	6	4	10	55	0.3
	7040300312	3	6	4	12	55	0.3
	7040300316	3	6	4	16	55	0.3
	7040300320	3	6	4	20	60	0.3
	7040300508	3	6	4	8	55	0.5
	7040300509	3	6	4	9	55	0.5
	7040300510	3	6	4	10	55	0.5
	7040300512	3	6	4	12	55	0.5
	7040300516	3	6	4	16	55	0.5
	7040300520	3	6	4	20	60	0.5
	7040301008	3	6	4	8	55	1
	7040301010	3	6	4	10	55	1
	7040301012	3	6	4	12	55	1
	7040301016	3	6	4	16	55	1
	7040301020	3	6	4	20	60	1
	7040400110	4	6	6	10	55	0.1
	7040400112	4	6	6	12	55	0.1
	7040400116	4	6	6	16	55	0.1
	7040400120	4	6	6	20	60	0.1
	7040400125	4	6	6	25	60	0.1
	7040400210	4	6	6	10	55	0.2
	7040400212	4	6	6	12	55	0.2
	7040400216	4	6	6	16	55	0.2
	7040400220	4	6	6	20	60	0.2
	7040400225	4	6	6	25	60	0.2
	7040400310	4	6	6	10	55	0.3
	7040400312	4	6	6	12	55	0.3
	7040400316	4	6	6	16	55	0.3
	7040400320	4	6	6	20	60	0.3
	7040400325	4	6	6	25	60	0.3
	7040400510	4	6	6	10	55	0.5
	7040400512	4	6	6	12	55	0.5
	7040400516	4	6	6	16	55	0.5

ESR704

4 flutes neck type radius

CARBIDE | 4 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESR	7040400520	4	6	6	20	60	0.5
	7040400525	4	6	6	25	60	0.5
	7040401010	4	6	6	10	55	1
	7040401012	4	6	6	12	55	1
	7040401016	4	6	6	16	55	1
	7040401020	4	6	6	20	60	1
	7040401025	4	6	6	25	60	1
	7040600220	6	6	9	20	60	0.2
	7040600320	6	6	9	20	60	0.3
	7040600520	6	6	9	20	60	0.5
	7040601020	6	6	9	20	60	1
	7040601520	6	6	9	20	60	1.5
	7040602020	6	6	9	20	60	2
	7040800225	8	8	12	25	60	0.2
	7040800325	8	8	12	25	60	0.3

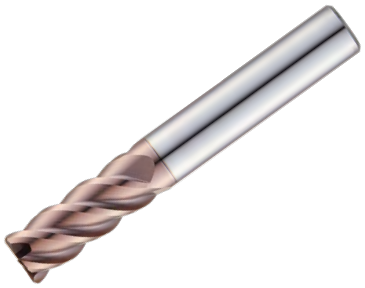
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESR	7040800525	8	8	12	25	60	0.5
	7040801025	8	8	12	25	60	1
	7040801525	8	8	12	25	60	1.5
	7040802025	8	8	12	25	60	2
	7041000232	10	10	15	32	70	0.2
	7041000332	10	10	15	32	70	0.3
	7041000532	10	10	15	32	70	0.5
	7041001032	10	10	15	32	70	1
	7041001532	10	10	15	32	70	1.5
	7041002032	10	10	15	32	70	2
	7041200338	12	12	18	38	80	0.3
	7041200538	12	12	18	38	80	0.5
	7041201038	12	12	18	38	80	1
	7041201538	12	12	18	38	80	1.5
	7041202038	12	12	18	38	80	2

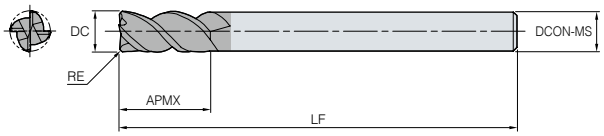
ESR714

4 flutes radius

CARBIDE | 4 | H·A 45° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø3 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015





(mm)

Designation		DC	DCON-MS	APMX	LF	RE
ESR	7140303	3	6	8	50	0.3
	7140305S4	3	4	8	50	0.5
	7140305	3	6	8	50	0.5
	7140403	4	6	11	50	0.3
	7140405	4	6	11	50	0.5
	7140405S4	4	4	11	50	0.5
	7140410	4	6	11	50	1
	7140603	6	6	15	60	0.3
	7140605	6	6	15	60	0.5
	7140610	6	6	15	60	1
	7140803	8	8	20	60	0.3
	7140805	8	8	20	60	0.5
	7140810	8	8	20	60	1
	7140815	8	8	20	60	1.5
	7140820	8	8	20	60	2

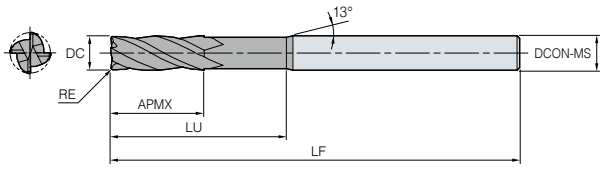
Designation		DC	DCON-MS	APMX	LF	RE
ESR	7141003	10	10	25	70	0.3
	7141005	10	10	25	70	0.5
	7141010	10	10	25	70	1
	7141015	10	10	25	70	1.5
	7141020	10	10	25	70	2
	7141025	10	10	25	70	2.5
	7141030	10	10	25	70	3
	7141203	12	12	30	80	0.3
	7141205	12	12	30	80	0.5
	7141210	12	12	30	80	1
	7141215	12	12	30	80	1.5
	7141220	12	12	30	80	2
	7141225	12	12	30	80	2.5
	7141230	12	12	30	80	3

ESR724

4 flutes neck type radius

CARBIDE | 4 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESR	7240600520	6	6	9	20	90	0.5
	7240601020	6	6	9	20	90	1
	7240800525	8	8	12	25	100	0.5
	7240801025	8	8	12	25	100	1
	7241000532	10	10	15	32	100	0.5

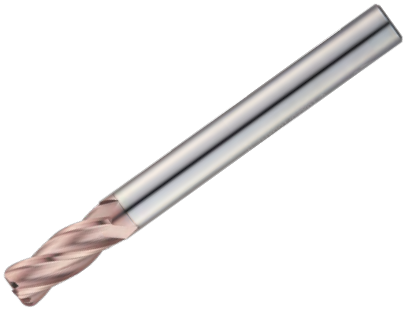
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESR	7241001032	10	10	15	32	100	1
	7241002032	10	10	15	32	100	2
	7241200538	12	12	18	38	110	0.5
	7241201038	12	12	18	38	110	1
	7241202038	12	12	18	38	110	2

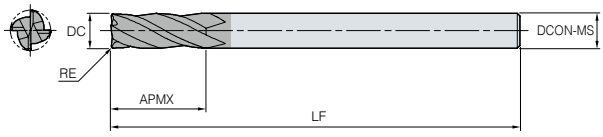
ESR734

4 flutes long shank radius

CARBIDE | 4 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015





(mm)

Designation		DC	DCON-MS	APMX	LF	RE
ESR	73401001	1	6	2	50	0.1
	73401002	1	6	2	50	0.2
	73401003	1	6	2	50	0.3
	73401501	1.5	6	3	50	0.1
	73401502	1.5	6	3	50	0.2
	73401503	1.5	6	3	50	0.3
	73401505	1.5	6	3	50	0.5
	73402001	2	6	5	50	0.1
	73402002	2	6	5	50	0.2
	73402003	2	6	5	50	0.3
	73402005	2	6	5	50	0.5
	73402501	2.5	6	7	60	0.1
	73402502	2.5	6	7	60	0.2
	73402503	2.5	6	7	60	0.3
	73402505	2.5	6	7	60	0.5
	73403001	3	6	8	60	0.1
	73403002	3	6	8	60	0.2
	73403003	3	6	8	60	0.3
	73403005	3	6	8	60	0.5
	73404001	4	6	10	70	0.1
	73404002	4	6	10	70	0.2
	73404002S4	4	4	10	70	0.2
	73404003	4	6	10	70	0.3
	73404005	4	6	10	70	0.5
	73404005S4	4	4	10	70	0.5
	73404010	4	6	10	70	1
	73405001	5	6	13	80	0.1

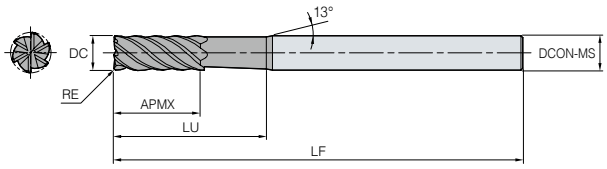
Designation		DC	DCON-MS	APMX	LF	RE
ESR	73405002	5	6	13	80	0.2
	73405003	5	6	13	80	0.3
	73405005	5	6	13	80	0.5
	73405010	5	6	13	80	1
	73406001	6	6	15	90	0.1
	73406002	6	6	15	90	0.2
	73406003	6	6	15	90	0.3
	73406005	6	6	15	90	0.5
	73406010	6	6	15	90	1
	73408001	8	8	20	100	0.1
	73408002	8	8	20	100	0.2
	73408003	8	8	20	100	0.3
	73408005	8	8	20	100	0.5
	73408010	8	8	20	100	1
	73408020	8	8	20	100	2
	73410002	10	10	25	100	0.2
	73410003	10	10	25	100	0.3
	73410005	10	10	25	100	0.5
	73410010	10	10	25	100	1
	73410020	10	10	25	100	2
	73412002	12	12	30	110	0.2
	73412003	12	12	30	110	0.3
	73412005	12	12	30	110	0.5
	73412010	12	12	30	110	1
	73412010L	12	12	30	150	1
	73412020	12	12	30	110	2

ESR706

6 flutes neck type radius

CARBIDE | 6 | H·A 45° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

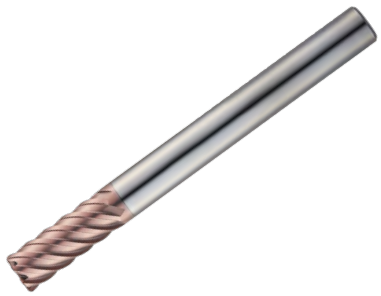
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESR	7060600314	6	6	6	14	50	0.3
	7060600514	6	6	6	14	50	0.5
	7060800524	8	8	8	24	60	0.5
	7060801024	8	8	8	24	60	1
	7061000530	10	10	10	30	70	0.5
	7061001030	10	10	10	30	70	1
	7061200530	12	12	12	30	75	0.5
	7061201030	12	12	12	30	75	1

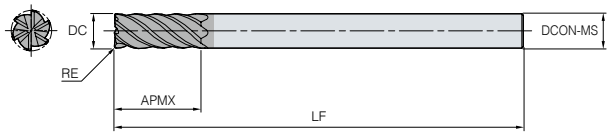
ESR736

6 flutes radius

CARBIDE | 6 | H·A 45° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



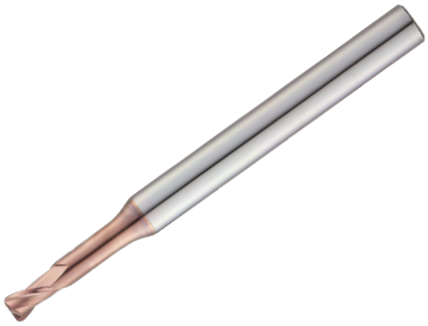


(mm)

Designation		DC	DCON-MS	APMX	LF	RE
ESR	73606005	6	6	15	90	0.5
	73606010	6	6	15	90	1
	73608005	8	8	20	100	0.5
	73608010	8	8	20	100	1
	73610005	10	10	25	100	0.5
	73610010	10	10	25	100	1
	73612005	12	12	30	110	0.5
	73612010	12	12	30	110	1

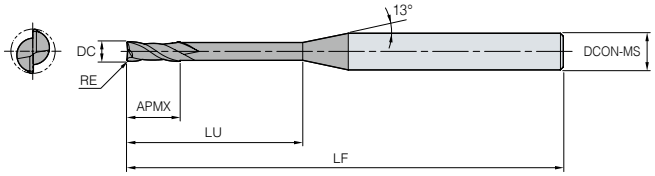
ESRR712

2 flutes rib ball



CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.2 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø16	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	712002002005	0.2	4	0.2	0.5	40	0.02
	71200200201	0.2	4	0.2	1	40	0.02
	712002002015	0.2	4	0.2	1.5	40	0.02
	712002005005	0.2	4	0.2	0.5	40	0.05
	71200200501	0.2	4	0.2	1	40	0.05
	712002005015	0.2	4	0.2	1.5	40	0.05
	71200300201	0.3	4	0.3	1	40	0.02
	71200300202	0.3	4	0.3	2	40	0.02
	71200300203	0.3	4	0.3	3	40	0.02
	71200300501	0.3	4	0.3	1	40	0.05
	71200300502	0.3	4	0.3	2	40	0.05
	71200300503	0.3	4	0.3	3	40	0.05
	71200400201	0.4	4	0.4	1	40	0.02
	71200400202	0.4	4	0.4	2	40	0.02
	71200400203	0.4	4	0.4	3	40	0.02
	71200400204	0.4	4	0.4	4	40	0.02
	71200400501	0.4	4	0.4	1	40	0.05
	71200400502	0.4	4	0.4	2	40	0.05
	71200400503	0.4	4	0.4	3	40	0.05
	71200400504	0.4	4	0.4	4	40	0.05
	71200401001	0.4	4	0.4	1	40	0.1
	712004010015	0.4	4	0.4	1.5	40	0.1
	71200401002	0.4	4	0.4	2	40	0.1
	71200401003	0.4	4	0.4	3	40	0.1
	71200401004	0.4	4	0.4	4	40	0.1
	71200500201	0.5	4	0.5	1	45	0.02
	712005002015	0.5	4	0.5	1.5	45	0.02
	71200500202	0.5	4	0.5	2	45	0.02
	712005002025	0.5	4	0.5	2.5	45	0.02
	71200500203	0.5	4	0.5	3	45	0.02
	71200500204	0.5	4	0.5	4	45	0.02
	71200500205	0.5	4	0.5	5	45	0.02
	71200500206	0.5	4	0.5	6	45	0.02
	71200500208	0.5	4	0.5	8	45	0.02
	71200500210	0.5	4	0.5	10	45	0.02
	71200500501	0.5	4	0.5	1	45	0.05
	712005005015	0.5	4	0.5	1.5	45	0.05
	71200500502	0.5	4	0.5	2	45	0.05
	712005005025	0.5	4	0.5	2.5	45	0.05

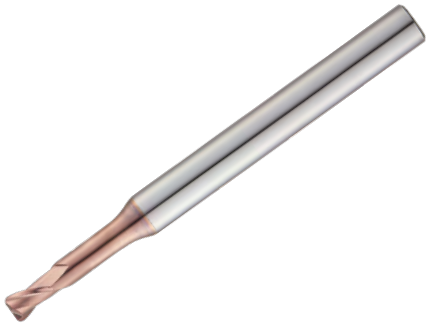
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71200500503	0.5	4	0.5	3	45	0.05
	71200500504	0.5	4	0.5	4	45	0.05
	71200500505	0.5	4	0.5	5	45	0.05
	71200500506	0.5	4	0.5	6	45	0.05
	71200500508	0.5	4	0.5	8	45	0.05
	71200500510	0.5	4	0.5	10	45	0.05
	71200501001	0.5	4	0.5	1	45	0.1
	712005010015	0.5	4	0.5	1.5	45	0.1
	71200501002	0.5	4	0.5	2	45	0.1
	712005010025	0.5	4	0.5	2.5	45	0.1
	71200501003	0.5	4	0.5	3	45	0.1
	71200501004	0.5	4	0.5	4	45	0.1
	71200501005	0.5	4	0.5	5	45	0.1
	71200501006	0.5	4	0.5	6	45	0.1
	71200501008	0.5	4	0.5	8	45	0.1
	71200501010	0.5	4	0.5	10	45	0.1
	71200600202	0.6	4	0.6	2	45	0.02
	71200600203	0.6	4	0.6	3	45	0.02
	71200600204	0.6	4	0.6	4	45	0.02
	71200600206	0.6	4	0.6	6	45	0.02
	71200600208	0.6	4	0.6	8	45	0.02
	71200600210	0.6	4	0.6	10	45	0.02
	71200600212	0.6	4	0.6	12	50	0.02
	71200600502	0.6	4	0.6	2	45	0.05
	71200600503	0.6	4	0.6	3	45	0.05
	71200600504	0.6	4	0.6	4	45	0.05
	71200600506	0.6	4	0.6	6	45	0.05
	71200600508	0.6	4	0.6	8	45	0.05
	71200600510	0.6	4	0.6	10	45	0.05
	71200600512	0.6	4	0.6	12	50	0.05
	71200601002	0.6	4	0.6	2	45	0.1
	71200601003	0.6	4	0.6	3	45	0.1
	71200601004	0.6	4	0.6	4	45	0.1
	71200601006	0.6	4	0.6	6	45	0.1
	71200601008	0.6	4	0.6	8	45	0.1
	71200601010	0.6	4	0.6	10	45	0.1
	71200601012	0.6	4	0.6	12	50	0.1
	71200701002	0.7	4	0.7	2	45	0.1
	71200701004	0.7	4	0.7	4	45	0.1

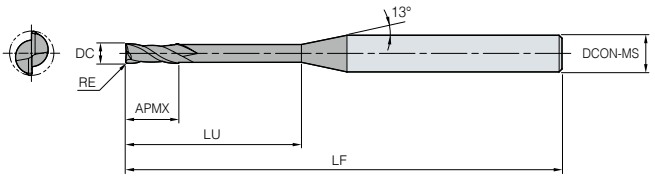
ESRR712

2 flutes rib ball

CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.2 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø16	0.000 ~ -0.015





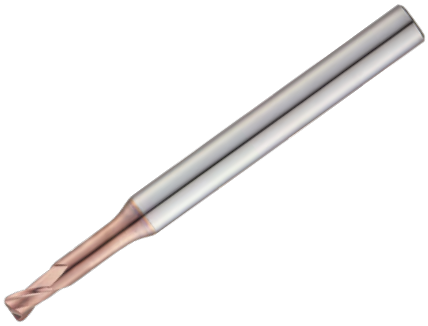
(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71200701006	0.7	4	0.7	6	45	0.1
	71200701008	0.7	4	0.7	8	45	0.1
	71200701010	0.7	4	0.7	10	45	0.1
	71200800202	0.8	4	0.8	2	45	0.02
	71200800204	0.8	4	0.8	4	45	0.02
	71200800206	0.8	4	0.8	6	45	0.02
	71200800208	0.8	4	0.8	8	45	0.02
	71200800210	0.8	4	0.8	10	45	0.02
	71200800212	0.8	4	0.8	12	50	0.02
	71200800502	0.8	4	0.8	2	45	0.05
	71200800504	0.8	4	0.8	4	45	0.05
	71200800506	0.8	4	0.8	6	45	0.05
	71200800508	0.8	4	0.8	8	45	0.05
	71200800510	0.8	4	0.8	10	45	0.05
	71200800512	0.8	4	0.8	12	50	0.05
	71200801002	0.8	4	0.8	2	45	0.1
	71200801004	0.8	4	0.8	4	45	0.1
	71200801006	0.8	4	0.8	6	45	0.1
	71200801008	0.8	4	0.8	8	45	0.1
	71200801010	0.8	4	0.8	10	45	0.1
	71200801012	0.8	4	0.8	12	50	0.1
	71200802002	0.8	4	0.8	2	45	0.2
	71200802004	0.8	4	0.8	4	45	0.2
	71200802006	0.8	4	0.8	6	45	0.2
	71200802008	0.8	4	0.8	8	45	0.2
	71200802010	0.8	4	0.8	10	45	0.2
	71200802012	0.8	4	0.8	12	50	0.2
	71201000204	1	4	1	4	45	0.02
	71201000206	1	4	1	6	45	0.02
	71201000208	1	4	1	8	45	0.02
	71201000210	1	4	1	10	50	0.02
	71201000212	1	4	1	12	50	0.02
	71201000214	1	4	1	14	50	0.02
	71201000216	1	4	1	16	50	0.02
	71201000220	1	4	1	20	50	0.02
	71201000504	1	4	1	4	45	0.05
	71201000506	1	4	1	6	45	0.05
	71201000508	1	4	1	8	45	0.05
	71201000510	1	4	1	10	50	0.05

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71201000512	1	4	1	12	50	0.05
	71201000514	1	4	1	14	50	0.05
	71201000516	1	4	1	16	50	0.05
	71201000520	1	4	1	20	50	0.05
	71201001004	1	4	1	4	45	0.1
	71201001006	1	4	1	6	45	0.1
	71201001008	1	4	1	8	45	0.1
	71201001010	1	4	1	10	50	0.1
	71201001012	1	4	1	12	50	0.1
	71201001014	1	4	1	14	50	0.1
	71201001016	1	4	1	16	50	0.1
	71201001020	1	4	1	20	50	0.1
	71201002004	1	4	1	4	45	0.2
	71201002006	1	4	1	6	45	0.2
	71201002008	1	4	1	8	45	0.2
	71201002010	1	4	1	10	50	0.2
	71201002012	1	4	1	12	50	0.2
	71201002014	1	4	1	14	50	0.2
	71201002016	1	4	1	16	50	0.2
	71201002020	1	4	1	20	50	0.2
	71201003004	1	4	1	4	45	0.3
	71201003006	1	4	1	6	45	0.3
	71201003008	1	4	1	8	45	0.3
	71201003010	1	4	1	10	50	0.3
	71201003012	1	4	1	12	50	0.3
	71201003014	1	4	1	14	50	0.3
	71201003016	1	4	1	16	50	0.3
	71201003020	1	4	1	20	50	0.3
	71201200204	1.2	4	1.2	4	45	0.02
	71201200206	1.2	4	1.2	6	45	0.02
	71201200208	1.2	4	1.2	8	45	0.02
	71201200210	1.2	4	1.2	10	50	0.02
	71201200212	1.2	4	1.2	12	50	0.02
	71201200214	1.2	4	1.2	14	50	0.02
	71201200216	1.2	4	1.2	16	50	0.02
	71201200220	1.2	4	1.2	20	50	0.02
	71201200504	1.2	4	1.2	4	45	0.05
	71201200506	1.2	4	1.2	6	45	0.05
	71201200508	1.2	4	1.2	8	45	0.05

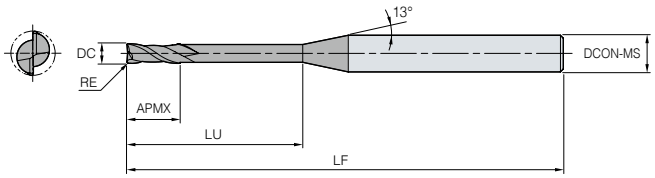
ESRR712

2 flutes rib ball



CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.2 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø16	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71201200510	1.2	4	1.2	10	50	0.05
	71201200512	1.2	4	1.2	12	50	0.05
	71201200514	1.2	4	1.2	14	50	0.05
	71201200516	1.2	4	1.2	16	50	0.05
	71201200520	1.2	4	1.2	20	50	0.05
	71201201004	1.2	4	1.2	4	45	0.1
	71201201006	1.2	4	1.2	6	45	0.1
	71201201008	1.2	4	1.2	8	45	0.1
	71201201010	1.2	4	1.2	10	50	0.1
	71201201012	1.2	4	1.2	12	50	0.1
	71201201014	1.2	4	1.2	14	50	0.1
	71201201016	1.2	4	1.2	16	50	0.1
	71201201020	1.2	4	1.2	20	50	0.1
	71201202004	1.2	4	1.2	4	45	0.2
	71201202006	1.2	4	1.2	6	45	0.2
	71201202008	1.2	4	1.2	8	45	0.2
	71201202010	1.2	4	1.2	10	50	0.2
	71201202012	1.2	4	1.2	12	50	0.2
	71201202014	1.2	4	1.2	14	50	0.2
	71201202016	1.2	4	1.2	16	50	0.2
	71201202020	1.2	4	1.2	20	50	0.2
	71201203004	1.2	4	1.2	4	45	0.3
	71201203006	1.2	4	1.2	6	45	0.3
	71201203008	1.2	4	1.2	8	45	0.3
	71201203010	1.2	4	1.2	10	50	0.3
	71201203012	1.2	4	1.2	12	50	0.3
	71201203014	1.2	4	1.2	14	50	0.3
	71201203016	1.2	4	1.2	16	50	0.3
	71201203020	1.2	4	1.2	20	50	0.3
	71201500204	1.5	4	1.5	4	45	0.02
	71201500206	1.5	4	1.5	6	45	0.02
	71201500208	1.5	4	1.5	8	45	0.02
	71201500210	1.5	4	1.5	10	50	0.02
	71201500212	1.5	4	1.5	12	50	0.02
	71201500214	1.5	4	1.5	14	50	0.02
	71201500216	1.5	4	1.5	16	50	0.02
	71201500220	1.5	4	1.5	20	50	0.02
	71201500504	1.5	4	1.5	4	45	0.05
	71201500506	1.5	4	1.5	6	45	0.05

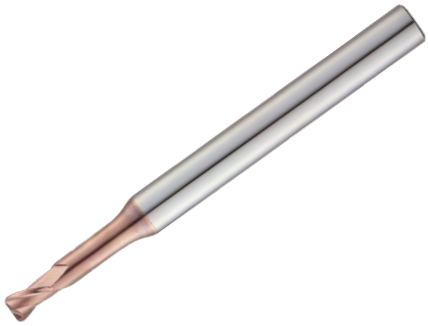
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71201500508	1.5	4	1.5	8	45	0.05
	71201500510	1.5	4	1.5	10	50	0.05
	71201500512	1.5	4	1.5	12	50	0.05
	71201500514	1.5	4	1.5	14	50	0.05
	71201500516	1.5	4	1.5	16	50	0.05
	71201500520	1.5	4	1.5	20	50	0.05
	71201501004	1.5	4	1.5	4	45	0.1
	71201501006	1.5	4	1.5	6	45	0.1
	71201501008	1.5	4	1.5	8	45	0.1
	71201501010	1.5	4	1.5	10	50	0.1
	71201501012	1.5	4	1.5	12	50	0.1
	71201501014	1.5	4	1.5	14	50	0.1
	71201501016	1.5	4	1.5	16	50	0.1
	71201501020	1.5	4	1.5	20	50	0.1
	71201502004	1.5	4	1.5	4	45	0.2
	71201502006	1.5	4	1.5	6	45	0.2
	71201502008	1.5	4	1.5	8	45	0.2
	71201502010	1.5	4	1.5	10	50	0.2
	71201502012	1.5	4	1.5	12	50	0.2
	71201502014	1.5	4	1.5	14	50	0.2
	71201502016	1.5	4	1.5	16	50	0.2
	71201502020	1.5	4	1.5	20	50	0.2
	71201503004	1.5	4	1.5	4	45	0.3
	71201503006	1.5	4	1.5	6	45	0.3
	71201503008	1.5	4	1.5	8	45	0.3
	71201503010	1.5	4	1.5	10	50	0.3
	71201503012	1.5	4	1.5	12	50	0.3
	71201503014	1.5	4	1.5	14	50	0.3
	71201503016	1.5	4	1.5	16	50	0.3
	71201503020	1.5	4	1.5	20	50	0.3
	71201505004	1.5	4	1.5	4	45	0.5
	71201505006	1.5	4	1.5	6	45	0.5
	71201505008	1.5	4	1.5	8	45	0.5
	71201505010	1.5	4	1.5	10	50	0.5
	71201505012	1.5	4	1.5	12	50	0.5
	71201505014	1.5	4	1.5	14	50	0.5
	71201505016	1.5	4	1.5	16	50	0.5
	71201505020	1.5	4	1.5	20	50	0.5
	71202000206	2	4	2	6	45	0.02

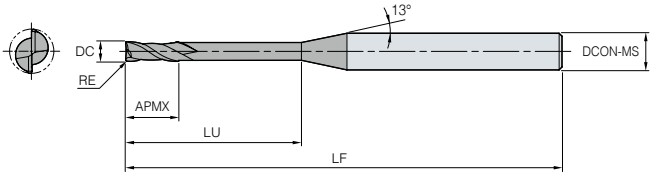
ESRR712

2 flutes rib ball

CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.2 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø16	0.000 ~ -0.015





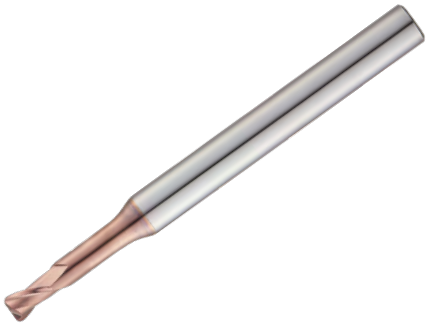
(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71202000208	2	4	2	8	45	0.02
	71202000210	2	4	2	10	50	0.02
	71202000212	2	4	2	12	50	0.02
	71202000214	2	4	2	14	50	0.02
	71202000216	2	4	2	16	50	0.02
	71202000220	2	4	2	20	50	0.02
	71202000225	2	4	2	25	60	0.02
	71202000506	2	4	2	6	45	0.05
	71202000508	2	4	2	8	45	0.05
	71202000510	2	4	2	10	50	0.05
	71202000512	2	4	2	12	50	0.05
	71202000514	2	4	2	14	50	0.05
	71202000516	2	4	2	16	50	0.05
	71202000520	2	4	2	20	50	0.05
	71202000525	2	4	2	25	60	0.05
	71202001006	2	4	2	6	45	0.1
	71202001008	2	4	2	8	45	0.1
	71202001010	2	4	2	10	50	0.1
	71202001012	2	4	2	12	50	0.1
	71202001014	2	4	2	14	50	0.1
	71202001016	2	4	2	16	50	0.1
	71202001020	2	4	2	20	50	0.1
	71202001025	2	4	2	25	60	0.1
	71202001030	2	4	2	30	70	0.1
	71202002006	2	4	2	6	45	0.2
	71202002008	2	4	2	8	45	0.2
	71202002010	2	4	2	10	50	0.2
	71202002012	2	4	2	12	50	0.2
	71202002014	2	4	2	14	50	0.2
	71202002016	2	4	2	16	50	0.2
	71202002020	2	4	2	20	50	0.2
	71202002025	2	4	2	25	60	0.2
	71202002030	2	4	2	30	70	0.2
	71202003006	2	4	2	6	45	0.3
	71202003008	2	4	2	8	45	0.3
	71202003010	2	4	2	10	50	0.3
	71202003012	2	4	2	12	50	0.3
	71202003014	2	4	2	14	50	0.3
	71202003016	2	4	2	16	50	0.3

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71202003020	2	4	2	20	50	0.3
	71202003025	2	4	2	25	60	0.3
	71202003030	2	4	2	30	70	0.3
	71202005006	2	4	2	6	45	0.5
	71202005008	2	4	2	8	45	0.5
	71202005010	2	4	2	10	50	0.5
	71202005012	2	4	2	12	50	0.5
	71202005014	2	4	2	14	50	0.5
	71202005016	2	4	2	16	50	0.5
	71202005020	2	4	2	20	50	0.5
	71202005025	2	4	2	25	60	0.5
	71202005030	2	4	2	30	70	0.5
	71202501010	2.5	4	2.5	10	50	0.1
	71202501016	2.5	4	2.5	16	50	0.1
	71202501020	2.5	4	2.5	20	50	0.1
	71202501025	2.5	4	2.5	25	60	0.1
	71202501030	2.5	4	2.5	30	70	0.1
	71202502010	2.5	4	2.5	10	50	0.2
	71202502016	2.5	4	2.5	16	50	0.2
	71202502020	2.5	4	2.5	20	50	0.2
	71202503010	2.5	4	2.5	10	50	0.3
	71202503016	2.5	4	2.5	16	50	0.3
	71202503020	2.5	4	2.5	20	50	0.3
	71202505010	2.5	4	2.5	10	50	0.5
	71202505016	2.5	4	2.5	16	50	0.5
	71202505020	2.5	4	2.5	20	50	0.5
	71203001010	3	6	3	10	50	0.1
	71203001012	3	6	3	12	50	0.1
	71203001016	3	6	3	16	55	0.1
	71203001020	3	6	3	20	60	0.1
	71203001025	3	6	3	25	65	0.1
	71203001030	3	6	3	30	70	0.1
	71203001035	3	6	3	35	75	0.1
	71203001040	3	6	3	40	80	0.1
	71203002010	3	6	3	10	50	0.2
	71203002012	3	6	3	12	50	0.2
	71203002016	3	6	3	16	55	0.2
	71203002020	3	6	3	20	60	0.2
	71203002025	3	6	3	25	65	0.2

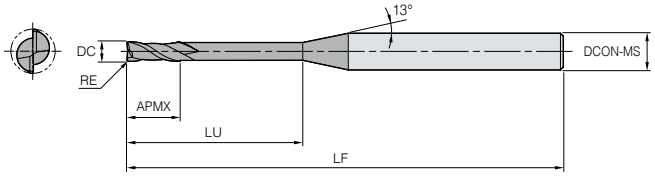
ESRR712

2 flutes rib ball



CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.2 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø16	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71203002030	3	6	3	30	70	0.2
	71203002035	3	6	3	35	75	0.2
	71203002040	3	6	3	40	80	0.2
	71203003010	3	6	3	10	50	0.3
	71203003012	3	6	3	12	50	0.3
	71203003016	3	6	3	16	55	0.3
	71203003020	3	6	3	20	60	0.3
	71203003025	3	6	3	25	65	0.3
	71203003030	3	6	3	30	70	0.3
	71203003035	3	6	3	35	75	0.3
	71203003040	3	6	3	40	80	0.3
	71203005010	3	6	3	10	50	0.5
	71203005012	3	6	3	12	50	0.5
	71203005016	3	6	3	16	55	0.5
	71203005020	3	6	3	20	60	0.5
	71203005025	3	6	3	25	65	0.5
	71203005030	3	6	3	30	70	0.5
	71203005035	3	6	3	35	75	0.5
	71203005040	3	6	3	40	80	0.5
	71203010010	3	6	3	10	50	1
	71203010012	3	6	3	12	50	1
	71203010016	3	6	3	16	55	1
	71203010020	3	6	3	20	60	1
	71203010025	3	6	3	25	65	1
	71203010030	3	6	3	30	70	1
	71203010035	3	6	3	35	75	1
	71203010040	3	6	3	40	80	1
	71204001012	4	6	4	12	50	0.1
	71204001016	4	6	4	16	55	0.1
	71204001020	4	6	4	20	60	0.1
	71204001025	4	6	4	25	65	0.1
	71204001030	4	6	4	30	70	0.1
	71204001035	4	6	4	35	75	0.1
	71204001040	4	6	4	40	80	0.1
	71204002012	4	6	4	12	50	0.2
	71204002016	4	6	4	16	55	0.2
	71204002020	4	6	4	20	60	0.2
	71204002025	4	6	4	25	65	0.2
	71204002030	4	6	4	30	70	0.2

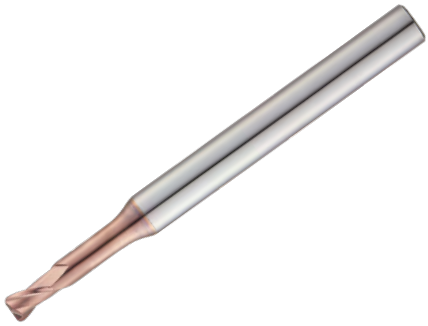
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71204002035	4	6	4	35	75	0.2
	71204002040	4	6	4	40	80	0.2
	71204003012	4	6	4	12	50	0.3
	71204003016	4	6	4	16	55	0.3
	71204003020	4	6	4	20	60	0.3
	71204003025	4	6	4	25	65	0.3
	71204003030	4	6	4	30	70	0.3
	71204003035	4	6	4	35	75	0.3
	71204003040	4	6	4	40	80	0.3
	71204005012	4	6	4	12	50	0.5
	71204005016	4	6	4	16	55	0.5
	71204005020	4	6	4	20	60	0.5
	71204005025	4	6	4	25	65	0.5
	71204005030	4	6	4	30	70	0.5
	71204005035	4	6	4	35	75	0.5
	71204005040	4	6	4	40	80	0.5
	71204010012	4	6	4	12	50	1
	71204010016	4	6	4	16	55	1
	71204010020	4	6	4	20	60	1
	71204010025	4	6	4	25	65	1
	71204010030	4	6	4	30	70	1
	71204010035	4	6	4	35	75	1
	71204010040	4	6	4	40	80	1
	71205002015	5	6	6	15	60	0.2
	71205002025	5	6	6	25	70	0.2
	71205002030	5	6	6	30	70	0.2
	71205002040	5	6	6	40	80	0.2
	71205005015	5	6	6	15	60	0.5
	71205005025	5	6	6	25	70	0.5
	71205005030	5	6	6	30	70	0.5
	71205005040	5	6	6	40	80	0.5
	71205010015	5	6	6	15	60	1
	71205010025	5	6	6	25	70	1
	71205010030	5	6	6	30	70	1
	71205010040	5	6	6	40	80	1
	71206001020	6	6	7	20	60	0.1
	71206001040	6	6	7	40	80	0.1
	71206002020	6	6	7	20	60	0.2
	71206002040	6	6	7	40	80	0.2

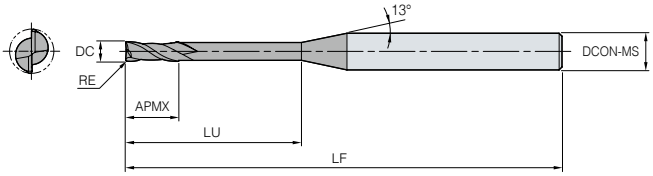
ESRR712

2 flutes rib ball

CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.2 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø16	0.000 ~ -0.015





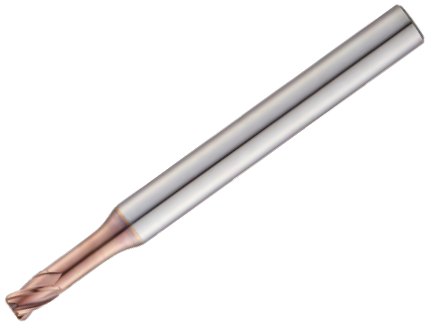
(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71206003020	6	6	7	20	60	0.3
	71206003040	6	6	7	40	80	0.3
	71206005020	6	6	7	20	60	0.5
	71206005040	6	6	7	40	80	0.5
	71206010020	6	6	7	20	60	1
	71206010040	6	6	7	40	80	1
	71206015020	6	6	7	20	60	1.5
	71206015040	6	6	7	40	80	1.5
	71208002022	8	8	9	22	65	0.2
	71208003022	8	8	9	22	65	0.3
	71208005022	8	8	9	22	65	0.5
	71208010022	8	8	9	22	65	1
	71208015022	8	8	9	22	65	1.5
	71210002024	10	10	11	24	70	0.2

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71210003024	10	10	11	24	70	0.3
	71210005024	10	10	11	24	70	0.5
	71210010024	10	10	11	24	70	1
	71210015024	10	10	11	24	70	1.5
	71210020024	10	10	11	24	70	2
	71212002026	12	12	13	26	80	0.2
	71212003026	12	12	13	26	80	0.3
	71212005026	12	12	13	26	80	0.5
	71212010026	12	12	13	26	80	1
	71212015026	12	12	13	26	80	1.5
	71212020026	12	12	13	26	80	2
	71212030026	12	12	13	26	80	3
	71216005035	16	16	20	35	110	0.5
	71216010035	16	16	20	35	110	1

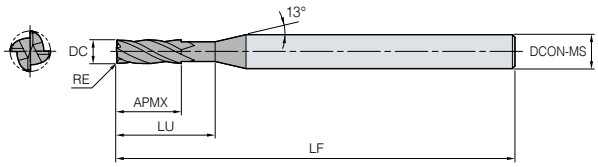
ESRR714

4 flutes rib ball



CARBIDE | 4 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.5 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø20	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71400500502	0.5	4	0.5	2	45	0.05
	71400500504	0.5	4	0.5	4	45	0.05
	71400500506	0.5	4	0.5	6	45	0.05
	71400500508	0.5	4	0.5	8	45	0.05
	71400501002	0.5	4	0.5	2	45	0.1
	71400501004	0.5	4	0.5	4	45	0.1
	71400501006	0.5	4	0.5	6	45	0.1
	71400501008	0.5	4	0.5	8	45	0.1
	71400600502	0.6	4	0.6	2	45	0.05
	71400600504	0.6	4	0.6	4	45	0.05
	71400600506	0.6	4	0.6	6	45	0.05
	71400600508	0.6	4	0.6	8	45	0.05
	71400601002	0.6	4	0.6	2	45	0.1
	71400601004	0.6	4	0.6	4	45	0.1
	71400601006	0.6	4	0.6	6	45	0.1
	71400601008	0.6	4	0.6	8	45	0.1
	71400700502	0.7	4	0.7	2	45	0.05
	71400700504	0.7	4	0.7	4	45	0.05
	71400700506	0.7	4	0.7	6	45	0.05
	71400700508	0.7	4	0.7	8	45	0.05
	71400701002	0.7	4	0.7	2	45	0.1
	71400701004	0.7	4	0.7	4	45	0.1
	71400701006	0.7	4	0.7	6	45	0.1
	71400701008	0.7	4	0.7	8	45	0.1
	71400800202	0.8	4	0.8	2	45	0.02
	71400800204	0.8	4	0.8	4	45	0.02
	71400800206	0.8	4	0.8	6	45	0.02
	71400800208	0.8	4	0.8	8	45	0.02
	71400800210	0.8	4	0.8	10	45	0.02
	71400800212	0.8	4	0.8	12	50	0.02
	71400800502	0.8	4	0.8	2	45	0.05
	71400800504	0.8	4	0.8	4	45	0.05
	71400800506	0.8	4	0.8	6	45	0.05
	71400800508	0.8	4	0.8	8	45	0.05
	71400800510	0.8	4	0.8	10	45	0.05
	71400800512	0.8	4	0.8	12	50	0.05
	71400801002	0.8	4	0.8	2	45	0.1
	71400801004	0.8	4	0.8	4	45	0.1
	71400801006	0.8	4	0.8	6	45	0.1

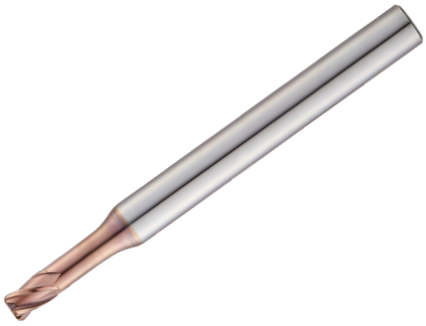
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71400801008	0.8	4	0.8	8	45	0.1
	71400801010	0.8	4	0.8	10	45	0.1
	71400801012	0.8	4	0.8	12	50	0.1
	71401000204	1	4	1	4	45	0.02
	71401000206	1	4	1	6	45	0.02
	71401000208	1	4	1	8	45	0.02
	71401000210	1	4	1	10	50	0.02
	71401000212	1	4	1	12	50	0.02
	71401000214	1	4	1	14	50	0.02
	71401000216	1	4	1	16	50	0.02
	71401000220	1	4	1	20	50	0.02
	71401000503	1	4	1	3	45	0.05
	71401000504	1	4	1	4	45	0.05
	71401000506	1	4	1	6	45	0.05
	71401000508	1	4	1	8	45	0.05
	71401000510	1	4	1	10	50	0.05
	71401000512	1	4	1	12	50	0.05
	71401000514	1	4	1	14	50	0.05
	71401000516	1	4	1	16	50	0.05
	71401000520	1	4	1	20	50	0.05
	71401001003	1	4	1	3	45	0.1
	71401001004	1	4	1	4	45	0.1
	71401001006	1	4	1	6	45	0.1
	71401001008	1	4	1	8	45	0.1
	71401001010	1	4	1	10	50	0.1
	71401001012	1	4	1	12	50	0.1
	71401001014	1	4	1	14	50	0.1
	71401001016	1	4	1	16	50	0.1
	71401001020	1	4	1	20	50	0.1
	71401002003	1	4	1	3	45	0.2
	71401002004	1	4	1	4	45	0.2
	71401002006	1	4	1	6	45	0.2
	71401002008	1	4	1	8	45	0.2
	71401002010	1	4	1	10	50	0.2
	71401002012	1	4	1	12	50	0.2
	71401002014	1	4	1	14	50	0.2
	71401002016	1	4	1	16	50	0.2
	71401002020	1	4	1	20	50	0.2
	71401003003	1	4	1	3	45	0.3

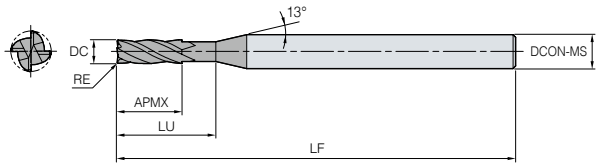
ESRR714

4 flutes rib ball

CARBIDE | 4 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.5 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø20	0.000 ~ -0.015





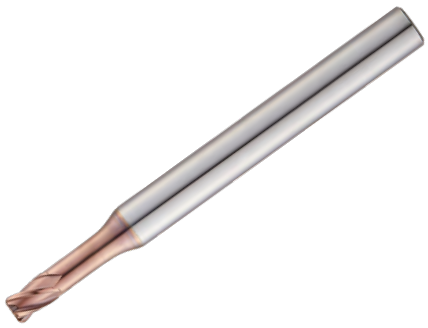
(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71401003004	1	4	1	4	45	0.3
	71401003006	1	4	1	6	45	0.3
	71401003008	1	4	1	8	45	0.3
	71401003010	1	4	1	10	50	0.3
	71401003012	1	4	1	12	50	0.3
	71401003014	1	4	1	14	50	0.3
	71401003016	1	4	1	16	50	0.3
	71401003020	1	4	1	20	50	0.3
	71401200204	1.2	4	1.2	4	45	0.02
	71401200206	1.2	4	1.2	6	45	0.02
	71401200208	1.2	4	1.2	8	45	0.02
	71401200210	1.2	4	1.2	10	50	0.02
	71401200212	1.2	4	1.2	12	50	0.02
	71401200214	1.2	4	1.2	14	50	0.02
	71401200216	1.2	4	1.2	16	50	0.02
	71401200220	1.2	4	1.2	20	50	0.02
	71401200503	1.2	4	1.2	3	45	0.05
	71401200504	1.2	4	1.2	4	45	0.05
	71401200506	1.2	4	1.2	6	45	0.05
	71401200508	1.2	4	1.2	8	45	0.05
	71401200510	1.2	4	1.2	10	50	0.05
	71401200512	1.2	4	1.2	12	50	0.05
	71401200514	1.2	4	1.2	14	50	0.05
	71401200516	1.2	4	1.2	16	50	0.05
	71401200520	1.2	4	1.2	20	50	0.05
	71401201003	1.2	4	1.2	3	45	0.1
	71401201004	1.2	4	1.2	4	45	0.1
	71401201006	1.2	4	1.2	6	45	0.1
	71401201008	1.2	4	1.2	8	45	0.1
	71401201010	1.2	4	1.2	10	50	0.1
	71401201012	1.2	4	1.2	12	50	0.1
	71401201014	1.2	4	1.2	14	50	0.1
	71401201016	1.2	4	1.2	16	50	0.1
	71401201020	1.2	4	1.2	20	50	0.1
	71401202003	1.2	4	1.2	3	45	0.2
	71401202004	1.2	4	1.2	4	45	0.2
	71401202006	1.2	4	1.2	6	45	0.2
	71401202008	1.2	4	1.2	8	45	0.2
	71401202010	1.2	4	1.2	10	50	0.2

Designation		DC	DCON-MS	APMX	LU	RE	LF
ESRR	71401202012	1.2	4	1.2	12	0.2	50
	71401202014	1.2	4	1.2	14	0.2	50
	71401202016	1.2	4	1.2	16	0.2	50
	71401202020	1.2	4	1.2	20	0.2	50
	71401203003	1.2	4	1.2	3	0.3	45
	71401203004	1.2	4	1.2	4	0.3	45
	71401203006	1.2	4	1.2	6	0.3	45
	71401203008	1.2	4	1.2	8	0.3	45
	71401203010	1.2	4	1.2	10	0.3	50
	71401203012	1.2	4	1.2	12	0.3	50
	71401203016	1.2	4	1.2	16	0.3	50
	71401203020	1.2	4	1.2	20	0.3	50
	71401500206	1.5	4	1.5	6	0.02	45
	71401500208	1.5	4	1.5	8	0.02	45
	71401500210	1.5	4	1.5	10	0.02	50
	71401500212	1.5	4	1.5	12	0.02	50
	71401500214	1.5	4	1.5	14	0.02	50
	71401500216	1.5	4	1.5	16	0.02	50
	71401500220	1.5	4	1.5	20	0.02	50
	71401500222	1.5	4	1.5	22	0.02	60
	71401500504	1.5	4	1.5	4	0.05	45
	71401500506	1.5	4	1.5	6	0.05	45
	71401500508	1.5	4	1.5	8	0.05	45
	71401500510	1.5	4	1.5	10	0.05	50
	71401500512	1.5	4	1.5	12	0.05	50
	71401500514	1.5	4	1.5	14	0.05	50
	71401500516	1.5	4	1.5	16	0.05	50
	71401500520	1.5	4	1.5	20	0.05	50
	71401500522	1.5	4	1.5	22	0.05	60
	71401500526	1.5	4	1.5	26	0.05	60
	71401501004	1.5	4	1.5	4	0.1	45
	71401501006	1.5	4	1.5	6	0.1	45
	71401501008	1.5	4	1.5	8	0.1	45
	71401501010	1.5	4	1.5	10	0.1	50
	71401501012	1.5	4	1.5	12	0.1	50
	71401501014	1.5	4	1.5	14	0.1	50
	71401501016	1.5	4	1.5	16	0.1	50
	71401501020	1.5	4	1.5	20	0.1	50
	71401501022	1.5	4	1.5	22	0.1	60

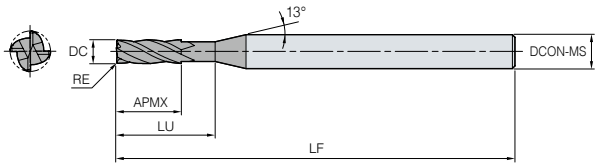
ESRR714

4 flutes rib ball



CARBIDE | 4 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.5 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø20	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71401501026	1.5	4	1.5	26	60	0.1
	71401502004	1.5	4	1.5	4	45	0.2
	71401502006	1.5	4	1.5	6	45	0.2
	71401502008	1.5	4	1.5	8	45	0.2
	71401502010	1.5	4	1.5	10	50	0.2
	71401502012	1.5	4	1.5	12	50	0.2
	71401502014	1.5	4	1.5	14	50	0.2
	71401502016	1.5	4	1.5	16	50	0.2
	71401502020	1.5	4	1.5	20	50	0.2
	71401502022	1.5	4	1.5	22	60	0.2
	71401502025	1.5	4	1.5	25	60	0.2
	71401503004	1.5	4	1.5	4	45	0.3
	71401503006	1.5	4	1.5	6	45	0.3
	71401503008	1.5	4	1.5	8	45	0.3
	71401503010	1.5	4	1.5	10	50	0.3
	71401503012	1.5	4	1.5	12	50	0.3
	71401503014	1.5	4	1.5	14	50	0.3
	71401503016	1.5	4	1.5	16	50	0.3
	71401503020	1.5	4	1.5	20	50	0.3
	71401503022	1.5	4	1.5	22	60	0.3
	71401503025	1.5	4	1.5	25	60	0.3
	71401505004	1.5	4	1.5	4	45	0.5
	71401505006	1.5	4	1.5	6	45	0.5
	71401505008	1.5	4	1.5	8	45	0.5
	71401505010	1.5	4	1.5	10	50	0.5
	71401505012	1.5	4	1.5	12	50	0.5
	71401505014	1.5	4	1.5	14	50	0.5
	71401505016	1.5	4	1.5	16	50	0.5
	71401505020	1.5	4	1.5	20	50	0.5
	71401505022	1.5	4	1.5	22	60	0.5
	71401505025	1.5	4	1.5	25	60	0.5
	71402000206	2	4	2	6	45	0.02
	71402000208	2	4	2	8	45	0.02
	71402000210	2	4	2	10	50	0.02
	71402000212	2	4	2	12	50	0.02
	71402000214	2	4	2	14	50	0.02
	71402000216	2	4	2	16	50	0.02
	71402000220	2	4	2	20	50	0.02
	71402000225	2	4	2	25	60	0.02

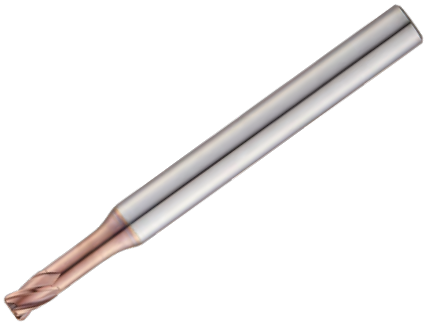
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71402000230	2	4	2	30	70	0.02
	71402000506	2	4	2	6	45	0.05
	71402000508	2	4	2	8	45	0.05
	71402000510	2	4	2	10	50	0.05
	71402000512	2	4	2	12	50	0.05
	71402000514	2	4	2	14	50	0.05
	71402000516	2	4	2	16	50	0.05
	71402000520	2	4	2	20	50	0.05
	71402000525	2	4	2	25	60	0.05
	71402000530	2	4	2	30	70	0.05
	71402001006	2	4	2	6	45	0.1
	71402001008	2	4	2	8	45	0.1
	71402001010	2	4	2	10	50	0.1
	71402001012	2	4	2	12	50	0.1
	71402001014	2	4	2	14	50	0.1
	71402001016	2	4	2	16	50	0.1
	71402001020	2	4	2	20	50	0.1
	71402001022	2	4	2	22	60	0.1
	71402001025	2	4	2	25	60	0.1
	71402001030	2	4	2	30	70	0.1
	71402002006	2	4	2	6	45	0.2
	71402002008	2	4	2	8	45	0.2
	71402002010	2	4	2	10	50	0.2
	71402002012	2	4	2	12	50	0.2
	71402002014	2	4	2	14	50	0.2
	71402002016	2	4	2	16	50	0.2
	71402002020	2	4	2	20	50	0.2
	71402002022	2	4	2	22	60	0.2
	71402002025	2	4	2	25	60	0.2
	71402002030	2	4	2	30	70	0.2
	71402003006	2	4	2	6	45	0.3
	71402003008	2	4	2	8	45	0.3
	71402003010	2	4	2	10	50	0.3
	71402003012	2	4	2	12	50	0.3
	71402003014	2	4	2	14	50	0.3
	71402003016	2	4	2	16	50	0.3
	71402003020	2	4	2	20	50	0.3
	71402003022	2	4	2	22	60	0.3
	71402003025	2	4	2	25	60	0.3

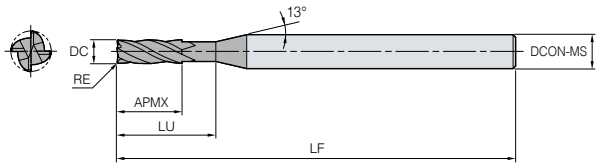
ESRR714

4 flutes rib ball

CARBIDE | 4 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.5 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø20	0.000 ~ -0.015





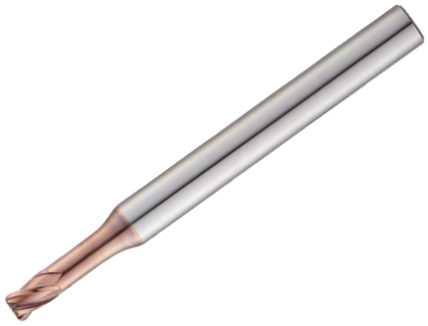
(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71402003030	2	4	2	30	70	0.3
	71402005006	2	4	3	6	45	0.5
	71402005008	2	4	2	8	45	0.5
	71402005010	2	4	2	10	50	0.5
	71402005012	2	4	2	12	50	0.5
	71402005014	2	4	2	14	50	0.5
	71402005016	2	4	2	16	50	0.5
	71402005020	2	4	2	20	50	0.5
	71402005022	2	4	2	22	60	0.5
	71402005025	2	4	2	25	60	0.5
	71402005030	2	4	2	30	70	0.5
	71402501008	2.5	4	2.5	8	45	0.1
	71402501010	2.5	4	2.5	10	50	0.1
	71402501012	2.5	4	2.5	12	50	0.1
	71402501014	2.5	4	2.5	14	50	0.1
	71402501016	2.5	4	2.5	16	50	0.1
	71402501020	2.5	4	2.5	20	50	0.1
	71402501025	2.5	4	2.5	25	60	0.1
	71402501030	2.5	4	2.5	30	70	0.1
	71402502008	2.5	4	2.5	8	45	0.2
	71402502010	2.5	4	2.5	10	50	0.2
	71402502012	2.5	4	2.5	12	50	0.2
	71402502014	2.5	4	2.5	14	50	0.2
	71402502016	2.5	4	2.5	16	50	0.2
	71402502020	2.5	4	2.5	20	50	0.2
	71402502025	2.5	4	2.5	25	60	0.2
	71402502030	2.5	4	2.5	30	70	0.2
	71402503008	2.5	4	2.5	8	45	0.3
	71402503010	2.5	4	2.5	10	50	0.3
	71402503012	2.5	4	2.5	12	50	0.3
	71402503014	2.5	4	2.5	14	50	0.3
	71402503016	2.5	4	2.5	16	50	0.3
	71402503020	2.5	4	2.5	20	50	0.3
	71402503025	2.5	4	2.5	25	60	0.3
	71402503030	2.5	4	2.5	30	70	0.3
	71402505008	2.5	4	2.5	8	45	0.5
	71402505010	2.5	4	2.5	10	50	0.5
	71402505012	2.5	4	2.5	12	50	0.5
	71402505014	2.5	4	2.5	14	50	0.5

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71402505016	2.5	4	2.5	16	50	0.5
	71402505020	2.5	4	2.5	20	50	0.5
	71402505025	2.5	4	2.5	25	60	0.5
	71402505030	2.5	4	2.5	30	70	0.5
	71403001008	3	6	3	8	45	0.1
	71403001010	3	6	3	10	50	0.1
	71403001012	3	6	3	12	50	0.1
	71403001014	3	6	3	14	50	0.1
	71403001016	3	6	3	16	55	0.1
	71403001020	3	6	3	20	60	0.1
	71403001025	3	6	3	25	65	0.1
	71403001030	3	6	3	30	70	0.1
	71403001035	3	6	3	35	75	0.1
	71403001040	3	6	3	40	80	0.1
	71403001045	3	6	3	45	90	0.1
	71403002008	3	6	3	8	45	0.2
	71403002010	3	6	3	10	50	0.2
	71403002012	3	6	3	12	50	0.2
	71403002014	3	6	3	14	50	0.2
	71403002016	3	6	3	16	55	0.2
	71403002020	3	6	3	20	60	0.2
	71403002025	3	6	3	25	65	0.2
	71403002030	3	6	3	30	70	0.2
	71403002035	3	6	3	35	75	0.2
	71403002040	3	6	3	40	80	0.2
	71403002045	3	6	3	45	90	0.2
	71403003008	3	6	3	8	45	0.3
	71403003010	3	6	3	10	50	0.3
	71403003012	3	6	3	12	50	0.3
	71403003014	3	6	3	14	50	0.3
	71403003016	3	6	3	16	55	0.3
	71403003020	3	6	3	20	60	0.3
	71403003025	3	6	3	25	65	0.3
	71403003030	3	6	3	30	70	0.3
	71403003035	3	6	3	35	75	0.3
	71403003040	3	6	3	40	80	0.3
	71403003045	3	6	3	45	90	0.3
	71403005008	3	6	3	8	45	0.5
	71403005010	3	6	3	10	50	0.5

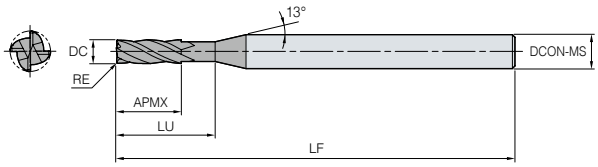
ESRR714

4 flutes rib ball



CARBIDE | 4 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.5 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø20	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71403005012	3	6	3	12	50	0.5
	71403005014	3	6	3	14	50	0.5
	71403005016	3	6	3	16	55	0.5
	71403005020	3	6	3	20	60	0.5
	71403005025	3	6	3	25	65	0.5
	71403005030	3	6	3	30	70	0.5
	71403005035	3	6	3	35	75	0.5
	71403005040	3	6	3	40	80	0.5
	71403005045	3	6	3	45	90	0.5
	71403005050	3	6	3	50	100	0.5
	71403010008	3	6	3	8	45	1
	71403010010	3	6	3	10	50	1
	71403010012	3	6	3	12	50	1
	71403010014	3	6	3	14	50	1
	71403010016	3	6	3	16	55	1
	71403010020	3	6	3	20	60	1
	71403010025	3	6	3	25	65	1
	71403010030	3	6	3	30	70	1
	71403010035	3	6	3	35	75	1
	71403010040	3	6	3	40	80	1
	71403010045	3	6	3	45	90	1
	71403010050	3	6	3	50	100	1
	71404001010	4	6	4	10	50	0.1
	71404001012	4	6	4	12	50	0.1
	71404001013	4	6	4	13	55	0.1
	71404001016	4	6	4	16	55	0.1
	71404001020	4	6	4	20	60	0.1
	71404001025	4	6	4	25	65	0.1
	71404001030	4	6	4	30	70	0.1
	71404001035	4	6	4	35	75	0.1
	71404001040	4	6	4	40	80	0.1
	71404001045	4	6	4	45	90	0.1
	71404001050	4	6	4	50	100	0.1
	71404002010	4	6	4	10	50	0.2
	71404002012	4	6	4	12	50	0.2
	71404002013	4	6	4	13	55	0.2
	71404002016	4	6	4	16	55	0.2
	71404002020	4	6	4	20	60	0.2
	71404002025	4	6	4	25	65	0.2

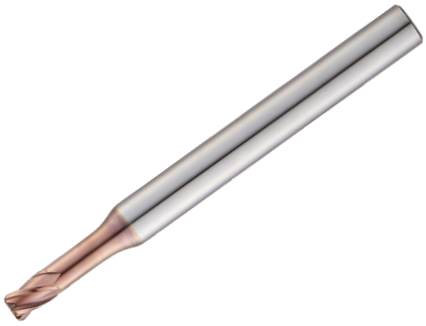
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71404002030	4	6	4	30	70	0.2
	71404002035	4	6	4	35	75	0.2
	71404002040	4	6	4	40	80	0.2
	71404002045	4	6	4	45	90	0.2
	71404002050	4	6	4	50	100	0.2
	71404003010	4	6	4	10	50	0.3
	71404003012	4	6	4	12	50	0.3
	71404003013	4	6	4	13	55	0.3
	71404003016	4	6	4	16	55	0.3
	71404003020	4	6	4	20	60	0.3
	71404003025	4	6	4	25	65	0.3
	71404003030	4	6	4	30	70	0.3
	71404003035	4	6	4	35	75	0.3
	71404003040	4	6	4	40	80	0.3
	71404003045	4	6	4	45	90	0.3
	71404003050	4	6	4	50	100	0.3
	71404005010	4	6	4	10	50	0.5
	71404005012	4	6	4	12	50	0.5
	71404005013	4	6	4	13	55	0.5
	71404005016	4	6	4	16	55	0.5
	71404005020	4	6	4	20	60	0.5
	71404005025	4	6	4	25	65	0.5
	71404005030	4	6	4	30	70	0.5
	71404005035	4	6	4	35	75	0.5
	71404005040	4	6	4	40	80	0.5
	71404005045	4	6	4	45	90	0.5
	71404005050	4	6	4	50	100	0.5
	71404005055	4	6	4	55	100	0.5
	71404010010	4	6	4	10	50	1
	71404010012	4	6	4	12	50	1
	71404010013	4	6	4	13	55	1
	71404010016	4	6	4	16	55	1
	71404010020	4	6	4	20	60	1
	71404010025	4	6	4	25	65	1
	71404010030	4	6	4	30	70	1
	71404010035	4	6	4	35	75	1
	71404010040	4	6	4	40	80	1
	71404010045	4	6	4	45	90	1
	71404010050	4	6	4	50	100	1

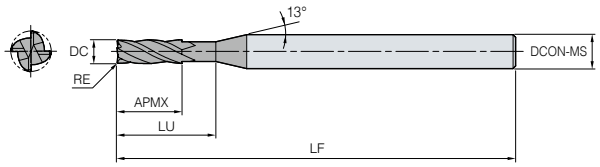
ESRR714

4 flutes rib ball

CARBIDE | 4 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.5 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø20	0.000 ~ -0.015





(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71404010055	4	6	4	55	100	1
	71405001016	5	6	5	16	60	0.1
	71405001030	5	6	5	30	70	0.1
	71405001040	5	6	5	40	80	0.1
	71405002016	5	6	5	16	60	0.2
	71405002030	5	6	5	30	70	0.2
	71405002040	5	6	5	40	80	0.2
	71405003016	5	6	5	16	60	0.3
	71405003030	5	6	5	30	70	0.3
	71405003040	5	6	5	40	80	0.3
	71405005016	5	6	5	16	60	0.5
	71405005030	5	6	5	30	70	0.5
	71405005040	5	6	5	40	80	0.5
	71405005050	5	6	5	50	100	0.5
	71405005060	5	6	5	60	110	0.5
	71405010016	5	6	5	16	60	1
	71405010030	5	6	5	30	70	1
	71405010040	5	6	5	40	80	1
	71405010050	5	6	5	50	100	1
	71405010060	5	6	5	60	110	1
	71405015015	5	6	5	15	60	1.5
	71405020015	5	6	5	15	60	2
	71406001020	6	6	7	20	60	0.1
	71406001040	6	6	7	40	80	0.1
	71406001050	6	6	7	50	100	0.1
	71406002020	6	6	7	20	60	0.2
	71406002040	6	6	7	40	80	0.2
	71406002050	6	6	7	50	100	0.2
	71406003020	6	6	7	20	60	0.3
	71406003030	6	6	7	30	70	0.3
	71406003040	6	6	7	40	80	0.3
	71406003050	6	6	7	50	100	0.3
	71406005020	6	6	7	20	60	0.5
	71406005030	6	6	7	30	70	0.5
	71406005040	6	6	7	40	80	0.5
	71406005050	6	6	7	50	100	0.5
	71406005060	6	6	7	60	110	0.5
	71406010020	6	6	7	20	60	1
	71406010030	6	6	7	30	70	1

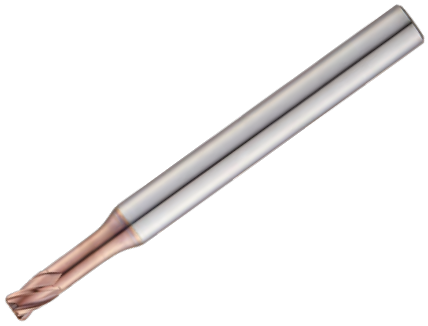
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71406010040	6	6	7	40	80	1
	71406010050	6	6	7	50	100	1
	71406010060	6	6	7	60	110	1
	71406015020	6	6	7	20	60	1.5
	71406015040	6	6	7	40	80	1.5
	71406015050	6	6	7	50	100	1.5
	71406020020	6	6	7	20	60	2
	71406020030	6	6	7	30	70	2
	71406020040	6	6	7	40	80	2
	71406020050	6	6	7	50	100	2
	71408001025	8	8	9	25	70	0.1
	71408002022	8	8	9	22	65	0.2
	71408002040	8	8	9	40	100	0.2
	71408003022	8	8	9	22	65	0.3
	71408003040	8	8	9	40	100	0.3
	71408005022	8	8	9	22	65	0.5
	71408005035	8	8	9	35	100	0.5
	71408005040	8	8	9	40	100	0.5
	71408005050	8	8	9	50	120	0.5
	71408005060	8	8	9	60	120	0.5
	71408010022	8	8	9	22	65	1
	71408010035	8	8	9	35	100	1
	71408010040	8	8	9	40	100	1
	71408010050	8	8	9	50	120	1
	71408010060	8	8	9	60	120	1
	71408015022	8	8	9	22	65	1.5
	71408015040	8	8	9	40	100	1.5
	71408020022	8	8	9	22	65	2
	71408020040	8	8	9	40	100	2
	71408020050	8	8	9	50	120	2
	71410001030	10	10	11	30	75	0.1
	71410002024	10	10	11	24	70	0.2
	71410002040	10	10	11	40	100	0.2
	71410003024	10	10	11	24	70	0.3
	71410003040	10	10	11	40	100	0.3
	71410005024	10	10	11	24	70	0.5
	71410005040	10	10	11	40	100	0.5
	71410005050	10	10	11	50	120	0.5
	71410005060	10	10	11	60	120	0.5

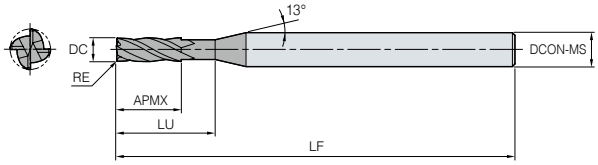
ESRR714

4 flutes rib ball

CARBIDE | 4 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.5 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø20	0.000 ~ -0.015





(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71410010024	10	10	11	24	70	1
	71410010040	10	10	11	40	100	1
	71410010050	10	10	11	50	120	1
	71410010060	10	10	11	60	120	1
	71410015024	10	10	11	24	70	1.5
	71410015040	10	10	11	40	100	1.5
	71410020024	10	10	11	24	70	2
	71410020040	10	10	11	40	100	2
	71410020050	10	10	11	50	120	2
	71410025024	10	10	11	24	70	2.5
	71412002032	12	12	13	32	80	0.2
	71412003026	12	12	13	26	80	0.3
	71412003045	12	12	13	45	110	0.3
	71412005026	12	12	13	26	80	0.5
	71412005040	12	12	13	40	110	0.5
	71412005060	12	12	13	60	130	0.5

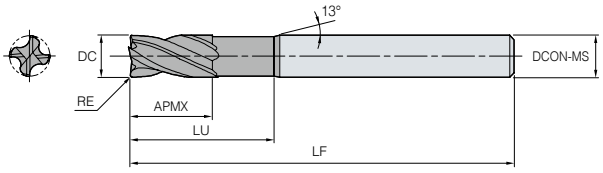
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRR	71412010026	12	12	13	26	80	1
	71412010040	12	12	13	40	110	1
	71412010060	12	12	13	60	130	1
	71412015026	12	12	13	26	80	1.5
	71412020026	12	12	13	26	80	2
	71412020040	12	12	13	40	110	2
	71412030026	12	12	13	26	80	3
	71416005035	16	16	20	35	100	0.5
	71416005050	16	20	35	50	150	0.5
	71416010035	16	16	20	35	100	1
	71416010050	16	20	35	50	150	1
	71420005040	20	20	25	40	100	0.5
	71420005055	20	20	40	55	150	0.5
	71420010040	20	20	25	40	100	1
	71420010055	20	20	40	55	150	1

ESXR704

4 flutes neck type radius

CARBIDE | 4 | H·A Multi | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
ALL	0.000 ~ -0.020



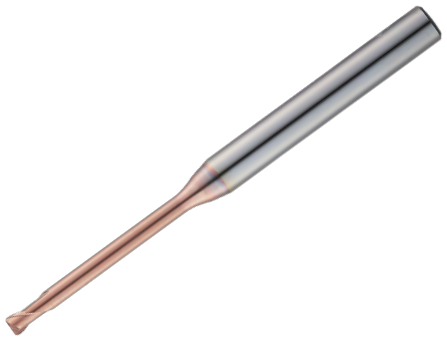
(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESXR	70401000504	1	4	1.5	4	45	0.05
	70402000506	2	4	3	6	45	0.05
	70402000507	2	4	2.5	7	50	0.05
	7040200107	2	4	2.5	7	50	0.1
	7040300107	3	6	4	7	45	0.1
	7040300109	3	6	4	9	55	0.1
	7040300209	3	6	4	9	55	0.2
	7040300309	3	6	4	9	55	0.3
	7040300312	3	6	4	12	55	0.3
	7040300316	3	6	4	16	55	0.3
	7040400109	4	6	5	9	45	0.1
	7040400212	4	6	5	12	55	0.2
	7040400212S4	4	4	5	12	55	0.2
	7040400312	4	6	5	12	55	0.3
	7040400316	4	6	5	16	55	0.3
	7040400320	4	6	5	20	55	0.3
	7040400512	4	6	5	12	55	0.5
	7040400516	4	6	5	16	55	0.5
	7040400516S4	4	4	5	16	55	0.5
	7040400520	4	6	5	20	55	0.5
	7040401012	4	6	5	12	55	1
	7040500116	5	6	6	16	60	0.1
	7040500216	5	6	6	16	60	0.2
	7040500316	5	6	6	16	60	0.3
	7040500516	5	6	6	16	60	0.5
	7040501016	5	6	6	16	60	1
	7040600120	6	6	7	20	60	0.1
	7040600214	6	6	7	14	50	0.2

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESXR	7040600220	6	6	7	20	60	0.2
	7040600320	6	6	7	20	60	0.3
	7040600520	6	6	7	20	60	0.5
	7040601020	6	6	7	20	60	1
	7040601520	6	6	7	20	60	1.5
	7040800125	8	8	9	25	60	0.1
	7040800218	8	8	9	18	60	0.2
	7040800225	8	8	9	25	60	0.2
	7040800325	8	8	9	25	60	0.3
	7040800525	8	8	9	25	60	0.5
	7040801025	8	8	9	25	60	1
	7040801525	8	8	9	25	60	1.5
	7040802025	8	8	9	25	60	2
	7041000225	10	10	12	25	75	0.2
	7041000232	10	10	11	32	75	0.2
	7041000332	10	10	11	32	75	0.3
	7041000532	10	10	11	32	75	0.5
	7041001032	10	10	11	32	75	1
	7041001532	10	10	11	32	75	1.5
	7041002032	10	10	11	32	75	2
	7041200238	12	12	12	38	75	0.2
	7041200330	12	12	15	30	75	0.3
	7041200338	12	12	12	38	75	0.3
	7041200538	12	12	12	38	75	0.5
	7041201038	12	12	12	38	75	1
	7041201538	12	12	12	38	75	1.5
	7041202038	12	12	12	38	75	2

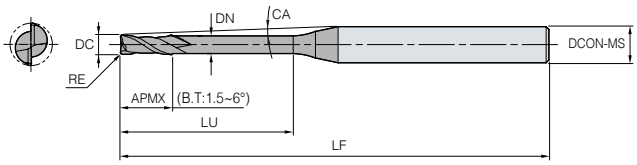
ESLNR20

2 flutes long neck type radius



CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01

DC	Tolerance
ALL	0.000 ~ -0.012

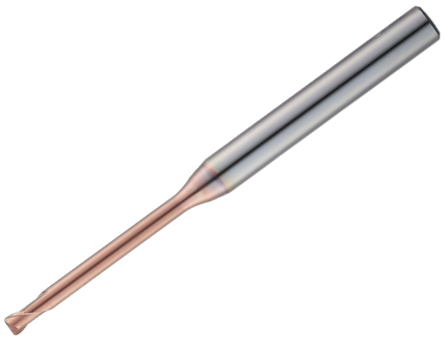


(mm)

Designation		DC	DCON-MS	APMX	LU	LF	DN	CA	RE	Effective length by inclination angle				
										0.5°	1°	1.5°	2°	3°
ESLNR	2002-0.5-005	0.2	4	0.15	0.5	50	0.17	11.4	0.05	0.9	1	1	1.1	12
	2002-1-005	0.2	4	0.15	1	50	0.17	10.9	0.05	1.6	1.7	1.9	2	2.3
	2002-1.5-005	0.2	4	0.15	1.5	50	0.17	10.3	0.05	2.1	2.3	2.5	2.7	3
	2002-2-005	0.2	4	0.15	2	50	0.17	9.9	0.05	2.8	3.1	3.4	3.6	4.1
	2003-1-005	0.3	4	0.25	1	50	0.27	10.8	0.05	1.4	1.5	1.6	1.7	1.9
	2003-1.5-005	0.3	4	0.25	1.5	50	0.27	10.3	0.05	2.1	2.3	2.5	2.7	3
	2003-2.5-005	0.3	4	0.25	2.5	50	0.27	9.8	0.05	2.7	2.9	3.1	3.3	3.6
	2003-2-005	0.3	4	0.25	2	50	0.27	9.4	0.05	3.2	3.5	3.7	3.9	4.3
	2003-3-005	0.3	4	0.25	3	50	0.27	9	0.05	3.9	4.3	4.6	4.9	5.4
	2004-1-005	0.4	4	0.3	1	50	0.37	10.8	0.05	1.4	1.5	1.6	1.7	1.9
	2004-1.5-005	0.4	4	0.3	1.5	50	0.37	10.3	0.05	2	2.1	2.2	2.3	2.5
	2004-2-005	0.4	4	0.3	2	50	0.37	9.8	0.05	2.7	2.9	3.1	3.3	3.6
	2004-2.5-005	0.4	4	0.3	2.5	50	0.37	9.4	0.05	3.2	3.5	3.7	3.9	4.3
	2004-3-005	0.4	4	0.3	3	50	0.37	9	0.05	3.8	4	4.3	4.5	4.9
	2004-3.5-005	0.4	4	0.3	3.5	50	0.37	8.6	0.05	4.3	4.6	4.9	5.1	5.5
	2004-4-005	0.4	4	0.3	4	50	0.37	8.3	0.05	5	5.4	5.8	6.1	6.6
	2004-2-01	0.4	4	0.3	2	50	0.37	9.8	0.1	2.7	2.9	3.1	3.3	3.6
	2004-3-01	0.4	4	0.3	3	50	0.37	9	0.1	3.8	4	4.3	4.5	4.9
	2004-4-01	0.4	4	0.3	4	50	0.37	8.3	0.1	5	5.4	5.8	6.1	6.6
	2005-1-005	0.5	4	0.35	1	50	0.47	10.8	0.05	1.4	1.5	1.6	1.7	1.9
	2005-2-005	0.5	4	0.35	2	50	0.47	9.7	0.05	2.5	2.6	2.8	2.9	3.1
	2005-3-005	0.5	4	0.35	3	50	0.47	8.9	0.05	3.8	4	4.3	4.5	4.9
	2005-4-005	0.5	4	0.35	4	50	0.47	8.2	0.05	4.8	5.2	5.4	5.7	6.1
	2005-5-005	0.5	4	0.35	5	50	0.47	7.6	0.05	6.1	6.6	6.9	7.3	7.8
	2005-6-005	0.5	4	0.35	6	50	0.47	7	0.05	7.2	7.7	8.1	8.4	9
	2005-1-01	0.5	4	0.35	1	50	0.47	10.8	0.1	1.4	1.5	1.6	1.7	1.9
	2005-2-01	0.5	4	0.35	2	50	0.47	9.8	0.1	2.5	2.6	2.8	2.9	3.1
	2005-3-01	0.5	4	0.35	3	50	0.47	8.9	0.1	3.8	4	4.3	4.5	4.9
	2005-4-01	0.5	4	0.35	4	50	0.47	8.2	0.1	4.8	5.2	5.4	5.7	6.1
	2005-5-01	0.5	4	0.35	5	50	0.47	7.6	0.1	6.1	6.5	6.9	7.2	7.8
	2005-6-01	0.5	4	0.35	6	50	0.47	7.1	0.1	7.2	7.7	8.1	8.4	9
	2006-2-01	0.6	4	0.4	2	50	0.57	9.7	0.1	2.5	2.6	2.8	2.9	3.1
	2006-4-01	0.6	4	0.4	4	50	0.57	8.1	0.1	4.8	5.2	5.4	5.7	6.1
	2006-6-01	0.6	4	0.4	6	50	0.57	7	0.1	7.2	7.7	8.1	8.4	9

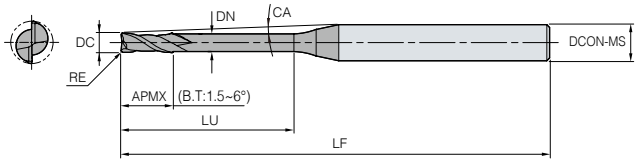
ESLNR20

2 flutes long neck type radius



CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01

DC	Tolerance
ALL	0.000 ~ -0.012

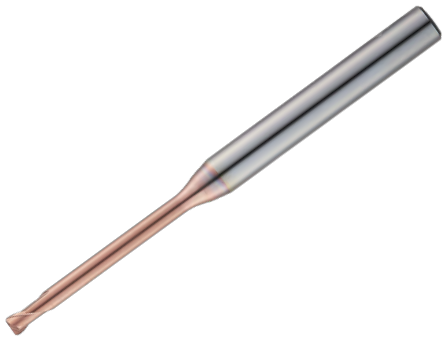


(mm)

Designation		DC	DCON-MS	APMX	LU	LF	DN	CA	RE	Effective length by inclination angle				
										0.5°	1°	1.5°	2°	3°
ESLNR	2006-8-01	0.6	4	0.4	8	50	0.57	6.1	0.1	9.3	9.9	10.3	10.7	11
	2006-10-01	0.6	4	0.4	10	50	0.57	5.5	0.1	11.5	12.1	12.5	13	13.7
	2008-4-01	0.8	4	0.5	4	50	4	8	0.1	4.8	5.2	5.4	5.7	6.1
	2008-6-01	0.8	4	0.5	6	50	6	6.8	0.1	7	7.4	7.7	7.9	8.4
	2008-8-01	0.8	4	0.5	8	50	8	5.9	0.1	9.3	9.9	10.3	10.7	11.4
	2008-12-01	0.8	4	0.5	12	50	12	4.7	0.1	13.6	14.2	14.7	15.2	16
	2008-4-02	0.8	4	0.5	4	50	4	8	0.2	4.8	5.1	5.4	5.6	6.1
	2008-6-02	0.8	4	0.5	6	50	6	6.9	0.2	7	7.3	7.7	7.9	8.4
	2010-4-01	1	4	0.8	4	50	0.94	7.7	0.1	4.7	4.9	5.1	5.2	5.5
	2010-6-01	1	4	0.8	6	50	0.94	6.6	0.1	7.1	7.4	7.7	8	8.5
	2010-8-01	1	4	0.8	8	50	0.94	5.7	0.1	9.2	9.6	9.9	10.2	10.8
	2010-10-01	1	4	0.8	10	50	0.94	5.1	0.1	11.6	12.1	12.6	13	13.7
	2010-12-01	1	4	0.8	12	55	0.94	4.5	0.1	13.7	14.3	14.8	15.3	16
	2010-16-01	1	4	0.8	16	60	0.94	3.8	0.1	17.9	18.6	19.2	19.7	21.3
	2010-20-01	1	4	0.8	20	60	0.94	3.2	0.1	22	22.8	23.5	24	26.7
	2010-4-02	1	4	0.8	4	50	0.94	7.8	0.2	4.7	4.9	5.1	5.2	5.5
	2010-6-02	1	4	0.8	6	50	0.94	6.6	0.2	7.1	7.4	7.7	8	8.5
	2010-8-02	1	4	0.8	8	50	0.94	5.8	0.2	9.2	9.6	9.9	10.2	10.8
	2010-10-02	1	4	0.8	10	50	0.94	5.1	0.2	11.6	12.1	12.6	13	13.7
	2010-12-02	1	4	0.8	12	55	0.94	4.6	0.2	13.7	14.3	14.8	15.2	16
	2010-16-02	1	4	0.8	16	60	0.94	3.8	0.2	17.9	18.6	19.2	19.7	21.3
	2010-20-02	1	4	0.8	20	60	0.94	3.2	0.2	22	22.8	23.5	24	26.6
	2010-6-03	1	4	0.8	6	50	0.94	6.7	0.3	7.1	7.4	7.7	8	8.4
	2010-10-03	1	4	0.8	10	50	0.94	5.1	0.3	11.5	12.1	12.6	13	13.7
	2010-16-03	1	4	0.8	16	60	0.94	3.8	0.3	17.9	18.6	19.1	19.6	21.3
	2010-20-03	1	4	0.8	20	60	0.94	3.2	0.3	22	22.8	23.5	24	26.6
	2015-4-01	1.5	4	1.35	4	50	1.42	7.2	0.1	4.8	4.9	5.1	5.3	5.5
	2015-8-01	1.5	4	1.35	8	50	1.42	5.2	0.1	9.2	9.6	10	10.3	10.8
	2015-12-01	1.5	4	1.35	12	55	1.42	4	0.1	13.4	13.9	14.3	14.7	16.1
	2015-15-01	1.5	4	1.35	15	55	1.42	3.5	0.1	16.9	17.6	18.1	18.6	20.1
	2015-20-01	1.5	4	1.35	20	60	1.42	2.8	0.1	22.1	22.9	23.5	24.1	-
	2015-4-02	1.5	4	1.35	4	50	1.42	7.3	0.2	4.7	4.9	5.1	5.3	5.5
	2015-8-02	1.5	4	1.35	8	50	1.42	5.2	0.2	9.2	9.6	10	10.3	10.8
	2015-12-02	1.5	4	1.35	12	55	1.42	4.1	0.2	13.4	13.9	14.3	14.7	16.1

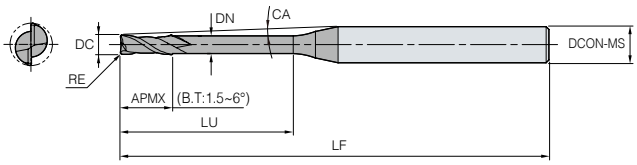
ESLNR20

2 flutes long neck type radius



CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01

DC	Tolerance
ALL	0.000 ~ -0.012

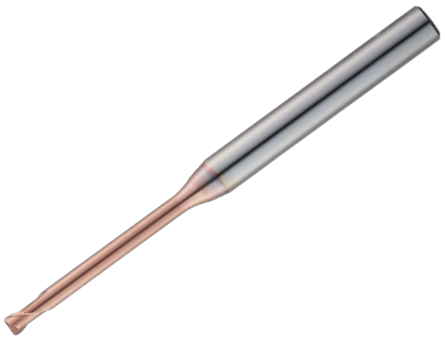


(mm)

Designation		DC	DCON-MS	APMX	LU	LF	DN	CA	RE	Effective length by inclination angle				
										0.5°	1°	1.5°	2°	3°
ESLNR	2015-15-02	1.5	4	1.35	15	55	1.42	3.5	0.2	16.9	17.5	18.1	18.6	20
	2015-20-02	1.5	4	1.35	20	60	1.42	2.8	0.2	22.1	22.9	23.5	24.1	-
	2015-8-03	1.5	4	1.35	8	50	1.42	5.2	0.3	9.2	9.6	10	10.3	10.8
	2015-15-03	1.5	4	1.35	15	55	1.42	3.5	0.3	16.9	17.5	18.1	18.6	20
	2015-20-03	1.5	4	1.35	20	60	1.42	2.8	0.3	22.1	22.9	23.5	24	-
	2020-6-02	2	4	1.7	6	50	1.92	5.4	0.2	6.8	7.1	7.3	7.5	8.1
	2020-8-02	2	4	1.7	8	50	1.92	4.6	0.2	8.9	9.2	9.4	9.7	10.8
	2020-12-02	2	4	1.7	12	55	1.92	3.5	0.2	13.4	13.9	14.3	14.7	16.1
	2020-16-02	2	4	1.7	16	55	1.92	2.8	0.2	17.6	18.1	18.6	19.3	-
	2020-20-02	2	4	1.7	20	60	1.92	2.4	0.2	22.1	22.9	23.5	24.1	-
	2020-25-02	2	4	1.7	25	65	1.92	2	0.2	27.3	28.2	28.8	-	-
	2020-30-02	2	4	1.7	30	70	1.92	1.7	0.2	32.5	33.4	34.4	-	-
	2020-8-03	2	4	1.7	8	50	1.92	4.6	0.3	8.9	9.2	9.4	9.7	10.7
	2020-16-03	2	4	1.7	16	55	1.92	2.8	0.3	17.6	18.1	18.6	19.3	-
	2020-20-03	2	4	1.7	20	60	1.92	2.4	0.3	22.1	22.9	23.5	24	-
	2020-6-05	2	4	1.7	6	50	1.92	5.5	0.5	6.8	7.1	7.3	7.4	8
	2020-8-05	2	4	1.7	8	50	1.92	4.7	0.5	8.9	9.2	9.4	9.6	10.7
	2020-12-05	2	4	1.7	12	55	1.92	3.5	0.5	13.4	13.9	14.3	14.6	16
	2020-16-05	2	4	1.7	16	55	1.92	2.9	0.5	17.6	18.1	18.6	19.2	-
	2020-20-05	2	4	1.7	20	60	1.92	2.4	0.5	22.1	22.9	23.5	24	-
	2020-25-05	2	4	1.7	25	65	1.92	2	0.5	27.3	28.1	28.8	-	-
	2020-30-05	2	4	1.7	30	70	1.92	1.7	0.5	32.5	33.4	34.3	-	-
	2020-8-08	2	4	1.7	8	50	1.92	4.8	0.8	8.9	9.2	9.4	9.6	10.6
	2020-16-08	2	4	1.7	16	55	1.92	2.9	0.8	17.6	18.1	18.6	19.2	-
	2020-20-08	2	4	1.7	20	60	1.92	2.4	0.8	22.1	22.8	23.5	24	-
	2030-8-02	3	6	2.5	8	55	2.86	5.7	0.2	9	9.3	9.5	9.9	10.9
	2030-12-02	3	6	2.5	12	60	2.86	4.5	0.2	13.1	13.5	14	14.7	16.2
	2030-16-02	3	6	2.5	16	60	2.86	3.8	0.2	17.7	18.2	18.7	19.5	21.6
	2030-20-02	3	6	2.5	20	65	2.86	3.2	0.2	21.8	22.4	23.1	24.2	26.9
	2030-30-02	3	6	2.5	30	75	2.86	2.4	0.2	32.6	33.5	34.5	36.2	-
	2030-35-02	3	6	2.5	35	80	2.86	2.1	0.2	37.7	38.7	40.2	42.2	-
	2030-8-03	3	6	2.5	8	55	2.86	5.7	0.3	9	9.3	9.5	9.9	10.9
	2030-16-03	3	6	2.5	16	60	2.86	3.8	0.3	17.7	18.2	18.7	19.4	21.5
	2030-20-03	3	6	2.5	20	65	2.86	3.2	0.3	21.8	22.4	23.1	24.2	26.8

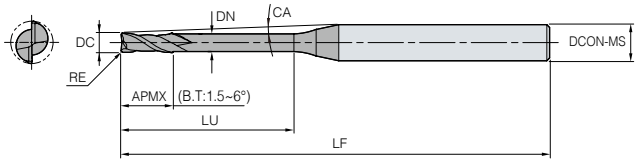
ESLNR20

2 flutes long neck type radius



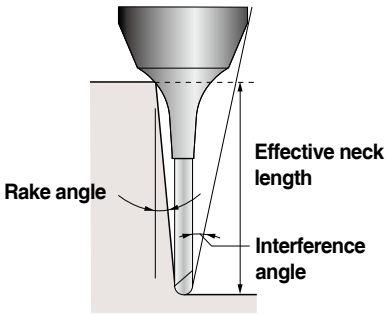
CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01

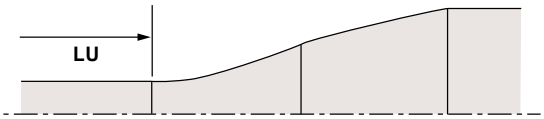
DC	Tolerance
ALL	0.000 ~ -0.012



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	DN	CA	RE	Effective length by inclination angle				
										0.5°	1°	1.5°	2°	3°
ESLNR	2030-30-03	3	6	2.5	30	75	2.86	2.4	0.3	32.6	33.5	34.5	36.2	-
	2030-8-05	3	6	2.5	8	55	2.86	5.8	0.5	9	9.3	9.5	9.8	10.8
	2030-12-05	3	6	2.5	12	60	2.86	4.6	0.5	13.1	13.5	13.9	14.6	16.2
	2030-16-05	3	6	2.5	16	60	2.86	3.8	0.5	17.7	18.2	18.7	19.4	21.5
	2030-20-05	3	6	2.5	20	65	2.86	3.2	0.5	21.8	22.4	23.1	24.2	26.8
	2030-30-05	3	6	2.5	30	75	2.86	2.4	0.5	32.6	33.5	34.5	36.1	-
	2030-35-05	3	6	2.5	35	80	2.86	2.1	0.5	37.7	38.7	40.2	42.1	-

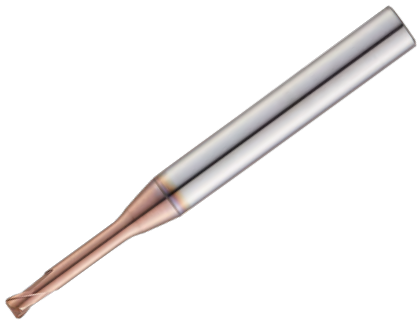




※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required.

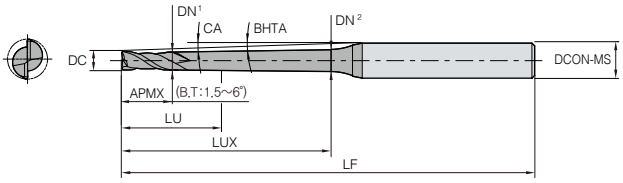
ESTNR20

2 flutes tapered neck type radius



CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01

DC	Tolerance
ALL	0.000 ~ -0.012



(mm)

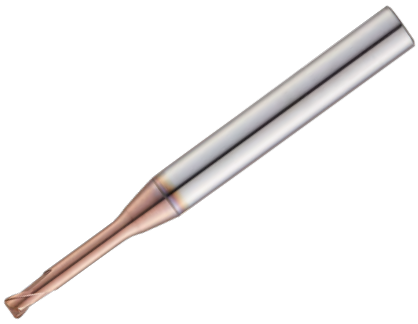
	Designation	DC	DCON-MS	APMX	LU	LUX	CA	BHTA(°)	DN1	DN2	LF	RE	Effective length by inclination angle				
													0.5°	1°	1.5°	2°	3°
ESTNR	2002-2-09005	0.2	4	0.15	1.1	2	0.9	10	0.17	0.23	50	0.05	-	2.8	3.1	3.4	3.9
	2004-4-09005	0.4	4	0.3	1.25	4	0.9	8.4	0.37	0.49	50	0.05	-	4.9	5.3	5.7	6.3
	2004-5-09005	0.4	4	0.3	1.25	5	0.9	7.8	0.37	0.52	50	0.05	-	5.9	6.4	6.8	7.5
	2004-4-0901	0.4	4	0.3	1.25	4	0.9	8.5	0.37	0.49	50	0.1	-	4.9	5.3	5.7	6.3
	2004-5-0901	0.4	4	0.3	1.25	5	0.9	7.9	0.37	0.52	50	0.1	-	5.9	6.4	6.8	7.5
	2005-5-0901	0.5	4	0.35	1.3	5	0.9	7.8	0.47	0.62	50	0.1	-	5.9	6.4	6.8	7.5
	2005-8-0901	0.5	4	0.35	1.3	8	0.9	6.4	0.47	0.71	50	0.1	-	9	9.7	10.2	11
	2005-10-0901	0.5	4	0.35	1.3	10	0.9	5.8	0.47	0.77	55	0.1	-	11	11.8	12.4	13.2
	2006-12-0901	0.6	4	0.4	1.35	12	0.9	5.1	0.57	0.93	55	0.1	-	13	13.9	14.5	15.5
	2006-15-0901	0.6	4	0.4	1.35	15	0.9	4.5	0.57	13	55	0.1	-	16.1	17.1	17.8	18.8
	2008-6-0402	0.8	4	0.5	2.64	6	0.4	7	0.77	0.85	50	0.2	6.6	7.1	7.5	7.8	8.3
	2008-12-0902	0.8	4	0.5	1.45	12	0.9	5	0.77	1.13	55	0.2	-	13	13.9	14.5	15.5
	2010-8-0402	1	6	0.8	5.09	8	0.4	7.4	0.94	14	55	0.2	8.8	9.3	9.7	10.1	10.6
	2010-10-0902	1	6	0.8	5.09	10	0.9	6.8	0.94	1.23	55	0.2	-	11.2	11.9	12.4	13.3
	2010-15-0902	1	6	0.8	2.7	15	0.9	5.6	0.94	1.39	60	0.2	-	16.3	17.2	17.8	18.8
	2010-20-0902	1	6	0.8	2.7	20	0.9	4.8	0.94	1.54	65	0.2	-	21.3	22.4	23.2	24.7
	2010-25-0902	1	6	0.8	2.7	25	0.9	4.1	0.94	1.7	70	0.2	-	26.4	27.6	28.5	30.9
	2010-30-0902	1	6	0.8	2.7	30	0.9	3.7	0.94	1.86	75	0.2	-	31.5	32.8	33.7	37
	2010-35-0902	1	6	0.8	2.7	35	0.9	3.3	0.94	22	80	0.2	-	36.5	38	39	43.2
	2010-8-0403	1	6	0.8	2.7	8	0.4	7.4	0.94	14	55	0.3	8.8	9.3	9.7	10	10.6
	2010-15-0903	1	6	0.8	2.7	15	0.9	5.6	0.94	1.39	60	0.3	-	16.3	17.2	17.8	18.8
	2010-25-0903	1	6	0.8	2.7	25	0.9	4.2	0.94	1.7	70	0.3	-	26.4	27.6	28.5	30.8
	2010-30-0903	1	6	0.8	2.7	30	0.9	3.7	0.94	1.86	75	0.3	-	31.5	32.8	33.7	37
	2015-10-0402	1.5	6	1.35	7.07	10	0.4	6.4	1.42	1.54	55	0.2	11	11.5	11.9	12.3	13
	2015-15-0902	1.5	6	1.35	7.07	15	0.9	5.3	1.42	1.85	60	0.2	-	16.4	17.3	17.9	18.9
	2015-20-0902	1.5	6	1.35	3.89	20	0.9	4.5	1.42	21	65	0.2	-	21.5	22.5	23.2	24.9
	2015-25-0902	1.5	6	1.35	3.89	25	0.9	3.9	1.42	2.16	70	0.2	-	26.6	27.7	28.5	31
	2015-30-0902	1.5	6	1.35	3.89	30	0.9	3.4	1.42	2.32	75	0.2	-	31.6	32.9	33.8	37.1
	2015-10-0403	1.5	6	1.35	3.89	10	0.4	6.4	1.42	1.54	55	0.3	11	11.5	11.9	12.3	13
	2015-20-0903	1.5	6	1.35	3.89	20	0.9	4.5	1.42	21	65	0.3	-	21.5	22.5	23.2	24.8
	2015-25-0903	1.5	6	1.35	3.89	25	0.9	3.9	1.42	2.16	70	0.3	-	26.5	27.7	28.5	31
	2015-30-0903	1.5	6	1.35	3.89	30	0.9	3.4	1.42	2.32	75	0.3	-	31.6	32.9	33.8	37.1
	2020-30-0902	2	6	1.7	7.42	30	0.9	3.1	1.92	2.81	70	0.2	-	31.6	32.9	33.8	37.2
	2020-40-0902	2	6	1.7	7.42	40	0.9	2.5	1.92	3.12	80	0.2	-	41.8	43.3	44.6	-
	2020-50-0902	2	6	1.7	7.42	50	0.9	2.1	1.92	3.44	90	0.2	-	51.9	53.6	55.7	-
	2020-12-0403	2	6	1.7	7.42	12	0.4	5.5	1.92	2.06	55	0.3	13	13.6	14.1	14.5	15.6
	2020-20-0903	2	6	1.7	4.24	20	0.9	4.1	1.92	2.5	65	0.3	-	21.5	22.5	23.2	24.9
	2020-30-0903	2	6	1.7	4.24	30	0.9	3.1	1.92	2.81	70	0.3	-	31.6	32.9	33.8	37.1

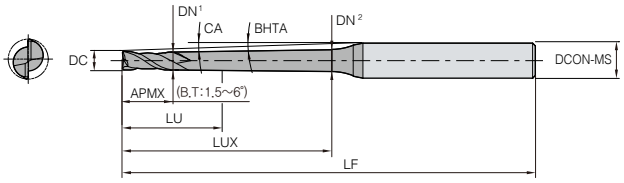
ESTNR20

2 flutes tapered neck type radius

CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01

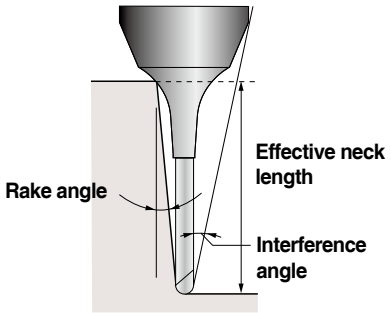
DC	Tolerance
ALL	0.000 ~ -0.012

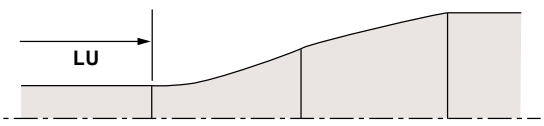




(mm)

	Designation	DC	DCON-MS	APMX	LU	LUX	CA	BHTA(°)	DN1	DN2	LF	RE	Effective length by inclination angle				
													0.5°	1°	1.5°	2°	3°
ESTNR	2020-40-0903	2	6	1.7	4.24	40	0.9	2.5	1.92	3.12	80	0.3	-	41.7	43.3	44.6	-
	2020-50-0903	2	6	1.7	4.24	50	0.9	2.1	1.92	3.44	90	0.3	-	51.8	53.6	55.7	-
	2020-8-0405	2	6	1.7	4.24	8	0.4	6.8	1.92	2.01	50	0.5	8.7	9	9.3	9.5	10.4
	2020-12-0405	2	6	1.7	4.24	12	0.4	5.6	1.92	2.06	55	0.5	13	13.6	14.1	14.4	15.5
	2020-16-0405	2	6	1.7	4.24	16	0.4	4.7	1.92	2.12	60	0.5	17	17.8	18.3	18.7	20.7
	2020-20-0905	2	6	1.7	4.24	20	0.9	4.2	1.92	2.5	65	0.5	-	21.5	22.5	23.2	24.8
	2020-25-0905	2	6	1.7	4.24	25	0.9	3.6	1.92	2.65	65	0.5	-	26.6	27.7	28.5	30.9
	2020-30-0905	2	6	1.7	4.24	30	0.9	3.1	1.92	2.81	70	0.5	-	31.6	32.9	33.8	37.1
	2020-40-0905	2	6	1.7	4.24	40	0.9	2.5	1.92	3.12	80	0.5	-	41.7	43.2	44.6	-
	2020-50-0905	2	6	1.7	4.24	50	0.9	2.1	1.92	3.44	90	0.5	-	51.8	53.6	55.6	-
	2030-40-0902	3	6	2.5	6.95	40	0.9	2	2.86	4.04	80	0.2	-	42	43.4	-	-
	2030-50-0902	3	6	2.5	6.95	50	0.9	1.6	2.86	4.35	90	0.2	-	52.1	53.7	-	-
	2030-60-0902	3	6	2.5	6.95	60	0.9	1.4	2.86	4.67	100	0.2	-	62.2	-	-	-
	2030-40-0903	3	6	2.5	6.95	40	0.9	2	2.86	4.04	80	0.3	-	42	43.4	-	-
	2030-50-0903	3	6	2.5	6.95	50	0.9	1.7	2.86	4.35	90	0.3	-	52.1	53.7	-	-
	2030-60-0903	3	6	2.5	6.95	60	0.9	1.4	2.86	4.67	100	0.3	-	62.2	-	-	-
	2030-40-0905	3	6	2.5	6.95	40	0.9	2	2.86	4.04	80	0.5	-	42	43.4	-	-
	2030-50-0905	3	6	2.5	6.95	50	0.9	1.7	2.86	4.35	90	0.5	-	52.1	53.7	-	-
	2030-60-0905	3	6	2.5	6.95	60	0.9	1.4	2.86	4.67	100	0.5	-	62.1	-	-	-





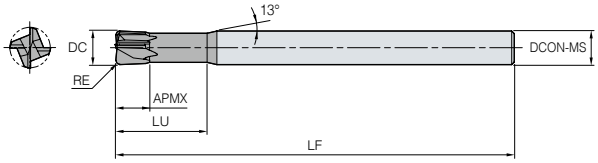
※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required.

ESPM4

4 flutes neck type radius

CARBIDE | 4 | H·A 0° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø3 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

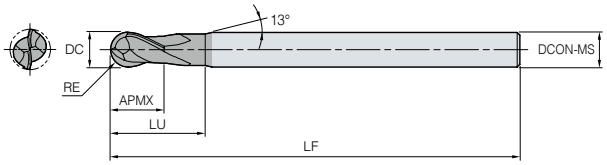
	Designation	DC	DCON-MS	APMX	LU	LF	RE
ESPM	4030-05	3	6	1.2	8	50	0.5
	4040-05	4	6	1.5	10	50	0.5
	4060-05	6	6	2.5	12	60	0.5
	4060-10	6	6	2.5	12	60	1
	4060-15	6	6	2.5	12	60	1.5
	4060-15L	6	6	2.5	12	90	1.5
	4080-10	8	8	3.5	16	60	1
	4080-20	8	8	3.5	16	60	2
	4080-20L	8	8	3.5	16	100	2
	4100-10	10	10	4	20	70	1
	4100-20	10	10	4	20	70	2
	4100-20L	10	10	4	20	100	2
	4120-20	12	12	5	25	80	2
	4120-30	12	12	5	25	80	3
	4120-30L	12	12	5	25	110	3

ESB702

2 flutes neck type ball

CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.008 (Above DC6)

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

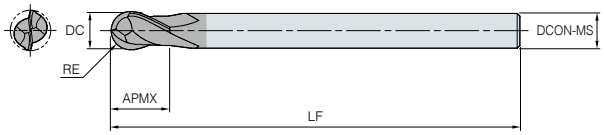
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESB	702001	0.1	4	0.15	-	40	0.05
	702002	0.2	4	0.3	-	40	0.1
	702003	0.3	4	0.5	-	40	0.15
	702004	0.4	4	0.6	-	40	0.2
	702005	0.5	4	0.7	-	40	0.25
	702006	0.6	4	0.9	-	40	0.3
	702007	0.7	4	1.1	-	40	0.35
	702008	0.8	4	1.2	-	40	0.4
	702009	0.9	4	1.4	-	40	0.45
	702010	1	6	1.5	3	50	0.5
	702010S4	1	4	1.5	-	45	0.5
	702015	1.5	6	2.0	4	50	0.75
	702015S4	1.5	4	2.0	-	45	0.75
	702020	2	6	2.5	5	50	1
	702020S4	2	4	2.5	-	45	1
	702025	2.5	6	3.0	7	50	1.25
	702030	3	6	4.0	10	60	1.5
	702030S	3	6	4.0	10	50	1.5
	702030S4	3	4	4.0	-	45	1.5
	702031	3	6	4.0	10	70	1.5
	702040	4	6	5.0	10	60	2
	702040S	4	6	5.0	10	50	2
	702040S4	4	4	5.0	-	45	2
	702041	4	6	5.0	10	70	2
	702050	5	6	6.0	12	60	2.5
	702060	6	6	7.0	12	60	3
	702061	6	6	7.0	12	90	3
	702080	8	8	9.0	15	70	4
	702081	8	8	9.0	15	100	4
	702100	10	10	11.0	25	75	5
	702101	10	10	11.0	25	100	5
	702120	12	12	12	25	80	6
	702121	12	12	12	25	110	6

ESB712

2 flutes ball

CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.008 (Above DC6)

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

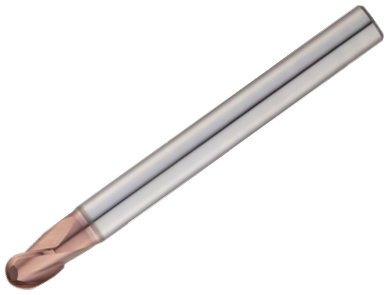
Designation		DC	DCON-MS	APMX	LF	RE
ESB	712010	1	6	2.5	50	0.5
	712010S	1	6	1.5	40	0.5
	712010S4	1	4	2.5	50	0.5
	712012	1.2	6	3	50	0.6
	712015	1.5	6	4	50	0.75
	712015S	1.5	6	2.5	40	0.75
	712015S4	1.5	4	4	50	0.75
	712020	2	6	5	50	1
	712020S	2	6	3	40	1
	712020S4	2	4	5	50	1
	712025	2.5	6	7	60	1.25
	712030	3	6	8	60	1.5
	712030S	3	6	4.5	50	1.5
	712030S4	3	4	8	60	1.5
	712040	4	6	8	70	2
	712040S	4	6	6	50	2
	712050	5	6	10	80	2.5
	712050S	5	6	7.5	50	2.5
	712060	6	6	12	90	3
	712060S	6	6	9	50	3
	712080S	8	8	12	50	4
	712081	8	8	14	100	4
	712100	10	10	18	100	5
	712100S	10	10	15	60	5
	712120	12	12	22	110	6
	712120S	12	12	18	60	6

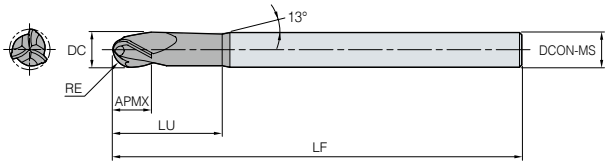
ESB703

3 flutes neck type ball

CARBIDE | 3 | H·A 30° | Grade PC305H | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.008 (Above DC6)

DC	Tolerance
Ø2 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015





(mm)

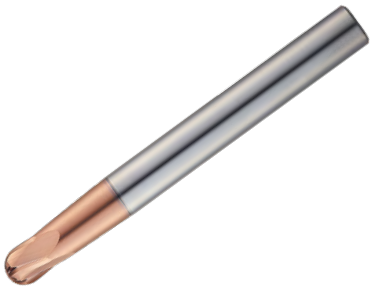
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESB	703020	2	6	2.5	5	50	1
	703025	2.5	6	3	7	50	1.25
	703030	3	6	4	10	60	1.5
	703030S	3	6	4	10	50	1.5
	703031	3	6	4	10	70	1.5
	703040	4	6	5	10	60	2
	703040S	4	6	5	10	50	2
	703041	4	6	5	10	70	2
	703050	5	6	6	12	60	2.5
	703060	6	6	7	12	60	3
	703061	6	6	7	12	90	3
	703080	8	8	9	15	70	4
	703081	8	8	9	15	100	4
	703100	10	10	11	25	75	5
	703101	10	10	11	25	100	5
	703120	12	12	12	25	80	6
	703121	12	12	12	25	110	6

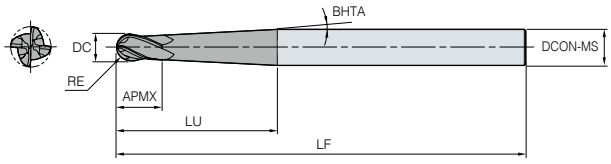
ESB734

4 flutes 15° helix ball

CARBIDE | 4 | H·A 15° | Grade PC305H | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.008 (Above DC6)

DC	Tolerance
Ø2 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø10	0.000 ~ -0.015





(mm)

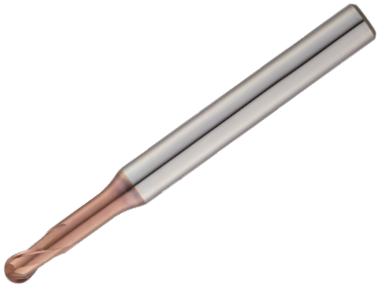
Designation		DC	DCON-MS	APMX	LU	LF	RE	BHTA(°)
ESB	734020-2.5	2	4	2	25	60	1	2.5
	734020-3.5	2	4	2	18	60	1	3.5
	734025-2.5	2.5	4	3	20	60	1.25	2.5
	734025-3.0	2.5	4	3	17	60	1.25	3
	734030-2.0	3	6	3	46	70	1.5	2
	734030-2.5	3	6	3	37	70	1.5	2.5
	734040-2.0	4	6	4	33	70	2	2
	734040-2.5	4	6	4	27	70	2	2.5
	734050-2.5	5	6	5	16	70	2.5	2.5
	734060-1.5	6	8	6	44	100	3	1.5
	734060-2.5	6	8	6	29	100	3	2.5
	734080-1.5	8	10	8	46	100	4	1.5
	734080-2.5	8	10	8	31	100	4	2.5
	734100-1.5	10	12	10	48	110	5	1.5
	734100-2.5	10	12	10	33	110	5	2.5

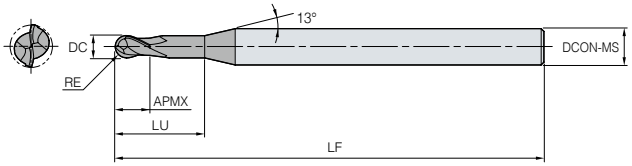
ESRB712

2 flutes rib ball

CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.008 (Above DC6)

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015





(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRB	712001002	0.1	4	0.1	0.2	40	0.05
	712001003	0.1	4	0.1	0.3	40	0.05
	712001005	0.1	4	0.1	0.5	40	0.05
	71200101	0.1	4	0.1	1	40	0.05
	712002005	0.2	4	0.2	0.5	40	0.1
	712002015	0.2	4	0.2	1.5	40	0.1
	71200201	0.2	4	0.2	1	40	0.1
	71200202	0.2	4	0.2	2	40	0.1
	71200203	0.2	4	0.2	3	40	0.1
	712003015	0.3	4	0.3	1.5	40	0.15
	71200301	0.3	4	0.3	1	40	0.15
	712003025	0.3	4	0.3	2.5	40	0.15
	71200302	0.3	4	0.3	2	40	0.15
	71200303	0.3	4	0.3	3	40	0.15
	71200304	0.3	4	0.3	4	40	0.15
	71200305	0.3	4	0.3	5	40	0.15
	712004015	0.4	4	0.4	1.5	40	0.2
	71200401	0.4	4	0.4	1	40	0.2
	712004025	0.4	4	0.4	2.5	40	0.2
	71200402	0.4	4	0.4	2	40	0.2
	71200403	0.4	4	0.4	3	40	0.2
	71200404	0.4	4	0.4	4	40	0.2
	71200405	0.4	4	0.4	5	40	0.2
	71200406	0.4	4	0.4	6	40	0.2
	71200408	0.4	4	0.4	8	40	0.2
	71200410	0.4	4	0.4	10	40	0.2
	712005015	0.5	4	0.5	1.5	45	0.25
	71200501	0.5	4	0.5	1	45	0.25
	71200501S6	0.5	6	0.5	1	45	0.25
	712005025	0.5	4	0.5	2.5	45	0.25
	71200502	0.5	4	0.5	2	45	0.25
	71200502S6	0.5	6	0.5	2	45	0.25
	71200503	0.5	4	0.5	3	45	0.25
	71200504	0.5	4	0.5	4	45	0.25
	71200504S6	0.5	6	0.5	4	45	0.25
	71200505	0.5	4	0.5	5	45	0.25
	71200506	0.5	4	0.5	6	45	0.25
	71200508	0.5	4	0.5	8	45	0.25
	71200510	0.5	4	0.5	10	45	0.25

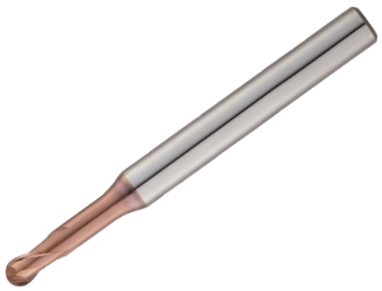
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRB	71200512	0.5	4	0.5	12	45	0.25
	71200514	0.5	4	0.5	14	45	0.25
	71200516	0.5	4	0.5	16	45	0.25
	71200601	0.6	4	0.6	1	45	0.3
	71200601S6	0.6	6	0.6	1	45	0.3
	71200602	0.6	4	0.6	2	45	0.3
	71200602S6	0.6	6	0.6	2	45	0.3
	71200603	0.6	4	0.6	3	45	0.3
	71200603S6	0.6	6	0.6	3	45	0.3
	71200604	0.6	4	0.6	4	45	0.3
	71200604S6	0.6	6	0.6	4	45	0.3
	71200605	0.6	4	0.6	5	45	0.3
	71200605S6	0.6	6	0.6	5	45	0.3
	71200606	0.6	4	0.6	6	45	0.3
	71200606S6	0.6	6	0.6	6	45	0.3
	71200608	0.6	4	0.6	8	45	0.3
	71200608S6	0.6	6	0.6	8	45	0.3
	71200610	0.6	4	0.6	10	45	0.3
	71200610S6	0.6	6	0.6	10	45	0.3
	71200612	0.6	4	0.6	12	45	0.3
	71200612S6	0.6	6	0.6	12	45	0.3
	71200614	0.6	4	0.6	14	45	0.3
	71200614S6	0.6	6	0.6	14	45	0.3
	71200616	0.6	4	0.6	16	45	0.3
	71200616S6	0.6	6	0.6	16	50	0.3
	71200702	0.7	4	0.7	2	45	0.35
	71200704	0.7	4	0.7	4	45	0.35
	71200706	0.7	4	0.7	6	45	0.35
	71200708	0.7	4	0.7	8	45	0.35
	71200710	0.7	4	0.7	10	45	0.35
	71200712	0.7	4	0.7	12	45	0.35
	71200801	0.8	4	0.8	1	45	0.4
	71200801S6	0.8	6	0.8	1	45	0.4
	71200802	0.8	4	0.8	2	45	0.4
	71200802S6	0.8	6	0.8	2	45	0.4
	71200803	0.8	4	0.8	3	45	0.4
	71200803S6	0.8	6	0.8	3	45	0.4
	71200804	0.8	4	0.8	4	45	0.4
	71200804S6	0.8	6	0.8	4	45	0.4

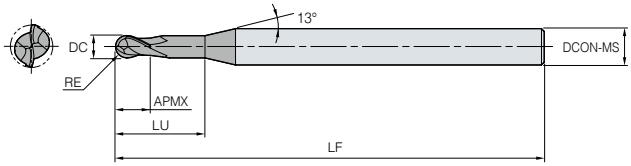
ESRB712

2 flutes rib ball

CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.008 (Above DC6)

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015





(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRB	71200805	0.8	4	0.8	5	45	0.4
	71200805S6	0.8	6	0.8	5	45	0.4
	71200806	0.8	4	0.8	6	45	0.4
	71200806S6	0.8	6	0.8	6	45	0.4
	71200808	0.8	4	0.8	8	45	0.4
	71200808S6	0.8	6	0.8	8	45	0.4
	71200810	0.8	4	0.8	10	45	0.4
	71200810S6	0.8	6	0.8	10	45	0.4
	71200812	0.8	4	0.8	12	45	0.4
	71200812S6	0.8	6	0.8	12	45	0.4
	71200814	0.8	4	0.8	14	45	0.4
	71200814S6	0.8	6	0.8	14	45	0.4
	71200816	0.8	4	0.8	16	45	0.4
	71200816S6	0.8	6	0.8	16	50	0.4
	71200820	0.8	4	0.8	20	50	0.4
	71200820S6	0.8	6	0.8	20	55	0.4
	71200904	0.9	4	0.9	4	45	0.45
	71200906	0.9	4	0.9	6	45	0.45
	71200908	0.9	4	0.9	8	45	0.45
	71200910	0.9	4	0.9	10	45	0.45
	71201002	1	4	1	2	50	0.5
	71201002S6	1	6	1	2	50	0.5
	71201003	1	4	1	3	50	0.5
	71201003S6	1	6	1	3	50	0.5
	71201004	1	4	1	4	50	0.5
	71201004S6	1	6	1	4	50	0.5
	71201005	1	4	1	5	50	0.5
	71201005S6	1	6	1	5	50	0.5
	71201006	1	4	1	6	50	0.5
	71201006S6	1	6	1	6	50	0.5
	71201007	1	4	1	7	50	0.5
	71201007S6	1	6	1	7	50	0.5
	71201008	1	4	1	8	50	0.5
	71201008S6	1	6	1	8	50	0.5
	71201009	1	4	1	9	50	0.5
	71201009S6	1	6	1	9	50	0.5
	71201010	1	4	1	10	50	0.5
	71201010S6	1	6	1	10	50	0.5
	71201012	1	4	1	12	50	0.5

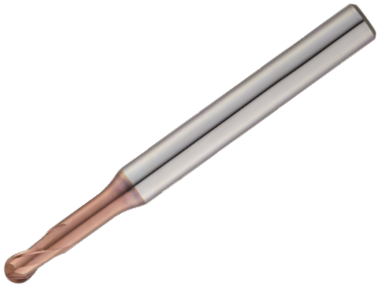
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRB	71201012S6	1	6	1	12	50	0.5
	71201014	1	4	1	14	50	0.5
	71201014S6	1	6	1	14	50	0.5
	71201016	1	4	1	16	50	0.5
	71201016S6	1	6	1	16	50	0.5
	71201018	1	4	1	18	50	0.5
	71201018S6	1	6	1	18	50	0.5
	71201020	1	4	1	20	55	0.5
	71201020S6	1	6	1	20	55	0.5
	71201022	1	4	1	22	60	0.5
	71201022S6	1	6	1	22	60	0.5
	71201026	1	4	1	26	60	0.5
	71201026S6	1	6	1	26	60	0.5
	71201030	1	4	1	30	70	0.5
	71201030S6	1	6	1	30	70	0.5
	71201040	1	4	1	40	80	0.5
	71201050	1	4	1	50	100	0.5
	71201204	1.2	4	1.2	4	50	0.6
	71201206	1.2	4	1.2	6	50	0.6
	71201208	1.2	4	1.2	8	50	0.6
	71201210	1.2	4	1.2	10	50	0.6
	71201212	1.2	4	1.2	12	50	0.6
	71201216	1.2	4	1.2	16	50	0.6
	71201220	1.2	4	1.2	20	50	0.6
	71201226	1.2	4	1.2	26	60	0.6
	71201406	1.4	4	1.4	6	50	0.7
	71201408	1.4	4	1.4	8	50	0.7
	71201410	1.4	4	1.4	10	50	0.7
	71201412	1.4	4	1.4	12	50	0.7
	71201416	1.4	4	1.4	16	50	0.7
	71201503	1.5	4	1.5	3	50	0.75
	71201503S6	1.5	6	1.5	3	50	0.75
	71201504	1.5	4	1.5	4	50	0.75
	71201504S6	1.5	6	1.5	4	50	0.75
	71201505	1.5	4	1.5	5	50	0.75
	71201506	1.5	4	1.5	6	50	0.75
	71201506S6	1.5	6	1.5	6	50	0.75
	71201507	1.5	4	1.5	7	50	0.75
	71201508	1.5	4	1.5	8	50	0.75

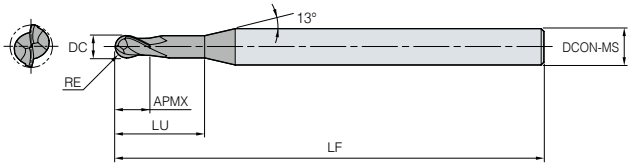
ESRB712

2 flutes rib ball

CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.008 (Above DC6)

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015





(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRB	71201508S6	1.5	6	1.5	8	50	0.75
	71201510	1.5	4	1.5	10	50	0.75
	71201510S6	1.5	6	1.5	10	50	0.75
	71201512	1.5	4	1.5	12	50	0.75
	71201512S6	1.5	6	1.5	12	50	0.75
	71201514	1.5	4	1.5	14	50	0.75
	71201514S6	1.5	6	1.5	14	50	0.75
	71201516	1.5	4	1.5	16	50	0.75
	71201516S6	1.5	6	1.5	16	50	0.75
	71201518	1.5	4	1.5	18	50	0.75
	71201518S6	1.5	6	1.5	18	50	0.75
	71201520	1.5	4	1.5	20	55	0.75
	71201520S6	1.5	6	1.5	20	55	0.75
	71201522	1.5	4	1.5	22	60	0.75
	71201522S6	1.5	6	1.5	22	60	0.75
	71201526	1.5	4	1.5	26	60	0.75
	71201526S6	1.5	6	1.5	26	60	0.75
	71201530	1.5	4	1.5	30	70	0.75
	71201530S6	1.5	6	1.5	30	70	0.75
	71201535	1.5	4	1.5	35	70	0.75
	71201535S6	1.5	6	1.5	35	70	0.75
	71201540	1.5	4	1.5	40	80	0.75
	71201540S6	1.5	6	1.5	40	80	0.75
	71201604	1.6	4	1.6	4	50	0.8
	71201606	1.6	4	1.6	6	50	0.8
	71201608	1.6	4	1.6	8	50	0.8
	71201610	1.6	4	1.6	10	50	0.8
	71201612	1.6	4	1.6	12	50	0.8
	71201616	1.6	4	1.6	16	50	0.8
	71201620	1.6	4	1.6	20	50	0.8
	71201804	1.8	4	1.8	4	50	0.9
	71201806	1.8	4	1.8	6	50	0.9
	71201808	1.8	4	1.8	8	50	0.9
	71201810	1.8	4	1.8	10	50	0.9
	71201812	1.8	4	1.8	12	50	0.9
	71201816	1.8	4	1.8	16	50	0.9
	71201820	1.8	4	1.8	20	50	0.9
	71202004	2	4	2	4	50	1
	71202004S6	2	6	2	4	50	1

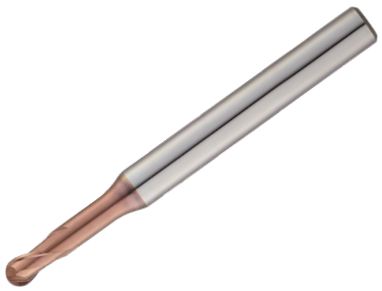
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRB	71202006	2	4	2	6	50	1
	71202006S6	2	6	2	6	50	1
	71202008	2	4	2	8	50	1
	71202008S6	2	6	2	8	50	1
	71202010	2	4	2	10	50	1
	71202010S6	2	6	2	10	50	1
	71202012	2	4	2	12	50	1
	71202012S6	2	6	2	12	50	1
	71202014	2	4	2	14	50	1
	71202014S6	2	6	2	14	50	1
	71202016	2	4	2	16	50	1
	71202016S6	2	6	2	16	50	1
	71202018	2	4	2	18	55	1
	71202018S6	2	6	2	18	55	1
	71202020	2	4	2	20	55	1
	71202020S6	2	6	2	20	55	1
	71202022	2	4	2	22	60	1
	71202022S6	2	6	2	22	60	1
	71202026	2	4	2	26	60	1
	71202026S6	2	6	2	26	60	1
	71202030	2	4	2	30	70	1
	71202030S6	2	6	2	30	70	1
	71202035	2	4	2	35	70	1
	71202035S6	2	6	2	35	70	1
	71202040	2	4	2	40	80	1
	71202040S6	2	6	2	40	80	1
	71202045	2	4	2	45	90	1
	71202045S6	2	6	2	45	90	1
	71202050	2	4	2	50	100	1
	71202050S6	2	6	2	50	100	1
	71202060	2	4	2	60	110	1
	71202508	2.5	4	2.5	8	50	1.25
	71202510	2.5	4	2.5	10	50	1.25
	71202512	2.5	4	2.5	12	50	1.25
	71202516	2.5	4	2.5	16	50	1.25
	71202520	2.5	4	2.5	20	50	1.25
	71202522	2.5	4	2.5	22	60	1.25
	71202526	2.5	4	2.5	26	60	1.25
	71202530	2.5	4	2.5	30	70	1.25

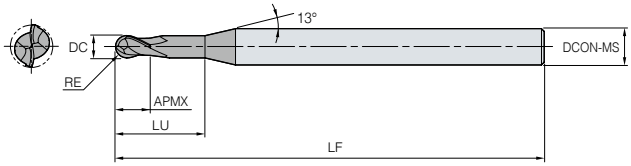
ESRB712

2 flutes rib ball

CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.008 (Above DC6)

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015





(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRB	71202535	2.5	4	2.5	35	70	1.25
	71202540	2.5	4	2.5	40	80	1.25
	71202545	2.5	4	2.5	45	90	1.25
	71202550	2.5	4	2.5	50	100	1.25
	71203006	3	6	3	6	50	1.5
	71203008	3	6	3	8	50	1.5
	71203010	3	6	3	10	50	1.5
	71203012	3	6	3	12	50	1.5
	71203014	3	6	3	14	60	1.5
	71203016	3	6	3	16	60	1.5
	71203018	3	6	3	18	60	1.5
	71203020	3	6	3	20	60	1.5
	71203022	3	6	3	22	65	1.5
	71203026	3	6	3	26	65	1.5
	71203030	3	6	3	30	70	1.5
	71203035	3	6	3	35	70	1.5
	71203040	3	6	3	40	80	1.5
	71203045	3	6	3	45	90	1.5
	71203050	3	6	3	50	100	1.5
	71203060	3	6	3	60	100	1.5
	71203510	3.5	6	3	10	50	1.75
	71203516	3.5	6	3	16	60	1.75
	71203520	3.5	6	3	20	60	1.75
	71203526	3.5	6	3	26	65	1.75
	71203530	3.5	6	3	30	70	1.75
	71204008	4	6	4	8	50	2
	71204010	4	6	4	10	50	2
	71204012	4	6	4	12	50	2
	71204014	4	6	4	14	60	2
	71204016	4	6	4	16	60	2
	71204018	4	6	4	18	60	2
	71204020	4	6	4	20	60	2
	71204022	4	6	4	22	65	2
	71204026	4	6	4	26	65	2

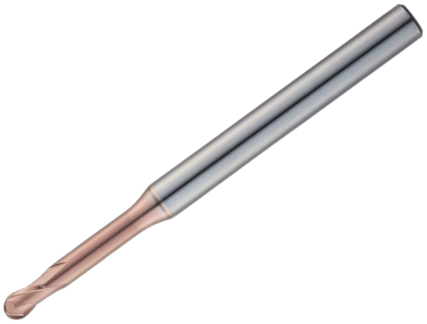
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRB	71204030	4	6	4	30	70	2
	71204035	4	6	4	35	70	2
	71204040	4	6	4	40	80	2
	71204045	4	6	4	45	90	2
	71204050	4	6	4	50	100	2
	71204055	4	6	4	55	100	2
	71204060	4	6	4	60	100	2
	71205015	5	6	6	15	60	2.5
	71205020	5	6	6	20	60	2.5
	71205026	5	6	6	26	65	2.5
	71205030	5	6	6	30	70	2.5
	71205035	5	6	6	35	70	2.5
	71205040	5	6	6	40	80	2.5
	71205045	5	6	6	45	90	2.5
	71205050	5	6	6	50	100	2.5
	71205055	5	6	6	55	100	2.5
	71205060	5	6	6	60	100	2.5
	7120602090	6	6	12	20	90	3
	71206020	6	6	8	20	60	3
	7120603090	6	6	12	30	90	3
	71206030	6	6	8	30	60	3
	71208025100	8	8	14	25	100	4
	71208025	8	8	10	25	70	4
	71208035100	8	8	14	35	100	4
	71208035	8	8	10	35	70	4
	71210030100	10	10	18	30	100	5
	71210030	10	10	12	30	75	5
	71210040100	10	10	18	40	100	5
	71210040	10	10	12	40	75	5
	71212032110	12	12	22	32	110	6
	71212032	12	12	14	32	80	6
	71212045110	12	12	22	45	110	6
	71212045	12	12	14	45	80	6

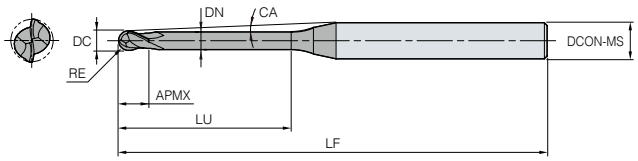
ESLNB20

2 flutes long neck type ball

CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.008 (Above DC6)

DC	Tolerance
ALL	0.000 ~ -0.012



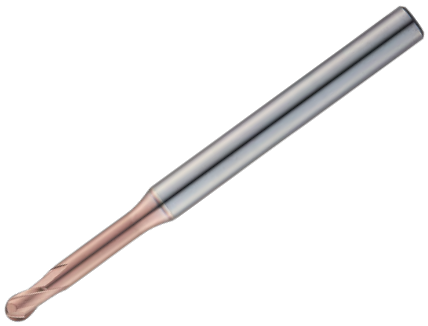


(mm)

	Designation	DC	DCON-MS	APMX	LU	LF	DN	CA	RE	Effective length by inclination angle				
										0.5°	1°	1.5°	2°	3°
ESLNB	2001-0.2	0.1	4	0.08	0.2	45	0.08	11.8	0.05	0.3	0.3	0.3	0.4	0.4
	2001-0.3	0.1	4	0.08	0.3	45	0.08	11.7	0.05	0.4	0.4	0.5	0.5	0.5
	2001-0.5	0.1	4	0.08	0.5	45	0.08	11.4	0.05	0.6	0.7	0.7	0.7	0.8
	2002-0.5	0.2	4	0.15	0.5	50	0.17	11.5	0.1	1.2	1.3	1.5	1.6	2
	2002-1	0.2	4	0.15	1	50	0.17	10.9	0.1	1.7	1.9	2.1	2.3	2.7
	2002-1.5	0.2	4	0.15	1.5	50	0.17	10.4	0.1	2.3	2.5	2.8	3	3.4
	2002-2	0.2	4	0.15	2	50	0.17	9.9	0.1	2.8	3.1	3.4	3.6	4.1
	2002-2.5	0.2	4	0.15	2.5	50	0.17	9.5	0.1	3.4	3.7	4	4.2	4.7
	2002-3.0	0.2	4	0.15	3	50	0.17	9.1	0.1	3.9	4.3	4.6	4.9	5.4
	2003-1	0.3	4	0.25	1	50	0.27	10.9	0.15	1.7	1.9	2.1	2.3	2.7
	2003-1.5	0.3	4	0.25	1.5	50	0.27	10.4	0.15	2.3	2.5	2.7	3	3.4
	2003-2	0.3	4	0.25	2	50	0.27	9.9	0.15	2.8	3.1	3.4	3.6	4
	2003-2.5	0.3	4	0.25	2.5	50	0.27	9.5	0.15	3.4	3.7	4	4.2	4.7
	2003-3	0.3	4	0.25	3	50	0.27	9.1	0.15	3.9	4.3	4.6	4.8	5.3
	2004-1	0.4	4	0.3	1	50	0.37	11	0.2	1.7	1.9	2.1	2.3	2.7
	2004-1.5	0.4	4	0.3	1.5	50	0.37	10.4	0.2	2.3	2.5	2.7	2.9	3.4
	2004-2	0.4	4	0.3	2	50	0.37	9.9	0.2	2.8	3.1	3.4	3.6	4
	2004-2.5	0.4	4	0.3	2.5	50	0.37	9.5	0.2	3.4	3.7	4	4.2	4.7
	2004-3	0.4	4	0.3	3	50	0.37	9.1	0.2	3.9	4.3	4.6	4.8	5.3
	2004-3.5	0.4	4	0.3	3.5	50	0.37	8.7	0.2	4.5	4.8	5.2	5.4	6
	2004-4	0.4	4	0.3	4	50	0.37	8.3	0.2	5	5.4	5.7	6	6.6
	2004-4.5	0.4	4	0.3	4.5	50	0.37	8	0.2	5.6	6	6.3	6.6	7.2
	2005-1	0.5	4	0.35	1	50	0.47	11	0.25	1.7	1.9	2.1	2.3	2.6
	2005-2	0.5	4	0.35	2	50	0.47	9.9	0.25	2.8	3.1	3.3	3.6	4
	2005-3	0.5	4	0.35	3	50	0.47	9	0.25	3.9	4.3	4.6	4.8	5.3
	2005-4	0.5	4	0.35	4	50	0.47	8.3	0.25	5	5.4	5.7	6	6.6
	2005-5	0.5	4	0.35	5	50	0.47	7.7	0.25	6.1	6.5	6.9	7.2	7.8
	2005-6	0.5	4	0.35	6	50	0.47	7.1	0.25	7.2	7.6	8	8.4	9
	2005-8	0.5	4	0.35	8	50	0.47	6.3	0.25	9.3	9.9	10.3	10.7	11.4
	2006-1	0.6	4	0.4	1	50	0.57	11	0.3	1.7	1.9	2.1	2.3	2.6
	2006-2	0.6	4	0.4	2	50	0.57	9.9	0.3	2.8	3.1	3.3	3.6	4
	2006-3	0.6	4	0.4	3	50	0.57	9	0.3	3.9	4.3	4.5	4.8	5.3
	2006-4	0.6	4	0.4	4	50	0.57	8.3	0.3	5	5.4	5.7	6	6.6
	2006-5	0.6	4	0.4	5	50	0.57	7.6	0.3	6.1	6.5	6.9	7.2	7.8
	2006-6	0.6	4	0.4	6	50	0.57	7.1	0.3	7.2	7.6	8	8.4	9
	2006-7	0.6	4	0.4	7	50	0.57	6.6	0.3	8.3	8.8	9.2	9.5	10.2

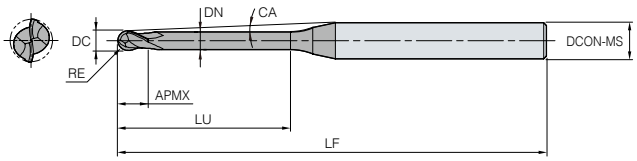
ESLNB20

2 flutes long neck type ball



CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.008 (Above DC6)

DC	Tolerance
ALL	0.000 ~ -0.012



(mm)

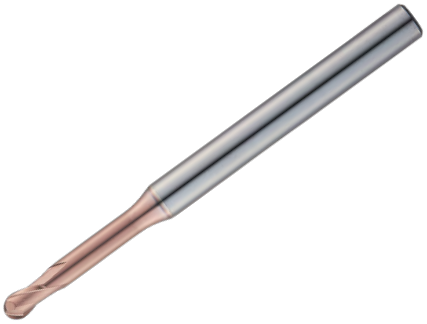
	Designation	DC	DCON-MS	APMX	LU	LF	DN	CA	RE	Effective length by inclination angle				
										0.5°	1°	1.5°	2°	3°
ESLNB	2006-8	0.6	4	0.4	8	50	0.57	6.2	0.3	9.3	9.9	10.3	10.7	11.4
	2006-9	0.6	4	0.4	9	50	0.57	5.8	0.3	10.4	10.9	11.4	11.8	12.5
	2006-10	0.6	4	0.4	10	50	0.57	5.5	0.3	11.4	12	12.5	12.9	13.7
	2006-12	0.6	4	0.4	12	50	0.57	5	0.3	13.6	14.2	14.7	15.2	16
	2008-2	0.8	4	0.5	2	50	0.77	9.9	0.4	2.8	3.1	3.3	3.5	4
	2008-4	0.8	4	0.5	4	50	0.77	8.2	0.4	5	5.4	5.7	6	6.5
	2008-5	0.8	4	0.5	5	50	0.77	7.5	0.4	6.1	6.5	6.9	7.2	7.8
	2008-6	0.8	4	0.5	6	50	0.77	7	0.4	7.2	7.6	8	8.4	9
	2008-8	0.8	4	0.5	8	50	0.77	6.1	0.4	9.3	9.8	10.3	10.7	11.3
	2008-10	0.8	4	0.5	10	50	0.77	5.4	0.4	11.4	12	12.5	12.9	13.7
	2010-2	1	4	0.8	2	50	0.96	9.9	0.5	2.9	3.1	3.3	3.5	4
	2010-3	1	4	0.8	3	50	0.96	8.9	0.5	4	4.3	4.5	4.8	5.3
	2010-4	1	4	0.8	4	50	0.96	8.1	0.5	5	5.4	5.7	6	6.5
	2010-5	1	4	0.8	5	50	0.96	7.4	0.5	6.1	6.5	6.9	7.2	7.8
	2010-6	1	4	0.8	6	50	0.96	6.8	0.5	7.2	7.7	8	8.4	9
	2010-7	1	4	0.8	7	50	0.96	6.3	0.5	8.3	8.8	9.2	9.5	10.2
	2010-8	1	4	0.8	8	50	0.96	5.9	0.5	9.3	9.9	10.3	10.7	11.3
	2010-9	1	4	0.8	9	50	0.96	5.5	0.5	10.4	11	11.4	11.8	12.5
	2010-10	1	4	0.8	10	50	0.96	5.2	0.5	11.5	12	12.5	12.9	13.7
	2010-12	1	4	0.8	12	55	0.96	4.6	0.5	13.6	14.2	14.7	15.2	15.9
	2010-14	1	4	0.8	14	55	0.96	4.2	0.5	15.7	16.4	16.9	17.4	18.5
	2010-16	1	4	0.8	16	55	0.96	3.8	0.5	17.8	18.5	19.1	19.6	21.2
	2010-18	1	4	0.8	18	60	0.96	3.5	0.5	19.9	20.7	21.3	21.8	23.8
	2010-20	1	4	0.8	20	60	0.96	3.3	0.5	22	22.8	23.4	24	26.5
	2012-4	1.2	4	1.1	4	50	1.15	7.9	0.6	5.1	5.4	5.7	6	6.5
	2012-6	1.2	4	1.1	6	50	1.15	6.6	0.6	7.2	7.7	8	8.4	9
	2012-8	1.2	4	1.1	8	50	1.15	5.7	0.6	9.4	9.9	10.3	10.7	11.3
	2012-10	1.2	4	1.1	10	50	1.15	5	0.6	11.5	12.1	12.5	12.9	13.7
	2012-12	1.2	4	1.1	12	55	1.15	4.5	0.6	13.6	14.2	14.7	15.2	15.9
	2014-8	1.4	4	1.3	8	50	1.34	5.5	0.7	9.4	9.9	10.3	10.7	11.3
	2014-12	1.4	4	1.3	12	55	1.34	4.3	0.7	13.6	14.2	14.7	15.2	15.9
	2014-16	1.4	4	1.3	16	55	1.34	3.5	0.7	17.8	18.5	19.1	19.6	21.2
	2015-4	1.5	4	1.35	4	50	1.44	7.7	0.75	5.1	5.4	5.7	6	6.5
	2015-6	1.5	4	1.35	6	50	1.44	6.4	0.75	7.3	7.7	8	8.4	9
	2015-8	1.5	4	1.35	8	50	1.44	5.4	0.75	9.4	9.9	10.3	10.7	11.3
	2015-10	1.5	4	1.35	10	50	1.44	4.7	0.75	11.5	12.1	12.5	12.9	13.7

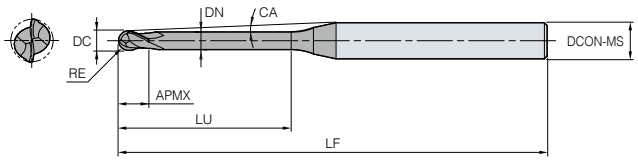
ESLNB20

2 flutes long neck type ball

CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.008 (Above DC6)

DC	Tolerance
ALL	0.000 ~ -0.012



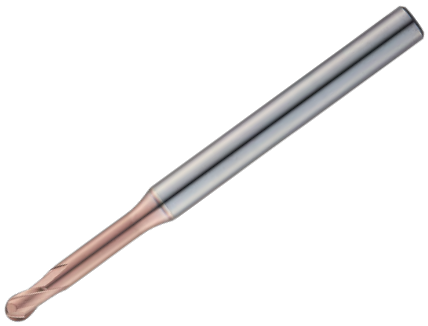


(mm)

	Designation	DC	DCON-MS	APMX	LU	LF	DN	CA	RE	Effective length by inclination angle				
										0.5°	1°	1.5°	2°	3°
ESLNB	2015-12	1.5	4	1.35	12	55	1.44	4.2	0.75	13.6	14.2	14.7	15.2	15.9
	2015-14	1.5	4	1.35	14	55	1.44	3.8	0.75	15.7	16.4	16.9	17.4	18.5
	2015-16	1.5	4	1.35	16	55	1.44	3.4	0.75	17.8	18.5	19.1	19.6	21.1
	2015-20	1.5	4	1.35	20	60	1.44	2.9	0.75	22	22.8	23.4	24	-
	2016-8	1.6	4	1.4	8	50	1.54	5.3	0.8	9.4	9.9	10.3	10.7	11.3
	2016-10	1.6	4	1.4	10	55	1.54	4.6	0.8	11.5	12.1	12.5	12.9	13.7
	2016-12	1.6	4	1.4	12	55	1.54	4.1	0.8	13.6	14.2	14.7	15.2	15.9
	2016-16	1.6	4	1.4	16	55	1.54	3.3	0.8	17.8	18.5	19.1	19.6	21.1
	2016-20	1.6	4	1.4	20	60	1.54	2.8	0.8	22	22.8	23.4	24	-
	2018-8	1.8	4	1.6	8	50	1.73	5.1	0.9	9.4	9.9	10.3	10.7	11.3
	2018-12	1.8	4	1.6	12	55	1.73	3.9	0.9	13.7	14.3	14.7	15.2	15.9
	2018-16	1.8	4	1.6	16	55	1.73	3.1	0.9	17.9	18.6	19.1	19.6	21.1
	2018-20	1.8	4	1.6	20	60	1.73	2.6	0.9	22	22.8	23.4	24	-
	2020-3	2	4	1.7	3	50	1.92	8.3	1	4.1	4.4	4.6	4.8	5.2
	2020-4	2	4	3	4	50	1.92	7.3	1	5.2	5.5	5.8	6	6.5
	2020-6	2	4	3	6	50	1.92	5.8	1	7.3	7.7	8.1	8.4	9
	2020-8	2	4	3	8	50	1.92	4.9	1	9.5	9.9	10.3	10.7	11.3
	2020-10	2	4	3	10	50	1.92	4.2	1	11.6	12.1	12.6	12.9	13.6
	2020-12	2	4	3	12	55	1.92	3.7	1	13.7	14.3	14.8	15.2	15.9
	2020-14	2	4	3	14	55	1.92	3.2	1	15.8	16.4	16.9	17.4	18.5
	2020-16	2	4	3	16	55	1.92	2.9	1	17.9	18.6	19.1	19.6	-
	2020-18	2	4	3	18	60	1.92	2.7	1	20	20.7	21.3	21.8	-
	2020-20	2	4	3	20	60	1.92	2.4	1	22.1	22.8	23.4	24	-
	2020-22	2	4	3	22	60	1.92	2.3	1	24.1	24.9	25.6	26.3	-
	2020-25	2	4	3	25	65	1.92	2	1	27.3	28.1	28.8	-	-
	2020-30	2	4	3	30	70	1.92	1.7	1	32.4	33.4	34.2	-	-
	2020-35	2	4	3	35	75	1.92	1.5	1	37.6	38.6	-	-	-
	2020-40	2	4	3	40	80	1.92	1.4	1	42.8	43.8	-	-	-
	2025-10	2.5	4	4	10	50	2.4	3.4	1.25	11.6	12.1	12.6	13	13.6
	2025-16	2.5	4	4	16	55	2.4	2.3	1.25	17.9	18.6	19.1	19.6	-
	2025-20	2.5	4	4	20	60	2.4	1.9	1.25	22.1	22.8	23.5	-	-
	2030-8	3	6	4	8	55	2.88	6.2	1.5	9.6	10	10.4	10.7	11.3
	2030-10	3	6	4	10	55	2.88	5.5	1.5	11.7	12.2	12.6	13	13.6
	2030-13	3	6	4	13	60	2.88	4.6	1.5	14.8	15.4	15.9	16.3	17.1
	2030-16	3	6	4	16	60	2.88	4	1.5	18	18.6	19.1	19.6	21.1
	2030-18	3	6	4	18	60	2.88	3.6	1.5	20	20.7	21.3	21.8	23.7

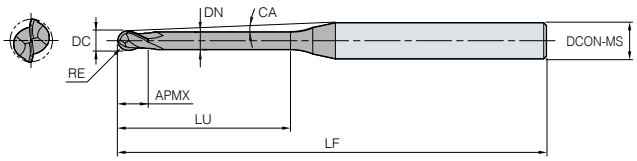
ESLNB20

2 flutes long neck type ball



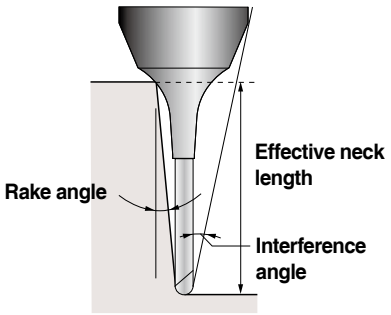
CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.008 (Above DC6)

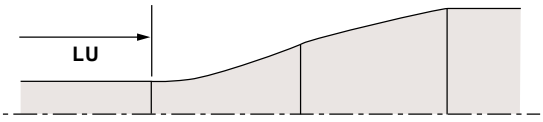
DC	Tolerance
ALL	0.000 ~ -0.012



(mm)

	Designation	DC	DCON-MS	APMX	LU	LF	DN	CA	RE	Effective length by inclination angle				
										0.5°	1°	1.5°	2°	3°
ESLNB	2030-20	3	6	4	20	65	2.88	3.4	1.5	22.1	22.9	23.5	24	26.4
	2030-25	3	6	4	25	70	2.88	2.8	1.5	27.3	28.2	28.8	29.9	-
	2030-30	3	6	4	30	75	2.88	2.5	1.5	32.5	33.4	34.3	35.9	-
	2030-35	3	6	4	35	80	2.88	2.2	1.5	37.7	38.7	40	41.9	-
	2040-10	4	6	5	10	55	3.9	4.5	2	11.6	12.1	12.5	12.9	13.5
	2040-13	4	6	5	13	60	3.9	3.6	2	14.7	15.3	15.8	16.2	17
	2040-16	4	6	5	16	60	3.9	3.1	2	17.9	18.5	19.1	19.5	20.9
	2040-20	4	6	5	20	65	3.9	2.5	2	22.1	22.8	23.4	23.9	-
	2040-25	4	6	5	25	70	3.9	2.1	2	27.3	28.1	28.8	29.8	-
	2040-30	4	6	5	30	75	3.9	1.8	2	32.4	33.4	34.2	-	-
	2040-35	4	6	5	35	80	3.9	1.6	2	37.6	38.6	39.9	-	-
	2040-40	4	6	5	40	80	3.9	1.4	2	42.8	43.8	-	-	-
	2040-45	4	6	5	45	90	3.9	1.2	2	47.9	49.1	-	-	-
	2040-50	4	6	5	50	100	3.9	1.1	2	53.1	54.5	-	-	-
	2050-20	5	6	6	20	65	4.9	1.4	2.5	22	22.8	-	-	-
	2050-25	5	6	6	25	70	4.9	1.2	2.5	27.2	28.1	-	-	-
	2050-30	5	6	6	30	75	4.9	1	2.5	32.4	-	-	-	-
	2050-35	5	6	6	35	80	4.9	0.8	2.5	42.8	-	-	-	-
	2050-40	5	6	6	40	90	4.9	0.7	2.5	42.8	-	-	-	-

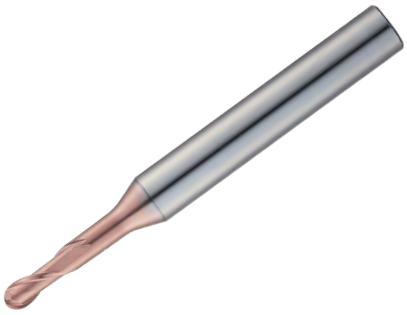




※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required.

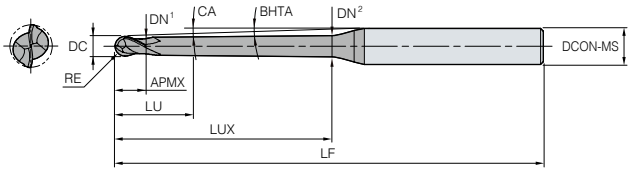
ESTNB20

2 flutes tapered neck type ball



CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.2 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø10	0.000 ~ -0.015



(mm)

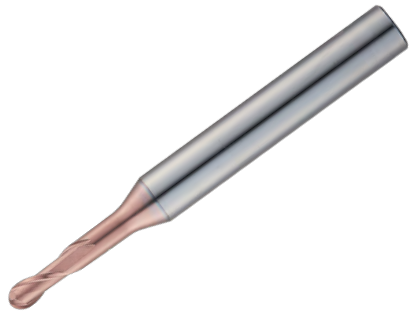
	Designation	DC	DCON-MS	APMX	LU	LUX	LF	DN1	DN2	RE	BHTA(°)	CA	Effective length by inclination angle				
													0.5°	1°	1.5°	2°	3°
ESTNB	2002-1-04	0.2	4	0.15	1.35	1	50	0.17	0.18	0.1	0.4	10.9	1.5	1.7	1.8	2	2.3
	2002-1.5-04	0.2	4	0.15	1.77	1.5	50	0.17	0.19	0.1	0.4	10.4	2	2.2	2.4	2.6	2.9
	2002-2-09	0.2	4	0.15	1.1	2	50	0.17	0.23	0.1	0.9	10.1	-	2.8	3.1	3.4	3.9
	2002-2.5-09	0.2	4	0.15	1.1	2.5	50	0.17	0.24	0.1	0.9	9.6	-	3.3	3.7	4	4.5
	2003-2-04	0.3	4	0.25	2.19	2	50	0.28	0.29	0.15	0.4	10	2.5	2.8	3	3.2	3.5
	2003-3-09	0.3	4	0.25	1.2	3	50	0.28	0.36	0.15	0.9	9.3	-	3.8	4.2	4.5	5.1
	2003-4-09	0.3	4	0.25	1.2	4	50	0.28	0.39	0.15	0.9	8.6	-	4.8	5.3	5.7	6.3
	2004-2-04	0.4	4	0.3	2.2	2	50	0.37	0.39	0.2	0.4	10	2.5	2.8	3	3.2	3.5
	2004-3-04	0.4	4	0.3	2.44	3	50	0.37	0.41	0.2	0.4	9.1	3.6	3.9	4.1	4.4	4.8
	2004-4-04	0.4	4	0.3	2.44	4	50	0.37	0.42	0.2	0.4	8.4	4.7	5.2	5.6	5.9	6.5
	2004-4-09	0.4	4	0.3	1.25	4	50	0.37	0.49	0.2	0.9	8.5	-	4.8	5.3	5.7	6.3
	2004-5-04	0.4	4	0.3	2.44	5	50	0.37	0.44	0.2	0.4	7.8	5.7	6.3	6.7	7.1	7.7
	2004-5-09	0.4	4	0.3	1.25	5	50	0.37	0.52	0.2	0.9	7.9	-	5.9	6.4	6.8	7.5
	2005-4-04	0.5	4	0.35	2.49	4	50	0.47	0.52	0.25	0.4	8.4	4.6	5	5.3	5.5	5.9
	2005-8-09	0.5	4	0.35	1.3	8	50	0.47	0.71	0.25	0.9	6.5	-	8.9	9.6	10.1	10.9
	2005-12-09	0.5	4	0.35	1.3	12	50	0.47	0.84	0.25	0.9	5.3	-	13	13.9	14.5	15.4
	20054-2-04	0.54	4	0.37	1.8	2	50	0.52	0.54	0.27	0.4	10	2.3	2.5	2.7	2.8	3
	20054-4-04	0.54	4	0.37	1.8	4	50	0.52	0.57	0.27	0.4	8.4	4.5	4.9	5.2	5.5	5.9
	20054-5-04	0.54	4	0.37	1.8	5	50	0.52	0.59	0.27	0.4	7.8	5.5	6	6.3	6.6	7.1
	20054-6-04	0.54	4	0.37	1.8	6	50	0.52	0.6	0.27	0.4	7.2	6.7	7.3	7.8	8.2	8.8
	20054-6.5-04	0.54	4	0.37	1.8	6.5	50	0.52	0.61	0.27	0.4	7	7.2	7.9	8.3	8.7	9.4
	20054-7-04	0.54	4	0.37	1.8	7	50	0.52	0.61	0.27	0.4	6.8	7.7	8.4	8.9	9.3	10
	2006-2-04	0.6	4	0.4	2.17	2	50	0.57	0.59	0.3	0.4	10	2.4	2.5	2.7	2.8	3
	2006-4-04	0.6	4	0.4	2.54	4	50	0.57	0.62	0.3	0.4	8.4	4.6	5	5.2	5.5	5.9
	2006-6-04	0.6	4	0.4	2.54	6	50	0.57	0.65	0.3	0.4	7.2	6.8	7.4	7.8	8.2	8.8
	2006-6-09	0.6	4	0.4	1.35	6	50	0.57	0.75	0.3	0.9	7.3	-	6.9	7.5	7.9	8.6
	2006-8-09	0.6	4	0.4	1.35	8	50	0.57	0.81	0.3	0.9	6.4	-	8.9	9.6	10.1	10.9
	2006-10-04	0.6	4	0.4	2.54	10	50	0.57	0.7	0.3	0.4	5.6	10.8	11.7	12.2	12.7	13.5
	2006-10-09	0.6	4	0.4	1.35	10	50	0.57	0.87	0.3	0.9	5.7	-	11	11.8	12.3	13.2
	2006-12-09	0.6	4	0.4	1.35	12	55	0.57	0.93	0.3	0.9	5.2	-	13	13.9	14.5	15.4
	2006-15-04	0.6	4	0.4	2.54	15	55	0.57	0.77	0.3	0.4	4.4	15.9	17	17.6	18.2	19.2
	2006-15-09	0.6	4	0.4	1.35	15	55	0.57	1.03	0.3	0.9	4.5	-	16.1	17.1	17.7	18.8
	2008-4-04	0.8	4	0.5	2.64	4	50	0.77	0.82	0.4	0.4	8.3	4.6	4.9	5.2	5.5	5.9
	2008-6-04	0.8	4	0.5	2.64	6	50	0.77	0.85	0.4	0.4	7.1	6.6	7.1	7.5	7.7	8.3
	2008-8-09	0.8	4	0.5	1.45	8	50	0.77	1.01	0.4	0.9	6.3	-	8.9	9.6	10.1	10.9
	2008-12-09	0.8	4	0.5	1.45	12	55	0.77	1.13	0.4	0.9	5	-	13	13.9	14.5	15.4

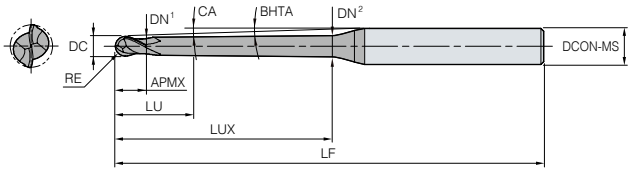
ESTNB20

2 flutes tapered neck type ball

CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.2 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø10	0.000 ~ -0.015





(mm)

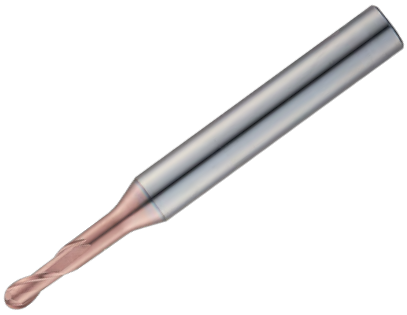
	Designation	DC	DCON-MS	APMX	LU	LUX	LF	DN1	DN2	RE	BHTA(°)	CA	Effective length by inclination angle				
													0.5°	1°	1.5°	2°	3°
ESTNB	2008-16-09	0.8	4	0.5	1.45	16	55	0.77	1.26	0.4	0.9	4.2	-	17.1	18.1	18.8	19.9
	2009-4-04	0.9	4	0.6	3.46	4	50	0.86	0.91	0.45	0.4	8.2	4.5	4.7	4.9	5.1	5.4
	2009-8-04	0.9	4	0.6	3.46	8	55	0.86	0.96	0.45	0.4	6.1	8.7	9.3	9.7	10	10.6
	2009-12-04	0.9	4	0.6	3.46	12	55	0.86	1.02	0.45	0.4	4.8	12.9	13.8	14.4	14.9	15.7
	2009-16-04	0.9	4	0.6	3.46	16	60	0.86	1.08	0.45	0.4	4	17	18	18.7	19.3	20.5
	2009-18-04	0.9	4	0.6	3.46	18	65	0.86	1.1	0.45	0.4	3.7	19.1	20.1	20.9	21.5	23.1
	2009-20-04	0.9	4	0.6	3.46	20	65	0.86	1.13	0.45	0.4	3.4	21.1	22.2	23	23.6	25.6
	2009-22-04	0.9	4	0.6	3.46	22	65	0.86	1.16	0.45	0.4	3.2	23.1	24.3	25.1	25.8	28.2
	2009-24-04	0.9	4	0.6	3.46	24	70	0.86	1.19	0.45	0.4	3	25.2	26.4	27.2	27.9	-
	2010-6-04	1	6	0.8	5.09	6	50	0.94	1.01	0.5	0.4	8.3	6.8	7.2	7.5	7.8	8.3
	2010-8-04	1	6	0.8	5.09	8	55	0.94	1.04	0.5	0.4	7.5	8.8	9.3	9.7	10	10.6
	2010-10-04	1	6	0.8	5.09	10	55	0.94	1.07	0.5	0.4	6.8	11	11.7	12.3	12.7	13.5
	2010-10-09	1	6	0.8	2.7	10	55	0.94	1.23	0.5	0.9	6.9	-	11.2	11.9	12.4	13.2
	2010-15-09	1	6	0.8	2.7	15	60	0.94	1.39	0.5	0.9	5.7	-	16.2	17.1	17.8	18.8
	2010-20-04	1	6	0.8	5.09	20	65	0.94	1.21	0.5	0.4	4.7	21.2	22.3	23	23.6	25.7
	2010-20-09	1	6	0.8	2.7	20	65	0.94	1.54	0.5	0.4	4.8	-	21.3	22.4	23.1	24.6
	2010-25-09	1	6	0.8	2.7	25	70	0.94	1.7	0.5	0.4	4.2	-	26.4	27.6	28.4	30.8
	2010-30-04	1	6	0.8	5.09	30	75	0.94	1.35	0.5	0.4	3.6	31.3	32.7	33.6	34.8	38.5
	2010-30-09	1	6	0.8	2.7	30	75	0.94	1.86	0.5	0.9	3.7	-	31.4	32.8	33.7	36.9
	2010-35-09	1	6	0.8	2.7	35	80	0.94	2.02	0.5	0.9	3.3	-	36.5	38	39	43.1
	2010-40-09	1	6	0.8	2.7	40	85	0.94	2.17	0.5	0.9	3	-	41.6	43.2	44.4	-
	2010-50-09	1	6	0.8	2.7	50	95	0.94	2.49	0.5	0.9	2.5	-	51.7	53.5	55.5	-
	2010-60-09	1	6	0.8	2.7	60	105	0.94	2.8	0.5	0.9	2.2	-	61.8	63.8	66.6	-
	2010-70-09	1	6	0.8	2.7	70	115	0.94	3.11	0.5	0.9	1.9	-	71.9	74	-	-
	2015-8-04	1.5	6	1.35	7.07	8	55	1.42	1.51	0.75	0.4	7.3	8.9	9.4	9.7	10	10.6
	2015-10-04	1.5	6	1.35	7.07	10	55	1.42	1.54	0.75	0.4	6.6	10.9	11.5	11.9	12.2	12.9
	2015-12-04	1.5	6	1.35	7.07	12	55	1.42	1.57	0.75	0.4	6	13	13.6	14	14.4	15.4
	2015-15-09	1.5	6	1.35	3.89	15	60	1.42	1.85	0.75	0.9	5.4	-	16.4	17.2	17.8	18.8
	2015-20-09	1.5	6	1.35	3.89	20	65	1.42	2.01	0.75	0.9	4.5	-	21.4	22.4	23.2	24.7
	2015-30-09	1.5	6	1.35	3.89	30	75	1.42	2.32	0.75	0.9	3.4	-	31.5	32.9	33.7	37
	2018-4-04	1.8	6	1.6	4.38	4	50	1.73	1.76	0.9	0.4	9.2	4.6	4.8	4.9	5.1	5.4
	2018-8-04	1.8	6	1.6	6.61	8	50	1.73	1.82	0.9	0.4	7.1	8.6	9	9.2	9.4	10.2
	2018-12-04	1.8	6	1.6	6.61	12	55	1.73	1.88	0.9	0.4	5.8	12.9	13.5	14	14.4	15.4
	2018-16-04	1.8	6	1.6	6.61	16	60	1.73	1.93	0.9	0.4	4.9	17	17.7	18.3	18.7	20.5
	2018-20-04	1.8	6	1.6	6.61	20	65	1.73	1.99	0.9	0.4	4.3	21.2	22.3	23	23.6	25.6
	2018-24-04	1.8	6	1.6	6.61	24	65	1.73	2.04	0.9	0.4	3.8	25.3	26.5	27.3	27.9	30.8

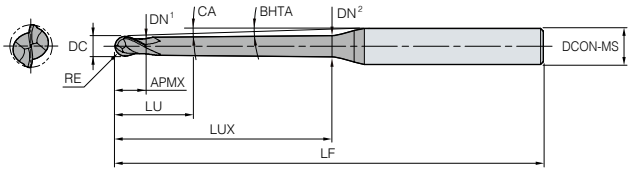
ESTNB20

2 flutes tapered neck type ball

CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.2 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø10	0.000 ~ -0.015



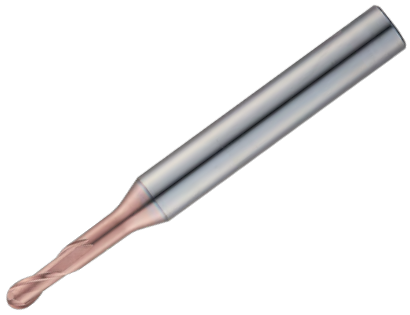


(mm)

	Designation	DC	DCON-MS	APMX	LU	LUX	LF	DN1	DN2	RE	BHTA(°)	CA	Effective length by inclination angle				
													0.5°	1°	1.5°	2°	3°
ESTNB	2018-28-04	1.8	6	1.6	6.61	28	70	1.73	2.1	0.9	0.4	3.4	29.4	30.6	31.5	32.4	35.9
	2018-32-04	1.8	6	1.6	6.61	32	70	1.73	2.15	0.9	0.4	3	33.4	34.8	35.7	37.1	-
	2018-36-04	1.8	6	1.6	6.61	36	75	1.73	2.21	0.9	0.4	2.8	37.5	38.9	39.9	41.7	-
	2018-38-04	1.8	6	1.6	6.61	38	80	1.73	2.24	0.9	0.4	2.7	39.5	41	42	44	-
	2018-40-04	1.8	6	1.6	6.61	40	80	1.73	2.27	0.9	0.4	2.6	41.5	43.1	44.2	46.3	-
	2020-8-04	2	6	1.7	7.42	8	50	1.92	2.01	1	0.4	7	8.7	9	9.2	9.5	10.2
	2020-12-04	2	6	1.7	7.42	12	55	1.92	2.06	1	0.4	5.7	13	13.6	14	14.4	15.4
	2020-16-04	2	6	1.7	7.42	16	60	1.92	2.12	1	0.4	4.8	17	17.7	18.3	18.7	20.5
	2020-20-04	2	6	1.7	7.42	20	65	1.92	2.18	1	0.4	4.1	21.3	22.3	23	23.6	25.6
	2020-20-09	2	6	1.7	4.24	20	65	1.92	2.5	1	0.9	4.2	-	21.4	22.4	23.2	24.6
	2020-25-09	2	6	1.7	4.24	25	65	1.92	2.65	1	0.9	3.6	-	26.5	27.7	28.5	30.8
	2020-30-04	2	6	1.7	7.42	30	70	1.92	2.32	1	0.4	3.1	31.4	32.7	33.6	34.8	38.5
	2020-30-09	2	6	1.7	4.24	30	70	1.92	2.81	1	0.9	3.2	-	31.6	32.9	33.7	36.9
	2020-35-09	2	6	1.7	4.24	35	75	1.92	2.97	1	0.9	2.8	-	36.6	38	39	-
	2020-40-04	2	6	1.7	7.42	40	80	1.92	2.46	1	0.4	2.5	41.5	43.1	44.2	46.3	-
	2020-40-09	2	6	1.7	4.24	40	80	1.92	3.12	1	0.9	2.6	-	41.7	43.2	44.5	-
	2020-50-09	2	6	1.7	4.24	50	90	1.92	3.44	1	0.9	2.1	-	51.5	53.5	55.5	-
	2020-60-09	2	6	1.7	4.24	60	100	1.92	3.75	1	0.9	1.8	-	61.9	63.8	-	-
	2020-70-09	2	6	1.7	4.24	70	110	1.92	4.07	1	0.9	1.8	-	72	74.1	-	-
	2030-8-04	3	6	2.5	8.5	8	50	2.86	2.94	1.5	0.4	6.3	8.8	9.1	9.3	9.5	10.3
	2030-16-04	3	6	2.5	12.52	16	55	2.86	3.05	1.5	0.4	4.1	17.2	17.8	18.3	18.7	20.6
	2030-20-04	3	6	2.5	12.52	20	60	2.86	3.1	1.5	0.4	3.4	21.2	22	22.6	23.3	25.7
	2030-30-04	3	6	2.5	12.52	30	70	2.86	3.24	1.5	0.4	2.5	31.6	32.8	33.7	34.9	-
	2030-30-09	3	6	2.5	6.95	30	70	2.86	3.72	1.5	0.9	2.6	-	31.8	33	33.8	-
	2030-40-04	3	6	2.5	12.52	40	80	2.86	3.38	1.5	0.4	2	41.7	43.2	44.3	-	-
	2030-40-09	3	6	2.5	6.95	40	80	2.86	4.04	1.5	0.9	2	-	41.9	43.3	-	-
	2030-50-09	3	6	2.5	6.95	50	90	2.86	4.35	1.5	0.9	1.7	-	52	53.6	-	-
	2030-60-09	3	6	2.5	6.95	60	100	2.86	4.67	1.5	0.9	1.4	-	62.1	-	-	-
	2030-70-09	3	6	2.5	6.95	70	110	2.86	4.98	1.5	0.9	1.2	-	72.1	-	-	-
	2040-20-10	4	8	8	12.01	20	70	3.86	4.28	2	1	5	20.5	21.6	22.3	22.8	23.5
	2040-30-10	4	8	8	12.01	30	80	3.86	4.63	2	1	3.51	22	31.6	32.5	33.2	34.16
	2040-40-10	4	8	8	12.01	40	90	3.86	4.98	2	1	2.7	22	42	43.4	44.3	-
	2040-50-10	4	8	8	12.01	50	100	3.86	5.33	2	1	2.2	22	52	53.6	54.7	-
	2040-60-10	4	8	8	12.01	60	110	3.86	5.68	2	1	1.9	22	62	63.8	-	-
	2050-30-10	5	8	10	14.01	30	80	4.86	5.56	2.5	1	2.8	25.5	31.7	32.6	33.2	-
	2050-40-10	5	8	10	14.01	40	90	4.86	5.91	2.5	1	2.1	25.5	41.7	42.8	43.5	-

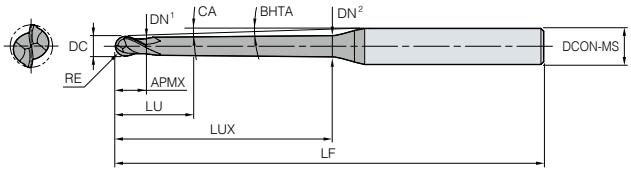
ESTNB20

2 flutes tapered neck type ball



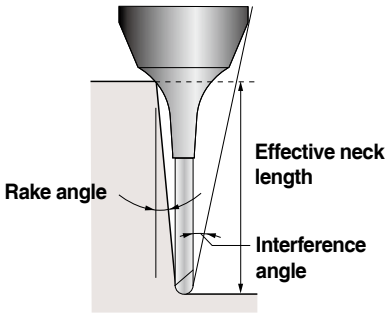
CARBIDE | 2 | H·A 30° | Grade PC305H | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

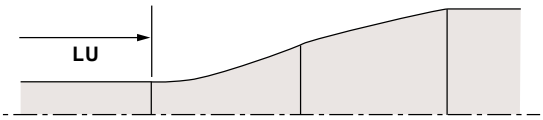
DC	Tolerance
Ø0.2 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø10	0.000 ~ -0.015



(mm)

	Designation	DC	DCON-MS	APMX	LU	LUX	LF	DN1	DN2	RE	BHTA(°)	CA	Effective length by inclination angle				
													0.5°	1°	1.5°	2°	3°
ESTNB	2050-60-10	5	8	10	14.01	60	110	4.86	6.61	2.5	1	1.5	25.5	62.1	-	-	-
	2060-30-10	6	8	12	16.01	30	80	5.86	6.49	3	1	1.9	29	31.8	32.6	-	-
	2060-40-10	6	8	12	16.01	40	90	5.86	6.84	3	1	1.5	29	41.8	-	-	-
	2060-50-10	6	8	12	16.01	50	100	5.86	7.19	3	1	1.2	29	51.8	-	-	-
	2060-60-10	6	10	12	16.01	60	110	5.86	7.54	3	1	1.9	29	62.2	63.9	-	-
	2060-70-10	6	10	12	16.01	70	120	5.86	7.89	3	1	1.7	29	72.2	74.1	-	-
	2060-80-10	6	10	12	16.01	80	130	5.86	8.23	3	1	1.5	29	82.2	-	-	-
	2080-50-10	8	10	14	18.01	50	110	7.86	9.12	4	1	1.2	32	51.9	-	-	-
	2080-60-10	8	10	14	18.01	60	120	7.86	9.47	4	1	1	32	-	-	-	-
	2080-70-10	8	10	14	18.01	70	130	7.86	9.82	4	1	0.9	32	-	-	-	-
	2080-80-10	8	12	14	18.01	80	140	7.86	10.16	4	1	1.5	32	82.3	-	-	-
	2100-60-10	10	12	18	22.01	60	130	9.86	11.33	5	1	1.1	39	62.1	-	-	-
	2100-75-10	10	12	18	22.01	75	140	9.86	11.85	5	1	0.9	39	-	-	-	-





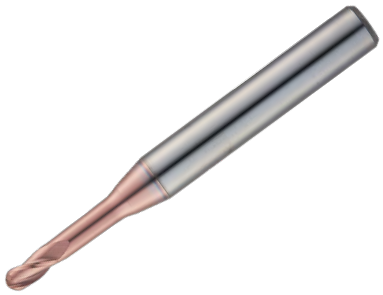
※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required.

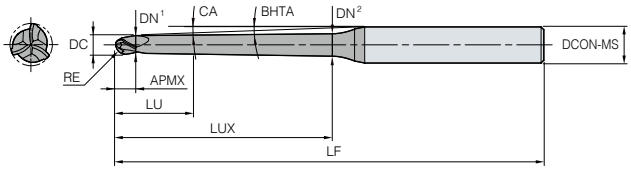
ESTNB30

3 flutes tapered neck type ball

CARBIDE | 3 | H·A 30° | Grade PC305H | h5 shank | RE ±0.005

DC	Tolerance
ALL	0.000 ~ -0.015





(mm)

	Designation	DC	DCON-MS	APMX	LU	LUX	LF	DN1	DN2	RE	BHTA(°)	CA	Effective length by inclination angle				
													0.5°	1°	1.5°	2°	3°
ESTNB	3020-8-04	2	6	1.7	7.42	8	50	1.92	2.01	1	0.4	7	8.7	9	9.2	9.5	10.2
	3020-12-04	2	6	1.7	7.42	12	55	1.92	2.06	1	0.4	5.7	13	13.6	14	14.4	15.4
	3020-16-04	2	6	1.7	7.42	16	60	1.92	2.12	1	0.4	4.8	17	17.7	18.3	18.7	20.5
	3020-20-04	2	6	1.7	7.42	20	65	1.92	2.18	1	0.4	4.1	21.3	22.3	23	23.6	25.6
	3020-20-09	2	6	1.7	4.24	20	65	1.92	2.5	1	0.9	4.2	-	21.4	22.4	23.2	24.6
	3020-25-09	2	6	1.7	4.24	25	65	1.92	2.65	1	0.9	3.6	-	26.5	27.7	28.5	30.8
	3020-30-04	2	6	1.7	7.42	30	70	1.92	2.32	1	0.4	3.1	31.4	32.7	33.6	34.8	38.5
	3020-30-09	2	6	1.7	4.24	30	70	1.92	2.81	1	0.9	3.2	-	31.6	32.9	33.7	36.9
	3020-35-09	2	6	1.7	4.24	35	75	1.92	2.97	1	0.9	2.8	-	36.6	38	39	-
	3020-40-04	2	6	1.7	7.42	40	80	1.92	2.46	1	0.4	2.5	41.5	43.1	44.2	46.3	-
	3020-40-09	2	6	1.7	4.24	40	80	1.92	3.12	1	0.9	2.6	-	41.7	43.2	44.5	-
	3020-50-09	2	6	1.7	4.24	50	90	1.92	3.44	1	0.9	2.1	-	51.8	53.5	55.5	-
	3020-60-09	2	6	1.7	4.24	60	100	1.92	3.75	1	0.9	1.8	-	61.9	63.8	-	-
	3020-70-09	2	6	1.7	4.24	70	110	1.92	4.07	1	0.9	1.6	-	72	74.1	-	-
	3030-8-04	3	6	2.5	8.5	8	50	2.86	2.94	1.5	0.4	6.3	8.8	9.1	9.3	9.5	10.3
	3030-16-04	3	6	2.5	12.52	16	55	2.86	3.05	1.5	0.4	4.1	17.2	17.8	18.3	18.7	20.6
	3030-20-04	3	6	2.5	12.52	20	60	2.86	3.1	1.5	0.4	3.4	21.2	22	22.6	23.3	25.7
	3030-30-04	3	6	2.5	12.52	30	70	2.86	3.24	1.5	0.4	2.5	31.6	32.8	33.7	34.9	-
	3030-30-09	3	6	2.5	6.95	30	70	2.86	3.72	1.5	0.9	2.6	-	31.8	33	33.8	-
	3030-40-04	3	6	2.5	12.52	40	80	2.86	3.38	1.5	0.4	2	41.7	43.2	44.3	-	-
	3030-40-09	3	6	2.5	6.95	40	80	2.86	4.04	1.5	0.9	2	-	41.9	43.3	-	-
	3030-50-09	3	6	2.5	6.95	50	90	2.86	4.35	1.5	0.9	1.7	-	52	53.6	-	-
	3030-60-09	3	6	2.5	6.95	60	100	2.86	4.67	1.5	0.9	1.4	-	62.1	-	-	-
	3030-70-09	3	6	2.5	6.95	70	110	2.86	4.98	1.5	0.9	1.2	-	72.1	-	-	-
	3040-20-10	4	8	8	12.01	20	70	3.86	4.28	2	1	5	20.5	21.6	22.3	22.8	23.5
	3040-30-10	4	8	8	12.01	30	80	3.86	4.63	2	1	3.6	22	31.6	32.5	33.2	34.1
	3040-40-10	4	8	8	12.01	40	90	3.86	4.98	2	1	2.7	22	42	43.4	44.3	-
	3040-50-10	4	8	8	12.01	50	100	3.86	5.33	2	1	2.2	22	52	53.6	54.7	-
	3040-60-10	4	8	8	12.01	60	110	3.86	5.68	2	1	1.9	22	62	63.8	-	-
	3050-30-10	5	8	10	14.01	30	80	4.86	5.56	2.5	1	2.8	25.5	31.7	32.6	33.2	-
	3050-40-10	5	8	10	14.01	40	90	4.86	5.91	2.5	1	2.1	25.5	41.7	42.8	43.5	-
	3050-60-10	5	8	10	12.52	60	110	4.86	6.61	2.5	1	1.5	25.5	62.1	-	-	-

For medium hardness steel(HRC30~50)

U-Star Endmill

- Enhanced cutting edge strength of ball Endmill applying ultra-fine substrate (PC303W)
- Higher chipping resistance of flat Endmill applying high toughness substrate (PC315W)
- Various shaped line-ups for complicated mold machining
- Suitable for precision cutting with high precision Range of h5 shank, flute and radius

Code system

U	R	51	2	010	10	50	100	S3

U-Star Endmill

Type
- B: Ball
- SB: Staright ball
- E: Flat
- R: Radius
- SPM: High feed
- XE: Heavy cut flat
- XR: Multi helix radius
- TE: Taper flat
- TR: Taper radius
- TB: Taper ball
- DR: Double radius
- F: Roughing
- LE: Flat (lathe)

Length, Shank type
- 50: Straight
- 51: Neck
- 52: Long shank
- 53: Lollipop
- 54: Taper neck

No. of flute
- 2: 2 flutes
- 3: 3 flutes
- 4: 4 flutes
- 5: 5 flutes
- 6: 6 flutes

Tool diameter
- 10: Ø1mm
- 60: Ø6mm
- 250: Ø25mm

Corner R
- 5: 0.05mm
- 10: 0.1mm
- 20: 0.2mm

Effective length
- 5: 0.5mm
- 10: 10mm
- 50: 50mm

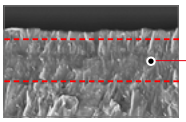
Overall length
- 50: 50mm
- 100: 100mm
- 150: 150mm

Shank diameter
- S3: Ø3mm
- S6: Ø6mm
- S20: Ø20mm

Features

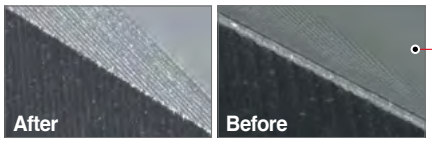
• Grade PC315W •

• AlCrN base new coating

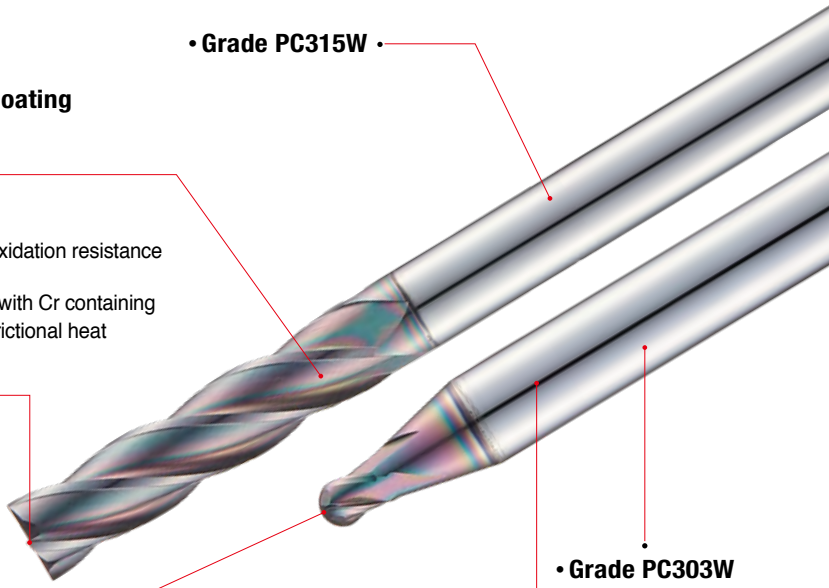


- Increased wear and oxidation resistance due to multi layer
- Enhanced lubrication with Cr containing
- Stable cutting under frictional heat

• Edge treatment

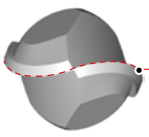


- Enhanced chipping resistance in the beginning of cutting
- Guiding stable cutting for managing the properties of mold machining



• Grade PC303W

• Applying S-curved gash shape

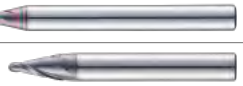


- Increased cutting performance and wear resistance due to dispersing cutting force

• Applying substrate for medium hardness steel cutting

- Separating the substrate (PC303W and PC315W)maximizes the features of tool and ensures general use

Line-up

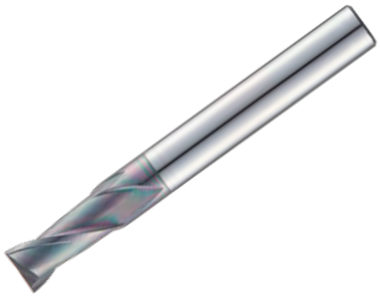
Designation	Picture	Product name	Range	Irregular flute spacing	Page
UE502		2 flutes flat Endmill	Ø0.1 ~ 25		B94 ~ B95
UE512		2 flutes long neck flat Endmill	Ø0.1 ~ 12.		B96 ~ B98
UE522		2 flutes flat Endmill	Ø1 ~ 25		B99 ~ B100
UXE502		2 flutes flat for heavy cuts	Ø0.1 ~ 20		B101 ~ 102
UE504H		4 flutes 45° helix flat Endmill	Ø1 ~ 20		B103
UE514		4 flutes long neck flat Endmill	Ø1 ~ 12		B104 ~ B105
UE524		4 flutes flat Endmill	Ø1 ~ 25		B106 ~ B107
ULE504		4 flutes automatic cnc flat Endmill	Ø3 ~ 16		B108
UE504		4 flutes flat Endmill	Ø0.8 ~ 25	●	B109
UXE504		4 flutes flat for heavy cuts	Ø1 ~ 20	●	B110
UE506		6 flutes flat Endmill	Ø6 ~ 25		B111
UTE502		2 flutes tapered flat Endmill	Ø0.3 ~ 10		B112 ~ B113
UTE504		4 flutes tapered flat Endmill	Ø0.8 ~ 10		B114 ~ B116
UR502		2 flutes radius Endmill	Ø0.2 ~ 20		B117 ~ B119
UR512		2 flutes neck type radius Endmill	Ø0.2 ~ 20		B120 ~ B125
UR542		2 flutes tapered neck radius Endmill	Ø0.2 ~ 4		B126 ~ B131
UR504		4 flutes radius Endmill	Ø3 ~ 20	●	B132
UR544		4 flutes tapered neck radius Endmill	Ø1 ~ 4		B133 ~ B136
UXR504		4 flutes multi helix radius Endmill	Ø1 ~ 20	●	B137 ~ B139
UXR514		4 flutes multi helix neck radius Endmill	Ø1 ~ 20	●	B140 ~ B144
UR506		6 flutes radius Endmill	Ø6 ~ 20		B145
UDR503		3 flutes double radius Endmill	Ø6 ~ 20		B146
USPM4		4 flutes radius for high speed machining	Ø1 ~ 20		B147
UTR504		4 flutes tapered radius Endmill	Ø0.8 ~ 2.5		B148 ~ B151
UB502		2 flutes ball Endmill	Ø0.1 ~ 25		B152 ~ B153
UB502P		2 flutes high precision ball Endmill	Ø0.1 ~ 12		B154
UB512		2 flutes long neck ball Endmill	Ø0.1 ~ 12		B155 ~ B158
UB512S6		2 flutes long neck ball Endmill (shank 6)	Ø0.5 ~ 2		B159
UB532		2 flutes lollipop style ball Endmill	Ø3 ~ 12		B160
UB542		2 flutes tapered neck ball Endmill	Ø0.1 ~ 12		B161 ~ B167
USB502		2 flutes straight ball Endmill	Ø3 ~ 20		B168
UB503		3 flutes ball Endmill	Ø1 ~ 12		B169
UB504		4 flutes ball Endmill	Ø1 ~ 12		B169
UTB502		2 flutes tapered ball Endmill	Ø0.3 ~ 2		B170 ~ B171
UF50		3~5 flutes chamfer pitch roughing Endmill	Ø3 ~ 25		B172
UF51		3~5 flutes fine pitch roughing Endmill	Ø3 ~ 25		B173
UF51H		3~5 flutes 45° helix fine pitch roughing Endmill	Ø3 ~ 25		B174

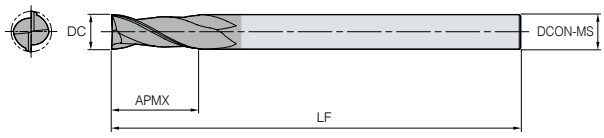
UE502

2 flutes flat

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø6.5 ~ Ø25	0.000 ~ -0.015





(mm)

Designation		DC	DCON-MS	APMX	LF
UE	502001S3	0.1	3	0.2	40
	502001	0.1	4	0.2	40
	5020015	0.15	4	0.3	40
	502002S3	0.2	3	0.4	40
	502002	0.2	4	0.4	40
	5020025	0.25	4	0.5	40
	502003S3	0.3	3	0.6	40
	502003	0.3	4	0.6	40
	5020035	0.35	4	0.7	40
	502004S3	0.4	3	0.8	40
	502004	0.4	4	0.8	40
	5020045	0.45	4	0.9	40
	502005S3	0.5	3	1	40
	502005	0.5	4	1	40
	5020055	0.55	4	1.1	40
	502006S3	0.6	3	1.2	40
	502006	0.6	4	1.2	40
	5020065	0.65	4	1.3	40
	502007S3	0.7	3	1.4	40
	502007	0.7	4	1.4	40
	5020075	0.75	4	1.5	40
	502008S3	0.8	3	1.6	40
	502008	0.8	4	1.6	40
	5020085	0.85	4	1.7	40
	502009S3	0.9	3	1.8	40
	502009	0.9	4	1.8	40
	5020095	0.95	4	2	40
	502010S3	1	3	2.5	50
	502010S4	1	4	2.5	50
	502010	1	6	2.5	50
	502011S4	1.1	4	3	50
	502012S3	1.2	3	3	50
	502012S4	1.2	4	3	50
	502012	1.2	6	3	50
	502013S4	1.3	4	3	50
	502014S4	1.4	4	4	50

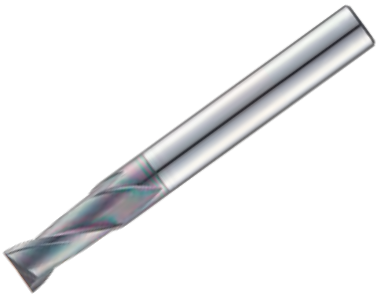
Designation		DC	DCON-MS	APMX	LF
UE	502015S3	1.5	3	4	50
	502015S4	1.5	4	4	50
	502015	1.5	6	4	50
	502016S4	1.6	4	4	50
	502017S4	1.7	4	4	50
	502018S4	1.8	4	5	50
	502019S4	1.9	4	5	50
	502020S3	2	3	6	50
	502020S4	2	4	6	50
	502020	2	6	6	50
	502021S4	2.1	4	6	50
	502022S4	2.2	4	6	50
	502023S4	2.3	4	6	50
	502024S4	2.4	4	6	50
	502025S3	2.5	3	7	50
	502025	2.5	6	7	50
	502025S4	2.5	4	8	50
	502026S4	2.6	4	8	50
	502027S4	2.7	4	8	50
	502028S4	2.8	4	8	50
	502029S4	2.9	4	8	50
	502030S3	3	3	8	50
	502030S4	3	4	8	50
	502030	3	6	8	50
	502035S4	3.5	4	10	50
	502035	3.5	6	10	50
	502040080S4	4	4	10	80
	502040S4	4	4	10	50
	502040	4	6	10	50
	502045	4.5	6	14	50
	502050	5	6	15	60
	502055	5.5	6	15	60
	502060	6	6	15	60
	502065	6.5	8	18	60
	502070	7	8	20	60
	502075	7.5	8	20	60

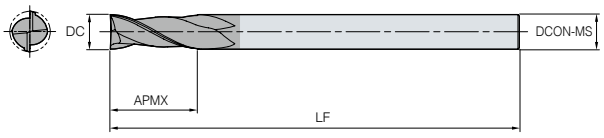
UE502

2 flutes flat

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø6.5 ~ Ø25	0.000 ~ -0.015





(mm)

Designation		DC	DCON-MS	APMX	LF
UE	502080	8	8	20	70
	502085	8.5	10	22	70
	502090	9	10	22	70
	502095	9.5	10	24	70
	502100	10	10	25	75
	502105	10.5	12	26	75
	502110	11	12	30	75
	502115	11.5	12	30	80
	502120	12	12	30	80
	502130	13	12	35	100
	502140S16	14	16	35	100
	502140	14	14	35	100
	502140S12	14	12	35	100

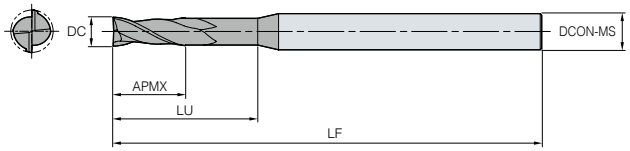
Designation		DC	DCON-MS	APMX	LF
UE	502150	15	16	38	100
	502160	16	16	40	100
	502170	17	16	42	100
	502180	18	18	45	100
	502180S16	18	16	45	100
	502190	19	20	45	100
	502200	20	20	45	100
	502210	21	20	45	100
	502220	22	20	45	100
	502230	23	25	50	120
	502240	24	25	50	120
	502250	25	25	50	120

UE512

2 flutes long neck flat

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LF
UE	512001003	0.1	4	0.15	0.3	40
	512001005	0.1	4	0.15	0.5	40
	51200101	0.1	4	0.15	1	40
	512002005	0.2	4	0.3	0.5	40
	51200201	0.2	4	0.3	1	40
	512002015	0.2	4	0.3	1.5	40
	51200202	0.2	4	0.3	2	40
	51200301	0.3	4	0.5	1	40
	512003015	0.3	4	0.5	1.5	40
	51200302	0.3	4	0.5	2	40
	512003025	0.3	4	0.5	2.5	40
	51200303	0.3	4	0.5	3	40
	51200304	0.3	4	0.5	4	40
	51200305	0.3	4	0.5	5	40
	51200401	0.4	4	0.6	1	40
	512004015	0.4	4	0.6	1.5	40
	51200402	0.4	4	0.6	2	40
	512004025	0.4	4	0.6	2.5	40
	51200403	0.4	4	0.6	3	40
	51200404	0.4	4	0.6	4	40
	51200405	0.4	4	0.6	5	40
	51200406	0.4	4	0.6	6	40
	51200408	0.4	4	0.6	8	40
	51200410	0.4	4	0.6	10	40
	51200501	0.5	4	0.7	1	45
	512005015	0.5	4	0.7	1.5	45
	51200502	0.5	4	0.7	2	45
	512005025	0.5	4	0.7	2.5	45
	51200503	0.5	4	0.7	3	45
	51200504	0.5	4	0.7	4	45
	51200505	0.5	4	0.7	5	45
	51200506	0.5	4	0.7	6	45
	51200508	0.5	4	0.7	8	45
	51200510	0.5	4	0.7	10	45
	51200512	0.5	4	0.7	12	45
	51200514	0.5	4	0.7	14	45
	51200516	0.5	4	0.7	16	45

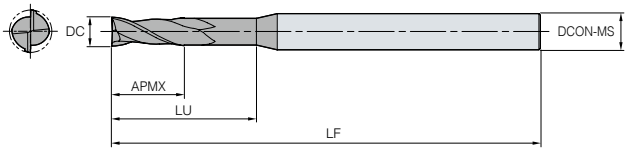
Designation		DC	DCON-MS	APMX	LU	LF
UE	51200602	0.6	4	0.9	2	45
	51200603	0.6	4	0.9	3	45
	51200604	0.6	4	0.9	4	45
	51200605	0.6	4	0.9	5	45
	51200606	0.6	4	0.9	6	45
	51200608	0.6	4	0.9	8	45
	51200610	0.6	4	0.9	10	45
	51200612	0.6	4	0.9	12	45
	51200614	0.6	4	0.9	14	45
	51200616	0.6	4	0.9	16	45
	51200702	0.7	4	1.2	2	45
	51200704	0.7	4	1.2	4	45
	51200706	0.7	4	1.2	6	45
	51200708	0.7	4	1.2	8	45
	51200710	0.7	4	1.2	10	45
	51200712	0.7	4	1.2	12	45
	51200802	0.8	4	1.2	2	45
	51200803	0.8	4	1.2	3	45
	51200804	0.8	4	1.2	4	45
	51200805	0.8	4	1.2	5	45
	51200806	0.8	4	1.2	6	45
	51200808	0.8	4	1.2	8	45
	51200810	0.8	4	1.2	10	45
	51200812	0.8	4	1.2	12	45
	51200814	0.8	4	1.2	14	45
	51200816	0.8	4	1.2	16	45
	51200820	0.8	4	1.2	20	45
	51200906	0.9	4	1.3	6	45
	51200908	0.9	4	1.3	8	45
	51200910	0.9	4	1.3	10	45
	51201002	1	4	1.5	2	50
	51201003	1	4	1.5	3	50
	51201004	1	4	1.5	4	50
	51201005	1	4	1.5	5	50
	51201006	1	4	1.5	6	50
	51201007	1	4	1.5	7	50
	51201008	1	4	1.5	8	50

UE512

2 flutes long neck flat

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LF
UE	51201010	1	4	1.5	10	50
	51201012	1	4	1.5	12	50
	51201014	1	4	1.5	14	50
	51201016	1	4	1.5	16	50
	51201018	1	4	1.5	18	50
	51201020	1	4	1.5	20	50
	51201022	1	4	1.5	22	60
	51201026	1	4	1.5	26	60
	51201030	1	4	1.5	30	70
	51201040	1	4	1.5	40	80
	51201050	1	4	1.5	50	100
	51201204	1.2	4	1.8	4	50
	51201206	1.2	4	1.8	6	50
	51201208	1.2	4	1.8	8	50
	51201210	1.2	4	1.8	10	50
	51201212	1.2	4	1.8	12	50
	51201214	1.2	4	1.8	14	50
	51201216	1.2	4	1.8	16	50
	51201220	1.2	4	1.8	20	50
	51201226	1.2	4	1.8	26	60
	51201230	1.2	4	1.8	30	70
	51201406	1.4	4	2.1	6	50
	51201408	1.4	4	2.1	8	50
	51201410	1.4	4	2.1	10	50
	51201414	1.4	4	2.1	14	50
	51201416	1.4	4	2.1	16	50
	51201420	1.4	4	2.1	20	50
	51201504	1.5	4	2.3	4	50
	51201505	1.5	4	2.3	5	50
	51201506	1.5	4	2.3	6	50
	51201507	1.5	4	2.3	7	50
	51201508	1.5	4	2.3	8	50
	51201510	1.5	4	2.3	10	50
	51201512	1.5	4	2.3	12	50
	51201514	1.5	4	2.3	14	50
	51201516	1.5	4	2.3	16	50
	51201518	1.5	4	2.3	18	50

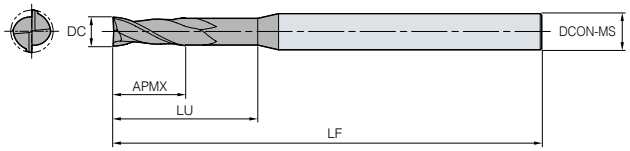
Designation		DC	DCON-MS	APMX	LU	LF
UE	51201520	1.5	4	2.3	20	50
	51201522	1.5	4	2.3	22	60
	51201526	1.5	4	2.3	26	60
	51201530	1.5	4	2.3	30	70
	51201608	1.6	4	2.3	8	50
	51201610	1.6	4	2.3	10	50
	51201612	1.6	4	2.3	12	50
	51201616	1.6	4	2.3	16	50
	51201620	1.6	4	2.3	20	50
	51201808	1.8	4	2.7	8	50
	51201810	1.8	4	2.7	10	50
	51201812	1.8	4	2.7	12	50
	51201816	1.8	4	2.7	16	50
	51201820	1.8	4	2.7	20	50
	51202006	2	4	3	6	50
	51202008	2	4	3	8	50
	51202010	2	4	3	10	50
	51202012	2	4	3	12	50
	51202014	2	4	3	14	50
	51202016	2	4	3	16	50
	51202018	2	4	3	18	50
	51202020	2	4	3	20	50
	51202022	2	4	3	22	60
	51202026	2	4	3	26	60
	51202030	2	4	3	30	70
	51202035	2	4	3	35	70
	51202040	2	4	3	40	80
	51202045	2	4	3	45	90
	51202050	2	4	3	50	100
	51202060	2	4	3	60	110
	51202508	2.5	4	4	8	50
	51202510	2.5	4	4	10	50
	51202512	2.5	4	4	12	50
	51202514	2.5	4	4	14	50
	51202516	2.5	4	4	16	50
	51202518	2.5	4	4	18	50
	51202520	2.5	4	4	20	50

UE512

2 flutes long neck flat

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LF
UE	51202522	2.5	4	4	22	60
	51202526	2.5	4	4	26	60
	51202530	2.5	4	4	30	70
	51202535	2.5	4	4	35	70
	51202540	2.5	4	4	40	80
	51202545	2.5	4	4	45	90
	51202550	2.5	4	4	50	100
	51203006	3	6	4.5	6	50
	51203008	3	6	4.5	8	50
	51203010	3	6	4.5	10	50
	51203012	3	6	4.5	12	50
	51203014	3	6	4.5	14	60
	51203016	3	6	4.5	16	60
	51203018	3	6	4.5	18	60
	51203020	3	6	4.5	20	60
	51203022	3	6	4.5	22	65
	51203026	3	6	4.5	26	65
	51203030	3	6	4.5	30	70
	51203035	3	6	4.5	35	70
	51203040	3	6	4.5	40	80
	51203045	3	6	4.5	45	90
	51203050	3	6	4.5	50	100
	51203060	3	6	4.5	60	100
	51204008	4	6	6	8	50
	51204010	4	6	6	10	50
	51204012	4	6	6	12	50
	51204014	4	6	6	14	60
	51204016	4	6	6	16	60
	51204018	4	6	6	18	60
	51204020	4	6	6	20	60

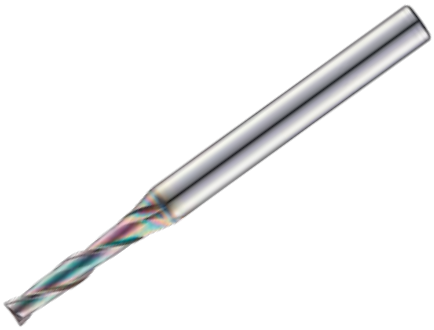
Designation		DC	DCON-MS	APMX	LU	LF
UE	51204022	4	6	6	22	65
	51204026	4	6	6	26	65
	51204030	4	6	6	30	70
	51204035	4	6	6	35	70
	51204040	4	6	6	40	80
	51204045	4	6	6	45	90
	51204050	4	6	6	50	100
	51204060	4	6	6	60	100
	51205016	5	6	8	16	60
	51205020	5	6	8	20	60
	51205026	5	6	8	26	65
	51205030	5	6	8	30	70
	51205035	5	6	8	35	75
	51205040	5	6	8	40	80
	51205050	5	6	8	50	90
	51205060	5	6	8	60	100
	51206015	6	6	9	15	60
	51206020	6	6	9	20	60
	51206030	6	6	9	30	70
	51206032	6	6	9	32	90
	51208025	8	8	12	25	70
	51208030	8	8	12	30	80
	51208042	8	8	12	42	100
	51210030	10	10	15	30	75
	51210035	10	10	15	35	80
	51210045	10	10	15	45	100
	51212035	12	12	20	35	80
	51212040	12	12	20	40	90
	51212050	12	12	20	50	110

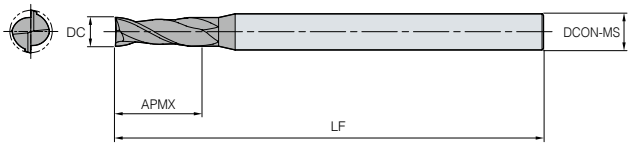
UE522

2 flutes flat

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.012
Ø6.5 ~ Ø25	0.000 ~ -0.015





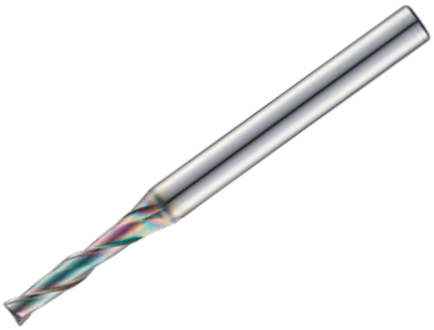
(mm)

Designation		DC	DCON-MS	APMX	LF
UE	52201003	1	6	3	60
	52201004	1	6	4	60
	52201005	1	6	5	60
	52201006	1	6	6	60
	52201007	1	6	7	60
	52201008	1	6	8	60
	52201010	1	6	10	60
	52201012	1	6	12	60
	52201204	1.2	6	4	60
	52201206	1.2	6	6	60
	52201208	1.2	6	8	60
	52201210	1.2	6	10	60
	52201212	1.2	6	12	60
	52201506	1.5	6	6	60
	52201508	1.5	6	8	60
	52201510	1.5	6	10	60
	52201512	1.5	6	12	60
	52201514	1.5	6	14	60
	52201516	1.5	6	16	60
	52202008	2	6	8	60
	52202010	2	6	10	60
	52202012	2	6	12	60
	52202014	2	6	14	60
	52202016	2	6	16	60
	52202510	2.5	6	10	60
	52202512	2.5	6	12	60
	52202516	2.5	6	16	60
	52202520	2.5	6	20	60
	52202526	2.5	6	26	60
	52203010	3	6	10	70
	52203012	3	6	12	70
	52203014	3	6	14	70
	52203016	3	6	16	70
	52203016S3	3	3	16	100
	52203020	3	6	20	70
	52203026	3	6	26	70
	52203030	3	6	30	70

Designation		DC	DCON-MS	APMX	LF
UE	52204012	4	6	12	70
	52204016	4	6	16	70
	52204020	4	6	20	70
	52204020S4	4	4	20	100
	52204026	4	6	26	70
	52204030	4	6	30	70
	52205015	5	6	15	70
	52205020	5	6	20	70
	52205025100	5	6	25	100
	52205025	5	6	25	70
	52205030	5	6	30	80
	52205035	5	6	35	90
	52205040	5	6	40	100
	52206015080	6	6	15	80
	52206015	6	6	15	60
	52206020090	6	6	20	90
	52206020	6	6	20	70
	52206025	6	6	25	75
	52206030150	6	6	30	150
	52206030100	6	6	30	100
	52206030	6	6	30	80
	52206035	6	6	35	90
	52206040120	6	6	40	120
	52206040	6	6	40	90
	52206045	6	6	45	150
	52207035	7	8	35	85
	52208020	8	8	20	100
	52208025	8	8	25	80
	52208030100	8	8	30	100
	52208030	8	8	30	80
	52208035	8	8	35	90
	52208040150	8	8	40	150
	52208040120	8	8	40	120
	52208040	8	8	40	90
	52208045	8	8	45	100
	52208050150	8	8	50	150
	52208050	8	8	50	100

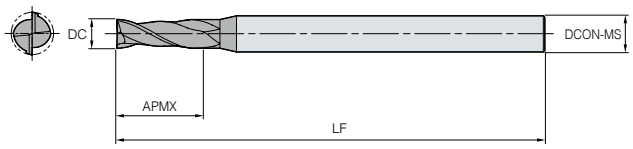
UE522

2 flutes flat



CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.012
Ø6.5 ~ Ø25	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LF
UE	52209045	9	10	45	100
	52210025	10	10	25	100
	52210030100	10	10	30	100
	52210030	10	10	30	80
	52210035	10	10	35	90
	52210040120	10	10	40	120
	52210040	10	10	40	90
	52210045	10	10	45	100
	52210050200	10	10	50	200
	52210050150	10	10	50	150
	52210050	10	10	50	100
	52210055	10	10	55	150
	52210060200	10	10	60	200
	52210060155	10	10	60	155
	52210060	10	10	60	110
	52211050	11	12	50	110
	52212035	12	12	35	90
	52212040120	12	12	40	120
	52212040	12	12	40	100
	52212045	12	12	45	130
	52212050150	12	12	50	150
	52212050	12	12	50	100
	52212055	12	12	55	110
	52212060200	12	12	60	200
	52212060150	12	12	60	150
	52212060	12	12	60	110
	52212065	12	12	65	150
	52212070200	12	12	70	200
	52212070	12	12	70	120
	52214040	14	16	40	110
	52214050	14	16	50	110
	52214060150	14	16	60	150

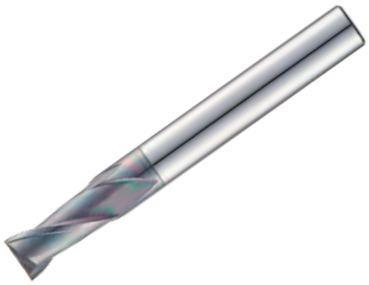
Designation		DC	DCON-MS	APMX	LF
UE	52214060	14	16	60	120
	52216040150	16	16	40	150
	52216040	16	16	40	120
	52216050150	16	16	50	150
	52216050	16	16	50	110
	52216060	16	16	60	120
	52216070200	16	16	70	200
	52216070150	16	16	70	150
	52216070	16	16	70	130
	52216080	16	16	80	150
	52216090	16	16	90	150
	522160110	16	16	110	200
	522160120	16	16	120	250
	52218050	18	20	50	120
	52218060	18	18	60	120
	52218070	18	20	70	130
	522180100	18	20	100	200
	52220050150	20	20	50	150
	52220050	20	20	50	110
	52220060	20	20	60	130
	52220070	20	20	70	130
	52220080	20	20	80	150
	52220090200	20	20	90	200
	52220090	20	20	90	150
	522200110	20	20	110	200
	522200120	20	20	120	250
	52222075	22	20	75	150
	522220110	22	20	110	200
	52225070	25	25	70	150
	52225090	25	25	90	150
	522250110	25	25	110	200
	522250120	25	25	120	250

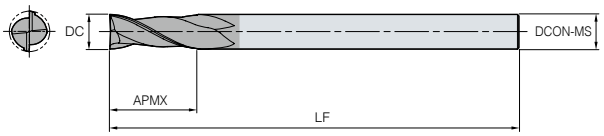
UXE502

2 flutes flat for heavy cuts

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank

DC	Tolerance
Ø0.1 ~ Ø7	0.000 ~ -0.012
Ø8 ~ Ø20	0.000 ~ -0.015





(mm)

Designation		DC	DCON-MS	APMX	LF
UXE	502001001	0.1	4	0.1	40
	502001	0.1	4	0.2	40
	502001003	0.1	4	0.3	40
	502002002	0.2	4	0.2	40
	502002	0.2	4	0.4	40
	502002006	0.2	4	0.6	40
	502003003	0.3	4	0.3	40
	502003	0.3	4	0.6	40
	502003009	0.3	4	0.9	40
	502004004	0.4	4	0.4	40
	502004	0.4	4	0.8	40
	502004012	0.4	4	1.2	40
	502005005	0.5	4	0.5	40
	502005	0.5	4	1	40
	502005015	0.5	4	1.5	40
	502006006	0.6	4	0.6	40
	502006	0.6	4	1.2	40
	502006018	0.6	4	1.8	40
	502007007	0.7	4	0.7	40
	502007	0.7	4	1.4	40
	502007021	0.7	4	2.1	40
	502008008	0.8	4	0.8	40
	502008	0.8	4	1.6	40
	502008024	0.8	4	2.4	40
	502009009	0.9	4	0.9	40
	502009	0.9	4	1.8	40
	502009027	0.9	4	2.7	40
	50201001	1	6	1	40
	50201002	1	6	2	40
	502010	1	6	2.5	50
	50201003	1	6	3	50
	50201004	1	6	4	50
	50201006	1	6	6	50
	50201202	1.2	6	2	40
	502012	1.2	6	3	50
	50201204	1.2	6	4	50
	50201206	1.2	6	6	50

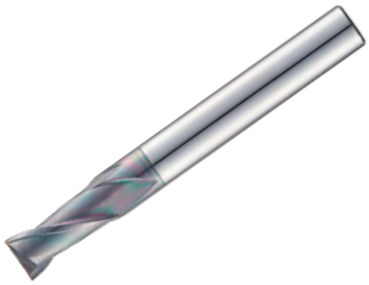
Designation		DC	DCON-MS	APMX	LF
UXE	502015015	1.5	6	1.5	40
	50201503	1.5	6	3	40
	502015	1.5	6	4	50
	50201506	1.5	6	6	50
	50201508	1.5	6	8	50
	50201510	1.5	6	10	50
	50202002	2	6	2	40
	50202004	2	6	4	40
	502020	2	6	6	50
	50202008	2	6	8	50
	50202010	2	6	10	50
	50202012	2	6	12	50
	502025025	2.5	6	2.5	40
	50202505	2.5	6	5	40
	502025	2.5	6	7	50
	50202510	2.5	6	10	50
	50202512	2.5	6	12	50
	50203003	3	6	3	40
	50203006	3	6	6	40
	502030	3	6	8	50
	50203010	3	6	10	50
	50203012	3	6	12	50
	50203014	3	6	14	50
	50203510	3.5	6	10	50
	50204004	4	6	4	40
	50204008	4	6	8	40
	502040	4	6	10	50
	50204012	4	6	12	50
	50204014	4	6	14	50
	50204016	4	6	16	50
	50204511	4.5	6	11	50
	50205005	5	6	5	50
	50205010	5	6	10	50
	502050	5	6	15	60
	50205020	5	6	20	60
	50205025	5	6	25	60
	50205513	5.5	6	13	50

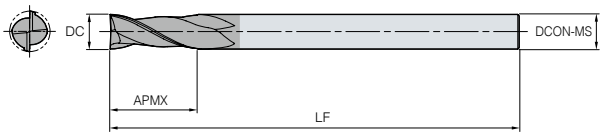
UXE502

2 flutes flat for heavy cuts

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank

DC	Tolerance
Ø0.1 ~ Ø7	0.000 ~ -0.012
Ø8 ~ Ø20	0.000 ~ -0.015





(mm)

Designation		DC	DCON-MS	APMX	LF
UXE	50206006	6	6	6	50
	50206012	6	6	12	50
	502060	6	6	15	60
	50206020	6	6	20	60
	50206025	6	6	25	60
	50206513	6.5	8	13	60
	50207018	7	8	18	60
	50208016	8	8	16	60
	502080	8	8	20	70
	50208025	8	8	25	70
	50208030	8	8	30	70
	50210022	10	10	22	65

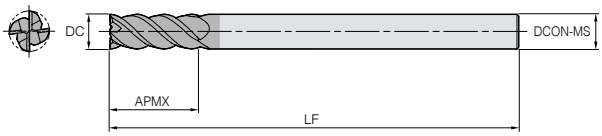
Designation		DC	DCON-MS	APMX	LF
UXE	502100	10	10	25	75
	50210030	10	10	30	75
	50210035	10	10	35	75
	50212026	12	12	26	70
	502120	12	12	30	80
	50212035	12	12	35	80
	50212040	12	12	40	80
	502140	14	16	35	100
	502160	16	16	32	100
	50216040	16	16	40	100
	502180	18	20	45	100
	502200	20	20	45	100

UE504H

4 flutes 45° helix flat

CARBIDE | 4 | H·A 45° | Grade PC315W | h5 shank

DC	Tolerance
Ø1 ~ Ø20	0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	LF
UE	504H010	1	6	2.5	50
	504H01004	1	6	4	60
	504H01006	1	6	6	60
	504H015	1.5	6	4	50
	504H01506	1.5	6	6	60
	504H01508	1.5	6	8	60
	504H020	2	6	6	50
	504H02008	2	6	8	60
	504H02010	2	6	10	60
	504H030	3	6	8	50
	504H03010	3	6	10	70
	504H03012	3	6	12	70
	504H03016	3	6	16	70
	504H040	4	6	10	50
	504H04012	4	6	12	70
	504H04016	4	6	16	70
	504H04020	4	6	20	70
	504H050	5	6	15	50
	504H05030	5	6	30	80
	504H060	6	6	15	60
	504H06020	6	6	20	70

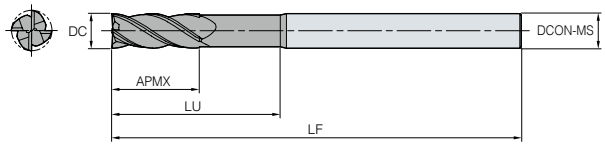
Designation		DC	DCON-MS	APMX	LF
UE	504H06030	6	6	30	80
	504H080	8	8	20	70
	504H08030	8	8	30	80
	504H08035	8	8	35	90
	504H08040	8	8	40	90
	504H100	10	10	25	75
	504H10030	10	10	30	80
	504H10040	10	10	40	90
	504H10050	10	10	50	100
	504H120	12	12	30	80
	504H12040	12	12	40	90
	504H12050	12	12	50	100
	504H12060	12	12	60	110
	504H160	16	16	40	100
	504H16050	16	16	50	110
	504H16060	16	16	60	120
	504H160110	16	16	110	200
	504H200	20	20	45	100
	504H20060	20	20	60	120
	504H20070	20	20	70	130
	504H200110	20	20	110	200

UE514

4 flutes long neck flat

CARBIDE | 4 | H·A 35° | Grade PC315W | h5 shank

DC	Tolerance
Ø1 ~ Ø12	0.000 ~ -0.030



(mm)

	Designation	DC	DCON-MS	APMX	LU	LF
UE	51401002	1	4	1.5	2	50
	51401003	1	4	1.5	3	50
	51401004	1	4	1.5	4	50
	51401005	1	4	1.5	5	50
	51401006	1	4	1.5	6	50
	51401007	1	4	1.5	7	50
	51401008	1	4	1.5	8	50
	51401010	1	4	1.5	10	50
	51401012	1	4	1.5	12	50
	51401014	1	4	1.5	14	50
	51401016	1	4	1.5	16	50
	51401018	1	4	1.5	18	50
	51401020	1	4	1.5	20	50
	51401022	1	4	1.5	22	60
	51401026	1	4	1.5	26	60
	51401030	1	4	1.5	30	70
	51401040	1	4	1.5	40	80
	51401050	1	4	1.5	50	100
	51401204	1.2	4	1.8	4	50
	51401206	1.2	4	1.8	6	50
	51401208	1.2	4	1.8	8	50
	51401210	1.2	4	1.8	10	50
	51401212	1.2	4	1.8	12	50
	51401214	1.2	4	1.8	14	50
	51401216	1.2	4	1.8	16	50
	51401220	1.2	4	1.8	20	50
	51401226	1.2	4	1.8	26	60
	51401230	1.2	4	1.8	30	70
	51401504	1.5	4	2.3	4	50
	51401505	1.5	4	2.3	5	50
	51401506	1.5	4	2.3	6	50
	51401507	1.5	4	2.3	7	50
	51401508	1.5	4	2.3	8	50
	51401510	1.5	4	2.3	10	50
	51401512	1.5	4	2.3	12	50
	51401514	1.5	4	2.3	14	50
	51401516	1.5	4	2.3	16	50

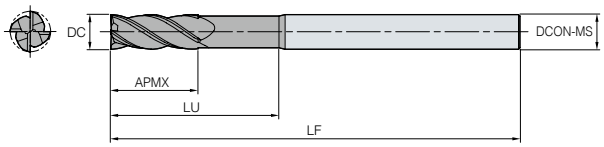
	Designation	DC	DCON-MS	APMX	LU	LF
UE	51401518	1.5	4	2.3	18	50
	51401520	1.5	4	2.3	20	50
	51401522	1.5	4	2.3	22	60
	51401526	1.5	4	2.3	26	60
	51401530	1.5	4	2.3	30	70
	51402006	2	4	3	6	50
	51402008	2	4	3	8	50
	51402010	2	4	3	10	50
	51402012	2	4	3	12	50
	51402014	2	4	3	14	50
	51402016	2	4	3	16	50
	51402018	2	4	3	18	50
	51402020	2	4	3	20	50
	51402022	2	4	3	22	60
	51402026	2	4	3	26	60
	51402030	2	4	3	30	70
	51402035	2	4	3	35	70
	51402040	2	4	3	40	80
	51402045	2	4	3	45	90
	51402050	2	4	3	50	100
	51402060	2	4	3	60	110
	51402508	2.5	4	4	8	50
	51402510	2.5	4	4	10	50
	51402512	2.5	4	4	12	50
	51402514	2.5	4	4	14	50
	51402516	2.5	4	4	16	50
	51402518	2.5	4	4	18	50
	51402520	2.5	4	4	20	50
	51402522	2.5	4	4	22	60
	51402526	2.5	4	4	26	60
	51402530	2.5	4	4	30	70
	51402535	2.5	4	4	35	70
	51402540	2.5	4	4	40	80
	51402545	2.5	4	4	45	90
	51402550	2.5	4	4	50	100
	51403006	3	6	4.5	6	50
	51403008	3	6	4.5	8	50

UE514

4 flutes long neck flat

CARBIDE | 4 | H·A 35° | Grade PC315W | h5 shank

DC	Tolerance
Ø1 ~ Ø12	0.000 ~ -0.030



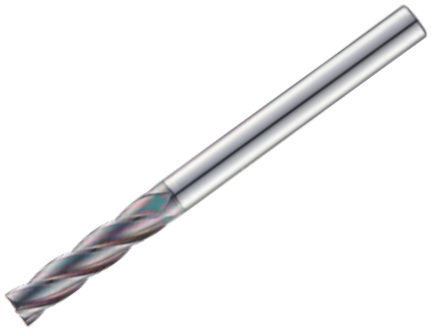
(mm)

Designation		DC	DCON-MS	APMX	LU	LF
UE	51403010	3	6	4.5	10	50
	51403012	3	6	4.5	12	50
	51403014	3	6	4.5	14	60
	51403016	3	6	4.5	16	60
	51403018	3	6	4.5	18	60
	51403020	3	6	4.5	20	60
	51403022	3	6	4.5	22	65
	51403026	3	6	4.5	26	65
	51403030	3	6	4.5	30	70
	51403035	3	6	4.5	35	70
	51403040	3	6	4.5	40	80
	51403045	3	6	4.5	45	90
	51403050	3	6	4.5	50	100
	51403060	3	6	4.5	60	100
	51404008	4	6	4.5	8	50
	51404010	4	6	4.5	10	50
	51404012	4	6	4.5	12	50
	51404014	4	6	4.5	14	60
	51404016	4	6	4.5	16	60
	51404018	4	6	4.5	18	60
	51404020	4	6	4.5	20	60
	51404022	4	6	4.5	22	65
	51404026	4	6	4.5	26	65
	51404030	4	6	4.5	30	70
	51404035	4	6	4.5	35	70

Designation		DC	DCON-MS	APMX	LU	LF
UE	51404040	4	6	4.5	40	80
	51404045	4	6	4.5	45	90
	51404050	4	6	4.5	50	100
	51404060	4	6	4.5	60	100
	51405016	5	6	8	16	60
	51405020	5	6	8	20	60
	51405026	5	6	8	26	65
	51405030	5	6	8	30	70
	51405035	5	6	8	35	75
	51405040	5	6	8	40	80
	51405050	5	6	8	50	90
	51405060	5	6	8	60	100
	51406015	6	6	9	15	60
	51406020	6	6	9	20	60
	51406030	6	6	9	30	70
	51406032	6	6	9	32	90
	51408025	8	8	12	25	70
	51408030	8	8	12	30	80
	51408042	8	8	12	42	100
	51410030	10	10	15	30	75
	51410035	10	10	15	35	80
	51410045	10	10	15	45	100
	51412035	12	12	20	35	80
	51412040	12	12	20	40	90
	51412050	12	12	20	50	110

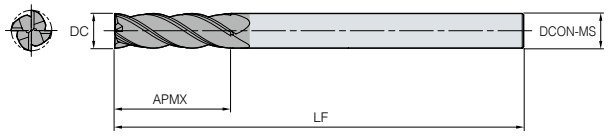
UE524

4 flutes flat



CARBIDE | 4 | H·A 35° | Grade PC315W | h5 shank

DC	Tolerance
Ø1 ~ Ø25	0.000 ~ -0.030



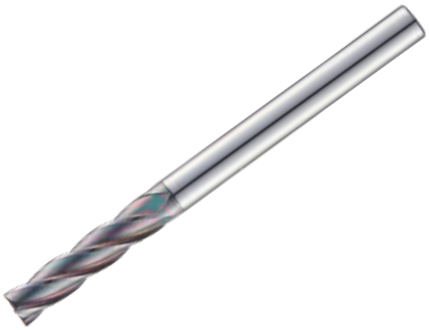
(mm)

	Designation	DC	DCON-MS	APMX	LF
UE	52401003	1	6	3	60
	52401004	1	6	4	60
	52401005	1	6	5	60
	52401006	1	6	6	60
	52401007	1	6	7	60
	52401008	1	6	8	60
	52401010	1	6	10	60
	52401012	1	6	12	60
	52401204	1.2	6	4	60
	52401206	1.2	6	6	60
	52401208	1.2	6	8	60
	52401210	1.2	6	10	60
	52401212	1.2	6	12	60
	52401506	1.5	6	6	60
	52401508	1.5	6	8	60
	52401510	1.5	6	10	60
	52401512	1.5	6	12	60
	52401514	1.5	6	14	60
	52401516	1.5	6	16	60
	52401520	1.5	6	20	60
	52401526	1.5	6	26	60
	52402008	2	6	8	60
	52402008S4	2	4	8	40
	52402010	2	6	10	60
	52402012	2	6	12	60
	52402014	2	6	14	60
	52402016	2	6	16	60
	52402510	2.5	6	10	60
	52402512	2.5	6	12	60
	52402516	2.5	6	16	60
	52402520	2.5	6	20	60
	52402526	2.5	6	26	60
	52403010	3	6	10	70
	52403012	3	6	12	70
	52403014	3	6	14	70
	52403016	3	6	16	70
	52403016S3	3	3	16	100
	52403020	3	6	20	70
	52403026	3	6	26	70
	52403030	3	6	30	70
	52403035	3	6	35	90

	Designation	DC	DCON-MS	APMX	LF
UE	52404012	4	6	12	70
	52404016	4	6	16	70
	52404020	4	6	20	70
	52404020S4	4	4	20	100
	52404026	4	6	26	70
	52404030	4	6	30	70
	52405015	5	6	15	70
	52405020	5	6	20	70
	52405025100	5	6	25	100
	52405025	5	6	25	70
	52405030	5	6	30	80
	52405035	5	6	35	90
	52405040	5	6	40	100
	52406015080	6	6	15	80
	52406015	6	6	15	60
	52406020090	6	6	20	90
	52406020	6	6	20	70
	52406025	6	6	25	75
	52406030150	6	6	30	150
	52406030100	6	6	30	100
	52406030	6	6	30	80
	52406030100	6	6	30	100
	52406030	6	6	30	80
	52406035	6	6	35	90
	52406040120	6	6	40	120
	52406040	6	6	40	90
	52406045	6	6	45	150
	52407035	7	8	35	85
	52408020	8	8	20	100
	52408025	8	8	25	80
	52408030100	8	8	30	100
	52408030	8	8	30	80
	52408035	8	8	35	90
	52408040150	8	8	40	150
	52408040120	8	8	40	120
	52408040	8	8	40	90
	52408045	8	8	45	100
	52408050150	8	8	50	150
	52408050	8	8	50	100
	52408060	8	8	60	155
	52408080	8	8	80	200

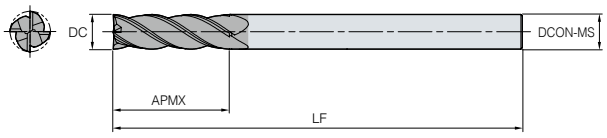
UE524

4 flutes flat



CARBIDE | 4 | H·A 35° | Grade PC315W | h5 shank

DC	Tolerance
Ø1 ~ Ø25	0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	LF
UE	52409045	9	10	45	100
	52410025	10	10	25	100
	524100100	10	10	30	100
	52410030	10	10	30	80
	52410035	10	10	35	90
	52410040120	10	10	40	120
	52410040	10	10	40	90
	52410045	10	10	45	100
	52410050200	10	10	50	200
	52410050150	10	10	50	150
	52410050	10	10	50	100
	52410055	10	10	55	150
	52410060200	10	10	60	200
	52410060155	10	10	60	155
	52410060	10	10	60	110
	52410080200	10	10	80	200
	52411050	11	12	50	110
	52412030	12	12	30	110
	52412035	12	12	35	90
	52412040120	12	12	40	120
	52412040	12	12	40	100
	52412045	12	12	45	130
	52412050150	12	12	50	150
	52412050	12	12	50	100
	52412055	12	12	55	110
	52412060200	12	12	60	200
	52412060150	12	12	60	150
	52412060	12	12	60	110
	52412065	12	12	65	150
	52412070200	12	12	70	200
	52412070	12	12	70	120
	52412080	12	12	80	200
	52414040	14	16	40	110
	52414050	14	16	50	110
	52414060	14	16	60	150

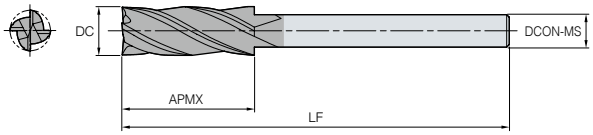
Designation		DC	DCON-MS	APMX	LF
UE	52416040	16	16	40	150
	52416050150	16	16	50	150
	52416050	16	16	50	110
	52416060	16	16	60	120
	52416070200	16	16	70	200
	52416070150	16	16	70	150
	52416070	16	16	70	130
	52416080	16	16	80	150
	52416090	16	16	90	150
	524160100	16	16	100	200
	524160110	16	16	110	200
	524160120	16	16	120	250
	52418050	18	20	50	120
	52418070	18	20	70	130
	524180100	18	20	100	200
	52420050150	20	20	50	150
	52420050	20	20	50	110
	52420060	20	20	60	130
	52420070	20	20	70	130
	52420080	20	20	80	150
	52420090200	20	20	90	200
	52420090	20	20	90	150
	524200100	20	20	100	200
	524200110	20	20	110	200
	524200120	20	20	120	250
	524200130	20	20	130	250
	52422075	22	20	75	150
	524220110	22	20	110	200
	52425070	25	25	70	150
	52425090	25	25	90	150
	524250100	25	25	100	200
	524250110	25	25	110	200
	524250120	25	25	120	250
	524250150	25	25	150	250

ULE504

4 flutes automatic CNC flat

CARBIDE | 4 | H·A 30° | Grade PC315W | h5 shank

DC	Tolerance
Ø3 ~ Ø16	0.000 ~ -0.020



(mm)

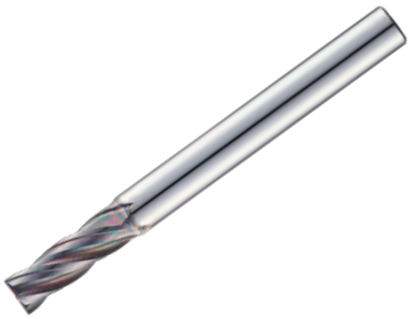
Designation		DC	DCON-MS	APMX	LF
ULE	504030S04	3	4	3	35
	504040S04	4	4	4	35
	504060S06	6	6	6	35
	504070S07	7	7	20	45
	504080S08	8	8	8	45
	504080S06	8	6	8	35
	504080S07	8	7	15	45
	504090S07	9	7	15	45
	504100S06	10	6	10	35
	504100S10	10	10	15	45
	504100S07	10	7	15	45
	504110S07	11	7	15	45
	504120S10	12	10	12	45
	504120S06	12	6	12	35
	504120S07	12	7	15	45
	504120-25S10	12	10	25	55
	504130S10	13	10	25	55
	504140S10	14	10	25	55
	504140S07	14	7	25	55
	504160S10	16	10	25	60

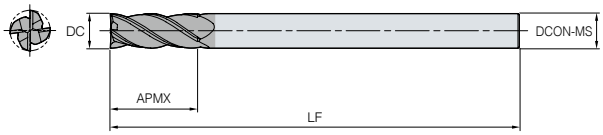
UE504

4 flutes flat

CARBIDE | 4 | H·A 34°/36° | Grade PC315W | h5 shank

DC	Tolerance
Ø0.8 ~ Ø25	0.000 ~ -0.030





(mm)

Designation		DC	DCON-MS	APMX	LF
UE	504008	0.8	4	1.6	40
	504009	0.9	4	1.8	40
	504010	1	6	2.5	50
	504012	1.2	6	3	50
	504015	1.5	6	4	50
	504020	2	6	6	50
	504025	2.5	6	7	50
	504030	3	6	8	50
	504035	3.5	6	10	50
	504040	4	6	10	50
	504045	4.5	6	14	50
	504050	5	6	15	60
	504055	5.5	6	15	60
	504060	6	6	15	60
	504065	6.5	8	18	60
	504070	7	8	20	60
	504075	7.5	8	20	60
	504080	8	8	20	70
	504085	8.5	10	22	70
	504090	9	10	22	70
	504095	9.5	10	24	70
	504100	10	10	25	75

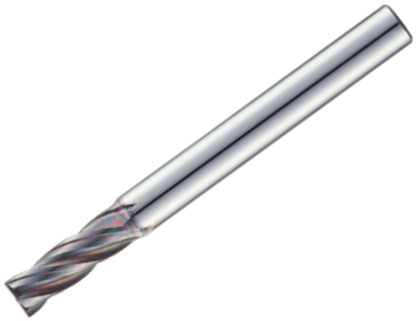
Designation		DC	DCON-MS	APMX	LF
UE	504105	10.5	12	26	75
	504110	11	12	30	75
	504115	11.5	12	30	80
	504120	12	12	30	80
	504125	12.5	12	30	80
	504130	13	12	35	100
	504140	14	16	35	100
	504140S14	14	14	35	100
	504140S12	14	12	35	100
	504150	15	16	38	100
	504160	16	16	40	100
	504170	17	16	42	100
	504180	18	18	45	100
	504180S16	18	16	45	100
	504190	19	20	45	100
	504200	20	20	45	100
	504210	21	20	45	100
	504220	22	20	45	100
	504230	23	25	50	120
	504240	24	25	50	120
	504250	25	25	50	120

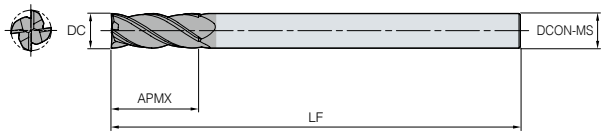
UXE504

4 flutes flat Endmill for heavy cuts

CARBIDE | 4 | H·A 34°/36° | Grade PC315W | h5 shank

DC	Tolerance
Ø1 ~ Ø20	0.000 ~ -0.030





(mm)

Designation		DC	DCON-MS	APMX	LF
UXE	50401001	1	6	1	40
	50401002	1	6	2	40
	504010	1	6	2.5	50
	50401003	1	6	3	50
	50401004	1	6	4	50
	50401006	1	6	6	50
	50401202	1.2	6	2	40
	504012	1.2	6	3	50
	50401204	1.2	6	4	50
	50401206	1.2	6	6	50
	504015015	1.5	6	1.5	40
	50401503	1.5	6	3	40
	504015	1.5	6	4	50
	50401506	1.5	6	6	50
	50401508	1.5	6	8	50
	50401510	1.5	6	10	50
	50402002	2	6	2	40
	50402004	2	6	4	40
	504020	2	6	6	50
	50402008	2	6	8	50
	50402010	2	6	10	50
	50402012	2	6	12	50
	504025025	2.5	6	2.5	40
	50402505	2.5	6	5	40
	504025	2.5	6	7	50
	50402510	2.5	6	10	50
	50402512	2.5	6	12	50
	50403003	3	6	3	40
	50403006	3	6	6	40
	504030	3	6	8	50
	50403010	3	6	10	50
	50403012	3	6	12	50
	50403014	3	6	14	50

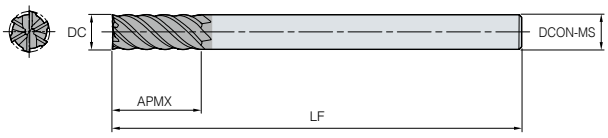
Designation		DC	DCON-MS	APMX	LF
UXE	50404004	4	6	4	40
	50404008	4	6	8	40
	504040	4	6	10	50
	50404012	4	6	12	50
	50404014	4	6	14	50
	50404016	4	6	16	50
	50405005	5	6	5	50
	50405010	5	6	10	50
	504050	5	6	15	60
	50405020	5	6	20	60
	50405025	5	6	25	60
	50406006	6	6	6	50
	50406012	6	6	12	50
	504060	6	6	15	60
	50406020	6	6	20	60
	50406025	6	6	25	60
	50408016	8	8	16	60
	504080	8	8	20	70
	50408025	8	8	25	70
	50408030	8	8	30	70
	50410022	10	10	22	65
	504100	10	10	25	75
	50410030	10	10	30	75
	50410035	10	10	35	75
	50412026	12	12	26	70
	504120	12	12	30	80
	50412035	12	12	35	80
	50412040	12	12	40	80
	504140	14	16	35	100
	50416032	16	16	32	100
	504160	16	16	40	100
	504180	18	20	45	100
	504200	20	20	45	100

UE506

6 flutes flat

CARBIDE | 6 | H·A 45° | Grade PC315W | h5 shank

DC	Tolerance
Ø6 ~ Ø25	0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	LF
UE	506060	6	6	15	60
	50606020	6	6	20	70
	50606030110	6	6	30	110
	50606030	6	6	30	80
	506070	7	8	18	60
	506080	8	8	20	70
	50608030	8	8	30	80
	50608035	8	8	35	90
	50608040130	8	8	40	130
	50608040	8	8	40	90
	506090	9	10	22	70
	506100	10	10	25	75
	50610030	10	10	30	80
	50610040	10	10	40	90
	50610050150	10	10	50	150
	50610050	10	10	50	100
	506110	11	12	26	75
	506120	12	12	30	80
	50612040	12	12	40	90
	50612050	12	12	50	100

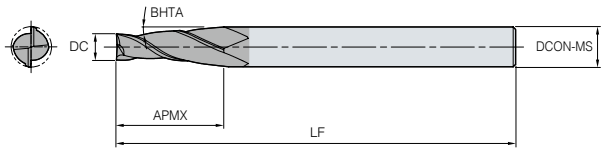
Designation		DC	DCON-MS	APMX	LF
UE	50612060150	12	12	60	150
	50612060	12	12	60	110
	506130	13	14	32	85
	506140	14	14	32	85
	506160	16	16	40	100
	50616050	16	16	50	110
	50616060	16	16	60	120
	50616090	16	16	90	150
	506160110250	16	16	110	250
	506160110	16	16	110	200
	506180	18	18	44	100
	506200	20	20	45	100
	50620060	20	20	60	120
	50620070	20	20	70	130
	506200110300	20	20	110	300
	506200110250	20	20	110	250
	506200110	20	20	110	200
	506250	25	25	50	120
	506251	25	25	92	180

UTE502

2 flutes tapered flat

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank

DC	Tolerance
Ø0.3 ~ Ø10	0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	BHTA(°)	LF
UTE	502003005	0.3	4	1.2	0.5	40
	50200301	0.3	4	1.2	1	40
	502003015	0.3	4	1.2	1.5	40
	50200302	0.3	4	1.2	2	40
	50200303	0.3	4	1.5	3	40
	50200305	0.3	4	1.5	5	40
	50200307	0.3	4	1.5	7	40
	50200310	0.3	4	1.5	10	40
	502004005	0.4	4	1.6	0.5	40
	50200401	0.4	4	1.6	1	40
	502004015	0.4	4	1.6	1.5	40
	50200402	0.4	4	1.6	2	40
	50200403	0.4	4	1.6	3	40
	50200405	0.4	4	2	5	40
	50200407	0.4	4	2	7	40
	50200410	0.4	4	2	10	40
	502005005	0.5	4	2	0.5	45
	50200501	0.5	4	2	1	45
	502005015	0.5	4	2	1.5	45
	50200502	0.5	4	2	2	45
	50200503	0.5	4	2	3	45
	50200505	0.5	4	2.5	5	45
	50200507	0.5	4	2.5	7	45
	50200510	0.5	4	2.5	10	45
	502006005	0.6	4	2.4	0.5	45
	50200601	0.6	4	2.4	1	45
	502006015	0.6	4	2.4	1.5	45
	50200602	0.6	4	2.4	2	45
	50200603	0.6	4	2.4	3	45
	50200605	0.6	4	3	5	45
	50200607	0.6	4	3	7	45
	50200610	0.6	4	3	10	45
	502007005	0.7	4	2.8	0.5	45
	50200701	0.7	4	2.8	1	45
	502007015	0.7	4	2.8	1.5	45
	50200702	0.7	4	2.8	2	45

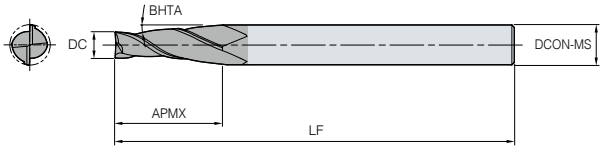
Designation		DC	DCON-MS	APMX	BHTA(°)	LF
UTE	50200703	0.7	4	2.8	3	45
	50200705	0.7	4	3.5	5	45
	50200707	0.7	4	3.5	7	45
	50200710	0.7	4	3.5	10	45
	502008005	0.8	4	3.2	0.5	45
	50200801	0.8	4	3.2	1	45
	502008015	0.8	4	3.2	1.5	45
	50200802	0.8	4	3.2	2	45
	50200803	0.8	4	3.2	3	45
	50200805	0.8	4	4	5	45
	50200807	0.8	4	4	7	45
	50200810	0.8	4	4	10	45
	502010005	1	4	4	0.5	50
	50201001	1	4	4	1	50
	502010015	1	4	4	1.5	50
	50201002	1	4	6	2	50
	50201003	1	4	6	3	50
	50201005	1	4	8	5	50
	50201007	1	4	8	7	50
	50201010	1	4	8	10	50
	502015005	1.5	4	6	0.5	50
	50201501	1.5	4	6	1	50
	502015015	1.5	4	6	1.5	50
	50201502	1.5	4	8	2	50
	50201503	1.5	4	8	3	50
	50201505	1.5	4	10	5	50
	50201507	1.5	4	10	7	50
	50201510	1.5	6	10	10	50
	502020005	2	4	8	0.5	50
	50202001	2	4	8	1	50
	502020015	2	4	8	1.5	50
	50202002	2	4	10	2	50
	50202003	2	4	10	3	50
	50202005	2	6	12	5	50
	50202007	2	6	12	7	50
	50202010	2	8	12	10	50

UTE502

2 flutes tapered flat

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank

DC	Tolerance
Ø0.3 ~ Ø10	0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	BHTA(°)	LF
UTE	502025005	2.5	6	10	0.5	50
	50202501	2.5	6	10	1	50
	502025015	2.5	6	10	1.5	50
	50202502	2.5	6	12	2	50
	50202503	2.5	6	12	3	50
	50202505	2.5	6	14	5	50
	50202507	2.5	6	14	7	50
	50202510	2.5	8	14	10	50
	502030005	3	6	12	0.5	50
	50203001	3	6	12	1	50
	502030015	3	6	12	1.5	50
	50203002	3	6	14	2	50
	50203003	3	6	14	3	50
	50203005	3	6	16	5	50
	50203007	3	8	16	7	50
	50203010	3	10	16	10	50
	502040005	4	6	16	0.5	60
	50204001	4	6	16	1	60
	502040015	4	6	16	1.5	60
	50204002	4	6	16	2	60
	50204003	4	6	19	3	60
	50204005	4	8	22	5	65
	50204007	4	8	16	7	65
	50204010	4	10	17	10	65
	502060005	6	8	20	0.5	65
	50206001	6	8	20	1	65
	502060015	6	8	20	1.5	65
	50206002	6	8	20	2	65

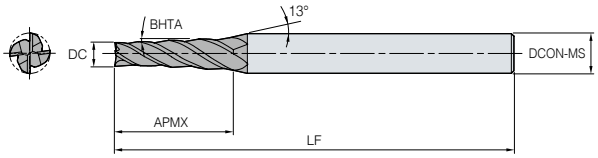
Designation		DC	DCON-MS	APMX	BHTA(°)	LF
UTE	50206003	6	8	19	3	65
	50206005	6	10	22	5	75
	50206007	6	12	24	7	75
	50206010	6	12	17	10	75
	502070005	7	8	28	0.5	70
	50207001	7	8	28	1	70
	502070015	7	10	28	1.5	70
	50207002	7	10	28	2	80
	50207003	7	10	28	3	80
	50207005	7	12	28	5	80
	502080005	8	10	35	0.5	90
	50208001	8	10	35	1	90
	502080015	8	10	35	1.5	90
	50208002	8	10	28	2	90
	50208003	8	12	38	3	90
	50208005	8	16	45	5	100
	50208007	8	16	32	7	90
	50208010	8	20	34	10	100
	50208010S25	8	25	48	10	150
	502100005	10	12	40	0.5	90
	50210001	10	12	40	1	90
	502100015	10	12	38	1.5	90
	50210002	10	16	40	2	75
	50210003	10	16	40	3	100
	50210005	10	16	34	5	100
	50210007	10	20	40	7	90
	50210010	10	25	42	10	100

UTE504

4 flutes tapered flat

CARBIDE | 4 | H·A 30° | Grade PC315W | h5 shank

DC	Tolerance
Ø0.8 ~ Ø10	0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	BHTA(°)	LF
UTE	50400800504	0.8	4	4	0.5	45
	50400800506	0.8	4	6	0.5	45
	50400800508	0.8	4	8	0.5	45
	50400800510	0.8	4	10	0.5	45
	50400800512	0.8	4	12	0.5	45
	50400801004	0.8	4	4	1	45
	50400801006	0.8	4	6	1	45
	50400801008	0.8	4	8	1	45
	50400801010	0.8	4	10	1	45
	50400801012	0.8	4	12	1	45
	50400801504	0.8	4	4	1.5	45
	50400801506	0.8	4	6	1.5	45
	50400801508	0.8	4	8	1.5	45
	50400801510	0.8	4	10	1.5	45
	50400801512	0.8	4	12	1.5	45
	50400802004	0.8	4	4	2	45
	50400802006	0.8	4	6	2	45
	50400802008	0.8	4	8	2	45
	50400802010	0.8	4	10	2	45
	50400802012	0.8	4	12	2	45
	50401000504	1	4	4	0.5	50
	50401000506	1	4	6	0.5	50
	50401000508	1	4	8	0.5	50
	50401000510	1	4	10	0.5	50
	50401000512	1	4	12	0.5	50
	50401000516	1	4	16	0.5	50
	50401001004	1	4	4	1	50
	50401001006	1	4	6	1	50
	50401001008	1	4	8	1	50
	50401001010	1	4	10	1	50
	50401001012	1	4	12	1	50
	50401001016	1	4	16	1	50
	50401001504	1	4	4	1.5	50
	50401001506	1	4	6	1.5	50
	50401001508	1	4	8	1.5	50
	50401001510	1	4	10	1.5	50
	50401001512	1	4	12	1.5	50

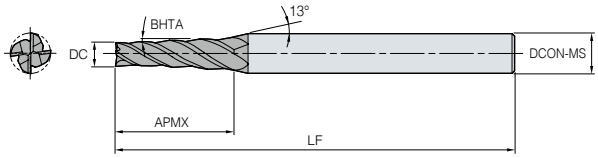
Designation		DC	DCON-MS	APMX	BHTA(°)	LF
UTE	50401001516	1	4	16	1.5	50
	50401002004	1	4	4	2	50
	50401002006	1	4	6	2	50
	50401002008	1	4	8	2	50
	50401002010	1	4	10	2	50
	50401002012	1	4	12	2	50
	50401002016	1	4	16	2	50
	50401003004	1	4	4	3	50
	50401003006	1	4	6	3	50
	50401003008	1	4	8	3	50
	50401003010	1	4	10	3	50
	50401003012	1	4	12	3	50
	50401003016	1	4	16	3	50
	50401200506	1.2	4	6	0.5	50
	50401200508	1.2	4	8	0.5	50
	50401200510	1.2	4	10	0.5	50
	50401200512	1.2	4	12	0.5	50
	50401200516	1.2	4	16	0.5	50
	50401201006	1.2	4	6	1	50
	50401201008	1.2	4	8	1	50
	50401201010	1.2	4	10	1	50
	50401201012	1.2	4	12	1	50
	50401201016	1.2	4	16	1	50
	50401201506	1.2	4	6	1.5	50
	50401201508	1.2	4	8	1.5	50
	50401201510	1.2	4	10	1.5	50
	50401201512	1.2	4	12	1.5	50
	50401201516	1.2	4	16	1.5	50
	50401202006	1.2	4	6	2	50
	50401202008	1.2	4	8	2	50
	50401202010	1.2	4	10	2	50
	50401202012	1.2	4	12	2	50
	50401202016	1.2	4	16	2	50
	50401203006	1.2	4	6	3	50
	50401203008	1.2	4	8	3	50
	50401203010	1.2	4	10	3	50
	50401203012	1.2	4	12	3	50

UTE504

4 flutes tapered flat

CARBIDE | 4 | H·A 30° | Grade PC315W | h5 shank

DC	Tolerance
Ø0.8 ~ Ø10	0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	BHTA(°)	LF
UTE	50401203016	1.2	4	16	3	50
	50401500506	1.5	4	6	0.5	50
	50401500508	1.5	4	8	0.5	50
	50401500510	1.5	4	10	0.5	50
	50401500512	1.5	4	12	0.5	50
	50401500516	1.5	4	16	0.5	50
	50401500520	1.5	4	20	0.5	60
	50401501006	1.5	4	6	1	50
	50401501008	1.5	4	8	1	50
	50401501010	1.5	4	10	1	50
	50401501012	1.5	4	12	1	50
	50401501016	1.5	4	16	1	50
	50401501020	1.5	4	20	1	60
	50401501506	1.5	4	6	1.5	50
	50401501508	1.5	4	8	1.5	50
	50401501510	1.5	4	10	1.5	50
	50401501512	1.5	4	12	1.5	50
	50401501516	1.5	4	16	1.5	50
	50401501520	1.5	4	20	1.5	60
	50401502006	1.5	4	6	2	50
	50401502008	1.5	4	8	2	50
	50401502010	1.5	4	10	2	50
	50401502012	1.5	4	12	2	50
	50401502016	1.5	4	16	2	50
	50401502020	1.5	4	20	2	60
	50401503006	1.5	4	6	3	50
	50401503008	1.5	4	8	3	50
	50401503010	1.5	4	10	3	50
	50401503012	1.5	4	12	3	50
	50401503016	1.5	4	16	3	50
	50401503020	1.5	4	20	3	60
	50402000508	2	4	8	0.5	50
	50402000510	2	4	10	0.5	50
	50402000512	2	4	12	0.5	50
	50402000516	2	4	16	0.5	50
	50402000520	2	4	20	0.5	60
	50402000525	2	4	25	0.5	60

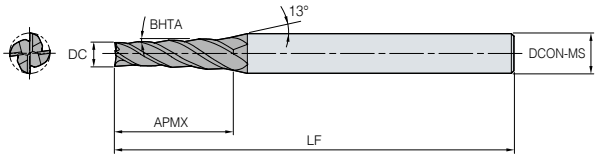
Designation		DC	DCON-MS	APMX	BHTA(°)	LF
UTE	50402001008	2	4	8	1	50
	50402001010	2	4	10	1	50
	50402001012	2	4	12	1	50
	50402001016	2	4	16	1	50
	50402001020	2	4	20	1	60
	50402001025	2	4	25	1	60
	50402001508	2	4	8	1.5	50
	50402001510	2	4	10	1.5	50
	50402001512	2	4	12	1.5	50
	50402001516	2	4	16	1.5	50
	50402001520	2	4	20	1.5	60
	50402001525	2	4	25	1.5	60
	50402002008	2	4	8	2	50
	50402002010	2	4	10	2	50
	50402002012	2	4	12	2	50
	50402002016	2	4	16	2	50
	50402002020	2	4	20	2	60
	50402002025	2	4	25	2	60
	50402003008	2	4	8	3	50
	50402003010	2	4	10	3	50
	50402003012	2	4	12	3	50
	50402003016	2	4	16	3	50
	50402003020	2	6	20	3	60
	50402003025	2	6	25	3	60
	50402500510	2.5	4	10	0.5	50
	50402500512	2.5	4	12	0.5	50
	50402500516	2.5	4	16	0.5	50
	50402500520	2.5	4	20	0.5	60
	50402500525	2.5	4	25	0.5	60
	50402500530	2.5	4	30	0.5	60
	50402501010	2.5	4	10	1	50
	50402501012	2.5	4	12	1	50
	50402501016	2.5	4	16	1	50
	50402501020	2.5	4	20	1	60
	50402501025	2.5	4	25	1	60
	50402501030	2.5	4	30	1	60
	50402501510	2.5	4	10	1.5	50

UTE504

4 flutes tapered flat

CARBIDE | 4 | H·A 30° | Grade PC315W | h5 shank

DC	Tolerance
Ø0.8 ~ Ø10	0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	BHTA(°)	LF
UTE	50402501512	2.5	4	12	1.5	50
	50402501516	2.5	4	16	1.5	50
	50402501520	2.5	4	20	1.5	60
	50402501525	2.5	4	25	1.5	60
	50402501530	2.5	6	30	1.5	60
	50402502010	2.5	4	10	2	50
	50402502012	2.5	4	12	2	50
	50402502016	2.5	4	16	2	50
	50402502020	2.5	4	20	2	60
	50402502025	2.5	6	25	2	60
	50402502030	2.5	6	30	2	60
	50402503010	2.5	4	10	3	50
	50402503012	2.5	4	12	3	50
	50402503016	2.5	6	16	3	50
	50402503020	2.5	6	20	3	60
	50402503025	2.5	6	25	3	60
	50402503030	2.5	6	30	3	60
	504030005	3	6	12	0.5	50
	50403001	3	6	12	1	50
	504030015	3	6	12	1.5	50
	50403002	3	6	14	2	50
	50403003	3	6	14	3	50
	50403005	3	6	16	5	50
	50403007	3	8	16	7	50
	50403010	3	10	16	10	50
	504040005	4	6	16	0.5	60
	50404001	4	6	16	1	60
	504040015	4	6	16	1.5	60
	50404002	4	6	16	2	60
	50404003	4	6	19	3	60
	50404005	4	8	22	5	65
	50404007	4	8	16	7	65

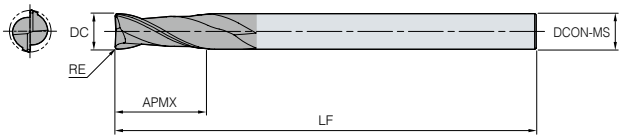
Designation		DC	DCON-MS	APMX	BHTA(°)	LF
UTE	50404010	4	10	17	10	65
	504060005	6	8	20	0.5	65
	50406001	6	8	20	1	65
	504060015	6	8	20	1.5	65
	50406002	6	8	20	2	65
	50406003	6	8	19	3	65
	50406005	6	10	22	5	75
	50406007	6	12	24	7	75
	50406010	6	12	17	10	75
	504070005	7	8	28	0.5	70
	50407001	7	8	28	1	70
	504070015	7	10	28	1.5	70
	50407002	7	10	28	2	80
	50407003	7	10	28	3	80
	50407005	7	12	28	5	80
	504080005	8	10	35	0.5	90
	50408001	8	10	35	1	90
	504080015	8	10	35	1.5	90
	50408002	8	10	28	2	90
	50408003	8	12	38	3	90
	50408005	8	16	45	5	100
	50408007	8	16	32	7	90
	50408010	8	20	34	10	100
	504100005	10	12	40	0.5	90
	50410001	10	12	40	1	90
	504100015	10	12	38	1.5	90
	50410002	10	16	40	2	90
	50410003	10	16	40	3	100
	50410005	10	16	34	5	100
	50410007	10	20	40	7	90
	50410010	10	25	42	10	100

UR502

2 flutes radius

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.2 ~ Ø6	0.000 ~ -0.012
Ø7 ~ Ø20	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LF	RE
UR	502002002	0.2	4	0.4	40	0.02
	502002005	0.2	4	0.4	40	0.05
	502003002	0.3	4	0.6	40	0.02
	502003005	0.3	4	0.6	40	0.05
	502004005	0.4	4	0.8	40	0.05
	50200401	0.4	4	0.8	40	0.1
	502005005	0.5	4	1	40	0.05
	50200501	0.5	4	1	40	0.1
	502006005	0.6	4	1.2	40	0.05
	50200601	0.6	4	1.2	40	0.1
	50200602	0.6	4	1.2	40	0.2
	502007005	0.7	4	1.4	40	0.05
	50200701	0.7	4	1.4	40	0.1
	50200702	0.7	4	1.4	40	0.2
	502008005	0.8	4	1.6	40	0.05
	50200801	0.8	4	1.6	40	0.1
	50200802	0.8	4	1.6	40	0.2
	502009005	0.9	4	1.8	40	0.05
	50200901	0.9	4	1.8	40	0.1
	502010005	1	6	2.5	50	0.05
	50201001	1	6	2.5	50	0.1
	50201002	1	6	2.5	50	0.2
	50201003	1	6	2.5	50	0.3
	502012005	1.2	6	3	50	0.05
	50201201	1.2	6	3	50	0.1
	50201202	1.2	6	3	50	0.2
	50201203	1.2	6	3	50	0.3
	502015005	1.5	6	4	50	0.05
	50201501	1.5	6	4	50	0.1
	50201502	1.5	6	4	50	0.2
	50201503	1.5	6	4	50	0.3
	50201505	1.5	6	4	50	0.5
	50202001	2	6	6	50	0.1
	50202002	2	6	6	50	0.2
	50202003	2	6	6	50	0.3
	50202005	2	6	6	50	0.5
	50202501	2.5	6	7	60	0.1
	50202502	2.5	6	7	60	0.2
	50202503	2.5	6	7	60	0.3

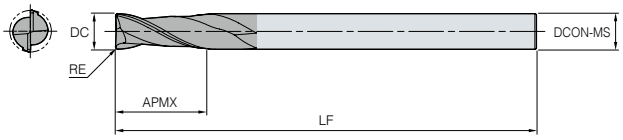
Designation		DC	DCON-MS	APMX	LF	RE
UR	50202505	2.5	6	7	60	0.5
	50203001	3	6	8	60	0.1
	50203002	3	6	8	60	0.2
	50203003	3	6	8	60	0.3
	50203005	3	6	8	60	0.5
	50203010	3	6	8	60	1
	50203501	3.5	6	10	70	0.1
	50203502	3.5	6	10	70	0.2
	50203503	3.5	6	10	70	0.3
	50203505	3.5	6	10	70	0.5
	50204001	4	6	10	70	0.1
	50204001100S4	4	4	10	100	0.1
	50204001S4	4	4	10	70	0.1
	50204002	4	6	10	70	0.2
	50204002100S4	4	4	10	100	0.2
	50204002S4	4	4	10	70	0.2
	50204003	4	6	10	70	0.3
	50204003100S4	4	4	10	100	0.3
	50204003S4	4	4	10	70	0.3
	50204005	4	6	10	70	0.5
	50204005100S4	4	4	10	100	0.5
	50204005S4	4	4	10	70	0.5
	50204010	4	6	10	70	1
	50204010100S4	4	4	10	100	1
	50204010S4	4	4	10	70	1
	50204501	4.5	6	11	80	0.1
	50204502	4.5	6	11	80	0.2
	50204503	4.5	6	11	80	0.3
	50204505	4.5	6	11	80	0.5
	50205001	5	6	13	90	0.1
	50205002	5	6	13	90	0.2
	50205003	5	6	13	90	0.3
	50205005	5	6	13	90	0.5
	50205010	5	6	13	90	1
	50205501	5.5	6	13	90	0.1
	50205502	5.5	6	13	90	0.2
	50205503	5.5	6	13	90	0.3
	50205505	5.5	6	13	90	0.5
	50205510	5.5	6	13	90	1

UR502

2 flutes radius

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.2 ~ Ø6	0.000 ~ -0.012
Ø7 ~ Ø20	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LF	RE
UR	50206001	6	6	15	90	0.1
	50206002	6	6	15	90	0.2
	50206003	6	6	15	90	0.3
	5020600360	6	6	15	60	0.3
	50206005	6	6	15	90	0.5
	50206005110	6	6	15	110	0.5
	50206005130	6	6	15	130	0.5
	5020600560	6	6	15	60	0.5
	50206010	6	6	15	90	1
	50206010110	6	6	15	110	1
	50206010130	6	6	15	130	1
	5020601060	6	6	15	60	1
	50206015	6	6	15	90	1.5
	50206020	6	6	15	90	2
	50207001	7	8	16	90	0.1
	50207002	7	8	16	90	0.2
	50207003	7	8	16	90	0.3
	50207005	7	8	16	90	0.5
	50207010	7	8	16	90	1
	50207020	7	8	16	90	2
	50208001	8	8	20	100	0.1
	50208002	8	8	20	100	0.2
	50208003	8	8	20	100	0.3
	5020800370	8	8	20	70	0.3
	50208005	8	8	20	100	0.5
	50208005120	8	8	20	120	0.5
	50208005150	8	8	20	150	0.5
	5020800570	8	8	20	70	0.5
	50208010	8	8	20	100	1
	50208010120	8	8	20	120	1
	50208010150	8	8	20	150	1
	5020801070	8	8	20	70	1
	50208015	8	8	20	100	1.5
	50208020	8	8	20	100	2
	50208025	8	8	20	100	2.5
	50208030	8	8	20	100	3
	50210001	10	10	25	100	0.1
	50210002	10	10	25	100	0.2
	50210003	10	10	25	100	0.3

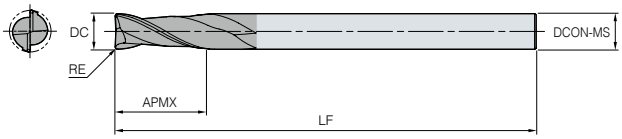
Designation		DC	DCON-MS	APMX	LF	RE
UR	5021000375	10	10	25	75	0.3
	50210005	10	10	25	100	0.5
	50210005130	10	10	25	130	0.5
	50210005150	10	10	25	150	0.5
	5021000575	10	10	25	75	0.5
	50210010	10	10	25	100	1
	50210010130	10	10	25	130	1
	50210010150	10	10	25	150	1
	5021001075	10	10	25	75	1
	50210015	10	10	25	100	1.5
	50210020	10	10	25	100	2
	50210025	10	10	25	100	2.5
	50210030	10	10	25	100	3
	50210040	10	10	25	100	4
	50211002	11	12	25	110	0.2
	50211003	11	12	25	110	0.3
	50211005	11	12	25	110	0.5
	50211010	11	12	25	110	1
	50211020	11	12	25	110	2
	50212001	12	12	30	110	0.1
	50212002	12	12	30	110	0.2
	50212003	12	12	30	110	0.3
	5021200380	12	12	30	80	0.3
	50212005	12	12	30	110	0.5
	50212005130	12	12	30	130	0.5
	50212005150	12	12	30	150	0.5
	5021200580	12	12	30	80	0.5
	50212010	12	12	30	110	1
	50212010130	12	12	30	130	1
	50212010150	12	12	30	150	1
	5021201080	12	12	30	80	1
	50212015	12	12	30	110	1.5
	50212020	12	12	30	110	2
	50212025	12	12	30	110	2.5
	50212030	12	12	30	110	3
	50212040	12	12	30	110	4
	50212050	12	12	30	110	5
	50214005	14	16	30	150	0.5
	50214010	14	16	30	150	1

UR502

2 flutes radius

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.2 ~ Ø6	0.000 ~ -0.012
Ø7 ~ Ø20	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LF	RE
UR	50214020	14	16	30	150	2
	50216005	16	16	32	150	0.5
	50216010	16	16	32	150	1
	50216015	16	16	32	150	1.5
	50216020	16	2	32	150	16
	50210030	16	3	32	150	16

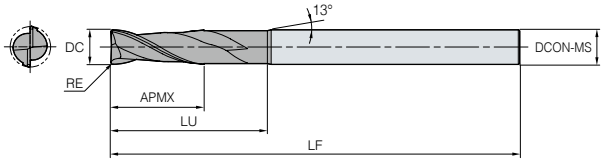
Designation		DC	DCON-MS	APMX	LF	RE
UR	50220005	20	0.5	38	150	20
	50220010	20	1	38	150	20
	50220015	20	1.5	38	150	20
	50220020	20	2	38	150	20
	50220030	20	3	38	150	20

UR512

2 flutes neck type radius

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.2 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø20	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
UR	512002002005	0.2	4	0.3	0.5	40	0.02
	51200200201	0.2	4	0.3	1	40	0.02
	512002002015	0.2	4	0.3	1.5	40	0.02
	51200200202	0.2	4	0.3	2	40	0.02
	512002005005	0.2	4	0.3	0.5	40	0.05
	51200200501	0.2	4	0.3	1	40	0.05
	512002005015	0.2	4	0.3	1.5	40	0.05
	51200200502	0.2	4	0.3	2	40	0.05
	51200300201	0.3	4	0.5	1	40	0.02
	51200300202	0.3	4	0.5	2	40	0.02
	51200300203	0.3	4	0.5	3	40	0.02
	51200300501	0.3	4	0.5	1	40	0.05
	51200300502	0.3	4	0.5	2	40	0.05
	51200300503	0.3	4	0.5	3	40	0.05
	51200400501	0.4	4	0.6	1	40	0.05
	512004005015	0.4	4	0.6	1.5	40	0.05
	51200400502	0.4	4	0.6	2	40	0.05
	512004005025	0.4	4	0.6	2.5	40	0.05
	51200400503	0.4	4	0.6	3	40	0.05
	51200400504	0.4	4	0.6	4	40	0.05
	5120040101	0.4	4	0.6	1	40	0.1
	51200401015	0.4	4	0.6	1.5	40	0.1
	5120040102	0.4	4	0.6	2	40	0.1
	51200401025	0.4	4	0.6	2.5	40	0.1
	5120040103	0.4	4	0.6	3	40	0.1
	5120040104	0.4	4	0.6	4	40	0.1
	51200500501	0.5	4	0.7	1	45	0.05
	512005005015	0.5	4	0.7	1.5	45	0.05
	51200500502	0.5	4	0.7	2	45	0.05
	512005005025	0.5	4	0.7	2.5	45	0.05
	51200500503	0.5	4	0.7	3	45	0.05
	51200500504	0.5	4	0.7	4	45	0.05
	51200500505	0.5	4	0.7	5	45	0.05
	51200500506	0.5	4	0.7	6	45	0.05
	5120050101	0.5	4	0.7	1	45	0.1
	51200501015	0.5	4	0.7	1.5	45	0.1
	5120050102	0.5	4	0.7	2	45	0.1
	51200501025	0.5	4	0.7	2.5	45	0.1

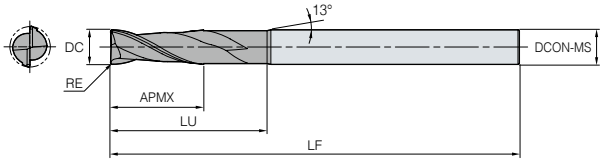
Designation		DC	DCON-MS	APMX	LU	LF	RE
UR	5120050103	0.5	4	0.7	3	45	0.1
	5120050104	0.5	4	0.7	4	45	0.1
	5120050105	0.5	4	0.7	5	45	0.1
	5120050106	0.5	4	0.7	6	45	0.1
	51200600502	0.6	4	0.9	2	45	0.05
	51200600503	0.6	4	0.9	3	45	0.05
	51200600504	0.6	4	0.9	4	45	0.05
	51200600506	0.6	4	0.9	6	45	0.05
	51200600508	0.6	4	0.9	8	45	0.05
	51200600510	0.6	4	0.9	10	45	0.05
	5120060102	0.6	4	0.9	2	45	0.1
	5120060103	0.6	4	0.9	3	45	0.1
	5120060104	0.6	4	0.9	4	45	0.1
	5120060106	0.6	4	0.9	6	45	0.1
	5120060108	0.6	4	0.9	8	45	0.1
	5120060110	0.6	4	0.9	10	45	0.1
	5120060202	0.6	4	0.9	2	45	0.2
	5120060203	0.6	4	0.9	3	45	0.2
	5120060204	0.6	4	0.9	4	45	0.2
	5120060206	0.6	4	0.9	6	45	0.2
	5120060208	0.6	4	0.9	8	45	0.2
	5120060210	0.6	4	0.9	10	45	0.2
	51200700502	0.7	4	1.2	2	45	0.05
	51200700504	0.7	4	1.2	4	45	0.05
	51200700506	0.7	4	1.2	6	45	0.05
	51200700508	0.7	4	1.2	8	45	0.05
	51200700510	0.7	4	1.2	10	45	0.05
	5120070102	0.7	4	1.2	2	45	0.1
	5120070104	0.7	4	1.2	4	45	0.1
	5120070106	0.7	4	1.2	6	45	0.1
	5120070108	0.7	4	1.2	8	45	0.1
	5120070110	0.7	4	1.2	10	45	0.1
	5120070202	0.7	4	1.2	2	45	0.2
	5120070204	0.7	4	1.2	4	45	0.2
	5120070206	0.7	4	1.2	6	45	0.2
	5120070208	0.7	4	1.2	8	45	0.2
	5120070210	0.7	4	1.2	10	45	0.2
	51200800502	0.8	4	1.2	2	45	0.05

UR512

2 flutes neck type radius

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.2 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø20	0.000 ~ -0.015



(mm)

	Designation	DC	DCON-MS	APMX	LU	LF	RE
UR	51200800503	0.8	4	1.2	3	45	0.05
	51200800504	0.8	4	1.2	4	45	0.05
	51200800506	0.8	4	1.2	6	45	0.05
	51200800508	0.8	4	1.2	8	45	0.05
	51200800510	0.8	4	1.2	10	45	0.05
	5120080102	0.8	4	1.2	2	45	0.1
	5120080103	0.8	4	1.2	3	45	0.1
	5120080104	0.8	4	1.2	4	45	0.1
	5120080106	0.8	4	1.2	6	45	0.1
	5120080108	0.8	4	1.2	8	45	0.1
	5120080110	0.8	4	1.2	10	45	0.1
	5120080202	0.8	4	1.2	2	45	0.2
	5120080203	0.8	4	1.2	3	45	0.2
	5120080204	0.8	4	1.2	4	45	0.2
	5120080206	0.8	4	1.2	6	45	0.2
	5120080208	0.8	4	1.2	8	45	0.2
	5120080210	0.8	4	1.2	10	45	0.2
	51201000503	1	4	1.5	3	50	0.05
	51201000504	1	4	1.5	4	50	0.05
	51201000506	1	4	1.5	6	50	0.05
	51201000508	1	4	1.5	8	50	0.05
	51201000510	1	4	1.5	10	50	0.05
	51201000512	1	4	1.5	12	50	0.05
	51201000514	1	4	1.5	14	50	0.05
	51201000516	1	4	1.5	16	50	0.05
	51201000520	1	4	1.5	20	50	0.05
	5120100103	1	4	1.5	3	50	0.1
	5120100104	1	4	1.5	4	50	0.1
	5120100106	1	4	1.5	6	50	0.1
	5120100108	1	4	1.5	8	50	0.1
	5120100110	1	4	1.5	10	50	0.1
	5120100112	1	4	1.5	12	50	0.1
	5120100114	1	4	1.5	14	50	0.1
	5120100116	1	4	1.5	16	50	0.1
	5120100120	1	4	1.5	20	50	0.1
	5120100203	1	4	1.5	3	50	0.2
	5120100204	1	4	1.5	4	50	0.2
	5120100206	1	4	1.5	6	50	0.2

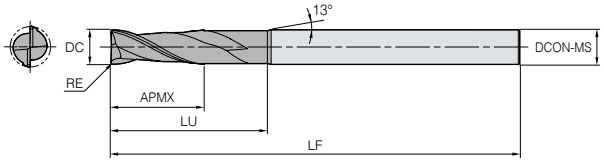
	Designation	DC	DCON-MS	APMX	LU	LF	RE
UR	5120100208	1	4	1.5	8	50	0.2
	5120100210	1	4	1.5	10	50	0.2
	5120100212	1	4	1.5	12	50	0.2
	5120100214	1	4	1.5	14	50	0.2
	5120100216	1	4	1.5	16	50	0.2
	5120100220	1	4	1.5	20	50	0.2
	5120100303	1	4	1.5	3	50	0.3
	5120100304	1	4	1.5	4	50	0.3
	5120100306	1	4	1.5	6	50	0.3
	5120100308	1	4	1.5	8	50	0.3
	5120100310	1	4	1.5	10	50	0.3
	5120100312	1	4	1.5	12	50	0.3
	5120100314	1	4	1.5	14	50	0.3
	5120100316	1	4	1.5	16	50	0.3
	5120100320	1	4	1.5	20	50	0.3
	51201200503	1.2	4	1.8	3	50	0.05
	51201200504	1.2	4	1.8	4	50	0.05
	51201200506	1.2	4	1.8	6	50	0.05
	51201200508	1.2	4	1.8	8	50	0.05
	51201200510	1.2	4	1.8	10	50	0.05
	51201200512	1.2	4	1.8	12	50	0.05
	51201200516	1.2	4	1.8	16	50	0.05
	51201200520	1.2	4	1.8	20	50	0.05
	5120120103	1.2	4	1.8	3	50	0.1
	5120120104	1.2	4	1.8	4	50	0.1
	5120120106	1.2	4	1.8	6	50	0.1
	5120120108	1.2	4	1.8	8	50	0.1
	5120120110	1.2	4	1.8	10	50	0.1
	5120120112	1.2	4	1.8	12	50	0.1
	5120120116	1.2	4	1.8	16	50	0.1
	5120120120	1.2	4	1.8	20	50	0.1
	5120120203	1.2	4	1.8	3	50	0.2
	5120120204	1.2	4	1.8	4	50	0.2
	5120120206	1.2	4	1.8	6	50	0.2
	5120120208	1.2	4	1.8	8	50	0.2
	5120120210	1.2	4	1.8	10	50	0.2
	5120120212	1.2	4	1.8	12	50	0.2
	5120120216	1.2	4	1.8	16	50	0.2

UR512

2 flutes neck type radius

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.2 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø20	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
UR	5120120220	1.2	4	1.8	20	50	0.2
	5120120303	1.2	4	1.8	3	50	0.3
	5120120304	1.2	4	1.8	4	50	0.3
	5120120306	1.2	4	1.8	6	50	0.3
	5120120308	1.2	4	1.8	8	50	0.3
	5120120310	1.2	4	1.8	10	50	0.3
	5120120312	1.2	4	1.8	12	50	0.3
	5120120316	1.2	4	1.8	16	50	0.3
	5120120320	1.2	4	1.8	20	50	0.3
	51201500504	1.5	4	2.3	4	50	0.05
	51201500506	1.5	4	2.3	6	50	0.05
	51201500508	1.5	4	2.3	8	50	0.05
	51201500510	1.5	4	2.3	10	50	0.05
	51201500512	1.5	4	2.3	12	50	0.05
	51201500514	1.5	4	2.3	14	50	0.05
	51201500516	1.5	4	2.3	16	50	0.05
	51201500520	1.5	4	2.3	20	50	0.05
	51201500522	1.5	4	2.3	22	60	0.05
	51201500526	1.5	4	2.3	26	60	0.05
	5120150104	1.5	4	2.3	4	50	0.1
	5120150106	1.5	4	2.3	6	50	0.1
	5120150108	1.5	4	2.3	8	50	0.1
	5120150110	1.5	4	2.3	10	50	0.1
	5120150112	1.5	4	2.3	12	50	0.1
	5120150114	1.5	4	2.3	14	50	0.1
	5120150116	1.5	4	2.3	16	50	0.1
	5120150120	1.5	4	2.3	20	50	0.1
	5120150122	1.5	4	2.3	22	60	0.1
	5120150126	1.5	4	2.3	26	60	0.1
	5120150204	1.5	4	2.3	4	50	0.2
	5120150206	1.5	4	2.3	6	50	0.2
	5120150208	1.5	4	2.3	8	50	0.2
	5120150210	1.5	4	2.3	10	50	0.2
	5120150212	1.5	4	2.3	12	50	0.2
	5120150214	1.5	4	2.3	14	50	0.2
	5120150216	1.5	4	2.3	16	50	0.2
	5120150220	1.5	4	2.3	20	50	0.2
	5120150222	1.5	4	2.3	22	60	0.2

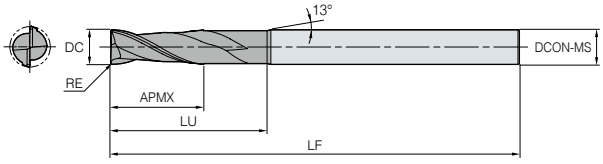
Designation		DC	DCON-MS	APMX	LU	LF	RE
UR	5120150226	1.5	4	2.3	26	60	0.2
	5120150304	1.5	4	2.3	4	50	0.3
	5120150306	1.5	4	2.3	6	50	0.3
	5120150308	1.5	4	2.3	8	50	0.3
	5120150310	1.5	4	2.3	10	50	0.3
	5120150312	1.5	4	2.3	12	50	0.3
	5120150314	1.5	4	2.3	14	50	0.3
	5120150316	1.5	4	2.3	16	50	0.3
	5120150320	1.5	4	2.3	20	50	0.3
	5120150322	1.5	4	2.3	22	60	0.3
	5120150326	1.5	4	2.3	26	60	0.3
	5120150504	1.5	4	2.3	4	50	0.5
	5120150506	1.5	4	2.3	6	50	0.5
	5120150508	1.5	4	2.3	8	50	0.5
	5120150510	1.5	4	2.3	10	50	0.5
	5120150512	1.5	4	2.3	12	50	0.5
	5120150514	1.5	4	2.3	14	50	0.5
	5120150516	1.5	4	2.3	16	50	0.5
	5120150520	1.5	4	2.3	20	50	0.5
	5120150522	1.5	4	2.3	22	60	0.5
	5120150526	1.5	4	2.3	26	60	0.5
	5120200106	2	4	3	6	50	0.1
	5120200108	2	4	3	8	50	0.1
	5120200110	2	4	3	10	50	0.1
	5120200112	2	4	3	12	50	0.1
	5120200114	2	4	3	14	50	0.1
	5120200116	2	4	3	16	50	0.1
	5120200120	2	4	3	20	50	0.1
	5120200122	2	4	3	22	60	0.1
	5120200126	2	4	3	26	60	0.1
	5120200130	2	4	3	30	70	0.1
	5120200206	2	4	3	6	50	0.2
	5120200208	2	4	3	8	50	0.2
	5120200210	2	4	3	10	50	0.2
	5120200212	2	4	3	12	50	0.2
	5120200214	2	4	3	14	50	0.2
	5120200216	2	4	3	16	50	0.2
	5120200220	2	4	3	20	50	0.2

UR512

2 flutes neck type radius

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.2 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø20	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
UR	5120200222	2	4	3	22	60	0.2
	5120200226	2	4	3	26	60	0.2
	5120200230	2	4	3	30	70	0.2
	5120200306	2	4	3	6	50	0.3
	5120200308	2	4	3	8	50	0.3
	5120200310	2	4	3	10	50	0.3
	5120200312	2	4	3	12	50	0.3
	5120200314	2	4	3	14	50	0.3
	5120200316	2	4	3	16	50	0.3
	5120200320	2	4	3	20	50	0.3
	5120200322	2	4	3	22	60	0.3
	5120200326	2	4	3	26	60	0.3
	5120200330	2	4	3	30	70	0.3
	5120200506	2	4	3	6	50	0.5
	5120200508	2	4	3	8	50	0.5
	5120200510	2	4	3	10	50	0.5
	5120200512	2	4	3	12	50	0.5
	5120200514	2	4	3	14	50	0.5
	5120200516	2	4	3	16	50	0.5
	5120200520	2	4	3	20	50	0.5
	5120200522	2	4	3	22	60	0.5
	5120200526	2	4	3	26	60	0.5
	5120200530	2	4	3	30	70	0.5
	5120250108	2.5	4	4	8	50	0.1
	5120250110	2.5	4	4	10	50	0.1
	5120250112	2.5	4	4	12	50	0.1
	5120250114	2.5	4	4	14	50	0.1
	5120250116	2.5	4	4	16	50	0.1
	5120250120	2.5	4	4	20	50	0.1
	5120250126	2.5	4	4	26	60	0.1
	5120250130	2.5	4	4	30	70	0.1
	5120250208	2.5	4	4	8	50	0.2
	5120250210	2.5	4	4	10	50	0.2
	5120250212	2.5	4	4	12	50	0.2
	5120250214	2.5	4	4	14	50	0.2
	5120250216	2.5	4	4	16	50	0.2
	5120250220	2.5	4	4	20	50	0.2
	5120250226	2.5	4	4	26	60	0.2

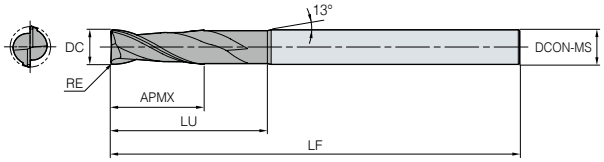
Designation		DC	DCON-MS	APMX	LU	LF	RE
UR	5120250230	2.5	4	4	30	70	0.2
	5120250308	2.5	4	4	8	50	0.3
	5120250310	2.5	4	4	10	50	0.3
	5120250312	2.5	4	4	12	50	0.3
	5120250314	2.5	4	4	14	50	0.3
	5120250316	2.5	4	4	16	50	0.3
	5120250320	2.5	4	4	20	50	0.3
	5120250326	2.5	4	4	26	60	0.3
	5120250330	2.5	4	4	30	70	0.3
	5120250508	2.5	4	4	8	50	0.5
	5120250510	2.5	4	4	10	50	0.5
	5120250512	2.5	4	4	12	50	0.5
	5120250514	2.5	4	4	14	50	0.5
	5120250516	2.5	4	4	16	50	0.5
	5120250520	2.5	4	4	20	50	0.5
	5120250526	2.5	4	4	26	60	0.5
	5120250530	2.5	4	4	30	70	0.5
	5120300108	3	6	4.5	8	50	0.1
	5120300110	3	6	4.5	10	50	0.1
	5120300112	3	6	4.5	12	50	0.1
	5120300114	3	6	4.5	14	60	0.1
	5120300116	3	6	4.5	16	60	0.1
	5120300120	3	6	4.5	20	60	0.1
	5120300126	3	6	4.5	26	65	0.1
	5120300130	3	6	4.5	30	70	0.1
	5120300135	3	6	4.5	35	70	0.1
	5120300140	3	6	4.5	40	80	0.1
	5120300208	3	6	4.5	8	50	0.2
	5120300210	3	6	4.5	10	50	0.2
	5120300212	3	6	4.5	12	50	0.2
	5120300214	3	6	4.5	14	60	0.2
	5120300216	3	6	4.5	16	60	0.2
	5120300220	3	6	4.5	20	60	0.2
	5120300226	3	6	4.5	26	65	0.2
	5120300230	3	6	4.5	30	70	0.2
	5120300235	3	6	4.5	35	70	0.2
	5120300240	3	6	4.5	40	80	0.2
	5120300308	3	6	4.5	8	50	0.3

UR512

2 flutes neck type radius

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.2 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø20	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
UR	5120300310	3	6	4.5	10	50	0.3
	5120300312	3	6	4.5	12	50	0.3
	5120300314	3	6	4.5	14	60	0.3
	5120300316	3	6	4.5	16	60	0.3
	5120300320	3	6	4.5	20	60	0.3
	5120300326	3	6	4.5	26	65	0.3
	5120300330	3	6	4.5	30	70	0.3
	5120300335	3	6	4.5	35	70	0.3
	5120300340	3	6	4.5	40	80	0.3
	5120300508	3	6	4.5	8	50	0.5
	5120300510	3	6	4.5	10	50	0.5
	5120300512	3	6	4.5	12	50	0.5
	5120300514	3	6	4.5	14	60	0.5
	5120300516	3	6	4.5	16	60	0.5
	5120300520	3	6	4.5	20	60	0.5
	5120300526	3	6	4.5	26	65	0.5
	5120300530	3	6	4.5	30	70	0.5
	5120300535	3	6	4.5	35	70	0.5
	5120300540	3	6	4.5	40	80	0.5
	5120301008	3	6	4.5	8	50	1
	5120301010	3	6	4.5	10	50	1
	5120301012	3	6	4.5	12	50	1
	5120301014	3	6	4.5	14	60	1
	5120301016	3	6	4.5	16	60	1
	5120301020	3	6	4.5	20	60	1
	5120301026	3	6	4.5	26	65	1
	5120301030	3	6	4.5	30	70	1
	5120301035	3	6	4.5	35	70	1
	5120301040	3	6	4.5	40	80	1
	5120400110	4	6	6	10	50	0.1
	5120400112	4	6	6	12	50	0.1
	5120400114	4	6	6	14	60	0.1
	5120400116	4	6	6	16	60	0.1
	5120400120	4	6	6	20	60	0.1
	5120400126	4	6	6	26	65	0.1
	5120400130	4	6	6	30	65	0.1
	5120400135	4	6	6	35	70	0.1
	5120400140	4	6	6	40	80	0.1

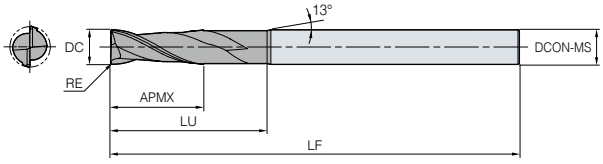
Designation		DC	DCON-MS	APMX	LU	LF	RE
UR	5120400145	4	6	6	45	90	0.1
	5120400150	4	6	6	50	100	0.1
	5120400210	4	6	6	10	50	0.2
	5120400212	4	6	6	12	50	0.2
	5120400214	4	6	6	14	60	0.2
	5120400216	4	6	6	16	60	0.2
	5120400220	4	6	6	20	60	0.2
	5120400226	4	6	6	26	65	0.2
	5120400230	4	6	6	30	65	0.2
	5120400235	4	6	6	35	70	0.2
	5120400240	4	6	6	40	80	0.2
	5120400245	4	6	6	45	90	0.2
	5120400250	4	6	6	50	100	0.2
	5120400310	4	6	6	10	50	0.3
	5120400312	4	6	6	12	50	0.3
	5120400314	4	6	6	14	60	0.3
	5120400316	4	6	6	16	60	0.3
	5120400320	4	6	6	20	60	0.3
	5120400326	4	6	6	26	65	0.3
	5120400330	4	6	6	30	65	0.3
	5120400335	4	6	6	35	70	0.3
	5120400340	4	6	6	40	80	0.3
	5120400345	4	6	6	45	90	0.3
	5120400350	4	6	6	50	100	0.3
	5120400510	4	6	6	10	50	0.5
	5120400512	4	6	6	12	50	0.5
	5120400514	4	6	6	14	60	0.5
	5120400516	4	6	6	16	60	0.5
	5120400520	4	6	6	20	60	0.5
	5120400526	4	6	6	26	65	0.5
	5120400530	4	6	6	30	65	0.5
	5120400535	4	6	6	35	70	0.5
	5120400540	4	6	6	40	80	0.5
	5120400545	4	6	6	45	90	0.5
	5120400550	4	6	6	50	100	0.5
	5120401010	4	6	6	10	50	1
	5120401012	4	6	6	12	50	1
	5120401014	4	6	6	14	60	1

UR512

2 flutes neck type radius

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01 (DC6 or below) | RE ±0.015 (Above DC6)

DC	Tolerance
Ø0.2 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø20	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
UR	5120401016	4	6	6	16	60	1
	5120401020	4	6	6	20	60	1
	5120401026	4	6	6	26	65	1
	5120401030	4	6	6	30	65	1
	5120401035	4	6	6	35	70	1
	5120401040	4	6	6	40	80	1
	5120401045	4	6	6	45	90	1
	5120401050	4	6	6	50	100	1
	51205001	5	6	8	15	60	0.1
	51205002	5	6	8	15	60	0.2
	51205003	5	6	8	15	60	0.3
	51205005	5	6	8	15	60	0.5
	51205010	5	6	8	15	60	1
	51205015	5	6	8	15	60	1.5
	51205020	5	6	8	15	60	2
	51206001	6	6	9	20	60	0.1
	51206002	6	6	9	20	60	0.2
	51206003	6	6	9	20	60	0.3
	5120600390	6	6	15	30	90	0.3
	51206005	6	6	9	20	60	0.5
	5120600590	6	6	15	30	90	0.5
	51206010	6	6	9	20	60	1
	5120601090	6	6	15	30	90	1
	51206015	6	6	9	20	60	1.5
	51206020	6	6	9	20	60	2
	51208001	8	8	12	25	70	0.1
	51208002	8	8	12	25	70	0.2
	51208003	8	8	12	25	70	0.3
	51208003100	8	8	20	35	100	0.3
	51208005	8	8	12	25	70	0.5
	51208005100	8	8	20	35	100	0.5

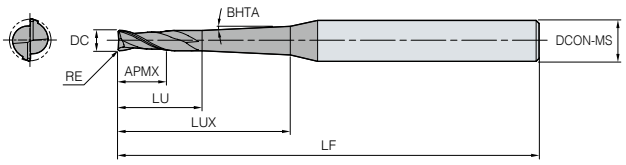
Designation		DC	DCON-MS	APMX	LU	LF	RE
UR	51208010	8	8	12	25	70	1
	51208010100	8	8	20	35	100	1
	51208015	8	8	12	25	70	1.5
	51208020	8	8	12	25	70	2
	51210001	10	10	15	30	75	0.1
	51210002	10	10	15	30	75	0.2
	51210003	10	10	15	30	75	0.3
	51210003100	10	10	25	40	100	0.3
	51210005	10	10	15	30	75	0.5
	51210005100	10	10	25	40	100	0.5
	51210010	10	10	15	30	75	1
	51210010100	10	10	25	40	100	1
	51210015	10	10	15	30	75	1.5
	51210020	10	10	15	30	75	2
	51212002	12	12	18	32	80	0.2
	51212003	12	12	18	32	80	0.3
	51212003110	12	12	30	45	110	0.3
	51212005	12	12	18	32	80	0.5
	51212005110	12	12	30	45	110	0.5
	51212010	12	12	18	32	80	1
	51212010110	12	12	30	45	110	1
	51212015	12	12	18	32	80	1.5
	51212020	12	12	18	32	80	2
	51216005	16	16	20	35	100	0.5
	51216005150	16	16	35	50	150	0.5
	51216010	16	16	20	35	100	1
	51216010150	16	16	35	50	150	1
	51220005	20	20	25	40	100	0.5
	51220005150	20	20	40	55	150	0.5
	51220010	20	20	25	40	100	1
	51220010150	20	20	40	55	150	1

UR542

2 flutes tapered neck

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01

DC	Tolerance
Ø0.2 ~ Ø4	0.000 ~ -0.012



(mm)

Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UR	5420020050101	0.2	4	0.3	0.4	1	40	1	0.05
	5420020050102	0.2	4	0.3	0.4	2	40	1	0.05
	5420020050103	0.2	4	0.3	0.4	3	40	1	0.05
	5420020050201	0.2	4	0.3	0.4	1	40	2	0.05
	5420020050202	0.2	4	0.3	0.4	2	40	2	0.05
	5420020050203	0.2	4	0.3	0.4	3	40	2	0.05
	5420030050102	0.3	4	0.5	0.6	2	40	1	0.05
	5420030050103	0.3	4	0.5	0.6	3	40	1	0.05
	5420030050104	0.3	4	0.5	0.6	4	40	1	0.05
	5420030050105	0.3	4	0.5	0.6	5	40	1	0.05
	5420030050202	0.3	4	0.5	0.6	2	40	2	0.05
	5420030050203	0.3	4	0.5	0.6	3	40	2	0.05
	5420030050204	0.3	4	0.5	0.6	4	40	2	0.05
	5420030050205	0.3	4	0.5	0.6	5	40	2	0.05
	5420040050102	0.4	4	0.6	0.8	2	50	1	0.05
	5420040050103	0.4	4	0.6	0.8	3	50	1	0.05
	5420040050104	0.4	4	0.6	0.8	4	50	1	0.05
	5420040050105	0.4	4	0.6	0.8	5	50	1	0.05
	5420040050106	0.4	4	0.6	0.8	6	50	1	0.05
	5420040050202	0.4	4	0.6	0.8	2	50	2	0.05
	5420040050203	0.4	4	0.6	0.8	3	50	2	0.05
	5420040050204	0.4	4	0.6	0.8	4	50	2	0.05
	5420040050205	0.4	4	0.6	0.8	5	50	2	0.05
	5420040050206	0.4	4	0.6	0.8	6	50	2	0.05
	542004010102	0.4	4	0.6	0.8	2	50	1	0.1
	542004010103	0.4	4	0.6	0.8	3	50	1	0.1
	542004010104	0.4	4	0.6	0.8	4	50	1	0.1
	542004010105	0.4	4	0.6	0.8	5	50	1	0.1
	542004010106	0.4	4	0.6	0.8	6	50	1	0.1
	542004010202	0.4	4	0.6	0.8	2	50	2	0.1
	542004010203	0.4	4	0.6	0.8	3	50	2	0.1
	542004010204	0.4	4	0.6	0.8	4	50	2	0.1
	542004010205	0.4	4	0.6	0.8	5	50	2	0.1

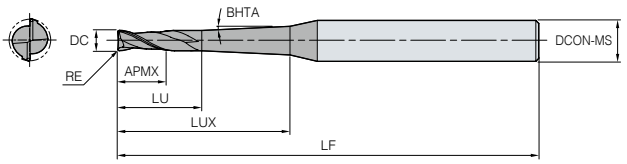
Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UR	542004010206	0.4	4	0.6	0.8	6	50	2	0.1
	5420050050104	0.5	4	0.7	1	4	50	1	0.05
	5420050050106	0.5	4	0.7	1	6	50	1	0.05
	5420050050108	0.5	4	0.7	1	8	50	1	0.05
	5420050050110	0.5	4	0.7	1	10	50	1	0.05
	5420050050204	0.5	4	0.7	1	4	50	2	0.05
	5420050050206	0.5	4	0.7	1	6	50	2	0.05
	5420050050208	0.5	4	0.7	1	8	50	2	0.05
	5420050050210	0.5	4	0.7	1	10	50	2	0.05
	542005010104	0.5	4	0.7	1	4	50	1	0.1
	542005010106	0.5	4	0.7	1	6	50	1	0.1
	542005010108	0.5	4	0.7	1	8	50	1	0.1
	542005010110	0.5	4	0.7	1	10	50	1	0.1
	542005010204	0.5	4	0.7	1	4	50	2	0.1
	542005010206	0.5	4	0.7	1	6	50	2	0.1
	542005010208	0.5	4	0.7	1	8	50	2	0.1
	542005010210	0.5	4	0.7	1	10	50	2	0.1
	542006010104	0.6	4	0.9	1.2	4	50	1	0.1
	542006010106	0.6	4	0.9	1.2	6	50	1	0.1
	542006010108	0.6	4	0.9	1.2	8	50	1	0.1
	542006010110	0.6	4	0.9	1.2	10	50	1	0.1
	542006010112	0.6	4	0.9	1.2	12	50	1	0.1
	542006010204	0.6	4	0.9	1.2	4	50	2	0.1
	542006010206	0.6	4	0.9	1.2	6	50	2	0.1
	542006010208	0.6	4	0.9	1.2	8	50	2	0.1
	542006010210	0.6	4	0.9	1.2	10	50	2	0.1
	542006010212	0.6	4	0.9	1.2	12	50	2	0.1
	542006020104	0.6	4	0.9	1.2	4	50	1	0.2
	542006020106	0.6	4	0.9	1.2	6	50	1	0.2
	542006020108	0.6	4	0.9	1.2	8	50	1	0.2
	542006020110	0.6	4	0.9	1.2	10	50	1	0.2
	542006020112	0.6	4	0.9	1.2	12	50	1	0.2
	542006020204	0.6	4	0.9	1.2	4	50	2	0.2

UR542

2 flutes tapered neck

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01

DC	Tolerance
Ø0.2 ~ Ø4	0.000 ~ -0.012



(mm)

Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UR	542006020206	0.6	4	0.9	1.2	6	50	2	0.2
	542006020208	0.6	4	0.9	1.2	8	50	2	0.2
	542006020210	0.6	4	0.9	1.2	10	50	2	0.2
	542006020212	0.6	4	0.9	1.2	12	50	2	0.2
	542008010104	0.8	4	1.2	1.6	4	50	1	0.1
	542008010106	0.8	4	1.2	1.6	6	50	1	0.1
	542008010108	0.8	4	1.2	1.6	8	50	1	0.1
	542008010110	0.8	4	1.2	1.6	10	50	1	0.1
	542008010112	0.8	4	1.2	1.6	12	50	1	0.1
	542008010116	0.8	4	1.2	1.6	16	50	1	0.1
	542008010204	0.8	4	1.2	1.6	4	50	2	0.1
	542008010206	0.8	4	1.2	1.6	6	50	2	0.1
	542008010208	0.8	4	1.2	1.6	8	50	2	0.1
	542008010210	0.8	4	1.2	1.6	10	50	2	0.1
	542008010212	0.8	4	1.2	1.6	12	50	2	0.1
	542008010216	0.8	4	1.2	1.6	16	50	2	0.1
	542008020104	0.8	4	1.2	1.6	4	50	1	0.2
	542008020106	0.8	4	1.2	1.6	6	50	1	0.2
	542008020108	0.8	4	1.2	1.6	8	50	1	0.2
	542008020110	0.8	4	1.2	1.6	10	50	1	0.2
	542008020112	0.8	4	1.2	1.6	12	50	1	0.2
	542008020116	0.8	4	1.2	1.6	16	50	1	0.2
	542008020204	0.8	4	1.2	1.6	4	50	2	0.2
	542008020206	0.8	4	1.2	1.6	6	50	2	0.2
	542008020208	0.8	4	1.2	1.6	8	50	2	0.2
	542008020210	0.8	4	1.2	1.6	10	50	2	0.2
	542008020212	0.8	4	1.2	1.6	12	50	2	0.2
	542008020216	0.8	4	1.2	1.6	16	50	2	0.2
	542010010106	1	4	1.5	2.5	6	50	1	0.1
	542010010108	1	4	1.5	2.5	8	50	1	0.1
	542010010110	1	4	1.5	2.5	10	50	1	0.1
	542010010112	1	4	1.5	2.5	12	50	1	0.1
	542010010116	1	4	1.5	2.5	16	50	1	0.1

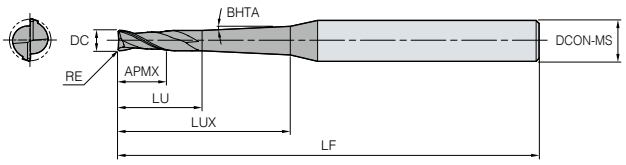
Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UR	542010010120	1	4	1.5	2.5	20	50	1	0.1
	542010010125	1	4	1.5	2.5	25	60	1	0.1
	542010010130	1	4	1.5	2.5	30	70	1	0.1
	542010010140	1	4	1.5	2.5	40	80	1	0.1
	542010010150	1	6	1.5	2.5	50	90	1	0.1
	542010010206	1	4	1.5	2.5	6	50	2	0.1
	542010010208	1	4	1.5	2.5	8	50	2	0.1
	542010010210	1	4	1.5	2.5	10	50	2	0.1
	542010010212	1	4	1.5	2.5	12	50	2	0.1
	542010010216	1	4	1.5	2.5	16	50	2	0.1
	542010010220	1	4	1.5	2.5	20	50	2	0.1
	542010010225	1	4	1.5	2.5	25	60	2	0.1
	542010010230	1	4	1.5	2.5	30	70	2	0.1
	542010010240	1	4	1.5	2.5	40	80	2	0.1
	542010010250	1	6	1.5	2.5	50	90	2	0.1
	542010020106	1	4	1.5	2.5	6	50	1	0.2
	542010020108	1	4	1.5	2.5	8	50	1	0.2
	542010020110	1	4	1.5	2.5	10	50	1	0.2
	542010020112	1	4	1.5	2.5	12	50	1	0.2
	542010020116	1	4	1.5	2.5	16	50	1	0.2
	542010020120	1	4	1.5	2.5	20	50	1	0.2
	542010020125	1	4	1.5	2.5	25	60	1	0.2
	542010020130	1	4	1.5	2.5	30	70	1	0.2
	542010020140	1	4	1.5	2.5	40	80	1	0.2
	542010020150	1	6	1.5	2.5	50	90	1	0.2
	542010020206	1	4	1.5	2.5	6	50	2	0.2
	542010020208	1	4	1.5	2.5	8	50	2	0.2
	542010020210	1	4	1.5	2.5	10	50	2	0.2
	542010020212	1	4	1.5	2.5	12	50	2	0.2
	542010020216	1	4	1.5	2.5	16	50	2	0.2
	542010020220	1	4	1.5	2.5	20	50	2	0.2
	542010020225	1	4	1.5	2.5	25	60	2	0.2
	542010020230	1	4	1.5	2.5	30	70	2	0.2

UR542

2 flutes tapered neck

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01

DC	Tolerance
Ø0.2 ~ Ø4	0.000 ~ -0.012



(mm)

	Designation	DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UR	542010020240	1	4	1.5	2.5	40	80	2	0.2
	542010020250	1	6	1.5	2.5	50	90	2	0.2
	542012010108	1.2	4	1.8	3	8	50	1	0.1
	542012010112	1.2	4	1.8	3	12	50	1	0.1
	542012010116	1.2	4	1.8	3	16	50	1	0.1
	542012010120	1.2	4	1.8	3	20	50	1	0.1
	542012010125	1.2	4	1.8	3	25	60	1	0.1
	542012010130	1.2	4	1.8	3	30	70	1	0.1
	542012010208	1.2	4	1.8	3	8	50	2	0.1
	542012010212	1.2	4	1.8	3	12	50	2	0.1
	542012010216	1.2	4	1.8	3	16	50	2	0.1
	542012010220	1.2	4	1.8	3	20	50	2	0.1
	542012010225	1.2	4	1.8	3	25	60	2	0.1
	542012010230	1.2	4	1.8	3	30	70	2	0.1
	542012020108	1.2	4	1.8	3	8	50	1	0.2
	542012020112	1.2	4	1.8	3	12	50	1	0.2
	542012020116	1.2	4	1.8	3	16	50	1	0.2
	542012020120	1.2	4	1.8	3	20	50	1	0.2
	542012020125	1.2	4	1.8	3	25	60	1	0.2
	542012020130	1.2	4	1.8	3	30	70	1	0.2
	542012020208	1.2	4	1.8	3	8	50	2	0.2
	542012020212	1.2	4	1.8	3	12	50	2	0.2
	542012020216	1.2	4	1.8	3	16	50	2	0.2
	542012020220	1.2	4	1.8	3	20	50	2	0.2
	542012020225	1.2	4	1.8	3	25	60	2	0.2
	542012020230	1.2	4	1.8	3	30	70	2	0.2
	542015010108	1.5	4	2.3	3	8	50	1	0.1
	542015010110	1.5	4	2.3	3	10	50	1	0.1
	542015010112	1.5	4	2.3	3	12	50	1	0.1
	542015010116	1.5	4	2.3	3	16	50	1	0.1
	542015010120	1.5	4	2.3	3	20	50	1	0.1
	542015010125	1.5	4	2.3	3	25	60	1	0.1
	542015010130	1.5	4	2.3	3	30	70	1	0.1

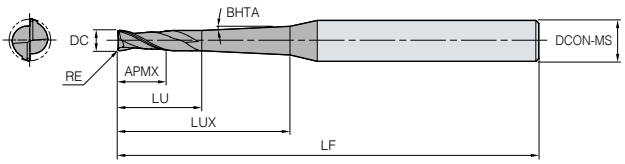
	Designation	DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UR	542015010140	1.5	4	2.3	3	40	80	1	0.1
	542015010150	1.5	4	2.3	3	50	90	1	0.1
	542015010208	1.5	4	2.3	3	8	50	2	0.1
	542015010210	1.5	4	2.3	3	10	50	2	0.1
	542015010212	1.5	4	2.3	3	12	50	2	0.1
	542015010216	1.5	4	2.3	3	16	50	2	0.1
	542015010220	1.5	4	2.3	3	20	50	2	0.1
	542015010225	1.5	4	2.3	3	25	60	2	0.1
	542015010230	1.5	4	2.3	3	30	70	2	0.1
	542015010240	1.5	6	2.3	3	40	80	2	0.1
	542015010250	1.5	6	2.3	3	50	90	2	0.1
	542015020108	1.5	4	2.3	3	8	50	1	0.2
	542015020110	1.5	4	2.3	3	10	50	1	0.2
	542015020112	1.5	4	2.3	3	12	50	1	0.2
	542015020116	1.5	4	2.3	3	16	50	1	0.2
	542015020120	1.5	4	2.3	3	20	50	1	0.2
	542015020125	1.5	4	2.3	3	25	60	1	0.2
	542015020130	1.5	4	2.3	3	30	70	1	0.2
	542015020140	1.5	4	2.3	3	40	80	1	0.2
	542015020150	1.5	4	2.3	3	50	90	1	0.2
	542015020208	1.5	4	2.3	3	8	50	2	0.2
	542015020210	1.5	4	2.3	3	10	50	2	0.2
	542015020212	1.5	4	2.3	3	12	50	2	0.2
	542015020216	1.5	4	2.3	3	16	50	2	0.2
	542015020220	1.5	4	2.3	3	20	50	2	0.2
	542015020225	1.5	4	2.3	3	25	60	2	0.2
	542015020230	1.5	4	2.3	3	30	70	2	0.2
	542015020240	1.5	6	2.3	3	40	80	2	0.2
	542015020250	1.5	6	2.3	3	50	90	2	0.2
	542015030108	1.5	4	2.3	3	8	50	1	0.3
	542015030110	1.5	4	2.3	3	10	50	1	0.3
	542015030112	1.5	4	2.3	3	12	50	1	0.3
	542015030116	1.5	4	2.3	3	16	50	1	0.3

UR542

2 flutes tapered neck

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01

DC	Tolerance
Ø0.2 ~ Ø4	0.000 ~ -0.012



(mm)

Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UR	542015030120	1.5	4	2.3	3	20	50	1	0.3
	542015030125	1.5	4	2.3	3	25	60	1	0.3
	542015030130	1.5	4	2.3	3	30	70	1	0.3
	542015030140	1.5	4	2.3	3	40	80	1	0.3
	542015030150	1.5	4	2.3	3	50	90	1	0.3
	542015030208	1.5	4	2.3	3	8	50	2	0.3
	542015030210	1.5	4	2.3	3	10	50	2	0.3
	542015030212	1.5	4	2.3	3	12	50	2	0.3
	542015030216	1.5	4	2.3	3	16	50	2	0.3
	542015030220	1.5	4	2.3	3	20	50	2	0.3
	542015030225	1.5	4	2.3	3	25	60	2	0.3
	542015030230	1.5	4	2.3	3	30	70	2	0.3
	542015030240	1.5	6	2.3	3	40	80	2	0.3
	542015030250	1.5	6	2.3	3	50	90	2	0.3
	542020010110	2	4	2	5	10	50	1	0.1
	542020010112	2	4	2	5	12	50	1	0.1
	542020010116	2	4	2	5	16	50	1	0.1
	542020010120	2	4	2	5	20	50	1	0.1
	542020010125	2	4	2	5	25	60	1	0.1
	542020010130	2	4	2	5	30	70	1	0.1
	542020010140	2	6	2	5	40	80	1	0.1
	542020010150	2	6	2	5	50	100	1	0.1
	542020010160	2	6	2	5	60	100	1	0.1
	542020010180	2	6	2	5	80	140	1	0.1
	542020010210	2	4	2	5	10	50	2	0.1
	542020010212	2	4	2	5	12	50	2	0.1
	542020010216	2	4	2	5	16	50	2	0.1
	542020010220	2	4	2	5	20	50	2	0.1
	542020010225	2	4	2	5	25	60	2	0.1
	542020010230	2	4	2	5	30	70	2	0.1
	542020010240	2	6	2	5	40	80	2	0.1
	542020010250	2	6	2	5	50	100	2	0.1
	542020010260	2	6	2	5	60	100	2	0.1

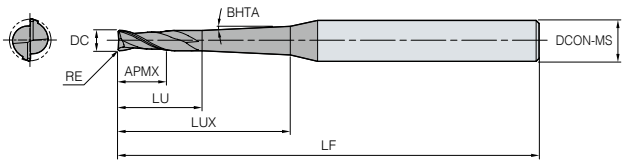
Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UR	542020010280	2	8	2	5	80	140	2	0.1
	542020020110	2	4	2	5	10	50	1	0.2
	542020020112	2	4	2	5	12	50	1	0.2
	542020020116	2	4	2	5	16	50	1	0.2
	542020020120	2	4	2	5	20	50	1	0.2
	542020020125	2	4	2	5	25	60	1	0.2
	542020020130	2	4	2	5	30	70	1	0.2
	542020020140	2	6	2	5	40	80	1	0.2
	542020020150	2	6	2	5	50	100	1	0.2
	542020020160	2	6	2	5	60	100	1	0.2
	542020020180	2	6	2	5	80	140	1	0.2
	542020020210	2	4	2	5	10	50	2	0.2
	542020020212	2	4	2	5	12	50	2	0.2
	542020020216	2	4	2	5	16	50	2	0.2
	542020020220	2	4	2	5	20	50	2	0.2
	542020020225	2	4	2	5	25	60	2	0.2
	542020020230	2	4	2	5	30	70	2	0.2
	542020020240	2	6	2	5	40	80	2	0.2
	542020020250	2	6	2	5	50	100	2	0.2
	542020020260	2	6	2	5	60	100	2	0.2
	542020020280	2	8	2	5	80	140	2	0.2
	542020030110	2	4	2	5	10	50	1	0.3
	542020030112	2	4	2	5	12	50	1	0.3
	542020030116	2	4	2	5	16	50	1	0.3
	542020030120	2	4	2	5	20	50	1	0.3
	542020030125	2	4	2	5	25	60	1	0.3
	542020030130	2	4	2	5	30	70	1	0.3
	542020030140	2	6	2	5	40	80	1	0.3
	542020030150	2	6	2	5	50	100	1	0.3
	542020030160	2	6	2	5	60	100	1	0.3
	542020030180	2	6	2	5	80	140	1	0.3
	542020030210	2	4	2	5	10	50	2	0.3
	542020030212	2	4	2	5	12	50	2	0.3

UR542

2 flutes tapered neck

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01

DC	Tolerance
Ø0.2 ~ Ø4	0.000 ~ -0.012



(mm)

Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UR	542020030216	2	4	2	5	16	50	2	0.3
	542020030220	2	4	2	5	20	50	2	0.3
	542020030225	2	4	2	5	25	60	2	0.3
	542030050260	3	8	4.5	6	60	100	2	0.5
	542030050270	3	8	4.5	6	70	120	2	0.5
	542040020140	4	6	6	8	40	90	1	0.2
	542040020150	4	6	6	8	50	100	1	0.2
	542020030230	2	4	2	5	30	70	2	0.3
	542020030240	2	6	2	5	40	80	2	0.3
	542020030250	2	6	2	5	50	100	2	0.3
	542020030260	2	6	2	5	60	100	2	0.3
	542020030280	2	8	2	5	80	140	2	0.3
	542020050110	2	4	2	5	10	50	1	0.5
	542020050112	2	4	2	5	12	50	1	0.5
	542020050116	2	4	2	5	16	50	1	0.5
	542020050120	2	4	2	5	20	50	1	0.5
	542020050125	2	4	2	5	25	60	1	0.5
	542020050130	2	4	2	5	30	70	1	0.5
	542020050140	2	6	2	5	40	80	1	0.5
	542020050150	2	6	2	5	50	100	1	0.5
	542020050160	2	6	2	5	60	100	1	0.5
	542020050180	2	6	2	5	80	140	1	0.5
	542020050210	2	4	2	5	10	50	2	0.5
	542020050212	2	4	2	5	12	50	2	0.5
	542020050216	2	4	2	5	16	50	2	0.5
	542020050220	2	4	2	5	20	50	2	0.5
	542020050225	2	4	2	5	25	60	2	0.5
	542020050230	2	4	2	5	30	70	2	0.5
	542020050240	2	6	2	5	40	80	2	0.5
	542020050250	2	6	2	5	50	100	2	0.5
	542020050260	2	6	2	5	60	100	2	0.5
	542020050280	2	8	2	5	80	140	2	0.5
	542030020116	3	6	4.5	6	16	60	1	0.2

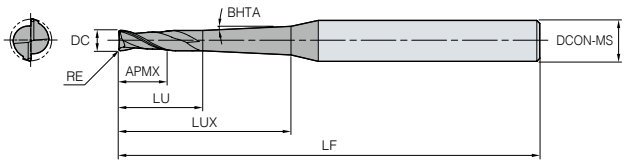
Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UR	542030020120	3	6	4.5	6	20	65	1	0.2
	542030020130	3	6	4.5	6	30	70	1	0.2
	542030020140	3	6	4.5	6	40	80	1	0.2
	542030020150	3	6	4.5	6	50	90	1	0.2
	542030020160	3	6	4.5	6	60	100	1	0.2
	542030020216	3	6	4.5	6	16	60	2	0.2
	542030020220	3	6	4.5	6	20	65	2	0.2
	542030020230	3	6	4.5	6	30	70	2	0.2
	542030020240	3	6	4.5	6	40	80	2	0.2
	542030020250	3	8	4.5	6	50	90	2	0.2
	542030020260	3	8	4.5	6	60	100	2	0.2
	542030020270	3	8	4.5	6	70	120	2	0.2
	542030030116	3	6	4.5	6	16	60	1	0.3
	542030030120	3	6	4.5	6	20	65	1	0.3
	542030030130	3	6	4.5	6	30	70	1	0.3
	542030030140	3	6	4.5	6	40	80	1	0.3
	542030030150	3	6	4.5	6	50	90	1	0.3
	542030030160	3	6	4.5	6	60	100	1	0.3
	542030030216	3	6	4.5	6	16	60	2	0.3
	542030030220	3	6	4.5	6	20	65	2	0.3
	542030030230	3	6	4.5	6	30	70	2	0.3
	542030030240	3	6	4.5	6	40	80	2	0.3
	542030030250	3	8	4.5	6	50	90	2	0.3
	542030030260	3	8	4.5	6	60	100	2	0.3
	542030030270	3	8	4.5	6	70	120	2	0.3
	542030050116	3	6	4.5	6	16	60	1	0.5
	542030050120	3	6	4.5	6	20	65	1	0.5
	542030050130	3	6	4.5	6	30	70	1	0.5
	542030050140	3	6	4.5	6	40	80	1	0.5
	542030050150	3	6	4.5	6	50	90	1	0.5
	542030050160	3	6	4.5	6	60	100	1	0.5
	542030050216	3	6	4.5	6	16	60	2	0.5
	542030050220	3	6	4.5	6	20	65	2	0.5

UR542

2 flutes tapered neck

CARBIDE | 2 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01

DC	Tolerance
Ø0.2 ~ Ø4	0.000 ~ -0.012



(mm)

Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UR	542030050230	3	6	4.5	6	30	70	2	0.5
	542030050240	3	6	4.5	6	40	80	2	0.5
	542030050250	3	8	4.5	6	50	90	2	0.5
	542040020160	4	6	6	8	60	110	1	0.2
	542040020170	4	8	6	8	70	120	1	0.2
	542040020240	4	8	6	8	40	90	2	0.2
	542040020250	4	8	6	8	50	100	2	0.2
	542040020260	4	8	6	8	60	110	2	0.2
	542040020270	4	10	6	8	70	120	2	0.2
	542040030140	4	6	6	8	40	90	1	0.3
	542040030150	4	6	6	8	50	100	1	0.3
	542040030160	4	6	6	8	60	110	1	0.3
	542040030170	4	8	6	8	70	120	1	0.3

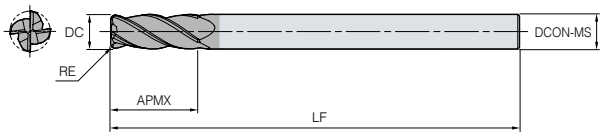
Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UR	542040030240	4	8	6	8	40	90	2	0.3
	542040030250	4	8	6	8	50	100	2	0.3
	542040030260	4	8	6	8	60	110	2	0.3
	542040030270	4	10	6	8	70	120	2	0.3
	542040050140	4	6	6	8	40	90	1	0.5
	542040050150	4	6	6	8	50	100	1	0.5
	542040050160	4	6	6	8	60	110	1	0.5
	542040050170	4	8	6	8	70	120	1	0.5
	542040050240	4	8	6	8	40	90	2	0.5
	542040050250	4	8	6	8	50	100	2	0.5
	542040050260	4	8	6	8	60	110	2	0.5
	542040050270	4	10	6	8	70	120	2	0.5

UR504

4 flutes radius

CARBIDE | 4 | H·A 40° | Grade PC315W | h5 shank | RE ±0.01

DC	Tolerance
Ø3 ~ Ø20	0.000 ~ -0.030



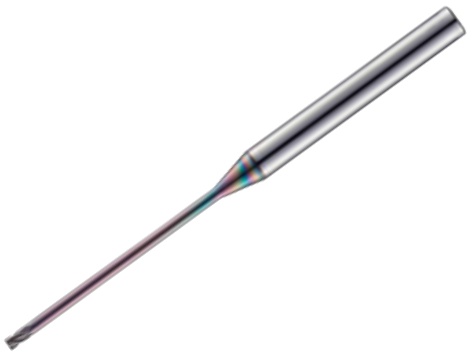
(mm)

	Designation	DC	DCON-MS	APMX	LF	RE
UR	50403002	3	6	8	60	0.2
	50403002S4	3	4	8	60	0.2
	50403003	3	6	8	60	0.3
	50403005	3	6	8	60	0.5
	50403005S4	3	4	8	60	0.5
	50404002	4	6	10	70	0.2
	50404002S4	4	4	10	70	0.2
	50404003	4	6	10	70	0.3
	50404005	4	6	10	70	0.5
	50404005S4	4	4	10	70	0.5
	50404010	4	6	10	70	1
	50404010S4	4	4	10	70	1
	50405002	5	6	13	90	0.2
	50405003	5	6	13	90	0.3
	50405003060	5	6	13	60	0.3
	50405005	5	6	13	90	0.5
	50405005060	5	6	13	60	0.5
	50405010	5	6	13	90	1
	50406002	6	6	13	90	0.2
	50406003	6	6	15	90	0.3
	50406003060	6	6	15	60	0.3
	50406005	6	6	15	90	0.5
	50406005060	6	6	15	60	0.5
	50406010	6	6	15	90	1
	50406010060	6	6	15	60	1
	50408003	8	8	20	100	0.3
	50408003070	8	8	20	70	0.3
	50408005	8	8	20	100	0.5
	50408005070	8	8	20	70	0.5
	50408010	8	8	20	100	1
	50408010070	8	8	20	70	1
	50408015	8	8	20	100	1.5
	50408020	8	8	20	100	2
	50410003	10	10	25	100	0.3

	Designation	DC	DCON-MS	APMX	LF	RE
UR	50410003075	10	10	25	75	0.3
	50410005	10	10	25	100	0.5
	50410005075	10	10	25	75	0.5
	50410010	10	10	25	100	1
	50410010075	10	10	25	75	1
	50410015	10	10	25	100	1.5
	50410020	10	10	25	100	2
	50410025	10	10	25	100	2.5
	50412003	12	12	30	110	0.3
	50412003080	12	12	30	80	0.3
	50412005	12	12	30	110	0.5
	50412005080	12	12	30	80	0.5
	50412010	12	12	30	110	1
	50412010080	12	12	30	80	1
	50412015	12	12	30	110	1.5
	50412020	12	12	30	110	2
	50412025	12	12	30	110	2.5
	50412030	12	12	30	110	3
	50416005	16	16	32	150	0.5
	50416005100	16	16	32	100	0.5
	50416010	16	16	32	150	1
	50416010100	16	16	32	100	1
	50416015	16	16	32	150	1.5
	50416015100	16	16	32	100	1.5
	50416020	16	16	32	150	2
	50416020100	16	16	32	100	2
	50420005	20	20	38	150	0.5
	50420005100	20	20	38	100	0.5
	50420010	20	20	38	150	1
	50420010100	20	20	38	100	1
	50420015	20	20	38	150	1.5
	50420015100	20	20	38	100	1.5
	50420020	20	20	38	150	2
	50420020100	20	20	38	100	2

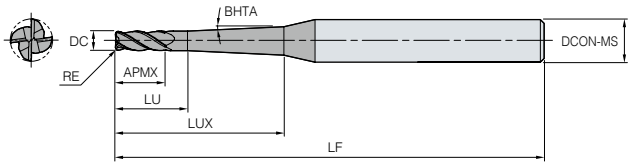
UR544

4 flutes tapered neck radius



CARBIDE | 4 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01

DC	Tolerance
Ø1 ~ Ø4	0.000 ~ -0.012



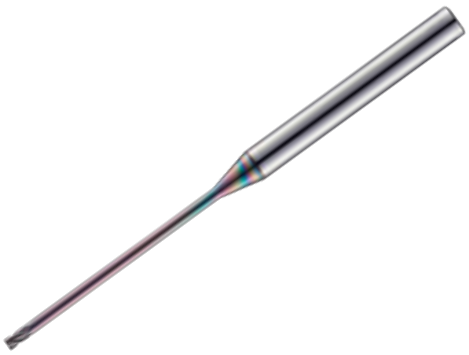
(mm)

Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UR	544010010106	1	4	1.5	2.5	6	50	1	0.1
	544010010108	1	4	1.5	2.5	8	50	1	0.1
	544010010110	1	4	1.5	2.5	10	50	1	0.1
	544010010112	1	4	1.5	2.5	12	50	1	0.1
	544010010116	1	4	1.5	2.5	16	50	1	0.1
	544010010120	1	4	1.5	2.5	20	50	1	0.1
	544010010125	1	4	1.5	2.5	25	60	1	0.1
	544010010130	1	4	1.5	2.5	30	70	1	0.1
	544010010140	1	4	1.5	2.5	40	80	1	0.1
	544010010150	1	4	1.5	2.5	50	90	1	0.1
	544010010206	1	4	1.5	2.5	6	50	1	0.1
	544010010208	1	4	1.5	2.5	8	50	2	0.1
	544010010210	1	4	1.5	2.5	10	50	2	0.1
	544010010212	1	4	1.5	2.5	12	50	2	0.1
	544010010216	1	4	1.5	2.5	16	50	2	0.1
	544010010220	1	4	1.5	2.5	20	50	2	0.1
	544010010225	1	4	1.5	2.5	25	60	2	0.1
	544010010230	1	4	1.5	2.5	30	70	2	0.1
	544010010240	1	4	1.5	2.5	40	80	2	0.1
	544010010250	1	6	1.5	2.5	50	90	2	0.1
	544010020106	1	4	1.5	2.5	6	50	2	0.2
	544010020108	1	4	1.5	2.5	8	50	1	0.2
	544010020110	1	4	1.5	2.5	10	50	1	0.2
	544010020112	1	4	1.5	2.5	12	50	1	0.2
	544010020116	1	4	1.5	2.5	16	50	1	0.2
	544010020120	1	4	1.5	2.5	20	50	1	0.2
	544010020125	1	4	1.5	2.5	25	60	1	0.2
	544010020130	1	4	1.5	2.5	30	70	1	0.2
	544010020140	1	4	1.5	2.5	40	80	1	0.2
	544010020150	1	4	1.5	2.5	50	90	1	0.2
	544010020206	1	4	1.5	2.5	6	50	1	0.2
	544010020208	1	4	1.5	2.5	8	50	2	0.2
	544010020210	1	4	1.5	2.5	10	50	2	0.2
	544010020212	1	4	1.5	2.5	12	50	2	0.2
	544010020216	1	4	1.5	2.5	16	50	2	0.2
	544010020220	1	4	1.5	2.5	20	50	2	0.2

Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UR	544010020225	1	4	1.5	2.5	25	60	2	0.2
	544010020230	1	4	1.5	2.5	30	70	2	0.2
	544010020240	1	4	1.5	2.5	40	80	2	0.2
	544010020250	1	6	1.5	2.5	50	90	2	0.2
	544012010108	1.2	4	1.8	3	8	50	2	0.1
	544012010112	1.2	4	1.8	3	12	50	1	0.1
	544012010116	1.2	4	1.8	3	16	50	1	0.1
	544012010120	1.2	4	1.8	3	20	50	1	0.1
	544012010125	1.2	4	1.8	3	25	60	1	0.1
	544012010130	1.2	4	1.8	3	30	70	1	0.1
	544012010208	1.2	4	1.8	3	8	50	1	0.1
	544012010212	1.2	4	1.8	3	12	50	2	0.1
	544012010216	1.2	4	1.8	3	16	50	2	0.1
	544012010220	1.2	4	1.8	3	20	50	2	0.1
	544012010225	1.2	4	1.8	3	25	60	2	0.1
	544012010230	1.2	4	1.8	3	30	70	2	0.1
	544012020108	1.2	4	1.8	3	8	50	2	0.2
	544012020112	1.2	4	1.8	3	12	50	1	0.2
	544012020116	1.2	4	1.8	3	16	50	1	0.2
	544012020120	1.2	4	1.8	3	20	50	1	0.2
	544012020125	1.2	4	1.8	3	25	60	1	0.2
	544012020130	1.2	4	1.8	3	30	70	1	0.2
	544012020208	1.2	4	1.8	3	8	50	1	0.2
	544012020212	1.2	4	1.8	3	12	50	2	0.2
	544012020216	1.2	4	1.8	3	16	50	2	0.2
	544012020220	1.2	4	1.8	3	20	50	2	0.2
	544012020225	1.2	4	1.8	3	25	60	2	0.2
	544012020230	1.2	4	1.8	3	30	70	2	0.2
	544015010108	1.5	4	2.3	3	8	50	2	0.1
	544015010110	1.5	4	2.3	3	10	50	1	0.1
	544015010112	1.5	4	2.3	3	12	50	1	0.1
	544015010116	1.5	4	2.3	3	16	50	1	0.1
	544015010120	1.5	4	2.3	3	20	50	1	0.1
	544015010125	1.5	4	2.3	3	25	60	1	0.1
	544015010130	1.5	4	2.3	3	30	70	1	0.1
	544015010140	1.5	4	2.3	3	40	80	1	0.1

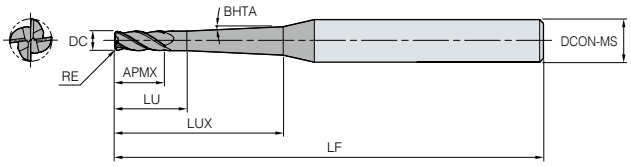
UR544

4 flutes tapered neck radius



CARBIDE | 4 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01

DC	Tolerance
Ø1 ~ Ø4	0.000 ~ -0.012



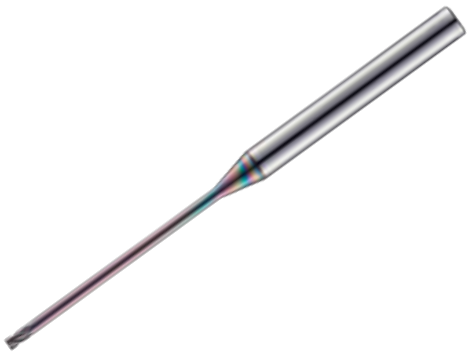
(mm)

Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UR	544015010150	1.5	4	2.3	3	50	90	1	0.1
	544015010208	1.5	4	2.3	3	8	50	1	0.1
	544015010210	1.5	4	2.3	3	10	50	2	0.1
	544015010212	1.5	4	2.3	3	12	50	2	0.1
	544015010216	1.5	4	2.3	3	16	50	2	0.1
	544015010220	1.5	4	2.3	3	20	50	2	0.1
	544015010225	1.5	4	2.3	3	25	60	2	0.1
	544015010230	1.5	4	2.3	3	30	70	2	0.1
	544015010240	1.5	6	2.3	3	40	80	2	0.1
	544015010250	1.5	6	2.3	3	50	90	2	0.1
	544015020108	1.5	4	2.3	3	8	50	2	0.2
	544015020110	1.5	4	2.3	3	10	50	1	0.2
	544015020112	1.5	4	2.3	3	12	50	1	0.2
	544015020116	1.5	4	2.3	3	16	50	1	0.2
	544015020120	1.5	4	2.3	3	20	50	1	0.2
	544015020125	1.5	4	2.3	3	25	60	1	0.2
	544015020130	1.5	4	2.3	3	30	70	1	0.2
	544015020140	1.5	4	2.3	3	40	80	1	0.2
	544015020150	1.5	4	2.3	3	50	90	1	0.2
	544015020208	1.5	4	2.3	3	8	50	1	0.2
	544015020210	1.5	4	2.3	3	10	50	2	0.2
	544015020212	1.5	4	2.3	3	12	50	2	0.2
	544015020216	1.5	4	2.3	3	16	50	2	0.2
	544015020220	1.5	4	2.3	3	20	50	2	0.2
	544015020225	1.5	4	2.3	3	25	60	2	0.2
	544015020230	1.5	4	2.3	3	30	70	2	0.2
	544015020240	1.5	6	2.3	3	40	80	2	0.2
	544015020250	1.5	6	2.3	3	50	90	2	0.2
	544015030108	1.5	4	2.3	3	8	50	2	0.3
	544015030110	1.5	4	2.3	3	10	50	1	0.3
	544015030112	1.5	4	2.3	3	12	50	1	0.3
	544015030116	1.5	4	2.3	3	16	50	1	0.3
	544015030120	1.5	4	2.3	3	20	50	1	0.3
	544015030125	1.5	4	2.3	3	25	60	1	0.3
	544015030130	1.5	4	2.3	3	30	70	1	0.3
	544015030140	1.5	4	2.3	3	40	80	1	0.3

Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UR	544015030150	1.5	4	2.3	3	50	90	1	0.3
	544015030208	1.5	4	2.3	3	8	50	1	0.3
	544015030210	1.5	4	2.3	3	10	50	2	0.3
	544015030212	1.5	4	2.3	3	12	50	2	0.3
	544015030216	1.5	4	2.3	3	16	50	2	0.3
	544015030220	1.5	4	2.3	3	20	50	2	0.3
	544015030225	1.5	4	2.3	3	25	60	2	0.3
	544015030230	1.5	4	2.3	3	30	70	2	0.3
	544015030240	1.5	6	2.3	3	40	80	2	0.3
	544015030250	1.5	6	2.3	3	50	90	2	0.3
	544020010110	2	4	2	5	10	50	2	0.1
	544020010112	2	4	2	5	12	50	1	0.1
	544020010116	2	4	2	5	16	50	1	0.1
	544020010120	2	4	2	5	20	50	1	0.1
	544020010125	2	4	2	5	25	60	1	0.1
	544020010130	2	4	2	5	30	70	1	0.1
	544020010140	2	6	2	5	40	80	1	0.1
	544020010150	2	6	2	5	50	100	1	0.1
	544020010160	2	6	2	5	60	100	1	0.1
	544020010180	2	6	2	5	80	140	1	0.1
	544020010210	2	4	2	5	10	50	1	0.1
	544020010212	2	4	2	5	12	50	2	0.1
	544020010216	2	4	2	5	16	50	2	0.1
	544020010220	2	4	2	5	20	50	2	0.1
	544020010225	2	4	2	5	25	60	2	0.1
	544020010230	2	4	2	5	30	70	2	0.1
	544020010240	2	6	2	5	40	80	2	0.1
	544020010250	2	6	2	5	50	100	2	0.1
	544020010260	2	6	2	5	60	100	2	0.1
	544020010280	2	8	2	5	80	140	2	0.1
	544020020110	2	4	2	5	10	50	2	0.2
	544020020112	2	4	2	5	12	50	1	0.2
	544020020116	2	4	2	5	16	50	1	0.2
	544020020120	2	4	2	5	20	50	1	0.2
	544020020125	2	4	2	5	25	60	1	0.2
	544020020130	2	4	2	5	30	70	1	0.2

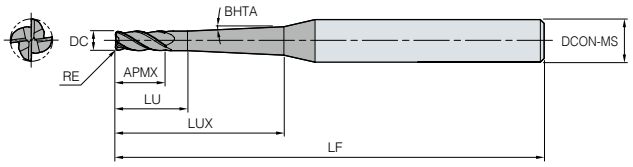
UR544

4 flutes tapered neck radius



CARBIDE | 4 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01

DC	Tolerance
Ø1 ~ Ø4	0.000 ~ -0.012



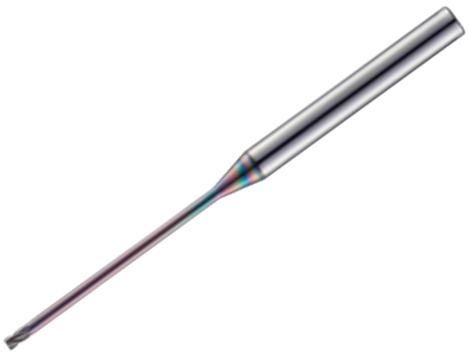
(mm)

Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UR	544020020140	2	6	2	5	40	80	1	0.2
	544020020150	2	6	2	5	50	100	1	0.2
	544020020160	2	6	2	5	60	100	1	0.2
	544020020180	2	6	2	5	80	140	1	0.2
	544020020210	2	4	2	5	10	50	1	0.2
	544020020212	2	4	2	5	12	50	2	0.2
	544020020216	2	4	2	5	16	50	2	0.2
	544020020220	2	4	2	5	20	50	2	0.2
	544020020225	2	4	2	5	25	60	2	0.2
	544020020230	2	4	2	5	30	70	2	0.2
	544020020240	2	6	2	5	40	80	2	0.2
	544020020250	2	6	2	5	50	100	2	0.2
	544020020260	2	6	2	5	60	100	2	0.2
	544020020280	2	8	2	5	80	140	2	0.2
	544020030110	2	4	2	5	10	50	2	0.3
	544020030112	2	4	2	5	12	50	1	0.3
	544020030116	2	4	2	5	16	50	1	0.3
	544020030120	2	4	2	5	20	50	1	0.3
	544020030125	2	4	2	5	25	60	1	0.3
	544020030130	2	4	2	5	30	70	1	0.3
	544020030140	2	6	2	5	40	80	1	0.3
	544020030150	2	6	2	5	50	100	1	0.3
	544020030160	2	6	2	5	60	100	1	0.3
	544020030180	2	6	2	5	80	140	1	0.3
	544020030210	2	4	2	5	10	50	1	0.3
	544020030212	2	4	2	5	12	50	2	0.3
	544020030216	2	4	2	5	16	50	2	0.3
	544020030220	2	4	2	5	20	50	2	0.3
	544020030225	2	4	2	5	25	60	2	0.3
	544020030230	2	4	2	5	30	70	2	0.3
	544020030240	2	6	2	5	40	80	2	0.3
	544020030250	2	6	2	5	50	100	2	0.3
	544020030260	2	6	2	5	60	100	2	0.3
	544020030280	2	8	2	5	80	140	2	0.3
	544020050110	2	4	2	5	10	50	2	0.5
	544020050112	2	4	2	5	12	50	1	0.5

Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UR	544020050116	2	4	2	5	16	50	1	0.5
	544020050120	2	4	2	5	20	50	1	0.5
	544020050125	2	4	2	5	25	60	1	0.5
	544020050130	2	4	2	5	30	70	1	0.5
	544020050140	2	6	2	5	40	80	1	0.5
	544020050150	2	6	2	5	50	100	1	0.5
	544020050160	2	6	2	5	60	100	1	0.5
	544020050180	2	6	2	5	80	140	1	0.5
	544020050210	2	4	2	5	10	50	1	0.5
	544020050212	2	4	2	5	12	50	2	0.5
	544020050216	2	4	2	5	16	50	2	0.5
	544020050220	2	4	2	5	20	50	2	0.5
	544020050225	2	4	2	5	25	60	2	0.5
	544020050230	2	4	2	5	30	70	2	0.5
	544020050240	2	6	2	5	40	80	2	0.5
	544020050250	2	6	2	5	50	100	2	0.5
	544020050260	2	6	2	5	60	100	2	0.5
	544020050280	2	8	2	5	80	140	2	0.5
	544030020116	3	6	4.5	6	16	60	2	0.2
	544030020120	3	6	4.5	6	20	65	1	0.2
	544030020130	3	6	4.5	6	30	70	1	0.2
	544030020140	3	6	4.5	6	40	80	1	0.2
	544030020150	3	6	4.5	6	50	90	1	0.2
	544030020160	3	6	4.5	6	60	100	1	0.2
	544030020216	3	6	4.5	6	16	60	1	0.2
	544030020220	3	6	4.5	6	20	65	2	0.2
	544030020230	3	6	4.5	6	30	70	2	0.2
	544030020240	3	6	4.5	6	40	80	2	0.2
	544030020250	3	8	4.5	6	50	90	2	0.2
	544030020260	3	8	4.5	6	60	100	2	0.2
	544030020270	3	8	4.5	6	70	120	2	0.2
	544030030116	3	6	4.5	6	16	60	2	0.3
	544030030120	3	6	4.5	6	20	65	1	0.3
	544030030130	3	6	4.5	6	30	70	1	0.3
	544030030140	3	6	4.5	6	40	80	1	0.3
	544030030150	3	6	4.5	6	50	90	1	0.3

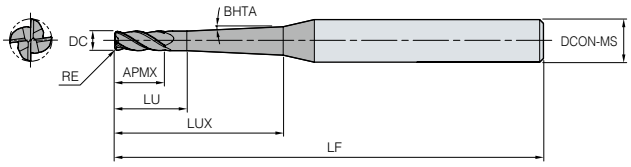
UR544

4 flutes tapered neck radius



CARBIDE | 4 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01

DC	Tolerance
Ø1 ~ Ø4	0.000 ~ -0.012



(mm)

Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UR	544030030160	3	6	4.5	6	60	100	1	0.3
	544030030216	3	6	4.5	6	16	60	1	0.3
	544030030220	3	6	4.5	6	20	65	2	0.3
	544030030230	3	6	4.5	6	30	70	2	0.3
	544030030240	3	6	4.5	6	40	80	2	0.3
	544030030250	3	8	4.5	6	50	90	2	0.3
	544030030260	3	8	4.5	6	60	100	2	0.3
	544030030270	3	8	4.5	6	70	120	2	0.3
	544030050116	3	6	4.5	6	16	60	2	0.5
	544030050120	3	6	4.5	6	20	65	1	0.5
	544030050130	3	6	4.5	6	30	70	1	0.5
	544030050140	3	6	4.5	6	40	80	1	0.5
	544030050150	3	6	4.5	6	50	90	1	0.5
	544030050160	3	6	4.5	6	60	100	1	0.5
	544030050216	3	6	4.5	6	16	60	1	0.5
	544030050220	3	6	4.5	6	20	65	2	0.5
	544030050230	3	6	4.5	6	30	70	2	0.5
	544030050240	3	6	4.5	6	40	80	2	0.5
	544030050250	3	8	4.5	6	50	90	2	0.5
	544030050260	3	8	4.5	6	60	100	2	0.5
	544030050270	3	8	4.5	6	70	120	2	0.5
	544040020140	4	6	6	8	40	90	2	0.2
	544040020150	4	6	6	8	50	100	1	0.2

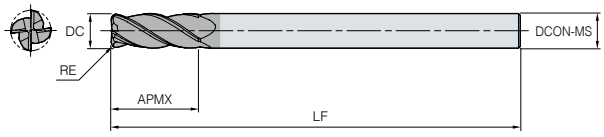
Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UR	544040020160	4	6	6	8	60	110	1	0.2
	544040020170	4	8	6	8	70	120	1	0.2
	544040020240	4	8	6	8	40	90	1	0.2
	544040020250	4	8	6	8	50	100	2	0.2
	544040020260	4	8	6	8	60	110	2	0.2
	544040020270	4	10	6	8	70	120	2	0.2
	544040030140	4	6	6	8	40	90	2	0.3
	544040030150	4	6	6	8	50	100	1	0.3
	544040030160	4	6	6	8	60	110	1	0.3
	544040030170	4	8	6	8	70	120	1	0.3
	544040030240	4	8	6	8	40	90	1	0.3
	544040030250	4	8	6	8	50	100	2	0.3
	544040030260	4	8	6	8	60	110	2	0.3
	544040030270	4	10	6	8	70	120	2	0.3
	544040050140	4	6	6	8	40	90	2	0.5
	544040050150	4	6	6	8	50	100	1	0.5
	544040050160	4	6	6	8	60	110	1	0.5
	544040050170	4	8	6	8	70	120	1	0.5
	544040050240	4	8	6	8	40	90	1	0.5
	544040050250	4	8	6	8	50	100	2	0.5
	544040050260	4	8	6	8	60	110	2	0.5
	544040050270	4	10	6	8	70	120	2	0.5

UXR504

4 flutes multi helix radius

CARBIDE | 4 | H·A 34°/36° | Grade PC315W | h5 shank | RE ±0.02

DC	Tolerance
Ø1 ~ Ø20	0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	LF	RE
UXR	504010005	1	6	2.5	50	0.05
	50401001	1	6	2.5	50	0.1
	50401002	1	6	2.5	50	0.2
	50401003	1	6	2.5	50	0.3
	504012005	1.2	6	3	50	0.05
	50401201	1.2	6	3	50	0.1
	50401202	1.2	6	3	50	0.2
	50401203	1.2	6	3	50	0.3
	504015005	1.5	6	4	50	0.05
	50401501	1.5	6	4	50	0.1
	50401502	1.5	6	4	50	0.2
	50401503	1.5	6	4	50	0.3
	50401505	1.5	6	4	50	0.5
	50402001	2	6	6	50	0.1
	50402002	2	6	6	50	0.2
	50402003	2	6	6	50	0.3
	50402005	2	6	6	50	0.5
	50402501	2.5	6	7	60	0.1
	50402502	2.5	6	7	60	0.2
	50402503	2.5	6	7	60	0.3
	50402505	2.5	6	7	60	0.5
	50403001	3	6	8	60	0.1
	50403002	3	6	8	60	0.2
	50403003	3	6	8	60	0.3
	50403005	3	6	8	60	0.5
	50403010	3	6	8	60	1
	50403501	3.5	6	10	70	0.1
	50403502	3.5	6	10	70	0.2
	50403503	3.5	6	10	70	0.3
	50403505	3.5	6	10	70	0.5
	50404001	4	6	10	70	0.1
	50404001100S4	4	4	10	100	0.1
	50404001S4	4	4	10	70	0.1
	50404002	4	6	10	70	0.2
	50404002100S4	4	4	10	100	0.2
	50404002S4	4	4	10	70	0.2

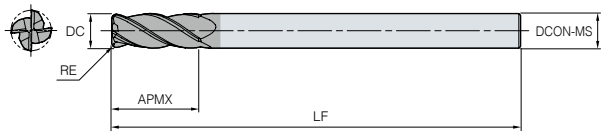
Designation		DC	DCON-MS	APMX	LF	RE
UXR	50404003	4	6	10	70	0.3
	50404003100S4	4	4	10	100	0.3
	50404003S4	4	4	10	70	0.3
	50404005	4	6	10	70	0.5
	50404005100S4	4	4	10	100	0.5
	50404005S4	4	4	10	70	0.5
	50404010	4	6	10	70	1
	50404010100S4	4	4	10	100	1
	50404010S4	4	4	10	70	1
	50404501	4.5	6	11	80	0.1
	50404502	4.5	6	11	80	0.2
	50404503	4.5	6	11	80	0.3
	50404505	4.5	6	11	80	0.5
	50405001	5	6	13	90	0.1
	50405002	5	6	13	90	0.2
	50405003	5	6	13	90	0.3
	50405005	5	6	13	90	0.5
	50405010	5	6	13	90	1
	50405501	5.5	6	13	90	0.1
	50405502	5.5	6	13	90	0.2
	50405503	5.5	6	13	90	0.3
	50405505	5.5	6	13	90	0.5
	50405510	5.5	6	13	90	1
	50406001	6	6	15	90	0.1
	50406001060	6	6	15	60	0.1
	50406002	6	6	15	90	0.2
	50406002060	6	6	15	60	0.2
	50406003	6	6	15	90	0.3
	50406005	6	6	15	90	0.5
	50406005060	6	6	15	60	0.5
	50406005110	6	6	15	110	0.5
	50406005130	6	6	15	130	0.5
	50406010	6	6	15	90	1
	50406010060	6	6	15	60	1
	50406010110	6	6	15	110	1
	50406010130	6	6	15	130	1

UXR504

4 flutes multi helix radius

CARBIDE | 4 | H·A 34°/36° | Grade PC315W | h5 shank | RE ±0.02

DC	Tolerance
Ø1 ~ Ø20	0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	LF	RE
UXR	50406015	6	6	15	90	1.5
	50406020	6	6	15	90	2
	50407001	7	8	16	90	0.1
	50407002	7	8	16	90	0.2
	50407003	7	8	16	90	0.3
	50407005	7	8	16	90	0.5
	50407010	7	8	16	90	1
	50407020	7	8	16	90	2
	50408001	8	8	20	100	0.1
	50408002	8	8	20	100	0.2
	50408003	8	8	20	100	0.3
	50408003070	8	8	20	70	0.3
	50408005	8	8	20	100	0.5
	50408005070	8	8	20	70	0.5
	50408005120	8	8	20	120	0.5
	50408005150	8	8	20	150	0.5
	50408010	8	8	20	100	1
	50408010070	8	8	20	70	1
	50408010120	8	8	20	120	1
	50408010150	8	8	20	150	1
	50408015	8	8	20	100	1.5
	50408015070	8	8	20	70	1.5
	50408020	8	8	20	100	2
	50408020070	8	8	20	70	2
	50408025	8	8	20	100	2.5
	50408030	8	8	20	100	3
	50410001	10	10	25	100	0.1
	50410002	10	10	25	100	0.2
	50410003	10	10	25	100	0.3
	50410003075	10	10	25	75	0.3
	50410005	10	10	25	100	0.5
	50410005075	10	10	25	75	0.5
	50410005130	10	10	22	130	0.5
	50410005150	10	10	22	150	0.5
	50410010	10	10	25	100	1
	50410010075	10	10	25	75	1

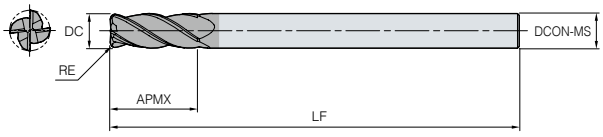
Designation		DC	DCON-MS	APMX	LF	RE
UXR	50410010130	10	10	22	130	1
	50410010150	10	10	22	150	1
	50410015	10	10	25	100	1.5
	50410020	10	10	25	100	2
	50410025	10	10	25	100	2.5
	50410030	10	10	25	100	3
	50410040	10	10	25	100	4
	50411002	11	12	25	110	0.2
	50411003	11	12	25	110	0.3
	50411005	11	12	25	110	0.5
	50411010	11	12	25	110	1
	50411020	11	12	25	110	2
	50412001	12	12	30	110	0.1
	50412002	12	12	30	110	0.2
	50412003	12	12	30	110	0.3
	50412003080	12	12	30	80	0.3
	50412005	12	12	30	110	0.5
	50412005080	12	12	30	80	0.5
	50412005130	12	12	30	130	0.5
	50412005150	12	12	30	150	0.5
	50412010	12	12	30	110	1
	50412010080	12	12	30	80	1
	50412010130	12	12	30	130	1
	50412010150	12	12	30	150	1
	50412015	12	12	30	110	1.5
	50412015080	12	12	30	80	1.5
	50412020	12	12	30	110	2
	50412020080	12	12	30	80	2
	50412025	12	12	30	110	2.5
	50412025080	12	12	30	80	2.5
	50412030	12	12	30	110	3
	50412030080	12	12	30	80	3
	50412040	12	12	30	110	4
	50412050	12	12	30	110	5
	50414005	14	16	35	150	0.5
	50414010	14	16	35	150	1

UXR504

4 flutes multi helix radius

CARBIDE | 4 | H·A 34°/36° | Grade PC315W | h5 shank | RE ±0.02

DC	Tolerance
Ø1 ~ Ø20	0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	LF	RE
UXR	50414020	14	16	35	150	2
	50416005	16	16	40	100	0.5
	50416005150	16	16	40	150	0.5
	50416010	16	16	40	100	1
	50416010150	16	16	40	150	1
	50416015	16	16	40	100	1.5
	50416015150	16	16	40	150	1.5
	50416020	16	16	40	100	2
	50416020150	16	16	40	150	2
	50416030	16	16	40	100	3

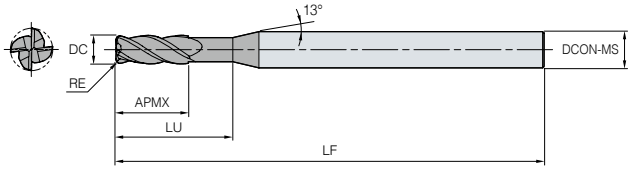
Designation		DC	DCON-MS	APMX	LF	RE
UXR	50420005	20	20	45	110	0.5
	50420005150	20	20	45	150	0.5
	50420010	20	20	45	110	1
	50420010150	20	20	45	150	1
	50420015	20	20	45	110	1.5
	50420015150	20	20	45	150	1.5
	50420020	20	20	45	110	2
	50420020150	20	20	45	150	2
	50420030	20	20	45	110	3

UXR514

4 flutes multi helix neck radius

CARBIDE | 4 | H·A 34°/36° | Grade PC315W | h5 shank | RE ±0.02

DC	Tolerance
Ø1 ~ Ø20	0.000 ~ -0.030



(mm)

	Designation	DC	DCON-MS	APMX	LU	LF	RE
UXR	51401000503	1	4	1.5	3	50	0.05
	51401000504	1	4	1.5	4	50	0.05
	51401000506	1	4	1.5	6	50	0.05
	51401000508	1	4	1.5	8	50	0.05
	51401000510	1	4	1.5	10	50	0.05
	51401000512	1	4	1.5	12	50	0.05
	51401000514	1	4	1.5	14	50	0.05
	51401000516	1	4	1.5	16	50	0.05
	51401000520	1	4	1.5	20	50	0.05
	5140100103	1	4	1.5	3	50	0.1
	5140100104	1	4	1.5	4	50	0.1
	5140100106	1	4	1.5	6	50	0.1
	5140100108	1	4	1.5	8	50	0.1
	5140100110	1	4	1.5	10	50	0.1
	5140100112	1	4	1.5	12	50	0.1
	5140100114	1	4	1.5	14	50	0.1
	5140100116	1	4	1.5	16	50	0.1
	5140100120	1	4	1.5	20	50	0.1
	5140100203	1	4	1.5	3	50	0.2
	5140100204	1	4	1.5	4	50	0.2
	5140100206	1	4	1.5	6	50	0.2
	5140100208	1	4	1.5	8	50	0.2
	5140100210	1	4	1.5	10	50	0.2
	5140100212	1	4	1.5	12	50	0.2
	5140100214	1	4	1.5	14	50	0.2
	5140100216	1	4	1.5	16	50	0.2
	5140100220	1	4	1.5	20	50	0.2
	5140100303	1	4	1.5	3	50	0.3
	5140100304	1	4	1.5	4	50	0.3
	5140100306	1	4	1.5	6	50	0.3
	5140100308	1	4	1.5	8	50	0.3
	5140100310	1	4	1.5	10	50	0.3
	5140100312	1	4	1.5	12	50	0.3
	5140100314	1	4	1.5	14	50	0.3
	5140100316	1	4	1.5	16	50	0.3
	5140100320	1	4	1.5	20	50	0.3

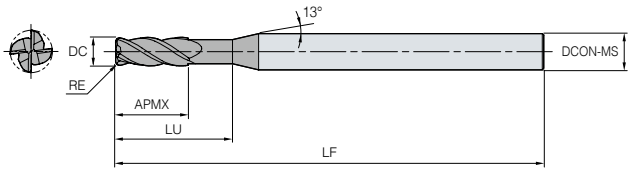
	Designation	DC	DCON-MS	APMX	LU	LF	RE
UXR	51401200503	1.2	4	1.8	3	50	0.05
	51401200504	1.2	4	1.8	4	50	0.05
	51401200506	1.2	4	1.8	6	50	0.05
	51401200508	1.2	4	1.8	8	50	0.05
	51401200510	1.2	4	1.8	10	50	0.05
	51401200512	1.2	4	1.8	12	50	0.05
	51401200516	1.2	4	1.8	16	50	0.05
	51401200520	1.2	4	1.8	20	50	0.05
	5140120103	1.2	4	1.8	3	50	0.1
	5140120104	1.2	4	1.8	4	50	0.1
	5140120106	1.2	4	1.8	6	50	0.1
	5140120108	1.2	4	1.8	8	50	0.1
	5140120110	1.2	4	1.8	10	50	0.1
	5140120112	1.2	4	1.8	12	50	0.1
	5140120116	1.2	4	1.8	16	50	0.1
	5140120120	1.2	4	1.8	20	50	0.1
	5140120203	1.2	4	1.8	3	50	0.2
	5140120204	1.2	4	1.8	4	50	0.2
	5140120206	1.2	4	1.8	6	50	0.2
	5140120208	1.2	4	1.8	8	50	0.2
	5140120210	1.2	4	1.8	10	50	0.2
	5140120212	1.2	4	1.8	12	50	0.2
	5140120216	1.2	4	1.8	16	50	0.2
	5140120220	1.2	4	1.8	20	50	0.2
	5140120303	1.2	4	1.8	3	50	0.3
	5140120304	1.2	4	1.8	4	50	0.3
	5140120306	1.2	4	1.8	6	50	0.3
	5140120308	1.2	4	1.8	8	50	0.3
	5140120310	1.2	4	1.8	10	50	0.3
	5140120312	1.2	4	1.8	12	50	0.3
	5140120316	1.2	4	1.8	16	50	0.3
	5140120320	1.2	4	1.8	20	50	0.3
	51401500504	1.5	4	2.3	4	50	0.05
	51401500506	1.5	4	2.3	6	50	0.05
	51401500508	1.5	4	2.3	8	50	0.05
	51401500510	1.5	4	2.3	10	50	0.05

UXR514

4 flutes multi helix neck radius

CARBIDE | 4 | H·A 34°/36° | Grade PC315W | h5 shank | RE ±0.02

DC	Tolerance
Ø1 ~ Ø20	0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
UXR	51401500512	1.5	4	2.3	12	50	0.05
	51401500514	1.5	4	2.3	14	50	0.05
	51401500516	1.5	4	2.3	16	50	0.05
	51401500520	1.5	4	2.3	20	50	0.05
	51401500522	1.5	4	2.3	22	60	0.05
	51401500526	1.5	4	2.3	26	60	0.05
	5140150104	1.5	4	2.3	4	50	0.1
	5140150106	1.5	4	2.3	6	50	0.1
	5140150108	1.5	4	2.3	8	50	0.1
	5140150110	1.5	4	2.3	10	50	0.1
	5140150112	1.5	4	2.3	12	50	0.1
	5140150114	1.5	4	2.3	14	50	0.1
	5140150116	1.5	4	2.3	16	50	0.1
	5140150120	1.5	4	2.3	20	50	0.1
	5140150122	1.5	4	2.3	22	60	0.1
	5140150126	1.5	4	2.3	26	60	0.1
	5140150204	1.5	4	2.3	4	50	0.2
	5140150206	1.5	4	2.3	6	50	0.2
	5140150208	1.5	4	2.3	8	50	0.2
	5140150210	1.5	4	2.3	10	50	0.2
	5140150212	1.5	4	2.3	12	50	0.2
	5140150214	1.5	4	2.3	14	50	0.2
	5140150216	1.5	4	2.3	16	50	0.2
	5140150220	1.5	4	2.3	20	50	0.2
	5140150222	1.5	4	2.3	22	60	0.2
	5140150226	1.5	4	2.3	26	60	0.2
	5140150304	1.5	4	2.3	4	50	0.3
	5140150306	1.5	4	2.3	6	50	0.3
	5140150308	1.5	4	2.3	8	50	0.3
	5140150310	1.5	4	2.3	10	50	0.3
	5140150312	1.5	4	2.3	12	50	0.3
	5140150314	1.5	4	2.3	14	50	0.3
	5140150316	1.5	4	2.3	16	50	0.3
	5140150320	1.5	4	2.3	20	50	0.3
	5140150322	1.5	4	2.3	22	60	0.3
	5140150326	1.5	4	2.3	26	60	0.3

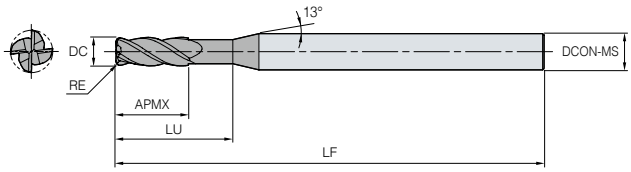
Designation		DC	DCON-MS	APMX	LU	LF	RE
UXR	5140150504	1.5	4	2.3	4	50	0.5
	5140150506	1.5	4	2.3	6	50	0.5
	5140150508	1.5	4	2.3	8	50	0.5
	5140150510	1.5	4	2.3	10	50	0.5
	5140150512	1.5	4	2.3	12	50	0.5
	5140150514	1.5	4	2.3	14	50	0.5
	5140150516	1.5	4	2.3	16	50	0.5
	5140150520	1.5	4	2.3	20	50	0.5
	5140150522	1.5	4	2.3	22	60	0.5
	5140150526	1.5	4	2.3	26	60	0.5
	5140200106	2	4	3	6	50	0.1
	5140200108	2	4	3	8	50	0.1
	5140200110	2	4	3	10	50	0.1
	5140200112	2	4	3	12	50	0.1
	5140200114	2	4	3	14	50	0.1
	5140200116	2	4	3	16	50	0.1
	5140200120	2	4	3	20	50	0.1
	5140200122	2	4	3	22	60	0.1
	5140200126	2	4	3	26	60	0.1
	5140200130	2	4	3	30	70	0.1
	5140200206	2	4	3	6	50	0.2
	5140200208	2	4	3	8	50	0.2
	5140200210	2	4	3	10	50	0.2
	5140200212	2	4	3	12	50	0.2
	5140200214	2	4	3	14	50	0.2
	5140200216	2	4	3	16	50	0.2
	5140200220	2	4	3	20	50	0.2
	5140200222	2	4	3	22	60	0.2
	5140200226	2	4	3	26	60	0.2
	5140200230	2	4	3	30	70	0.2
	5140200306	2	4	3	6	50	0.3
	5140200308	2	4	3	8	50	0.3
	5140200310	2	4	3	10	50	0.3
	5140200312	2	4	3	12	50	0.3
	5140200314	2	4	3	14	50	0.3
	5140200316	2	4	3	16	50	0.3

UXR514

4 flutes multi helix neck radius

CARBIDE | 4 | H·A 34°/36° | Grade PC315W | h5 shank | RE ±0.02

DC	Tolerance
Ø1 ~ Ø20	0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
UXR	5140200320	2	4	3	20	50	0.3
	5140200322	2	4	3	22	60	0.3
	5140200326	2	4	3	26	60	0.3
	5140200330	2	4	3	30	70	0.3
	5140200506	2	4	3	6	50	0.5
	5140200508	2	4	3	8	50	0.5
	5140200510	2	4	3	10	50	0.5
	5140200512	2	4	3	12	50	0.5
	5140200514	2	4	3	14	50	0.5
	5140200516	2	4	3	16	50	0.5
	5140200520	2	4	3	20	50	0.5
	5140200522	2	4	3	22	60	0.5
	5140200526	2	4	3	26	60	0.5
	5140200530	2	4	3	30	70	0.5
	5140250108	2.5	4	4	8	50	0.1
	5140250110	2.5	4	4	10	50	0.1
	5140250112	2.5	4	4	12	50	0.1
	5140250114	2.5	4	4	14	50	0.1
	5140250116	2.5	4	4	16	50	0.1
	5140250120	2.5	4	4	20	50	0.1
	5140250126	2.5	4	4	26	60	0.1
	5140250130	2.5	4	4	30	70	0.1
	5140250208	2.5	4	4	8	50	0.2
	5140250210	2.5	4	4	10	50	0.2
	5140250212	2.5	4	4	12	50	0.2
	5140250214	2.5	4	4	14	50	0.2
	5140250216	2.5	4	4	16	50	0.2
	5140250220	2.5	4	4	20	50	0.2
	5140250226	2.5	4	4	26	60	0.2
	5140250230	2.5	4	4	30	70	0.2
	5140250308	2.5	4	4	8	50	0.3
	5140250310	2.5	4	4	10	50	0.3
	5140250312	2.5	4	4	12	50	0.3
	5140250314	2.5	4	4	14	50	0.3
	5140250316	2.5	4	4	16	50	0.3
	5140250320	2.5	4	4	20	50	0.3

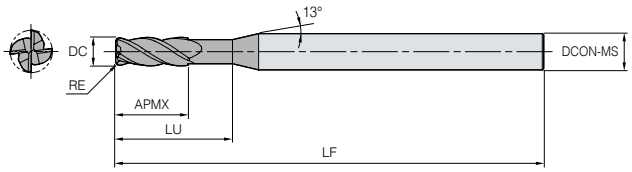
Designation		DC	DCON-MS	APMX	LU	LF	RE
UXR	5140250326	2.5	4	4	26	60	0.3
	5140250330	2.5	4	4	30	70	0.3
	5140250508	2.5	4	4	8	50	0.5
	5140250510	2.5	4	4	10	50	0.5
	5140250512	2.5	4	4	12	50	0.5
	5140250514	2.5	4	4	14	50	0.5
	5140250516	2.5	4	4	16	50	0.5
	5140250520	2.5	4	4	20	50	0.5
	5140250526	2.5	4	4	26	60	0.5
	5140250530	2.5	4	4	30	70	0.5
	5140300108	3	6	4.5	8	50	0.1
	5140300110	3	6	4.5	10	50	0.1
	5140300112	3	6	4.5	12	50	0.1
	5140300114	3	6	4.5	14	60	0.1
	5140300116	3	6	4.5	16	60	0.1
	5140300120	3	6	4.5	20	60	0.1
	5140300126	3	6	4.5	26	65	0.1
	5140300130	3	6	4.5	30	70	0.1
	5140300135	3	6	4.5	35	70	0.1
	5140300140	3	6	4.5	40	80	0.1
	5140300208	3	6	4.5	8	50	0.2
	5140300210	3	6	4.5	10	50	0.2
	5140300212	3	6	4.5	12	50	0.2
	5140300214	3	6	4.5	14	60	0.2
	5140300216	3	6	4.5	16	60	0.2
	5140300220	3	6	4.5	20	60	0.2
	5140300226	3	6	4.5	26	65	0.2
	5140300230	3	6	4.5	30	70	0.2
	5140300235	3	6	4.5	35	70	0.2
	5140300240	3	6	4.5	40	80	0.2
	5140300308	3	6	4.5	8	50	0.3
	5140300310	3	6	4.5	10	50	0.3
	5140300312	3	6	4.5	12	50	0.3
	5140300314	3	6	4.5	14	60	0.3
	5140300316	3	6	4.5	16	60	0.3
	5140300320	3	6	4.5	20	60	0.3

UXR514

4 flutes multi helix neck radius

CARBIDE | 4 | H·A 34°/36° | Grade PC315W | h5 shank | RE ±0.02

DC	Tolerance
Ø1 ~ Ø20	0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
UXR	5140300326	3	6	4.5	26	65	0.3
	5140300330	3	6	4.5	30	70	0.3
	5140300335	3	6	4.5	35	70	0.3
	5140300340	3	6	4.5	40	80	0.3
	5140300508	3	6	4.5	8	50	0.5
	5140300510	3	6	4.5	10	50	0.5
	5140300512	3	6	4.5	12	50	0.5
	5140300514	3	6	4.5	14	60	0.5
	5140300516	3	6	4.5	16	60	0.5
	5140300520	3	6	4.5	20	60	0.5
	5140300526	3	6	4.5	26	65	0.5
	5140300530	3	6	4.5	30	70	0.5
	5140300535	3	6	4.5	35	70	0.5
	5140300540	3	6	4.5	40	80	0.5
	5140301008	3	6	4.5	8	50	1
	5140301010	3	6	4.5	10	50	1
	5140301012	3	6	4.5	12	50	1
	5140301014	3	6	4.5	14	60	1
	5140301016	3	6	4.5	16	60	1
	5140301020	3	6	4.5	20	60	1
	5140301026	3	6	4.5	26	65	1
	5140301030	3	6	4.5	30	70	1
	5140301035	3	6	4.5	35	70	1
	5140301040	3	6	4.5	40	80	1
	5140400110	4	6	6	10	50	0.1
	5140400112	4	6	6	12	50	0.1
	5140400114	4	6	6	14	60	0.1
	5140400116	4	6	6	16	60	0.1
	5140400120	4	6	6	20	60	0.1
	5140400126	4	6	6	26	65	0.1
	5140400130	4	6	6	30	70	0.1
	5140400135	4	6	6	35	70	0.1
	5140400140	4	6	6	40	80	0.1
	5140400145	4	6	6	45	90	0.1
	5140400150	4	6	6	50	100	0.1
	5140400210	4	6	6	10	50	0.2

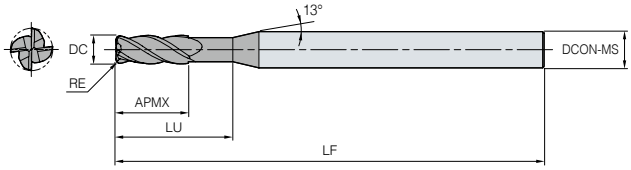
Designation		DC	DCON-MS	APMX	LU	LF	RE
UXR	5140400212	4	6	6	12	50	0.2
	5140400214	4	6	6	14	60	0.2
	5140400216	4	6	6	16	60	0.2
	5140400220	4	6	6	20	60	0.2
	5140400226	4	6	6	26	65	0.2
	5140400230	4	6	6	30	70	0.2
	5140400235	4	6	6	35	70	0.2
	5140400240	4	6	6	40	80	0.2
	5140400245	4	6	6	45	90	0.2
	5140400250	4	6	6	50	100	0.2
	5140400310	4	6	6	10	50	0.3
	5140400312	4	6	6	12	50	0.3
	5140400314	4	6	6	14	60	0.3
	5140400316	4	6	6	16	60	0.3
	5140400320	4	6	6	20	60	0.3
	5140400326	4	6	6	26	65	0.3
	5140400330	4	6	6	30	70	0.3
	5140400335	4	6	6	35	70	0.3
	5140400340	4	6	6	40	80	0.3
	5140400345	4	6	6	45	90	0.3
	5140400350	4	6	6	50	100	0.3
	5140400510	4	6	6	10	50	0.5
	5140400512	4	6	6	12	50	0.5
	5140400514	4	6	6	14	60	0.5
	5140400516	4	6	6	16	60	0.5
	5140400520	4	6	6	20	60	0.5
	5140400526	4	6	6	26	65	0.5
	5140400530	4	6	6	30	70	0.5
	5140400535	4	6	6	35	70	0.5
	5140400540	4	6	6	40	80	0.5
	5140400545	4	6	6	45	90	0.5
	5140400550	4	6	6	50	100	0.5
	5140401010	4	6	6	10	50	1
	5140401012	4	6	6	12	50	1
	5140401014	4	6	6	14	60	1
	5140401016	4	6	6	16	60	1

UXR514

4 flutes multi helix neck radius

CARBIDE | 4 | H·A 34°/36° | Grade PC315W | h5 shank | RE ±0.02

DC	Tolerance
Ø1 ~ Ø20	0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
UXR	5140401020	4	6	6	20	60	1
	5140401026	4	6	6	26	65	1
	5140401030	4	6	6	30	70	1
	5140401035	4	6	6	35	70	1
	5140401040	4	6	6	40	80	1
	5140401045	4	6	6	45	90	1
	5140401050	4	6	6	50	100	1
	51405001	5	6	8	15	60	0.1
	51405002	5	6	8	15	60	0.2
	51405003	5	6	8	15	60	0.3
	51405005	5	6	8	15	60	0.5
	51405010	5	6	8	15	60	1
	51405015	5	6	8	15	60	1.5
	51405020	5	6	8	15	60	2
	51406001	6	6	9	20	60	0.1
	51406002	6	6	9	20	60	0.2
	51406003	6	6	9	20	60	0.3
	51406003090	6	6	15	30	90	0.3
	51406005	6	6	9	20	60	0.5
	51406005090	6	6	15	30	90	0.5
	51406010	6	6	9	20	60	1
	51406010090	6	6	15	30	90	1
	51406015	6	6	9	20	60	1.5
	51406020	6	6	9	20	60	2
	51408001	8	8	12	25	70	0.1
	51408002	8	8	12	25	70	0.2
	51408003	8	8	12	25	70	0.3
	51408003100	8	8	20	35	100	0.3
	51408005	8	8	12	25	70	0.5
	51408005100	8	8	20	35	100	0.5
	51408010	8	8	12	25	70	1

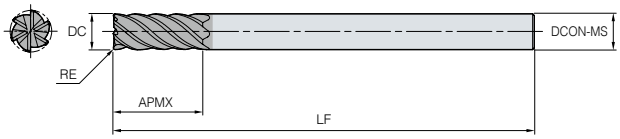
Designation		DC	DCON-MS	APMX	LU	LF	RE
UXR	51408010100	8	8	20	35	100	1
	51408015	8	8	12	25	70	1.5
	51408020	8	8	12	25	70	2
	51410001	10	10	15	30	75	0.1
	51410002	10	10	15	30	75	0.2
	51410003	10	10	15	30	75	0.3
	51410003100	10	10	25	40	100	0.3
	51410005	10	10	15	30	75	0.5
	51410005100	10	10	25	40	100	0.5
	51410010	10	10	15	30	75	1
	51410010100	10	10	25	40	100	1
	51410015	10	10	15	30	75	1.5
	51410020	10	10	15	30	75	2
	51412002	12	12	18	32	80	0.2
	51412003	12	12	18	32	80	0.3
	51412003110	12	12	30	45	110	0.3
	51412005	12	12	18	32	80	0.5
	51412005110	12	12	30	45	110	0.5
	51412010	12	12	18	32	80	1
	51412010110	12	12	30	45	110	1
	51412015	12	12	18	32	80	1.5
	51412020	12	12	18	32	80	2
	51416005	16	16	20	35	100	0.5
	51416005150	16	16	35	50	150	0.5
	51416010	16	16	20	35	100	1
	51416010150	16	16	35	50	150	1
	51420005	20	20	25	40	100	0.5
	51420005150	20	20	40	55	150	0.5
	51420010	20	20	25	40	100	1
	51420010150	20	20	40	55	150	1

UR506

6 flutes radius

CARBIDE | 6 | H·A 45° | Grade PC315W | h5 shank | RE ±0.015

DC	Tolerance
Ø6 ~ Ø20	0.000 ~ -0.030



(mm)

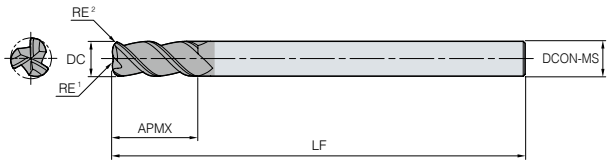
Designation		DC	DCON-MS	APMX	LF	RE
UR	50606003	6	6	15	90	0.3
	50606005	6	6	15	90	0.5
	50606010	6	6	15	90	1
	50608003	8	8	20	100	0.3
	50608005	8	8	20	100	0.5
	50608010	8	8	20	100	1
	50610003	10	10	25	100	0.3
	50610005	10	10	25	100	0.5
	50610010	10	10	25	100	1
	50612003	12	12	30	110	0.3
	50612005	12	12	30	110	0.5
	50612010	12	12	30	110	1
	50616005	16	16	32	150	0.5
	50616010	16	16	32	150	1
	50616015	16	16	32	150	1.5
	50616020	16	16	32	150	2
	50620005	20	20	38	150	0.5
	50620010	20	20	38	150	1
	50620015	20	20	38	150	1.5
	50620020	20	20	38	150	2

UDR503

3 flutes double radius

CARBIDE | 3 | H·A 45° | Grade PC315W | h5 shank | RE ±0.02

DC	Tolerance
Ø6 ~ Ø20	0.000 ~ -0.020



(mm)

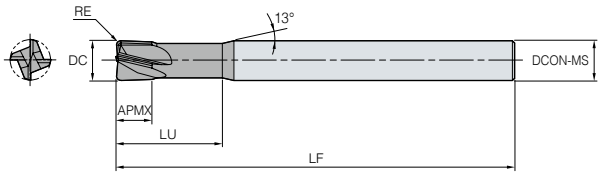
Designation		DC	DCON-MS	APMX	LF	RE¹	RE²
UDR	50306005	6	6	10	90	0.5	6
	50306010	6	6	10	90	1	6
	50306020	6	6	10	90	2	6
	50308005	8	8	16	100	0.5	8
	50308010	8	8	16	100	1	8
	50308020	8	8	16	100	2	8
	50310005	10	10	20	100	0.5	10
	50310010	10	10	20	100	1	10
	50310020	10	10	20	100	2	10
	50312005	12	12	24	110	0.5	12
	50312010	12	12	24	110	1	12
	50312020	12	12	24	110	2	12
	50316005	16	16	32	150	0.5	16
	50316010	16	16	32	150	1	16
	50320005	20	20	40	150	0.5	20
	50320010	20	20	40	150	1	20

USPM4

4 flutes radius Endmill for high speed machining

CARBIDE | 4 | H·A 10° | Grade PC315W | h5 shank | RE ±0.02

DC	Tolerance
Ø1 ~ Ø20	0.000 ~ -0.030



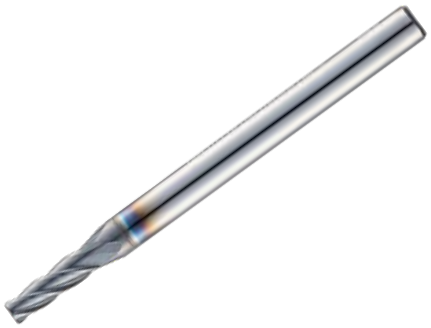
(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
USPM	4010-01	1	6	1	2.5	50	0.1
	4010-02	1	6	1	2.5	50	0.2
	4010-03	1	6	1	2.5	50	0.3
	4015-02	1.5	6	1.5	4	50	0.2
	4015-03	1.5	6	1.5	4	50	0.3
	4015-05	1.5	6	1.5	4	50	0.5
	4020-02	2	6	2	6	50	0.2
	4020-03	2	6	2	6	50	0.3
	4020-05	2	6	2	6	50	0.5
	4030-02	3	6	3	8	50	0.2
	4030-03	3	6	3	8	50	0.3
	4030-05	3	6	3	8	50	0.5
	4040-02	4	6	4	10	50	0.2
	4040-03	4	6	4	10	50	0.3
	4040-05	4	6	4	10	50	0.5
	4040-10	4	6	4	10	50	1
	4060-02	6	6	6	15	60	0.2
	4060-02L	6	6	6	15	90	0.2
	4060-03	6	6	6	15	60	0.3
	4060-03L	6	6	6	15	90	0.3
	4060-05	6	6	6	15	60	0.5
	4060-05L	6	6	6	15	90	0.5
	4060-10	6	6	6	15	60	1
	4060-10L	6	6	6	15	90	1
	4060-20	6	6	6	15	60	2
	4060-20L	6	6	6	15	90	2
	4080-02	8	8	8	20	70	0.2
	4080-02L	8	8	8	20	100	0.2
	4080-03	8	8	8	20	70	0.3
	4080-03L	8	8	8	20	100	0.3
	4080-05	8	8	8	20	70	0.5
	4080-05L	8	8	8	20	100	0.5
	4080-10	8	8	8	20	70	1
	4080-10L	8	8	8	20	100	1
	4080-20	8	8	8	20	70	2
	4080-20L	8	8	8	20	100	2

Designation		DC	DCON-MS	APMX	LU	LF	RE
USPM	4100-02	10	10	10	25	75	0.2
	4100-02L	10	10	10	25	100	0.2
	4100-03	10	10	10	25	75	0.3
	4100-03L	10	10	10	25	100	0.3
	4100-05	10	10	10	25	75	0.5
	4100-05L	10	10	10	25	100	0.5
	4100-10	10	10	10	25	75	1
	4100-10L	10	10	10	25	100	1
	4100-15	10	10	10	25	75	1.5
	4100-15L	10	10	10	25	100	1.5
	4100-20	10	10	10	25	75	2
	4100-20L	10	10	10	25	100	2
	4120-03	12	12	12	30	80	0.3
	4120-03L	12	12	12	30	110	0.3
	4120-05	12	12	12	30	80	0.5
	4120-05L	12	12	12	30	110	0.5
	4120-10	12	12	12	30	80	1
	4120-10L	12	12	12	30	110	1
	4120-15	12	12	12	30	80	1.5
	4120-15L	12	12	12	30	110	1.5
	4120-20	12	12	12	30	80	2
	4120-20L	12	12	12	30	110	2
	4120-30	12	12	12	30	80	3
	4120-30L	12	12	12	30	110	3
	4160-05	16	16	16	35	100	0.5
	4160-05L	16	16	16	35	150	0.5
	4160-10	16	16	16	35	100	1
	4160-10L	16	16	16	35	150	1
	4160-20	16	16	16	35	100	2
	4160-20L	16	16	16	35	150	2
	4200-05	20	20	20	40	100	0.5
	4200-05L	20	20	20	40	150	0.5
	4200-10	20	20	20	40	100	1
	4200-10L	20	20	20	40	150	1
	4200-20	20	20	20	40	100	2
	4200-20L	20	20	20	40	150	2

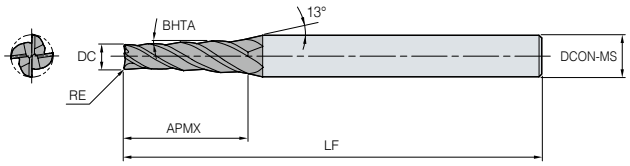
UTR504

4 flutes tapered radius



CARBIDE | 4 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01

DC	Tolerance
Ø0.8 ~ Ø2.5	0.000 ~ -0.030



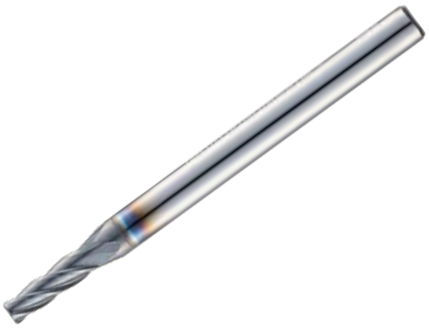
(mm)

Designation		DC	DCON-MS	APMX	BHTA(°)	LF	RE
UTR	504008010104	0.8	4	4	1	45	0.1
	504008010106	0.8	4	6	1	45	0.1
	504008010108	0.8	4	8	1	45	0.1
	5040080101504	0.8	4	4	1.5	45	0.1
	5040080101506	0.8	4	6	1.5	45	0.1
	5040080101508	0.8	4	8	1.5	45	0.1
	504008020104	0.8	4	4	1	45	0.2
	504008020106	0.8	4	6	1	45	0.2
	504008020108	0.8	4	8	1	45	0.2
	5040080201504	0.8	4	4	1.5	45	0.2
	5040080201506	0.8	4	6	1.5	45	0.2
	5040080201508	0.8	4	8	1.5	45	0.2
	504010010104	1	4	4	1	50	0.1
	504010010106	1	4	6	1	50	0.1
	504010010108	1	4	8	1	50	0.1
	504010010110	1	4	10	1	50	0.1
	504010010112	1	4	12	1	50	0.1
	5040100101504	1	4	4	1.5	50	0.1
	5040100101506	1	4	6	1.5	50	0.1
	5040100101508	1	4	8	1.5	50	0.1
	5040100101510	1	4	10	1.5	50	0.1
	5040100101512	1	4	12	1.5	50	0.1
	504010010204	1	4	4	2	50	0.1
	504010010206	1	4	6	2	50	0.1
	504010010208	1	4	8	2	50	0.1
	504010010210	1	4	10	2	50	0.1
	504010010212	1	4	12	2	50	0.1
	504010010304	1	4	4	3	50	0.1
	504010010306	1	4	6	3	50	0.1
	504010010308	1	4	8	3	50	0.1
	504010010310	1	4	10	3	50	0.1
	504010010312	1	4	12	3	50	0.1
	504010020104	1	4	4	1	50	0.2
	504010020106	1	4	6	1	50	0.2
	504010020108	1	4	8	1	50	0.2
	504010020110	1	4	10	1	50	0.2

Designation		DC	DCON-MS	APMX	BHTA(°)	LF	RE
UTR	504010020112	1	4	12	1	50	0.2
	5040100201504	1	4	4	1.5	50	0.2
	5040100201506	1	4	6	1.5	50	0.2
	5040100201508	1	4	8	1.5	50	0.2
	5040100201510	1	4	10	1.5	50	0.2
	5040100201512	1	4	12	1.5	50	0.2
	504010020204	1	4	4	2	50	0.2
	504010020206	1	4	6	2	50	0.2
	504010020208	1	4	8	2	50	0.2
	504010020210	1	4	10	2	50	0.2
	504010020212	1	4	12	2	50	0.2
	504010020304	1	4	4	3	50	0.2
	504010020306	1	4	6	3	50	0.2
	504010020308	1	4	8	3	50	0.2
	504010020310	1	4	10	3	50	0.2
	504010020312	1	4	12	3	50	0.2
	504010030104	1	4	4	1	50	0.3
	504010030106	1	4	6	1	50	0.3
	504010030108	1	4	8	1	50	0.3
	504010030110	1	4	10	1	50	0.3
	504010030112	1	4	12	1	50	0.3
	5040100301504	1	4	4	1.5	50	0.3
	5040100301506	1	4	6	1.5	50	0.3
	5040100301508	1	4	8	1.5	50	0.3
	5040100301510	1	4	10	1.5	50	0.3
	5040100301512	1	4	12	1.5	50	0.3
	504010030204	1	4	4	2	50	0.3
	504010030206	1	4	6	2	50	0.3
	504010030208	1	4	8	2	50	0.3
	504010030210	1	4	10	2	50	0.3
	504010030212	1	4	12	2	50	0.3
	504010030304	1	4	4	3	50	0.3
	504010030306	1	4	6	3	50	0.3
	504010030308	1	4	8	3	50	0.3
	504010030310	1	4	10	3	50	0.3
	504010030312	1	4	12	3	50	0.3

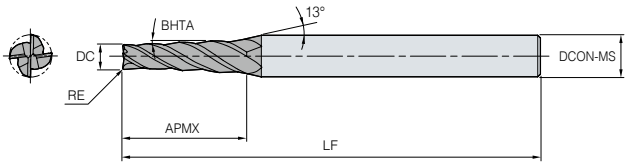
UTR504

4 flutes tapered radius



CARBIDE | 4 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01

DC	Tolerance
Ø0.8 ~ Ø2.5	0.000 ~ -0.030



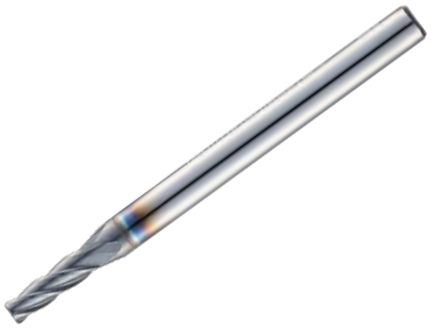
(mm)

Designation		DC	DCON-MS	APMX	BHTA(°)	LF	RE
UTR	504012010106	1.2	4	6	1	50	0.1
	504012010108	1.2	4	8	1	50	0.1
	504012010110	1.2	4	10	1	50	0.1
	504012010112	1.2	4	12	1	50	0.1
	504012010206	1.2	4	6	2	50	0.1
	504012010208	1.2	4	8	2	50	0.1
	504012010210	1.2	4	10	2	50	0.1
	504012010212	1.2	4	12	2	50	0.1
	504012010306	1.2	4	6	3	50	0.1
	504012010308	1.2	4	8	3	50	0.1
	504012010310	1.2	4	10	3	50	0.1
	504012010312	1.2	4	12	3	50	0.1
	504012020106	1.2	4	6	1	50	0.2
	504012020108	1.2	4	8	1	50	0.2
	504012020110	1.2	4	10	1	50	0.2
	504012020112	1.2	4	12	1	50	0.2
	504012020206	1.2	4	6	2	50	0.2
	504012020208	1.2	4	8	2	50	0.2
	504012020210	1.2	4	10	2	50	0.2
	504012020212	1.2	4	12	2	50	0.2
	504012020306	1.2	4	6	3	50	0.2
	504012020308	1.2	4	8	3	50	0.2
	504012020310	1.2	4	10	3	50	0.2
	504012020312	1.2	4	12	3	50	0.2
	504012030106	1.2	4	6	1	50	0.3
	504012030108	1.2	4	8	1	50	0.3
	504012030110	1.2	4	10	1	50	0.3
	504012030112	1.2	4	12	1	50	0.3
	504012030206	1.2	4	6	2	50	0.3
	504012030208	1.2	4	8	2	50	0.3
	504012030210	1.2	4	10	2	50	0.3
	504012030212	1.2	4	12	2	50	0.3
	504012030306	1.2	4	6	3	50	0.3
	504012030308	1.2	4	8	3	50	0.3
	504012030310	1.2	4	10	3	50	0.3
	504012030312	1.2	4	12	3	50	0.3

Designation		DC	DCON-MS	APMX	BHTA(°)	LF	RE
UTR	504015010106	1.5	4	6	1	50	0.1
	504015010108	1.5	4	8	1	50	0.1
	504015010110	1.5	4	10	1	50	0.1
	504015010112	1.5	4	12	1	50	0.1
	504015010116	1.5	4	16	1	50	0.1
	504015010120	1.5	4	20	1	60	0.1
	504015010206	1.5	4	6	2	50	0.1
	504015010208	1.5	4	8	2	50	0.1
	504015010210	1.5	4	10	2	50	0.1
	504015010212	1.5	4	12	2	50	0.1
	504015010216	1.5	4	16	2	50	0.1
	504015010220	1.5	4	20	2	60	0.1
	504015010306	1.5	4	6	3	50	0.1
	504015010308	1.5	4	8	3	50	0.1
	504015010310	1.5	4	10	3	50	0.1
	504015010312	1.5	4	12	3	50	0.1
	504015010316	1.5	4	16	3	50	0.1
	504015010320	1.5	4	20	3	60	0.1
	504015020106	1.5	4	6	1	50	0.2
	504015020108	1.5	4	8	1	50	0.2
	504015020110	1.5	4	10	1	50	0.2
	504015020112	1.5	4	12	1	50	0.2
	504015020116	1.5	4	16	1	50	0.2
	504015020120	1.5	4	20	1	60	0.2
	504015020206	1.5	4	6	2	50	0.2
	504015020208	1.5	4	8	2	50	0.2
	504015020210	1.5	4	10	2	50	0.2
	504015020212	1.5	4	12	2	50	0.2
	504015020216	1.5	4	16	2	50	0.2
	504015020220	1.5	4	20	2	60	0.2
	504015020306	1.5	4	6	3	50	0.2
	504015020308	1.5	4	8	3	50	0.2
	504015020310	1.5	4	10	3	50	0.2
	504015020312	1.5	4	12	3	50	0.2
	504015020316	1.5	4	16	3	50	0.2
	504015020320	1.5	4	20	3	60	0.2

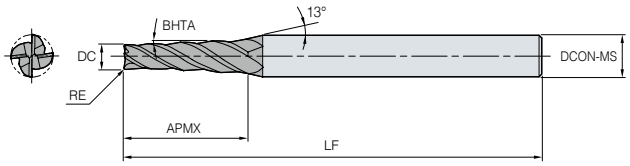
UTR504

4 flutes tapered radius



CARBIDE | 4 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01

DC	Tolerance
Ø0.8 ~ Ø2.5	0.000 ~ -0.030



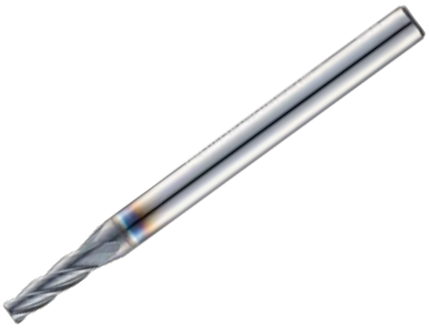
(mm)

Designation		DC	DCON-MS	APMX	BHTA(°)	LF	RE
UTR	504015030106	1.5	4	6	1	50	0.3
	504015030108	1.5	4	8	1	50	0.3
	504015030110	1.5	4	10	1	50	0.3
	504015030112	1.5	4	12	1	50	0.3
	504015030116	1.5	4	16	1	50	0.3
	504015030120	1.5	4	20	1	60	0.3
	504015030206	1.5	4	6	2	50	0.3
	504015030208	1.5	4	8	2	50	0.3
	504015030210	1.5	4	10	2	50	0.3
	504015030212	1.5	4	12	2	50	0.3
	504015030216	1.5	4	16	2	50	0.3
	504015030220	1.5	4	20	2	60	0.3
	504015030306	1.5	4	6	3	50	0.3
	504015030308	1.5	4	8	3	50	0.3
	504015030310	1.5	4	10	3	50	0.3
	504015030312	1.5	4	12	3	50	0.3
	504015030316	1.5	4	16	3	50	0.3
	504015030320	1.5	4	20	3	60	0.3
	504020010108	2	4	8	1	50	0.1
	504020010110	2	4	10	1	50	0.1
	504020010112	2	4	12	1	50	0.1
	504020010116	2	4	16	1	50	0.1
	504020010120	2	4	20	1	60	0.1
	504020010125	2	4	25	1	60	0.1
	504020010208	2	4	8	2	50	0.1
	504020010210	2	4	10	2	50	0.1
	504020010212	2	4	12	2	50	0.1
	504020010216	2	4	16	2	50	0.1
	504020010220	2	4	20	2	60	0.1
	504020010225	2	4	25	2	60	0.1
	504020010308	2	4	8	3	50	0.1
	504020010310	2	4	10	3	50	0.1
	504020010312	2	4	12	3	50	0.1
	504020010316	2	4	16	3	50	0.1
	504020010320	2	6	20	3	60	0.1
	504020010325	2	6	25	3	60	0.1

Designation		DC	DCON-MS	APMX	BHTA(°)	LF	RE
UTR	504020020108	2	4	8	1	50	0.2
	504020020110	2	4	10	1	50	0.2
	504020020112	2	4	12	1	50	0.2
	504020020116	2	4	16	1	50	0.2
	504020020120	2	4	20	1	60	0.2
	504020020125	2	4	25	1	60	0.2
	504020020208	2	4	8	2	50	0.2
	504020020210	2	4	10	2	50	0.2
	504020020212	2	4	12	2	50	0.2
	504020020216	2	4	16	2	50	0.2
	504020020220	2	4	20	2	60	0.2
	504020020225	2	4	25	2	60	0.2
	504020020308	2	4	8	3	50	0.2
	504020020310	2	4	10	3	50	0.2
	504020020312	2	4	12	3	50	0.2
	504020020316	2	4	16	3	50	0.2
	504020020320	2	6	20	3	60	0.2
	504020020325	2	6	25	3	60	0.2
	504020030108	2	4	8	1	50	0.3
	504020030110	2	4	10	1	50	0.3
	504020030112	2	4	12	1	50	0.3
	504020030116	2	4	16	1	50	0.3
	504020030120	2	4	20	1	60	0.3
	504020030125	2	4	25	1	60	0.3
	504020030208	2	4	8	2	50	0.3
	504020030210	2	4	10	2	50	0.3
	504020030212	2	4	12	2	50	0.3
	504020030216	2	4	16	2	50	0.3
	504020030220	2	4	20	2	60	0.3
	504020030225	2	4	25	2	60	0.3
	504020030308	2	4	8	3	50	0.3
	504020030310	2	4	10	3	50	0.3
	504020030312	2	4	12	3	50	0.3
	504020030316	2	4	16	3	50	0.3
	504020030320	2	6	20	3	60	0.3
	504020030325	2	6	25	3	60	0.3

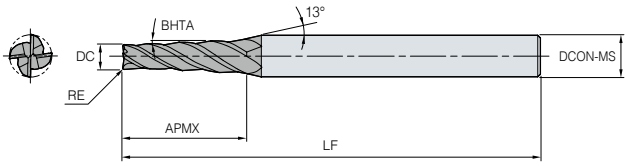
UTR504

4 flutes tapered radius



CARBIDE | 4 | H·A 30° | Grade PC315W | h5 shank | RE ±0.01

DC	Tolerance
Ø0.8 ~ Ø2.5	0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	BHTA(°)	LF	RE
UTR	504025010110	2.5	4	10	1	50	0.1
	504025010112	2.5	4	12	1	50	0.1
	504025010116	2.5	4	16	1	50	0.1
	504025010120	2.5	4	20	1	60	0.1
	504025010125	2.5	4	25	1	60	0.1
	504025010130	2.5	4	30	1	60	0.1
	504025010210	2.5	4	10	2	50	0.1
	504025010212	2.5	4	12	2	50	0.1
	504025010216	2.5	4	16	2	50	0.1
	504025010220	2.5	4	20	2	60	0.1
	504025010225	2.5	6	25	2	60	0.1
	504025010230	2.5	6	30	2	60	0.1
	504025010310	2.5	4	10	3	50	0.1
	504025010312	2.5	4	12	3	50	0.1
	504025010316	2.5	6	16	3	50	0.1
	504025010320	2.5	6	20	3	60	0.1
	504025010325	2.5	6	25	3	60	0.1
	504025010330	2.5	6	30	3	60	0.1
	504025020110	2.5	4	10	1	50	0.2
	504025020112	2.5	4	12	1	50	0.2
	504025020116	2.5	4	16	1	50	0.2
	504025020120	2.5	4	20	1	60	0.2
	504025020125	2.5	4	25	1	60	0.2
	504025020130	2.5	4	30	1	60	0.2
	504025020210	2.5	4	10	2	50	0.2
	504025020212	2.5	4	12	2	50	0.2
	504025020216	2.5	4	16	2	50	0.2

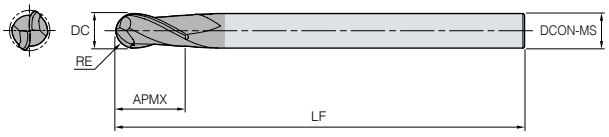
Designation		DC	DCON-MS	APMX	BHTA(°)	LF	RE
UTR	504025020220	2.5	4	20	2	60	0.2
	504025020225	2.5	6	25	2	60	0.2
	504025020230	2.5	6	30	2	60	0.2
	504025020310	2.5	4	10	3	50	0.2
	504025020312	2.5	4	12	3	50	0.2
	504025020316	2.5	6	16	3	50	0.2
	504025020320	2.5	6	20	3	60	0.2
	504025020325	2.5	6	25	3	60	0.2
	504025020330	2.5	6	30	3	60	0.2
	504025030110	2.5	4	10	1	50	0.3
	504025030112	2.5	4	12	1	50	0.3
	504025030116	2.5	4	16	1	50	0.3
	504025030120	2.5	4	20	1	60	0.3
	504025030125	2.5	4	25	1	60	0.3
	504025030130	2.5	4	30	1	60	0.3
	504025030212	2.5	4	12	2	50	0.3
	504025030216	2.5	4	16	2	50	0.3
	504025030220	2.5	4	20	2	60	0.3
	504025030225	2.5	6	25	2	60	0.3
	504025030230	2.5	6	30	2	60	0.3
	504025030310	2.5	4	10	3	50	0.3
	504025030312	2.5	4	12	3	50	0.3
	504025030316	2.5	6	16	3	50	0.3
	504025030320	2.5	6	20	3	60	0.3
	504025030325	2.5	6	25	3	60	0.3
	504025030330	2.5	6	30	3	60	0.3

UB502

2 flutes ball

CARBIDE | 2 | H·A 30° | Grade PC303W | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.01 (Above DC6)

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø6.5 ~ Ø25	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LF	RE
UB	502001S	0.1	4	0.1	40	0.05
	502001	0.1	4	0.2	40	0.05
	502001S3	0.1	3	0.2	40	0.05
	5020015S	0.15	4	0.15	40	0.075
	5020015	0.15	4	0.3	40	0.075
	5020015S3	0.15	3	0.3	40	0.075
	502002S	0.2	4	0.2	40	0.1
	502002	0.2	4	0.4	40	0.1
	502002S3	0.2	3	0.4	40	0.1
	502003S	0.3	4	0.3	40	0.15
	502003	0.3	4	0.6	40	0.15
	502003S3	0.3	3	0.6	40	0.15
	502004S	0.4	4	0.4	40	0.2
	502004	0.4	4	0.8	40	0.2
	502004S3	0.4	3	0.8	40	0.2
	502005S	0.5	4	0.5	40	0.25
	502005	0.5	4	1	40	0.25
	502005S3	0.5	3	1	40	0.25
	502006S	0.6	4	0.6	40	0.3
	502006	0.6	4	1.2	40	0.3
	502006S3	0.6	3	1.2	40	0.3
	502007S	0.7	4	0.7	40	0.35
	502007	0.7	4	1.4	40	0.35
	502007S3	0.7	3	1.4	40	0.35
	502008S	0.8	4	0.8	40	0.4
	502008	0.8	4	1.6	40	0.4
	502008S3	0.8	3	1.6	40	0.4
	502009S	0.9	4	0.9	40	0.45
	502009	0.9	4	1.8	40	0.45
	502009S3	0.9	3	1.8	40	0.45
	502010S	1	6	1.5	40	0.5
	502010S3	1	3	2.5	50	0.5
	502010S4	1	4	2.5	50	0.5
	502010	1	6	2.5	50	0.5
	502010070	1	6	2.5	70	0.5
	502010100	1	6	2.5	100	0.5
	502012S	1.2	6	2	40	0.6

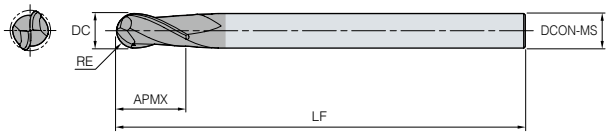
Designation		DC	DCON-MS	APMX	LF	RE
UB	502012S3	1.2	3	3	50	0.6
	502012S4	1.2	4	3	50	0.6
	502012	1.2	6	3	50	0.6
	502012070	1.2	6	3	70	0.6
	502012100	1.2	6	3	100	0.6
	502015S	1.5	6	2.5	40	0.75
	502015S3	1.5	3	4	50	0.75
	502015S4	1.5	4	4	50	0.75
	502015	1.5	6	4	50	0.75
	502015070	1.5	6	4	70	0.75
	502015100	1.5	6	4	100	0.75
	502020S	2	6	3	40	1
	502020S3	2	3	5	50	1
	502020S4	2	4	5	50	1
	502020	2	6	5	50	1
	502020080	2	6	5	80	1
	502020100	2	6	5	100	1
	502025S	2.5	6	4	40	1.25
	502025S3	2.5	3	6	60	1.25
	502025S4	2.5	4	6	60	1.25
	502025	2.5	6	6	60	1.25
	502025080	2.5	6	6	80	1.25
	502025100	2.5	6	6	100	1.25
	502030S	3	6	4.5	40	1.5
	502030S3	3	3	6	60	1.5
	502030S4	3	4	6	60	1.5
	502030	3	6	6	60	1.5
	502030080	3	6	6	80	1.5
	502030100	3	6	6	100	1.5
	502035	3.5	6	8	70	1.75
	502040S	4	6	6	50	2
	502040S4	4	4	8	70	2
	502040	4	6	8	70	2
	502040100S4	4	4	8	100	2
	502040120S4	4	4	8	120	2
	502040100	4	6	8	100	2
	502040120	4	6	8	120	2

UB502

2 flutes ball

CARBIDE | 2 | H·A 30° | Grade PC303W | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.01 (Above DC6)

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø6.5 ~ Ø25	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LF	RE
UB	502045	4.5	6	9	80	2.25
	502050S	5	6	7.5	60	2.5
	502050	5	6	10	80	2.5
	502050S5	5	5	10	80	2.5
	502055	5.5	6	11	90	2.75
	502060S	6	6	9	50	3
	502060060	6	6	9	60	3
	502060080	6	6	9	80	3
	502060	6	6	12	90	3
	502060110	6	6	12	110	3
	502060130	6	6	12	130	3
	502060150	6	6	12	150	3
	502065	6.5	8	13	90	3.25
	502070	7	8	14	90	3.5
	502080S	8	8	12	50	4
	502080060	8	8	12	60	4
	502080080	8	8	12	80	4
	502080090	8	8	12	90	4
	502080	8	8	14	100	4
	502080130	8	8	14	130	4
	502080150	8	8	14	150	4
	502085	8.5	10	16	100	4.25
	502090	9	10	18	100	4.5
	502100S	10	10	15	50	5
	502100060	10	10	15	60	5
	502100080	10	10	15	80	5
	502100090	10	10	15	90	5
	502100	10	10	18	100	5
	502100130	10	10	18	130	5
	502100150	10	10	18	150	5

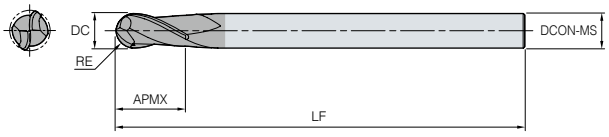
Designation		DC	DCON-MS	APMX	LF	RE
UB	502100180	10	10	18	180	5
	502100200	10	10	18	200	5
	502110	11	12	20	100	5.5
	502120S	12	12	18	60	6
	502120080	12	12	18	80	6
	502120090	12	12	18	90	6
	502120100	12	12	18	100	6
	502120	12	12	24	110	6
	502120130	12	12	24	130	6
	502120150	12	12	24	150	6
	502120180	12	12	24	180	6
	502120200	12	12	24	200	6
	502130	13	12	24	100	6.5
	502140S12	14	12	26	100	7
	502140	14	14	26	100	7
	502140S16	14	16	26	100	7
	502150	15	16	28	140	7.5
	502160100	16	16	24	100	8
	502160130	16	16	24	130	8
	502160	16	16	30	150	8
	502160180	16	16	30	180	8
	502160200	16	16	30	200	8
	502180S16	18	16	34	150	9
	502180	18	18	34	150	9
	502200100	20	20	30	100	10
	502200130	20	20	30	130	10
	502200	20	20	38	150	10
	502200200	20	20	38	200	10
	502250120	25	25	50	120	12.5
	502250180	25	25	50	180	12.5

UB502P

2 flutes high precision ball

CARBIDE | 2 | H·A 30° | Grade PC303W | h5 shank | RE ±0.002 (DC6 or below) | RE ±0.003 (Above DC6)

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

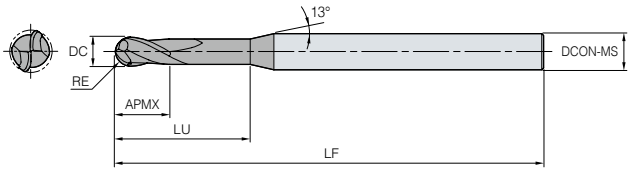
Designation		DC	DCON-MS	APMX	LF	RE
UB	502001P	0.1	4	0.2	40	0.05
	5020015P	0.15	4	0.3	40	0.075
	502002P	0.2	4	0.4	40	0.1
	502003P	0.3	4	0.6	40	0.15
	502004P	0.4	4	0.8	40	0.2
	502005P	0.5	4	1	40	0.25
	502006P	0.6	4	1.2	40	0.3
	502007P	0.7	4	1.4	40	0.35
	502008P	0.8	4	1.6	40	0.4
	502009P	0.9	4	1.8	40	0.45
	502010P	1	6	2.5	50	0.5
	502012P	1.2	6	3	50	0.6
	502015P	1.5	6	4	50	0.75
	502020P	2	6	5	50	1
	502025P	2.5	6	6	60	1.25
	502030P	3	6	6	60	1.5
	502040P	4	6	8	70	2
	502050P	5	6	10	80	2.5
	502060P	6	6	12	90	3
	502080P	8	8	14	100	4
	502100P	10	10	18	100	5
	502120P	12	12	24	110	6

UB512

2 flutes long neck ball

CARBIDE | 2 | H·A 30° | Grade PC303W | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.01 (Above DC6)

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
UB	512001002	0.1	4	0.1	0.2	40	0.05
	512001003	0.1	4	0.1	0.3	40	0.05
	512001005	0.1	4	0.1	0.5	40	0.05
	51200101	0.1	4	0.1	1	40	0.05
	512002005	0.2	4	0.2	0.5	40	0.1
	51200201	0.2	4	0.2	1	40	0.1
	512002015	0.2	4	0.2	1.5	40	0.1
	51200202	0.2	4	0.2	2	40	0.1
	51200203	0.2	4	0.2	3	40	0.1
	51200301	0.3	4	0.3	1	40	0.15
	512003015	0.3	4	0.3	1.5	40	0.15
	51200302	0.3	4	0.3	2	40	0.15
	512003025	0.3	4	0.3	2.5	40	0.15
	51200303	0.3	4	0.3	3	40	0.15
	51200304	0.3	4	0.3	4	40	0.15
	51200305	0.3	4	0.3	5	40	0.15
	51200401	0.4	4	0.4	1	40	0.2
	512004015	0.4	4	0.4	1.5	40	0.2
	51200402	0.4	4	0.4	2	40	0.2
	512004025	0.4	4	0.4	2.5	40	0.2
	51200403	0.4	4	0.4	3	40	0.2
	51200404	0.4	4	0.4	4	40	0.2
	51200405	0.4	4	0.4	5	40	0.2
	51200406	0.4	4	0.4	6	40	0.2
	51200408	0.4	4	0.4	8	40	0.2
	51200410	0.4	4	0.4	10	40	0.2
	51200501	0.5	4	0.5	1	45	0.25
	512005015	0.5	4	0.5	1.5	45	0.25
	51200502	0.5	4	0.5	2	45	0.25
	512005025	0.5	4	0.5	2.5	45	0.25
	51200503	0.5	4	0.5	3	45	0.25
	51200504	0.5	4	0.5	4	45	0.25
	51200505	0.5	4	0.5	5	45	0.25
	51200506	0.5	4	0.5	6	45	0.25

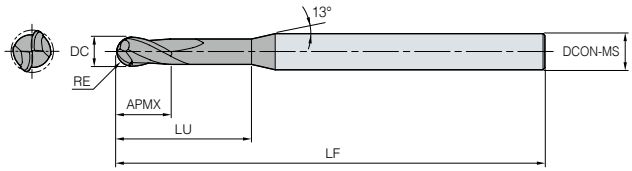
Designation		DC	DCON-MS	APMX	LU	LF	RE
UB	51200508	0.5	4	0.5	8	45	0.25
	51200510	0.5	4	0.5	10	45	0.25
	51200512	0.5	4	0.5	12	45	0.25
	51200514	0.5	4	0.5	14	45	0.25
	51200516	0.5	4	0.5	16	45	0.25
	51200601	0.6	4	0.6	1	45	0.3
	51200602	0.6	4	0.6	2	45	0.3
	51200603	0.6	4	0.6	3	45	0.3
	51200604	0.6	4	0.6	4	45	0.3
	51200605	0.6	4	0.6	5	45	0.3
	51200606	0.6	4	0.6	6	45	0.3
	51200608	0.6	4	0.6	8	45	0.3
	51200610	0.6	4	0.6	10	45	0.3
	51200612	0.6	4	0.6	12	45	0.3
	51200614	0.6	4	0.6	14	45	0.3
	51200616	0.6	4	0.6	16	45	0.3
	51200702	0.7	4	0.7	2	45	0.35
	51200704	0.7	4	0.7	4	45	0.35
	51200706	0.7	4	0.7	6	45	0.35
	51200708	0.7	4	0.7	8	45	0.35
	51200710	0.7	4	0.7	10	45	0.35
	51200712	0.7	4	0.7	12	45	0.35
	51200801	0.8	4	0.8	1	45	0.4
	51200802	0.8	4	0.8	2	45	0.4
	51200803	0.8	4	0.8	3	45	0.4
	51200804	0.8	4	0.8	4	45	0.4
	51200805	0.8	4	0.8	5	45	0.4
	51200806	0.8	4	0.8	6	45	0.4
	51200807	0.8	4	0.8	7	45	0.4
	51200808	0.8	4	0.8	8	45	0.4
	51200810	0.8	4	0.8	10	45	0.4
	51200812	0.8	4	0.8	12	45	0.4
	51200814	0.8	4	0.8	14	45	0.4
	51200816	0.8	4	0.8	16	45	0.4

UB512

2 flutes long neck ball

CARBIDE | 2 | H·A 30° | Grade PC303W | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.01 (Above DC6)

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

	Designation	DC	DCON-MS	APMX	LU	LF	RE
UB	51200820	0.8	4	0.8	20	45	0.4
	51200904	0.9	4	0.9	4	45	0.45
	51200906	0.9	4	0.9	6	45	0.45
	51200908	0.9	4	0.9	8	45	0.45
	51200910	0.9	4	0.9	10	45	0.45
	51201002	1	4	1	2	50	0.5
	512010025	1	4	1	2.5	50	0.5
	51201003	1	4	1	3	50	0.5
	51201004	1	4	1	4	50	0.5
	51201005	1	4	1	5	50	0.5
	51201006	1	4	1	6	50	0.5
	51201007	1	4	1	7	50	0.5
	51201008	1	4	1	8	50	0.5
	51201009	1	4	1	9	50	0.5
	51201010	1	4	1	10	50	0.5
	51201012	1	4	1	12	50	0.5
	51201014	1	4	1	14	50	0.5
	51201016	1	4	1	16	50	0.5
	51201018	1	4	1	18	50	0.5
	51201020	1	4	1	20	55	0.5
	51201022	1	4	1	22	60	0.5
	51201026	1	4	1	26	60	0.5
	51201030	1	4	1	30	70	0.5
	51201040	1	4	1	40	80	0.5
	51201050	1	4	1	50	100	0.5
	51201204	1.2	4	1.2	4	50	0.6
	51201206	1.2	4	1.2	6	50	0.6
	51201208	1.2	4	1.2	8	50	0.6
	51201210	1.2	4	1.2	10	50	0.6
	51201212	1.2	4	1.2	12	50	0.6
	51201214	1.2	4	1.2	14	50	0.6
	51201216	1.2	4	1.2	16	50	0.6
	51201220	1.2	4	1.2	20	55	0.6
	51201226	1.2	4	1.2	26	60	0.6

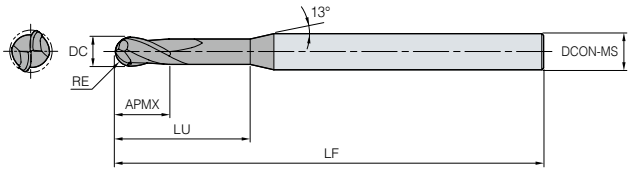
	Designation	DC	DCON-MS	APMX	LU	LF	RE
UB	51201406	1.4	4	1.4	6	50	0.7
	51201408	1.4	4	1.4	8	50	0.7
	51201410	1.4	4	1.4	10	50	0.7
	51201412	1.4	4	1.4	12	50	0.7
	51201416	1.4	4	1.4	16	50	0.7
	51201503	1.5	4	1.5	3	50	0.75
	51201504	1.5	4	1.5	4	50	0.75
	51201505	1.5	4	1.5	5	50	0.75
	51201506	1.5	4	1.5	6	50	0.75
	51201507	1.5	4	1.5	7	50	0.75
	51201508	1.5	4	1.5	8	50	0.75
	51201510	1.5	4	1.5	10	50	0.75
	51201512	1.5	4	1.5	12	50	0.75
	51201514	1.5	4	1.5	14	50	0.75
	51201516	1.5	4	1.5	16	50	0.75
	51201518	1.5	4	1.5	18	50	0.75
	51201520	1.5	4	1.5	20	55	0.75
	51201522	1.5	4	1.5	22	60	0.75
	51201526	1.5	4	1.5	26	60	0.75
	51201530	1.5	4	1.5	30	70	0.75
	51201535	1.5	4	1.5	35	70	0.75
	51201540	1.5	4	1.5	40	80	0.75
	51201604	1.6	4	1.6	4	50	0.8
	51201606	1.6	4	1.6	6	50	0.8
	51201608	1.6	4	1.6	8	50	0.8
	51201610	1.6	4	1.6	10	50	0.8
	51201612	1.6	4	1.6	12	50	0.8
	51201616	1.6	4	1.6	16	50	0.8
	51201620	1.6	4	1.6	20	50	0.8
	51201804	1.8	4	1.8	4	50	0.9
	51201806	1.8	4	1.8	6	50	0.9
	51201808	1.8	4	1.8	8	50	0.9
	51201810	1.8	4	1.8	10	50	0.9
	51201812	1.8	4	1.8	12	50	0.9

UB512

2 flutes long neck ball

CARBIDE | 2 | H·A 30° | Grade PC303W | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.01 (Above DC6)

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
UB	51201816	1.8	4	1.8	16	50	0.9
	51201820	1.8	4	1.8	20	50	0.9
	51202004	2	4	2	4	50	1
	51202005	2	4	2	5	50	1
	51202006	2	4	2	6	50	1
	51202008	2	4	2	8	50	1
	51202010	2	4	2	10	50	1
	51202012	2	4	2	12	50	1
	51202014	2	4	2	14	50	1
	51202016	2	4	2	16	50	1
	51202018	2	4	2	18	55	1
	51202020	2	4	2	20	55	1
	51202022	2	4	2	22	60	1
	51202026	2	4	2	26	60	1
	51202030	2	4	2	30	70	1
	51202035	2	4	2	35	70	1
	51202040	2	4	2	40	80	1
	51202045	2	4	2	45	90	1
	51202050	2	4	2	50	100	1
	51202060	2	4	2	60	110	1
	51202508	2.5	4	2.5	8	50	1.25
	51202510	2.5	4	2.5	10	50	1.25
	51202512	2.5	4	2.5	12	50	1.25
	51202516	2.5	4	2.5	16	50	1.25
	51202520	2.5	4	2.5	20	50	1.25
	51202522	2.5	4	2.5	22	60	1.25
	51202526	2.5	4	2.5	26	60	1.25
	51202530	2.5	4	2.5	30	70	1.25
	51202535	2.5	4	2.5	35	70	1.25
	51202540	2.5	4	2.5	40	80	1.25
	51202545	2.5	4	2.5	45	90	1.25
	51202550	2.5	4	2.5	50	100	1.25
	51203006	3	6	3	6	50	1.5
	51203008	3	6	3	8	50	1.5

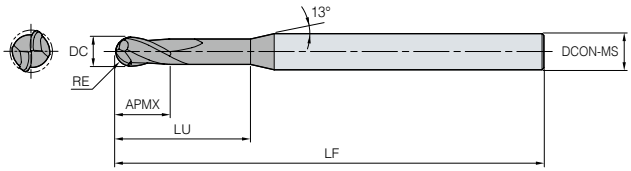
Designation		DC	DCON-MS	APMX	LU	LF	RE
UB	51203010	3	6	3	10	50	1.5
	51203012	3	6	3	12	50	1.5
	51203014	3	6	3	14	60	1.5
	51203016	3	6	3	16	60	1.5
	51203018	3	6	3	18	60	1.5
	51203020	3	6	3	20	60	1.5
	51203022	3	6	3	22	65	1.5
	51203026	3	6	3	26	65	1.5
	51203030	3	6	3	30	70	1.5
	51203035	3	6	3	35	70	1.5
	51203040	3	6	3	40	80	1.5
	51203045	3	6	3	45	90	1.5
	51203050	3	6	3	50	100	1.5
	51203060	3	6	3	60	100	1.5
	51204008	4	6	4	8	50	2
	51204010	4	6	4	10	50	2
	51204012	4	6	4	12	50	2
	51204014	4	6	4	14	60	2
	51204016	4	6	4	16	60	2
	51204018	4	6	4	18	60	2
	51204020	4	6	4	20	60	2
	51204022	4	6	4	22	65	2
	51204026	4	6	4	26	65	2
	51204030	4	6	4	30	70	2
	51204035	4	6	4	35	70	2
	51204040	4	6	4	40	80	2
	51204045	4	6	4	45	90	2
	51204050	4	6	4	50	100	2
	51204055	4	6	4	55	100	2
	51204060	4	6	4	60	100	2
	51205015	5	6	6	15	60	2.5
	51205020	5	6	6	20	60	2.5
	51205026	5	6	6	26	65	2.5
	51205030	5	6	6	30	70	2.5

UB512

2 flutes long neck ball

CARBIDE | 2 | H·A 30° | Grade PC303W | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.01 (Above DC6)

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
UB	51205035	5	6	6	35	70	2.5
	51205040	5	6	6	40	80	2.5
	51205045	5	6	6	45	90	2.5
	51205050	5	6	6	50	100	2.5
	51205055	5	6	6	55	100	2.5
	51205060	5	6	6	60	100	2.5
	51206020	6	6	8	20	60	3
	5120602090	6	6	12	20	90	3
	51206030	6	6	8	30	60	3
	5120603090	6	6	12	30	90	3
	51208025	8	8	10	25	70	4

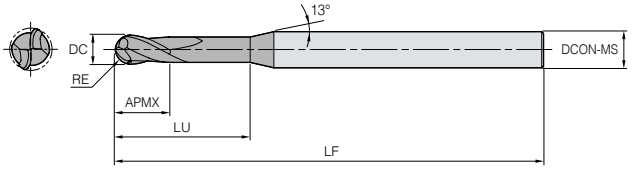
Designation		DC	DCON-MS	APMX	LU	LF	RE
UB	51208025100	8	8	14	25	100	4
	51208035	8	8	10	35	70	4
	51208035100	8	8	14	35	100	4
	51210030	10	10	12	30	75	5
	51210030100	10	10	18	30	100	5
	51210040	10	10	12	40	75	5
	51210040100	10	10	18	40	100	5
	51212032	12	12	14	32	80	6
	51212032110	12	12	22	32	110	6
	51212045	12	12	14	45	80	6
	51212045110	12	12	22	45	110	6

UB512S6

2 flutes long neck ball

CARBIDE | 2 | H·A 30° | Grade PC303W | h5 shank | RE ±0.005

DC	Tolerance
Ø0.5 ~ Ø2	0.000 ~ -0.012



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
UB	51200501S6	0.5	6	0.5	1	45	0.25
	51200502S6	0.5	6	0.5	2	45	0.25
	51200504S6	0.5	6	0.5	4	45	0.25
	51200601S6	0.6	6	0.6	1	45	0.3
	51200602S6	0.6	6	0.6	2	45	0.3
	51200603S6	0.6	6	0.6	3	45	0.3
	51200604S6	0.6	6	0.6	4	45	0.3
	51200605S6	0.6	6	0.6	5	45	0.3
	51200606S6	0.6	6	0.6	6	45	0.3
	51200608S6	0.6	6	0.6	8	45	0.3
	51200610S6	0.6	6	0.6	10	45	0.3
	51200612S6	0.6	6	0.6	12	45	0.3
	51200614S6	0.6	6	0.6	14	45	0.3
	51200616S6	0.6	6	0.6	16	45	0.3
	51200801S6	0.8	6	0.8	1	45	0.4
	51200802S6	0.8	6	0.8	2	45	0.4
	51200803S6	0.8	6	0.8	3	45	0.4
	51200804S6	0.8	6	0.8	4	45	0.4
	51200805S6	0.8	6	0.8	5	45	0.4
	51200806S6	0.8	6	0.8	6	45	0.4
	51200808S6	0.8	6	0.8	8	45	0.4
	51200810S6	0.8	6	0.8	10	45	0.4
	51200812S6	0.8	6	0.8	12	45	0.4
	51200814S6	0.8	6	0.8	14	45	0.4
	51200816S6	0.8	6	0.8	16	45	0.4
	51200820S6	0.8	6	0.8	20	55	0.4
	51201002S6	1	6	1	2	50	0.5
	51201003S6	1	6	1	3	50	0.5
	51201004S6	1	6	1	4	50	0.5
	51201005S6	1	6	1	5	50	0.5
	51201006S6	1	6	1	6	50	0.5
	51201007S6	1	6	1	7	50	0.5
	51201008S6	1	6	1	8	50	0.5
	51201009S6	1	6	1	9	50	0.5
	51201010S6	1	6	1	10	50	0.5
	51201012S6	1	6	1	12	50	0.5
	51201014S6	1	6	1	14	50	0.5

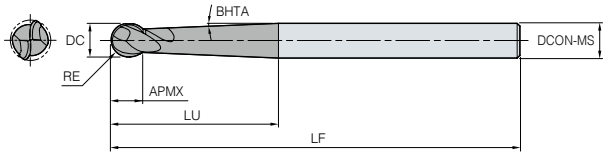
Designation		DC	DCON-MS	APMX	LU	LF	RE
UB	51201016S6	1	6	1	16	50	0.5
	51201018S6	1	6	1	18	50	0.5
	51201020S6	1	6	1	20	55	0.5
	51201022S6	1	6	1	22	60	0.5
	51201026S6	1	6	1	26	60	0.5
	51201030S6	1	6	1	30	70	0.5
	51201503S6	1.5	6	1.5	3	50	0.75
	51201504S6	1.5	6	1.5	4	50	0.75
	51201506S6	1.5	6	1.5	6	50	0.75
	51201508S6	1.5	6	1.5	8	50	0.75
	51201510S6	1.5	6	1.5	10	50	0.75
	51201512S6	1.5	6	1.5	12	50	0.75
	51201514S6	1.5	6	1.5	14	50	0.75
	51201516S6	1.5	6	1.5	16	50	0.75
	51201518S6	1.5	6	1.5	18	50	0.75
	51201520S6	1.5	6	1.5	20	55	0.75
	51201522S6	1.5	6	1.5	22	60	0.75
	51201526S6	1.5	6	1.5	26	60	0.75
	51201530S6	1.5	6	1.5	30	70	0.75
	51201535S6	1.5	6	1.5	35	70	0.75
	51201540S6	1.5	6	1.5	40	80	0.75
	51202004S6	2	6	2	4	50	1
	51202006S6	2	6	2	6	50	1
	51202008S6	2	6	2	8	50	1
	51202010S6	2	6	2	10	50	1
	51202012S6	2	6	2	12	50	1
	51202014S6	2	6	2	14	50	1
	51202016S6	2	6	2	16	50	1
	51202018S6	2	6	2	18	50	1
	51202020S6	2	6	2	20	50	1
	51202022S6	2	6	2	22	60	1
	51202026S6	2	6	2	26	60	1
	51202030S6	2	6	2	30	70	1
	51202035S6	2	6	2	35	70	1
	51202040S6	2	6	2	40	80	1
	51202045S6	2	6	2	45	90	1
	51202050S6	2	6	2	50	100	1

UB532

2 flutes lollipop style

CARBIDE | 2 | H·A 30° | Grade PC303W | h5 shank | RE ±0.01

DC	Tolerance
Ø3 ~ Ø12	0.000 ~ -0.030



(mm)

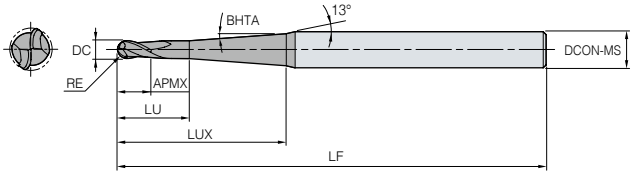
Designation		DC	DCON-MS	APMX	LU	LF	BHTA(°)	RE
UB	532030	3	6	2.3	16	80	1.5	1.5
	532040	4	6	3.1	20	80	1.5	2
	532050	5	6	3.9	25	80	1.5	2.5
	532060	6	6	4.9	30	100	1.5	3
	532080	8	8	6.3	35	100	1.5	4
	532100	10	10	7.9	40	100	1.5	5
	532120	12	12	9.5	50	100	1.5	6

UB542

2 flutes tapered neck ball

CARBIDE | 2 | H·A 30° | Grade PC303W | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.01 (Above DC6)

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UB	54200105005	0.1	4	0.1	-	0.5	40	0.5	0.05
	5420010501	0.1	4	0.1	-	1	40	0.5	0.05
	54200110005	0.1	4	0.1	-	0.5	40	1	0.05
	5420011001	0.1	4	0.1	-	1	40	1	0.05
	54200115005	0.1	4	0.1	-	0.5	40	1.5	0.05
	5420011501	0.1	4	0.1	-	1	40	1.5	0.05
	54200120005	0.1	4	0.1	-	0.5	40	2	0.05
	5420012001	0.1	4	0.1	-	1	40	2	0.05
	54200130005	0.1	4	0.1	-	0.5	40	3	0.05
	5420013001	0.1	4	0.1	-	1	40	3	0.05
	5420020501	0.2	4	0.2	0.4	1	40	0.5	0.1
	5420020502	0.2	4	0.2	0.4	2	40	0.5	0.1
	5420020503	0.2	4	0.2	0.4	3	40	0.5	0.1
	5420021001	0.2	4	0.2	0.4	1	40	1	0.1
	5420021002	0.2	4	0.2	0.4	2	40	1	0.1
	5420021003	0.2	4	0.2	0.4	3	40	1	0.1
	5420021501	0.2	4	0.2	0.4	1	40	1.5	0.1
	5420021502	0.2	4	0.2	0.4	2	40	1.5	0.1
	5420021503	0.2	4	0.2	0.4	3	40	1.5	0.1
	5420022001	0.2	4	0.2	0.4	1	40	2	0.1
	5420022002	0.2	4	0.2	0.4	2	40	2	0.1
	5420022003	0.2	4	0.2	0.4	3	40	2	0.1
	5420023001	0.2	4	0.2	0.4	1	40	3	0.1
	5420023002	0.2	4	0.2	0.4	2	40	3	0.1
	5420023003	0.2	4	0.2	0.4	3	40	3	0.1
	5420025002	0.2	4	0.2	0.4	2	40	5	0.1
	5420025003	0.2	4	0.2	0.4	3	40	5	0.1
	5420030502	0.3	4	0.3	0.6	2	40	0.5	0.15
	5420030503	0.3	4	0.3	0.6	3	40	0.5	0.15
	5420030504	0.3	4	0.3	0.6	4	40	0.5	0.15
	5420030505	0.3	4	0.3	0.6	5	40	0.5	0.15
	5420031002	0.3	4	0.3	0.6	2	40	1	0.15
	5420031003	0.3	4	0.3	0.6	3	40	1	0.15
	5420031004	0.3	4	0.3	0.6	4	40	1	0.15
	5420031005	0.3	4	0.3	0.6	5	40	1	0.15
	5420031502	0.3	4	0.3	0.6	2	40	1.5	0.15

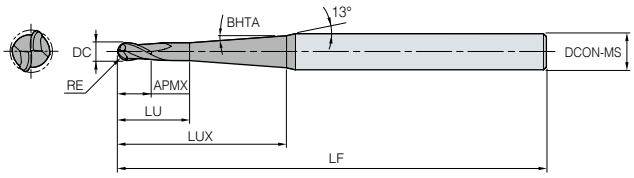
Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UB	5420031503	0.3	4	0.3	0.6	3	40	1.5	0.15
	5420031504	0.3	4	0.3	0.6	4	40	1.5	0.15
	5420031505	0.3	4	0.3	0.6	5	40	1.5	0.15
	5420032002	0.3	4	0.3	0.6	2	40	2	0.15
	5420032003	0.3	4	0.3	0.6	3	40	2	0.15
	5420032004	0.3	4	0.3	0.6	4	40	2	0.15
	5420032005	0.3	4	0.3	0.6	5	40	2	0.15
	5420033002	0.3	4	0.3	0.6	2	40	3	0.15
	5420033003	0.3	4	0.3	0.6	3	40	3	0.15
	5420033004	0.3	4	0.3	0.6	4	40	3	0.15
	5420033005	0.3	4	0.3	0.6	5	40	3	0.15
	5420035005	0.3	4	0.3	0.6	5	40	5	0.15
	5420040502	0.4	4	0.4	0.8	2	50	0.5	0.2
	5420040503	0.4	4	0.4	0.8	3	50	0.5	0.2
	5420040504	0.4	4	0.4	0.8	4	50	0.5	0.2
	5420040505	0.4	4	0.4	0.8	5	50	0.5	0.2
	5420040506	0.4	4	0.4	0.8	6	50	0.5	0.2
	5420041002	0.4	4	0.4	0.8	2	50	1	0.2
	5420041003	0.4	4	0.4	0.8	3	50	1	0.2
	5420041004	0.4	4	0.4	0.8	4	50	1	0.2
	5420041005	0.4	4	0.4	0.8	5	50	1	0.2
	5420041006	0.4	4	0.4	0.8	6	50	1	0.2
	5420041502	0.4	4	0.4	0.8	2	50	1.5	0.2
	5420041503	0.4	4	0.4	0.8	3	50	1.5	0.2
	5420041504	0.4	4	0.4	0.8	4	50	1.5	0.2
	5420041505	0.4	4	0.4	0.8	5	50	1.5	0.2
	5420041506	0.4	4	0.4	0.8	6	50	1.5	0.2
	5420042002	0.4	4	0.4	0.8	2	50	2	0.2
	5420042003	0.4	4	0.4	0.8	3	50	2	0.2
	5420042004	0.4	4	0.4	0.8	4	50	2	0.2
	5420042005	0.4	4	0.4	0.8	5	50	2	0.2
	5420042006	0.4	4	0.4	0.8	6	50	2	0.2
	5420043002	0.4	4	0.4	0.8	2	50	3	0.2
	5420043003	0.4	4	0.4	0.8	3	50	3	0.2
	5420043004	0.4	4	0.4	0.8	4	50	3	0.2
	5420043005	0.4	4	0.4	0.8	5	50	3	0.2

UB542

2 flutes tapered neck ball

CARBIDE | 2 | H·A 30° | Grade PC303W | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.01 (Above DC6)

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UB	5420043006	0.4	4	0.4	0.8	6	50	3	0.2
	5420045004	0.4	4	0.4	0.8	4	50	5	0.2
	5420045006	0.4	4	0.4	0.8	6	50	5	0.2
	5420050504	0.5	4	0.5	1	4	50	0.5	0.25
	5420050506	0.5	4	0.5	1	6	50	0.5	0.25
	5420050508	0.5	4	0.5	1	8	50	0.5	0.25
	5420050510	0.5	4	0.5	1	10	50	0.5	0.25
	5420051004	0.5	4	0.5	1	4	50	1	0.25
	5420051006	0.5	4	0.5	1	6	50	1	0.25
	5420051008	0.5	4	0.5	1	8	50	1	0.25
	5420051010	0.5	4	0.5	1	10	50	1	0.25
	5420051504	0.5	4	0.5	1	4	50	1.5	0.25
	5420051506	0.5	4	0.5	1	6	50	1.5	0.25
	5420051508	0.5	4	0.5	1	8	50	1.5	0.25
	5420051510	0.5	4	0.5	1	10	50	1.5	0.25
	5420052004	0.5	4	0.5	1	4	50	2	0.25
	5420052006	0.5	4	0.5	1	6	50	2	0.25
	5420052008	0.5	4	0.5	1	8	50	2	0.25
	5420052010	0.5	4	0.5	1	10	50	2	0.25
	5420053004	0.5	4	0.5	1	4	50	3	0.25
	5420053006	0.5	4	0.5	1	6	50	3	0.25
	5420053008	0.5	4	0.5	1	8	50	3	0.25
	5420053010	0.5	4	0.5	1	10	50	3	0.25
	5420060504	0.6	4	0.6	1.2	4	50	0.5	0.3
	5420060506	0.6	4	0.6	1.2	6	50	0.5	0.3
	5420060508	0.6	4	0.6	1.2	8	50	0.5	0.3
	5420060510	0.6	4	0.6	1.2	10	50	0.5	0.3
	5420060512	0.6	4	0.6	1.2	12	50	0.5	0.3
	5420061004	0.6	4	0.6	1.2	4	50	1	0.3
	5420061006	0.6	4	0.6	1.2	6	50	1	0.3
	5420061008	0.6	4	0.6	1.2	8	50	1	0.3
	5420061010	0.6	4	0.6	1.2	10	50	1	0.3
	5420061012	0.6	4	0.6	1.2	12	50	1	0.3
	5420061504	0.6	4	0.6	1.2	4	50	1.5	0.3
	5420061506	0.6	4	0.6	1.2	6	50	1.5	0.3
	5420061508	0.6	4	0.6	1.2	8	50	1.5	0.3

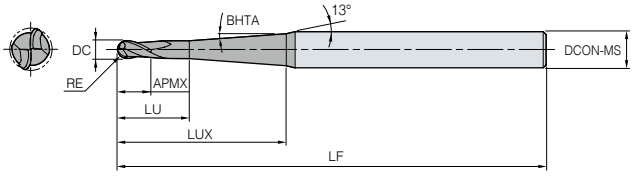
Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UB	5420061510	0.6	4	0.6	1.2	10	50	1.5	0.3
	5420061512	0.6	4	0.6	1.2	12	50	1.5	0.3
	5420062004	0.6	4	0.6	1.2	4	50	2	0.3
	5420062006	0.6	4	0.6	1.2	6	50	2	0.3
	5420062008	0.6	4	0.6	1.2	8	50	2	0.3
	5420062010	0.6	4	0.6	1.2	10	50	2	0.3
	5420062012	0.6	4	0.6	1.2	12	50	2	0.3
	5420063004	0.6	4	0.6	1.2	4	50	3	0.3
	5420063006	0.6	4	0.6	1.2	6	50	3	0.3
	5420063008	0.6	4	0.6	1.2	8	50	3	0.3
	5420063010	0.6	4	0.6	1.2	10	50	3	0.3
	5420063012	0.6	4	0.6	1.2	12	50	3	0.3
	5420080504	0.8	4	0.8	1.6	4	50	0.5	0.4
	5420080506	0.8	4	0.8	1.6	6	50	0.5	0.4
	5420080508	0.8	4	0.8	1.6	8	50	0.5	0.4
	5420080510	0.8	4	0.8	1.6	10	50	0.5	0.4
	5420080512	0.8	4	0.8	1.6	12	50	0.5	0.4
	5420080516	0.8	4	0.8	1.6	16	50	0.5	0.4
	5420081004	0.8	4	0.8	1.6	4	50	1	0.4
	5420081006	0.8	4	0.8	1.6	6	50	1	0.4
	5420081008	0.8	4	0.8	1.6	8	50	1	0.4
	5420081010	0.8	4	0.8	1.6	10	50	1	0.4
	5420081012	0.8	4	0.8	1.6	12	50	1	0.4
	5420081016	0.8	4	0.8	1.6	16	50	1	0.4
	5420081504	0.8	4	0.8	1.6	4	50	1.5	0.4
	5420081506	0.8	4	0.8	1.6	6	50	1.5	0.4
	5420081508	0.8	4	0.8	1.6	8	50	1.5	0.4
	5420081510	0.8	4	0.8	1.6	10	50	1.5	0.4
	5420081512	0.8	4	0.8	1.6	12	50	1.5	0.4
	5420081516	0.8	4	0.8	1.6	16	50	1.5	0.4
	5420082004	0.8	4	0.8	1.6	4	50	2	0.4
	5420082006	0.8	4	0.8	1.6	6	50	2	0.4
	5420082008	0.8	4	0.8	1.6	8	50	2	0.4
	5420082010	0.8	4	0.8	1.6	10	50	2	0.4
	5420082012	0.8	4	0.8	1.6	12	50	2	0.4
	5420082016	0.8	4	0.8	1.6	16	50	2	0.4

UB542

2 flutes tapered neck ball

CARBIDE | 2 | H·A 30° | Grade PC303W | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.01 (Above DC6)

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UB	5420083004	0.8	4	0.8	1.6	4	50	3	0.4
	5420083006	0.8	4	0.8	1.6	6	50	3	0.4
	5420083008	0.8	4	0.8	1.6	8	50	3	0.4
	5420083010	0.8	4	0.8	1.6	10	50	3	0.4
	5420083012	0.8	4	0.8	1.6	12	50	3	0.4
	5420083016	0.8	4	0.8	1.6	16	50	3	0.4
	5420100506	1	4	1	2.5	6	50	0.5	0.5
	5420100508	1	4	1	2.5	8	50	0.5	0.5
	5420100510	1	4	1	2.5	10	50	0.5	0.5
	5420100512	1	4	1	2.5	12	50	0.5	0.5
	5420100516	1	4	1	2.5	16	50	0.5	0.5
	5420100520	1	4	1	2.5	20	50	0.5	0.5
	5420100525	1	4	1	2.5	25	60	0.5	0.5
	5420100530	1	4	1	2.5	30	70	0.5	0.5
	5420100540	1	4	1	2.5	40	80	0.5	0.5
	5420100550	1	4	1	2.5	50	90	0.5	0.5
	5420101006	1	4	1	2.5	6	50	1	0.5
	5420101008	1	4	1	2.5	8	50	1	0.5
	5420101010	1	4	1	2.5	10	50	1	0.5
	5420101012	1	4	1	2.5	12	50	1	0.5
	5420101016	1	4	1	2.5	16	50	1	0.5
	5420101020	1	4	1	2.5	20	50	1	0.5
	5420101025	1	4	1	2.5	25	60	1	0.5
	5420101030	1	4	1	2.5	30	70	1	0.5
	5420101040	1	4	1	2.5	40	80	1	0.5
	5420101050	1	4	1	2.5	50	90	1	0.5
	5420101506	1	4	1	2.5	6	50	1.5	0.5
	5420101508	1	4	1	2.5	8	50	1.5	0.5
	5420101510	1	4	1	2.5	10	50	1.5	0.5
	5420101512	1	4	1	2.5	12	50	1.5	0.5
	5420101516	1	4	1	2.5	16	50	1.5	0.5
	5420101520	1	4	1	2.5	20	50	1.5	0.5
	5420101525	1	4	1	2.5	25	60	1.5	0.5
	5420101530	1	4	1	2.5	30	70	1.5	0.5
	5420101540	1	4	1	2.5	40	80	1.5	0.5
	5420101550	1	4	1	2.5	50	90	1.5	0.5

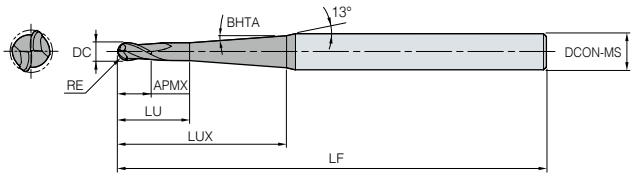
Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UB	5420102006	1	4	1	2.5	6	50	2	0.5
	5420102008	1	4	1	2.5	8	50	2	0.5
	5420102010	1	4	1	2.5	10	50	2	0.5
	5420102012	1	4	1	2.5	12	50	2	0.5
	5420102016	1	4	1	2.5	16	50	2	0.5
	5420102020	1	4	1	2.5	20	50	2	0.5
	5420102025	1	4	1	2.5	25	60	2	0.5
	5420102030	1	4	1	2.5	30	70	2	0.5
	5420102040	1	4	1	2.5	40	80	2	0.5
	5420102050	1	6	1	2.5	50	90	2	0.5
	5420103006	1	4	1	2.5	6	50	3	0.5
	5420103008	1	4	1	2.5	8	50	3	0.5
	5420103010	1	4	1	2.5	10	50	3	0.5
	5420103012	1	4	1	2.5	12	50	3	0.5
	5420103016	1	4	1	2.5	16	50	3	0.5
	5420103020	1	4	1	2.5	20	50	3	0.5
	5420103025	1	4	1	2.5	25	60	3	0.5
	5420103030	1	6	1	2.5	30	70	3	0.5
	5420103040	1	6	1	2.5	40	80	3	0.5
	5420103050	1	6	1	2.5	50	90	3	0.5
	5420105030	1	6	1	2.5	30	70	5	0.5
	5420120508	1.2	4	1.2	3	8	50	0.5	0.6
	5420120512	1.2	4	1.2	3	12	50	0.5	0.6
	5420120516	1.2	4	1.2	3	16	50	0.5	0.6
	5420120520	1.2	4	1.2	3	20	50	0.5	0.6
	5420120525	1.2	4	1.2	3	25	60	0.5	0.6
	5420120530	1.2	4	1.2	3	30	70	0.5	0.6
	5420121008	1.2	4	1.2	3	8	50	1	0.6
	5420121012	1.2	4	1.2	3	12	50	1	0.6
	5420121016	1.2	4	1.2	3	16	50	1	0.6
	5420121020	1.2	4	1.2	3	20	50	1	0.6
	5420121025	1.2	4	1.2	3	25	60	1	0.6
	5420121030	1.2	4	1.2	3	30	70	1	0.6
	5420121508	1.2	4	1.2	3	8	50	1.5	0.6
	5420121512	1.2	4	1.2	3	12	50	1.5	0.6
	5420121516	1.2	4	1.2	3	16	50	1.5	0.6

UB542

2 flutes tapered neck ball

CARBIDE | 2 | H·A 30° | Grade PC303W | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.01 (Above DC6)

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UB	5420121520	1.2	4	1.2	3	20	50	1.5	0.6
	5420121525	1.2	4	1.2	3	25	60	1.5	0.6
	5420121530	1.2	4	1.2	3	30	70	1.5	0.6
	5420122008	1.2	4	1.2	3	8	50	2	0.6
	5420122012	1.2	4	1.2	3	12	50	2	0.6
	5420122016	1.2	4	1.2	3	16	50	2	0.6
	5420122020	1.2	4	1.2	3	20	50	2	0.6
	5420122025	1.2	4	1.2	3	25	60	2	0.6
	5420122030	1.2	4	1.2	3	30	70	2	0.6
	5420123008	1.2	4	1.2	3	8	50	3	0.6
	5420123012	1.2	4	1.2	3	12	50	3	0.6
	5420123016	1.2	4	1.2	3	16	50	3	0.6
	5420123020	1.2	4	1.2	3	20	50	3	0.6
	5420123025	1.2	4	1.2	3	25	60	3	0.6
	5420123030	1.2	6	1.2	3	30	70	5	0.6
	5420150508	1.5	4	1.5	4	8	50	0.5	0.75
	5420150510	1.5	4	1.5	4	10	50	0.5	0.75
	5420150512	1.5	4	1.5	4	12	50	0.5	0.75
	5420150516	1.5	4	1.5	4	16	50	0.5	0.75
	5420150520	1.5	4	1.5	4	20	50	0.5	0.75
	5420150525	1.5	4	1.5	4	25	60	0.5	0.75
	5420150530	1.5	4	1.5	4	30	70	0.5	0.75
	5420150540	1.5	4	1.5	4	40	80	0.5	0.75
	5420150550	1.5	4	1.5	4	50	90	0.5	0.75
	5420151008	1.5	4	1.5	4	8	50	1	0.75
	5420151010	1.5	4	1.5	4	10	50	1	0.75
	5420151012	1.5	4	1.5	4	12	50	1	0.75
	5420151016	1.5	4	1.5	4	16	50	1	0.75
	5420151020	1.5	4	1.5	4	20	50	1	0.75
	5420151025	1.5	4	1.5	4	25	60	1	0.75
	5420151030	1.5	4	1.5	4	30	70	1	0.75
	5420151040	1.5	4	1.5	4	40	80	1	0.75
	5420151050	1.5	4	1.5	4	50	90	1	0.75
	5420151508	1.5	4	1.5	4	8	50	1.5	0.75
	5420151510	1.5	4	1.5	4	10	50	1.5	0.75
	5420151512	1.5	4	1.5	4	12	50	1.5	0.75

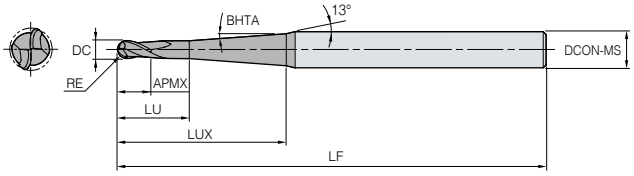
Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UB	5420151516	1.5	4	1.5	4	16	50	1.5	0.75
	5420151520	1.5	4	1.5	4	20	50	1.5	0.75
	5420151525	1.5	4	1.5	4	25	60	1.5	0.75
	5420151530	1.5	4	1.5	4	30	70	1.5	0.75
	5420151540	1.5	4	1.5	4	40	80	1.5	0.75
	5420151550	1.5	4	1.5	4	50	90	1.5	0.75
	5420121016	1.2	4	1.2	3	16	50	1	0.6
	5420121020	1.2	4	1.2	3	20	50	1	0.6
	5420121025	1.2	4	1.2	3	25	60	1	0.6
	5420121030	1.2	4	1.2	3	30	70	1	0.6
	5420121508	1.2	4	1.2	3	8	50	1.5	0.6
	5420121512	1.2	4	1.2	3	12	50	1.5	0.6
	5420121516	1.2	4	1.2	3	16	50	1.5	0.6
	5420121520	1.2	4	1.2	3	20	50	1.5	0.6
	5420121525	1.2	4	1.2	3	25	60	1.5	0.6
	5420121530	1.2	4	1.2	3	30	70	1.5	0.6
	5420122008	1.2	4	1.2	3	8	50	2	0.6
	5420122012	1.2	4	1.2	3	12	50	2	0.6
	5420122016	1.2	4	1.2	3	16	50	2	0.6
	5420122020	1.2	4	1.2	3	20	50	2	0.6
	5420122025	1.2	4	1.2	3	25	60	2	0.6
	5420122030	1.2	4	1.2	3	30	70	2	0.6
	5420123008	1.2	4	1.2	3	8	50	3	0.6
	5420123012	1.2	4	1.2	3	12	50	3	0.6
	5420123016	1.2	4	1.2	3	16	50	3	0.6
	5420123020	1.2	4	1.2	3	20	50	3	0.6
	5420123025	1.2	4	1.2	3	25	60	3	0.6
	5420123030	1.2	6	1.2	3	30	70	5	0.6
	5420150508	1.5	4	1.5	4	8	50	0.5	0.75
	5420150510	1.5	4	1.5	4	10	50	0.5	0.75
	5420150512	1.5	4	1.5	4	12	50	0.5	0.75
	5420150516	1.5	4	1.5	4	16	50	0.5	0.75
	5420150520	1.5	4	1.5	4	20	50	0.5	0.75
	5420150525	1.5	4	1.5	4	25	60	0.5	0.75
	5420150530	1.5	4	1.5	4	30	70	0.5	0.75
	5420150540	1.5	4	1.5	4	40	80	0.5	0.75

UB542

2 flutes tapered neck ball

CARBIDE | 2 | H·A 30° | Grade PC303W | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.01 (Above DC6)

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UB	5420150550	1.5	4	1.5	4	50	90	0.5	0.75
	5420151008	1.5	4	1.5	4	8	50	1	0.75
	5420151010	1.5	4	1.5	4	10	50	1	0.75
	5420151012	1.5	4	1.5	4	12	50	1	0.75
	5420151016	1.5	4	1.5	4	16	50	1	0.75
	5420151020	1.5	4	1.5	4	20	50	1	0.75
	5420151025	1.5	4	1.5	4	25	60	1	0.75
	5420151030	1.5	4	1.5	4	30	70	1	0.75
	5420151040	1.5	4	1.5	4	40	80	1	0.75
	5420151050	1.5	4	1.5	4	50	90	1	0.75
	5420151508	1.5	4	1.5	4	8	50	1.5	0.75
	5420151510	1.5	4	1.5	4	10	50	1.5	0.75
	5420151512	1.5	4	1.5	4	12	50	1.5	0.75
	5420151516	1.5	4	1.5	4	16	50	1.5	0.75
	5420151520	1.5	4	1.5	4	20	50	1.5	0.75
	5420151525	1.5	4	1.5	4	25	60	1.5	0.75
	5420151530	1.5	4	1.5	4	30	70	1.5	0.75
	5420151540	1.5	4	1.5	4	40	80	1.5	0.75
	5420151550	1.5	4	1.5	4	50	90	1.5	0.75
	5420152008	1.5	4	1.5	4	8	50	2	0.75
	5420152010	1.5	4	1.5	4	10	50	2	0.75
	5420152012	1.5	4	1.5	4	12	50	2	0.75
	5420152016	1.5	4	1.5	4	16	50	2	0.75
	5420152020	1.5	4	1.5	4	20	50	2	0.75
	5420152025	1.5	4	1.5	4	25	60	2	0.75
	5420152030	1.5	4	1.5	4	30	70	2	0.75
	5420152040	1.5	6	1.5	4	40	80	2	0.75
	5420152050	1.5	6	1.5	4	50	90	2	0.75
	5420153020	1.5	6	1.5	4	20	50	3	0.75
	5420153030	1.5	6	1.5	4	30	70	3	0.75
	5420153040	1.5	6	1.5	4	40	80	3	0.75
	5420153050	1.5	8	1.5	4	50	90	3	0.75
	5420155030	1.5	8	1.5	4	30	70	5	0.75
	5420200510	2	4	2	5	10	50	0.5	1
	5420200512	2	4	2	5	12	50	0.5	1
	5420200516	2	4	2	5	16	50	0.5	1

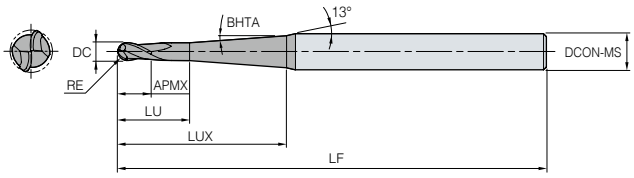
Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UB	5420200520	2	4	2	5	20	50	0.5	1
	5420200525	2	4	2	5	25	60	0.5	1
	5420200530	2	4	2	5	30	70	0.5	1
	5420200540	2	4	2	5	40	80	0.5	1
	5420200550	2	6	2	5	50	100	0.5	1
	5420200560	2	6	2	5	60	100	0.5	1
	5420200580	2	6	2	5	80	140	0.5	1
	5420201010	2	4	2	5	10	50	1	1
	5420201012	2	4	2	5	12	50	1	1
	5420201016	2	4	2	5	16	50	1	1
	5420201020	2	4	2	5	20	50	1	1
	5420201025	2	4	2	5	25	60	1	1
	5420201030	2	4	2	5	30	70	1	1
	5420201040	2	6	2	5	40	80	1	1
	5420201050	2	6	2	5	50	100	1	1
	5420201060	2	6	2	5	60	100	1	1
	5420201080	2	6	2	5	80	140	1	1
	5420201510	2	4	2	5	10	50	1.5	1
	5420201512	2	4	2	5	12	50	1.5	1
	5420201516	2	4	2	5	16	50	1.5	1
	5420201520	2	4	2	5	20	50	1.5	1
	5420201525	2	4	2	5	25	60	1.5	1
	5420201530	2	6	2	5	30	70	1.5	1
	5420201540	2	6	2	5	40	80	1.5	1
	5420201550	2	6	2	5	50	100	1.5	1
	5420201560	2	6	2	5	60	100	1.5	1
	5420201580	2	6	2	5	80	140	1.5	1
	5420202010	2	4	2	5	10	50	2	1
	5420202012	2	4	2	5	12	50	2	1
	5420202016	2	4	2	5	16	50	2	1
	5420202020	2	4	2	5	20	55	2	1
	5420202025	2	4	2	5	25	60	2	1
	5420202030	2	4	2	5	30	70	2	1
	5420202040	2	6	2	5	40	80	2	1
	5420202050	2	6	2	5	50	90	2	1
	5420202060	2	6	2	5	60	100	2	1

UB542

2 flutes tapered neck ball

CARBIDE | 2 | H·A 30° | Grade PC303W | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.01 (Above DC6)

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UB	5420202080	2	8	2	5	80	140	2	1
	5420203030	2	6	2	5	30	70	3	1
	5420203040	2	6	2	5	40	80	3	1
	5420203050	2	8	2	5	50	90	3	1
	5420203060	2	8	2	5	60	100	3	1
	5420203080	2	10	2	5	80	140	3	1
	5420205030	2	8	2	5	30	70	5	1
	5420205040	2	10	2	5	40	90	5	1
	5420300516	3	6	4.5	6	16	60	0.5	1.5
	5420300520	3	6	4.5	6	20	65	0.5	1.5
	5420300530	3	6	4.5	6	30	70	0.5	1.5
	5420300540	3	6	4.5	6	40	80	0.5	1.5
	5420300550	3	6	4.5	6	50	90	0.5	1.5
	5420300560	3	6	4.5	6	60	100	0.5	1.5
	5420301016	3	6	4.5	6	16	60	1	1.5
	5420301020	3	6	4.5	6	20	65	1	1.5
	5420301030	3	6	4.5	6	30	70	1	1.5
	5420301040	3	6	4.5	6	40	80	1	1.5
	5420301050	3	6	4.5	6	50	90	1	1.5
	5420301060	3	6	4.5	6	60	100	1	1.5
	5420301070	3	6	4.5	6	70	120	1	1.5
	5420301516	3	6	4.5	6	16	60	1.5	1.5
	5420301520	3	6	4.5	6	20	65	1.5	1.5
	5420301530	3	6	4.5	6	30	70	1.5	1.5
	5420301540	3	6	4.5	6	40	80	1.5	1.5
	5420301550	3	6	4.5	6	50	90	1.5	1.5
	5420301560	3	6	4.5	6	60	100	1.5	1.5
	5420302016	3	6	4.5	6	16	60	2	1.5
	5420302020	3	6	4.5	6	20	65	2	1.5
	5420302030	3	6	4.5	6	30	70	2	1.5
	5420302040	3	6	4.5	6	40	80	2	1.5
	5420302050	3	8	4.5	6	50	90	2	1.5
	5420303030	3	6	4.5	6	30	70	3	1.5
	5420303040	3	8	4.5	6	40	90	3	1.5
	5420305030	3	8	4.5	6	30	70	5	1.5
	5420305040	3	10	4.5	6	40	90	5	1.5

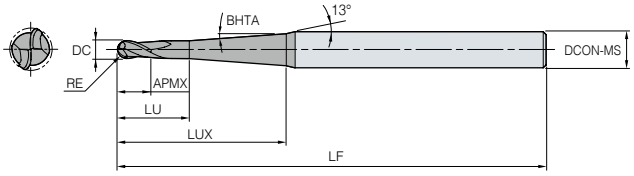
Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UB	5420400540	4	6	6	8	40	90	0.5	2
	5420400550	4	6	6	8	50	100	0.5	2
	5420400560	4	6	6	8	60	110	0.5	2
	5420400570	4	6	6	8	70	120	0.5	2
	5420401040	4	6	6	8	40	90	1	2
	5420401050	4	6	6	8	50	100	1	2
	5420401060	4	8	6	8	60	110	1	2
	5420401070	4	8	6	8	70	120	1	2
	5420401540	4	6	6	8	40	90	1.5	2
	5420401550	4	8	6	8	50	100	1.5	2
	5420401560	4	8	6	8	60	110	1.5	2
	5420401570	4	8	6	8	70	120	1.5	2
	5420403050	4	10	6	8	50	100	3	2
	5420405050	4	12	6	8	50	100	5	2
	5420501060	5	8	10	13	60	120	1	2.5
	5420501560	5	8	10	13	60	120	1.5	2.5
	5420503040	5	8	10	13	40	120	3	2.5
	5420601060	6	8	12	15	60	120	1	3
	5420601090	6	10	12	15	90	150	1	3
	5420601560	6	10	12	15	60	120	1.5	3
	5420601590	6	10	12	15	90	150	1.5	3
	5420602060	6	10	12	15	60	120	2	3
	5420602090	6	12	12	15	90	150	2	3
	5420603060	6	12	12	15	60	120	3	3
	5420603090	6	14	12	15	90	150	3	3
	54208010100	8	12	14	18	100	150	1	4
	5420801070	8	10	14	18	70	130	1	4
	54208015100	8	14	14	18	100	150	1.5	4
	5420801570	8	12	14	18	70	130	1.5	4
	54208020100	8	14	14	18	100	150	2	4
	5420802070	8	12	14	18	70	130	2	4
	54208030100	8	18	14	18	100	150	3	4
	5420803070	8	14	14	18	70	130	3	4
	54210010100	10	14	18	22	100	200	1	5
	5421001070	10	12	18	22	70	130	1	5
	5421001080	10	14	18	22	80	150	1	5

UB542

2 flutes tapered neck ball

CARBIDE | 2 | H·A 30° | Grade PC303W | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.01 (Above DC6)

DC	Tolerance
Ø0.1 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø12	0.000 ~ -0.015



(mm)

Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UB	54210015100	10	16	18	22	100	200	1.5	5
	5421001570	10	14	18	22	70	130	1.5	5
	5421001580	10	14	18	22	80	150	1.5	5
	54210020100	10	16	18	22	100	200	2	5
	5421002070	10	14	18	22	70	130	2	5
	5421002080	10	16	18	22	80	150	2	5
	54210030100	10	20	18	22	100	200	3	5
	5421003070	10	16	18	22	70	130	3	5
	5421003080	10	18	18	22	80	150	3	5
	54212010100	12	16	22	25	100	200	1	6
	5421201060	12	14	22	25	60	130	1	6
	5421201080	12	14	22	25	80	150	1	6
	5421201090	12	16	22	25	90	180	1	6

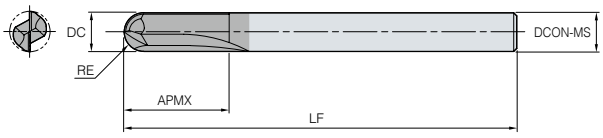
Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
UB	54212015100	12	16	22	25	100	200	1.5	6
	5421201560	12	14	22	25	60	130	1.5	6
	5421201580	12	16	22	25	80	150	1.5	6
	5421201590	12	16	22	25	90	180	1.5	6
	54212020100	12	18	22	25	100	200	2	6
	5421202060	12	16	22	25	60	130	2	6
	5421202080	12	16	22	25	80	150	2	6
	5421202090	12	18	22	25	90	180	2	6
	54212030100	12	20	22	25	100	200	3	6
	5421203060	12	16	22	25	60	130	3	6
	5421203080	12	18	22	25	80	150	3	6
	5421203090	12	20	22	25	90	180	3	6

USB502

2 flutes straight ball

CARBIDE | 2 | H·A 0° | Grade PC303W | h5 shank | RE ±0.005 (DC6 or below) | RE ±0.01 (Above DC6)

DC	Tolerance
Ø3 ~ Ø6	0.000 ~ -0.012
Ø8 ~ Ø20	0.000 ~ -0.015



(mm)

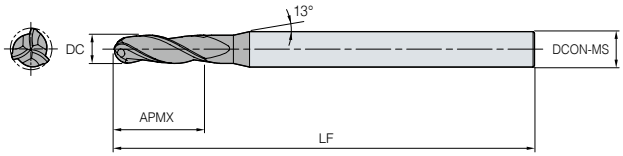
Designation		DC	DCON-MS	APMX	LF	RE
USB	502030	3	6	10	70	1.5
	502040	4	6	12	70	2
	502050	5	6	18	90	2.5
	502060	6	6	20	90	3
	502080	8	8	25	100	4
	502100	10	10	30	100	5
	502120	12	12	32	110	6
	502160	16	16	35	150	8
	502200	20	20	40	150	10

UB503

3 flutes ball

CARBIDE | 3 | H·A 30° | Grade PC303W | h5 shank | RE ±0.005 DC6 or below | RE ±0.01 Above DC6

DC	Tolerance
Ø1 ~ Ø12	0.000 ~ -0.020



(mm)

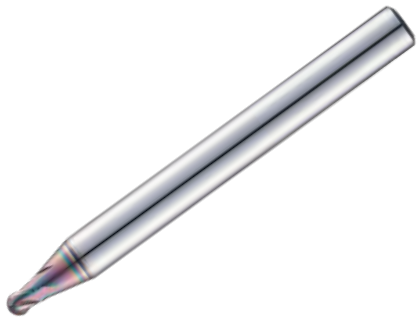
	Designation	DC	DCON-MS	APMX	LF	RE
UB	503010	1	6	1	50	0.5
	503015	1.5	6	1.5	50	0.75
	503020	2	6	2	50	1
	503030	3	6	3	60	1.5
	503040	4	6	4	70	2
	503050	5	6	5	80	2.5
	503060	6	6	6	90	3
	503080	8	8	8	100	4
	503100	10	10	10	100	5
	503120	12	12	12	110	6

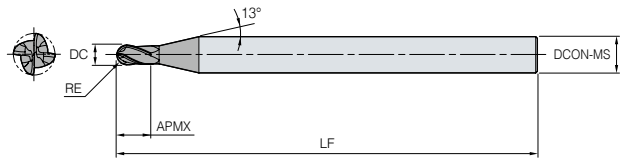
UB504

4 flutes ball

CARBIDE | 4 | H·A 30° | Grade PC303W | h5 shank | RE ±0.005 DC6 or below | RE ±0.01 Above DC6

DC	Tolerance
Ø1 ~ Ø12	0.000 ~ -0.020





(mm)

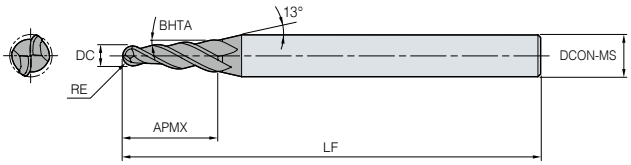
	Designation	DC	DCON-MS	APMX	LF	RE
UB	504010	1	6	1	50	0.5
	504015	1.5	6	1.5	50	0.75
	504020	2	6	2	50	1
	504030	3	6	3	60	1.5
	504040	4	6	4	70	2
	504050	5	6	5	80	2.5
	504060	6	6	6	90	3
	504080	8	8	8	100	4
	504100	10	10	10	100	5
	504120	12	12	12	110	6

UTB502

2 flutes tapered ball

CARBIDE | 2 | H·A 30° | Grade PC303W | h5 shank | RE ±0.01

DC	Tolerance
Ø0.3 ~ Ø2	0.000 ~ -0.030



(mm)

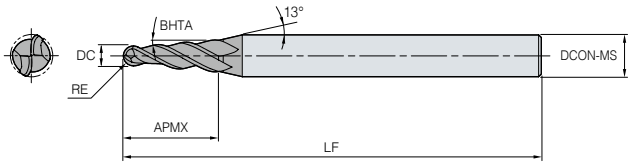
Designation		DC	DCON-MS	APMX	BHTA(°)	LF	RE
UTB	502003005	0.3	4	1.2	0.5	40	0.15
	50200301	0.3	4	1.2	1	40	0.15
	502003015	0.3	4	1.2	1.5	40	0.15
	50200302	0.3	4	1.2	2	40	0.15
	50200303	0.3	4	1.2	3	40	0.15
	50200305	0.3	4	1.2	5	40	0.15
	50200307	0.3	4	1.5	7	40	0.15
	50200310	0.3	4	1.5	10	40	0.15
	502004005	0.4	4	1.6	0.5	40	0.2
	50200401	0.4	4	1.6	1	40	0.2
	502004015	0.4	4	1.6	1.5	40	0.2
	50200402	0.4	4	1.6	2	40	0.2
	50200403	0.4	4	1.6	3	40	0.2
	50200405	0.4	4	1.6	5	40	0.2
	50200407	0.4	4	2	7	40	0.2
	50200410	0.4	4	2	10	40	0.2
	502005005	0.5	4	2	0.5	45	0.25
	50200501	0.5	4	2	1	45	0.25
	502005015	0.5	4	2	1.5	45	0.25
	50200502	0.5	4	2	2	45	0.25
	50200503	0.5	4	2	3	45	0.25
	50200505	0.5	4	2	5	45	0.25
	50200507	0.5	4	2.5	7	45	0.25
	50200510	0.5	4	2.5	10	45	0.25
	502006005	0.6	4	2	0.5	45	0.3
	50200601	0.6	4	2	1	45	0.3
	502006015	0.6	4	2	1.5	45	0.3
	50200602	0.6	4	2	2	45	0.3
	50200603	0.6	4	2	3	45	0.3
	50200605	0.6	4	2	5	45	0.3
	50200607	0.6	4	2.5	7	45	0.3
	50200610	0.6	4	2.5	10	45	0.3
	502007005	0.7	4	2.5	0.5	45	0.35
	50200701	0.7	4	2.5	1	45	0.35
	502007015	0.7	4	2.5	1.5	45	0.35
	50200702	0.7	4	2.5	2	45	0.35

UTB502

2 flutes tapered ball

CARBIDE | 2 | H·A 30° | Grade PC303W | h5 shank | RE ±0.01

DC	Tolerance
Ø0.3 ~ Ø2	0.000 ~ -0.030



(mm)

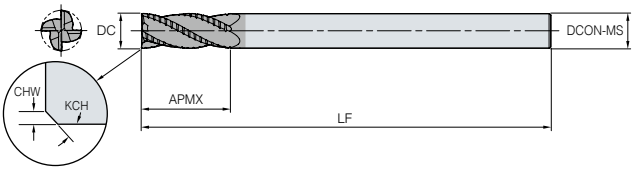
Designation		DC	DCON-MS	APMX	BHTA(°)	LF	RE
UTB	50200703	0.7	4	2.5	3	45	0.35
	50200705	0.7	4	2.5	5	45	0.35
	50200707	0.7	4	3	7	45	0.35
	50200710	0.7	4	3	10	45	0.35
	502008005	0.8	4	3.2	0.5	45	0.4
	50200801	0.8	4	3.2	1	45	0.4
	502008015	0.8	4	3.2	1.5	45	0.4
	50200802	0.8	4	3.2	2	45	0.4
	50200803	0.8	4	3.2	3	45	0.4
	50200805	0.8	4	3.2	5	45	0.4
	50200807	0.8	4	3.2	7	45	0.4
	50200810	0.8	4	3.2	10	45	0.4
	502010005	1	4	4	0.5	50	0.5
	50201001	1	4	4	1	50	0.5
	502010015	1	4	4	1.5	50	0.5
	50201002	1	4	4	2	50	0.5
	50201003	1	4	4	3	50	0.5
	50201005	1	4	4	5	50	0.5
	50201007	1	4	4	7	50	0.5
	50201010	1	4	4	10	50	0.5
	502015005	1.5	4	6	0.5	50	0.75
	50201501	1.5	4	6	1	50	0.75
	502015015	1.5	4	6	1.5	50	0.75
	50201502	1.5	4	7	2	50	0.75
	50201503	1.5	4	8	3	50	0.75
	50201505	1.5	4	10	5	50	0.75
	50201507	1.5	4	10	7	50	0.75
	50201510	1.5	6	10	10	50	0.75
	502020005	2	4	6	0.5	50	1
	50202001	2	4	6	1	50	1
	502020015	2	4	6	1.5	50	1
	50202002	2	4	10	2	50	1
	50202003	2	4	10	3	50	1
	50202005	2	4	10	5	50	1
	50202007	2	6	10	7	50	1
	50202010	2	6	11	10	50	1

UF50

3~5 flutes chamfer pitch roughing

CARBIDE | 3 | 4 | 5 | H·A 29°/31° | Grade PC303W | CHAMFERED | h5 shank | RE ±0.025

DC	Tolerance
Ø3 ~ Ø25	0.000 ~ -0.050



(mm)

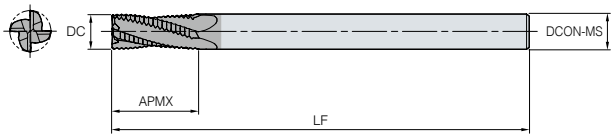
Designation		DC	DCON-MS	APMX	LF	KCH	CHW	NOF
UF	503030	3	6	8	50	45°	0.2	3
	503040	4	6	10	50	45°	0.2	3
	504050	5	6	13	50	45°	0.2	4
	504060	6	6	10	50	45°	0.2	4
	50406015	6	6	15	60	45°	0.2	4
	504070	7	8	18	70	45°	0.2	4
	504080	8	8	12	60	45°	0.2	4
	50408020	8	8	20	70	45°	0.2	4
	504090	9	10	22	75	45°	0.3	4
	504100	10	10	15	65	45°	0.3	4
	50410025	10	10	25	75	45°	0.3	4
	504110	11	12	27	80	45°	0.3	4
	504120	12	12	20	70	45°	0.3	4
	50412030	12	12	30	80	45°	0.3	4
	505130	13	12	35	100	45°	0.5	5
	505140S16	14	16	35	100	45°	0.5	5
	505140	14	14	35	100	45°	0.5	5
	505150	15	16	35	100	45°	0.5	5
	505160	16	16	25	80	45°	1	5
	50516040	16	16	40	100	45°	1	5
	505180S20	18	20	40	100	45°	1	5
	505180	18	18	40	100	45°	1	5
	505200	20	20	25	80	45°	1	5
	50520045	20	20	45	100	45°	1	5
	505250	25	25	45	100	45°	1	5

UF51

3~5 flutes fine pitch roughing

CARBIDE | 3 | 4 | 5 | H·A 20° | Grade PC303W | FINE | h5 shank

DC	Tolerance
Ø3	0.000 ~ -0.040
Ø4 ~ Ø6	0.000 ~ -0.048
Ø7 ~ Ø10	0.000 ~ -0.058
Ø11 ~ Ø18	0.000 ~ -0.070
Ø20 ~ Ø25	0.000 ~ -0.084



(mm)

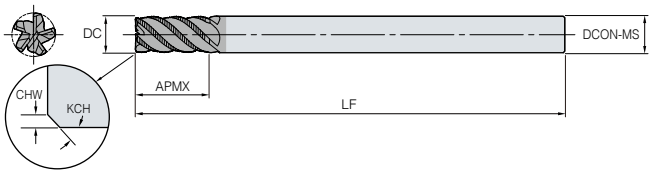
Designation		DC	DCON-MS	APMX	LF	NOF
UF	513030	3	6	8	50	3
	513040	4	6	10	50	3
	513050	5	6	13	50	3
	513060	6	6	15	60	3
	51306020	6	6	20	60	3
	513070	7	8	18	70	3
	513080	8	8	20	70	3
	51308025	8	8	25	70	3
	514090	9	10	22	75	4
	514100	10	10	25	75	4
	51410030	10	10	30	75	4
	514110	11	12	27	80	4
	514120	12	12	30	80	4
	51412035	12	12	35	80	4
	514130	13	12	35	100	4
	514140	14	16	35	100	4
	514160	16	16	40	100	4
	514180	18	18	40	100	4
	514200	20	20	50	100	4
	515250	25	25	50	100	5

UF51H

3~5 flutes 45° helix fine pitch roughing

CARBIDE | 3 | 4 | 5 | H·A 45° | Grade PC303W | FINE | h5 shank | RE ±0.025

DC	Tolerance
Ø3 ~ Ø25	0.000 ~ -0.050



(mm)

Designation		DC	DCON-MS	APMX	LF	KCH	CHW	NOF
UF	513030H	3	6	8	50	45°	0.2	3
	513040H	4	6	10	50	45°	0.2	3
	514050H	5	6	13	50	45°	0.3	4
	514060H	6	6	10	50	45°	0.3	4
	51406015H	6	6	15	60	45°	0.3	4
	514070H	7	8	18	70	45°	0.4	4
	514080H	8	8	12	60	45°	0.4	4
	51408020H	8	8	20	70	45°	0.4	4
	514090H	9	10	22	75	45°	0.4	4
	514100H	10	10	15	65	45°	0.4	4
	51410025H	10	10	25	75	45°	0.4	4
	514110H	11	12	27	80	45°	0.5	4
	514120H	12	12	20	70	45°	0.5	4
	51412030H	12	12	30	80	45°	0.5	4
	515130H	13	12	35	100	45°	0.5	5
	515140S16H	14	16	35	100	45°	0.5	5
	515140H	14	14	35	100	45°	0.5	5
	515160H	16	16	25	80	45°	0.5	5
	51516040H	16	16	40	100	45°	0.5	5
	515180S20H	18	20	40	100	45°	0.5	5
	515180H	18	18	40	100	45°	0.5	5
	515200H	20	20	25	80	45°	0.5	5
	51520045H	20	20	45	100	45°	0.5	5
	515250H	25	25	45	100	45°	0.5	5

For low hardness

G-Star Endmill

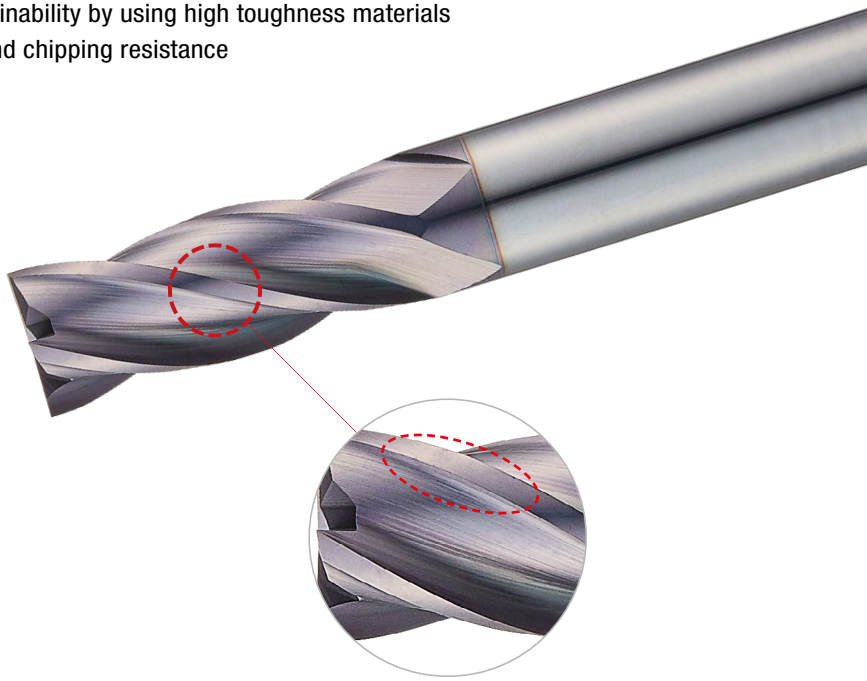
- Suitable for low hardness steel (HRC10 ~ 30); Alloy steel, Carbon steel, Pre-harden, Hardened steel etc.
- Suitable for general purpose machining from roughing to finishing; even on curved or sloped surfaces

Code system

Z	R	32	4H	08	02	S4
Type	**Appearance**	**Length, Shank type**	**No. of flute**	**Cutting dia.**	**Corner R**	**Shank dia.**
D: Dynamic Z: Zamus T: Thunder	B: Ball E: Flat R: Radius X: Flat S: Flat XB: Ball	30: Straight 31: Standard 32: Long Cutting Length 33: Long Shank 34: Tapered Neck	2: 2 flutes 4: 4 flutes 4H: 4 flutes (Helix 45º)	1 ~ 20	0.2 ~ 3 mm	4 ~ 20 mm

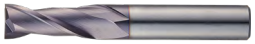
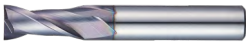
Features

- Excellent rake angle and cutting edge considered the characteristics of workpiece.
- Improved chipping resistance and enhanced machinability by using high toughness materials
- TiAlN coating for enhanced oxidation resistance and chipping resistance



- Excellent workpiece finishes by 45°high helix angle

Line-up

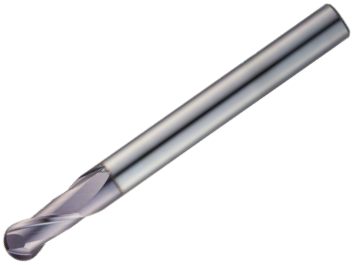
Designation	Appearance	Type	Range	Page
DB312		2 flutes ball Endmill	Ø1.0 ~ 20.0	B177
DB342		2 flutes tapered neck type ball Endmill	Ø1.0 ~ 12.0	B178
TX202		2 flutes short shank flat Endmill	Ø1.0 ~ 20.0	B179
TX204		4 flutes short shank flat Endmill	Ø1.0 ~ 20.0	B180
TX222		2 flutes long flat Endmill	Ø3.0 ~ 20.0	B181
TX224		4 flutes long flat Endmill	Ø3.0 ~ 20.0	B182
TX302		2 flutes flat Endmill	Ø1.0 ~ 20.0	B183
TX304		4 flutes flat Endmill	Ø1.0 ~ 20.0	B184
TX304H		4 flutes 45° helix flat Endmill	Ø3.0 ~ 20.0	B185
TXB202		2 flutes short shank ball Endmill	Ø1.0 ~ 20.0	B186
TXB204		4 flutes short shank ball Endmill	Ø2.0 ~ 20.0	B187
TXB222		2 flutes long ball Endmill	Ø3.0 ~ 20.0	B188
TXB232		2 flutes long shank ball Endmill	Ø3.0 ~ 20.0	B189
TXB302		2 flutes ball Endmill	Ø1.0 ~ 20.0	B190
TXB304		4 flutes ball Endmill	Ø1.0 ~ 20.0	B191
ZE302P		2 flutes flat Endmill	Ø1.0 ~ 20.0	B192
ZE304P		4 flutes flat Endmill	Ø1.0 ~ 20.0	B193
ZE322		2 flutes extra long flat Endmill	Ø3.0 ~ 20.0	B194
ZE324		4 flutes extra long flat Endmill	Ø3.0 ~ 20.0	B195
ZR304H		4 flutes 45° helix radius Endmill	Ø3.0 ~ 12.0	B196
ZR322		2 flutes long shank radius Endmill	Ø3.0 ~ 12.0	B197
ZR324		4 flutes long shank radius Endmill	Ø3.0 ~ 12.0	B198
ZR324H		4 flutes 45° helix radius Endmill	Ø6.0 ~ 12.0	B199

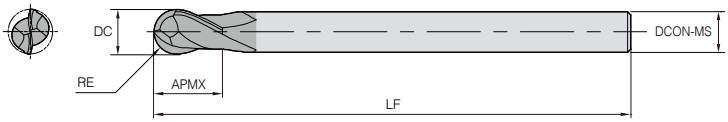
DB312

2 flutes ball

FINE GRAIN | 2 | H·A 30° | Grade AiTIN | h6.5 shank | RE ±0.01

DC	Tolerance
All sizes	0 ~ -0.02





(mm)

Designation		DC	DCON-MS	APMX	LF	RE
DB	312010S4	1	4	2.5	50	0.5
	312010	1	6	2.5	50	0.5
	312012	1.2	6	3	50	0.6
	312015	1.5	6	4	50	0.75
	312020S4	2	4	5	50	1
	312020	2	6	5	50	1
	312025	2.5	6	6	60	1.25
	312030S3	3	3	8	60	1.5
	312030S4	3	4	8	60	1.5
	312030	3	6	8	60	1.5
	312035	3.5	6	8	70	1.75
	312040S4	4	4	8	70	2
	312040	4	6	8	70	2
	312045	4.5	6	8	70	2.25
	312050	5	6	10	80	2.5
	312055	5.5	6	10	80	2.75
	312060S	6	6	12	60	3
	312060	6	6	12	90	3
	312065	6.5	8	12	90	3.25
	312070	7	8	14	90	3.5
	312080S	8	8	14	60	4
	312080	8	8	14	100	4
	312090	9	10	18	100	4.5
	312100S	10	10	18	60	5
	312100	10	10	18	100	5
	312120	12	12	22	110	6
	312140	14	14	26	110	7
	312160	16	16	30	140	8
	312180	18	18	34	140	9
	312200	20	20	38	160	10

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

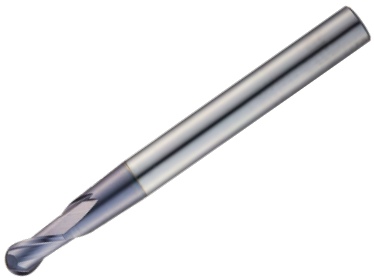
◎: EXCELLENT ○: GOOD

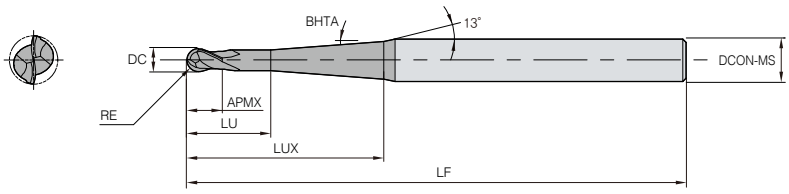
DB342

2 flutes tapered neck type ball

FINE GRAIN | 2 | H·A 30° | Grade AiTIN | h6 shank | RE ±0.01

DC	Tolerance
All sizes	0 ~ -0.02





(mm)

Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA(°)	RE
DB	34201015	1	6	2	4	23	60	1˚30´	0.5
	34201050	1	6	2	4	23	60	5˚	0.5
	34201030	1	6	2	4	42	80	3˚	0.5
	34202015	2	6	4	6	23	60	1˚30´	1
	34202050	2	6	4	6	23	60	5˚	1
	34202030	2	6	4	6	41	80	3˚	1
	34203030	3	6	6	8	32	70	3˚	1.5
	34203015	3	6	6	8	52	90	1˚30´	1.5
	34204030	4	6	8	10	28	70	3˚	2
	34204015	4	6	8	10	49	90	1˚30´	2
	34205030	5	8	10	12	41	90	3˚	2.5
	34205015	5	8	10	12	61	110	1˚30´	2.5
	34206030	6	8	12	15	34	90	3˚	3
	34206015	6	8	12	15	53	110	1˚30´	3
	34208030	8	10	14	17	36	100	3˚	4
	34208015	8	10	14	17	55	120	1˚30´	4
	34210030	10	12	18	21	40	110	3˚	5
	34210015	10	12	18	21	59	130	1˚30´	5
	34212030	12	16	22	25	63	140	3˚	6
	34212015	12	16	22	25	83	160	1˚30´	6

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

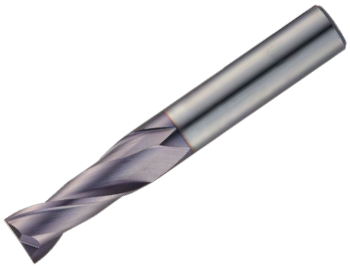
◎: EXCELLENT ○: GOOD

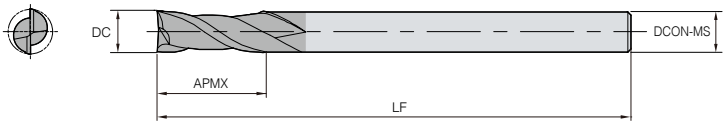
TX202

2 flutes short shank flat

FINE GRAIN | 2 | H·A 30° | Grade AlTiN | h6 shank

DC	Tolerance
Ø1 ~ Ø3	-0.014 ~ -0.028
Ø4 ~ Ø6	-0.02 ~ -0.038
Ø7 ~ Ø10	-0.025 ~ -0.047
Ø12 ~ Ø18	-0.032 ~ -0.059
Ø20 ~	-0.04 ~ -0.073





(mm)

Designation		DC	DCON-MS	APMX	LF
TX	202010	1	3	3	39
	202015	1.5	3	5	39
	202020	2	3	7	39
	202025	2.5	3	8	39
	202030	3	3	10	39
	202040	4	4	14	51
	202050	5	5	16	51
	202060	6	6	19	64
	202080	8	8	21	64
	202100	10	10	25	70
	202120	12	12	25	76
	202160	16	16	32	89
	202200	20	20	38	102

※ The above specifications are subject to change without prior notice for product quality improvement.

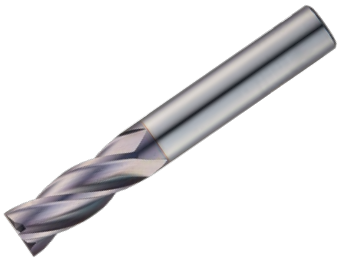
• Applicable Workpiece

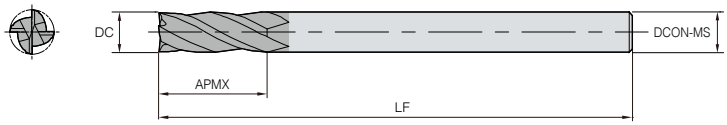
Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: EXCELLENT ○: GOOD

TX204

4 flutes short shank flat





DC	Tolerance
Ø1 ~ Ø3	-0.014 ~ -0.028
Ø4 ~ Ø6	-0.02 ~ -0.038
Ø7 ~ Ø10	-0.025 ~ -0.047
Ø12 ~ Ø18	-0.032 ~ -0.059
Ø20 ~	-0.04 ~ -0.073

(mm)

Designation		DC	DCON-MS	APMX	LF
TX	204010	1	3	3	39
	204015	1.5	3	5	39
	204020	2	3	7	39
	204025	2.5	3	8	39
	204030	3	3	10	39
	204040	4	4	14	51
	204050	5	5	16	51
	204060	6	6	19	64
	204080	8	8	21	64
	204100	10	10	25	70
	204120	12	12	25	76
	204160	16	16	32	89
	204200	20	20	38	102

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

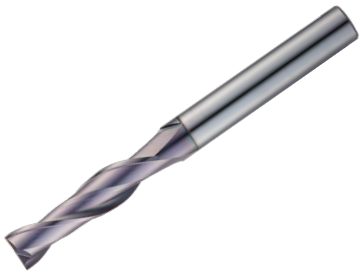
◎: EXCELLENT ○: GOOD

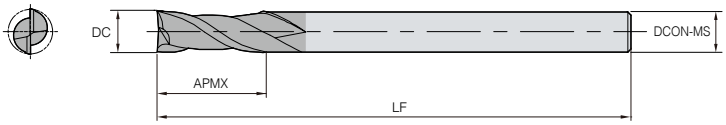
TX222

2 flutes long flat

FINE GRAIN | 2 | H·A 30° | Grade AlTiN | h6 shank

DC	Tolerance
Ø1 ~ Ø3	-0.014 ~ -0.028
Ø4 ~ Ø6	-0.02 ~ -0.038
Ø7 ~ Ø10	-0.025 ~ -0.047
Ø12 ~ Ø18	-0.032 ~ -0.059
Ø20 ~	-0.04 ~ -0.073





(mm)

Designation		DC	DCON-MS	APMX	LF
TX	222030	3	3	20	60
	222040	4	4	20	60
	222050	5	5	25	75
	222060	6	6	30	75
	222080	8	8	30	75
	222100	10	10	40	100
	222120	12	12	45	100
	222140	14	14	45	100
	222160	16	16	45	100
	222180	18	18	45	100
	222200	20	20	45	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

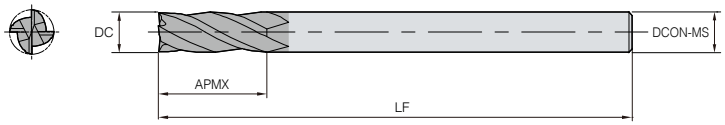
◎: EXCELLENT ○: GOOD

TX224

4 flutes long flat

FINE GRAIN | 4 | H·A 30° | Grade AiTIN | h6 shank

DC	Tolerance
Ø1 ~ Ø3	-0.014 ~ -0.028
Ø4 ~ Ø6	-0.02 ~ -0.038
Ø7 ~ Ø10	-0.025 ~ -0.047
Ø12 ~ Ø18	-0.032 ~ -0.059
Ø20 ~	-0.04 ~ -0.073



(mm)

Designation		DC	DCON-MS	APMX	LF
TX	224030	3	3	20	60
	224040	4	4	20	60
	224050	5	5	25	75
	224060	6	6	30	75
	224080	8	8	30	75
	224081	8	8	30	100
	224100	10	10	40	100
	224120	12	12	45	100
	224140	14	14	45	100
	224160	16	16	45	100
	224180	18	18	45	100
	224200	20	20	45	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

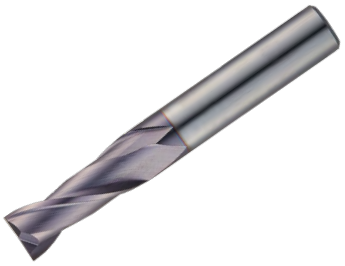
◎: EXCELLENT ○: GOOD

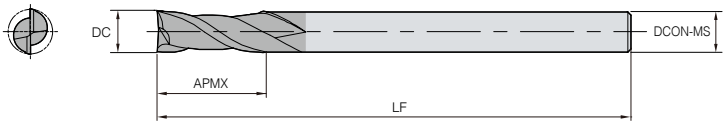
TX302

2 flutes flat

FINE GRAIN | 2 | H·A 30° | Grade AlTiN | h6 shank

DC	Tolerance
Ø1 ~ Ø3	-0.014 ~ -0.028
Ø4 ~ Ø6	-0.02 ~ -0.038
Ø7 ~ Ø10	-0.025 ~ -0.047
Ø12 ~ Ø18	-0.032 ~ -0.059
Ø20 ~	-0.04 ~ -0.073





(mm)

Designation		DC	DCON-MS	APMX	LF
TX	302010	1	4	3	50
	302015	1.5	4	4	50
	302020	2	4	6	50
	302025	2.5	4	8	50
	302030	3	4	9	50
	302040	4	4	11	50
	302050	5	6	13	50
	302060	6	6	16	50
	302070	7	8	16	60
	302080	8	8	19	60
	302090	9	10	19	60
	302100	10	10	25	75
	302120	12	12	30	75
	302140	14	14	32	75
	302160	16	16	32	100
	302180	18	18	32	100
	302200	20	20	38	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

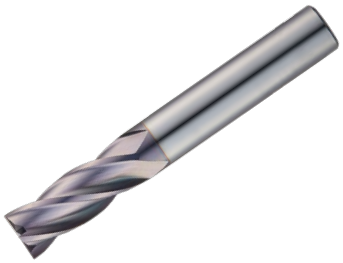
◎: EXCELLENT ○: GOOD

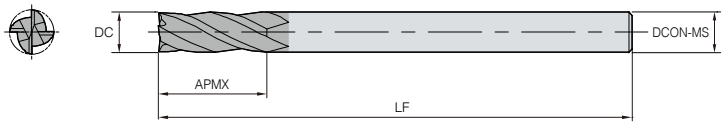
TX304

4 flutes flat

FINE GRAIN | 4 | H·A 30° | Grade AiTIN | h6 shank

DC	Tolerance
Ø1 ~ Ø3	-0.014 ~ -0.028
Ø4 ~ Ø6	-0.02 ~ -0.038
Ø7 ~ Ø10	-0.025 ~ -0.047
Ø12 ~ Ø18	-0.032 ~ -0.059
Ø20 ~	-0.04 ~ -0.073





(mm)

Designation		DC	DCON-MS	APMX	LF
TX	304010	1	4	3	50
	304015	1.5	4	4	50
	304020	2	4	6	50
	304025	2.5	4	8	50
	304030	3	4	9	50
	304040	4	4	11	50
	304050	5	6	13	50
	304060	6	6	16	50
	304070	7	8	16	60
	304080	8	8	19	60
	304090	9	10	19	60
	304100	10	10	25	75
	304120	12	12	30	75
	304140	14	14	32	75
	304160	16	16	32	100
	304180	18	18	32	100
	304200	20	20	38	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

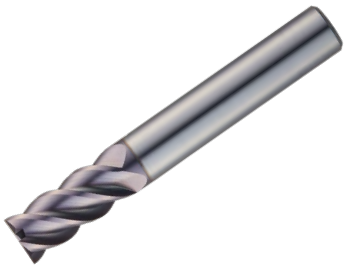
◎: EXCELLENT ○: GOOD

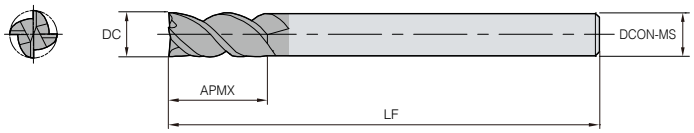
TX304H

4 flutes 45° helix flat

FINE GRAIN | 4 | H·A 45° | Grade AlTiN | h6 shank

DC	Tolerance
Ø1 ~ Ø3	-0.014 ~ -0.028
Ø4 ~ Ø6	-0.02 ~ -0.038
Ø7 ~ Ø10	-0.025 ~ -0.047
Ø12 ~ Ø18	-0.032 ~ -0.059
Ø20 ~	-0.04 ~ -0.073





(mm)

Designation		DC	DCON-MS	APMX	LF
TX	304H030	3	6	8	50
	304H030S3	3	3	8	50
	304H030S4	3	4	8	50
	304H040	4	6	11	50
	304H040S4	4	4	11	50
	304H050	5	6	13	50
	304H060	6	6	13	50
	304H080	8	8	19	60
	304H100	10	10	22	70
	304H120	12	12	26	75
	304H130	13	12	26	80
	304H140	14	14	26	80
	304H160	16	16	32	90
	304H180	18	18	32	100
	304H200	20	20	38	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

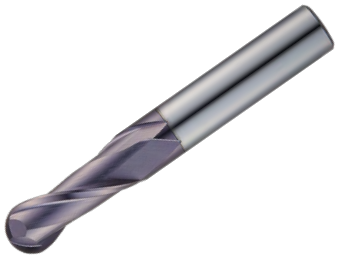
◎: EXCELLENT ○: GOOD

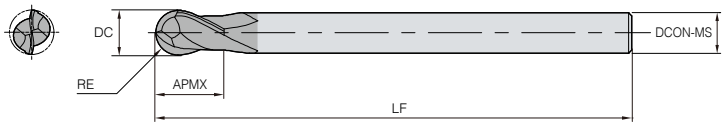
TXB202

2 flutes short shank ball

FINE GRAIN | 2 | H·A 30° | Grade AiTIN | h6 shank | RE ±0.02

DC	Tolerance
All sizes	0 ~ -0.04





(mm)

Designation		DC	DCON-MS	APMX	LF	RE
TXB	202010	1	3	3	39	0.5
	202015	1.5	3	5	39	0.75
	202020	2	3	7	39	1
	202025	2.5	3	8	39	1.25
	202030	3	3	10	39	1.5
	202040	4	4	14	51	2
	202050	5	5	16	51	2.5
	202060	6	6	19	64	3
	202080	8	8	21	64	4
	202100	10	10	25	70	5
	202120	12	12	25	76	6
	202160	16	16	32	89	8
	202200	20	20	38	100	10

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

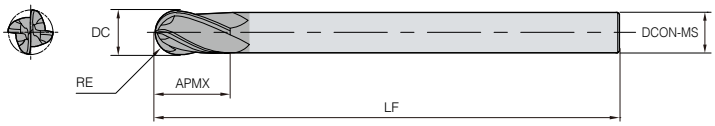
◎: EXCELLENT ○: GOOD

TXB204

4 flutes short shank ball

FINE GRAIN | 4 | H·A 30° | Grade AiTIN | h6 shank | RE ±0.01

DC	Tolerance
All sizes	0 ~ -0.04



(mm)

Designation		DC	DCON-MS	APMX	LF	RE
TXB	204020	2	3	7	39	1
	204030	3	3	10	39	1.5
	204040	4	4	14	51	2
	204050	5	5	16	51	2.5
	204060	6	6	19	64	3
	204080	8	8	21	64	4
	204100	10	10	25	70	5
	204120	12	12	25	76	6
	204160	16	16	32	89	8
	204200	20	20	38	100	10

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

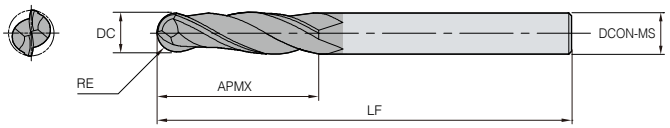
◎: EXCELLENT ○: GOOD

TXB222

2 flutes long ball

FINE GRAIN | 2 | H·A 30° | Grade AiTIN | h6 shank | RE ±0.02

DC	Tolerance
All sizes	0 ~ -0.04



(mm)

Designation		DC	DCON-MS	APMX	LF	RE
TXB	222030	3	3	20	60	1.5
	222040	4	4	20	60	2
	222050	5	5	25	75	2.5
	222060	6	6	30	75	3
	222080	8	8	30	100	4
	222100	10	10	40	100	5
	222120	12	12	45	100	6
	222140	14	14	45	100	7
	222160	16	16	45	100	8
	222180	18	18	45	100	9
	222200	20	20	45	100	10

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

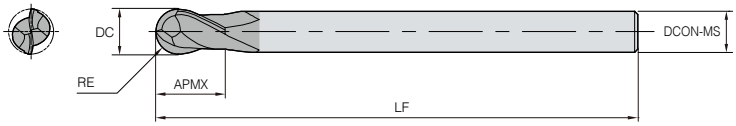
◎: EXCELLENT ○: GOOD

TXB232

2 flutes long shank ball

FINE GRAIN | 2 | H·A 30° | Grade AiTIN | h6 shank | RE ±0.02

DC	Tolerance
All sizes	0 ~ -0.04



(mm)

Designation		DC	DCON-MS	APMX	LF	RE
TXB	232030	3	3	5	75	1.5
	232040	4	4	8	75	2
	232050	5	5	9	75	2.5
	232060	6	6	10	100	3
	232060-75	6	6	10	75	3
	232080	8	8	12	100	4
	232080-75	8	8	12	75	4
	232100	10	10	14	100	5
	232100L	10	10	14	150	5
	232120	12	12	16	100	6
	232120L	12	12	16	150	6
	232140	14	14	18	100	7
	232160	16	16	22	150	8
	232200	20	20	26	150	10

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

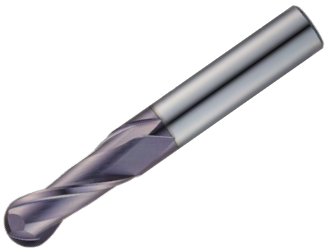
◎: EXCELLENT ○: GOOD

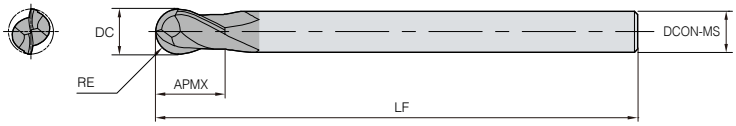
TXB302

2 flutes ball

FINE GRAIN | 2 | H·A 30° | Grade AiTIN | h6 shank | RE ±0.02

DC	Tolerance
All sizes	0 ~ -0.04





(mm)

Designation		DC	DCON-MS	APMX	LF	RE
TXB	302010	1	4	2	50	0.5
	302015	1.5	4	3	50	0.75
	302020	2	4	4	50	1
	302025	2.5	4	6	50	1.25
	302030	3	4	6	50	1.5
	302040	4	4	8	50	2
	302050	5	6	10	50	2.5
	302060	6	6	12	50	3
	302080	8	8	14	60	4
	302100	10	10	18	75	5
	302120	12	12	22	75	6
	302140	14	14	32	75	7
	302160	16	16	32	100	8
	302180	18	18	32	100	9
	302200	20	20	38	100	10

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

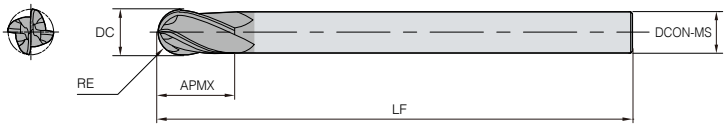
◎: EXCELLENT ○: GOOD

TXB304

4 flutes ball

FINE GRAIN | 4 | H·A 30° | Grade AiTiN | h6 shank | RE ±0.02

DC	Tolerance
All sizes	0 ~ -0.04



(mm)

Designation		DC	DCON-MS	APMX	LF	RE
TXB	304010	1	4	2	50	0.5
	304015	1.5	4	3	50	0.75
	304020	2	4	4	50	1
	304030	3	4	6	50	1.5
	304040	4	4	8	50	2
	304050	5	6	10	50	2.5
	304060	6	6	12	50	3
	304080	8	8	14	60	4
	304100	10	10	18	75	5
	304120	12	12	22	75	6
	304140	14	14	32	75	7
	304160	16	16	32	100	8
	304180	18	18	32	100	9
	304200	20	20	38	100	10

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

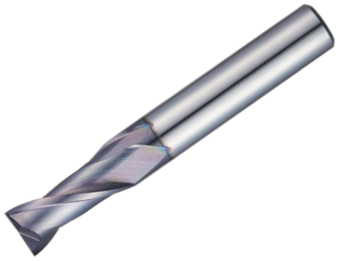
◎: EXCELLENT ○: GOOD

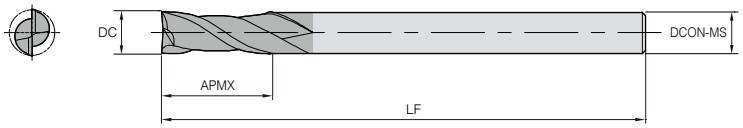
ZE302P

2 flutes flat

FINE GRAIN | 2 | H·A 30° | Grade AiTIN | h6 shank

DC	Tolerance
All sizes	0 ~ -0.02





(mm)

Designation		DC	DCON-MS	APMX	LF
ZE	302010P	1	6	2.5	50
	302015P	1.5	6	4	50
	302020P	2	6	6	50
	302025P	2.5	6	8	50
	302030P	3	6	10	50
	302035P	3.5	6	10	50
	302040P	4	6	12	50
	302045P	4.5	6	14	50
	302050P	5	6	15	60
	302055P	5.5	6	15	60
	302060P	6	6	15	60
	302065P	6.5	8	18	60
	302070P	7	8	20	65
	302075P	7.5	8	20	65
	302080P	8	8	20	65
	302085P	8.5	10	22	70
	302090P	9	10	22	70
	302095P	9.5	10	24	70
	302100P	10	10	25	70
	302105P	10.5	12	26	80
	302110P	11	12	30	80
	302115P	11.5	12	30	80
	302120P	12	12	30	80
	302130P	13	12	35	90
	302140P	14	14	35	100
	302150P	15	16	40	100
	302160P	16	16	40	100
	302180P	18	18	45	100
	302200P	20	20	45	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

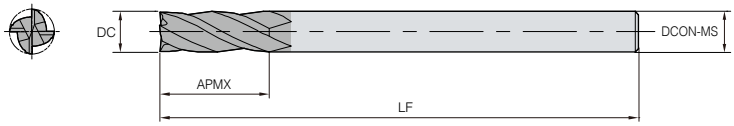
◎: EXCELLENT ○: GOOD

ZE304P

4 flutes flat

FINE GRAIN | 4 | H·A 30° | Grade AlTiN | h6 shank

DC	Tolerance
All sizes	0 ~ -0.02



(mm)

Designation		DC	DCON-MS	APMX	LF
ZE	304010P	1	6	2.5	50
	304015P	1.5	6	4	50
	304020P	2	6	6	50
	304025P	2.5	6	8	50
	304030P	3	6	10	50
	304035P	3.5	6	10	50
	304040P	4	6	12	50
	304045P	4.5	6	14	50
	304050P	5	6	15	60
	304055P	5.5	6	15	60
	304060P	6	6	15	60
	304065P	6.5	8	18	60
	304070P	7	8	20	65
	304075P	7.5	8	20	65
	304080P	8	8	20	65
	304085P	8.5	10	22	70
	304090P	9	10	22	70
	304095P	9.5	10	24	70
	304100P	10	10	25	70
	304105P	10.5	12	26	80
	304110P	11	12	30	80
	304115P	11.5	12	30	80
	304120P	12	12	30	80
	304130P	13	12	35	90
	304140P	14	14	35	100
	304150P	15	16	40	100
	304160P	16	16	40	100
	304180P	18	18	45	100
	304200P	20	20	45	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

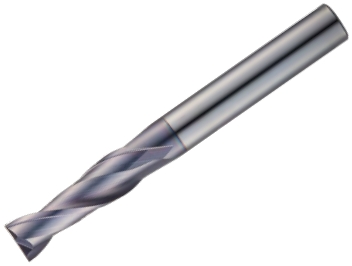
◎: EXCELLENT ○: GOOD

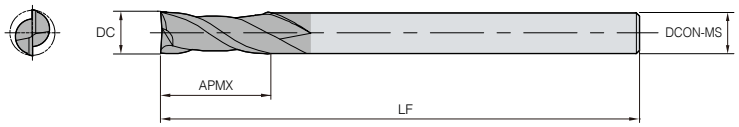
ZE322

2 flutes extra long flat

FINE GRAIN | 2 | H·A 30° | Grade AiTIN | h6 shank

DC	Tolerance
All sizes	0 ~ -0.03





(mm)

Designation		DC	DCON-MS	APMX	LF
ZE	322030	3	6	15	60
	322031	3	6	20	70
	322030S	3	3	20	100
	322040	4	6	15	60
	322041	4	6	20	70
	322040S	4	4	20	100
	322050	5	6	20	60
	322051	5	6	20	80
	322052	5	6	25	100
	322060	6	6	20	80
	322061	6	6	30	100
	322062	6	6	40	150
	322080	8	8	30	90
	322081	8	8	35	100
	322082	8	8	40	150
	322100	10	10	30	90
	322101	10	10	35	100
	322102	10	10	45	150
	322103	10	10	55	180
	322120	12	12	30	90
	322121	12	12	40	110
	322122	12	12	50	150
	322123	12	12	60	200
	322140	14	14	40	120
	322141	14	14	60	150
	322160	16	16	50	140
	322161	16	16	70	160
	322162	16	16	80	200
	322180	18	18	50	140
	322200	20	20	60	150
	322201	20	20	100	200
	322202	20	20	130	250

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

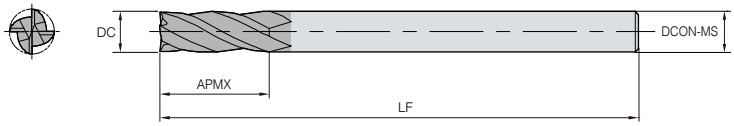
◎: EXCELLENT ○: GOOD

ZE324

4 flutes extra long flat

FINE GRAIN | 4 | H·A 30° | Grade AlTiN | h6 shank

DC	Tolerance
All sizes	0 ~ -0.03



(mm)

Designation		DC	DCON-MS	APMX	LF
ZE	324030	3	6	15	60
	324031	3	6	20	70
	324030S	3	3	20	100
	324040	4	6	15	60
	324041	4	6	20	70
	324040S	4	4	20	100
	324050	5	6	20	60
	324051	5	6	20	80
	324052	5	6	25	100
	324060	6	6	20	80
	324061	6	6	30	100
	324062	6	6	40	150
	324080	8	8	30	90
	324081	8	8	35	100
	324082	8	8	40	150
	324100	10	10	30	90
	324101	10	10	35	100
	324102	10	10	45	150
	324103	10	10	55	180
	324120	12	12	30	90
	324121	12	12	40	110
	324122	12	12	50	150
	324123	12	12	60	200
	324140	14	14	40	120
	324141	14	14	60	150
	324160	16	16	50	140
	324161	16	16	70	160
	324162	16	16	80	200
	324180	18	18	50	140
	324200	20	20	60	150
	324201	20	20	100	200
	324202	20	20	130	250

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

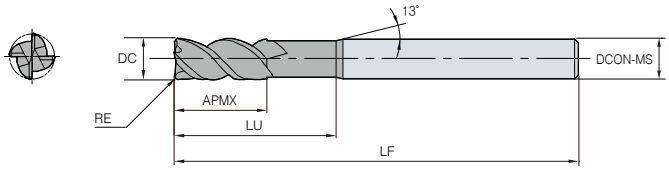
◎: EXCELLENT ○: GOOD

ZR304H

4 flutes 45° helix radius

FINE GRAIN | 4 | H·A 45° | Grade AiTIN | h6 shank | RE ±0.02

DC	Tolerance
All sizes	0 ~ -0.03



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ZR	304H0303	3	6	4	12	55	0.3
	304H0302S3	3	3	4	12	55	0.2
	304H0303S4	3	4	4	12	55	0.3
	304H0305	3	6	4	12	55	0.5
	304H0305S3	3	3	4	12	55	0.5
	304H0305S4	3	4	4	12	55	0.5
	304H0402S4	4	4	5	16	55	0.2
	304H0403	4	6	5	16	55	0.3
	304H0403S4	4	4	5	16	55	0.3
	304H0405	4	6	5	16	55	0.5
	304H0405S4	4	4	5	16	55	0.5
	304H0605	6	6	7	20	60	0.5
	304H0610	6	6	7	20	60	1
	304H0805	8	8	10	25	65	0.5
	304H0810	8	8	10	25	65	1
	304H1005	10	10	12	30	70	0.5
	304H1010	10	10	12	30	70	1
	304H1015	10	10	12	30	70	1.5
	304H1020	10	10	12	30	70	2
	304H1205	12	12	15	30	80	0.5
	304H1210	12	12	15	30	80	1
	304H1215	12	12	15	30	80	1.5
	304H1220	12	12	15	30	80	2

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

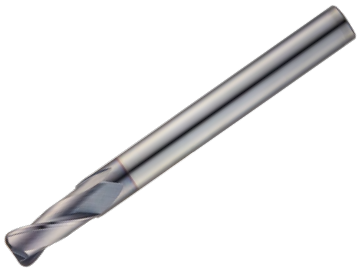
◎: EXCELLENT ○: GOOD

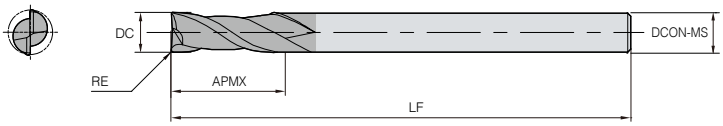
ZR322

2 flutes long shank radius

FINE GRAIN | 2 | H·A 30° | Grade AiTiN | h6 shank | RE ±0.02

DC	Tolerance
All sizes	0 ~ -0.03





(mm)

Designation		DC	DCON-MS	APMX	LF	RE
ZR	3220302S4	3	4	8	60	0.2
	3220302	3	6	8	60	0.2
	3220303	3	6	8	60	0.3
	3220305S4	3	4	8	60	0.5
	3220305	3	6	8	60	0.5
	3220402S4	4	4	11	70	0.2
	3220402	4	6	11	70	0.2
	3220403	4	6	11	70	0.3
	3220405S4	4	4	11	70	0.5
	3220405	4	6	11	70	0.5
	3220410S4	4	4	11	70	1
	3220410	4	6	11	70	1
	3220502	5	6	13	80	0.2
	3220503	5	6	13	80	0.3
	3220505	5	6	13	80	0.5
	3220510	5	6	13	80	1
	3220602	6	6	13	90	0.2
	3220603	6	6	13	90	0.3
	3220605	6	6	13	90	0.5
	3220610	6	6	13	90	1
	3220803	8	8	19	100	0.3
	3220805	8	8	19	100	0.5
	3220810	8	8	19	100	1
	3220815	8	8	19	100	1.5
	3220820	8	8	19	100	2
	3221003	10	10	22	100	0.3
	3221005	10	10	22	100	0.5
	3221010	10	10	22	100	1
	3221015	10	10	22	100	1.5
	3221020	10	10	22	100	2
	3221025	10	10	22	100	2.5
	3221205	12	12	26	110	0.5
	3221210	12	12	26	110	1
	3221215	12	12	26	110	1.5
	3221220	12	12	26	110	2
	3221225	12	12	26	110	2.5
	3221230	12	12	26	110	3

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

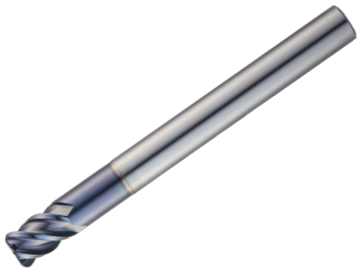
◎: EXCELLENT ○: GOOD

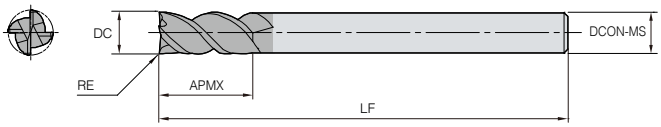
ZR324

4 flutes long shank radius

FINE GRAIN | 4 | H·A 30° | Grade AiTIN | h6 shank | RE ±0.02

DC	Tolerance
All sizes	0 ~ -0.03





(mm)

Designation		DC	DCON-MS	APMX	LF	RE
ZR	3240302S4	3	4	8	60	0.2
	3240302	3	6	8	60	0.2
	3240303	3	6	8	60	0.3
	3240305S4	3	4	8	60	0.5
	3240305	3	6	8	60	0.5
	3240402S4	4	4	11	70	0.2
	3240402	4	6	11	70	0.2
	3240403	4	6	11	70	0.3
	3240405S4	4	4	11	70	0.5
	3240405	4	6	11	70	0.5
	3240410S4	4	4	11	70	1
	3240410	4	6	11	70	1
	3240502	5	6	13	80	0.2
	3240503	5	6	13	80	0.3
	3240505	5	6	13	80	0.5
	3240510	5	6	13	80	1
	3240602	6	6	13	90	0.2
	3240603	6	6	13	90	0.3
	3240605	6	6	13	90	0.5
	3240610	6	6	13	90	1
	3240803	8	8	19	100	0.3
	3240805	8	8	19	100	0.5
	3240810	8	8	19	100	1
	3240815	8	8	19	100	1.5
	3240820	8	8	19	100	2
	3241003	10	10	22	100	0.3
	3241005	10	10	22	100	0.5
	3241010	10	10	22	100	1
	3241015	10	10	22	100	1.5
	3241020	10	10	22	100	2
	3241025	10	10	22	100	2.5
	3241205	12	12	26	110	0.5
	3241210	12	12	26	110	1
	3241215	12	12	26	110	1.5
	3241220	12	12	26	110	2
	3241225	12	12	26	110	2.5
	3241230	12	12	26	110	3

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

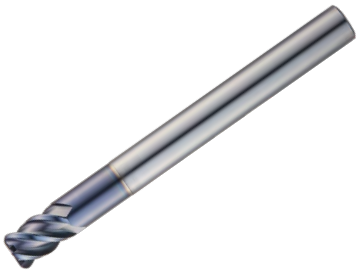
◎: EXCELLENT ○: GOOD

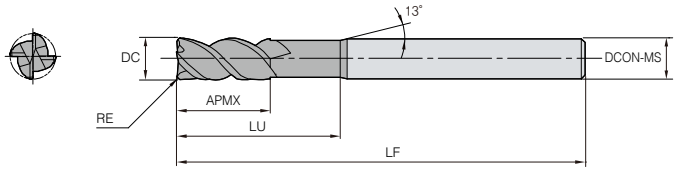
ZR324H

4 flutes 45° helix radius

FINE GRAIN | 4 | H·A 45° | Grade AiTiN | h6 shank | RE ±0.02

DC	Tolerance
All sizes	0 ~ -0.03





(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
ZR	324H0605	6	6	9	20	90	0.5
	324H0610	6	6	9	20	90	1
	324H0805	8	8	12	25	100	0.5
	324H0810	8	8	12	25	100	1
	324H1005	10	10	15	32	100	0.5
	324H1010	10	10	15	32	100	1
	324H1015	10	10	15	32	100	1.5
	324H1020	10	10	15	32	100	2
	324H1205	12	12	18	38	110	0.5
	324H1210	12	12	18	38	110	1
	324H1215	12	12	18	38	110	1.5
	324H1220	12	12	18	38	110	2

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: EXCELLENT ○: GOOD

High efficient roughing Endmill

R+ Endmill

- Cost-effective cutting-edge design for rough machining
- Specifically designed corners as irregular flute spacing and lead angle

Code system

RP(A)E 4 080 - 075 - RG (-H)

Roughing Plus (Aluminum) Endmill

Tooth

Drill dia.
080: Ø8

Overall length
075: 75mm

Flute information

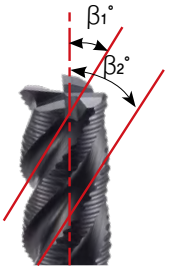
<Cutting-edge>
F: Fine Pitch
M: Medium Pitch
R: Roughing Pitch
X: 2-tooth finishing, 2-tooth roughing

<Flute>
P: Irregular Flutes/Leads
F: Irregular Flutes
L: Irregular Leads
G: General

Helix angle
H: High Helix
L: Low Helix

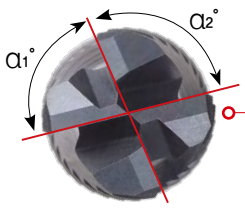
Features

- Excellent machining efficiency - Special design for medium to rough cutting
- Longer cutting life - Extended tool cost thanks to newly applied grades
- Higher cutting performance - Blade design ideal for roughing



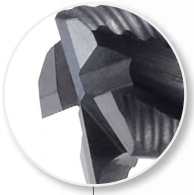
$(\beta_1^\circ \neq \beta_2^\circ)$

- Irregular lead angles to disperse cutting force



$(\alpha_1^\circ \neq \alpha_2^\circ)$

- Irregular flute spacing to prevent chattering



- **Lower cutting**
  - Ideal for medium to rough cutting
  - Special edge design

- **Soft cutting**
  - Serrated cutting edges
  - 3 Combo R

Grade system

Carbide Roughing		HSS Roughing	
FN30T	Carbide, uncoated	HN30T	HSS PM, uncoated
PC10T	Carbide, TiCN coated	HN20T	HSS, uncoated
PC20T	Carbide, TiN coated	HC10T	HSS, TiCNCoating
PC30T	Carbide, TiAlN coated	HC20T	HSS, TiNCoating
PC40T	Carbide, TiAlCrN coated	HC30T	HSS PM, TiAlN coated

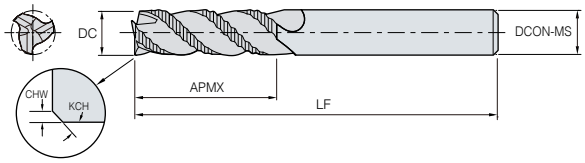
Line-up

Designation	Appearance	Type	Range	Page
RPAE		Wave roughing Endmill for Al	Ø6.0 ~ 25.0	B202
RPE-FP-H		Fine pitch standard type roughing Endmill	Ø5.0 ~ 20.0	B202
RPLE-FP-H		Fine pitch long type roughing Endmill	Ø5.0 ~ 20.0	B203
RPE-XG		Endmill for finishing and roughing	Ø5.0 ~ 20.0	B203
RPE-FP-L		Roughing Endmill for fine pitches	Ø5.0 ~ 20.0	B204
RPE-RG		Standard roughing Endmill	Ø5.0 ~ 20.0	B204
RPE-RG		4 flutes roughing Endmill	Ø6.0 ~ 20.0	B205
RPE-FF		Roughing Endmill for fine pitches	Ø6.0 ~ 20.0	B205
RPE-FP		Roughing Endmill for fine pitches	Ø6.0 ~ 20.0	B206
RPE-RG		Standard roughing Endmill	Ø6.0 ~ 50.0	B206

RPAE (Carbide)

Wave roughing Endmill for Al

DC	Tolerance
~ Ø6 ~ Ø25	0.000 ~ -0.050



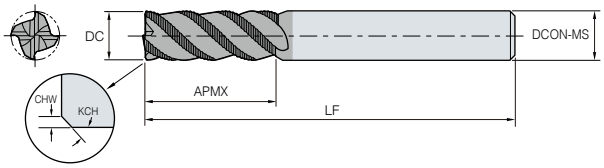
(mm)

Designation		DC	DCON-MS	APMX	LF	CHW	KCH
RPAE	3060-063	6	6	18	63	0.3	45°
	3070-063	7	8	23	63	0.3	45°
	3080-063	8	8	23	63	0.3	45°
	3090-080	9	10	30	80	0.3	45°
	3100-080	10	10	30	80	0.3	45°
	3110-080	11	12	32	80	0.5	45°
	3120-080	12	12	32	80	0.5	45°
	3140-080	14	14	32	80	0.5	45°
	3160-105	16	16	48	105	0.5	45°
	3180-105	18	18	48	105	0.5	45°
	3200-105	20	20	50	105	0.5	45°
	3250-105	25	25	50	105	0.5	45°

RPE-FP-H (Carbide, High helix angle, irregular flute spacing and lead)

Fine pitch standard type roughing

DC	Tolerance
Ø5 ~ Ø20	0.000 ~ -0.050



(mm)

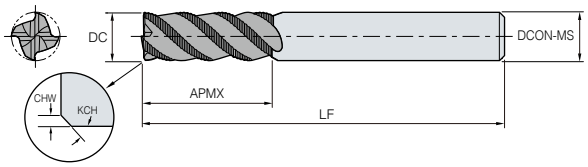
Designation		DC	DCON-MS	APMX	LF	CHW	KCH
RPE	4050-057-FP-H	5	6	13	57	0.3	45°
	4060-057-FP-H	6	6	13	57	0.5	45°
	4080-063-FP-H	8	8	19	63	0.5	45°
	4100-072-FP-H	10	10	22	72	0.5	45°
	4120-082-FP-H	12	12	26	82	0.5	45°
	4140-082-FP-H	14	16	26	82	0.6	45°
	4160-092-FP-H	16	16	32	92	0.6	45°
	4180-092-FP-H	18	20	32	92	0.6	45°
	4200-0104-FP-H	20	20	38	104	0.6	45°

RPLE-FP-H (Carbide, High helix angle, irregular flute spacing and lead)

Fine pitch long type roughing

4 | H·A 40°/42° | h6 shank | Grade PC30T

DC	Tolerance
Ø5 ~ Ø20	0.000 ~ -0.050



(mm)

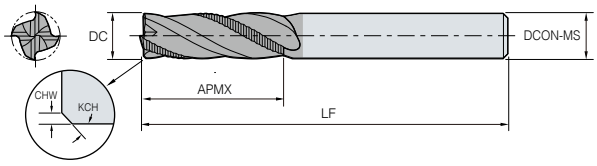
Designation		DC	DCON-MS	APMX	LF	CHW	KCH
RPLE	4050-063-FP-H	5	6	19	63	0.3	45°
	4060-063-FP-H	6	8	19	63	0.5	45°
	4080-072-FP-H	8	8	28	72	0.5	45°
	4100-082-FP-H	10	10	34	82	0.5	45°
	4120-097-FP-H	12	12	40	97	0.5	45°
	4140-097-FP-H	14	16	40	97	0.6	45°
	4160-108-FP-H	16	16	48	108	0.6	45°
	4180-108-FP-H	18	20	48	108	0.6	45°
	4200-122-FP-H	20	20	56	122	0.6	45°

RPE-XG (Carbide)

Endmill for finishing and roughing

4 | H·A 30° | h6 shank | Grade PC30T

DC	Tolerance
Ø5 ~ Ø20	0.000 ~ -0.050



(mm)

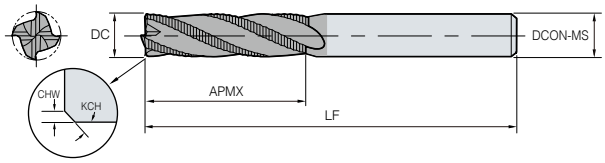
Designation		DC	DCON-MS	APMX	LF	CHW	KCH
RPE	4060-052-XG	6	6	14	52	0.25	45°
	4070-063-XG	7	8	18	63	0.3	45°
	4080-063-XG	8	8	18	63	0.3	45°
	4090-080-XG	9	10	22	80	0.3	45°
	4100-080-XG	10	10	22	80	0.3	45°
	4110-080-XG	11	12	26	80	0.4	45°
	4120-080-XG	12	12	26	80	0.4	45°
	4140-080-XG	14	14	30	80	0.4	45°
	4160-105-XG	16	16	34	105	0.6	45°
	4180-105-XG	18	18	38	105	0.6	45°
	4200-105-XG	20	20	42	105	0.6	45°

RPE-FP-L (Carbide, High helix angle, irregular flute spacing and lead)

Fine pitch long type roughing

4 | H·A 18°/23° | h6 shank | Grade PC30T

DC	Tolerance
Ø5 ~ Ø20	0.000 ~ -0.050



(mm)

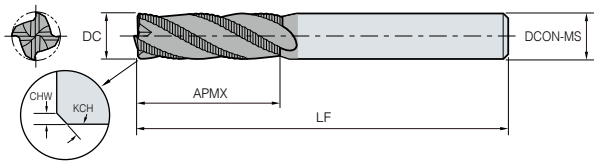
Designation		DC	DCON-MS	APMX	LF	CHW	KCH
RPE	4050-060-FP-L	5	6	13	60	0.3	45°
	4060-080-FP-L	6	8	13	80	0.5	45°
	4080-080-FP-L	8	8	19	80	0.5	45°
	4100-080-FP-L	10	10	22	80	0.5	45°
	4120-080-FP-L	12	12	26	80	0.5	45°
	4140-085-FP-L	14	16	26	85	0.6	45°
	4160-100-FP-L	16	16	32	100	0.6	45°
	4180-100-FP-L	18	20	32	100	0.6	45°
	4200-105-FP-L	20	20	38	105	0.6	45°

RPE-RG (Carbide)

Endmill for finishing and roughing

4 | H·A 30° | h6 shank | Grade PC40T

DC	Tolerance
Ø5 ~ Ø20	0.000 ~ -0.050



(mm)

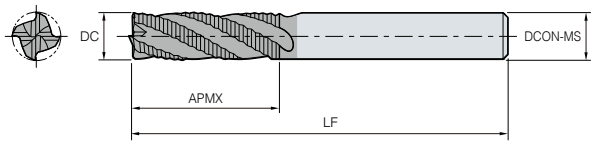
Designation		DC	DCON-MS	APMX	LF	CHW	KCH
RPE	4050-050-RG	5	6	13	50	0.3	45°
	4060-050-RG	6	6	16	50	0.3	45°
	4080-060-RG	8	8	20	60	0.3	45°
	4100-075-RG	10	10	25	75	0.3	45°
	4120-080-RG	12	12	30	80	0.4	45°
	4140-100-RG	14	16	35	100	0.6	45°
	4160-100-RG	16	16	40	100	0.6	45°
	4180-110-RG	18	20	40	110	0.6	45°
	4200-110-RG	20	20	45	110	0.6	45°

RPE-RG (HSS PM)

4 flutes roughing

4	H·A 30°	HSS PM	h6 shank	Grade HN30T HC30T

DC	Tolerance
Ø6 ~ Ø20	±0.1



(mm)

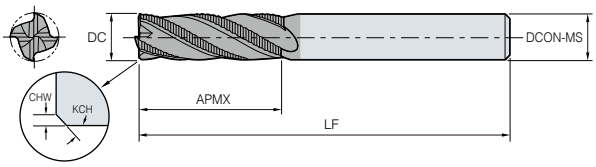
Designation		DC	DCON-MS	APMX	LF
RPE	4060-060-RG	6	6	20	60
	4070-070-RG	7	10	20	70
	4080-075-RG	8	10	25	75
	4090-075-RG	9	10	30	75
	4100-085-RG	10	10	35	85
	4120-100-RG	12	12	40	100
	4140-100-RG	14	16	40	100
	4160-110-RG	16	16	50	110
	4180-110-RG	18	20	50	110
	4200-125-RG	20	20	60	125

RPE-FF (HSS PM, irregular flute spacing and lead)

Roughing Endmill for fine pitches

4	H·A 25°/30°	HSS PM	h6 shank	Grade HC30T

DC	Tolerance
Ø6 ~ Ø20	±0.1



(mm)

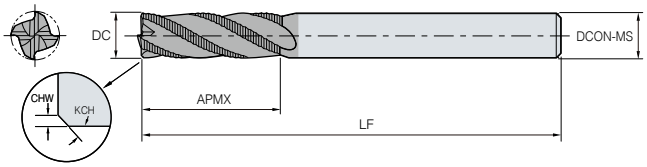
Designation		DC	DCON-MS	APMX	LF	CHW	KCH
RPE	4060-060-FF	6	6	20	60	0.5	45°
	4070-070-FF	7	10	20	70	0.5	45°
	4080-075-FF	8	10	25	75	0.5	45°
	4090-075-FF	9	10	30	75	0.5	45°
	4100-085-FF	10	10	35	85	0.5	45°
	4120-100-FF	12	12	40	100	0.6	45°
	4140-100-FF	14	12	40	100	0.6	45°
	4160-110-FF	16	16	50	110	0.6	45°
	4180-110-FF	18	16	50	110	0.6	45°
	4200-125-FF	20	20	60	125	0.6	45°

RPE-FP (HSS PM, irregular flute spacing and lead)

Roughing Endmill for fine pitches

4 | H·A 25°/30° | HSS PM | h6 shank | Grade HC30T

DC	Tolerance
Ø6 ~ Ø12	0.000 ~ -0.050
Ø12.1 ~ Ø20	0.000 ~ -0.100



(mm)

Designation		DC	DCON-MS	APMX	LF	CHW	KCH
RPE	4060-080-FP	6	6	13	80	0.5	45°
	4070-080-FP	7	10	16	80	0.5	45°
	4080-085-FP	8	10	19	85	0.5	45°
	4090-095-FP	9	10	19	95	0.5	45°
	4100-100-FP	10	10	22	100	0.5	45°

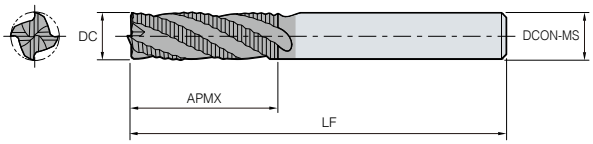
Designation		DC	DCON-MS	APMX	LF	CHW	KCH
RPE	4120-110-FP	12	12	26	110	0.6	45°
	4140-110-FP	14	12	26	110	0.6	45°
	4160-125-FP	16	16	32	125	0.6	45°
	4180-125-FP	18	16	32	125	0.6	45°
	4200-140-FP	20	20	38	140	0.6	45°

RPE-RG (HSS)

Roughing

4 | H·A 30° | HSS Co 8% | h6 shank | Grade HN20T HC20T HC10T

DC	Tolerance
Ø6 ~ Ø50	±0.1



(mm)

Designation		DC	DCON-MS	APMX	LF
RPE	4060-060-RG	6	6	15	60
	4070-065-RG	7	8	20	65
	4080-065-RG	8	8	20	65
	4090-075-RG	9	10	25	75
	4100-075-RG	10	10	25	75
	4110-080-RG	11	12	30	80
	4120-080-RG	12	12	30	80
	4130-090-RG	13	12	35	90
	4140-090-RG	14	12	35	90
	4150-095-RG	15	12	40	95
	4160-095-RG	16	16	40	95
	4170-095-RG	17	16	40	95
	4180-105-RG	18	16	40	105
	4190-110-RG	19	16	45	110
	4200-110-RG	20	20	45	110
	4210-110-RG	21	20	45	110
	4220-110-RG	22	20	45	110
	4230-110-RG	23	20	45	110

Designation		DC	DCON-MS	APMX	LF
RPE	4240-120-RG	24	25	50	120
	4250-120-RG	25	25	50	120
	4260-120-RG	26	25	50	120
	4270-125-RG	27	25	55	125
	4280-125-RG	28	25	55	125
	4300-125-RG	30	25	55	125
	4320-145-RG	32	32	60	145
	4340-145-RG	34	32	60	145
	4350-145-RG	35	32	60	145
	4360-145-RG	36	32	60	145
	4380-150-RG	38	32	65	150
	4400-150-RG	40	32	65	150
	4420-155-RG	42	42	65	155
	4440-155-RG	44	42	65	155
	4450-160-RG	45	42	70	160
	4460-160-RG	46	42	70	160
	4500-160-RG	50	42	70	160

Endmill for Stainless steel machining

S-Star Endmill

- Stable high speed processing with minimum vibration, unequal index and optimal rake angle
- High machinability and low vibration with the application of unequal index on the cutting edge
- Minimum vibration through optimized helix angle and R gash application which also enhanced chip emission and strengthness improvement
- Reduced friction resistance and improved chip emission by applying new coatings with high surface hardness oxidation resistance
- Newly strengthened flute with enhanced chipping resistance, and deposition resistance

Code system

SP FE 4 120 - 075 (-V00N00) - R10 (-N)

S-Star Endmill

Type
FE: Flat Endmill
RE: Radius Endmill
BE: Ball Endmill
XE: Roughing Endmill

No. of flute
4 : 4flutes

Tool dia
120: Ø 2.0mm

Length
075 : 75mm

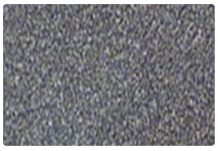
Flute length
V10: 10mm

Neck length
N20: 20mm

Corner radius
R10: 1.0mm
C05: 0.5mm

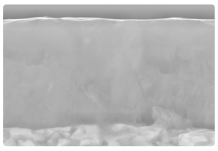
N: Nick type

Features



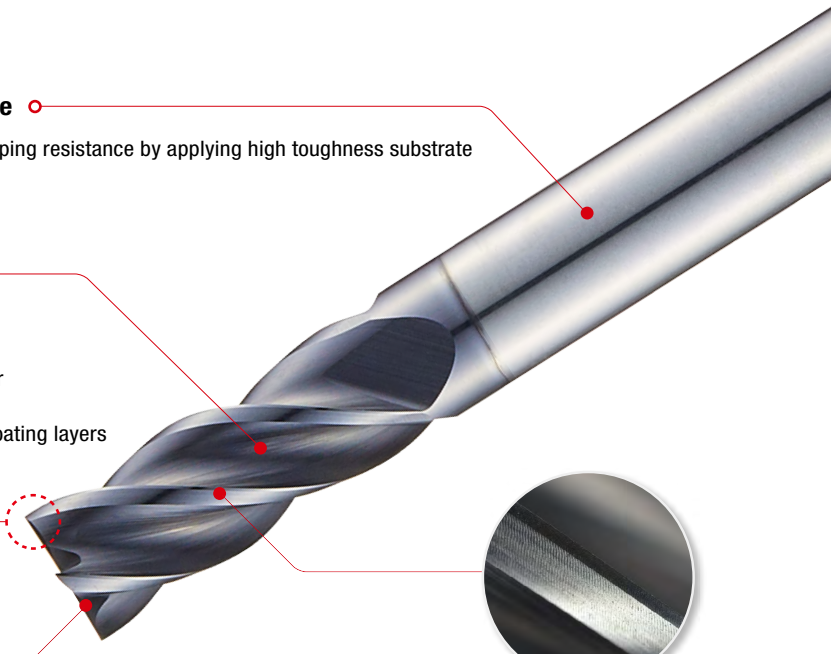
Applying high toughness substrate

- Stable cutting is ensured with better chipping resistance by applying high toughness substrate



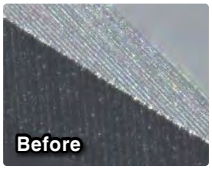
Applied differential AlCrN coating layer depth per tool size

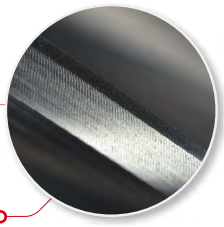
- Applied multi coating layers
- Increased lubrication due to containing Cr
- Enhanced stability against frictional heat
- Improved wear resistance from thicker coating layers



Cutting edge treatment

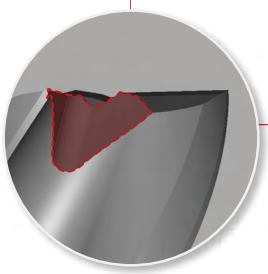
- Improved chipping resistance in the beginning of cutting
- Better wear resistance and stable cutting
- High quality of product from cutting edge treatment stabilization





Additionally finished edge

- Enhanced surface finish due to increased 1st O.D grinding roughness
- High quality cutting edge and good welding resistance



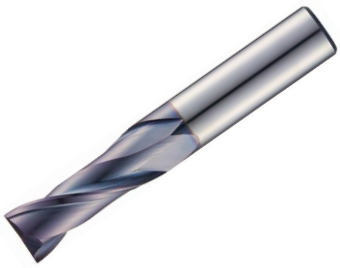
Uneven flute spacing / R gash

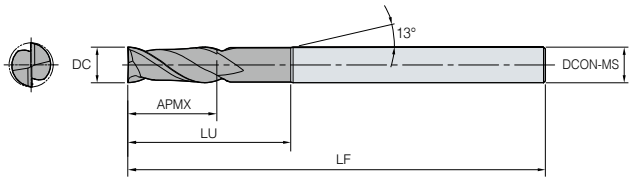
- High chip evacuation through R gash shape
- Stability in shouldering machining

SPFE2000

2 flutes flat

DC	Tolerance
Ø1 ~ Ø5	0.000 ~ -0.015
Ø6	0.000 ~ -0.020
Ø8 ~ Ø20	0.000 ~ -0.030





(mm)

Designation		DC	DCON-MS	APMX	LU	LF
SPFE	2010-050	1	6	2.5	7.5	50
	2012-050	1.2	6	3	8	50
	2015-050	1.5	6	4	9	50
	2020-050	2	6	6	11	50
	2025-050	2.5	6	7	12	50
	2030-055	3	6	8	13	55
	2040-055	4	6	10	15	55
	2050-055	5	6	15	20	55
	2060-060	6	6	15	22	60
	2080-070	8	8	20	32	70
	2100-075	10	10	25	33	75
	2120-080	12	12	30	35	80
	2140-090	14	16	35	42	90
	2160-100	16	16	42	52	100
	2180-100	18	16	45	-	100
	2200-100	20	20	48	50	100

• Applicable Workpiece

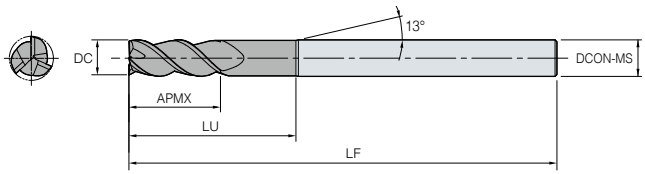
◎: EXCELLENT ○: GOOD

CARBON STEEL (~ HB225)	ALLOY STEEL (HB225 ~ 325)	PRE-HARDENED STEEL (HRC30 ~ 50)	HARDENED STEEL		CAST IRON ~ FCD500	ALUMINUM	STAINLESS STEEL	Ti-Alloy	Ni-Alloy
			SKD61 (~ HRC55)	SKD11 (HRC55 ~)					
○	○	○					◎	○	○

SPFE3000

3 flutes flat

DC	Tolerance
Ø1 ~ Ø5	0.000 ~ -0.015
Ø6	0.000 ~ -0.020
Ø8 ~ Ø20	0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	LU	LF
SPFE	3010-050	1	6	2.5	7.5	50
	3012-050	1.2	6	3	8	50
	3015-050	1.5	6	4	9	50
	3020-050	2	6	6	11	50
	3025-050	2.5	6	7	12	50
	3030-055	3	6	8	13	55
	3030-060-V10	3	6	10	15	60
	3040-055	4	6	10	15	55
	3040-060-V12	4	6	12	17	60
	3050-055	5	6	13	18	55
	3060-060	6	6	15	22	60
	3060-065-V20	6	6	20	27	65
	3080-070	8	8	20	32	70
	3080-080-V30	8	8	30	42	80
	3100-075	10	10	25	33	75
	3100-085-V35	10	10	35	43	85
	3120-080	12	12	30	35	80
	3120-090-V40	12	12	40	45	90
	3140-090	14	16	35	42	90
	3160-100	16	16	42	52	100
	3180-100	18	16	45	-	100
	3200-100	20	20	48	50	100

• Applicable Workpiece

◎: EXCELLENT ○: GOOD

CARBON STEEL (~ HB225)	ALLOY STEEL (HB225 ~ 325)	PRE-HARDENED STEEL (HRC30 ~ 50)	HARDENED STEEL		CAST IRON ~ FCD500	ALUMINUM	STAINLESS STEEL	Ti-Alloy	Ni-Alloy
			SKD61 (~ HRC55)	SKD11 (HRC55 ~)					
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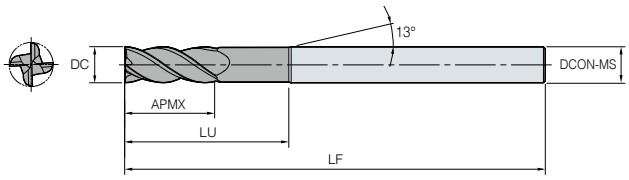
SPFE4000

4 flutes flat



4 | H·A 35°/37° | h5 shank | Grade PC325

DC	Tolerance
Ø1 ~ Ø5.5	0.000 ~ -0.015
Ø6 ~ Ø7	0.000 ~ -0.020
Ø8 ~ Ø20	0.000 ~ -0.030

(mm)

Designation		DC	DCON-MS	APMX	LU	LF
SPFE	4010-050	1	6	2.5	7.5	50
	4012-050	1.2	6	3	8	50
	4015-050	1.5	6	4	9	50
	4020-050	2	6	6	11	50
	4025-050	2.5	6	7	12	50
	4030-055	3	6	8	13	55
	4030-060-V10	3	6	10	15	60
	4035-055	3.5	6	10	15	55
	4040-055	4	6	10	15	55
	4040-060-V12	4	6	12	17	60
	4045-055	4.5	6	12	17	55
	4050-055	5	6	15	20	55
	4055-060	5.5	6	15	20	60
	4060-060	6	6	15	22	60
	4060-065-V20	6	6	20	27	65
	4065-060	6.5	8	15	22	60
	4070-080	7	8	20	42	80
	4080-070	8	8	20	32	70
	4080-070-V25	8	8	25	32	70
	4080-080-V30	8	8	30	42	80
	4085-070	8.5	10	20	28	70
	4090-080	9	10	25	38	80
	4100-075	10	10	25	33	75
	4100-085-V35	10	10	35	43	85
	4120-080	12	12	30	35	80
	4120-090-V40	12	12	40	45	90
	4140-090	14	16	35	42	90
	4160-100	16	16	42	52	100
	4180-100	18	16	45	-	100
	4200-100	20	20	48	50	100

• Applicable Workpiece

◎: EXCELLENT ○: GOOD

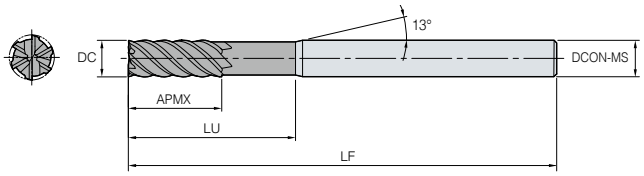
CARBON STEEL (~ HB225)	ALLOY STEEL (HB225 ~ 325)	PRE-HARDENED STEEL (HRC30 ~ 50)	HARDENED STEEL		CAST IRON ~ FCD500	ALUMINUM	STAINLESS STEEL	Ti-Alloy	Ni-Alloy
			SKD61 (~ HRC55)	SKD11 (HRC55 ~)					
○	○	○					◎	○	○

SPFE6000

6 flutes flat

6 | H·A 45° | h5 shank | Grade PC325

DC	Tolerance
Ø6	0.000 ~ -0.020
Ø8 ~ Ø20	0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	LU	LF
SPFE	6060-060	6	6	15	22	60
	6080-070	8	8	20	32	70
	6100-075	10	10	25	33	75
	6120-080	12	12	30	35	80
	6160-100	16	16	42	52	100
	6200-100	20	20	48	50	100

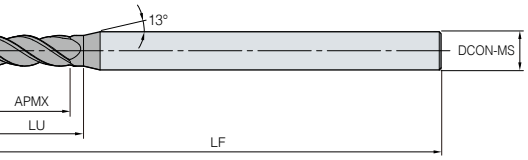
• Applicable Workpiece

◎: EXCELLENT ○: GOOD

CARBON STEEL (~ HB225)	ALLOY STEEL (HB225 ~ 325)	PRE-HARDENED STEEL (HRC30 ~ 50)	HARDENED STEEL		CAST IRON ~ FCD500	ALUMINUM	STAINLESS STEEL	Ti-Alloy	Ni-Alloy
			SKD61 (~ HRC55)	SKD11 (HRC55 ~)					
○	○	○					◎	○	○

SPRE4000

4 flutes radius



DC	Tolerance
Ø1 ~ Ø5.5	0.000 ~ -0.015
Ø6 ~ Ø7	0.000 ~ -0.020
Ø8 ~ Ø20	0.000 ~ -0.030

(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
SPRE	4010-050-R01	1	6	2.5	7.5	50	0.1
	4010-050-R02	1	6	2.5	7.5	50	0.2
	4012-050-R01	1.2	6	3	8	50	0.1
	4015-050-R01	1.5	6	4	9	50	0.1
	4015-050-R02	1.5	6	4	9	50	0.2
	4020-050-R01	2	6	6	11	50	0.1
	4020-050-R02	2	6	6	11	50	0.2
	4025-050-R02	2.5	6	7	12	50	0.2
	4030-055-R02	3	6	8	13	55	0.2
	4030-055-R03	3	6	8	13	55	0.3
	4030-055-R05	3	6	8	13	55	0.5
	4040-055-R02	4	6	10	15	55	0.2
	4040-055-R03	4	6	10	15	55	0.3
	4040-055-R05	4	6	10	15	55	0.5
	4050-055-R02	5	6	15	20	55	0.2
	4050-055-R03	5	6	15	20	55	0.3
	4050-055-R05	5	6	15	20	55	0.5
	4060-060-R03	6	6	15	22	60	0.3
	4060-060-R05	6	6	15	22	60	0.5
	4060-060-R10	6	6	15	22	60	1
	4070-060-R03	7	8	15	22	60	0.3
	4080-070-R02	8	8	20	32	70	0.2
	4080-070-R03	8	8	20	32	70	0.3
	4080-070-R05	8	8	20	32	70	0.5
	4080-070-R10	8	8	20	32	70	1
	4100-075-R03	10	10	25	33	75	0.3
	4100-075-R05	10	10	25	33	75	0.5
	4100-075-R10	10	10	25	33	75	1
	4100-075-R15	10	10	25	33	75	1.5
	4100-075-R20	10	10	25	33	75	2
	4100-075-R30	10	10	25	33	75	3
	4120-080-R03	12	12	30	35	80	0.3
	4120-080-R05	12	12	30	80	12	0.5

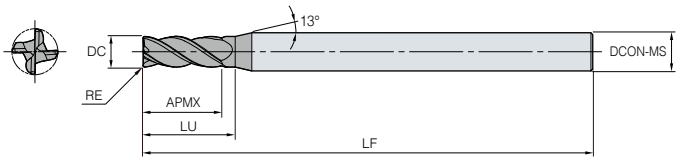
• Applicable Workpiece

◎: EXCELLENT ○: GOOD

CARBON STEEL (~ HB225)	ALLOY STEEL (HB225 ~ 325)	PRE-HARDENED STEEL (HRC30 ~ 50)	HARDENED STEEL		CAST IRON ~ FCD500	ALUMINUM	STAINLESS STEEL	Ti-Alloy	Ni-Alloy
			SKD61 (~ HRC55)	SKD11 (HRC55 ~)					
○	○	○					◎	○	○

SPRE4000

4 flutes radius



DC	Tolerance
Ø1 ~ Ø5.5	0.000 ~ -0.015
Ø6 ~ Ø7	0.000 ~ -0.020
Ø8 ~ Ø20	0.000 ~ -0.030

(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
SPRE	4120-080-R10	12	12	30	35	80	1
	4120-080-R15	12	12	30	35	80	1.5
	4120-080-R20	12	12	30	35	80	2
	4120-080-R30	12	12	30	35	80	3
	4120-080-R40	12	12	30	35	80	4
	4140-090-R05	14	16	35	42	90	0.5
	4140-090-R10	14	16	35	42	90	1
	4140-090-R20	14	16	35	42	90	2
	4140-090-R30	14	16	35	42	90	3
	4140-090-R40	14	16	35	42	90	4
	4160-100-R05	16	16	42	52	100	0.5
	4160-100-R10	16	16	42	52	100	1
	4160-100-R20	16	16	42	52	100	2
	4160-100-R30	16	16	42	52	100	3
	4160-100-R40	16	16	42	52	100	4
	4160-100-R50	16	16	42	52	100	5
	4180-100-R05	18	16	45	-	100	0.5
	4200-100-R05	20	20	48	50	100	0.5
	4200-100-R10	20	20	48	50	100	1
	4200-100-R20	20	20	48	50	100	2
	4200-100-R30	20	20	48	50	100	3
	4200-100-R40	20	20	48	50	100	4
	4200-100-R50	20	20	48	50	100	5

• Applicable Workpiece

◎: EXCELLENT ○: GOOD

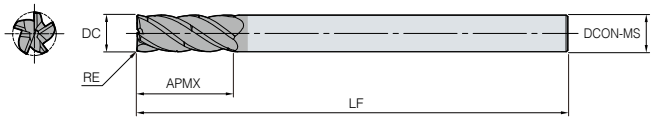
CARBON STEEL (~ HB225)	ALLOY STEEL (HB225 ~ 325)	PRE-HARDENED STEEL (HRC30 ~ 50)	HARDENED STEEL		CAST IRON ~ FCD500	ALUMINUM	STAINLESS STEEL	Ti-Alloy	Ni-Alloy
			SKD61 (~ HRC55)	SKD11 (HRC55 ~)					
○	○	○					◎	○	○

SPRE5000

5 flutes neck type radius

5 | H·A 35°/38° | h5 shank | Grade PC325

DC	Tolerance
Ø6	0.000 ~ -0.020
Ø8 ~ Ø20	0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	LF	RE
SPRE	5060-060-R05-N	6	6	15	60	0.5
	5060-070-R05-N	6	6	24	70	0.5
	5080-070-R05-N	8	8	20	70	0.5
	5080-090-R05-N	8	8	32	90	0.5
	5100-075-R05-N	10	10	25	75	0.5
	5100-100-R05-N	10	10	40	100	0.5
	5120-080-R05-N	12	12	30	80	0.5
	5120-080-R10-N	12	12	30	80	1
	5120-080-R20-N	12	12	30	80	2
	5120-080-R30-N	12	12	30	80	3
	5120-110-R05-N	12	12	48	110	0.5
	5160-100-R05-N	16	16	42	100	0.5
	5160-100-R10-N	16	16	42	100	1
	5160-100-R20-N	16	16	42	100	2
	5160-100-R30-N	16	16	42	100	3
	5160-100-R40-N	16	16	42	100	4
	5160-130-R05-N	16	16	65	130	0.5
	5200-110-R05-N	20	20	48	110	0.5
	5200-130-R05-N	20	20	65	130	0.5

• Applicable Workpiece

◎: EXCELLENT ○: GOOD

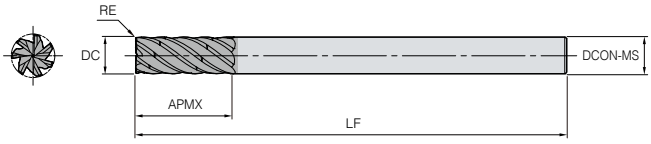
CARBON STEEL (~ HB225)	ALLOY STEEL (HB225 ~ 325)	PRE-HARDENED STEEL (HRC30 ~ 50)	HARDENED STEEL		CAST IRON ~ FCD500	ALUMINUM	STAINLESS STEEL	Ti-Alloy	Ni-Alloy
			SKD61 (~ HRC55)	SKD11 (HRC55 ~)					
○	○	○					◎	○	○

SPRE7000

7 flutes neck type radius

7 | H·A 35°/38° | h5 shank | Grade PC325

DC	Tolerance
Ø6 Ø8 ~ Ø20	0.000 ~ -0.020 0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	LF	RE
SPRE	7060-060-R05-N	6	6	15	60	0.5
	7060-070-R05-N	6	6	24	70	0.5
	7080-070-R05-N	8	8	20	70	0.5
	7080-090-R05-N	8	8	32	90	0.5
	7100-075-R05-N	10	10	25	75	0.5
	7100-100-R05-N	10	10	40	100	0.5
	7120-080-R05-N	12	12	30	80	0.5
	7120-080-R10-N	12	12	30	80	1
	7120-080-R20-N	12	12	30	80	2
	7120-080-R30-N	12	12	30	80	3
	7120-080-R40-N	12	12	30	80	4
	7120-110-R05-N	12	12	48	110	0.5
	7160-100-R05-N	16	16	42	100	0.5
	7160-100-R10-N	16	16	42	100	1
	7160-100-R20-N	16	16	42	100	2
	7160-100-R30-N	16	16	42	100	3
	7160-100-R40-N	16	16	42	100	4
	7160-100-R50-N	16	16	42	100	5
	7160-130-R05-N	16	16	65	130	0.5
	7200-110-R05-N	20	20	48	110	0.5
	7200-130-R05-N	20	20	65	130	0.5

• Applicable Workpiece

◎: EXCELLENT ○: GOOD

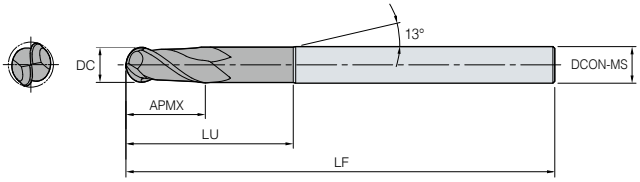
CARBON STEEL (~ HB225)	ALLOY STEEL (HB225 ~ 325)	PRE-HARDENED STEEL (HRC30 ~ 50)	HARDENED STEEL		CAST IRON ~ FCD500	ALUMINUM	STAINLESS STEEL	Ti-Alloy	Ni-Alloy
			SKD61 (~ HRC55)	SKD11 (HRC55 ~)					
○	○	○					◎	○	○

SPBE2000

2 flutes ball

2 | H·A 38° | h5 shank | Grade PC325

DC	Tolerance
Ø1 ~ Ø5 Ø6 Ø8 ~ Ø12	0.000 ~ -0.015 0.000 ~ -0.020 0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	LU	LF
SPBE	2010-050	1	6	3	8	50
	2020-050	2	6	6	11	50
	2030-050	3	6	8	13	50
	2030-070	3	6	8	13	70
	2040-050	4	6	10	15	50
	2040-070	4	6	10	15	70
	2050-050	5	6	13	18	50
	2050-080	5	6	13	18	80
	2060-050	6	6	13	20	50
	2060-090	6	6	13	52	90
	2080-060	8	8	19	24	60
	2080-100	8	8	19	62	100
	2100-070	10	10	22	30	70
	2100-100	10	10	22	58	100
	2120-075	12	12	26	30	75
	2120-110	12	12	26	63	110

• Applicable Workpiece

◎: EXCELLENT ○: GOOD

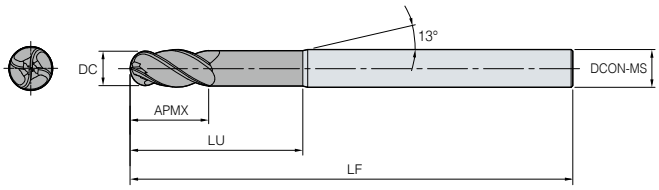
CARBON STEEL (~ HB225)	ALLOY STEEL (HB225 ~ 325)	PRE-HARDENED STEEL (HRC30 ~ 50)	HARDENED STEEL		CAST IRON ~ FCD500	ALUMINUM	STAINLESS STEEL	Ti-Alloy	Ni-Alloy
			SKD61 (~ HRC55)	SKD11 (HRC55 ~)					
○	○	○					◎	○	○

SPBE4000

4 flutes ball

4 | H·A 35°/37° | h5 shank | Grade PC325

DC	Tolerance
Ø3 ~ Ø5	0.000 ~ -0.015
Ø6	0.000 ~ -0.020
Ø8 ~ Ø20	0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	LU	LF
SPBE	4030-060	3	6	8	13	60
	4040-070	4	6	8	13	70
	4050-080	5	6	12	17	80
	4060-090	6	6	12	52	90
	4080-100	8	8	16	62	100
	4100-100	10	10	20	58	100
	4120-100	12	12	25	53	100
	4160-100	16	16	30	50	100
	4200-100	20	20	38	48	100

• Applicable Workpiece

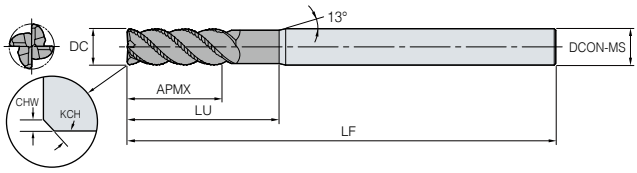
◎: EXCELLENT ○: GOOD

CARBON STEEL (~ HB225)	ALLOY STEEL (HB225 ~ 325)	PRE-HARDENED STEEL (HRC30 ~ 50)	HARDENED STEEL		CAST IRON ~ FCD500	ALUMINUM	STAINLESS STEEL	Ti-Alloy	Ni-Alloy
			SKD61 (~ HRC55)	SKD11 (HRC55 ~)					
○	○	○					◎	○	○

SPXE3000/4000/5000

3~5 flutes roughing

DC	Tolerance
Ø3 ~ Ø20	0.000 ~ -0.050



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	CHW	KCH
SPXE	3030-050-C02	3	6	8	13	50	0.2	45°
	3040-050-C02	4	6	10	15	50	0.2	45°
	4050-050-C03	5	6	13	18	50	0.3	45°
	4060-060-C03	6	6	13	22	60	0.3	45°
	4060-060-V10N20S6-C03	6	6	10	20	60	0.3	45°
	4070-070-C04	7	8	18	32	70	0.4	45°
	4080-070-C04	8	8	19	32	70	0.4	45°
	4080-070-V12N25S8-C04	8	8	12	25	70	0.4	45°
	4090-070-C04	9	10	20	28	70	0.4	45°
	4100-075-C04	10	10	22	33	75	0.4	45°
	4100-075-V15N30S10-C04	10	10	15	30	75	0.4	45°
	4110-080-C05	11	12	25	33	80	0.5	45°
	4120-080-C05	12	12	26	35	80	0.5	45°
	4120-080-V20N35S12-C05	12	12	20	35	80	0.5	45°
	5060-060-C05	6	6	13	22	60	0.5	45°
	5080-065-C05	8	8	19	27	65	0.5	45°
	5100-070-C05	10	10	22	30	70	0.5	45°
	5120-080-C05	12	12	26	35	80	0.5	45°
	5140-090-C05	14	16	28	40	90	0.5	45°
	5160-100-C05	16	16	32	50	100	0.5	45°
	5160-100-V42-C05	16	16	42	52	100	0.5	45°
	5200-100-C05	20	20	38	48	100	0.5	45°
	5200-100-V45-C05	20	20	45	50	100	0.5	45°

• Applicable Workpiece

◎: EXCELLENT ○: GOOD

CARBON STEEL (~ HB225)	ALLOY STEEL (HB225 ~ 325)	PRE-HARDENED STEEL (HRC30 ~ 50)	HARDENED STEEL		CAST IRON ~ FCD500	ALUMINUM	STAINLESS STEEL	Ti-Alloy	Ni-Alloy
			SKD61 (~ HRC55)	SKD11 (HRC55 ~)					
○	○	○					◎	○	○

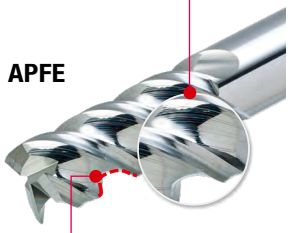
Endmill series for aluminum machining

A-Star Endmill

- Endmill series for Aluminum machining
- Optimized Solutions for each application - The wide selection of tools are available for various machining processes
- Higher Machining Efficiency - Advanced flute design and cutting edge technology are applied

Features

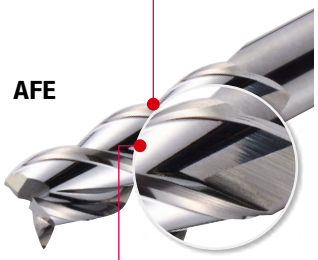
APFE



Sharp cutting edges and double relief angles
- Reduced cutting force
- Prevention of tool breakage due to reinforced cutting edges

U-shaped flutes with mirror-like finishing
- Efficient chip evacuation through wide chip pockets
- BUE is inhibited because of the mirror-like finishing

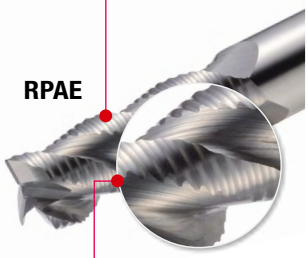
AFE



Sharp cutting edges
- Lower cutting force
- Efficient chip evacuation through chip breaking

Mirror-like flute surface
- Inhibited chip welding
- Reduced cutting force due to less build-up edges

RPAE



Wave formed blade design
- Lower cutting force
- Efficient chip evacuation through chip breaking

Sharp cutting edges
- Lower cutting force
- Reduced cutting load over equipment

Line-up

Designation	Appearance	Product name	Size(Ø)	Page
APFE		2~3 flutes flat Endmill	Ø2.0 ~ 20.0	B220
APMFE		2~3 flutes middle flat Endmill	Ø3.0 ~ 20.0	B221
APLFE		2~3 flutes long flat Endmill	Ø3.0 ~ 20.0	B222
APBE		2 flutes ball Endmill	Ø1.0 ~ 12.0	B223
AFE		3 flutes short flat Endmill	Ø1.0 ~ 20.0	B224
AFE		3 flutes flat Endmill	Ø1.0 ~ 20.0	B225
AFE		3 flutes long flat Endmill	Ø1.0 ~ 20.0	B226
APRE		3 flutes roughing Endmill	Ø4.0 ~ 25.0	B228
RPAE		3 flutes wave roughing Endmill	Ø6.0 ~ 25.0	B229

APFE2000/3000

2~3 flutes flat

2 | 3 | H·A 50° | h6 shank | Grade H05S

DC	Tolerance
Ø1 ~ Ø5	0.000 ~ -0.020
Ø6 ~ Ø8	0.000 ~ -0.025
Ø10 ~ Ø20	0.000 ~ -0.030

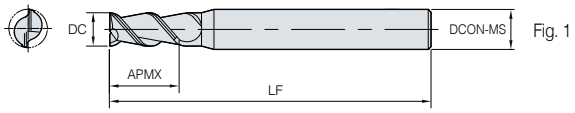


Fig. 1

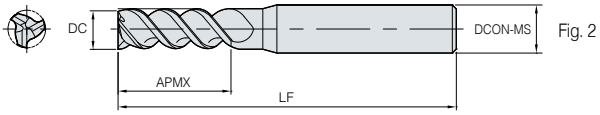


Fig. 2

(mm)

Designation		DC	DCON-MS	APMX	LF	Fig.
APFE	2020-050-S4	2	4	6	50	1
	2025-050	2.5	6	8	50	1
	2030-050	3	6	9	50	1
	2040-050	4	6	12	50	1
	2050-050	5	6	15	50	1
	2060-050	6	6	18	50	1
	2080-060	8	8	20	60	1
	2100-075	10	10	30	75	1
	2120-075	12	12	32	75	1
	2160-100	16	16	45	100	1
	2200-100	20	20	45	100	1
	3020-050-S4	2	4	6	50	2
	3025-050	2.5	6	8	50	2
	3030-050	3	6	9	50	2
	3040-050	4	6	12	50	2
	3050-050	5	6	15	50	2
	3060-050	6	6	18	50	2
	3080-060	8	8	20	60	2
	3100-075	10	10	30	75	2
	3120-075	12	12	32	75	2
	3160-100	16	16	45	100	2
	3200-100	20	20	45	100	2

APMFE2000/3000

2~3 middle flutes flat

2 | 3 | H·A 50° | h6 shank | Grade H05S

DC	Tolerance
Ø1 ~ Ø5	0.000 ~ -0.020
Ø6 ~ Ø8	0.000 ~ -0.025
Ø10 ~ Ø20	0.000 ~ -0.030

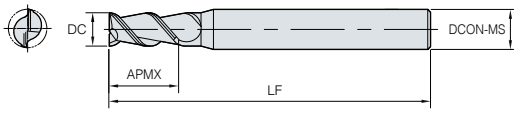


Fig. 1

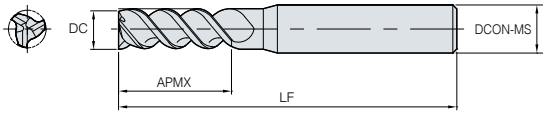


Fig. 2

(mm)

Designation		DC	DCON-MS	APMX	LF	Fig.
APMFE	2030-060	3	6	11	60	1
	2040-060	4	6	14	60	1
	2050-060	5	6	17	60	1
	2060-065	6	6	22	65	1
	2080-065	8	8	25	65	1
	2100-080	10	10	37	80	1
	2120-080	12	12	40	80	1
	2160-110	16	16	55	110	1
	2200-125	20	20	60	125	1
	3030-060	3	6	11	60	2
	3040-060	4	6	14	60	2
	3050-060	5	6	17	60	2
	3060-065	6	6	22	65	2
	3080-065	8	8	25	65	2
	3100-080	10	10	37	80	2
	3120-080	12	12	40	80	2
	3160-110	16	16	55	110	2
	3200-125	20	20	60	125	2

APLFE2000/3000

2~3 flutes long flat

DC	Tolerance
Ø1 ~ Ø5	0.000 ~ -0.020
Ø6 ~ Ø8	0.000 ~ -0.025
Ø10 ~ Ø20	0.000 ~ -0.030

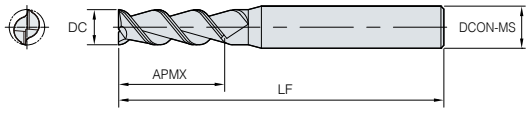


Fig. 1

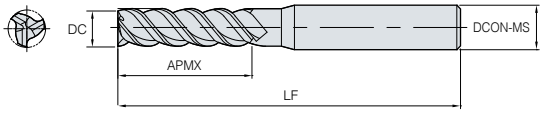


Fig. 2

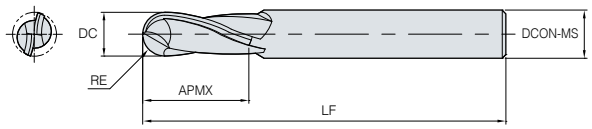
(mm)

Designation		DC	DCON-MS	APMX	LF	Fig.
APLFE	2030-060	3	6	12	60	1
	2040-060	4	6	16	60	1
	2050-060	5	6	20	60	1
	2060-075	6	6	25	75	1
	2080-075	8	8	32	75	1
	2100-100	10	10	45	100	1
	2120-100	12	12	45	100	1
	2160-150	16	16	65	150	1
	2200-150	20	20	75	150	1
	3030-060	3	6	12	60	2
	3040-060	4	6	16	60	2
	3050-060	5	6	20	60	2
	3060-075	6	6	25	75	2
	3080-075	8	8	32	75	2
	3100-100	10	10	45	100	2
	3120-100	12	12	45	100	2
	3160-150	16	16	65	150	2
	3200-150	20	20	75	150	2

APBE2000

2 flutes ball

DC	Tolerance
Ø1 ~ Ø5	0.000 ~ -0.020
Ø6 ~ Ø8	0.000 ~ -0.025
Ø10 ~ Ø20	0.000 ~ -0.030

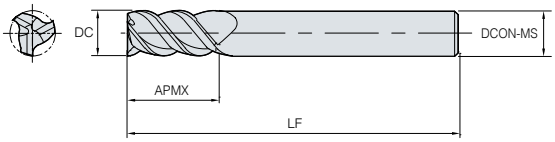


(mm)

Designation		DC	DCON-MS	APMX	LF	RE
APBE	2010-050	1	4	2	50	0.5
	2015-050	1.5	4	3	50	0.75
	2020-050	2	4	4	50	1
	2025-050	2.5	4	5	50	1.25
	2030-050	3	4	6	50	1.5
	2035-050	3.5	4	7	50	1.75
	2040-050	4	4	8	50	2
	2045-050	4.5	6	9	50	2.25
	2050-050	5	6	10	50	2.5
	2055-050	5.5	6	11	50	2.75
	2060-050	6	6	12	50	3
	2080-060	8	8	16	60	4
	2100-075	10	10	20	75	5
	2120-075	12	12	24	75	6

AFE3000

3 flutes short flat



DC	Tolerance
Ø1 ~ Ø12	0.000 ~ -0.020
Ø16 ~ Ø20	0.000 ~ -0.030

(mm)

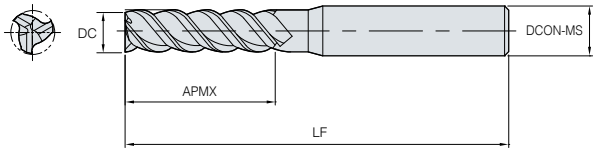
	Designation	DC	DCON-MS	APMX	LF
AFE	3010-040-V2S6	1	6	2	40
	3010-040-V2.5S6	1	6	2.5	40
	3015-040-V3S6	1.5	6	3	40
	3020-040-V3S6	2	6	3	40
	3030-045-V4S6	3	6	4	45
	3030-045-V8S6	3	6	8	45
	3040-045-V5S6	4	6	5	45
	3040-045-V8S6	4	6	8	45
	3040-045-V11S6	4	6	11	45
	3050-045-V6S6	5	6	6	45
	3060-050-V7S6	6	6	7	50
	3060-050-V13S6	6	6	13	50
	3080-060-V9S8	8	8	9	60
	3080-060-V19S8	8	8	19	60
	3100-065-V11S10	10	10	11	65
	3100-065-V22S10	10	10	22	65
	3120-070-V13S12	12	12	13	70
	3120-070-V26S12	12	12	26	70
	3160-090-V18S16	16	16	18	90
	3160-090-V32S16	16	16	32	90
	3200-090-V22S20	20	20	22	90
	3200-090-V38S20	20	20	38	90

AFE3000

3 flutes flat

3 | H·A 45° | h6 shank | Grade H05S

DC	Tolerance
Ø1 ~ Ø12	0.000 ~ -0.020
Ø16 ~ Ø20	0.000 ~ -0.030

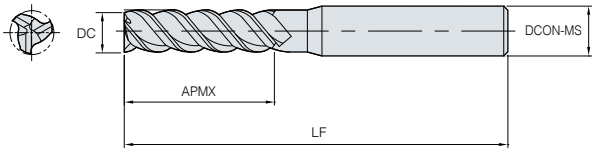


(mm)

	Designation	DC	DCON-MS	APMX	LF
AFE	3010-050-V3S6	1	6	3	50
	3015-050-V5S6	1.5	6	5	50
	3020-050-V6S6	2	6	6	50
	3030-055-V11S6	3	6	11	55
	3040-055-V13S6	4	6	13	55
	3050-055-V17S6	5	6	17	55
	3060-060-V17S6	6	6	17	60
	3080-070-V22S8	8	8	22	70
	3100-075-V27S10	10	10	27	75
	3120-080-V32S12	12	12	32	80
	3160-100-V42S16	16	16	42	100
	3200-100-V48S20	20	20	48	100

AFE3000

3 flutes long flat



DC	Tolerance
Ø1 ~ Ø12	0.000 ~ -0.020
Ø16 ~ Ø20	0.000 ~ -0.030

(mm)

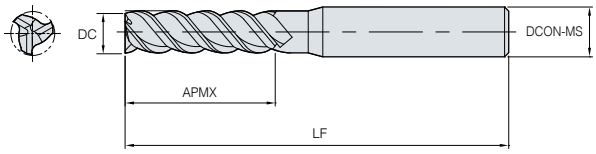
	Designation	DC	DCON-MS	APMX	LF
AFE	3010-060-V4S6	1	6	4	60
	3010-060-V6S6	1	6	6	60
	3015-060-V6S6	1.5	6	6	60
	3015-060-V8S6	1.5	6	8	60
	3015-060-V10S6	1.5	6	10	60
	3020-060-V8S6	2	6	8	60
	3020-060-V10S6	2	6	10	60
	3020-060-V12S6	2	6	12	60
	3030-065-V15S6	3	6	15	65
	3030-070-V20S6	3	6	20	70
	3030-075-V25S6	3	6	25	75
	3030-080-V30S6	3	6	30	80
	3040-065-V16S6	4	6	16	65
	3040-070-V20S6	4	6	20	70
	3040-075-V26S6	4	6	26	75
	3040-080-V30S6	4	6	30	80
	3060-060-V22S6	6	6	22	60
	3060-070-V25S6	6	6	25	70
	3060-075-V30S6	6	6	30	75
	3060-080-V35S6	6	6	35	80
	3060-090-V42S6	6	6	42	90
	3060-100-V50S6	6	6	50	100
	3080-080-V28S8	8	8	28	80
	3080-080-V30S8	8	8	30	80
	3080-085-V35S8	8	8	35	85
	3080-090-V40S8	8	8	40	90
	3080-095-V45S8	8	8	45	95
	3080-100-V50S8	8	8	50	100
	3080-105-V55S8	8	8	55	105
	3080-110-V65S8	8	8	65	110
	3100-090-V32S10	10	10	32	90
	3100-090-V35S10	10	10	35	90
	3100-090-V40S10	10	10	40	90
	3100-100-V45S10	10	10	45	100
	3100-100-V50S10	10	10	50	100

AFE3000

3 flutes long flat

3 | H·A 45° | h6 shank | Grade H05S

DC	Tolerance
Ø1 ~ Ø12	0.000 ~ -0.020
Ø16 ~ Ø20	0.000 ~ -0.030



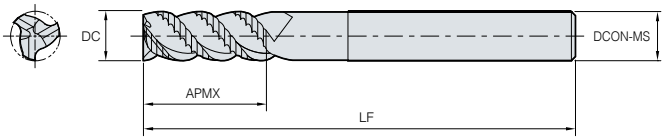
(mm)

	Designation	DC	DCON-MS	APMX	LF
AFE	3100-110-V55S10	10	10	55	110
	3100-110-V60S10	10	10	60	110
	3100-120-V65S10	10	10	65	120
	3120-095-V40S12	12	12	40	95
	3120-100-V45S12	12	12	45	100
	3120-100-V50S12	12	12	50	100
	3120-110-V55S12	12	12	55	110
	3120-110-V60S12	12	12	60	110
	3120-120-V65S12	12	12	65	120
	3120-120-V70S12	12	12	70	120
	3120-135-V75S12	12	12	75	135
	3160-105-V52S16	16	16	52	105
	3160-110-V55S16	16	16	55	110
	3160-130-V65S16	16	16	65	130
	3160-150-V75S16	16	16	75	150
	3160-160-V85S16	16	16	85	160
	3160-180-V95S16	16	16	95	180
	3160-190-V105S16	16	16	105	190
	3160-200-V115S16	16	16	115	200
	3200-110-V55S20	20	20	55	110
	3200-130-V65S20	20	20	65	130
	3200-150-V75S20	20	20	75	150
	3200-160-V85S20	20	20	85	160
	3200-180-V95S20	20	20	95	180
	3200-190-V105S20	20	20	105	190
	3200-200-V115S20	20	20	115	200
	3200-220-V125S20	20	20	125	220

APRE3000

3 flutes roughing

DC	Tolerance
Ø1 ~ Ø8	0.000 ~ -0.070
Ø8.5 ~ Ø25	0.000 ~ -0.010

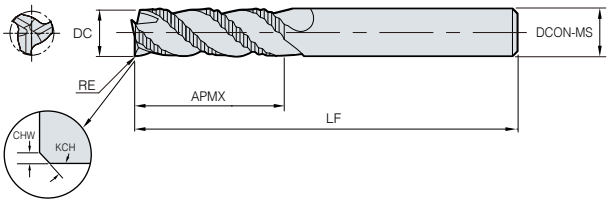


(mm)

	Designation	DC	DCON-MS	APMX	LF
APRE	3040-050	4	6	8	50
	3050-050	5	6	13	50
	3060-050	6	6	15	50
	3065-060	6.5	8	16	60
	3070-060	7	8	16	60
	3075-060	7.5	8	20	60
	3080-060	8	8	20	60
	3085-075	8.5	10	20	75
	3090-075	9	10	20	75
	3095-075	9.5	10	22	75
	3100-075	10	10	25	75
	3110-075	11	12	30	75
	3120-075	12	12	30	75
	3130-075	13	14	30	75
	3140-075	14	16	32	75
	3150-075	15	16	32	75
	3160-100	16	16	35	100
	3170-100	17	20	35	100
	3180-100	18	20	35	100
	3200-100	20	20	45	100
	3250-105	25	25	50	105

RPAE3000

3 flutes wave roughing



DC	Tolerance
Ø6 ~ Ø10	0.000 ~ -0.058
Ø11 ~ Ø18	0.000 ~ -0.070
Ø20 ~ Ø25	0.000 ~ -0.084

(mm)

Designation		DC	DCON-MS	APMX	LF	KCH	CHW
RPAE	3060-063	6	6	18	63	45°	0.3
	3070-063	7	8	23	63	45°	0.3
	3080-063	8	8	23	63	45°	0.3
	3090-080	9	10	30	80	45°	0.3
	3100-080	10	10	30	80	45°	0.3
	3110-080	11	12	32	80	45°	0.5
	3120-080	12	12	32	80	45°	0.5
	3140-080	14	14	32	80	45°	0.5
	3160-105	16	16	48	105	45°	0.5
	3180-105	18	18	48	105	45°	0.5
	3200-105	20	20	50	105	45°	0.5
	3250-105	25	25	50	105	45°	0.5

Diamond coated Endmill

D Endmill

- Tangential cutting-edge geometries for excellent surface finish
- Excellent wear resistance due to high hardness and high purity diamond coating
- Advanced surface finish and cutting performance thanks to sharp edges and tangential tool geometries

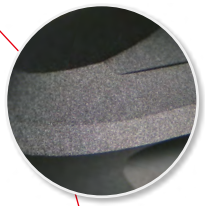
Code system

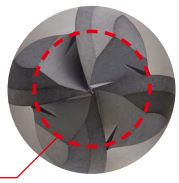
D	FE	2	030	-	080	-	N200	S04
D Endmill	Type	No. of flutes	Cutting diameter		Overall length		Neck length	Shank diameter

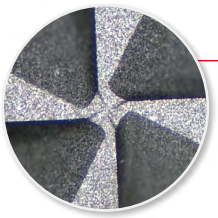
FE: Flat Endmill
RE: Radius Endmill
BE: Ball Endmill

Features

- **Tangential cutting-edge geometries**
  - One-Pass grinding system
  - Prevents stepped cone on the machined surface
  - Applied on 2 flutes and 4 flutes ball types







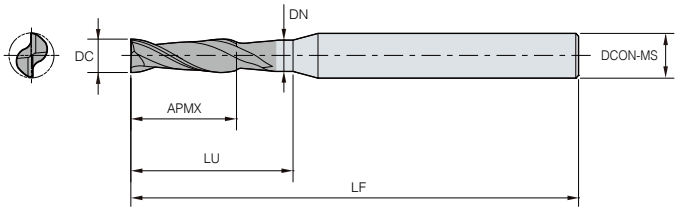
- **Center-matched ball shape (4-flutes)**
  - Ball point shape for high feed machining
  - Improved rigidity and excellent surface finish

DFE2000

Flat

2 | H·A 30° | h6 shank | Grade ND3000

DC	Tolerance
Ø0.2 ~ Ø5	0.000 ~ -0.020
Ø6 ~ Ø12	0.000 ~ -0.030



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	DN
DFE	2002-045-N004S04	0.2	4	0.4	-	45	-
	2003-045-N006S04	0.3	4	0.6	-	45	-
	2004-045-N008S04	0.4	4	0.8	-	45	-
	2005-045-N010S04	0.5	4	1	-	45	-
	2006-045-N012S04	0.6	4	1.2	-	45	-
	2007-045-N015S04	0.7	4	1.5	-	45	-
	2008-045-N020S04	0.8	4	2	-	45	-
	2009-045-N025S04	0.9	4	2.5	-	45	-
	2010-045-N030S04	1	4	3	-	45	0.95
	2010-045-N050S04	1	4	3	5	45	0.95
	2010-060-N050S04	1	4	3	5	60	0.95
	2010-060-N100S04	1	4	3	10	60	0.95
	2010-060-N150S04	1	4	3	15	60	0.95
	2010-060-N200S04	1	4	3	20	60	0.95
	2010-060-N250S04	1	4	3	25	60	0.95
	2015-060-N050S04	1.5	4	4	5	60	1.425
	2015-060-N060S04	1.5	4	4	6	60	1.425
	2015-060-N100S04	1.5	4	4	10	60	1.425
	2015-060-N150S04	1.5	4	4	15	60	1.425
	2015-060-N200S04	1.5	4	4	20	60	1.425
	2015-060-N250S04	1.5	4	4	25	60	1.425
	2020-045-N060S04	2	4	6	-	45	1.9
	2020-045-N080S04	2	4	6	8	45	1.9
	2020-080-N080S04	2	4	6	8	80	1.9
	2020-080-N100S04	2	4	6	10	80	1.9
	2020-080-N120S04	2	4	6	12	80	1.9
	2020-080-N150S04	2	4	6	15	80	1.9
	2020-080-N200S04	2	4	6	20	80	1.9

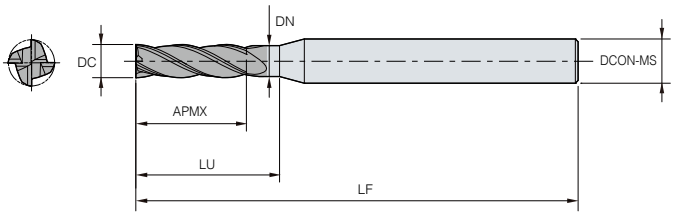
Designation		DC	DCON-MS	APMX	LU	LF	DN
DFE	2020-080-N250S04	2	4	6	25	80	1.9
	2020-080-N300S04	2	4	6	30	80	1.9
	2020-080-N400S04	2	4	6	40	80	1.9
	2030-050-N100S06	3	6	9	10	50	2.85
	2030-080-N100S04	3	4	9	10	80	2.85
	2030-080-N120S04	3	4	9	12	80	2.85
	2030-080-N200S04	3	4	9	20	80	2.85
	2030-080-N250S04	3	4	9	25	80	2.85
	2030-080-N300S04	3	4	9	30	80	2.85
	2030-080-N400S04	3	4	9	40	80	2.85
	2040-050-N120S06	4	6	12	-	50	2.85
	2040-050-N160S06	4	6	12	16	50	3.8
	2040-080-N160S04	4	4	12	16	80	3.8
	2050-060-N150S06	5	6	15	-	60	4.75
	2050-060-N200S06	5	6	15	20	60	4.75
	2050-110-N200S06	5	6	15	20	110	4.75
	2060-060-N180S06	6	6	18	-	60	6
	2060-110-N250S06	6	6	18	25	110	5.7
	2060-150-N250S06	6	6	18	25	150	5.7
	2080-070-N250S08	8	8	25	-	70	8
	2080-150-N400S08	8	8	25	40	150	7.6
	2100-080-N300S10	10	10	30	-	80	10
	2100-150-N500S10	10	10	30	50	150	9.5
	2100-160-N500S10	10	10	30	50	160	9.5
	2120-080-N250S12	12	12	25	-	80	12
	2120-080-N350S12	12	12	35	-	80	12
	2120-150-N600S12	12	12	35	60	150	11.4
	2120-160-N600S12	12	12	35	60	160	11.4

DFE4000

Flat

4 | H·A 30° | h6 shank | Grade ND3000

DC	Tolerance
Ø2 ~ Ø4	0.000 ~ -0.020
Ø6 ~ Ø12	0.000 ~ -0.030

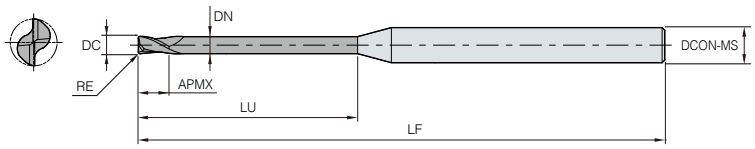


(mm)

	Designation	DC	DCON-MS	APMX	LU	LF	DN
DFE	4020-045-N060S04	2	4	6	8	45	1.9
	4020-060-N100S04	2	4	10	12	60	1.9
	4030-050-N100S06	3	6	10	12	50	2.85
	4030-060-N150S03	3	3	15	-	60	2.85
	4030-060-N150S04	3	4	15	18	60	2.85
	4040-050-N120S06	4	6	12	-	50	2.85
	4040-050-N150S06	4	6	15	18	50	3.8
	4040-080-N200S04	4	4	20	-	80	4
	4060-060-N180S06	6	6	18	-	60	6
	4060-110-N300S06	6	6	30	-	110	6
	4060-150-N300S06	6	6	30	-	150	6
	4080-070-N250S08	8	8	25	-	70	8
	4080-110-N400S08	8	8	40	-	110	8
	4080-150-N400S08	8	8	40	-	150	8
	4100-080-N250S10	10	10	25	-	80	10
	4100-110-N400S10	10	10	40	-	110	10
	4100-150-N500S10	10	10	50	-	150	10
	4120-080-N300S12	12	12	30	-	80	12
	4120-110-N400S12	12	12	40	-	110	12
	4120-110-N450S12	12	12	45	-	110	12
	4120-150-N500S12	12	12	50	-	150	12
	4120-150-N550S12	12	12	55	-	150	12

DRE2000

Radius



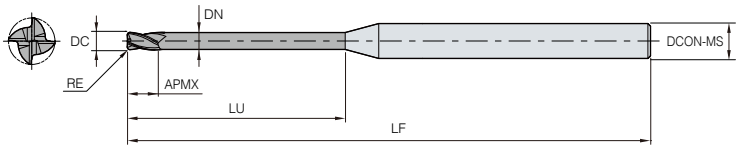
DC	Tolerance
ALL	0.000 ~ -0.020

(mm)

	Designation	DC	DCON-MS	APMX	LU	LF	RE	DN
DRE	2005-060-N050S04-R005	0.5	4	1	5	60	0.05	-
	2005-060-N080S04-R005	0.5	4	1	8	60	0.05	-
	2005-060-N100S04-R005	0.5	4	1	10	60	0.05	-
	2006-060-N060S04-R005	0.6	4	1.2	6	60	0.05	-
	2006-060-N090S04-R005	0.6	4	1.2	9	60	0.05	-
	2006-060-N120S04-R005	0.6	4	1.2	12	60	0.05	-
	2008-060-N040S04-R005	0.8	4	1.6	4	60	0.05	-
	2008-060-N080S04-R005	0.8	4	1.6	8	60	0.05	-
	2008-060-N100S04-R005	0.8	4	1.6	10	60	0.05	-
	2010-060-N050S04-R005	1	4	2	5	60	0.05	-
	2010-060-N100S04-R005	1	4	2	10	60	0.05	-
	2010-060-N100S04-R02	1	4	2	10	60	0.2	-
	2010-060-N150S04-R02	1	4	2	15	60	0.2	-
	2010-060-N200S04-R005	1	4	2	20	60	0.05	-
	2010-060-N200S04-R02	1	4	2	20	60	0.2	-
	2015-060-N050S04-R005	1.5	4	3	5	60	0.05	-
	2015-060-N100S04-R005	1.5	4	3	10	60	0.05	-
	2015-060-N150S04-R005	1.5	4	3	15	60	0.05	-
	2015-060-N150S04-R02	1.5	4	3	15	60	0.2	-
	2015-060-N200S04-R005	1.5	4	3	20	60	0.05	-
	2015-060-N200S04-R02	1.5	4	3	20	60	0.2	-
	2020-060-N120S04-R02	2	4	3.5	12	60	0.2	-
	2020-060-N120S04-R03	2	4	3.5	12	60	0.3	-
	2020-060-N180S04-R03	2	4	3.5	18	60	0.3	-
	2020-060-N250S04-R02	2	4	3.5	25	60	0.2	-
	2020-060-N250S04-R03	2	4	3.5	25	60	0.3	-
	2020-060-N300S04-R02	2	4	3.5	30	60	0.2	-
	2020-060-N300S04-R03	2	4	3.5	30	60	0.3	-
	2030-080-N100S04-R02	3	4	4	10	80	0.2	-
	2030-080-N200S04-R02	3	4	4	20	80	0.2	-
	2030-080-N200S04-R03	3	4	4	20	80	0.3	-
	2030-080-N300S04-R02	3	4	4	30	80	0.2	-
	2030-080-N400S04-R02	3	4	4	40	80	0.2	-
	2030-080-N400S04-R03	3	4	4	40	80	0.3	-

DRE4000

Radius



4	H·A 30°	h6 shank	Grade ND3000

DC	Tolerance
Ø0.2 ~ Ø4	0.000 ~ -0.020
Ø6 ~ Ø12	0.000 ~ -0.030

(mm)

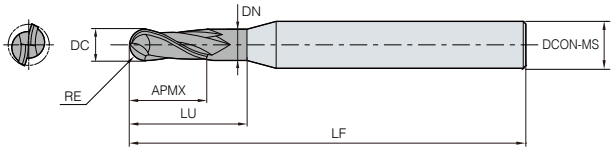
	Designation	DC	DCON-MS	APMX	LU	LF	RE	DN
DRE	4020-060-N120S04-R03	2	4	3.5	12	60	0.3	-
	4020-060-N180S04-R02	2	4	3.5	18	60	0.2	-
	4020-060-N180S04-R03	2	4	3.5	18	60	0.3	-
	4020-060-N250S04-R02	2	4	3.5	25	60	0.2	-
	4020-060-N250S04-R03	2	4	3.5	25	60	0.3	-
	4020-060-N300S04-R02	2	4	3.5	30	60	0.2	-
	4020-060-N300S04-R03	2	4	3.5	30	60	0.3	-
	4030-080-N100S04-R05	3	4	4	10	80	0.5	-
	4030-080-N200S04-R03	3	4	4	20	80	0.3	-
	4030-080-N200S04-R05	3	4	4	20	80	0.5	-
	4030-080-N300S04-R03	3	4	4	30	80	0.3	-
	4030-080-N300S04-R05	3	4	4	30	80	0.5	-
	4030-080-N400S04-R03	3	4	4	40	80	0.3	-
	4030-080-N400S04-R05	3	4	4	40	80	0.5	-
	4040-100-N200S04-R03	4	4	6	20	100	0.3	-
	4060-110-N250S06-R03	6	6	9	25	110	0.3	-
	4060-110-N250S06-R05	6	6	9	25	110	0.5	-
	4060-150-N300S06-R05	6	6	9	30	150	0.5	-
	4080-110-N300S08-R03	8	8	12	30	110	0.3	-
	4080-110-N300S08-R05	8	8	12	30	110	0.5	-
	4080-150-N400S08-R05	8	8	12	40	150	0.5	-
	4100-110-N350S10-R05	10	10	15	35	110	0.5	-
	4100-160-N450S10-R05	10	10	15	45	160	0.5	-
	4120-110-N400S12-R05	12	12	18	40	110	0.5	-
	4120-160-N450S12-R05	12	12	18	45	160	0.5	-

DBE2000

Ball

2 | H·A 30° | h6 shank | Grade ND3000

DC	Tolerance
Ø0.3 ~ Ø5	0.000 ~ -0.020
Ø6 ~ Ø12	0.000 ~ -0.030



(mm)

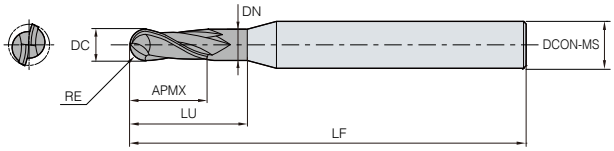
	Designation	DC	DCON-MS	APMX	LU	LF	RE	DN
DBE	2003-045-N012S04	0.3	4	1.2	-	45	0.15	-
	2003-045-N020S04	0.3	4	1.2	2	45	0.15	-
	2004-045-N015S04	0.4	4	1.5	-	45	0.2	-
	2004-045-N020S04	0.4	4	1.5	2	45	0.2	-
	2004-045-N030S04	0.4	4	1.5	3	45	0.2	-
	2004-045-N040S04	0.4	4	1.5	4	45	0.2	-
	2004-045-N050S04	0.4	4	1.5	5	45	0.2	-
	2005-045-N020S04	0.5	4	2	-	45	0.25	-
	2005-045-N030S04	0.5	4	2	3	45	0.25	-
	2005-045-N040S04	0.5	4	2	4	45	0.25	-
	2005-045-N050S04	0.5	4	2	5	45	0.25	-
	2005-045-N060S04	0.5	4	2	6	45	0.25	-
	2006-045-N020S04	0.6	4	2	2	45	0.3	0.6
	2006-045-N030S04	0.6	4	2	3	45	0.3	0.6
	2006-045-N040S04	0.6	4	2	4	45	0.3	0.57
	2006-045-N050S04	0.6	4	2	5	45	0.3	0.57
	2006-045-N060S04	0.6	4	2	6	45	0.3	0.57
	2006-045-N080S04	0.6	4	2	8	45	0.3	0.57
	2006-045-N100S04	0.6	4	2	10	45	0.3	0.57
	2008-045-N030S04	0.8	4	2.5	3	45	0.4	0.76
	2008-045-N040S04	0.8	4	2.5	4	45	0.4	0.76
	2008-045-N050S04	0.8	4	2.5	5	45	0.4	0.76
	2008-045-N060S04	0.8	4	2.5	6	45	0.4	0.76
	2008-045-N080S04	0.8	4	2.5	8	45	0.4	0.76
	2008-045-N100S04	0.8	4	2.5	10	45	0.4	0.76
	2010-060-N030S04	1	4	3	3	60	0.5	0.95
	2010-060-N040S04	1	4	3	4	60	0.5	0.95
	2010-060-N050S04	1	4	3	5	60	0.5	0.95
	2010-060-N060S04	1	4	3	6	60	0.5	0.95
	2010-060-N080S04	1	4	3	8	60	0.5	0.95
	2010-060-N100S04	1	4	3	10	60	0.5	0.95
	2010-060-N120S04	1	4	3	12	60	0.5	0.95
	2010-060-N150S04	1	4	3	15	60	0.5	0.95
	2010-060-N200S04	1	4	3	20	60	0.5	0.95
	2010-080-N250S04	1	4	3	25	80	0.5	0.95
	2010-080-N300S04	1	4	3	30	80	0.5	0.95

DBE2000

Ball

2 | H·A 30° | h6 shank | Grade ND3000

DC	Tolerance
Ø0.3 ~ Ø5	0.000 ~ -0.020
Ø6 ~ Ø12	0.000 ~ -0.030



(mm)

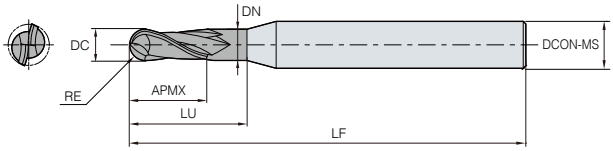
	Designation	DC	DCON-MS	APMX	LU	LF	RE	DN
DBE	2010-080-N350S04	1	4	3	35	80	0.5	0.95
	2010-080-N400S04	1	4	3	40	80	0.5	0.95
	2015-060-N050S04	1.5	4	4	5	60	0.75	1.425
	2015-060-N080S04	1.5	4	4	8	60	0.75	1.425
	2015-080-N100S04	1.5	4	4	10	80	0.75	1.425
	2015-080-N120S04	1.5	4	4	12	80	0.75	1.425
	2015-080-N150S04	1.5	4	4	15	80	0.75	1.425
	2015-080-N180S04	1.5	4	4	18	80	0.75	1.425
	2015-080-N200S04	1.5	4	4	20	80	0.75	1.425
	2015-080-N250S04	1.5	4	4	25	80	0.75	1.425
	2015-080-N300S04	1.5	4	4	30	80	0.75	1.425
	2015-080-N350S04	1.5	4	4	35	80	0.75	1.425
	2015-080-N400S04	1.5	4	4	40	80	0.75	1.425
	2020-060-N060S04	2	4	6	-	60	1	1.9
	2020-060-N080S04	2	4	6	8	60	1	1.9
	2020-080-N100S04	2	4	6	10	80	1	1.9
	2020-080-N150S04	2	4	6	15	80	1	1.9
	2020-080-N200S04	2	4	6	20	80	1	1.9
	2020-080-N250S04	2	4	6	25	80	1	1.9
	2020-080-N300S04	2	4	6	30	80	1	1.9
	2020-080-N350S04	2	4	6	35	80	1	1.9
	2020-100-N400S04	2	4	6	40	100	1	1.9
	2020-100-N450S04	2	4	6	45	100	1	1.9
	2020-100-N500S04	2	4	6	50	100	1	1.9
	2020-100-N600S04	2	4	6	60	100	1	2.85
	2030-060-N100S04	3	4	9	10	60	1.5	2.85
	2030-100-N150S04	3	4	9	15	100	1.5	2.85
	2030-100-N150S06	3	6	9	15	100	1.5	2.85
	2030-100-N200S04	3	4	9	20	100	1.5	2.85
	2030-100-N250S04	3	4	9	25	100	1.5	2.85
	2030-100-N300S04	3	4	9	30	100	1.5	2.85
	2030-100-N350S04	3	4	9	35	100	1.5	2.85
	2030-100-N400S04	3	4	9	40	100	1.5	2.85
	2030-100-N500S04	3	4	9	50	100	1.5	2.85
	2030-100-N600S04	3	4	9	60	100	1.5	2.85
	2040-060-N160S04	4	4	12	16	60	2	3.8

DBE2000

Ball

2 | H·A 30° | h6 shank | Grade ND3000

DC	Tolerance
Ø0.3 ~ Ø5	0.000 ~ -0.020
Ø6 ~ Ø12	0.000 ~ -0.030



(mm)

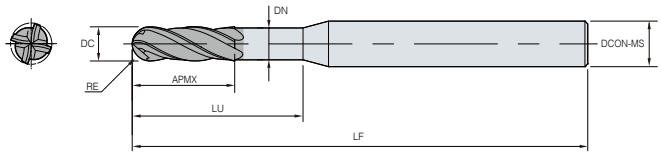
	Designation	DC	DCON-MS	APMX	LU	LF	RE	DN
DBE	2040-080-N160S04	4	4	12	16	80	2	3.8
	2040-080-N300S04	4	4	12	30	80	2	3.8
	2040-100-N160S04	4	4	12	16	100	2	3.8
	2040-100-N400S04	4	4	12	40	100	2	3.8
	2040-130-N160S04	4	4	12	16	130	2	3.8
	2040-130-N400S04	4	4	12	40	130	2	3.8
	2040-150-N160S04	4	4	12	16	150	2	3.8
	2040-150-N500S04	4	4	12	50	150	2	3.8
	2050-110-N200S06	5	6	15	20	110	2.5	4.75
	2060-080-N250S06	6	6	20	25	80	3	5.7
	2060-110-N250S06	6	6	20	25	110	3	5.7
	2060-110-N400S06	6	6	20	40	110	3	5.7
	2060-150-N300S06	6	6	20	30	150	3	5.7
	2060-150-N500S06	6	6	20	50	150	3	5.7
	2080-080-N300S08	8	8	25	30	80	4	7.6
	2080-110-N300S08	8	8	25	30	110	4	7.6
	2080-110-N400S08	8	8	25	40	110	4	7.6
	2080-150-N500S08	8	8	25	50	150	4	7.6
	2080-200-N400S08	8	8	25	40	200	4	7.6
	2100-080-N400S10	10	10	30	40	80	5	9.5
	2100-110-N400S10	10	10	30	40	110	5	9.5
	2100-110-N500S10	10	10	30	50	110	5	9.5
	2100-150-N600S10	10	10	30	60	150	5	9.5
	2100-160-N600S10	10	10	30	60	160	5	9.5
	2100-200-N500S10	10	10	30	50	200	5	9.5
	2120-110-N500S12	12	12	35	50	110	6	11.4
	2120-150-N500S12	12	12	35	50	150	6	11.4
	2120-160-N500S12	12	12	35	50	160	6	11.4
	2120-200-N600S12	12	12	35	60	200	6	11.4

DBE4000

Ball

4 | H·A 30° | h6 shank | Grade ND3000

DC	Tolerance
Ø1 ~ Ø4	0.000 ~ -0.020
Ø6 ~ Ø12	0.000 ~ -0.030



(mm)

	Designation	DC	DCON-MS	APMX	LU	LF	RE	DN
DBE	4010-060-N030S04	1	4	3	-	60	0.5	-
	4010-060-N050S04	1	4	3	5	60	0.5	-
	4010-060-N100S04	1	4	3	10	60	0.5	-
	4010-060-N150S04	1	4	3	15	60	0.5	-
	4010-060-N200S04	1	4	3	20	60	0.5	-
	4010-060-N250S04	1	4	3	25	60	0.5	-
	4015-045-N040S04	1.5	4	4	-	45	0.75	-
	4015-050-N040S04	1.5	4	4	-	50	0.75	-
	4015-060-N100S04	1.5	4	4	10	60	0.75	-
	4015-060-N150S04	1.5	4	4	15	60	0.75	-
	4015-060-N200S04	1.5	4	4	20	60	0.75	-
	4015-060-N250S04	1.5	4	4	25	60	0.75	-
	4020-060-N080S04	2	4	6	8	60	1	1.9
	4020-080-N100S04	2	4	6	10	80	1	1.9
	4020-080-N200S04	2	4	6	20	80	1	1.9
	4020-080-N300S04	2	4	6	30	80	1	1.9
	4020-080-N400S04	2	4	6	40	80	1	1.9
	4030-060-N100S04	3	4	9	10	60	1.5	2.85
	4030-100-N150S04	3	4	9	15	100	1.5	2.85
	4030-100-N200S04	3	4	9	20	100	1.5	2.85
	4030-100-N300S04	3	4	9	30	100	1.5	2.85
	4030-100-N400S04	3	4	9	40	100	1.5	2.85
	4030-100-N500S04	3	4	9	50	100	1.5	2.85
	4040-060-N160S04	4	4	12	16	60	2	-
	4040-080-N160S04	4	4	12	16	80	2	-
	4040-100-N160S04	4	4	12	16	100	2	-
	4040-130-N160S04	4	4	12	16	130	2	-
	4060-080-N250S06	6	6	20	25	80	3	-
	4060-110-N250S06	6	6	20	25	110	3	-
	4060-150-N300S06	6	6	20	30	150	3	-
	4080-080-N300S08	8	8	25	30	80	4	-
	4080-110-N300S08	8	8	25	30	110	4	-
	4080-150-N350S08	8	8	25	35	150	4	-
	4080-200-N400S08	8	8	25	40	200	4	-
	4100-080-N350S10	10	10	30	35	80	5	-
	4100-110-N350S10	10	10	30	35	110	5	-
	4100-150-N400S10	10	10	30	40	150	5	-
	4100-160-N400S10	10	10	30	40	160	5	-
	4100-200-N500S10	10	10	30	50	200	5	-
	4120-110-N500S12	12	12	35	50	110	6	-
	4120-150-N500S12	12	12	35	50	150	6	-
	4120-200-N600S12	12	12	35	60	200	6	-

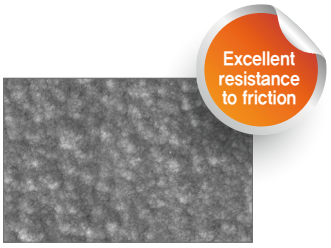
Router Endmill for machining composite materials

Composite Router Endmill

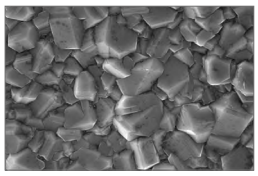
- Router Endmills optimized for machining composite materials (CFRP/GFRP)
- Excellent tool life thanks to nano-crystal diamond coating
- Blade design for reducing flaking and burrs
- Improved productivity through high efficiency machining

Features

- Diamond-coated grade ND2100 for machining composite materials
- High hardness diamond coating (over Hv 8,000)
- Nano-diamond coating with excellent resistance to friction and welding
- Improved resistance to flaking thanks by applying



Nano-diamond coating


Existing diamond coating

CCDR (Dual Helix Router Endmill)

- Dual helix design to inhibit flaking on upper and lower faces of workpieces
- Endmill for finishing, profiling, and grooving

CCHR (High-performance Router Endmill)

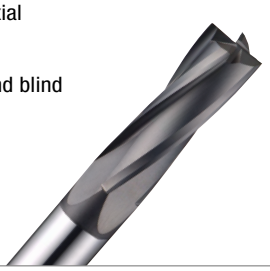
- Multi flute neck shaped for high efficient machining
- Endmill for shape contouring, grooving, roughing

CCR (Router Endmill)

- Down cut design for low vibrations and cutting force
- Endmill for roughing, profiling, and grooving

CCLR (Low Helix Router Endmill)

- Fewer burrs thanks to the low axial cutting force
- Endmill for finishing, profiling, and blind groove making



CCRR (Reverse Helix Router Endmill)

- Reverse helix design to inhibit a drift in the workpiece's course
- Endmill for finishing, profiling, and through groove making

CCDR4000/6000

Flat

4 | 6 | H·A 30°/-30° | h5 shank | Grade ND2100

DC	Tolerance
Ø6 ~ Ø12	0.000 ~ -0.030

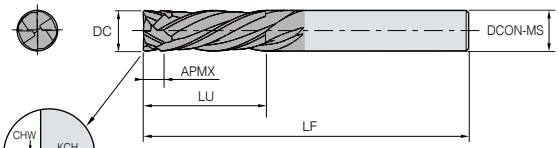


Fig. 1

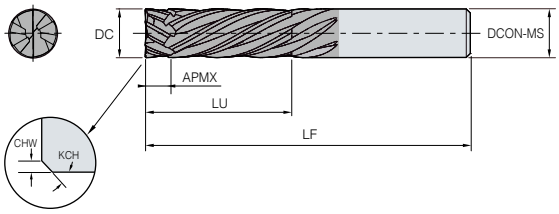


Fig. 2

(mm)

	Designation	DC	DCON-MS	APMX	LU	LF	KCH	CHW	Fig.
CCDR	4060-065	6	6	3	18	65	45°	0.1	1
	4080-075	8	8	4	24	75	45°	0.2	1
	6100-085	10	10	5	30	85	45°	0.2	2
	6120-100	12	12	6	36	100	45°	0.2	2

CCHR4000/6000

Flat

4 | 6 | H·A 15° | h5 shank | Grade ND2100

DC	Tolerance
Ø6 ~ Ø12	0.000 ~ -0.050

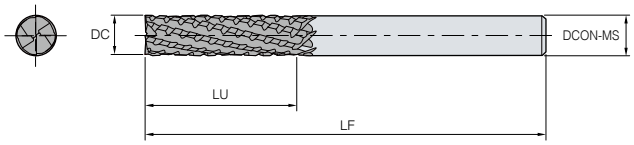


Fig. 1

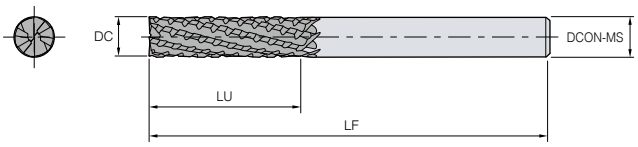


Fig. 2

(mm)

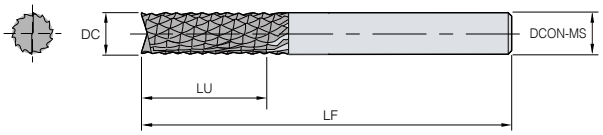
	Designation	DC	DCON-MS	APMX	LF	Fig.
CCHR	4060-065	6	6	18	65	1
	4080-075	8	8	24	75	1
	6100-085	10	10	30	85	2
	6120-100	12	12	36	100	2

CCR2000

Flat

2	H·A -27°	h5 shank	Grade ND2100

DC	Tolerance
Ø4 ~ Ø12	-0.020 ~ -0.080



(mm)

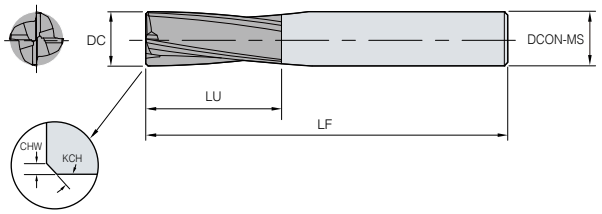
	Designation	DC	DCON-MS	APMX	LF
CCR	2040-050	4	4	12	50
	2050-050	5	5	15	50
	2060-065	6	6	18	65
	2080-075	8	8	24	75
	2100-085	10	10	30	85
	2120-100	12	12	36	100

CCLR4000

Flat

4	H·A 15°	h5 shank	Grade ND2100

DC	Tolerance
Ø4 ~ Ø12	0.000 ~ -0.030



(mm)

	Designation	DC	DCON-MS	APMX	LF	KCH	CHW
CCLR	4040-050	4	4	12	50	45°	0.1
	4050-050	5	5	15	50	45°	0.1
	4060-065	6	6	18	65	45°	0.1
	4080-075	8	8	24	75	45°	0.2
	4100-085	10	10	30	85	45°	0.2
	4120-100	12	12	36	100	45°	0.2

CCRR6000/8000

Flat

6 | 8 | H·A -25° | h5 shank | Grade ND2100

DC	Tolerance
Ø6 ~ Ø12	0.000 ~ -0.030

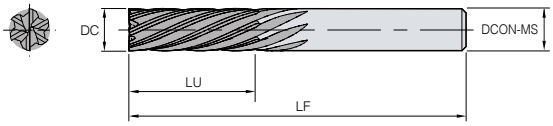


Fig. 1

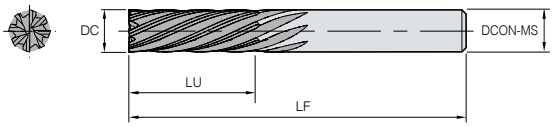


Fig. 2

(mm)

	Designation	DC	DCON-MS	APMX	LF	Fig.
CCRR	6060-065	6	6	18	65	1
	6080-075	8	8	24	75	1
	8100-085	10	10	30	85	2
	8120-100	12	12	36	100	2

Endmill for machining dental prostheses

T Endmill

- For machining dental prostheses made of zirconia, titanium, Co-Cr, wax, PMMA, etc
- Optimized cutting performance by matching a proper grade with each type of materials
- Inhibited unevenness and excellent finish in machined surfaces due to the optimized cutting-edge design
- Specialized tool shape for each machine type

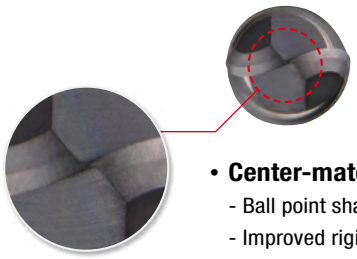
Code system

T Z BE 2 030 - 050 - N100 S04 (Z-MATCH)

T Endmill	**Workpiece** Z : Zirconia T : Ti/Co-Cr W : Wax/PMMA	**Type** BE : Ball Endmill FE : Flat Endmill RE : Radius Endmill	**No. of flutes** 2 : 2 flute	**Cutting dia.** 030 : 3mm	**Overall length** 050 : 50mm	**Neck length** N100 : 10mm	**Shank dia.** S04 : 4mm	**Machine Maker**

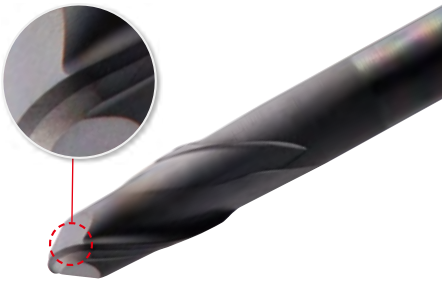
Features

- **A dedicated tool for each machine** - Meets marketplace demands
- **A specialized grade for each workpiece** - Provides optimized performance for various materials of implants
- **Optimized cutting-edge design** - Enables excellent machinability



- **Center-matched ball shape (4-flutes)**
  - Ball point shape for high feed machining
  - Improved rigidity and excellent surface finish

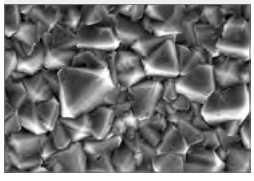
- **Tangential cutting-edge geometries**
  - One-Pass grinding system
  - Prevents stepped cone on the machined surface
  - 2-flutes and 4-flutes tooling with a ball nose



Grade solution for zirconia

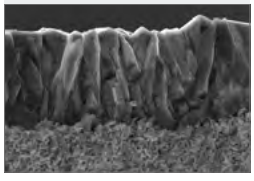
- **Development of ND3000 (Diamond-coated grade)**
  - High hardness diamond coating that is excellent in machining graphite and ceramic
  - Optimized for high speed and medium duty cutting thanks to its excellent grip to coated layers

Surface of ND3000



High hardness diamond coating (Hv 10,000) provides excellent wear resistance

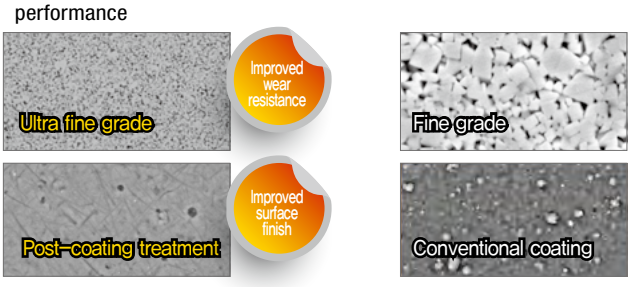
Cross section of coated layers



Specialized grade for Zirconia provides excellent adhesion

Grade solution for titanium

- **Development of PC2510 (Coated grade for high hardened steel)**
  - Post-coating treatment was applied to improve surface finish
  - A grade optimized for interrupted machining of high hardness steels and wet treatment accompanying high thermal shock.
    Its ultrafine substrate features high toughness which allows stable performance

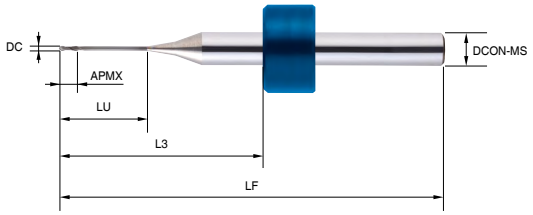


Special T Endmill order form

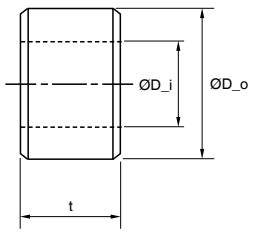
• Stop rings and other tool resources can be made to order

[Data Sheet]

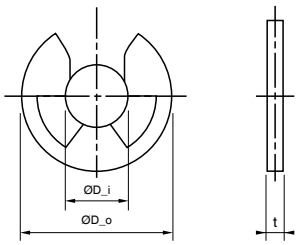
Type of machine	
Workpiece	
Dental material	
Cutting diameter (DC)	
Shank diameter (DCON-MS)	
Cutting length (APMX)	
Neck length (LU)	
Stop ring position (L3)	
Overall length (LF)	
Stop ring shape	



[Stop ring specification]



< Plastic ring >



< E type ring >

(mm)

Type	Stop ring			Shank diameter		
	ØD_o	ØD_i	t	Ø3	Ø4	~ Ø6
Plastic ring	Ø7.55	Ø3	4.45	●		
	Ø7.7	Ø4	5.0		●	
	Ø10.5	~ Ø6	6.5			●
E type ring	~ Ø6.0	Ø2.5	0.4	●		

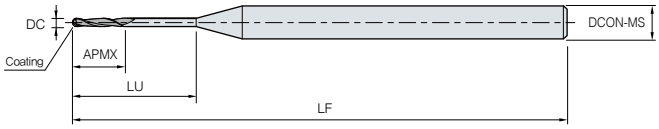
※ Stop ring can be made to order when specified sizes are send to an adjacent KORLOY sales office

ROLAND Type

(DWX-30, DWX-50, DWX-51D, DWX-52D)

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 (PVD) | Grade ND3000 (DIA)

DC	Tolerance
Ø0.3 ~ Ø1	0.000 ~ -0.015
Ø2	0.000 ~ -0.020



(mm)

	Designation	Coating	DC	DCON-MS	APMX	LU	LF	RE
TZBE	2003-050-N015S04(ROLAND)	-	0.3	4	1.5	20	50	DC/2
	2006-050-N12(ROLAND)	PVD	0.6	4	1.5	12	50	DC/2
	2010-050-N16(ROLAND)	DIA	1	4	2	16	50	DC/2
	2020-050-N20(ROLAND)	DIA	2	4	3	20	50	DC/2
TWBE	2010-050-N16(ROLAND)	-	1	4	2.2	16	50	DC/2
	2020-050-N20(ROLAND)	-	2	4	3.2	20	50	DC/2
ETRE	006050-S4M325-R	E.D DIA	0.6	4	10	10	50	DC/2
	010050-S4M170-R	E.D DIA	1	4	12	12	50	DC/2
	020050-S4M120-R	E.D DIA	2	4	17	17	50	DC/2

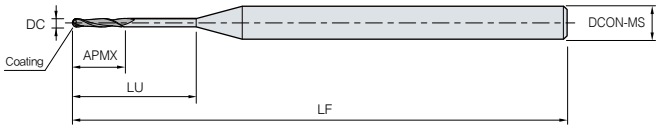
※ E.D DIA: Electro deposition DIA

IMES-ICORE Type

(250i, 340i, 450i)

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 (PVD) | Grade ND3000 (DIA)

DC	Tolerance
Ø0.3 ~ Ø1	0.000 ~ -0.015
Ø2 ~ Ø13	0.000 ~ -0.020



(mm)

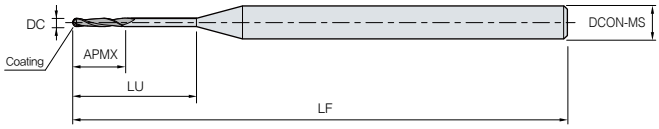
	Designation	Coating	DC	DCON-MS	APMX	LU	LF	RE
TZBE	2003-048-N015S03(450I)	PVD	0.3	3	1.8	3	48	DC/2
	2006-048-N080S03(450I)	PVD	0.6	3	1.5	8	48	DC/2
	2010-048-N14(450I)	DIA	1	3	4.5	14	48	DC/2
	2025-048-N20(450I)	DIA	2.5	3	6	20	48	DC/2
	2006-053-N090S06(450IS6)	PVD	0.6	6	3	9	53	DC/2
	2010-053-N142S06(450IS6)	DIA	1	6	4.5	14.2	53	DC/2
	2025-053-N201S06(450IS6)	DIA	2.5	6	7.5	20.1	53	DC/2
TWBE	2010-048-N140S03(250I340I450I)	-	1	3	4.5	14	48	DC/2
	2025-048-N200S03(250I340I450I)	-	2.5	3	6	20	48	DC/2
TTBE	2010-040-N090S03(450i)	PVD	1	3	2	9	40	DC/2
	2020-040-N120S03(450i)	PVD	2	3	4	12	40	DC/2
	2030-0385-N120S03(450i)	PVD	3	3	4	12	38.5	DC/2
ETND	006039-S3M325-T5(450i)	E.D DIA	10.3	3	10.3	10.3	39.8	DC/2
ETRE	010039-S3M230(450i)	E.D DIA	10.2	3	10.2	10.2	39.8	DC/2
	025039-S3M120(450i)	E.D DIA	13	3	13	13	39.8	DC/2

※ E.D DIA: Electro deposition DIA

WIELAND SELECT Type

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 (PVD) | Grade ND3000 (DIA)

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020



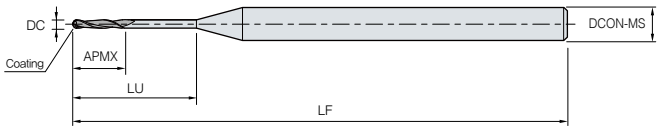
(mm)

	Designation	Coating	DC	DCON-MS	APMX	LU	LF	RE
TZBE	2007-040-N145S03(WIELAND)	PVD	0.7	3	2.5	14.5	40	DC/2
	2010-040-N145S03(WIELAND)	DIA	1	3	4.5	14.5	40	DC/2
	2025-040-N200S03(WIELAND)	DIA	2.5	3	7.5	20	40	DC/2
TWBE	2010-040-N145S03(WIELAND)	-	1	3	4.5	14.5	40	DC/2
	2025-040-N200S03(WIELAND)	-	2.5	3	7.5	20	40	DC/2

WIELAND MINI Type

2 | H·A 30° | h5 shank

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020



(mm)

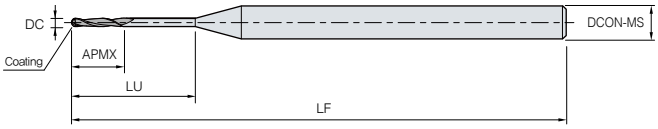
	Designation	Coating	DC	DCON-MS	APMX	LU	LF	RE
TZBE	2010-035-N140S03(WIELAND MINI)	-	1	3	4.5	14	35	DC/2
	2025-035-N200S03(WIELAND MINI)	-	2.5	3	6	20	35	DC/2

AMANN GIRRBACH Type

(CERA-MILL)

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 PVD | Grade ND3000 DIA

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020



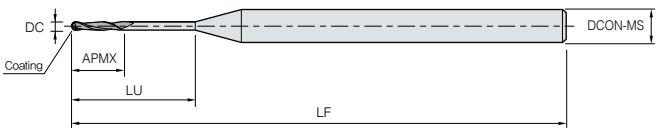
(mm)

Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
TZBE	2006-047-N135S03(CERAMILL)	PVD	0.6	3	2.4	13.5	47	DC/2
	2010-047-N165S03(CERAMILL)	DIA	1	3	2	16.5	47	DC/2
	2025-047-N180S03(CERAMILL)	DIA	2.5	3	4	18	47	DC/2
TWBE	2010-047-N165S03(CERAMILL)	-	1	3	2	16.5	47	DC/2
	2025-047-N180S03(CERAMILL)	-	2.5	3	4	18	47	DC/2

VHF-S1 Type

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 PVD | Grade ND3000 DIA

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020



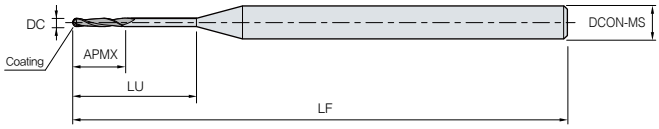
(mm)

Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
TZBE	2006-035-N030S03(VHF S1)	PVD	0.6	3	1.5	3	35	DC/2
	2010-040-N145S03(VHF S1)	DIA	1	3	5	14.5	40	DC/2
	2020-040-N160S03(VHF S1)	DIA	2	3	4	16	40	DC/2
TWBE	2010-040-N145S03(VHF S1)	-	1	3	5	14.5	40	DC/2
	2020-040-N160S03(VHF S1)	-	2	3	4	16	40	DC/2

VHF-K4/CM Type

2 | H·A 30° | h5 shank

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020



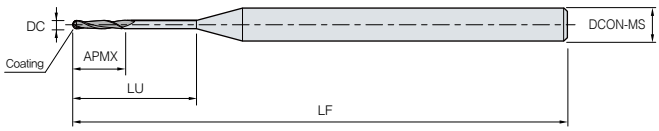
(mm)

Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
TWBE	2006-035-N030S03(VHF K4)	-	0.6	3	1	3	35	DC/2
	2010-035-N160S03(VHF K4)	-	1	3	2	16	35	DC/2
	3020-035-N160S03(VHF K4)	-	2	3	4	16	35	DC/2

CHARLY Type

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 (PVD) | Grade ND3000 (DIA)

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020



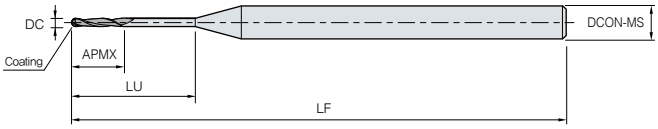
(mm)

Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
TZBE	2005-0385-N100S03(CHARLY)	PVD	0.5	3	1.5	10	38.5	DC/2
	2010-0385-N120S03(CHARLY)	DIA	1	3	2	12	38.5	DC/2
	2015-0385-N120S03(CHARLY)	DIA	1.5	3	3	12	38.5	DC/2
TZFE	2030-0385-N060S03(CHARLY)-DY	DIA	3	3	6	-	38.5	DC/2
TZBE	2010-0385-N120S03(CHARLY)-N	-	1	3	2	12	38.5	DC/2
	2015-0385-N120S03(CHARLY)-N	-	1.5	3	3	12	38.5	DC/2
	2030-0385-N060S03(CHARLY)-N	-	3	3	6	-	38.5	DC/2

ZIRKONZAHN M5 Type

2 | H·A 30° | h5 shank | Grade ND3000 DIA

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020



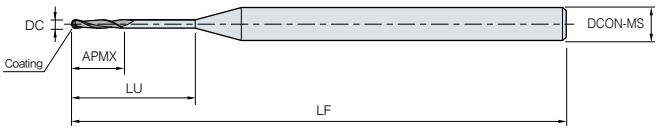
(mm)

Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
TZBE	2010-057-N120S03(ZIRKON)-DYD	DIA	1	3	6	12	57	DC/2
	2020-057-N180S03(ZIRKON)-DYD	DIA	2	3	10	18	57	DC/2
	2003-057-N060S03(ZIRKONZAHN)-DY	-	0.3	3	3	6	57	DC/2
	2005-057-N100S03(ZIRKONZHAN)-DY	-	0.5	3	3	10	57	DC/2
	2010-057-N120S03(ZIRKONZHAN)-DY	-	1	3	6	12	57	DC/2
	2020-057-N180S03(ZIRKONZHAN)-DY	-	2	3	10	18	57	DC/2

ZIRKONZAHN M1/M4 Type

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 PVD | Grade ND3000 DIA

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020



(mm)

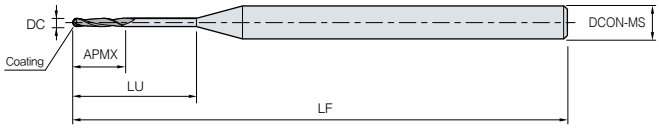
Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
TZBE	2005-050-N108S06(ZIRKON M1)	PVD	0.5	6	3.5	10.8	50	DC/2
	2010-050-N120S06(ZIRKON M1)	DIA	1	6	6	12	50	DC/2
	2020-050-N180S06(ZIRKON M1)	DIA	2	6	10	18	50	DC/2
	2005-050-N095S06(ZIRKON M1)	-	0.5	6	3	9.5	50	DC/2
	2010-050-N120S06(ZIRKON M1)-N	-	1	6	6	12	50	DC/2
	2020-050-N180S06(ZIRKON M1)-N	-	2	6	10	18	50	DC/2
TTBE	2010-050-N120S06(ZIRKON M1)	PVD	1	6	1	12	50	DC/2
	2020-050-N120S06(ZIRKON M1)	PVD	2	6	3	12	50	DC/2
	2030-050-N180S06(ZIRKON M1)	PVD	3	6	4	18	50	DC/2

SIRONA Type

(MC-X5)

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 (PVD) | Grade ND3000 (DIA)

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020



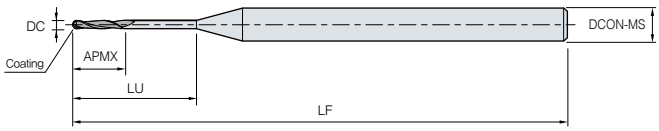
(mm)

Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
TZBE	2005-042-N060S03(MC-X5)	PVD	0.5	3	1	6	42	DC/2
	2010-043-N170S03(MC-X5)	DIA	1	3	3	17	43	DC/2
	4025-044-N240S03(MC-X5)	DIA	2.5	3	5	24	44	DC/2
TWBE	2010-043-N170S03(MC-X5)	-	1	3	3	17	43	DC/2
	2025-044-N240S3(MC-X5)	-	2.5	3	5	24	44	DC/2

YENA Type

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 (PVD) | Grade ND3000 (DIA)

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020



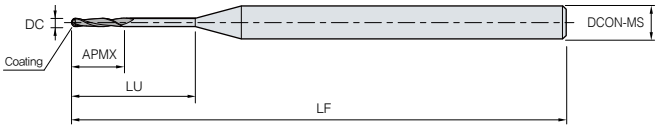
(mm)

Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
TZBE	2010-045-N160S04(YENA)-DY	DIA	1	4	3	16	45	DC/2
	2020-045-N160S04(YENA)-DY	DIA	2	4	3	16	45	DC/2
TWBE	2010-045-N160S04(YENA)-DY	-	1	4	3	16	45	DC/2
	2020-045-N160S04(YENA)-DY	-	2	4	3	16	45	DC/2
TTBE	2020-045-N122S04(YENA)	PVD	2	4	3.6	12.2	45	DC/2
	2030-045-N125S04(YENA)	PVD	3	4	5.5	12.5	45	DC/2

LEZIRTH Type

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 PVD

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020



(mm)

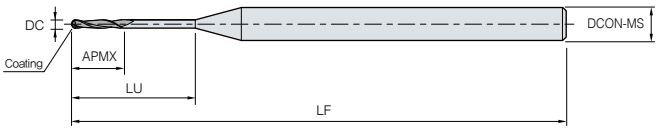
	Designation	Coating	DC	DCON-MS	APMX	LU	LF	RE
TTBE	2010-050-V1.2N8S6	PVD	1	6	1.2	8	50	DC/2
	2015-045-V1.7N8.5S6	PVD	1.5	6	1.7	8.5	45	DC/2
TTE	2020-050-V2.2N12S6	PVD	2	6	2.2	12	50	DC/2
	2030-060-V3.5N16S6	PVD	3	6	3.5	16	60	DC/2

ARUM Type

(4X/5X-100)

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 PVD | Grade ND3000 DIA

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020



(mm)

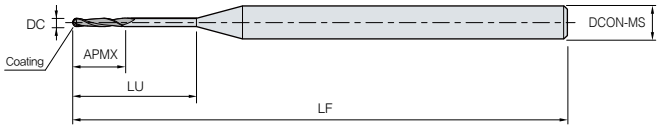
	Designation	Coating	DC	DCON-MS	APMX	LU	LF	RE
TZBE	2006-063-N120S06(4X-100)	PVD	0.6	6	1.5	12	63	DC/2
	2010-063-N160S06(4X-100)	DIA	1	6	2.5	16	63	DC/2
	2020-063-N200S06(4X-100)	DIA	2	6	6	20	63	DC/2
TWBE	2010-063-N160S06(4X-100)	-	1	6	2.5	16	63	DC/2
	2020-063-N200S06(4X-100)	-	2	6	6	20	63	DC/2

ARUM Type

(5X-150)

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 (PVD) | Grade ND3000 (DIA)

DC	Tolerance
Ø1.0 Ø1.1 ~ Ø3.0	0.000 ~ -0.015 0.000 ~ -0.020



(mm)

Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
TZBE	2006-045-N100S04(5X-100)	PVD	0.6	4	1.5	10	45	DC/2
	2010-050-N161S04(5X-100)-K	DIA	1	4	2.5	16.1	50	DC/2
	2020-050-N181S04(5X-100)	DIA	2	4	6.5	18.1	50	DC/2
TWBE	2010-050-N161S04(5X-100)	-	1	4	2.5	16.1	50	DC/2
	2020-050-N181S04(5X-100)	-	2	4	6.5	18.1	50	DC/2
ETND	006041-C4M325-T7	E.D DIA	0.6	4	8	8	41	DC/2
	010044-C4M170	E.D DIA	1	4	10	10	44	DC/2
	015044-C4M140	E.D DIA	1.5	4	10	10	44	DC/2
	025044-C4M120	E.D DIA	2.5	4	12	12	44	DC/2

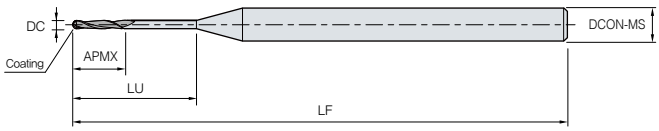
※ E.D DIA: Electro deposition DIA

ARUM Type

(5X-200)

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 (PVD) | Grade ND3000 (DIA)

DC	Tolerance
Ø1.0 Ø1.1 ~ Ø3.0	0.000 ~ -0.015 0.000 ~ -0.020



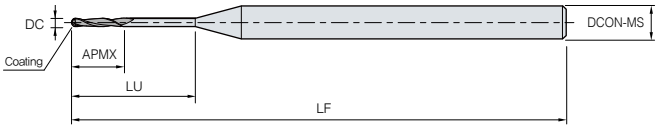
(mm)

Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
TZBE	2006-050-N080S06(5X-200)	PVD	0.6	6	1.6	8	50	DC/2
	2010-053-N140S06(5X-200)	DIA	1	6	2	14	53	DC/2
	2020-055-N200S06(5X-200)	DIA	2	6	6	20	55	DC/2
TWBE	2010-053-N140S06(5X-200)	-	1	6	2	14	53	DC/2
	2020-055-N200S06(5X-200)	-	2	6	6	20	55	DC/2
ETND	006050-H6M270-T7	E.D DIA	0.6	6	8	8	50	DC/2
ETRE	010050-H6M200	E.D DIA	1	6	10	10	50	DC/2
	015050-H6M170	E.D DIA	1.5	6	10	10	50	DC/2
	025050-H6M140	E.D DIA	2.5	6	12	12	50	DC/2

※ E.D DIA: Electro deposition DIA

ARUM Type

(5X-300)



2	H·A 30°	h5 shank	Grade PC2510 PC2010 (PVD)	Grade ND3000 (DIA)

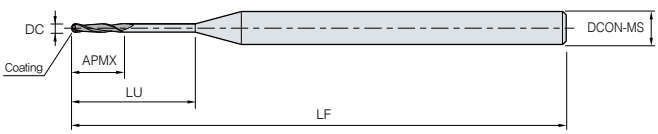
DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020

(mm)

	Designation	Coating	DC	DCON-MS	APMX	LU	LF	RE
TZBE	2003-045-N120S04(5X-300)	PVD	0.3	4	0.6	12	45	DC/2
	2006-045-N100S04(5X-300)	PVD	0.6	4	1.2	10	45	DC/2
	2010-050-N160S04(5X-300)	DIA	1	4	2	16	50	DC/2
	2020-050-N180S04(5X-300)	DIA	2	4	6	18	50	DC/2
TWBE	2010-050-N160S04(5X-300)	-	1	4	2	16	50	DC/2
	2020-050-N180S04(5X-300)	-	2	4	6	18	50	DC/2

ARUM Type

(Metal Tool)



2	H·A 30°	h5 shank	Grade PC2510 PC2010 (PVD)

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020

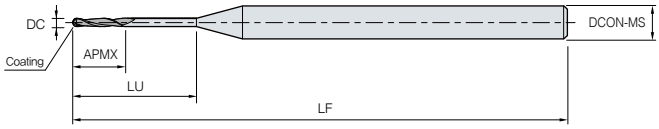
(mm)

	Designation	Coating	DC	DCON-MS	APMX	LU	LF	RE
TTBE	2010-050-N100S06(ARUM)-DY	PVD	1	6	2	10	50	DC/2
	2015-050-N100S06(ARUM)-DY	PVD	1.5	6	3	10	50	DC/2
	2020-050-N120S06(ARUM)-DY	PVD	2	6	4	12	50	DC/2
	2025-050-N140S06(ARUM)-DY	PVD	2.5	6	8	14	50	DC/2
	2030-050-N120S06(ARUM)-DY	PVD	3	6	6	12	50	DC/2

Z-MATCH/CAMELEON Type

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 (PVD) | Grade ND3000 (DIA)

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020



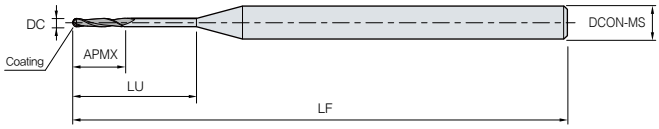
(mm)

Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
TZBE	2005-055-N8(Z-MATCH)	PVD	0.5	6	1.5	8	55	DC/2
	2010-055-N16(Z-MATCH)	DIA	1	6	3	16	55	DC/2
	2020-055-N20(Z-MATCH)	DIA	2	6	6	20	55	DC/2
TWBE	2010-055-N160S06(Z-MATCH)	-	1	6	3	16	55	DC/2
	2020-055-N200S06(Z-MATCH)	-	2	6	6	20	55	DC/2

CAMELEON CS Type

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 (PVD) | Grade ND3000 (DIA)

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020



(mm)

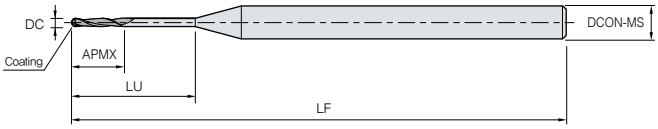
Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
TZBE	2005-040-N080S03(CAMELEON CS)	PVD	0.5	3	1	8	40	DC/2
	2010-040-N160S03(CAMELEON CS)	DIA	1	3	2	16	40	DC/2
	2020-040-N200S03(CAMELEON CS)	DIA	2	3	4	20	40	DC/2
TWBE	2010-040-N160S03(CAMELEON CS)	-	1	3	2	16	40	DC/2
	2020-040-N200S03(CAMELEON CS)	-	2	3	4	20	40	DC/2

CAMELEON Type

(Metal Tool)

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 PVD

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020



(mm)

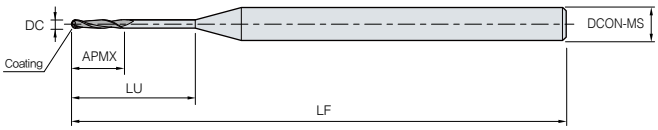
Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
TTBE	2015-045-N7(Z-MATCH-M)	PVD	1.5	6	3	7	45	DC/2
	2020-045-N7(Z-MATCH-M)	PVD	2	6	3	7	45	DC/2
	2030-045-N10(Z-MATCH-M)	PVD	3	6	4	10	45	DC/2
	2015-055-N8(CAMELEON-M)	PVD	1.5	6	1.5	8	55	DC/2
	2020-055-N8(CAMELEON-M)	PVD	2	6	2	8	55	DC/2
	2030-055-N10(CAMELEON-M)	PVD	3	6	3	10	55	DC/2

RND Type

(DS200-5Z, DM-100, DS-4WA)

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 PVD | Grade ND3000 DIA

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020



(mm)

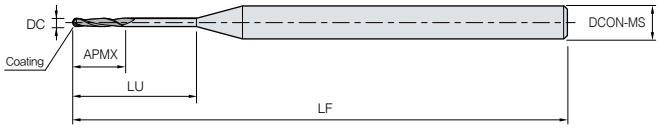
Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
TZBE	2006-045-N120S03(DS200-5Z)	PVD	0.6	3	1.2	12	45	DC/2
	2010-045-N180S03(DS200-5Z)	DIA	1	3	3	18	45	DC/2
	2020-045-N200S03(DS200-5Z)	DIA	2	3	4	20	45	DC/2
TWBE	2010-045-N180S03(DS200-5Z)	-	1	3	3	18	45	DC/2
	2020-045-N200S03(DS200-5Z)	-	2	3	4	20	45	DC/2
TTBE	2015-050-N100S06(RND)-DY	PVD	1.5	6	3	10	50	DC/2
	2020-050-N130S06(RND)-DY	PVD	2	6	4	13	50	DC/2
	2030-050-N120S06(RND)-DY	PVD	3	6	6	12	50	DC/2

MANIX Type

(Metal Tool)

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 (PVD) | Grade ND3000 (DIA)

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020



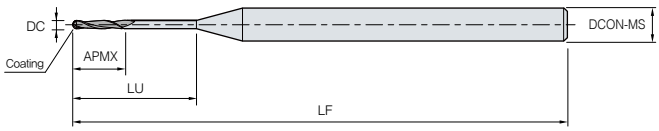
(mm)

Designation		Coating	DC	DCON-MS	APMX	LU	LF	DC
TZBE	2006-045-N145S04(ZX-5SD)	PVD	0.6	4	1	14.5	45	DC/2
	2010-050-N160S04(ZX-5SD)	DIA	1	4	3	16	50	DC/2
	2020-050-N200S04(ZX-5SD)	DIA	2	4	6	20	50	DC/2
TWBE	2010-050-N165S04(MANIX)	-	1	4	2.8	16.5	50	DC/2
	2020-050-N200S04(MANIX)	-	2	4	5	20	50	DC/2
TTBE	2015-045-N105S06(MANIX)	PVD	1.5	6	2	10.5	45	DC/2
	2020-045-N125S06(MANIX)	PVD	2	6	4.8	12.5	45	DC/2
	2025-045-N120S06(MANIX)	PVD	2.5	6	3	12	45	DC/2
	2030-045-N125S06(MANIX)	PVD	3	6	4	12.5	45	DC/2

SEUNGWON DI Type

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 (PVD)

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020



(mm)

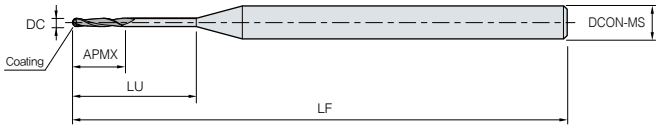
Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
TTBE	2015-050-N100S06(SW DI-M)	PVD	1.5	6	8	10	50	DC/2
	2020-050-N120S06(SW DI-M)	PVD	2	6	8	12	50	DC/2

PROTECH INNOTION Type

(Proden, Prodia, Nexus)

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 (PVD) | Grade ND3000 (DIA)

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020



(mm)

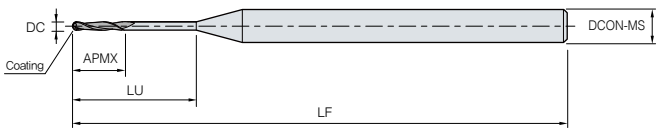
Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
TTBE	2006-060-N115S06(PRODEN)	PVD	0.6	6	2.2	11.5	60	DC/2
	2010-060-N180S06(PRODEN)	DIA	1	6	3	18	60	DC/2
	2020-060-N200S06(PRODEN)	DIA	2	6	5	20	60	DC/2
TWBE	2010-060-N180S06(PRODEN)	-	1	6	3	18	60	DC/2
	2020-060-N200S06(PRODEN)	-	2	6	5	20	60	DC/2

PROTECH INNOTION Type

(Metal Tool-Monster, Nexus, Protech)

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 (PVD)

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020



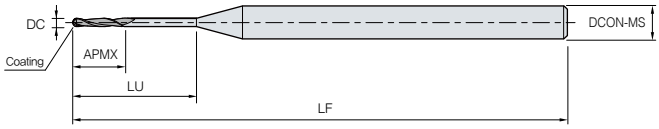
(mm)

Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
TTBE	2010-051-N100S06(NEXUS)	PVD	1	6	2	10	51	DC/2
	2015-051-N100S06(NEXUS)	PVD	1.5	6	2	10	51	DC/2
	2020-051-N120S06(NEXUS)	PVD	2	6	3	12	51	DC/2
	2030-051-N120S06(NEXUS)	PVD	3	6	4.5	12	51	DC/2

CERACUBE/TRION-Z Type

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 (PVD) | Grade ND3000 (DIA)

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020



(mm)

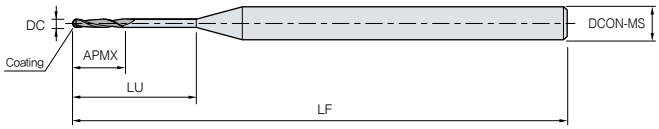
Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
TZBE	2005-050-N22(TRION-Z)	PVD	0.5	4	2	22	50	DC/2
	2010-050-N18(TRION-Z)	DIA	1	4	3	18	50	DC/2
	2020-050-N20(TRION-Z)	DIA	2	4	7	20	50	DC/2
TWBE	2010-050-N180S04(TRION-Z)	-	1	4	3	18	50	DC/2
	2020-050-N200S04(TRION-Z)	-	2	4	7	20	50	DC/2

DENTIUM Type

(Rainbow, Rainbow-Mill, Rainbow-Mill Zr 2nd)

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 (PVD) | Grade ND3000 (DIA)

DC	Tolerance
Ø1.0 Ø1.1 ~ Ø3.0	0.000 ~ -0.015 0.000 ~ -0.020



(mm)

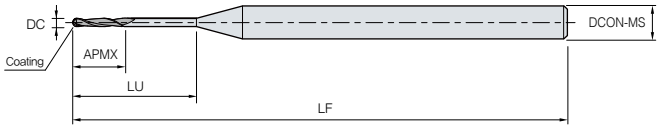
Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
TZBE	2005-050-N080S06(DENTIUM)	DIA	0.5	6	2	8	50	DC/2
	2010-050-N160S06(DENTIUM)	DIA	1	6	3	16	50	DC/2
	2020-050-N180S06(DENTIUM)	DIA	2	6	6	18	50	DC/2
	2005-043-N080S03(DENTIUM)	DIA	0.5	3	2	8	43	DC/2
	2010-050-N160S03(DENTIUM)	DIA	1	3	3	16	50	DC/2
	2020-050-N180S03(DENTIUM)	DIA	2	3	6	18	50	DC/2
	2005-045-N080S04(DENTIUM)	DIA	0.5	4	2	8	45	DC/2
	2010-045-N160S04(DENTIUM)	DIA	1	4	3	16	45	DC/2
	2025-045-N180S04(DENTIUM)	DIA	2.5	4	6	18	45	DC/2
TWBE	2005-050-N080S06(DENTIUM)	-	0.5	6	2	8	50	DC/2
	2010-050-N160S06(DENTIUM)	-	1	6	3	16	50	DC/2
	2020-050-N180S06(DENTIUM)	-	2	6	6	18	50	DC/2
	2010-050-N160S03(DENTIUM)	-	1	3	3	16	50	DC/2
	2020-050-N180S03(DENTIUM)	-	2	3	6	18	50	DC/2
	2010-045-N160S04(DENTIUM)	-	1	4	3	16	45	DC/2
	2025-045-N180S04(DENTIUM)	-	2.5	4	6	18	45	DC/2
TTBE	2010-050-N100S06(DENTIUM)	PVD	1	6	2	10	50	DC/2
	2015-050-N100S06(DENTIUM)	PVD	1.5	6	3	10	50	DC/2
	2020-050-N120S06(DENTIUM)	PVD	2	6	4	12	50	DC/2
	2030-050-N120S06(DENTIUM)	PVD	3	6	6	12	50	DC/2
ETRE	006050-H6M325-D(DENTIUM)	E.D DIA	0.6	6	6	6	50	DC/2
	010050-H6M170-D(DENTIUM)	E.D DIA	1	6	10	10	50	DC/2
	020050-H6M120-D(DENTIUM)	E.D DIA	2	6	12	12	50	DC/2
	006040-H3M325-D(DENTIUM)	E.D DIA	0.6	3	6	6	40	DC/2
	010045-H3M170-D(DENTIUM)	E.D DIA	1	3	10	10	45	DC/2
	020045-H3M120-D(DENTIUM)	E.D DIA	2	3	12	12	45	DC/2
	006045-H4M325-D(DENTIUM)	E.D DIA	0.6	4	6	6	45	DC/2
	010045-H4M170-D(DENTIUM)	E.D DIA	1	4	10	10	45	DC/2
	020045-H4M120-D(DENTIUM)	E.D DIA	2	4	12	12	45	DC/2

※ E.D DIA: Electro deposition DIA

DOF Type

2 | H·A 30° | h5 shank | Grade ND3000 (DIA)

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020



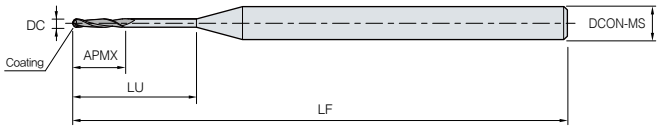
(mm)

Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
TZBE	2010-044-N19(DOF)	DIA	1	3	6	19	44	DC/2
	2020-044-N20(DOF)	DIA	2	3	8	20	44	DC/2
TWBE	2010-044-N19(DOF)	-	1	3	6	19	44	DC/2
	2020-044-N20(DOF)	-	2	3	8	20	44	DC/2

ELBEN Type

2 | H·A 30° | h5 shank | Grade PC2510 PC2010 (PVD) | Grade ND3000 (DIA)

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020

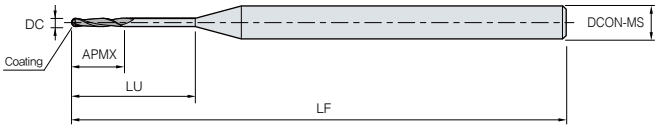


(mm)

Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
TZBE	2006-043-N080S06(ELBEN)	PVD	0.6	6	1.2	8	43	DC/2
	2010-050-N160S06(ELBEN)	DIA	1	6	3	16	50	DC/2
	2020-050-N200S06(ELBEN)	DIA	2	6	6	20	50	DC/2
TWBE	2010-050-N160S06(ELBEN)	-	1	6	3	16	50	DC/2
	2020-050-N200S06(ELBEN)	-	2	6	6	20	50	DC/2
TTBE	2010-045-N050S06(ELBEN)	PVD	1	6	2	5	45	DC/2
	2020-045-N120S06(ELBEN)	PVD	2	6	4	12	45	DC/2
	2030-045-N150S06(ELBEN)	PVD	3	6	6	15	45	DC/2

CEREC Type

(MC-XL)



2	H·A 30°	h5 shank	Grade ND3000 DIA

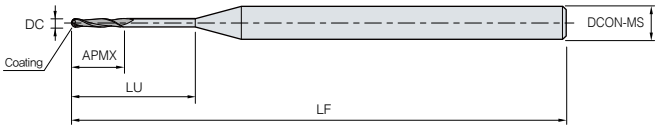
DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020

(mm)

Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
ETRE	018038-T35M230-12	DIA	1.73	3.5	8	12	38.1	DC/2
	009038-T35M230-12S	DIA	0.9	3.5	4	12	38.1	DC/2

UGINT Type

(D-100, D-200)



2	H·A 30°	h5 shank	Grade PC2510 PC2010 PVD	Grade ND3000 DIA

DC	Tolerance
Ø1.0	0.000 ~ -0.015
Ø1.1 ~ Ø3.0	0.000 ~ -0.020

(mm)

Designation		Coating	DC	DCON-MS	APMX	LU	LF	RE
TTBE	2007-040-N145S03(D-100)	PVD	0.7	3	2.5	14.5	40	DC/2
	2010-040-N145S03(D-100)	DIA	1	3	5	14.5	40	DC/2
	2020-040-N160S03(D-100)	DIA	2	3	4	16	40	DC/2
	2006-043-N080S06(D-200)	PVD	0.6	6	1.2	8	43	DC/2
	2010-050-N160S06(D-200)	DIA	1	6	3	16	50	DC/2
	2020-050-N200S06(D-200)	DIA	2	6	6	20	50	DC/2
TWBE	2010-040-N145S03(D-100)	-	1	3	5	14.5	40	DC/2
	2020-040-N160S03(D-100)	-	2	3	4	16	40	DC/2
	2010-050-N160S06(D-200)	-	1	6	3	16	50	DC/2
	2020-050-N200S06(D-200)	-	2	6	6	20	50	DC/2
TTBE	2015-050-N100S06(D-200)	PVD	1.5	6	7.4	10.2	50	DC/2
	2020-050-N120S06(D-200)	PVD	2	6	7.6	12.1	50	DC/2

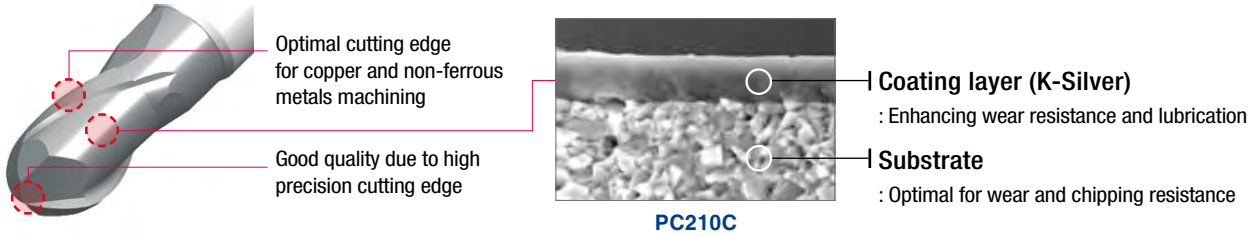
Long tool life and good surface roughness for electrode machining

C-Max

Copper

- Superior lubricity, wear resistance & chipping resistance due to the K-Silver coating layer and optimal substrate
- Optimal for copper and non-ferrous metal machining
- Wide line up (ball, flat, radius & long neck type)
- Long tool life and good surface roughness for electrode machining

Features

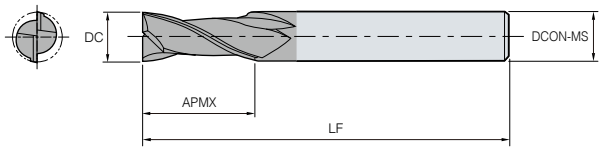


CFE2000

Flat

2 | H·A 30° | Grade PC210C

DC	Tolerance
Ø0.5 ~ Ø6	0.00 ~ 0.01
Ø8 ~ Ø12	0.00 ~ 0.02



(mm)

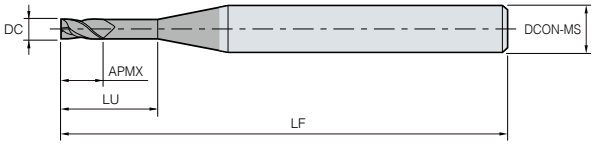
Designation		DC	DCON-MS	APMX	LF
CFE	2010-040	1	4	2.5	40
	2015-040	1.5	4	4	40
	2020-045	2	4	5	45
	2030-045	3	6	8	45
	2040-050	4	6	11	50
	2050-060	5	6	13	60
	2060-060	6	6	13	60
	2080-060	8	8	19	60
	2100-070	10	10	22	70
	2120-075	12	12	26	75

CFNE2000

Long neck type flat

2 | H·A 30° | Grade PC210C

DC	Tolerance
Ø0.5 ~ Ø6	0.00 ~ 0.01
Ø8 ~ Ø12	0.00 ~ 0.02



(mm)

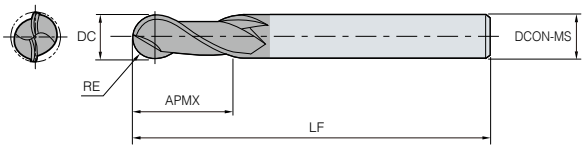
Designation		DC	DCON-MS	APMX	LU	LF
CFNE	2005-045-N2	0.5	4	0.8	2	45
	2005-045-N4	0.5	4	0.8	4	45
	2005-045-N6	0.5	4	0.8	6	45
	2005-050-N8	0.5	4	0.8	8	50
	2010-045-N4	1	4	1.5	4	45
	2010-045-N6	1	4	1.5	6	45
	2010-050-N8	1	4	1.5	8	50
	2010-050-N10	1	4	1.5	10	50
	2015-045-N6	1.5	4	2.3	6	45
	2015-050-N8	1.5	4	2.3	8	50
	2015-050-N10	1.5	4	2.3	10	50
	2015-050-N12	1.5	4	2.3	12	50
	2020-045-N6	2	4	3	6	45
	2020-050-N8	2	4	3	8	50
	2020-050-N10	2	4	3	10	50
	2020-055-N12	2	4	3	12	50
	2030-050-N10	3	4	4.5	10	50
	2030-050-N12	3	4	4.5	12	50
	2030-060-N14	3	4	4.5	14	60
	2030-060-N16	3	4	4.5	16	60
	2040-050-N12	4	6	6	12	50
	2040-050-N16	4	6	6	16	50
	2040-060-N20	4	6	6	20	60

CBE2000

Ball

2 | H·A 30° | Grade PC210C | RE ±0.005

DC	Tolerance
Ø0.5 ~ Ø6	0.00 ~ 0.01
Ø8 ~ Ø12	0.00 ~ 0.02



(mm)

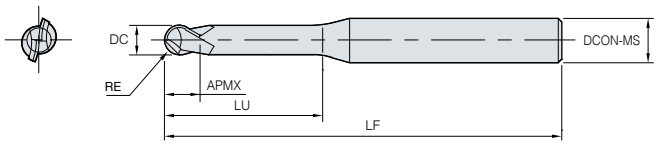
Designation		DC	DCON-MS	APMX	LF	RE
CBE	2010-050	1	4	2.5	50	0.5
	2015-050	1.5	4	4	50	0.75
	2020-050	2	4	5	50	1
	2030-060	3	6	8	60	1.2
	2040-070	4	6	8	70	2
	2050-080	5	6	10	80	2.5
	2060-080	6	6	12	80	3
	2080-090	8	8	14	90	4
	2100-100	10	10	18	100	5
	2120-110	12	12	22	110	6

CBNE2000

Long neck type ball

2 | H·A 30° | Grade PC210C

DC	Tolerance
Ø0.5 ~ Ø6	0.00 ~ 0.01
Ø8 ~ Ø12	0.00 ~ 0.02



(mm)

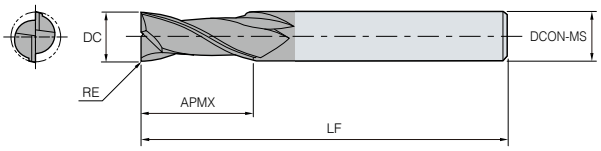
Designation		DC	DCON-MS	APMX	LU	LF	RE
CBNE	2005-045-N2	0.5	4	0.5	2	45	0.25
	2005-045-N4	0.5	4	0.5	4	45	0.25
	2005-045-N6	0.5	4	0.5	6	45	0.25
	2005-050-N8	0.5	4	0.5	8	50	0.25
	2010-045-N4	1	4	1	4	45	0.5
	2010-045-N6	1	4	1	6	45	0.5
	2010-050-N8	1	4	1	8	50	0.5
	2010-050-N10	1	4	1	10	50	0.5
	2015-050-N8	1.5	4	1.5	8	50	0.75
	2015-050-N10	1.5	4	1.5	10	50	0.75
	2015-050-N12	1.5	4	1.5	12	50	0.75
	2015-055-N14	1.5	4	1.5	14	55	0.75
	2020-050-N8	2	4	2	8	50	1
	2020-050-N10	2	4	2	10	50	1
	2020-050-N12	2	4	2	12	50	1
	2020-055-N14	2	4	2	14	55	1
	2030-050-N10	3	4	3	10	50	1.5
	2030-050-N12	3	4	3	12	50	1.5
	2030-055-N14	3	4	3	14	55	1.5
	2030-055-N16	3	4	3	16	60	1.5
	2040-060-N16	4	6	4	16	60	2
	2040-060-N20	4	6	4	20	60	2
	2040-070-N25	4	6	4	25	70	2
	2040-070-N30	4	6	4	30	70	2

CRE2000

Radius

2 | H·A 30° | Grade PC210C | RE ±0.005

DC	Tolerance
Ø0.5 ~ Ø6	0.00 ~ 0.01
Ø8 ~ Ø12	0.00 ~ 0.02



(mm)

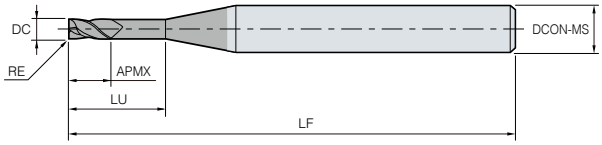
Designation		DC	DCON-MS	APMX	LF	RE
CRE	2020-045-R05	2	4	5	45	0.5
	2030-045-R05	3	6	8	45	0.5
	2040-050-R05	4	6	11	50	0.5
	2050-060-R05	5	6	13	60	0.5
	2060-060-R05	6	6	13	60	0.5
	2080-060-R10	8	8	19	60	1
	2100-070-R10	10	10	22	70	1
	2120-075-R10	12	12	26	75	1

CRNE2000

Long neck type radius

2 | H·A 30° | Grade PC210C | RE ±0.005

DC	Tolerance
Ø0.5 ~ Ø6	0.00 ~ 0.01
Ø8 ~ Ø12	0.00 ~ 0.02



(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
CRNE	2010-045-R02N4	1	4	1.5	4	45	0.2
	2010-045-R02N6	1	4	1.5	6	45	0.2
	2010-050-R02N8	1	4	1.5	8	50	0.2
	2010-050-R02N10	1	4	1.5	10	50	0.2
	2015-045-R02N6	1.5	4	2.3	6	45	0.2
	2015-050-R02N8	1.5	4	2.3	8	50	0.2
	2015-050-R02N10	1.5	4	2.3	10	50	0.2
	2015-050-R02N12	1.5	4	2.3	12	50	0.2
	2020-045-R05N6	2	4	3	6	45	0.5
	2020-050-R05N8	2	4	3	8	50	0.5
	2020-050-R05N10	2	4	3	10	50	0.5
	2020-055-R05N12	2	4	3	12	50	0.5
	2030-050-R05N10	3	4	4.5	10	50	0.5
	2030-050-R05N12	3	4	4.5	12	50	0.5
	2030-060-R05N14	3	4	4.5	14	60	0.5
	2030-060-R05N16	3	4	4.5	16	60	0.5
	2040-050-R05N12	4	6	6	12	50	0.5
	2040-050-R05N16	4	6	6	16	50	0.5
	2040-060-R05N20	4	6	6	20	60	0.5

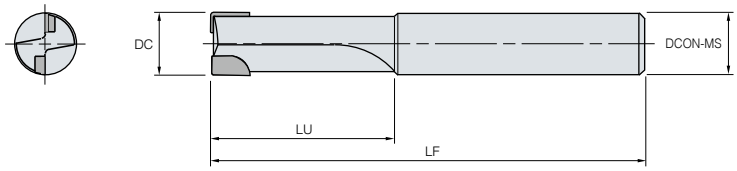
Longer tool life and good surface finishes

PCD Endmill

- Longer tool life and good surface roughness
- Reducing burrs at non-ferrous metals machining
- 1000 type: Ultra finishing for non-ferrous metals
- 2000 type: Optimal for aluminum alloy, carbon steel, graphite and reinforced Plastic machining

PDE1000/2000

Flat



(mm)

Designation		DC	DCON-MS	LU	LF
PDE	1040	4	6	15	45
	1050	5	6	15	50
	1060	6	6	20	60
	2060	6	8	20	60
	2070	7	8	20	60
	2080	8	8	20	60
	2090	9	10	25	70
	2100	10	10	25	70
	2120	12	12	25	75

Special Order Form for Endmills

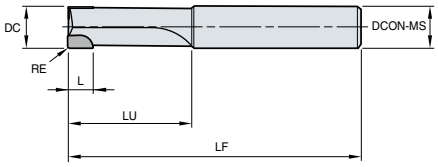


Fig 1

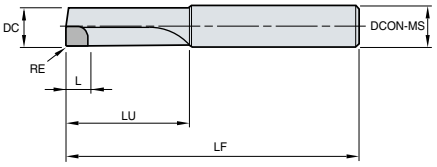
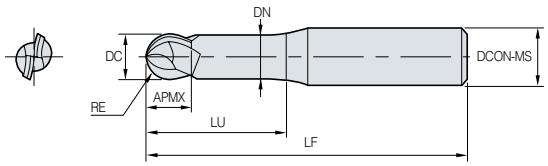


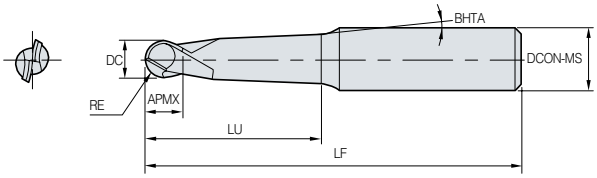
Fig 2

Designation	Fig	NOF	mm					
			DC	DCON-MS	RE	L	LU	LF
PDES								

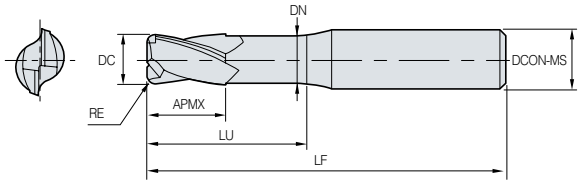
※ Depending on customer requests, we can make special Endmill



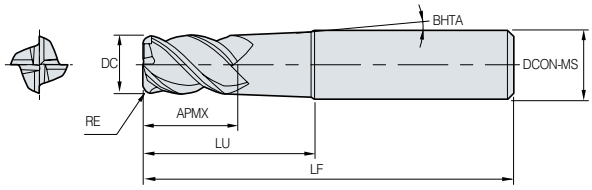
Designation	NOF	RE	DC	DCON-MS	DN	APMX	LU	LF



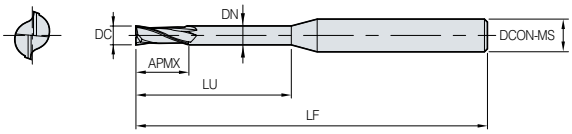
Designation	NOF	RE	DC	DCON-MS	APMX	LU	LF	BHTA(°)



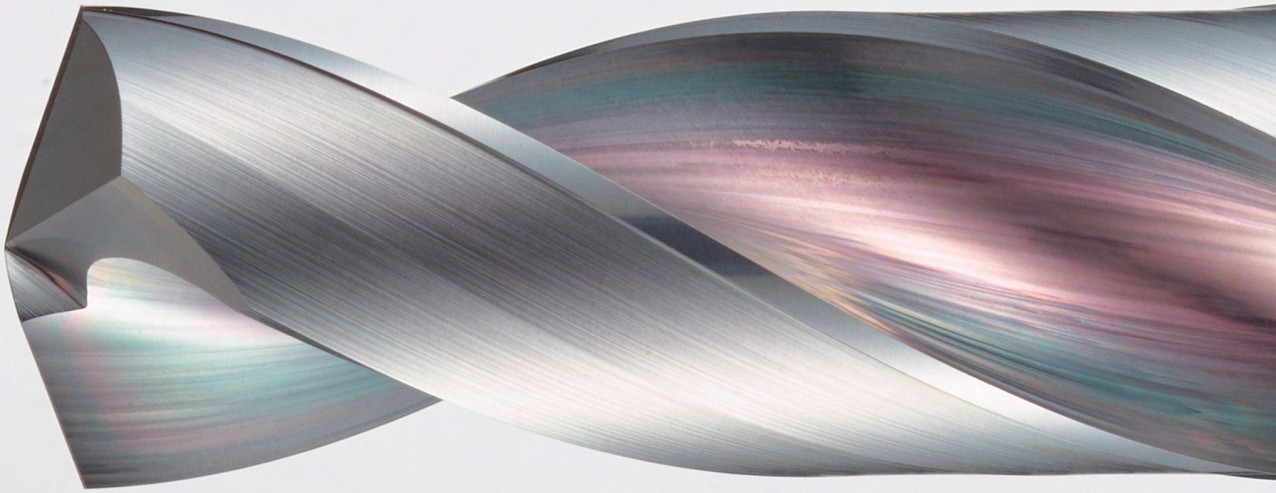
Designation	NOF	DC	DCON-MS	DN	RE	APMX	LU	LF



Designation	NOF	RE	DC	DCON-MS	APMX	LU	LF	BHTA(°)



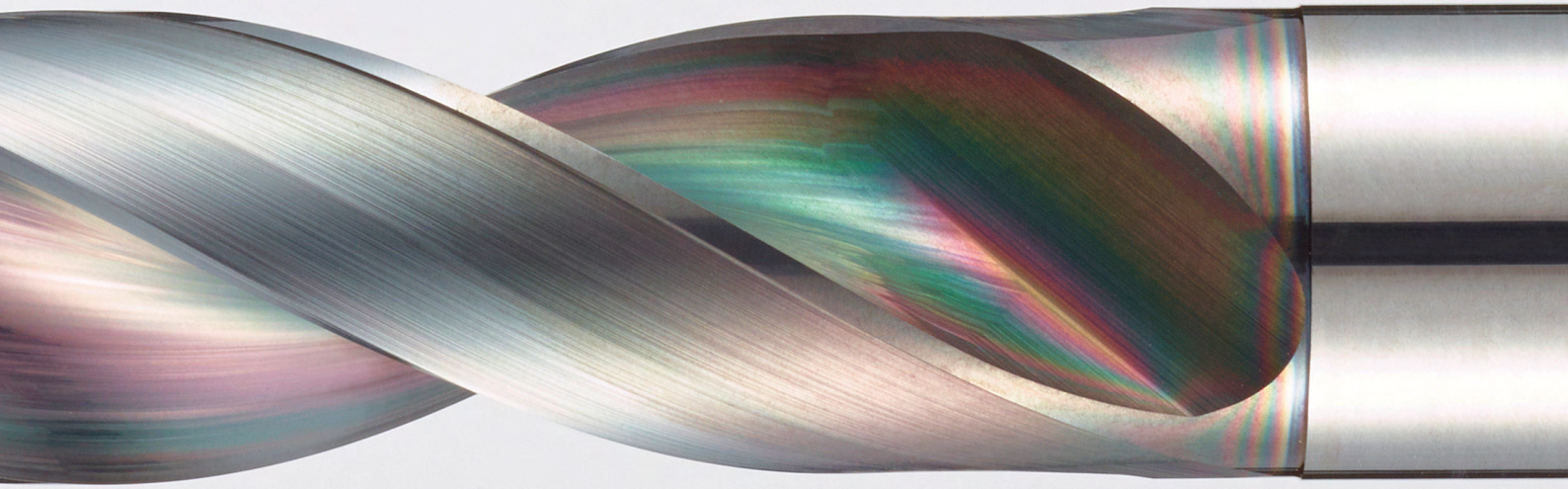
Designation	NOF	DC	DCON-MS	DN	APMX	LU	LF



PART

DRILL

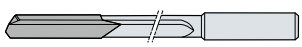
Korloy drills provide a total solution for hole making, based on tooling know-how as well as extensive research and development for our tools.



Technical information for DRILLS

C3 KORLOY Drill
C5 Solid drill Line-up and features
C6 MSD Plus
C11 MSD Plus-S
C20 MSD Plus for CFRP
C22 MSFD
C29 MLD Plus
C32 Mach step Drills Order Form
C33 P-Star Drill
C60 W-Star Drill
C65 SSD-N
C68 Burnishing Drill
C69 PCD Drill
C72 Gun Drill
C78 Chucking / Machine Reamer
C80 PCD Reamer
C81 Cermet / Broach Reamer
C82 Chamfer Tool
C85 Counter Sink

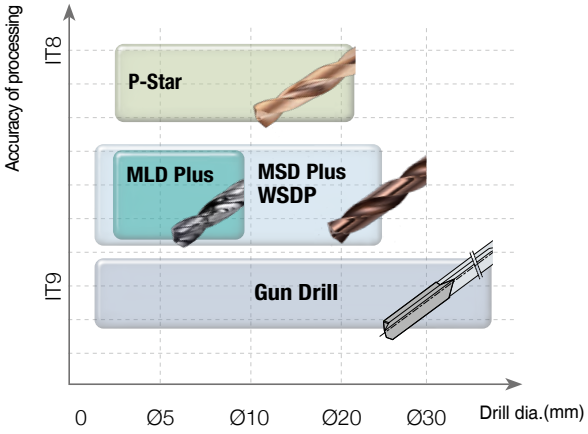
Solid Drill

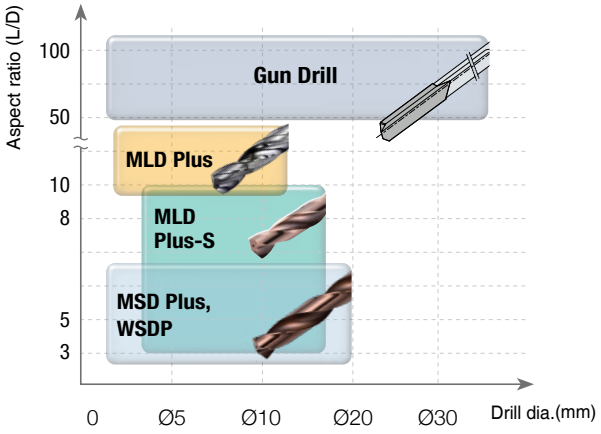
Type	Designation		Shape	Drills dia.	Aspect ratio	Page
Carbide coated solid drill	MSD Plus	MSDPH		Ø2.5 ~ Ø20.0	3D ~ 7D	C7
	MSD Plus-S	MSDPH-S		Ø3.0 ~ Ø16.0	3D ~ 10D	C12
	MSD Plus for CFRP	MSDP-C		Ø3.0 ~ Ø12.7	5D	C21
	MSFD	MSFD		Ø2.5 ~ Ø16.0	2D	C23
		MSFDH		Ø2.5 ~ Ø16.0	3D	C26
	MLD Plus	MLD		Ø3.0 ~ Ø10.0	10D ~ 25D	C30
	P-Star Drill	HP503		Ø3.0 ~ Ø16.0	3D	C35
		HPI503		Ø3.0 ~ Ø20.0	3D	C38
		HPI505		Ø3.0 ~ Ø20.0	5D	C42
		HPI508-N		Ø3.0 ~ Ø20.0	8D	C47
		P503A(F)		Ø3.0 ~ Ø20.0	3D	C51
		PI503A(F)		Ø3.0 ~ Ø20.0	3D	C54
		PI505A(F)		Ø4.0 ~ Ø20.0	5D	C56
	W-Star Drill	WSDP		Ø1.0 ~ Ø20.0	5D, 7D	C61
	SSD-N	SSD-N		Ø1.0 ~ Ø13.0	-	C66
	Burnishing Drill	BDS		Ø4.0 ~ Ø16.0	5D ~ 7D	C68
		BDT		Ø4.2 ~ Ø10.3	2D ~ 4D	C68
	PCD Drill	PDD		Ø5.0 ~ Ø12.0	5D	C69
		CPD		Ø2.0 ~ Ø8.0	3D ~ 5D	C70
		CPDL		Ø2.0 ~ Ø8.0	12D ~ 45D	C70
		SPD		Ø4.0 ~ Ø16.0	4D ~ 5D	C71
	Gun Drill	KGDS		Ø3.0 ~ Ø33.0	50D ~ 100D	C76
		KGDT		Ø6.0 ~ Ø26.5	50D ~ 100D	C77

Reamer / Chamfer

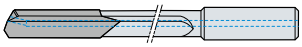
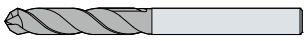
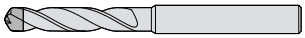
Type	Designation		Shape	Drills dia.	Aspect ratio	Page
Reamer	Chucking, Machine Reamer	SCRS		Ø5.0 ~ Ø20.0	2D ~ 3D	C78
		SCRH		Ø5.0 ~ Ø20.0	2D ~ 3D	C78
		TCRS		Ø7.0 ~ Ø30.0	2D ~ 3D	C79
		TMRS		Ø7.0 ~ Ø30.0	3D ~ 5D	C79
	PCD Reamer	PDR		Ø5.0 ~ Ø20.0	3D ~ 5D	C80
	Cermet Reamer	KCR		Ø6.0 ~ Ø30.0	3D ~ 7D	C81
	Broach Reamer	HBRE		Ø3.0 ~ Ø25.0	3D ~ 7D	C81
Chamfer	Chamfer Tool	CET		Ø3.0 ~ Ø16.0	-	C82
		CCT		Ø3.0 ~ Ø12.0	-	C83
	Counter Sink	CSPC		Ø6.0 ~ Ø20.0	-	C85
		CSNC		Ø10.0 ~ Ø30.0	-	C85
		CSNC		Ø10.0 ~ Ø30.0	-	C86
		CSHC		Ø10.0 ~ Ø30.0	-	C86
		CSPH		Ø6.3 ~ Ø25.0	-	C87
		CSNH		Ø10.0 ~ Ø50.0	-	C87
		CSNH		Ø10.0 ~ Ø50.0	-	C88
		CSHH		Ø10.0 ~ Ø50.0	-	C88

Application range





Solid drill Line-up and features

Workpiece	Use	Product name	Coolant	Drill dia. (tolerance)	Aspect ratio (L/D)	Geometries	Features
P M K	Medium hardness	P-Star	Central/ peripheral	Ø3.0~20.0 (h7)	3D~8D		• The optimal international standard for high speed machining with ~ HRC50
P M K	General	MSD Plus	Central/ peripheral	Ø2.5~20.0 (h7)	3D~7D		• High efficiency machining for various workpiece machining such as automobile components
P M K	General	MLD Plus (Long drill)	Central	Ø3.0~10.0 (h7)	10D~25D		• For deep drilling with high efficiency and high quality
P M K	General	W-Star Drill (WSDP)	Peripheral	Ø1.0~20.0 (h7)	5D, 7D		• High efficient and economic drill
P M K	General	MSFD	Central/ peripheral	Ø2.5~16.0 (h7)	2D~3D		• Flat drill for various types of drilling such as helical machining, curved surface machining, flat surface machining, etc.
P M K	General	Gun Drill	-	Ø3.0~33.0 (h7)	50D ~ 100D		• High efficient drilling of deep hole (50D~100D) • Availability of special types
S	HRSA	MSD Plus-S	Central	Ø3.0~16.0 (h7)	3D~10D		• For HRSA machining • For hard-to-cut material machining of aerospace, energy, power generation, automobile, etc.
N	CFRP	MSD Plus for CFRP	Peripheral	Ø3.0~12.7 (m7)	5D		• Machining for CFRP workpiece
N	Non-ferrous metal, Aluminum	SSD-N	Peripheral	Ø1.0~13.0 (h7)	-		• Non-coated drill for non-ferrous steel and mild steel
N	Non-ferrous metal, Aluminum	PCD Drill	Peripheral	Ø2.0~12.0 (h7)	-		• High precision and surface finish • Cone/Sandwich type

Highly efficient hole making for various workpieces including components

MSD Plus

Mach Solid Drill Plus

Code system

Special type

MSDP(H)	040	-	5	P	-	100L	-	5S
Oil hole	Drill dia.(DC)		Standard type	Machining area		Overall length		Shank dia.

Oil hole
None: MSDP
With oil hole: MSDPH

Drill dia.(DC)
040: Ø4.0 mm
(One decimal place marked)

Standard type
Aspect ratio (L/D)
3D, 5D, 7D

Special type
Flute length
100: 100 mm

Machining area
P: Carbon steel, alloy steel
M: Stainless steel
K: Cast iron
N: Aluminum, copper alloy

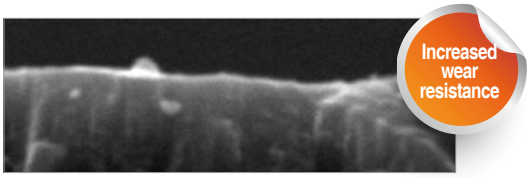
Overall length
100L: 100 mm

Shank dia.
5S: Ø5mm

Features

New grade (PC325U)

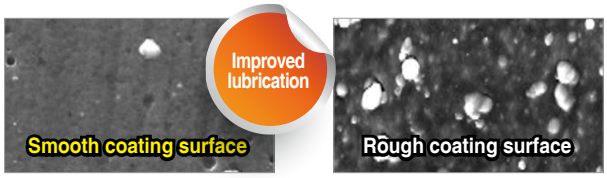
- Lubricative coating layer improves welding resistance at middle to high speed.
- Increase wear resistance in machining carbon steel



PC325U

Surface of coating layer

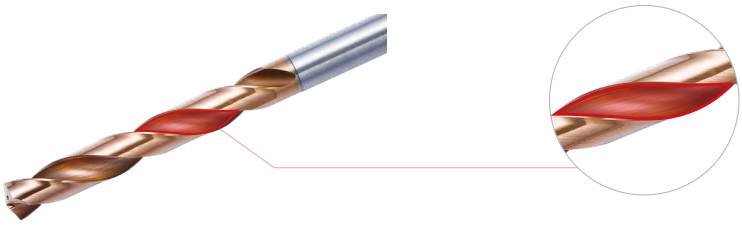
- Increased welding resistance and lower cutting load
- Reduced frictional resistance at cutting edges and on the flute



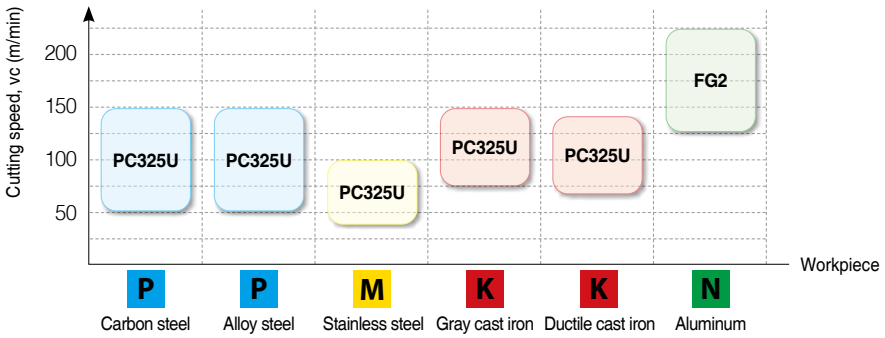
PC325U Competitor

Flute shape

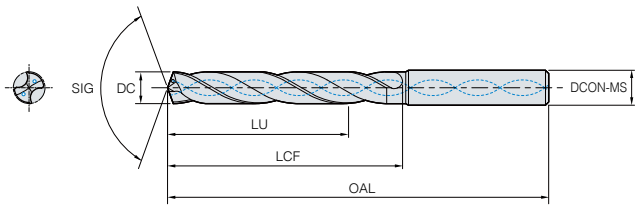
- Improved chip evacuation thanks to wider chip pocket



Application range



MSDPH-□(P/M/K/N)



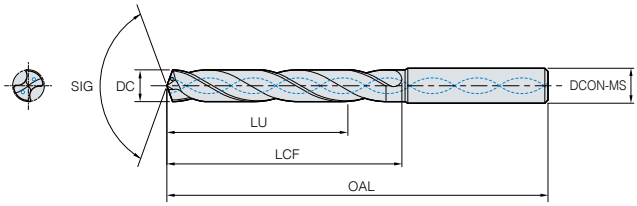
Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle(SIG)	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through/External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		DC	DCON-MS	3P,M,K,N			5P,M,K,N			7P,M,K,N		
				LU	LCF	OAL	LU	LCF	OAL	LU	LCF	OAL
MSDPH	025 - □P,M,K,N	2.5	3	7.5	14	53	12.5	20	66	17.5	30	70
	026 - □P,M,K,N	2.6	3	7.8	17	53	13	20	66	18.2	30	70
	027 - □P,M,K,N	2.7	3	8.1	17	53	13.5	20	66	18.9	30	70
	028 - □P,M,K,N	2.8	3	8.4	17	53	14	20	66	19.6	30	70
	029 - □P,M,K,N	2.9	3	8.7	17	53	14.5	20	66	20.3	30	70
	030 - □P,M,K,N	3	3	9	17	53	15	20	66	21	30	70
	031 - □P,M,K,N	3.1	4	9.3	20	58	15.5	28	74	21.7	30	70
	032 - □P,M,K,N	3.2	4	9.6	20	58	16	28	74	22.4	30	70
	033 - □P,M,K,N	3.3	4	9.9	20	58	16.5	28	74	23.1	30	70
	034 - □P,M,K,N	3.4	4	10.2	20	58	17	28	74	23.8	37.5	75
	035 - □P,M,K,N	3.5	4	10.5	20	58	17.5	28	74	24.5	37.5	75
	036 - □P,M,K,N	3.6	4	10.8	22	58	18	32	74	25.2	37.5	75
	037 - □P,M,K,N	3.7	4	11.1	22	58	18.5	32	74	25.9	37.5	75
	038 - □P,M,K,N	3.8	4	11.4	22	58	19	32	74	26.6	37.5	75
	039 - □P,M,K,N	3.9	4	11.7	22	58	19.5	32	74	27.3	37.5	75
	040 - □P,M,K,N	4	4	12	22	58	20	32	74	28	37.5	75
	041 - □P,M,K,N	4.1	5	12.3	24	62	20.5	36	82	28.7	37.5	75
	042 - □P,M,K,N	4.2	5	12.6	24	62	21	36	82	29.4	37.5	75
	043 - □P,M,K,N	4.3	5	12.9	24	62	21.5	36	82	30.1	45	85
	044 - □P,M,K,N	4.4	5	13.2	24	62	22	36	82	30.8	45	85
	045 - □P,M,K,N	4.5	5	13.5	24	62	22.5	36	82	31.5	45	85
	046 - □P,M,K,N	4.6	5	13.8	26	62	23	38	82	32.2	45	85
	047 - □P,M,K,N	4.7	5	14.1	26	62	23.5	38	82	32.9	45	85
	048 - □P,M,K,N	4.8	5	14.4	26	62	24	38	82	33.6	50	90
	049 - □P,M,K,N	4.9	5	14.7	26	62	24.5	38	82	34.3	50	90
	050 - □P,M,K,N	5	5	15	26	62	25	38	82	35	50	90
	051 - □P,M,K,N	5.1	6	15.3	28	66	25.5	44	82	35.7	50	90
	052 - □P,M,K,N	5.2	6	15.6	28	66	26	44	82	36.4	50	90
	053 - □P,M,K,N	5.3	6	15.9	28	66	26.5	44	82	37.1	50	90
	054 - □P,M,K,N	5.4	6	16.2	28	66	27	44	82	37.8	50	90
	055 - □P,M,K,N	5.5	6	16.5	28	66	27.5	44	82	38.5	57	97
	056 - □P,M,K,N	5.6	6	16.8	28	66	28	44	82	39.2	57	97
	057 - □P,M,K,N	5.7	6	17.1	28	66	28.5	44	82	39.9	57	97
	058 - □P,M,K,N	5.8	6	17.4	28	66	29	44	82	40.6	57	97
	059 - □P,M,K,N	5.9	6	17.7	28	66	29.5	44	82	41.3	57	97
	060 - □P,M,K,N	6	6	18	28	66	30	44	82	42	57	97
	061 - □P,M,K,N	6.1	7	18.3	34	74	30.5	50	91	42.7	66	106
	062 - □P,M,K,N	6.2	7	18.6	34	74	31	50	91	43.4	66	106
	063 - □P,M,K,N	6.3	7	18.9	34	74	31.5	50	91	44.1	66	106
	064 - □P,M,K,N	6.4	7	19.2	34	74	32	50	91	44.8	66	106
	065 - □P,M,K,N	6.5	7	19.5	34	74	32.5	50	91	45.5	66	106
	066 - □P,M,K,N	6.6	7	19.8	34	74	33	50	91	46.2	66	106
	067 - □P,M,K,N	6.7	7	20.1	34	74	33.5	50	91	46.9	66	106
	068 - □P,M,K,N	6.8	7	20.4	34	74	34	50	91	47.6	66	106

MSDPH-☐(P/M/K/N)



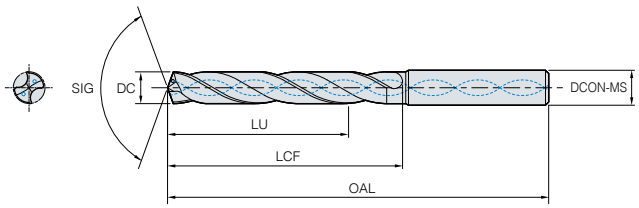
Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle(SIG)	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through/External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		DC	DCON-MS	3P,M,K,N			5P,M,K,N			7P,M,K,N		
				LU	LCF	OAL	LU	LCF	OAL	LU	LCF	OAL
MSDPH	069 - ☐P,M,K,N	6.9	7	20.7	34	74	34.5	50	91	48.3	76	116
	070 - ☐P,M,K,N	7	7	21	34	74	35	50	91	49	76	116
	071 - ☐P,M,K,N	7.1	8	21.3	41	79	35.5	53	91	49.7	76	116
	072 - ☐P,M,K,N	7.2	8	21.6	41	79	36	53	91	50.4	76	116
	073 - ☐P,M,K,N	7.3	8	21.9	41	79	36.5	53	91	51.1	76	116
	074 - ☐P,M,K,N	7.4	8	22.2	41	79	37	53	91	51.8	76	116
	075 - ☐P,M,K,N	7.5	8	22.5	41	79	37.5	53	91	52.5	76	116
	076 - ☐P,M,K,N	7.6	8	22.8	41	79	38	53	91	53.2	76	116
	077 - ☐P,M,K,N	7.7	8	23.1	41	79	38.5	53	91	53.9	76	116
	078 - ☐P,M,K,N	7.8	8	23.4	41	79	39	53	91	54.6	76	116
	079 - ☐P,M,K,N	7.9	8	23.7	41	79	39.5	53	91	55.3	76	116
	080 - ☐P,M,K,N	8	8	24	43	84	40	58	98	56	87	131
	081 - ☐P,M,K,N	8.1	9	24.3	43	84	40.5	58	98	56.7	87	131
	082 - ☐P,M,K,N	8.2	9	24.6	43	84	41	58	98	57.4	87	131
	083 - ☐P,M,K,N	8.3	9	24.9	43	84	41.5	58	98	58.1	87	131
	084 - ☐P,M,K,N	8.4	9	25.2	43	84	42	58	98	58.8	87	131
	085 - ☐P,M,K,N	8.5	9	25.5	43	84	42.5	58	98	59.5	87	131
	086 - ☐P,M,K,N	8.6	9	25.8	43	84	43	58	98	60.2	87	131
	087 - ☐P,M,K,N	8.7	9	26.1	43	84	43.5	58	98	60.9	87	131
	088 - ☐P,M,K,N	8.8	9	26.4	43	84	44	58	98	61.6	87	131
	089 - ☐P,M,K,N	8.9	9	26.7	43	84	44.5	58	98	62.3	87	131
	090 - ☐P,M,K,N	9	9	27	43	84	45	58	98	63	87	131
	091 - ☐P,M,K,N	9.1	10	27.3	47	89	45.5	61	105	63.7	95	139
	092 - ☐P,M,K,N	9.2	10	27.6	47	89	46	61	105	64.4	95	139
	093 - ☐P,M,K,N	9.3	10	27.9	47	89	46.5	61	105	65.1	95	139
	094 - ☐P,M,K,N	9.4	10	28.2	47	89	47	61	105	65.8	95	139
	095 - ☐P,M,K,N	9.5	10	28.5	47	89	47.5	61	105	66.5	95	139
	096 - ☐P,M,K,N	9.6	10	28.8	47	89	48	61	105	67.2	95	139
	097 - ☐P,M,K,N	9.7	10	29.1	47	89	48.5	61	105	67.9	95	139
	098 - ☐P,M,K,N	9.8	10	29.4	47	89	49	61	105	68.6	95	139
	099 - ☐P,M,K,N	9.9	10	29.7	47	89	49.5	61	105	69.3	95	139
	100 - ☐P,M,K,N	10	10	30	47	89	50	61	105	70	95	139
	101 - ☐P,M,K,N	10.1	11	30.3	55	95	50.5	68	114	70.7	106	155
	102 - ☐P,M,K,N	10.2	11	30.6	55	95	51	68	114	71.4	106	155
	103 - ☐P,M,K,N	10.3	11	30.9	55	95	51.5	68	114	72.1	106	155
	104 - ☐P,M,K,N	10.4	11	31.2	55	95	52	68	114	72.8	106	155
	105 - ☐P,M,K,N	10.5	11	31.5	55	95	52.5	68	114	73.5	106	155
	106 - ☐P,M,K,N	10.6	11	31.8	55	95	53	68	114	74.2	106	155
	107 - ☐P,M,K,N	10.7	11	32.1	55	95	53.5	68	114	74.9	106	155
	108 - ☐P,M,K,N	10.8	11	32.4	55	95	54	68	114	75.6	106	155
	109 - ☐P,M,K,N	10.9	11	32.7	55	95	54.5	68	114	76.3	106	155
	110 - ☐P,M,K,N	11	11	33	55	95	55	68	114	77	106	155
	111 - ☐P,M,K,N	11.1	12	33.3	55	102	55.5	71	120	77.7	114	163
	112 - ☐P,M,K,N	11.2	12	33.6	55	102	56	71	120	78.4	114	163

MSDPH-□(P/M/K/N)



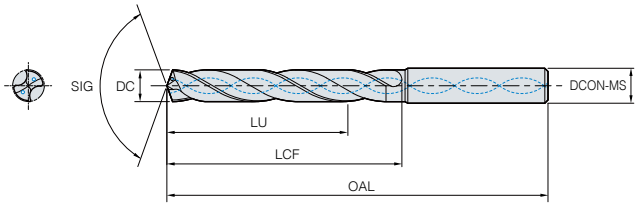
Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle(SIG)	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through/External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		DC	DCON-MS	3P,M,K,N			5P,M,K,N			7P,M,K,N		
				LU	LCF	OAL	LU	LCF	OAL	LU	LCF	OAL
MSDPH	113 - □P,M,K,N	11.3	12	33.9	55	102	56.5	71	120	79.1	114	163
	114 - □P,M,K,N	11.4	12	34.2	55	102	57	71	120	79.8	114	163
	115 - □P,M,K,N	11.5	12	34.5	55	102	57.5	71	120	80.5	114	163
	116 - □P,M,K,N	11.6	12	34.8	55	102	58	71	120	81.2	114	163
	117 - □P,M,K,N	11.7	12	35.1	55	102	58.5	71	120	81.9	114	163
	118 - □P,M,K,N	11.8	12	35.4	55	102	59	71	120	82.6	114	163
	119 - □P,M,K,N	11.9	12	35.7	55	102	59.5	71	120	83.3	114	163
	120 - □P,M,K,N	12	12	36	55	102	60	71	120	84	114	163
	121 - □P,M,K,N	12.1	13	36.3	60	107	60.5	77	124	84.7	133	182
	122 - □P,M,K,N	12.2	13	36.6	60	107	61	77	124	85.4	133	182
	123 - □P,M,K,N	12.3	13	36.9	60	107	61.5	77	124	86.1	133	182
	124 - □P,M,K,N	12.4	13	37.2	60	107	62	77	124	86.8	133	182
	125 - □P,M,K,N	12.5	13	37.5	60	107	62.5	77	124	87.5	133	182
	126 - □P,M,K,N	12.6	13	37.8	60	107	63	77	124	88.2	133	182
	127 - □P,M,K,N	12.7	13	38.1	60	107	63.5	77	124	88.9	133	182
	128 - □P,M,K,N	12.8	13	38.4	60	107	64	77	124	89.6	133	182
	129 - □P,M,K,N	12.9	13	38.7	60	107	64.5	77	124	90.3	133	182
	130 - □P,M,K,N	13	13	39	60	107	65	77	124	91	133	182
	131 - □P,M,K,N	13.1	14	39.3	62	107	65.5	80	133	91.7	133	182
	132 - □P,M,K,N	13.2	14	39.6	62	107	66	80	133	92.4	133	182
	133 - □P,M,K,N	13.3	14	39.9	62	107	66.5	80	133	93.1	133	182
	134 - □P,M,K,N	13.4	14	40.2	62	107	67	80	133	93.8	133	182
	135 - □P,M,K,N	13.5	14	40.5	62	107	67.5	80	133	94.5	133	182
	136 - □P,M,K,N	13.6	14	40.8	62	107	68	80	133	95.2	133	182
	137 - □P,M,K,N	13.7	14	41.1	62	107	68.5	80	133	95.9	133	182
	138 - □P,M,K,N	13.8	14	41.4	62	107	69	80	133	96.6	133	182
	139 - □P,M,K,N	13.9	14	41.7	62	107	69.5	80	133	97.3	133	182
	140 - □P,M,K,N	14	14	42	62	107	70	80	133	98	133	182
	141 - □P,M,K,N	14.1	15	42.3	65	115	70.5	85	143	98.7	152	204
	142 - □P,M,K,N	14.2	15	42.6	65	115	71	85	143	99.4	152	204
	143 - □P,M,K,N	14.3	15	42.9	65	115	71.5	85	143	100.1	152	204
	144 - □P,M,K,N	14.4	15	43.2	65	115	72	85	143	100.8	152	204
	145 - □P,M,K,N	14.5	15	43.5	65	115	72.5	85	143	101.5	152	204
	146 - □P,M,K,N	14.6	15	43.8	65	115	73	85	143	102.2	152	204
	147 - □P,M,K,N	14.7	15	44.1	65	115	73.5	85	143	102.9	152	204
	148 - □P,M,K,N	14.8	15	44.4	65	115	74	85	143	103.6	152	204
	149 - □P,M,K,N	14.9	15	44.7	65	115	74.5	85	143	104.3	152	204
	150 - □P,M,K,N	15	15	45	65	115	75	85	143	105	152	204
	151 - □P,M,K,N	15.1	16	45.3	68	115	75.5	88	143	105.7	152	204
	152 - □P,M,K,N	15.2	16	45.6	68	115	76	88	143	106.4	152	204
	153 - □P,M,K,N	15.3	16	45.9	68	115	76.5	88	143	107.1	152	204
	154 - □P,M,K,N	15.4	16	46.2	68	115	77	88	143	107.8	152	204
	155 - □P,M,K,N	15.5	16	46.5	68	115	77.5	88	143	108.5	152	204
	156 - □P,M,K,N	15.6	16	46.8	68	115	78	88	143	109.2	152	204

MSDPH-☐(P/M/K/N)



Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle(SIG)	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through/External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		DC	DCON-MS	3P,M,K,N			5P,M,K,N			7P,M,K,N		
				LU	LCF	OAL	LU	LCF	OAL	LU	LCF	OAL
MSDPH	157 - ☐ P,M,K,N	15.7	16	47.1	68	115	78.5	88	143	109.9	152	204
	158 - ☐ P,M,K,N	15.8	16	47.4	68	115	79	88	143	110.6	152	204
	159 - ☐ P,M,K,N	15.9	16	47.7	68	115	79.5	88	143	111.3	152	204
	160 - ☐ P,M,K,N	16	16	48	68	115	80	88	143	112	152	204
	161 - ☐ P,M,K,N	16.1	17	48.3	73	123	80.5	93	153	112.7	171	223
	162 - ☐ P,M,K,N	16.2	17	48.6	73	123	81	93	153	113.4	171	223
	163 - ☐ P,M,K,N	16.3	17	48.9	73	123	81.5	93	153	114.1	171	223
	164 - ☐ P,M,K,N	16.4	17	49.2	73	123	82	93	153	114.8	171	223
	165 - ☐ P,M,K,N	16.5	17	49.5	73	123	82.5	93	153	115.5	171	223
	166 - ☐ P,M,K,N	16.6	17	49.8	73	123	83	93	153	116.2	171	223
	167 - ☐ P,M,K,N	16.7	17	50.1	73	123	83.5	93	153	116.9	171	223
	168 - ☐ P,M,K,N	16.8	17	50.4	73	123	84	93	153	117.6	171	223
	169 - ☐ P,M,K,N	16.9	17	50.7	73	123	84.5	93	153	118.3	171	223
	170 - ☐ P,M,K,N	17	17	51	73	123	85	93	153	119	171	223
	171 - ☐ P,M,K,N	17.1	18	51.3	73	123	85.5	98	153	119.7	171	223
	172 - ☐ P,M,K,N	17.2	18	51.6	73	123	86	98	153	120.4	171	223
	173 - ☐ P,M,K,N	17.3	18	51.9	73	123	86.5	98	153	121.1	171	223
	174 - ☐ P,M,K,N	17.4	18	52.2	73	123	87	98	153	121.8	171	223
	175 - ☐ P,M,K,N	17.5	18	52.5	73	123	87.5	98	153	122.5	171	223
	176 - ☐ P,M,K,N	17.6	18	52.8	73	123	88	98	153	123.2	171	223
	177 - ☐ P,M,K,N	17.7	18	53.1	73	123	88.5	98	153	123.9	171	223
	178 - ☐ P,M,K,N	17.8	18	53.4	73	123	89	98	153	124.6	171	223
	179 - ☐ P,M,K,N	17.9	18	53.7	73	123	89.5	98	153	125.3	171	223
	180 - ☐ P,M,K,N	18	18	54	73	123	90	98	153	126	171	223
	181 - ☐ P,M,K,N	18.1	19	54.3	79	131	90.5	103	153	126.7	190	244
	182 - ☐ P,M,K,N	18.2	19	54.6	79	131	91	103	153	127.4	190	244
	183 - ☐ P,M,K,N	18.3	19	54.9	79	131	91.5	103	153	128.1	190	244
	184 - ☐ P,M,K,N	18.4	19	55.2	79	131	92	103	153	128.8	190	244
	185 - ☐ P,M,K,N	18.5	19	55.5	79	131	92.5	103	153	129.5	190	244
	186 - ☐ P,M,K,N	18.6	19	55.8	79	131	93	103	153	130.2	190	244
	187 - ☐ P,M,K,N	18.7	19	56.1	79	131	93.5	103	153	130.9	190	244
	188 - ☐ P,M,K,N	18.8	19	56.4	79	131	94	103	153	131.6	190	244
	189 - ☐ P,M,K,N	18.9	19	56.7	79	131	94.5	103	153	132.3	190	244
	190 - ☐ P,M,K,N	19	19	57	79	131	95	103	153	133	190	244
	191 - ☐ P,M,K,N	19.1	20	57.3	79	131	95.5	107	153	133.7	190	244
	192 - ☐ P,M,K,N	19.2	20	57.6	79	131	96	107	153	134.4	190	244
	193 - ☐ P,M,K,N	19.3	20	57.9	79	131	96.5	107	153	135.1	190	244
	194 - ☐ P,M,K,N	19.4	20	58.2	79	131	97	107	153	135.8	190	244
	195 - ☐ P,M,K,N	19.5	20	58.5	79	131	97.5	107	153	136.5	190	244
	196 - ☐ P,M,K,N	19.6	20	58.8	79	131	98	107	153	137.2	190	244
	197 - ☐ P,M,K,N	19.7	20	59.1	79	131	98.5	107	153	137.9	190	244
	198 - ☐ P,M,K,N	19.8	20	59.4	79	131	99	107	153	138.6	190	244
	199 - ☐ P,M,K,N	19.9	20	59.7	79	131	99.5	107	153	139.3	190	244
	200 - ☐ P,M,K,N	20	20	60	79	131	100	107	153	140	190	244

Specialized for heat-resistant alloys used in the aerospace, energy, power generation and automotive industries

MSD Plus-S

Mach Solid Drill Plus-S

- **Improved Productivity and Excellent Machinability** - Ensuring machinability with optimized blade design and chip pockets
- **Stronger Resistance to Wear** - Extended tool life due to excellent high temp resistance to chipping

Code system

Special type

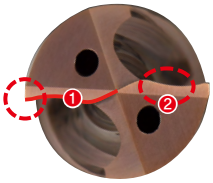
MSDP(H)	060	-	5	S	-	100L	-	5S
Oil hole	**Drill dia.(DC)**		**Standard type**	**Machining range**		**Overall length**		**Shank dia.**
None: MSDP With oil hole: MSDPH	060: Ø6.0 mm		Aspect ratio (L/D) 3D, 5D	S: HRSA		100L: 100mm		5S: Ø5mm

Special type

Flute length
50: 50 mm

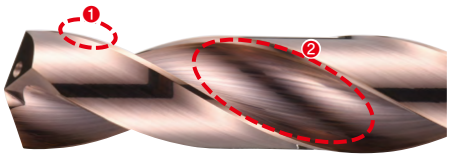
Features

- Notch-controlled blade design and specially treated cutting edges prevent chipping and breakage



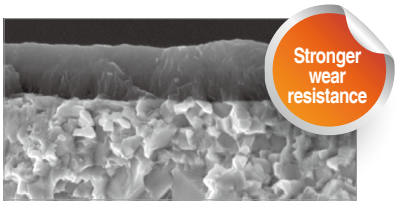
① Cutting edges designed for low cutting resistance
② Tip relief angle and shape optimized for heat evacuation

- Optimized margin and back-tapered design

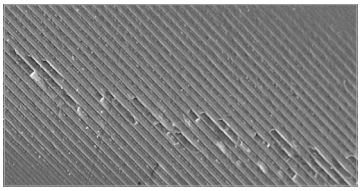


① Reduced friction resistance and cutting temperature
② Wider chip pockets improve chip evacuation

- Improved resistance to heat and oxidation thanks to the newly applied grade, PC325T
- Reduced friction resistance and improved chip evacuation due to excellent surface finish
- Exceptional wear resistance when machining heat-resistant alloys at high temperatures

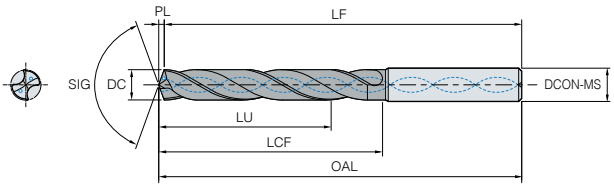


PC325T



Smooth coating surface

MSDPH-S (3D, 5D)



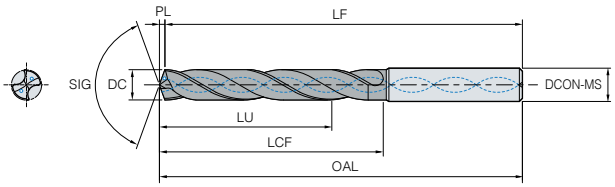
Terminology	S
Grade	PC325T
Tolerance(drill Dia.)	h7
Tolerance(shank Dia.)	h6
Point angle(SIG)	140°
Twist angle	30°
Thinning	X type
International standard	DIN 6537
Shank type	DIN 6535 HA
Coolant	Through

S Heat resistant alloy, Titanium alloy

(mm)

Designation		DC	DCON-MS	3S					5S				
				LU	LCF	LF	OAL	PL	LU	LCF	LF	OAL	PL
MSDPH	030-□S	3	6	9	20	61.5	62	0.5	15	28	65.5	66	0.5
	031-□S	3.1	6	9.3	20	61.4	62	0.6	15.5	28	65.4	66	0.6
	0318-□S	3.18	6	9.54	20	61.4	62	0.6	15.9	28	65.4	66	0.6
	032-□S	3.2	6	9.6	20	61.4	62	0.6	16	28	65.4	66	0.6
	033-□S	3.3	6	9.9	20	61.4	62	0.6	16.5	28	65.4	66	0.6
	034-□S	3.4	6	10.2	20	61.4	62	0.6	17	28	65.4	66	0.6
	035-□S	3.5	6	10.5	20	61.4	62	0.6	17.5	28	65.4	66	0.6
	0357-□S	3.57	6	10.71	20	61.4	62	0.6	17.85	28	65.4	66	0.6
	036-□S	3.6	6	10.8	20	61.3	62	0.7	18	28	65.3	66	0.7
	037-□S	3.7	6	11.1	20	61.3	62	0.7	18.5	28	65.3	66	0.7
	038-□S	3.8	6	11.4	24	65.3	66	0.7	19	36	73.3	74	0.7
	039-□S	3.9	6	11.7	24	65.3	66	0.7	19.5	36	73.3	74	0.7
	0397-□S	3.97	6	11.91	24	65.3	66	0.7	19.85	36	73.3	74	0.7
	040-□S	4	6	12	24	65.3	66	0.7	20	36	73.3	74	0.7
	041-□S	4.1	6	12.3	24	65.3	66	0.7	20.5	36	73.3	74	0.7
	042-□S	4.2	6	12.6	24	65.2	66	0.8	21	36	73.2	74	0.8
	043-□S	4.3	6	12.9	24	65.2	66	0.8	21.5	36	73.2	74	0.8
	0437-□S	4.37	6	13.11	24	65.2	66	0.8	21.85	36	73.2	74	0.8
	044-□S	4.4	6	13.2	24	65.2	66	0.8	22	36	73.2	74	0.8
	045-□S	4.5	6	13.5	24	65.2	66	0.8	22.5	36	73.2	74	0.8
	046-□S	4.6	6	13.8	24	65.2	66	0.8	23	36	73.2	74	0.8
	047-□S	4.7	6	14.1	24	65.1	66	0.9	23.5	36	73.1	74	0.9
	0476-□S	4.76	6	14.28	28	65.1	66	0.9	23.8	44	81.1	82	0.9
	048-□S	4.8	6	14.4	28	65.1	66	0.9	24	44	81.1	82	0.9
	049-□S	4.9	6	14.7	28	65.1	66	0.9	24.5	44	81.1	82	0.9
	050-□S	5	6	15	28	65.1	66	0.9	25	44	81.1	82	0.9
	051-□S	5.1	6	15.3	28	65.1	66	0.9	25.5	44	81.1	82	0.9
	0516-□S	5.16	6	15.48	28	65.1	66	0.9	25.8	44	81.1	82	0.9
	052-□S	5.2	6	15.6	28	65.1	66	0.9	26	44	81.1	82	0.9
	053-□S	5.3	6	15.9	28	65	66	1	26.5	44	81	82	1
	054-□S	5.4	6	16.2	28	65	66	1	27	44	81	82	1
	055-□S	5.5	6	16.5	28	65	66	1	27.5	44	81	82	1
	0556-□S	5.56	6	16.68	28	65	66	1	27.8	44	81	82	1
	056-□S	5.6	6	16.8	28	65	66	1	28	44	81	82	1
	057-□S	5.7	6	17.1	28	65	66	1	28.5	44	81	82	1
	058-□S	5.8	6	17.4	28	64.9	66	1.1	29	44	80.9	82	1.1
	059-□S	5.9	6	17.7	28	64.9	66	1.1	29.75	44	80.9	82	1.1
	0595-□S	5.9	6	17.7	28	64.9	66	1.1	29.75	44	80.9	82	1.1
	060-□S	6	6	18	28	64.9	66	1.1	30	44	80.9	82	1.1

MSDPH-S (3D, 5D)



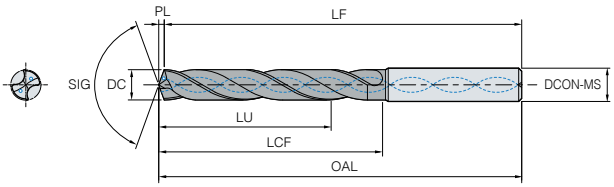
Terminology	S
Grade	PC325T
Tolerance(drill Dia.)	h7
Tolerance(shank Dia.)	h6
Point angle(SIG)	140°
Twist angle	30°
Thinning	X type
International standard	DIN 6537
Shank type	DIN 6535 HA
Coolant	Through

S Heat resistant alloy, Titanium alloy

(mm)

Designation		DC	DCON-MS	3S					5S				
				LU	LCF	LF	OAL	PL	LU	LCF	LF	OAL	PL
MSDPH	061-□S	6.1	8	18.3	34	77.9	79	1.1	30.5	53	89.9	91	1.1
	062-□S	6.2	8	18.6	34	77.9	79	1.1	31	53	89.9	91	1.1
	063-□S	6.3	8	18.9	34	77.9	79	1.1	31.5	53	89.9	91	1.1
	0635-□S	6.35	8	19.05	34	77.8	79	1.2	31.75	53	89.8	91	1.2
	064-□S	6.4	8	19.2	34	77.8	79	1.2	32	53	89.8	91	1.2
	065-□S	6.5	8	19.5	34	77.8	79	1.2	32.5	53	89.8	91	1.2
	066-□S	6.6	8	19.8	34	77.8	79	1.2	33	53	89.8	91	1.2
	067-□S	6.7	8	20.1	34	77.8	79	1.2	33.5	53	89.8	91	1.2
	0675-□S	6.75	8	20.25	34	77.8	79	1.2	33.75	53	89.8	91	1.2
	068-□S	6.8	8	20.4	34	77.8	79	1.2	34	53	89.8	91	1.2
	069-□S	6.9	8	20.7	34	77.7	79	1.3	34.5	53	89.7	91	1.3
	070-□S	7	8	21	34	77.7	79	1.3	35	53	89.7	91	1.3
	071-□S	7.1	8	21.3	41	77.7	79	1.3	35.5	53	89.7	91	1.3
	0714-□S	7.14	8	21.42	41	77.7	79	1.3	35.7	53	89.7	91	1.3
	072-□S	7.2	8	21.6	41	77.7	79	1.3	36	53	89.7	91	1.3
	073-□S	7.3	8	21.9	41	77.7	79	1.3	36.5	53	89.7	91	1.3
	074-□S	7.4	8	22.2	41	77.7	79	1.3	37	53	89.7	91	1.3
	075-□S	7.5	8	22.5	41	77.6	79	1.4	37.5	53	89.6	91	1.4
	0754-□S	7.54	8	22.62	41	77.6	79	1.4	37.7	53	89.6	91	1.4
	076-□S	7.6	8	22.8	41	77.6	79	1.4	38	53	89.6	91	1.4
	077-□S	7.7	8	23.1	41	77.6	79	1.4	38.5	53	89.6	91	1.4
	078-□S	7.8	8	23.4	41	77.6	79	1.4	39	53	89.6	91	1.4
	079-□S	7.9	8	23.7	41	77.6	79	1.4	39.5	53	89.6	91	1.4
	0794-□S	7.94	8	23.82	41	77.6	79	1.4	39.7	53	89.6	91	1.4
	080-□S	8	8	24	41	77.5	79	1.5	40	53	89.5	91	1.5
	081-□S	8.1	10	24.3	47	87.5	89	1.5	40.5	61	101.5	103	1.5
	082-□S	8.2	10	24.6	47	87.5	89	1.5	41	61	101.5	103	1.5
	083-□S	8.3	10	24.9	47	87.5	89	1.5	41.5	61	101.5	103	1.5
	0833-□S	8.33	10	24.99	47	87.5	89	1.5	41.65	61	101.5	103	1.5
	084-□S	8.4	10	25.2	47	87.5	89	1.5	42	61	101.5	103	1.5
	085-□S	8.5	10	25.5	47	87.5	89	1.5	42.5	61	101.5	103	1.5
	086-□S	8.6	10	25.8	47	87.4	89	1.6	43	61	101.4	103	1.6
	087-□S	8.7	10	26.1	47	87.4	89	1.6	43.5	61	101.4	103	1.6
	0873-□S	8.73	10	26.19	47	87.4	89	1.6	43.65	61	101.4	103	1.6
	088-□S	8.8	10	26.4	47	87.4	89	1.6	44	61	101.4	103	1.6
	089-□S	8.9	10	26.7	47	87.4	89	1.6	44.5	61	101.4	103	1.6
	090-□S	9	10	27	47	87.4	89	1.6	45	61	101.4	103	1.6
	091-□S	9.1	10	27.3	47	87.3	89	1.7	45.5	61	101.3	103	1.7
	0913-□S	9.13	10	27.39	47	87.3	89	1.7	45.65	61	101.3	103	1.7

MSDPH-S (3D, 5D)



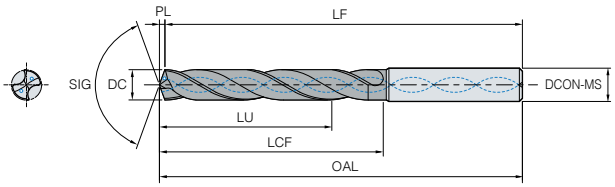
Terminology	S
Grade	PC325T
Tolerance(drill Dia.)	h7
Tolerance(shank Dia.)	h6
Point angle(SIG)	140°
Twist angle	30°
Thinning	X type
International standard	DIN 6537
Shank type	DIN 6535 HA
Coolant	Through

S Heat resistant alloy, Titanium alloy

(mm)

Designation		DC	DCON-MS	3S					5S				
				LU	LCF	LF	OAL	PL	LU	LCF	LF	OAL	PL
MSDPH	092-□S	9.2	10	27.6	47	87.3	89	1.7	46	61	101.3	103	1.7
	093-□S	9.3	10	27.9	47	87.3	89	1.7	46.5	61	101.3	103	1.7
	094-□S	9.4	10	28.2	47	87.3	89	1.7	47	61	101.3	103	1.7
	095-□S	9.5	10	28.5	47	87.3	89	1.7	47.5	61	101.3	103	1.7
	0953-□S	9.53	10	28.59	47	87.3	89	1.7	47.65	61	101.3	103	1.7
	096-□S	9.6	10	28.8	47	87.3	89	1.7	48	61	101.3	103	1.7
	097-□S	9.7	10	29.1	47	87.2	89	1.8	48.5	61	101.2	103	1.8
	098-□S	9.8	10	29.4	47	87.2	89	1.8	49	61	101.2	103	1.8
	099-□S	9.9	10	29.7	47	87.2	89	1.8	49.5	61	101.2	103	1.8
	0992-□S	9.92	10	29.76	47	87.2	89	1.8	49.6	61	101.2	103	1.8
	100-□S	10	10	30	47	87.2	89	1.8	50	61	101.2	103	1.8
	101-□S	10.1	12	30.3	55	100.2	102	1.8	50.5	71	116.2	118	1.8
	102-□S	10.2	12	30.6	55	100.1	102	1.9	51	71	116.1	118	1.9
	103-□S	10.3	12	30.9	55	100.1	102	1.9	51.5	71	116.1	118	1.9
	1032-□S	10.32	12	30.96	55	100.1	102	1.9	51.6	71	116.1	118	1.9
	104-□S	10.4	12	31.2	55	100.1	102	1.9	52	71	116.1	118	1.9
	105-□S	10.5	12	31.5	55	100.1	102	1.9	52.5	71	116.1	118	1.9
	106-□S	10.6	12	31.8	55	100.1	102	1.9	53	71	116.1	118	1.9
	107-□S	10.7	12	32.1	55	100.1	102	1.9	53.5	71	116.1	118	1.9
	1072-□S	10.72	12	32.16	55	100	102	2	53.6	71	116	118	2
	108-□S	10.8	12	32.4	55	100	102	2	54	71	116	118	2
	109-□S	10.9	12	32.7	55	100	102	2	54.5	71	116	118	2
	110-□S	11	12	33	55	100	102	2	55	71	116	118	2
	111-□S	11.1	12	33.3	55	100	102	2	55.5	71	116	118	2
	1111-□S	11.11	12	33.33	55	100	102	2	55.55	71	116	118	2
	112-□S	11.2	12	33.6	55	100	102	2	56	71	116	118	2
	113-□S	11.3	12	33.9	55	99.9	102	2.1	56.5	71	115.9	118	2.1
	114-□S	11.4	12	34.2	55	99.9	102	2.1	57	71	115.9	118	2.1
	115-□S	11.5	12	34.5	55	99.9	102	2.1	57.5	71	115.9	118	2.1
	1151-□S	11.51	12	34.53	55	99.9	102	2.1	57.55	71	115.9	118	2.1
	116-□S	11.6	12	34.8	55	99.9	102	2.1	58	71	115.9	118	2.1
	117-□S	11.7	12	35.1	55	99.9	102	2.1	58.5	71	115.9	118	2.1
	118-□S	11.8	12	35.4	55	99.9	102	2.1	59	71	115.9	118	2.1
	119-□S	11.9	12	35.7	55	99.8	102	2.2	59.5	71	115.8	118	2.2
	1191-□S	11.91	12	35.73	55	99.8	102	2.2	59.55	71	115.8	118	2.2
	120-□S	12	12	36	55	99.8	102	2.2	60	71	115.8	118	2.2
	121-□S	12.1	14	36.3	60	104.8	107	2.2	60.5	77	121.8	124	2.2
	122-□S	12.2	14	36.6	60	104.8	107	2.2	61	77	121.8	124	2.2
	123-□S	12.3	14	36.9	60	104.8	107	2.2	61.5	77	121.8	124	2.2

MSDPH-S (3D, 5D)



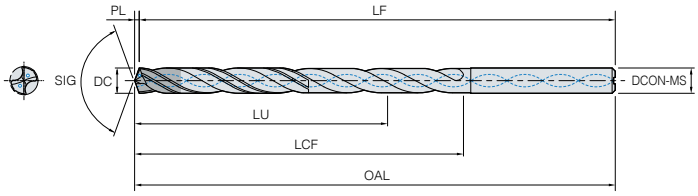
Terminology	S
Grade	PC325T
Tolerance(drill Dia.)	h7
Tolerance(shank Dia.)	h6
Point angle(SIG)	140°
Twist angle	30°
Thinning	X type
International standard	DIN 6537
Shank type	DIN 6535 HA
Coolant	Through

S Heat resistant alloy, Titanium alloy

(mm)

Designation		DC	DCON-MS	3S					5S				
				LU	LCF	LF	OAL	PL	LU	LCF	LF	OAL	PL
MSDPH	124-□S	12.4	14	37.2	60	104.7	107	2.3	62	77	121.7	124	2.3
	125-□S	12.5	14	37.5	60	104.7	107	2.3	62.5	77	121.7	124	2.3
	126-□S	12.6	14	37.8	60	104.7	107	2.3	63	77	121.7	124	2.3
	127-□S	12.7	14	38.1	60	104.7	107	2.3	63.5	77	121.7	124	2.3
	128-□S	12.8	14	38.4	60	104.7	107	2.3	64	77	121.7	124	2.3
	129-□S	12.9	14	38.7	60	104.7	107	2.3	64.5	77	121.7	124	2.3
	130-□S	13	14	39	60	104.6	107	2.4	65	77	121.6	124	2.4
	131-□S	13.1	14	39.3	60	104.6	107	2.4	65.5	77	121.6	124	2.4
	132-□S	13.2	14	39.6	60	104.6	107	2.4	66	77	121.6	124	2.4
	133-□S	13.3	14	39.9	60	104.6	107	2.4	66.5	77	121.6	124	2.4
	134-□S	13.4	14	40.2	60	104.6	107	2.4	67	77	121.6	124	2.4
	1349-□S	13.49	14	40.47	60	104.5	107	2.5	67.45	77	121.5	124	2.5
	135-□S	13.5	14	40.5	60	104.5	107	2.5	67.5	77	121.5	124	2.5
	136-□S	13.6	14	40.8	60	104.5	107	2.5	68	77	121.5	124	2.5
	137-□S	13.7	14	41.1	60	104.5	107	2.5	68.5	77	121.5	124	2.5
	138-□S	13.8	14	41.4	60	104.5	107	2.5	69	77	121.5	124	2.5
	139-□S	13.9	14	41.7	60	104.5	107	2.5	69.5	77	121.5	124	2.5
	140-□S	14	14	42	60	104.5	107	2.5	70	77	121.5	124	2.5
	141-□S	14.1	16	42.3	65	112.4	115	2.6	70.5	83	130.4	133	2.6
	142-□S	14.2	16	42.6	65	112.4	115	2.6	71	83	130.4	133	2.6
	1429-□S	14.29	16	42.87	65	112.4	115	2.6	71.45	83	130.4	133	2.6
	143-□S	14.3	16	42.9	65	112.4	115	2.6	71.5	83	130.4	133	2.6
	144-□S	14.4	16	43.2	65	112.4	115	2.6	72	83	130.4	133	2.6
	145-□S	14.5	16	43.5	65	112.4	115	2.6	72.5	83	130.4	133	2.6
	146-□S	14.6	16	43.8	65	112.3	115	2.7	73	83	130.3	133	2.7
	147-□S	14.7	16	44.1	65	112.3	115	2.7	73.5	83	130.3	133	2.7
	148-□S	14.8	16	44.4	65	112.3	115	2.7	74	83	130.3	133	2.7
	149-□S	14.9	16	44.7	65	112.3	115	2.7	74.5	83	130.3	133	2.7
	150-□S	15	16	45	65	112.3	115	2.7	75	83	130.3	133	2.7
	151-□S	15.1	16	45.3	65	112.3	115	2.7	75.5	83	130.3	133	2.7
	152-□S	15.2	16	45.6	65	112.2	115	2.8	76	83	130.2	133	2.8
	153-□S	15.3	16	45.9	65	112.2	115	2.8	76.5	83	130.2	133	2.8
	154-□S	15.4	16	46.2	65	112.2	115	2.8	77	83	130.2	133	2.8
	155-□S	15.5	16	46.5	65	112.2	115	2.8	77.5	83	130.2	133	2.8
	156-□S	15.6	16	46.8	65	112.2	115	2.8	78	83	130.2	133	2.8
	157-□S	15.7	16	47.1	65	112.1	115	2.9	78.5	83	130.1	133	2.9
	158-□S	15.8	16	47.4	65	112.1	115	2.9	79	83	130.1	133	2.9
	1587-□S	15.87	16	47.61	65	112.1	115	2.9	79.35	83	130.1	133	2.9
	159-□S	15.9	16	47.7	65	112.1	115	2.9	79.5	83	130.1	133	2.9
	160-□S	16	16	48	65	112.1	115	2.9	80	88	130.1	133	2.9

MSDPH-S (8D, 10D)



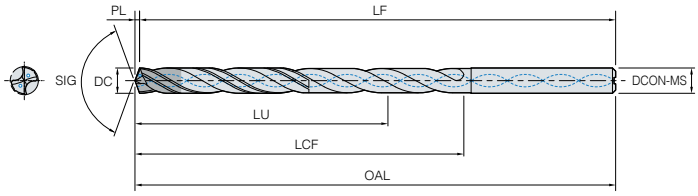
Terminology	S
Grade	PC325T
Tolerance(drill Dia.)	h7
Tolerance(shank Dia.)	h6
Point angle(SIG)	140°
Twist angle	30°
Thinning	X type
International standard	DIN 6537
Shank type	DIN 6535 HA
Coolant	Through

S Heat resistant alloy, Titanium alloy

(mm)

Designation		DC	DCON-MS	8S					10S				
				LU	LCF	LF	OAL	PL	LU	LCF	LF	OAL	PL
MSDPH	030-□S	3	3	24	33	82.5	83	0.5	30	39	88.5	89	0.5
	031-□S	3.1	4	24.8	38	93.4	94	0.6	31	45	101.4	102	0.6
	0318-□S	3.18	4	25.44	38	93.4	94	0.6	31.8	45	101.4	102	0.6
	032-□S	3.2	4	25.6	38	93.4	94	0.6	32	45	101.4	102	0.6
	033-□S	3.3	4	26.4	38	93.4	94	0.6	33	45	101.4	102	0.6
	034-□S	3.4	4	27.2	38	93.4	94	0.6	34	45	101.4	102	0.6
	035-□S	3.5	4	28	38	93.4	94	0.6	35	45	101.4	102	0.6
	0357-□S	3.57	4	28.56	44	93.4	94	0.6	35.7	52	101.4	102	0.6
	036-□S	3.6	4	28.8	44	93.3	94	0.7	36	52	101.3	102	0.7
	037-□S	3.7	4	29.6	44	93.3	94	0.7	37	52	101.3	102	0.7
	038-□S	3.8	4	30.4	44	93.3	94	0.7	38	52	101.3	102	0.7
	039-□S	3.9	4	31.2	44	93.3	94	0.7	39	52	101.3	102	0.7
	0397-□S	3.97	4	31.76	44	93.3	94	0.7	39.7	52	101.3	102	0.7
	040-□S	4	4	32	44	93.3	94	0.7	40	52	101.3	102	0.7
	041-□S	4.1	5	32.8	49	104.3	105	0.7	41	58	114.3	115	0.7
	042-□S	4.2	5	33.6	49	104.2	105	0.8	42	58	114.2	115	0.8
	043-□S	4.3	5	34.4	49	104.2	105	0.8	43	58	114.2	115	0.8
	0437-□S	4.37	5	34.96	49	104.2	105	0.8	43.7	58	114.2	115	0.8
	044-□S	4.4	5	35.2	49	104.2	105	0.8	44	58	114.2	115	0.8
	045-□S	4.5	5	36	49	104.2	105	0.8	45	58	114.2	115	0.8
	046-□S	4.6	5	36.8	55	104.2	105	0.8	46	65	114.2	115	0.8
	047-□S	4.7	5	37.6	55	104.1	105	0.9	47	65	114.1	115	0.9
	0476-□S	4.76	5	38.08	55	104.1	105	0.9	47.6	65	114.1	115	0.9
	048-□S	4.8	5	38.4	55	104.1	105	0.9	48	65	114.1	115	0.9
	049-□S	4.9	5	39.2	55	104.1	105	0.9	49	65	114.1	115	0.9
	050-□S	5	5	40	55	104.1	105	0.9	50	65	114.1	115	0.9
	051-□S	5.1	6	40.8	60	115.1	116	0.9	51	71	127.1	128	0.9
	0516-□S	5.16	6	41.28	60	115.1	116	0.9	51.6	71	127.1	128	0.9
	052-□S	5.2	6	41.6	60	115.1	116	0.9	52	71	127.1	128	0.9
	053-□S	5.3	6	42.4	60	115	116	1	53	71	127	128	1
	054-□S	5.4	6	43.2	60	115	116	1	54	71	127	128	1
	055-□S	5.5	6	44	60	115	116	1	55	71	127	128	1
	0556-□S	5.56	6	44.48	66	115	116	1	55.6	78	127	128	1
	056-□S	5.6	6	44.8	66	115	116	1	56	78	127	128	1
	057-□S	5.7	6	45.6	66	115	116	1	57	78	127	128	1
	058-□S	5.8	6	46.4	66	114.9	116	1.1	58	78	126.9	128	1.1
	0595-□S	5.95	6	47.6	66	114.9	116	1.1	59.5	78	126.9	128	1.1
	059-□S	5.95	6	47.6	66	114.9	116	1.1	59.5	78	126.9	128	1.1
	060-□S	6	6	48	66	114.9	116	1.1	60	78	126.9	128	1.1

MSDPH-S (8D, 10D)



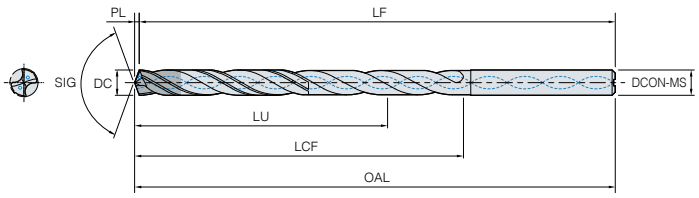
Terminology	S
Grade	PC325T
Tolerance(drill Dia.)	h7
Tolerance(shank Dia.)	h6
Point angle(SIG)	140°
Twist angle	30°
Thinning	X type
International standard	DIN 6537
Shank type	DIN 6535 HA
Coolant	Through

S Heat resistant alloy, Titanium alloy

(mm)

Designation		DC	DCON-MS	8S					10S				
				LU	LCF	LF	OAL	PL	LU	LCF	LF	OAL	PL
MSDPH	061-□S	6.1	7	48.8	71	125.9	127	1.1	61	84	139.9	141	1.1
	062-□S	6.2	7	49.6	71	125.9	127	1.1	62	84	139.9	141	1.1
	063-□S	6.3	7	50.4	71	125.9	127	1.1	63	84	139.9	141	1.1
	0635-□S	6.35	7	50.8	71	125.8	127	1.2	63.5	84	139.8	141	1.2
	064-□S	6.4	7	51.2	71	125.8	127	1.2	64	84	139.8	141	1.2
	065-□S	6.5	7	52	71	125.8	127	1.2	65	84	139.8	141	1.2
	066-□S	6.6	7	52.8	77	125.8	127	1.2	66	91	139.8	141	1.2
	067-□S	6.7	7	53.6	77	125.8	127	1.2	67	91	139.8	141	1.2
	0675-□S	6.75	7	54	77	125.8	127	1.2	67.5	91	139.8	141	1.2
	068-□S	6.8	7	54.4	77	125.8	127	1.2	68	91	139.8	141	1.2
	069-□S	6.9	7	55.2	77	125.7	127	1.3	69	91	139.7	141	1.3
	070-□S	7	7	56	77	125.7	127	1.3	70	91	139.7	141	1.3
	071-□S	7.1	8	56.8	82	136.7	138	1.3	71	97	152.7	154	1.3
	0714-□S	7.14	8	57.12	82	136.7	138	1.3	71.4	97	152.7	154	1.3
	072-□S	7.2	8	57.6	82	136.7	138	1.3	72	97	152.7	154	1.3
	073-□S	7.3	8	58.4	82	136.7	138	1.3	73	97	152.7	154	1.3
	074-□S	7.4	8	59.2	82	136.7	138	1.3	74	97	152.7	154	1.3
	075-□S	7.5	8	60	82	136.6	138	1.4	75	97	152.6	154	1.4
	0754-□S	7.54	8	60.32	88	136.6	138	1.4	75.4	104	152.6	154	1.4
	076-□S	7.6	8	60.8	88	136.6	138	1.4	76	104	152.6	154	1.4
	077-□S	7.7	8	61.6	88	136.6	138	1.4	77	104	152.6	154	1.4
	078-□S	7.8	8	62.4	88	136.6	138	1.4	78	104	152.6	154	1.4
	079-□S	7.9	8	63.2	88	136.6	138	1.4	79	104	152.6	154	1.4
	0794-□S	7.94	8	63.52	88	136.6	138	1.4	79.4	104	152.6	154	1.4
	080-□S	8	8	64	88	136.5	138	1.5	80	104	152.5	154	1.5
	081-□S	8.1	9	64.8	93	147.5	149	1.5	81	110	165.5	167	1.5
	082-□S	8.2	9	65.6	93	147.5	149	1.5	82	110	165.5	167	1.5
	083-□S	8.3	9	66.4	93	147.5	149	1.5	83	110	165.5	167	1.5
	0833-□S	8.33	9	66.64	93	147.5	149	1.5	83.3	110	165.5	167	1.5
	084-□S	8.4	9	67.2	93	147.5	149	1.5	84	110	165.5	167	1.5
	085-□S	8.5	9	68	93	147.5	149	1.5	85	110	165.5	167	1.5
	086-□S	8.6	9	68.8	99	147.4	149	1.6	86	117	165.4	167	1.6
	087-□S	8.7	9	69.6	99	147.4	149	1.6	87	117	165.4	167	1.6
	0873-□S	8.73	9	69.84	99	147.4	149	1.6	87.3	117	165.4	167	1.6
	088-□S	8.8	9	70.4	99	147.4	149	1.6	88	117	165.4	167	1.6
	089-□S	8.9	9	71.2	99	147.4	149	1.6	89	117	165.4	167	1.6
	090-□S	9	9	72	99	147.4	149	1.6	90	117	165.4	167	1.6
	091-□S	9.1	10	72.8	110	168.3	170	1.7	91	130	188.3	190	1.7
	0913-□S	9.13	10	73.04	110	168.3	170	1.7	91.3	130	188.3	190	1.7

MSDPH-S (8D, 10D)



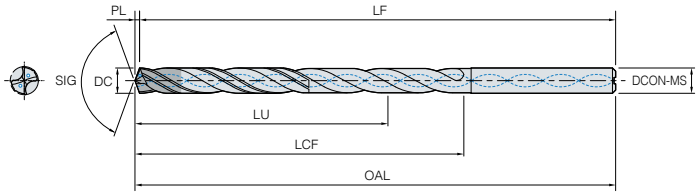
Terminology	S
Grade	PC325T
Tolerance(drill Dia.)	h7
Tolerance(shank Dia.)	h6
Point angle(SIG)	140°
Twist angle	30°
Thinning	X type
International standard	DIN 6537
Shank type	DIN 6535 HA
Coolant	Through

S Heat resistant alloy, Titanium alloy

(mm)

Designation		DC	DCON-MS	8S					10S				
				LU	LCF	LF	OAL	PL	LU	LCF	LF	OAL	PL
MSDPH	092-□S	9.2	10	73.6	110	168.3	170	1.7	92	130	188.3	190	1.7
	093-□S	9.3	10	74.4	110	168.3	170	1.7	93	130	188.3	190	1.7
	094-□S	9.4	10	75.2	110	168.3	170	1.7	94	130	188.3	190	1.7
	095-□S	9.5	10	76	110	168.3	170	1.7	95	130	188.3	190	1.7
	0953-□S	9.53	10	76.24	110	168.3	170	1.7	95.3	130	188.3	190	1.7
	096-□S	9.6	10	76.8	110	168.3	170	1.7	96	130	188.3	190	1.7
	097-□S	9.7	10	77.6	110	168.2	170	1.8	97	130	188.2	190	1.8
	098-□S	9.8	10	78.4	110	168.2	170	1.8	98	130	188.2	190	1.8
	099-□S	9.9	10	79.2	110	168.2	170	1.8	99	130	188.2	190	1.8
	0992-□S	9.92	10	79.36	110	168.2	170	1.8	99.2	130	188.2	190	1.8
	100-□S	10	10	80	110	168.2	170	1.8	100	130	188.2	190	1.8
	101-□S	10.1	11	80.8	121	179.2	181	1.8	101	143	201.2	203	1.8
	102-□S	10.2	11	81.6	121	179.1	181	1.9	102	143	201.1	203	1.9
	103-□S	10.3	11	82.4	121	179.1	181	1.9	103	143	201.1	203	1.9
	1032-□S	10.32	11	82.56	121	179.1	181	1.9	103.2	143	201.1	203	1.9
	104-□S	10.4	11	83.2	121	179.1	181	1.9	104	143	201.1	203	1.9
	105-□S	10.5	11	84	121	179.1	181	1.9	105	143	201.1	203	1.9
	106-□S	10.6	11	84.8	121	179.1	181	1.9	106	143	201.1	203	1.9
	107-□S	10.7	11	85.6	121	179.1	181	1.9	107	143	201.1	203	1.9
	1072-□S	10.72	11	85.76	121	179	181	2	107.2	143	201	203	2
	108-□S	10.8	11	86.4	121	179	181	2	108	143	201	203	2
	109-□S	10.9	11	87.2	121	179	181	2	109	143	201	203	2
	110-□S	11	11	88	121	179	181	2	110	143	201	203	2
	111-□S	11.1	12	88.8	132	190	192	2	111	156	214	216	2
	1111-□S	11.11	12	88.88	132	190	192	2	111.1	156	214	216	2
	112-□S	11.2	12	89.6	132	190	192	2	112	156	214	216	2
	113-□S	11.3	12	90.4	132	189.9	192	2.1	113	156	213.9	216	2.1
	114-□S	11.4	12	91.2	132	189.9	192	2.1	114	156	213.9	216	2.1
	115-□S	11.5	12	92	132	189.9	192	2.1	115	156	213.9	216	2.1
	1151-□S	11.51	12	92.08	132	189.9	192	2.1	115.1	156	213.9	216	2.1
	116-□S	11.6	12	92.8	132	189.9	192	2.1	116	156	213.9	216	2.1
	117-□S	11.7	12	93.6	132	189.9	192	2.1	117	156	213.9	216	2.1
	118-□S	11.8	12	94.4	132	189.9	192	2.1	118	156	213.9	216	2.1
	119-□S	11.9	12	95.2	132	189.8	192	2.2	119	156	213.8	216	2.2
	1191-□S	11.91	12	95.28	132	189.8	192	2.2	119.1	156	213.8	216	2.2
	120-□S	12	12	96	132	189.8	192	2.2	120	156	213.8	216	2.2
	121-□S	12.1	13	96.8	143	200.8	203	2.2	121	169	226.8	229	2.2
	122-□S	12.2	13	97.6	143	200.8	203	2.2	122	169	226.8	229	2.2
	123-□S	12.3	13	98.4	143	200.8	203	2.2	123	169	226.8	229	2.2

MSDPH-S (8D, 10D)



Terminology	S
Grade	PC325T
Tolerance(drill Dia.)	h7
Tolerance(shank Dia.)	h6
Point angle(SIG)	140°
Twist angle	30°
Thinning	X type
International standard	DIN 6537
Shank type	DIN 6535 HA
Coolant	Through

S Heat resistant alloy, Titanium alloy

(mm)

Designation		DC	DCON-MS	8S					10S				
				LU	LCF	LF	OAL	PL	LU	LCF	LF	OAL	PL
MSDPH	124-□S	12.4	13	99.2	143	200.7	203	2.3	124	169	226.7	229	2.3
	125-□S	12.5	13	100	143	200.7	203	2.3	125	169	226.7	229	2.3
	126-□S	12.6	13	100.8	143	200.7	203	2.3	126	169	226.7	229	2.3
	127-□S	12.7	13	101.6	143	200.7	203	2.3	127	169	226.7	229	2.3
	128-□S	12.8	13	102.4	143	200.7	203	2.3	128	169	226.7	229	2.3
	129-□S	12.9	13	103.2	143	200.7	203	2.3	129	169	226.7	229	2.3
	130-□S	13	13	104	143	200.6	203	2.4	130	169	226.6	229	2.4
	131-□S	13.1	14	104.8	154	211.6	214	2.4	131	182	239.6	242	2.4
	132-□S	13.2	14	105.6	154	211.6	214	2.4	132	182	239.6	242	2.4
	133-□S	13.3	14	106.4	154	211.6	214	2.4	133	182	239.6	242	2.4
	134-□S	13.4	14	107.2	154	211.6	214	2.4	134	182	239.6	242	2.4
	1349-□S	13.49	14	107.92	154	211.5	214	2.5	134.9	182	239.5	242	2.5
	135-□S	13.5	14	108	154	211.5	214	2.5	135	182	239.5	242	2.5
	136-□S	13.6	14	108.8	154	211.5	214	2.5	136	182	239.5	242	2.5
	137-□S	13.7	14	109.6	154	211.5	214	2.5	137	182	239.5	242	2.5
	138-□S	13.8	14	110.4	154	211.5	214	2.5	138	182	239.5	242	2.5
	139-□S	13.9	14	111.2	154	211.5	214	2.5	139	182	239.5	242	2.5
	140-□S	14	14	112	154	211.5	214	2.5	140	182	239.5	242	2.5
	141-□S	14.1	15	112.8	165	222.4	225	2.6	141	195	252.4	255	2.6
	142-□S	14.2	15	113.6	165	222.4	225	2.6	142	195	252.4	255	2.6
	1429-□S	14.29	15	114.32	165	222.4	225	2.6	142.9	195	252.4	255	2.6
	143-□S	14.3	15	114.4	165	222.4	225	2.6	143	195	252.4	255	2.6
	144-□S	14.4	15	115.2	165	222.4	225	2.6	144	195	252.4	255	2.6
	145-□S	14.5	15	116	165	222.4	225	2.6	145	195	252.4	255	2.6
	146-□S	14.6	15	116.8	165	222.3	225	2.7	146	195	252.3	255	2.7
	147-□S	14.7	15	117.6	165	222.3	225	2.7	147	195	252.3	255	2.7
	148-□S	14.8	15	118.4	165	222.3	225	2.7	148	195	252.3	255	2.7
	149-□S	14.9	15	119.2	165	222.3	225	2.7	149	195	252.3	255	2.7
	150-□S	15	15	120	165	222.3	225	2.7	150	195	252.3	255	2.7
	151-□S	15.1	16	120.8	176	233.3	236	2.7	151	208	265.3	268	2.7
	152-□S	15.2	16	121.6	176	233.2	236	2.8	152	208	265.2	268	2.8
	153-□S	15.3	16	122.4	176	233.2	236	2.8	153	208	265.2	268	2.8
	154-□S	15.4	16	123.2	176	233.2	236	2.8	154	208	265.2	268	2.8
	155-□S	15.5	16	124	176	233.2	236	2.8	155	208	265.2	268	2.8
	156-□S	15.6	16	124.8	176	233.2	236	2.8	156	208	265.2	268	2.8
	157-□S	15.7	16	125.6	176	233.1	236	2.9	157	208	265.1	268	2.9
	158-□S	15.8	16	126.4	176	233.1	236	2.9	158	208	265.1	268	2.9
	1587-□S	15.87	16	126.96	176	233.1	236	2.9	158.7	208	265.1	268	2.9
	159-□S	15.9	16	127.2	176	233.1	236	2.9	159	208	265.1	268	2.9
	160-□S	16	16	128	176	233.1	236	2.9	160	208	265.1	268	2.9

Optimized tool for hole making of CFRP

MSD Plus for CFRP

Mach Solid Drill Plus for CFRP

- KORLOY's new diamond coated grade ND2100 offers excellent wear resistance
- The optimal cutting edge reduces burrs

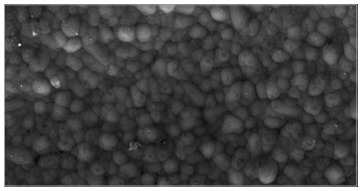
Code system

Special type

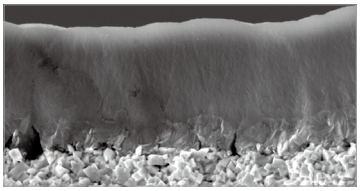
MSDP	060	-	5	C	-	100L	-	6S
Mach Solid Drill Plus	**Drill dia.(DC)** 060: Ø6.0 mm (One decimal place marked)		**Standard type** Aspect ratio (L/D) **Special type** Flute length 100: 100 mm	**Machining area** C: CFRP		**Overall length** 100L: 100mm		**Shank dia.** 6S: Ø6mm

Features

- Diamond coating specialized in CFRP machining
- Diamond-coated substrate optimized for CFRP cutting (ND2100)

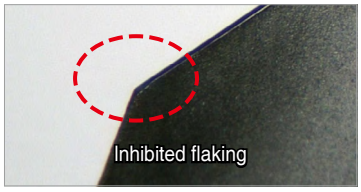


High hardness diamond coating maintains well-cut shapes

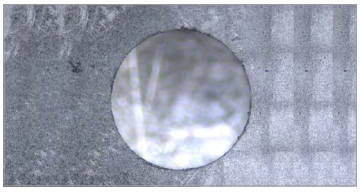


Diamond coating's strong grip to the substrate

- Inhibited burr creation by keeping cutting edges in good shape

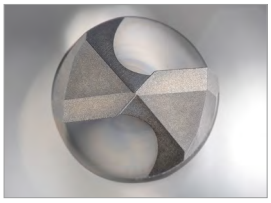


Less wear and flaking on the rake surface

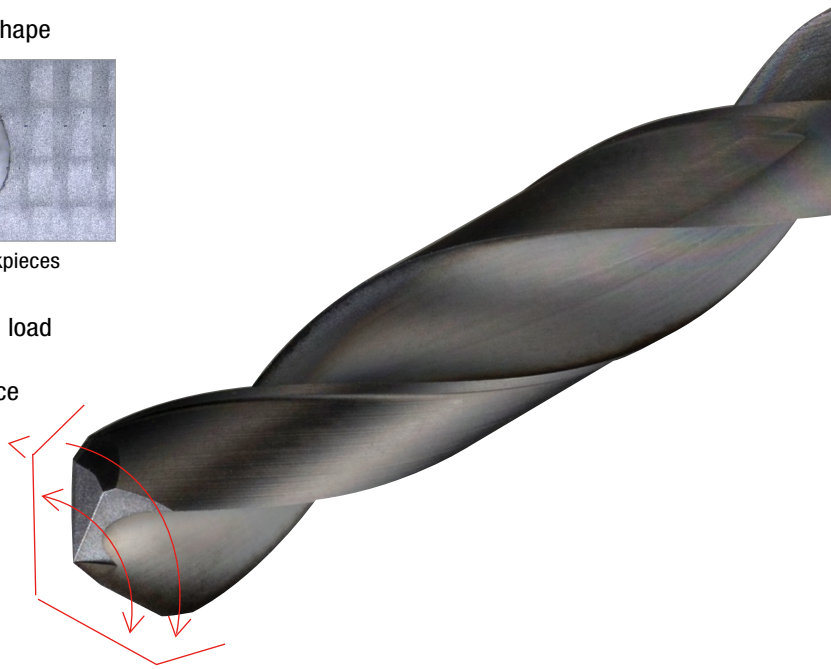


Fewer burrs on workpieces

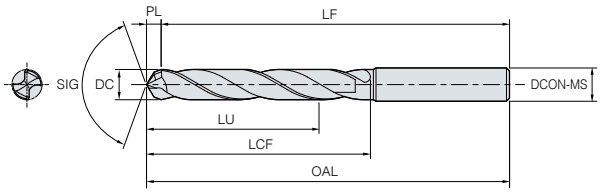
- The cutting edge with a 2 step shape reduces the cutting load
- The optimal point angle of cutting edge reduces burrs
- Higher hardness of cutting edge increases wear resistance



ND2100



MSDP-5C



Terminology	C
Grade	ND2100
Tolerance(drill Dia.)	m7
Tolerance(shank Dia.)	h6
Point angle(SIG)	118°
Twist angle	30°
Thinning	X type
Coolant	External

C CFRP

(mm)

Designation		DC		DCON-MS	5C		
		mm	inch		LU	LCF	OAL
MSDP	030-5C	3	-	6	15	28.7	66
	040-5C	4	-	6	20	37.2	74
	0476-5C	4.76	3/16	6	23.8	45.5	82
	050-5C	5	-	6	25	45.6	82
	060-5C	6	-	6	30	46	82
	0635-5C	6.35	1/4	8	31.75	55.2	91
	070-5C	7	-	8	35	55.4	91
	0794-5C	7.94	5/16	8	39.7	55.8	91
	080-5C	8	-	8	40	55.9	91
	090-5C	9	-	10	45	64.3	103
	0952-5C	9.52	3/8	10	47.6	64.5	103
	100-5C	10	-	10	50	64.7	103
	110-5C	11	-	12	55	75.1	118
	1111-5C	11.11	7/16	12	55.55	75.2	118
	120-5C	12	-	12	60	75.5	118
	127-5C	12.7	1/2	14	63.5	75.8	124

The best tool for ramped, curved or flat workpieces

MSFD

Mach Solid Flat Drill

- High quality hole making capability with 180° - point angle
- Improved anti chipping and welding resistance by edge honing and chamfering Minimized creation of burrs compared to general drills

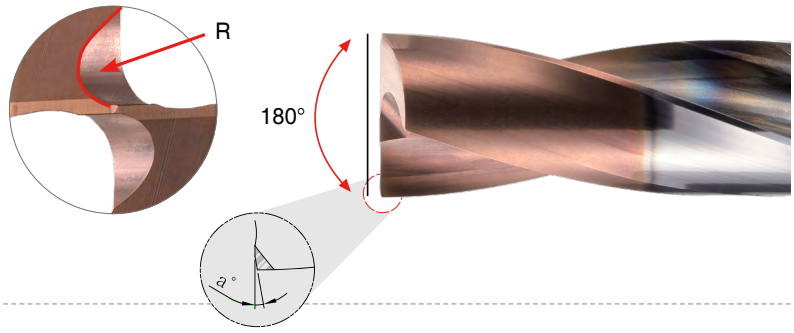
Code system

Special type

MSFD(H)	060	-	2	P	-	100L	-	6S
Oil hole	**Drill dia. (DC)**		**Standard type**	**Machining area**		**Overall length**		**Shank dia.**
None: MSFD With oil holes: MSFDH	060: Ø6.0 mm (One decimal place marked)		Aspect ratio (L/D) 2D, 3D **Special type** Flute length 100: 100 mm	P: General - Carbon steel, alloy steel		100L: 100mm		6S: Ø6mm

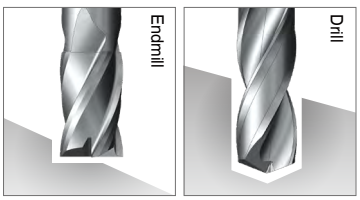
Features

- Excellent straightness with its 180° - point angle when drilling on ramped surface
- Stronger resistance to chipping through corner chamfering
- Widened chip pockets by the use of 'R' shape on the thinning part



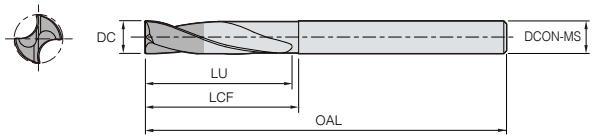
- Multi-functional capability - end milling and drilling using a single MSFD

MSFD



Conventional tools application example

MSFD-2P



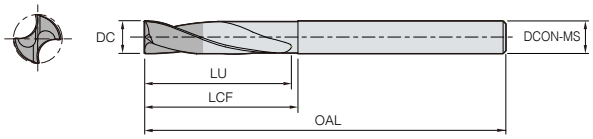
Terminology	P
Grade	PC325U
Tolerance(drill Dia.)	H7
Tolerance(shank Dia.)	h6
Point angle(SIG)	180°
Twist angle	20°
Thinning	R type
Coolant	External

P Steel

(mm)

Designation		DC	DCON-MS	2P		
				LU	LCF	OAL
MSFD	025-2P	2.5	4	5	10.5	50
	026-2P	2.6	4	5.2	10.9	50
	027-2P	2.7	4	5.4	11.3	50
	028-2P	2.8	4	5.6	11.8	50
	029-2P	2.9	4	5.8	12.2	50
	030-2P	3	6	6	12.6	50
	031-2P	3.1	6	6.2	13	50
	032-2P	3.2	6	6.4	13.4	50
	033-2P	3.3	6	6.6	13.9	50
	034-2P	3.4	6	6.8	14.3	50
	035-2P	3.5	6	7	14.7	50
	036-2P	3.6	6	7.2	15.1	50
	037-2P	3.7	6	7.4	15.5	50
	038-2P	3.8	6	7.6	16	50
	039-2P	3.9	6	7.8	16.4	50
	040-2P	4	6	8	16.8	50
	041-2P	4.1	6	8.2	17.2	60
	042-2P	4.2	6	8.4	17.6	60
	043-2P	4.3	6	8.6	18.1	60
	044-2P	4.4	6	8.8	18.5	60
	045-2P	4.5	6	9	18.9	60
	046-2P	4.6	6	9.2	19.3	60
	047-2P	4.7	6	9.4	19.7	60
	048-2P	4.8	6	9.6	20.2	60
	049-2P	4.9	6	9.8	20.6	60
	050-2P	5	6	10	21	60
	051-2P	5.1	6	10.2	21.4	60
	052-2P	5.2	6	10.4	21.8	60
	053-2P	5.3	6	10.6	22.3	60
	054-2P	5.4	6	10.8	22.7	60
	055-2P	5.5	6	11	23.1	60
	056-2P	5.6	6	11.2	23.5	60
	057-2P	5.7	6	11.4	23.9	60
	058-2P	5.8	6	11.6	24.4	60
	059-2P	5.9	6	11.8	24.8	60
	060-2P	6	6	12	25.2	60
	061-2P	6.1	8	12.2	25.6	70
	062-2P	6.2	8	12.4	26	70
	063-2P	6.3	8	12.6	26.5	70
	064-2P	6.4	8	12.8	26.9	70
	065-2P	6.5	8	13	27.3	70
	066-2P	6.6	8	13.2	27.7	70
	067-2P	6.7	8	13.4	28.1	70
	068-2P	6.8	8	13.6	28.6	70
	069-2P	6.9	8	13.8	29	70
	070-2P	7	8	14	29.4	70

MSFD-2P



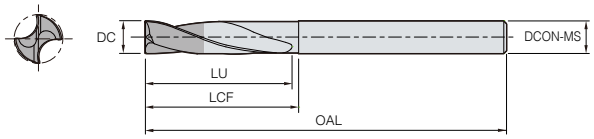
Terminology	P
Grade	PC325U
Tolerance(drill Dia.)	H7
Tolerance(shank Dia.)	h6
Point angle(SIG)	180°
Twist angle	20°
Thinning	R type
Coolant	External

P Steel

(mm)

Designation		DC	DCON-MS	2P		
				LU	LCF	OAL
MSFD	071-2P	7.1	8	14.2	29.8	70
	072-2P	7.2	8	14.4	30.2	70
	073-2P	7.3	8	14.6	30.7	70
	074-2P	7.4	8	14.8	31.1	70
	075-2P	7.5	8	15	31.5	70
	076-2P	7.6	8	15.2	31.9	70
	077-2P	7.7	8	15.4	32.3	70
	078-2P	7.8	8	15.6	32.8	70
	079-2P	7.9	8	15.8	33.2	70
	080-2P	8	8	16	33.6	70
	081-2P	8.1	10	16.2	34	80
	082-2P	8.2	10	16.4	34.4	80
	083-2P	8.3	10	16.6	34.9	80
	084-2P	8.4	10	16.8	35.3	80
	085-2P	8.5	10	17	35.7	80
	086-2P	8.6	10	17.2	36.1	80
	087-2P	8.7	10	17.4	36.5	80
	088-2P	8.8	10	17.6	37	80
	089-2P	8.9	10	17.8	37.4	80
	090-2P	9	10	18	37.8	80
	091-2P	9.1	10	18.2	38.2	80
	092-2P	9.2	10	18.4	38.6	80
	093-2P	9.3	10	18.6	39.1	80
	094-2P	9.4	10	18.8	39.5	80
	095-2P	9.5	10	19	39.9	80
	096-2P	9.6	10	19.2	40.3	80
	097-2P	9.7	10	19.4	40.7	80
	098-2P	9.8	10	19.6	41.2	80
	099-2P	9.9	10	19.8	41.6	80
	100-2P	10	10	20	42	80
	101-2P	10.1	12	20.2	42.4	90
	102-2P	10.2	12	20.4	42.8	90
	103-2P	10.3	12	20.6	43.3	90
	104-2P	10.4	12	20.8	43.7	90
	105-2P	10.5	12	21	44.1	90
	106-2P	10.6	12	21.2	44.5	90
	107-2P	10.7	12	21.4	44.9	90
	108-2P	10.8	12	21.6	45.4	90
	109-2P	10.9	12	21.8	45.8	90
	110-2P	11	12	22	46.2	90
	111-2P	11.1	12	22.2	46.6	90
	112-2P	11.2	12	22.4	47	90
	113-2P	11.3	12	22.6	47.5	90
	114-2P	11.4	12	22.8	47.9	90
	115-2P	11.5	12	23	48.3	90
	116-2P	11.6	12	23.2	48.7	90

MSFD-2P



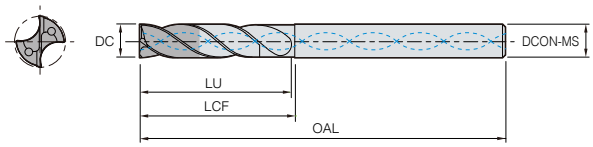
Terminology	P
Grade	PC325U
Tolerance(drill Dia.)	H7
Tolerance(shank Dia.)	h6
Point angle(SIG)	180°
Twist angle	20°
Thinning	R type
Coolant	External

P Steel

(mm)

Designation		DC	DCON-MS	2P		
				LU	LCF	OAL
MSFD	117-2P	11.7	12	23.4	49.1	90
	118-2P	11.8	12	23.6	49.6	90
	119-2P	11.9	12	23.8	50	90
	120-2P	12	12	24	50.4	90
	121-2P	12.1	14	24.2	50.8	100
	122-2P	12.2	14	24.4	51.2	100
	123-2P	12.3	14	24.6	51.7	100
	124-2P	12.4	14	24.8	52.1	100
	125-2P	12.5	14	25	52.5	100
	126-2P	12.6	14	25.2	52.9	100
	127-2P	12.7	14	25.4	53.3	100
	128-2P	12.8	14	25.6	53.8	100
	129-2P	12.9	14	25.8	54.2	100
	130-2P	13	14	26	54.6	100
	131-2P	13.1	14	26.2	55	100
	132-2P	13.2	14	26.4	55.4	100
	133-2P	13.3	14	26.6	55.9	100
	134-2P	13.4	14	26.8	56.3	100
	135-2P	13.5	14	27	56.7	110
	136-2P	13.6	14	27.2	57.1	110
	137-2P	13.7	14	27.4	57.5	110
	138-2P	13.8	14	27.6	58	110
	139-2P	13.9	14	27.8	58.4	110
	140-2P	14	14	28	58.8	110
	141-2P	14.1	16	28.2	59.2	110
	142-2P	14.2	16	28.4	59.6	110
	143-2P	14.3	16	28.6	60.1	110
	144-2P	14.4	16	28.8	60.5	110
	145-2P	14.5	16	29	60.9	110
	146-2P	14.6	16	29.2	61.3	110
	147-2P	14.7	16	29.4	61.7	110
	148-2P	14.8	16	29.6	62.2	110
	149-2P	14.9	16	29.8	62.6	110
	150-2P	15	16	30	63	110
	151-2P	15.1	16	30.2	65	115
	152-2P	15.2	16	30.4	65	115
	153-2P	15.3	16	30.6	65.1	115
	154-2P	15.4	16	30.8	65.1	115
	155-2P	15.5	16	31	65.1	115
	156-2P	15.6	16	31.2	67.1	115
	157-2P	15.7	16	31.4	67.1	115
	158-2P	15.8	16	31.6	67.2	115
	159-2P	15.9	16	31.8	67.2	115
	160-2P	16	16	32	67.2	115

MSFDH-3P



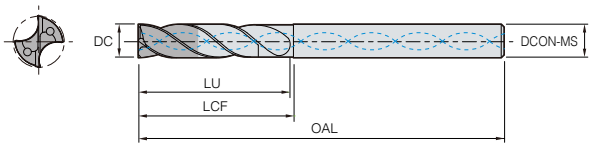
Terminology	P
Grade	PC325U
Tolerance(drill Dia.)	H7
Tolerance(shank Dia.)	h6
Point angle(SIG)	180°
Twist angle	30°
Thinning	R type
Coolant	Through

P Steel

(mm)

Designation		DC	DCON-MS	3P		
				LU	LCF	OAL
MSFDH	025-3P	2.5	3	7.5	17	58
	026-3P	2.6	3	7.8	17	58
	027-3P	2.7	3	8.1	17	58
	028-3P	2.8	3	8.4	17	58
	029-3P	2.9	3	8.7	17	58
	030-3P	3	6	9	20	62
	031-3P	3.1	6	9.3	20	62
	032-3P	3.2	6	9.6	20	62
	033-3P	3.3	6	9.9	20	62
	034-3P	3.4	6	10.2	20	62
	035-3P	3.5	6	10.5	20	62
	036-3P	3.6	6	10.8	20	62
	037-3P	3.7	6	11.1	20	62
	038-3P	3.8	6	11.4	24	66
	039-3P	3.9	6	11.7	24	66
	040-3P	4	6	12	24	66
	041-3P	4.1	6	12.3	24	66
	042-3P	4.2	6	12.6	24	66
	043-3P	4.3	6	12.9	24	66
	044-3P	4.4	6	13.2	24	66
	045-3P	4.5	6	13.5	24	66
	046-3P	4.6	6	13.8	24	66
	047-3P	4.7	6	14.1	24	66
	048-3P	4.8	6	14.4	28	66
	049-3P	4.9	6	14.7	28	66
	050-3P	5	6	15	28	66
	051-3P	5.1	6	15.3	28	66
	052-3P	5.2	6	15.6	28	66
	053-3P	5.3	6	15.9	28	66
	054-3P	5.4	6	16.2	28	66
	055-3P	5.5	6	16.5	28	66
	056-3P	5.6	6	16.8	28	66
	057-3P	5.7	6	17.1	28	66
	058-3P	5.8	6	17.4	28	66
	059-3P	5.9	6	17.7	28	66
	060-3P	6	6	18	28	66
	061-3P	6.1	8	18.3	34	79
	062-3P	6.2	8	18.6	34	79
	063-3P	6.3	8	18.9	34	79
	064-3P	6.4	8	19.2	34	79
	065-3P	6.5	8	19.5	34	79
	066-3P	6.6	8	19.8	34	79
	067-3P	6.7	8	20.1	34	79
	068-3P	6.8	8	20.4	34	79
	069-3P	6.9	8	20.7	34	79
	070-3P	7	8	21	34	79

MSFDH-3P



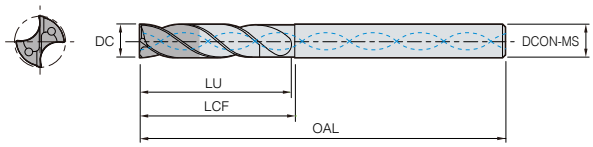
Terminology	P
Grade	PC325U
Tolerance(drill Dia.)	H7
Tolerance(shank Dia.)	h6
Point angle(SIG)	180°
Twist angle	30°
Thinning	R type
Coolant	Through

P Steel

(mm)

Designation		DC	DCON-MS	3P		
				LU	LCF	OAL
MSFDH	071-3P	7.1	8	21.3	41	79
	072-3P	7.2	8	21.6	41	79
	073-3P	7.3	8	21.9	41	79
	074-3P	7.4	8	22.2	41	79
	075-3P	7.5	8	22.5	41	79
	076-3P	7.6	8	22.8	41	79
	077-3P	7.7	8	23.1	41	79
	078-3P	7.8	8	23.4	41	79
	079-3P	7.9	8	23.7	41	79
	080-3P	8	8	24	41	79
	081-3P	8.1	10	24.3	47	89
	082-3P	8.2	10	24.6	47	89
	083-3P	8.3	10	24.9	47	89
	084-3P	8.4	10	25.2	47	89
	085-3P	8.5	10	25.5	47	89
	086-3P	8.6	10	25.8	47	89
	087-3P	8.7	10	26.1	47	89
	088-3P	8.8	10	26.4	47	89
	089-3P	8.9	10	26.7	47	89
	090-3P	9	10	27	47	89
	091-3P	9.1	10	27.3	47	89
	092-3P	9.2	10	27.6	47	89
	093-3P	9.3	10	27.9	47	89
	094-3P	9.4	10	28.2	47	89
	095-3P	9.5	10	28.5	47	89
	096-3P	9.6	10	28.8	47	89
	097-3P	9.7	10	29.1	47	89
	098-3P	9.8	10	29.4	47	89
	099-3P	9.9	10	29.7	47	89
	100-3P	10	10	30	47	89
	101-3P	10.1	12	30.3	55	102
	102-3P	10.2	12	30.6	55	102
	103-3P	10.3	12	30.9	55	102
	104-3P	10.4	12	31.2	55	102
	105-3P	10.5	12	31.5	55	102
	106-3P	10.6	12	31.8	55	102
	107-3P	10.7	12	32.1	55	102
	108-3P	10.8	12	32.4	55	102
	109-3P	10.9	12	32.7	55	102
	110-3P	11	12	33	55	102
	111-3P	11.1	12	33.3	55	102
	112-3P	11.2	12	33.6	55	102
	113-3P	11.3	12	33.9	55	102
	114-3P	11.4	12	34.2	55	102
	115-3P	11.5	12	34.5	55	102
	116-3P	11.6	12	34.8	55	102

MSFDH-3P



Terminology	P
Grade	PC325U
Tolerance(drill Dia.)	H7
Tolerance(shank Dia.)	h6
Point angle(SIG)	180°
Twist angle	30°
Thinning	R type
Coolant	Through

P Steel

(mm)

Designation		DC	DCON-MS	3P		
				LU	LCF	OAL
MSFDH	117-3P	11.7	12	35.1	55	102
	118-3P	11.8	12	35.4	55	102
	119-3P	11.9	12	35.7	55	102
	120-3P	12	12	36	55	102
	121-3P	12.1	14	36.3	60	107
	122-3P	12.2	14	36.6	60	107
	123-3P	12.3	14	36.9	60	107
	124-3P	12.4	14	37.2	60	107
	125-3P	12.5	14	37.5	60	107
	126-3P	12.6	14	37.8	60	107
	127-3P	12.7	14	38.1	60	107
	128-3P	12.8	14	38.4	60	107
	129-3P	12.9	14	38.7	60	107
	130-3P	13.0	14	39	60	107
	131-3P	13.1	14	39.3	60	107
	132-3P	13.2	14	39.6	60	107
	133-3P	13.3	14	39.9	60	107
	134-3P	13.4	14	40.2	60	107
	135-3P	13.5	14	40.5	60	107
	136-3P	13.6	14	40.8	60	107
	137-3P	13.7	14	41.1	60	107
	138-3P	13.8	14	41.4	60	107
	139-3P	13.9	14	41.7	60	107
	140-3P	14.0	14	42	60	107
	141-3P	14.1	16	42.3	65	115
	142-3P	14.2	16	42.6	65	115
	143-3P	14.3	16	42.9	65	115
	144-3P	14.4	16	43.2	65	115
	145-3P	14.5	16	43.5	65	115
	146-3P	14.6	16	43.8	65	115
	147-3P	14.7	16	44.1	65	115
	148-3P	14.8	16	44.4	65	115
	149-3P	14.9	16	44.7	65	115
	150-3P	15.0	16	45	65	115
	151-3P	15.1	16	45.3	65	115
	152-3P	15.2	16	45.6	65	115
	153-3P	15.3	16	45.9	65	115
	154-3P	15.4	16	46.2	65	115
	155-3P	15.5	16	46.5	65	115
	156-3P	15.6	16	46.8	65	115
	157-3P	15.7	16	47.1	65	115
	158-3P	15.8	16	47.4	65	115
	159-3P	15.9	16	47.7	65	115
	160-3P	16.0	16	48	65	115

High precision results when machining deep holes

MLD Plus

Mach Long Solid Drill Plus

Code system

Special type

MLD	0600N	-	10	P	-	100L	-	10S

Mach Long Solid Drill Plus (MLD Plus)

Drill dia. (DC)
0600: Ø6.00 mm (Two decimal place marked)

Standard type
Aspect ratio (L/D)
10D, 15D, 20D, 25D

Special type
Flute length
100: 100 mm

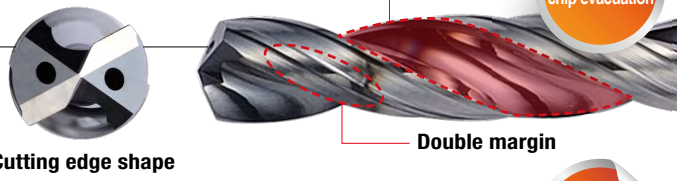
Machining area
P: Carbon steel, alloy steel
K: Cast iron
N: Aluminum, copper alloy

Overall length
100L: 100mm

Shank dia.
10S: Ø10mm

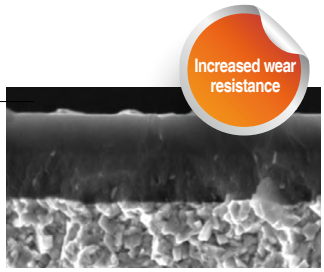
Features

- **Cutting edge and flute shape**
  - Straight cutting edge provides better rigidity
  - Excellent chip evacuation due to wider chip pocket and improved flute surface roughness
  - Double margin secures machining stability



Cutting edge shape

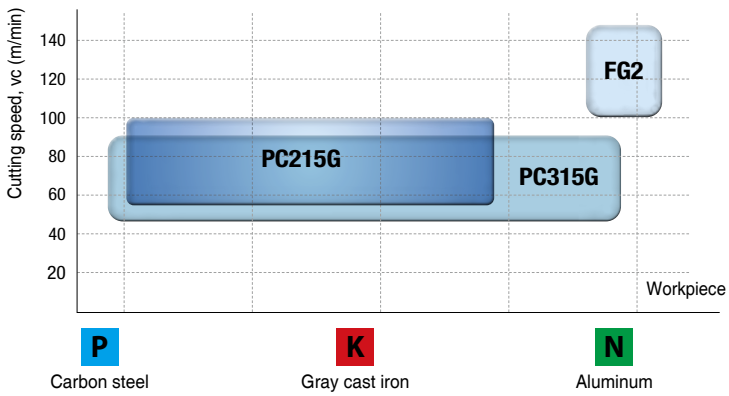
- **New grade (PC315G)**
  - Ultra-fine substrate and new coating applied
  - Lubricative coating layer improves chip evacuation with lower frictional resistance
  - Longer tool life due to higher wear resistance



PC315G

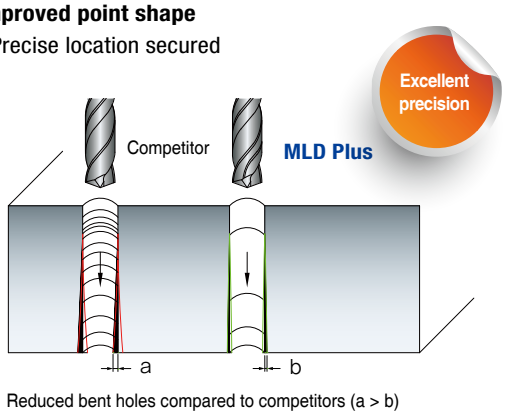
Application range

- **PC215G** - Excellent performance when machining cast iron and alloy steel at high speed
- **PC315G** - Universal grade excellent when machining carbon steel, cast iron, etc. at middle to low cutting speed



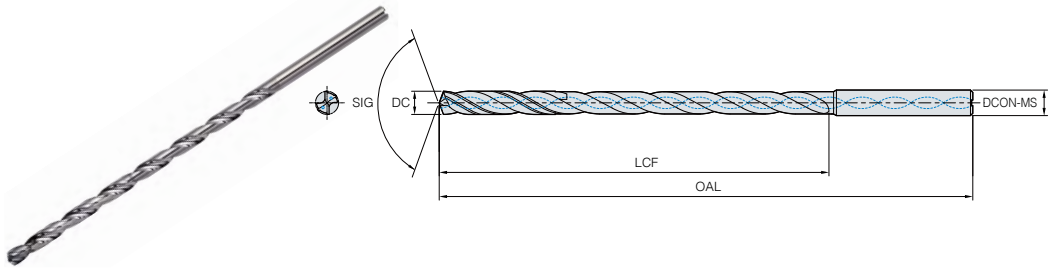
[Degree of machining precision]

- **Improved machining precision**
  - Bent holes reduced, Inside hole surface roughness improved
  - Hole size uniformity increased
- **Improved point shape**
  - Precise location secured



Reduced bent holes compared to competitors (a > b)

MLD-□□(P/K/N)



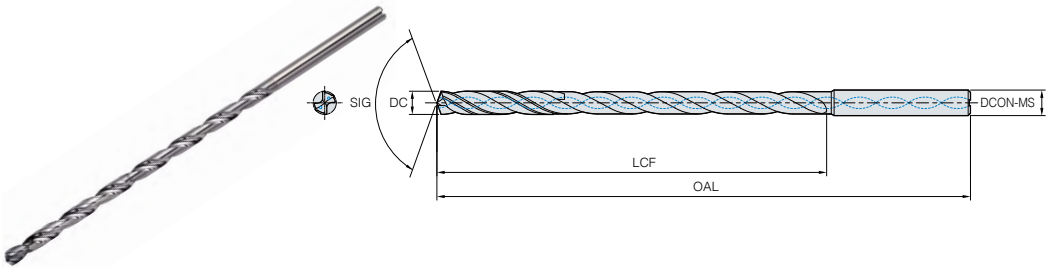
Terminology	P	K	N
Grade	PC215G PC315G		FG2
Tolerance(drill Dia.)	h7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	135°		
Twist angle	30°		
Thinning	X type		
Coolant	Through		

P Steel K Cast iron N Non-ferrous metal

(mm)

Designation		DC	DCON-MS	10P,K,N		15P,K,N		20P,K,N		25P,K,N	
				LCF	OAL	LCF	OAL	LCF	OAL	LCF	OAL
MLD	0300N - □□P,K,N	3	3	40	90	55	105	70	120	-	-
	0310N - □□P,K,N	3.1	4	45	100	60	125	80	140	-	-
	0320N - □□P,K,N	3.2	4	45	100	60	125	80	140	-	-
	0330N - □□P,K,N	3.3	4	45	100	60	125	80	140	-	-
	0340N - □□P,K,N	3.4	4	50	100	65	125	85	140	-	-
	0350N - □□P,K,N	3.5	4	50	100	65	125	85	140	-	-
	0360N - □□P,K,N	3.6	4	50	100	65	125	85	140	-	-
	0370N - □□P,K,N	3.7	4	50	100	65	125	85	140	-	-
	0380N - □□P,K,N	3.8	4	50	100	75	125	90	140	-	-
	0390N - □□P,K,N	3.9	4	50	100	75	125	90	140	-	-
	0400N - □□P,K,N	4	4	50	100	75	125	90	140	115	165
	0410N - □□P,K,N	4.1	5	55	115	75	140	100	165	120	190
	0420N - □□P,K,N	4.2	5	55	115	75	140	100	165	120	190
	0430N - □□P,K,N	4.3	5	60	115	85	140	110	165	135	190
	0440N - □□P,K,N	4.4	5	60	115	85	140	110	165	135	190
	0450N - □□P,K,N	4.5	5	60	115	85	140	110	165	135	190
	0460N - □□P,K,N	4.6	5	60	115	85	140	110	165	135	190
	0470N - □□P,K,N	4.7	5	60	115	85	140	110	165	135	190
	0480N - □□P,K,N	4.8	5	65	115	90	140	115	165	140	190
	0490N - □□P,K,N	4.9	5	65	115	90	140	115	165	140	190
	0500N - □□P,K,N	5	5	65	115	90	140	115	165	140	190
	0510N - □□P,K,N	5.1	6	70	128	95	160	120	190	150	220
	0520N - □□P,K,N	5.2	6	70	128	95	160	120	190	150	220
	0530N - □□P,K,N	5.3	6	70	128	95	160	120	190	150	220
	0540N - □□P,K,N	5.4	6	78	128	110	160	140	190	170	220
	0550N - □□P,K,N	5.5	6	78	128	110	160	140	190	170	220
	0560N - □□P,K,N	5.6	6	78	128	110	160	140	190	170	220
	0570N - □□P,K,N	5.7	6	78	128	110	160	140	190	170	220
	0580N - □□P,K,N	5.8	6	78	128	110	160	140	190	170	220
	0590N - □□P,K,N	5.9	6	78	128	110	160	140	190	170	220
	0600N - □□P,K,N	6	6	78	128	110	160	140	190	170	220
	0610N - □□P,K,N	6.1	7	87	140	120	175	155	210	190	250
	0620N - □□P,K,N	6.2	7	87	140	120	175	155	210	190	250
	0630N - □□P,K,N	6.3	7	87	140	120	175	155	210	190	250
	0640N - □□P,K,N	6.4	7	87	140	120	175	155	210	190	250
	0650N - □□P,K,N	6.5	7	87	140	120	175	155	210	190	250
	0660N - □□P,K,N	6.6	7	87	140	120	175	155	210	190	250
	0670N - □□P,K,N	6.7	7	87	140	120	175	155	210	190	250
	0680N - □□P,K,N	6.8	7	90	140	125	175	160	210	200	250
	0690N - □□P,K,N	6.9	7	90	140	125	175	160	210	200	250

MLD-□□(P/K/N)



Terminology	P	K	N
Grade	PC215G PC315G		FG2
Tolerance(drill Dia.)	h7		
Point angle(SIG)	h6		
Point angle	135°		
Twist angle	30°		
Thinning	X type		
Coolant	Through		

P Steel K Cast iron N Non-ferrous metal

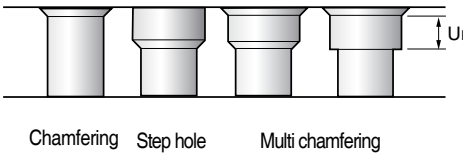
(mm)

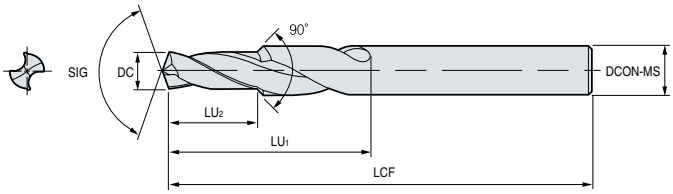
Designation		DC	DCON-MS	10P,K,N		15P,K,N		20P,K,N		25P,K,N	
				LCF	OAL	LCF	OAL	LCF	OAL	LCF	OAL
MLD	0700N - □□P,K,N	7	7	90	140	125	175	160	210	200	250
	0710N - □□P,K,N	7.1	8	100	155	135	195	170	230	-	-
	0720N - □□P,K,N	7.2	8	100	155	135	195	170	230	-	-
	0730N - □□P,K,N	7.3	8	100	155	135	195	170	230	-	-
	0740N - □□P,K,N	7.4	8	100	155	135	195	170	230	-	-
	0750N - □□P,K,N	7.5	8	100	155	135	195	170	230	-	-
	0760N - □□P,K,N	7.6	8	105	155	145	195	180	230	-	-
	0770N - □□P,K,N	7.7	8	105	155	145	195	180	230	-	-
	0780N - □□P,K,N	7.8	8	105	155	145	195	180	230	-	-
	0790N - □□P,K,N	7.9	8	105	155	145	195	180	230	-	-
	0800N - □□P,K,N	8	8	105	155	145	195	180	230	-	-
	0810N - □□P,K,N	8.1	9	110	165	155	210	195	260	-	-
	0820N - □□P,K,N	8.2	9	110	165	155	210	195	260	-	-
	0830N - □□P,K,N	8.3	9	110	165	155	210	195	260	-	-
	0840N - □□P,K,N	8.4	9	110	165	155	210	195	260	-	-
	0850N - □□P,K,N	8.5	9	110	165	155	210	195	260	-	-
	0860N - □□P,K,N	8.6	9	115	165	160	210	210	260	-	-
	0870N - □□P,K,N	8.7	9	115	165	160	210	210	260	-	-
	0880N - □□P,K,N	8.8	9	115	165	160	210	210	260	-	-
	0890N - □□P,K,N	8.9	9	115	165	160	210	210	260	-	-
	0900N - □□P,K,N	9	9	115	165	160	210	210	260	-	-
	0910N - □□P,K,N	9.1	10	125	190	170	240	-	-	-	-
	0920N - □□P,K,N	9.2	10	125	190	170	240	-	-	-	-
	0930N - □□P,K,N	9.3	10	125	190	170	240	-	-	-	-
	0940N - □□P,K,N	9.4	10	125	190	170	240	-	-	-	-
	0950N - □□P,K,N	9.5	10	125	190	170	240	-	-	-	-
	0960N - □□P,K,N	9.6	10	130	190	180	240	-	-	-	-
	0970N - □□P,K,N	9.7	10	130	190	180	240	-	-	-	-
	0980N - □□P,K,N	9.8	10	130	190	180	240	-	-	-	-
	0990N - □□P,K,N	9.9	10	130	190	180	240	-	-	-	-
	1000N - □□P,K,N	10	10	130	190	180	240	-	-	-	-

Code system for mach step drill

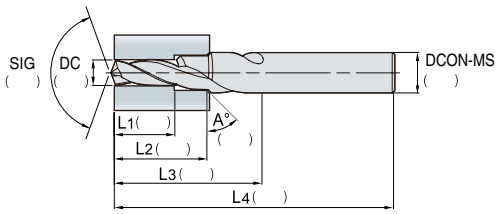
MSDP(H)S Drill dia. Effective flute length – Flute length – Overall length – Shank dia.

Oil hole type : MSDPHS	DC	LU_1	LU_2	LCF	DCON-MS

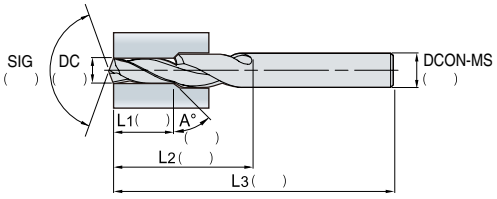




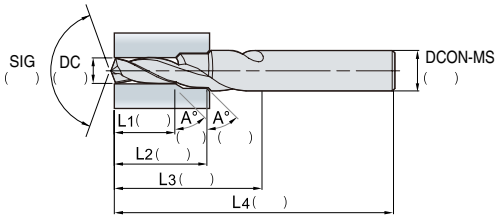
☐ **Multi chamfering** (Coolant : Internal☐/ External☐)



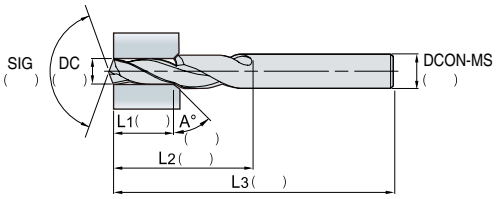
☐ **Step hole** (Coolant : Internal☐/ External☐)



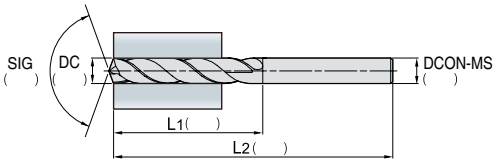
☐ **Multi chamfering** (Coolant : Internal☐/ External☐)



☐ **Chamfering** (Coolant : Internal☐/ External☐)



☐ **Drilling** (Coolant : Internal☐/ External☐)



General use drill with DIN standard

P-Star Drill

DIN standardized drill suitable for (~HRC50) high speed machining

- Suitable to High speed work for Alloy steels,Cast iron, Stainelss steels,Preharden Steels [Recommendation : ~HRC50]
- Extensive coverage of 3D ~ 20D Diameter

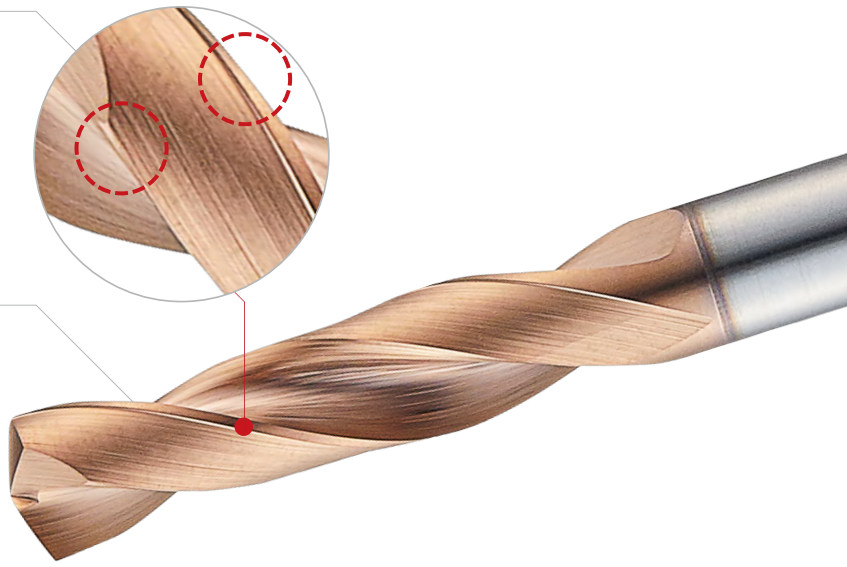
Code system

P	I	505	A	040
P-Star Drill	**Appearance**	**Drilling depth**	**Shank type**	**Cutting dia.**
P: Power max. (General) S: Spiral Coolant HP: High Precision	F: Facet Point I: Internal Coolant	503: 3×D 505: 5×D 508: 8×D 510: 10×D 520: 20×D	A: Plane F: DIN 6535 HE	3 ~ 20 mm

Features

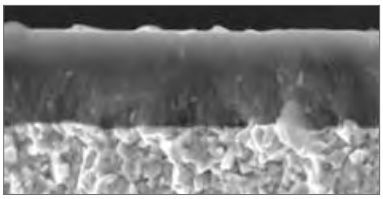
Features of drill

- High chipping resistance with high feed by used the high toughness material
- Toughening the surface hardness with heat resistance by applied to TiAlN coating
- Improvement of process-ability with decrease the frictional heat by possess the internal coolant series

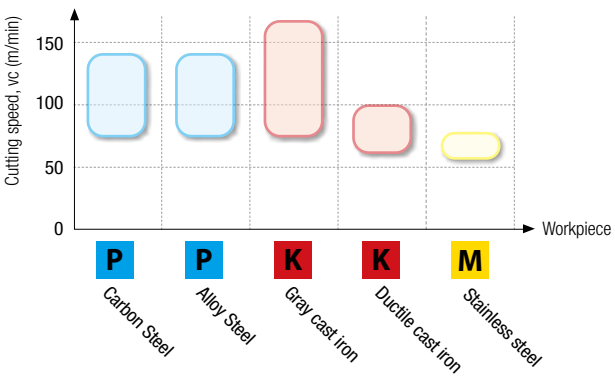


Features of substrate/grade

- Toughening the straightness and hole surface roughness by applied to double margin
- Toughening the chip emission by applied to wide chip pocket
- Improvement of processing efficiency with versatility who customer can choose between the external and internal coolant depends on the drilling depth



Application range



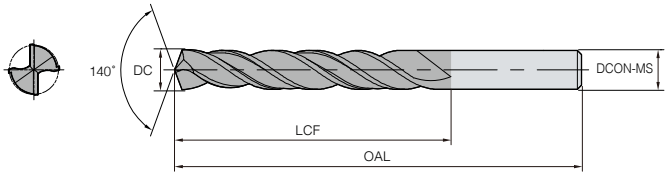
EDP. NO.		Flute	Feature		Length					Internal Coolant	Margin Type	Tolerance D	Diameter range (Ø)	
INCH : ◆ METRIC : ◇			Relief	Facet	3×D	5×D	8×D	10×D	20×D				Min.	Max.
HP503	◆ ◇	2		○	○						Double	m7	3	16
HPI503	◇	2		○	○					○	Double	m7	3	20
HPI505	◆ ◇	2		○		○				○	Double	m7	3	20
HPI508-N	◆ ◇	2		○			○			○	Double	m7	3	20
P503A(F)	◇	2	○		○						Single	m7	3	20
PI503A(F	◇	2		○	○					○	Single	m7	3	20
PI505A(F)	◇	2		○		○				○	Single	m7	4	20

Line-up

Designation	Appearance	Type	Drills dia.	page
HP503		DIN 6537K Double margin drill - 3×D	Ø3.0 ~ Ø16.0	35~37
HPI503		DIN 6537K Double margin internal coolant drill - 3×D	Ø3.0 ~ Ø20.0	38~41
HPI505		DIN 6537L Double margin internal coolant drill - 5×D	Ø3.0 ~ Ø20.0	42~46
HPI508-N		Double margin internal coolant drill - 8×D	Ø3.0 ~ Ø20.0	47~50
P503A(F)		Din 6537K type drill	Ø3.0 ~ Ø20.0	51~53
PI503A(F)		Din 6537K type internal coolant drill	Ø3.0 ~ Ø20.0	53~56
PI505A(F)		Din 6537L type internal coolant drill	Ø4.0 ~ Ø20.0	57~59

HP503

DIN 6537K Double margin drill - 3×D



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	External		

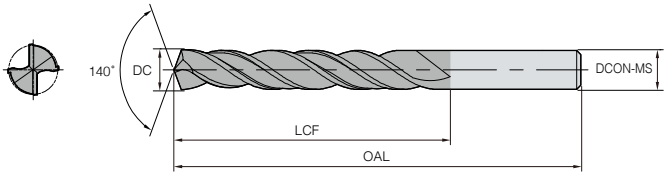
P Steel M Stainless steel K Cast iron

(mm)

Designation		DC		DCON-MS	LCF	OAL
		mm	inch			
HP	503 030	3	0.1181	6	20	62
	503 031	3.1	0.122	6	20	62
	503 032	3.2	0.126	6	20	62
	503 033	3.3	0.1299	6	20	62
	503 034	3.4	0.1339	6	20	62
	503 035	3.5	0.1378	6	20	62
	503 036	3.6	0.1417	6	20	62
	503 037	3.7	0.1457	6	20	62
	503 038	3.8	0.1496	6	24	66
	503 039	3.9	0.1535	6	24	66
	503 040	4	0.1575	6	24	66
	503 041	4.1	0.1614	6	24	66
	503 042	4.2	0.1654	6	24	66
	503 043	4.3	0.1693	6	24	66
	503 044	4.4	0.1732	6	24	66
	503 045	4.5	0.1772	6	24	66
	503 046	4.6	0.1811	6	24	66
	503 047	4.7	0.185	6	24	66
	503 048	4.8	0.189	6	28	66
	503 049	4.9	0.1929	6	28	66
	503 050	5	0.1969	6	28	66
	503 051	5.1	0.2008	6	28	66
	503 052	5.2	0.2047	6	28	66
	503 053	5.3	0.2087	6	28	66
	503 054	5.4	0.2126	6	28	66
	503 055	5.5	0.2165	6	28	66
	503 056	5.6	0.2205	6	28	66
	503 057	5.7	0.2244	6	28	66
	503 058	5.8	0.2283	6	28	66
	503 059	5.9	0.2322	6	28	66
	503 060	6	0.2362	6	28	66
	503 061	6.1	0.2402	8	34	79
	503 062	6.2	0.2441	8	34	79
	503 063	6.3	0.248	8	34	79
	503 064	6.4	0.252	8	34	79
	503 065	6.5	0.2559	8	34	79
	503 066	6.6	0.2598	8	34	79
	503 067	6.7	0.2638	8	34	79
	503 068	6.8	0.2677	8	34	79
	503 069	6.9	0.2717	8	34	79
	503 070	7	0.2756	8	34	79
	503 071	7.1	0.2795	8	41	79
	503 072	7.2	0.2835	8	41	79
	503 073	7.3	0.2874	8	41	79

HP503

DIN 6537K Double margin drill - 3×D



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	External		

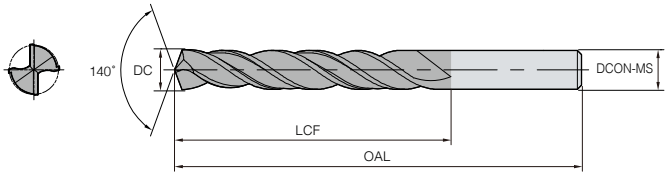
P Steel M Stainless steel K Cast iron

(mm)

Designation		DC		DCON-MS	LCF	OAL
		mm	inch			
HP	503 074	7.4	0.2913	8	41	79
	503 075	7.5	0.2953	8	41	79
	503 076	7.6	0.2992	8	41	79
	503 077	7.7	0.3031	8	41	79
	503 078	7.8	0.3071	8	41	79
	503 079	7.9	0.311	8	41	79
	503 080	8	0.315	8	41	79
	503 081	8.1	0.3189	10	47	89
	503 082	8.2	0.3228	10	47	89
	503 083	8.3	0.3268	10	47	89
	503 084	8.4	0.3307	10	47	89
	503 085	8.5	0.3346	10	47	89
	503 086	8.6	0.3386	10	47	89
	503 087	8.7	0.3425	10	47	89
	503 088	8.8	0.3465	10	47	89
	503 089	8.9	0.3504	10	47	89
	503 090	9	0.3543	10	47	89
	503 091	9.1	0.3583	10	47	89
	503 092	9.2	0.3622	10	47	89
	503 093	9.3	0.3661	10	47	89
	503 094	9.4	0.3701	10	47	89
	503 095	9.5	0.374	10	47	89
	503 096	9.6	0.378	10	47	89
	503 097	9.7	0.3819	10	47	89
	503 098	9.8	0.3858	10	47	89
	503 099	9.9	0.3898	10	47	89
	503 100	10	0.3937	10	47	89
	503 101	10.1	0.3976	12	55	102
	503 102	10.2	0.4016	12	55	102
	503 103	10.3	0.4055	12	55	102
	503 104	10.4	0.4094	12	55	102
	503 105	10.5	0.4134	12	55	102
	503 106	10.6	0.4173	12	55	102
	503 107	10.7	0.4213	12	55	102
	503 108	10.8	0.4252	12	55	102
	503 109	10.9	0.4291	12	55	102
	503 110	11	0.4331	12	55	102
	503 111	11.1	0.437	12	55	102
	503 112	11.2	0.4409	12	55	102
	503 113	11.3	0.4449	12	55	102
	503 114	11.4	0.4488	12	55	102
	503 115	11.5	0.4528	12	55	102
	503 116	11.6	0.4567	12	55	102
	503 117	11.7	0.4606	12	55	102

HP503

DIN 6537K Double margin drill - 3×D



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	External		

P Steel M Stainless steel K Cast iron

(mm)

Designation		DC		DCON-MS	LCF	OAL
		mm	inch			
HP	503 118	11.8	0.4646	12	55	102
	503 119	11.9	0.4685	12	55	102
	503 120	12	0.4724	12	55	102
	503 121	12.1	0.4764	14	60	107
	503 122	12.2	0.4803	14	60	107
	503 123	12.3	0.4843	14	60	107
	503 124	12.4	0.4882	14	60	107
	503 125	12.5	0.4921	14	60	107
	503 126	12.6	0.4961	14	60	107
	503 127	12.7	0.5	14	60	107
	503 128	12.8	0.5039	14	60	107
	503 129	12.9	0.5079	14	60	107
	503 130	13	0.5118	14	60	107
	503 131	13.1	0.5157	14	60	107
	503 132	13.2	0.5157	14	60	107
	503 133	13.3	0.5236	14	60	107
	503 135	13.5	0.5315	14	60	107
	503 137	13.7	0.5394	14	60	107
	503 140	14	0.5512	14	60	107
	503 142	14.2	0.5591	16	65	115
	503 143	14.3	0.563	16	65	115
	503 145	14.5	0.5709	16	65	115
	503 146	14.6	0.5787	16	65	115
	503 148	14.8	0.5827	16	65	115
	503 150	15	0.5906	16	65	115
	503 155	15.5	0.6102	16	65	115
	503 157	15.7	0.6181	16	65	115
	503 160	16	0.6299	16	65	115

※ The above specifications are subject to change without prior notice for product quality improvement.

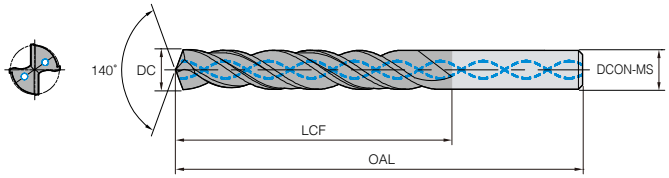
• Applicable Workpiece

Carbon steel ~ HB225	Alloy Steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○	○			◎		○

◎: Excellent ○: Good

HPI503

DIN 6537K type Double margin internal coolant drill - 3×D



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	Through		

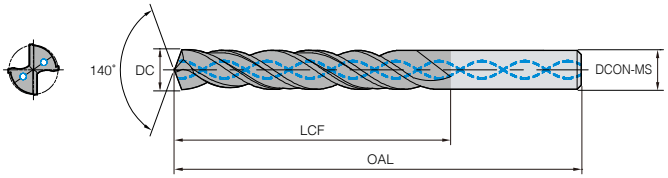
P Steel M Stainless steel K Cast iron

(mm)

Designation		DC			DCON-MS	LCF	OAL
		mm	fraction	inch			
HPI	503 030	3	-	0.1181	6	20	62
	503 031	3.1	-	0.112	6	20	62
	503 03175	3.175	1/8	0.125	6	20	62
	503 032	3.2	-	0.126	6	20	62
	503 03264	3.264	-	0.1285	6	20	62
	503 033	3.3	-	0.1299	6	20	62
	503 034	3.4	-	0.1339	6	20	62
	503 035	3.5	-	0.1378	6	20	62
	503 03572	3.572	9/64	0.1406	6	20	62
	503 036	3.6	-	0.1417	6	20	62
	503 037	3.7	-	0.1457	6	20	62
	503 038	3.8	-	0.1496	6	24	66
	503 039	3.9	-	0.1535	6	24	66
	503 0397	3.97	5/32	0.1563	6	24	66
	503 040	4	-	0.1575	6	24	66
	503 04039	4.039	-	0.159	6	24	66
	503 041	4.1	-	0.1614	6	24	66
	503 042	4.2	-	0.1654	6	24	66
	503 043	4.3	-	0.1693	6	24	66
	503 04366	4.366	-	0.1719	6	24	66
	503 044	4.4	-	0.1732	6	24	66
	503 045	4.5	-	0.1772	6	24	66
	503 046	4.6	-	0.1811	6	24	66
	503 047	4.7	-	0.185	6	24	66
	503 04763	4.763	3/16	0.1875	6	28	66
	503 048	4.8	-	0.189	6	28	66
	503 049	4.9	-	0.1929	6	28	66
	503 050	5	-	0.1969	6	28	66
	503 051	5.1	-	0.2008	6	28	66
	503 05159	5.159	13/64	0.2031	6	28	66
	503 052	5.2	-	0.2047	6	28	66
	503 053	5.3	-	0.2087	6	28	66
	503 054	5.4	-	0.2126	6	28	66
	503 055	5.5	-	0.2165	6	28	66
	503 05558	5.558	7/32	0.2188	6	28	66
	503 056	5.6	-	0.2205	6	28	66
	503 057	5.7	-	0.2244	6	28	66
	503 058	5.8	-	0.2283	6	28	66
	503 059	5.9	-	0.2323	6	28	66
	503 05953	5.953	15/64	0.2344	6	28	66
	503 060	6	-	0.2362	6	28	66
	503 061	6.1	-	0.2402	8	34	79
	503 062	6.2	-	0.2441	8	34	79
	503 063	6.3	-	0.248	8	34	79

HPI503

DIN 6537K type Double margin internal coolant drill - 3×D



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	Through		

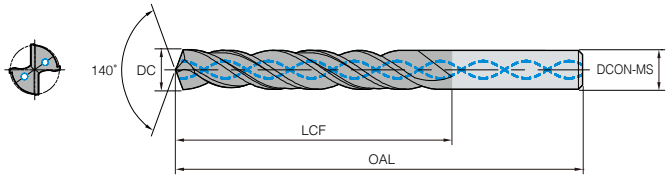
P Steel M Stainless steel K Cast iron

(mm)

Designation		DC			DCON-MS	LCF	OAL
		mm	fraction	inch			
HPI	503 0635	6.35	1/4	0.25	8	34	79
	503 064	6.4	-	0.252	8	34	79
	503 065	6.5	-	0.2559	8	34	79
	503 066	6.6	-	0.2598	8	34	79
	503 067	6.7	-	0.2638	8	34	79
	503 06747	6.747	17/64	0.2656	8	34	79
	503 068	6.8	-	0.2677	8	34	79
	503 069	6.9	-	0.2717	8	34	79
	503 070	7	-	0.2756	8	34	79
	503 071	7.1	-	0.2795	8	41	79
	503 07145	7.145	9/32	0.2813	8	41	79
	503 072	7.2	-	0.2835	8	41	79
	503 073	7.3	-	0.2874	8	41	79
	503 074	7.4	-	0.2913	8	41	79
	503 075	7.5	-	0.2953	8	41	79
	503 07541	7.541	19/64	0.2969	8	41	79
	503 076	7.6	-	0.2992	8	41	79
	503 077	7.7	-	0.3031	8	41	79
	503 078	7.8	-	0.0371	8	41	79
	503 079	7.9	-	0.311	8	41	79
	503 07938	7.938	5/16	0.3125	8	41	79
	503 080	8	-	0.315	8	41	79
	503 081	8.1	-	0.3189	10	47	89
	503 082	8.2	-	0.3228	10	47	89
	503 083	8.3	-	0.3268	10	47	89
	503 08334	8.334	21/64	0.3281	10	47	89
	503 0834	8.34	-	0.3283	10	47	89
	503 084	8.4	-	0.3307	10	47	89
	503 085	8.5	-	0.3346	10	47	89
	503 086	8.6	-	0.3386	10	47	89
	503 087	8.7	-	0.3425	10	47	89
	503 08733	8.733	11/32	0.3438	10	47	89
	503 088	8.8	-	0.3465	10	47	89
	503 089	8.9	-	0.6504	10	47	89
	503 090	9	-	0.3543	10	47	89
	503 091	9.1	-	0.3583	10	47	89
	503 09129	9.129	23/64	0.3594	10	47	89
	503 092	9.2	-	0.3622	10	47	89
	503 093	9.3	-	0.3661	10	47	89
	503 094	9.4	-	0.368	10	47	89
	503 095	9.5	-	0.374	10	47	89
	503 09525	9.525	3/8	0.375	10	47	89
	503 096	9.6	-	0.378	10	47	89
	503 097	9.7	-	0.3819	10	47	89

HPI503

DIN 6537K type Double margin internal coolant drill - 3×D



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	Through		

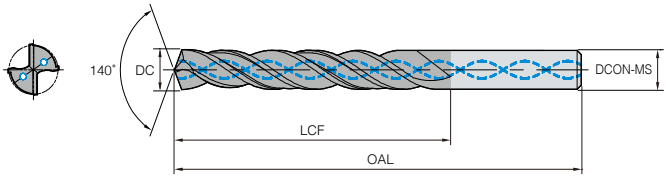
P Steel M Stainless steel K Cast iron

(mm)

Designation		DC			DCON-MS	LCF	OAL
		mm	fraction	inch			
HPI	503 098	9.8	-	0.3858	10	47	89
	503 099	9.9	-	0.3898	10	47	89
	503 09921	9.9921	25/64	0.3906	10	47	89
	503 100	10	-	0.3937	10	47	89
	503 101	10.1	-	0.3976	12	55	105
	503 102	10.2	-	0.4016	12	55	105
	503 103	10.3	-	0.4055	12	55	105
	503 1032	10.32	13/32	0.4063	12	55	105
	503 104	10.4	-	0.4094	12	55	105
	503 105	10.5	-	0.4134	12	55	105
	503 106	10.6	-	0.4173	12	55	105
	503 107	10.7	-	0.4213	12	55	105
	503 10716	10.716	27/64	0.4219	12	55	105
	503 108	10.8	-	0.4252	12	55	105
	503 109	10.9	-	0.4291	12	55	105
	503 110	11	-	0.4331	12	55	105
	503 111	11.1	-	0.437	12	55	105
	503 11113	11.113	7/16	0.4375	12	55	105
	503 112	11.2	-	0.4409	12	55	105
	503 113	11.3	-	0.4449	12	55	105
	503 114	11.4	-	0.4488	12	55	105
	503 115	11.5	-	0.4528	12	55	105
	503 11509	11.509	29/64	0.4531	12	55	105
	503 116	11.6	-	0.4567	12	55	105
	503 117	11.7	-	0.4606	12	55	105
	503 118	11.8	-	0.4646	12	55	105
	503 119	11.9	-	0.4685	12	55	105
	503 11908	11.908	15/32	0.4688	12	55	105
	503 120	12	-	0.4724	12	55	105
	503 121	12.1	-	0.4764	14	60	107
	503 122	12.2	-	0.4803	14	60	107
	503 123	12.3	-	0.4843	14	60	107
	503 12304	12.304	31/64	0.4844	14	60	107
	503 124	12.4	-	0.4882	14	60	107
	503 125	12.5	-	0.4921	14	60	107
	503 126	12.6	-	0.4961	14	60	107
	503 127	12.7	1/2	0.5	14	60	107
	503 128	12.8	-	0.5039	14	60	107
	503 129	12.9	-	0.5079	14	60	107
	503 130	13	-	0.5118	14	60	107
	503 132	13.2	-	0.5197	14	60	107
	503 133	13.3	-	0.5236	14	60	107
	503 13494	13.494	17/32	0.5313	14	60	107
	503 135	13.5	-	0.5315	14	60	107

HPI503

DIN 6537K type Double margin internal coolant drill - 3×D



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	Through		

P Steel M Stainless steel K Cast iron

(mm)

Designation		DC			DCON-MS	LCF	OAL
		mm	fraction	inch			
HPI	503 137	13.7	-	0.5394	14	60	107
	503 13891	13.891	35/64	0.5469	14	60	107
	503 140	14	-	0.5512	14	60	107
	503 141	14.1	-	0.5551	16	65	115
	503 142	14.2	-	0.5591	16	65	115
	503 14288	14.288	9/16	0.5625	16	65	115
	503 145	14.5	-	0.5709	16	65	115
	503 146	14.6	-	0.5746	16	65	115
	503 147	14.7	-	0.5787	16	65	115
	503 150	15	-	0.5906	16	65	115
	503 15081	15.081	19/32	0.5937	16	65	115
	503 155	15.5	-	0.6102	16	65	115
	503 157	15.7	-	0.6181	16	65	115
	503 158	15.8	-	0.622	16	65	115
	503 15875	15.875	5/8	0.625	16	65	115
	503 160	16	-	0.6299	16	65	115
	503 162	16.2	-	0.6378	18	73	123
	503 163	16.3	-	0.6417	18	73	123
	503 165	16.5	-	0.6496	18	73	123
	503 167	16.7	-	0.6575	18	73	123
	503 168	16.8	-	0.6614	18	73	123
	503 170	17	-	0.6693	18	73	123
	503 171	17.1	-	0.6732	18	73	123
	503 17463	17.463	11/16	0.6875	18	73	123
	503 175	17.5	-	0.689	18	73	123
	503 180	18	-	0.7087	18	73	123
	503 185	18.5	-	0.7883	20	79	131
	503 190	19	-	0.748	20	79	131
	503 1905	19.05	3/4	0.75	20	79	131
	503 197	19.7	-	0.7756	20	79	131
	503 200	20	-	0.7874	20	79	131

※ The above specifications are subject to change without prior notice for product quality improvement.

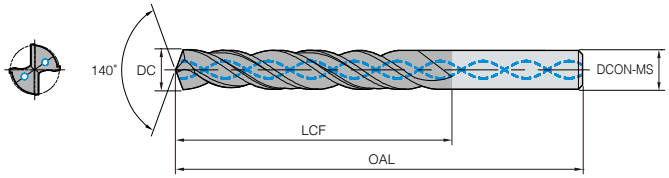
• Applicable Workpiece

Carbon steel ~ HB225	Alloy Steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○	○			◎		○

◎: Excellent ○: Good

HPI505

DIN 6537L type Double margin internal coolant drill - 5×D



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	Through		

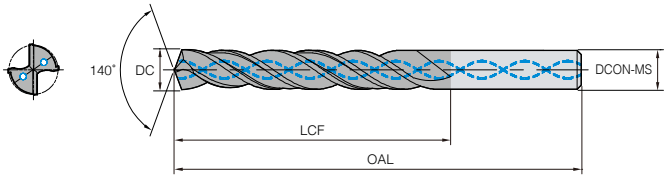
P Steel M Stainless steel K Cast iron

(mm)

Designation		DC			DCON-MS	LCF	OAL
		mm	fraction	inch			
HPI	505 030	3	-	0.1181	6	30	66
	505 031	3.1	-	0.112	6	30	66
	505 03175	3.175	-	0.125	6	30	66
	505 032	3.2	-	0.126	6	30	66
	505 03264	3.264	1/8	0.1285	6	30	66
	505 033	3.3	-	0.1299	6	30	66
	505 034	3.4	-	0.1339	6	30	66
	505 035	3.5	-	0.1378	6	30	66
	505 03572	3.572	9/64	0.1406	6	30	66
	505 036	3.6	-	0.1417	6	30	66
	505 037	3.7	-	0.1457	6	30	66
	505 038	3.8	-	0.1496	6	36	74
	505 039	3.9	-	0.1535	6	36	74
	505 0397	3.97	5/32	0.1563	6	36	74
	505 040	4	-	0.1575	6	36	74
	505 04039	4.039	-	0.159	6	36	74
	505 041	4.1	-	0.1614	6	36	74
	505 042	4.2	-	0.1654	6	36	74
	505 043	4.3	-	0.1693	6	36	74
	505 04366	4.366	-	0.1719	6	36	74
	505 044	4.4	-	0.1732	6	36	74
	505 045	4.5	-	0.1772	6	36	74
	505 0458	4.58	-	0.1803	6	36	74
	505 046	4.6	-	0.1811	6	36	74
	505 04623	4.623	-	0.182	6	36	74
	505 047	4.7	-	0.185	6	36	74
	505 04763	4.763	3/16	0.1875	6	44	82
	505 048	4.8	-	0.189	6	44	82
	505 049	4.9	-	0.1929	6	44	82
	505 050	5	-	0.1969	6	44	82
	505 051	5.1	-	0.2008	6	44	82
	505 05159	5.159	13/64	0.2031	6	44	82
	505 052	5.2	-	0.2047	6	44	82
	505 053	5.3	-	0.2087	6	44	82
	505 054	5.4	-	0.2126	6	44	82
	505 0541	5.41	-	0.213	6	44	82
	505 055	5.5	-	0.2165	6	44	82
	505 05558	5.558	7/32	0.2188	6	44	82
	505 056	5.6	-	0.2205	6	44	82
	505 057	5.7	-	0.2244	6	44	82
	505 058	5.8	-	0.2283	6	44	82
	505 059	5.9	-	0.2323	6	44	82
	505 05953	5.953	15/64	0.2344	6	44	82
	505 060	6	-	0.2362	6	44	82

HPI505

DIN 6537L type Double margin internal coolant drill - 5×D



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	Through		

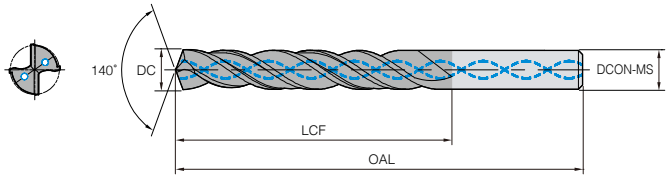
P Steel M Stainless steel K Cast iron

(mm)

Designation		DC			DCON-MS	LCF	OAL
		mm	fraction	inch			
HPI	505 061	6.1	-	0.2402	8	53	91
	505 062	6.2	-	0.2441	8	53	91
	505 063	6.3	-	0.248	8	53	91
	505 0635	6.35	1/4	0.25	8	53	91
	505 064	6.4	-	0.252	8	53	91
	505 065	6.5	-	0.2559	8	53	91
	505 06528	6.528	-	0.257	8	53	91
	505 066	6.6	-	0.2598	8	53	91
	505 067	6.7	-	0.2638	8	53	91
	505 06747	6.747	17/64	0.2656	8	53	91
	505 068	6.8	-	0.2677	8	53	91
	505 069	6.9	-	0.2717	8	53	91
	505 06909	6.909	-	0.272	8	53	91
	505 070	7	-	0.2756	8	53	91
	505 071	7.1	-	0.2795	8	53	91
	505 07145	7.145	9/32	0.2813	8	53	91
	505 072	7.2	-	0.2835	8	53	91
	505 073	7.3	-	0.2874	8	53	91
	505 074	7.4	-	0.2913	8	53	91
	505 075	7.5	-	0.2953	8	53	91
	505 07541	7.541	19/64	0.2969	8	53	91
	505 076	7.6	-	0.2992	8	53	91
	505 077	7.7	-	0.3031	8	53	91
	505 078	7.8	-	0.3071	8	53	91
	505 079	7.9	-	0.311	8	53	91
	505 07938	7.938	5/16	0.3125	8	53	91
	505 080	8	-	0.315	8	53	91
	505 081	8.1	-	0.3189	10	61	103
	505 082	8.2	-	0.3228	10	61	103
	505 083	8.3	-	0.3268	10	61	103
	505 08334	8.334	21/64	0.3281	10	61	103
	505 084	8.4	-	0.3307	10	61	103
	505 08433	8.433	-	0.332	10	61	103
	505 085	8.5	-	0.3346	10	61	103
	505 086	8.6	-	0.3386	10	61	103
	505 087	8.7	-	0.3425	10	61	103
	505 08733	8.733	11/32	0.3438	10	61	103
	505 088	8.8	-	0.3465	10	61	103
	505 089	8.9	-	0.3504	10	61	103
	505 090	9	-	0.3543	10	61	103
	505 091	9.1	-	0.3583	10	61	103
	505 09129	9.129	23/64	0.3594	10	61	103
	505 092	9.2	-	0.3622	10	61	103
	505 093	9.3	-	0.3661	10	61	103

HPI505

DIN 6537L type Double margin internal coolant drill - 5×D



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	Through		

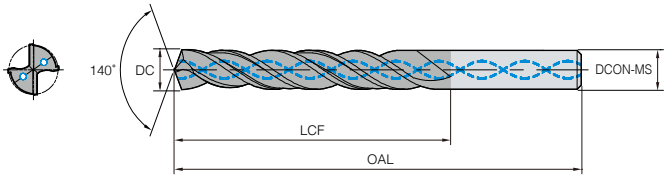
P Steel M Stainless steel K Cast iron

(mm)

Designation		DC			DCON-MS	LCF	OAL
		mm	fraction	inch			
HPI	505 09347	9.347	-	0.368	10	61	103
	505 094	9.4	-	0.3701	10	61	103
	505 095	9.5	-	0.374	10	61	103
	505 09525	9.525	3/8	0.375	10	61	103
	505 096	9.6	-	0.378	10	61	103
	505 097	9.7	-	0.3819	10	61	103
	505 09703	9.703	-	0.382	10	61	103
	505 09746	9.746	-	0.3837	10	61	103
	505 098	9.8	-	0.3858	10	61	103
	505 099	9.9	-	0.3898	10	61	103
	505 09921	9.921	25/64	0.3906	10	61	103
	505 100	10	-	0.3937	10	61	103
	505 101	10.1	-	0.3976	12	71	118
	505 102	10.2	-	0.4016	12	71	118
	505 103	10.3	-	0.4055	12	71	118
	505 1032	10.32	13/32	0.4063	12	71	118
	505 104	10.4	-	0.4074	12	71	118
	505 105	10.5	-	0.4134	12	71	118
	505 106	10.6	-	0.4173	12	71	118
	505 107	10.7	-	0.4213	12	71	118
	505 10716	10.716	27/64	0.4219	12	71	118
	505 108	10.8	-	0.4252	12	71	118
	505 109	10.9	-	0.4291	12	71	118
	505 110	11	-	0.4331	12	71	118
	505 111	11.1	-	0.437	12	71	118
	505 11113	11.113	7/16	0.4375	12	71	118
	505 112	11.2	-	0.4409	12	71	118
	505 113	11.3	-	0.4449	12	71	118
	505 114	11.4	-	0.4488	12	71	118
	505 115	11.5	-	0.4528	12	71	118
	505 11509	11.509	29/64	0.4531	12	71	118
	505 116	11.6	-	0.4567	12	71	118
	505 117	11.7	-	0.4606	12	71	118
	505 118	11.8	-	0.4646	12	71	118
	505 119	11.9	-	0.4685	12	71	118
	505 11908	11.908	15/32	0.4688	12	71	118
	505 120	12	-	0.4724	12	71	118
	505 121	12.1	-	0.4764	14	77	124
	505 122	12.2	-	0.4803	14	77	124
	505 123	12.3	-	0.4843	14	77	124
	505 12304	12.304	31/64	0.4844	14	77	124
	505 124	12.4	-	0.4882	14	77	124
	505 125	12.5	-	0.4921	14	77	124
	505 126	12.6	-	0.4961	14	77	124

HPI505

DIN 6537L type Double margin internal coolant drill - 5×D



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	Through		

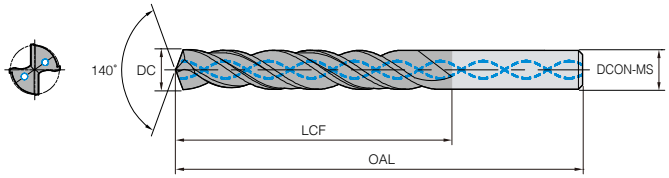
P Steel M Stainless steel K Cast iron

(mm)

Designation		DC			DCON-MS	LCF	OAL
		mm	fraction	inch			
HPI	505 127	12.7	1/2	0.5	14	77	124
	505 128	12.8	-	0.5039	14	77	124
	505 129	12.9	-	0.5079	14	77	124
	505 12903	12.903	-	0.508	14	77	124
	505 130	13	-	0.5118	14	77	124
	505 13096	13.096	33/64	0.5156	14	77	124
	505 131	13.1	-	0.5157	14	77	124
	505 132	13.2	-	0.5197	14	77	124
	505 133	13.3	-	0.5236	14	77	124
	505 134	13.4	-	0.5276	14	77	124
	505 13494	13.494	17/32	0.5313	14	77	124
	505 135	13.5	-	0.5315	14	77	124
	505 137	13.7	-	0.5394	14	77	124
	505 138	13.8	-	0.5433	14	77	124
	505 13891	13.981	35/64	0.5504	14	77	124
	505 140	14	-	0.5512	14	77	124
	505 141	14.1	-	0.5551	16	83	133
	505 142	14.2	-	0.5591	16	83	133
	505 14288	14.288	9/16	0.5625	16	83	133
	505 145	14.5	-	0.5709	16	83	133
	505 146	14.6	-	0.5748	16	83	133
	505 147	14.7	-	0.5787	16	83	133
	505 148	14.8	-	0.5827	16	83	133
	505 149	14.9	-	0.5866	16	83	133
	505 150	15	-	0.5906	16	83	133
	505 15081	15.081	19/32	0.5937	16	83	133
	505 151	15.1	-	0.5945	16	83	133
	505 152	15.2	-	0.5984	16	83	133
	505 155	15.5	-	0.6102	16	83	133
	505 156	15.6	-	0.6142	16	83	133
	505 157	15.7	-	0.6181	16	83	133
	505 158	15.8	-	0.622	16	83	133
	505 15875	15.875	5/8	0.625	16	83	133
	505 159	15.9	-	0.626	16	83	133
	505 160	16	-	0.6299	16	83	133
	505 16078	16.078	-	0.633	18	93	143
	505 162	16.2	-	0.6378	18	93	143
	505 164	16.4	-	0.6457	18	93	143
	505 165	16.5	-	0.6496	18	93	143
	505 166	16.6	-	0.6535	18	93	143
	505 16667	16.667	21/32	0.6562	18	93	143
	505 167	16.7	-	0.6575	18	93	143
	505 170	17	-	0.6693	18	93	143
	505 171	17.1	-	0.6732	18	93	143

HPI505

DIN 6537L type Double margin internal coolant drill - 5×D



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	Through		

P Steel M Stainless steel K Cast iron

(mm)

Designation		DC			DCON-MS	LCF	OAL
		mm	fraction	inch			
HPI	505 172	17.2	-	0.6772	18	93	143
	505 173	17.3	-	0.6811	18	93	143
	505 17463	17.463	11/16	0.6875	18	93	143
	505 175	17.5	-	0.689	18	93	143
	505 176	17.6	-	0.6929	18	93	143
	505 177	17.7	-	0.6969	18	93	143
	505 178	17.8	-	0.7008	18	93	143
	505 179	17.9	-	0.7047	18	93	143
	505 180	18	-	0.7087	18	93	143
	505 184	18.4	-	0.7244	20	101	153
	505 185	18.5	-	0.7283	20	101	153
	505 186	18.6	-	0.7323	20	101	153
	505 188	18.8	-	0.7402	20	101	153
	505 189	18.9	-	0.7441	20	101	153
	505 190	19	-	0.748	20	101	153
	505 1905	19.05	3/4	0.75	20	101	153
	505 192	19.2	-	0.7559	20	101	153
	505 19253	19.253	-	0.758	20	101	153
	505 19446	19.446	49/64	0.7656	20	101	153
	505 195	19.5	-	0.7677	20	101	153
	505 197	19.7	-	0.7756	20	101	153
	505 19844	19.844	25/32	0.7813	20	101	153
	505 200	20	-	0.7874	20	101	153

※ The above specifications are subject to change without prior notice for product quality improvement.

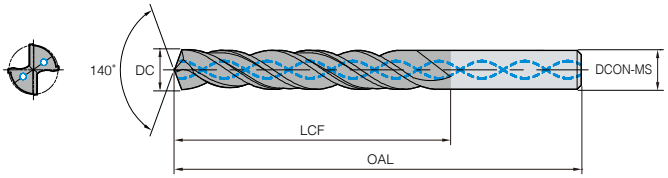
• Applicable Workpiece

Carbon steel ~ HB225	Alloy Steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○	○			◎		○

◎: Excellent ○: Good

HPI508-N

Double margin internal coolant drill - 8×D



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	Through		

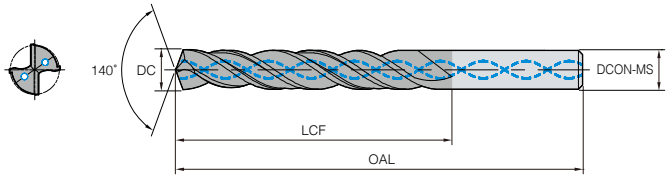
P Steel M Stainless steel K Cast iron

(mm)

Designation		DC			DCON-MS	LCF	OAL
		mm	fraction	inch			
HPI	508 030N	3	-	0.1181	6	43	80
	508 031N	3.1	-	0.122	6	43	80
	508 03175N	3.175	1/8	0.125	6	43	80
	508 032N	3.2	-	0.126	6	43	80
	508 03264N	3.264	-	0.1285	6	43	80
	508 033N	3.3	-	0.1299	6	43	80
	508 034N	3.4	-	0.1339	6	43	80
	508 035N	3.5	-	0.1378	6	43	80
	508 03572N	3.572	9/64	0.1406	6	43	80
	508 036N	3.6	-	0.1417	6	43	80
	508 037N	3.7	-	0.1457	6	43	80
	508 038N	3.8	-	0.1496	6	49	87
	508 039N	3.9	-	0.1535	6	49	87
	508 0397N	3.97	5/32	0.1563	6	49	87
	508 040N	4	-	0.1575	6	49	87
	508 04039N	4.039	-	0.159	6	49	87
	508 041N	4.1	-	0.1614	6	49	87
	508 042N	4.2	-	0.1654	6	49	87
	508 043N	4.3	-	0.1693	6	49	87
	508 04366N	4.366	-	0.1719	6	49	87
	508 044N	4.4	-	0.1732	6	49	87
	508 045N	4.5	-	0.1772	6	49	87
	508 046N	4.6	-	0.1811	6	49	87
	508 047N	4.7	-	0.185	6	49	87
	508 04763N	4.763	3/16	0.1875	6	56	94
	508 048N	4.8	-	0.189	6	56	94
	508 049N	4.9	-	0.1929	6	56	94
	508 050N	5	-	0.1969	6	56	94
	508 051N	5.1	-	0.2008	6	56	94
	508 05159N	5.159	13/64	0.2031	6	56	94
	508 052N	5.2	-	0.2047	6	56	94
	508 053N	5.3	-	0.2087	6	56	94
	508 054N	5.4	-	0.2126	6	56	94
	508 055N	5.5	-	0.2165	6	56	94
	508 05558N	5.558	7/32	0.2188	6	56	94
	508 056N	5.6	-	0.2205	6	56	94
	508 057N	5.7	-	0.2244	6	56	94
	508 058N	5.8	-	0.2283	6	56	94
	508 059N	5.9	-	0.2323	6	56	94
	508 05953N	5.953	15/64	0.2344	6	56	94
	508 060N	6	-	0.2362	6	65	94
	508 061N	6.1	-	0.2402	8	67	105
	508 062N	6.2	-	0.2441	8	67	105
	508 063N	6.3	-	0.248	8	67	105

HPI508-N

Double margin internal coolant drill - 8×D



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	Through		

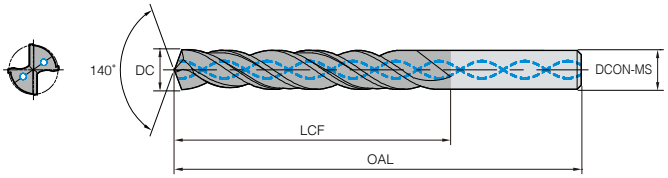
P Steel M Stainless steel K Cast iron

(mm)

Designation		DC			DCON-MS	LCF	OAL
		mm	fraction	inch			
HPI	508 0635N	6.35	1/4	0.25	8	67	105
	508 064N	6.4	-	0.252	8	67	105
	508 065N	6.5	-	0.2559	8	67	105
	508 066N	6.6	-	0.2598	8	67	105
	508 067N	6.7	-	0.2638	8	67	105
	508 06747N	6.747	17/64	0.2656	8	67	105
	508 068N	6.8	-	0.2677	8	67	105
	508 069N	6.9	-	0.2717	8	67	105
	508 070N	7	-	0.2756	8	76	116
	508 071N	7.1	-	0.2795	8	76	116
	508 07145N	7.145	9/32	0.2813	8	76	116
	508 072N	7.2	-	0.2835	8	76	116
	508 073N	7.3	-	0.2874	8	76	116
	508 074N	7.4	-	0.2913	8	76	116
	508 075N	7.5	-	0.2953	8	76	116
	508 07541N	7.541	19/64	0.2969	8	76	116
	508 076N	7.6	-	0.2992	8	76	116
	508 077N	7.7	-	0.3031	8	76	116
	508 078N	7.8	-	0.3071	8	76	116
	508 079N	7.9	-	0.311	8	76	116
	508 07938N	7.938	5/16	0.3125	8	76	116
	508 080N	8	-	0.315	8	76	116
	508 081N	8.1	-	0.3189	10	87	131
	508 082N	8.2	-	0.3228	10	87	131
	508 083N	8.3	-	0.3268	10	87	131
	508 08334N	8.334	21/64	0.3281	10	87	131
	508 084N	8.4	-	0.3307	10	87	131
	508 085N	8.5	-	0.3346	10	87	131
	508 086N	8.6	-	0.3386	10	87	131
	508 087N	8.7	-	0.3425	10	87	131
	508 08733N	8.733	11/32	0.3438	10	87	131
	508 088N	8.8	-	0.3465	10	87	131
	508 089N	8.9	-	0.3504	10	87	131
	508 090N	9	-	0.3543	10	87	131
	508 091N	9.1	-	0.3583	10	95	139
	508 09129N	9.129	23/64	0.3594	10	95	139
	508 092N	9.2	-	0.3622	10	95	139
	508 093N	9.3	-	0.3661	10	95	139
	508 094N	9.4	-	0.3701	10	95	139
	508 095N	9.5	-	0.374	10	95	139
	508 09525N	9.525	3/8	0.375	10	95	139
	508 096N	9.6	-	0.378	10	95	139
	508 097N	9.7	-	0.3819	10	95	139
	508 098N	9.8	-	0.3858	10	95	139

HPI508-N

Double margin internal coolant drill - 8×D



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	Through		

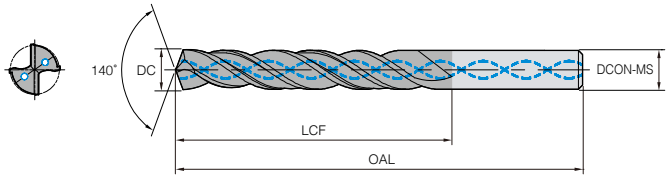
P Steel M Stainless steel K Cast iron

(mm)

Designation		DC			DCON-MS	LCF	OAL
		mm	fraction	inch			
HPI	508 099N	9.9	-	0.3898	10	95	139
	508 09921N	9.921	25/64	0.3906	10	95	139
	508 100N	10	-	0.3937	10	95	139
	508 101N	10.1	-	0.3976	12	106	155
	508 102N	10.2	-	0.4016	12	106	155
	508 103N	10.3	-	0.4055	12	106	155
	508 1032N	10.32	13/32	0.4063	12	106	155
	508 104N	10.4	-	0.4094	12	106	155
	508 105N	10.5	-	0.4134	12	106	155
	508 107N	10.7	-	0.4213	12	106	155
	508 10716N	10.716	27/64	0.4219	12	106	155
	508 108N	10.8	-	0.4252	12	106	155
	508 109N	10.9	-	0.4291	12	106	155
	508 110N	11	-	0.4331	12	106	155
	508 111N	11.1	-	0.437	12	114	163
	508 11113N	11.113	7/16	0.4375	12	114	163
	508 112N	11.2	-	0.4409	12	114	163
	508 113N	11.3	-	0.4449	12	114	163
	508 114N	11.4	-	0.4488	12	114	163
	508 115N	11.5	-	0.4528	12	114	163
	508 11509N	11.509	29/64	0.4531	12	114	163
	508 116N	11.6	-	0.4567	12	114	163
	508 117N	11.7	-	0.4606	12	114	163
	508 118N	11.8	-	0.4646	12	114	163
	508 119N	11.9	-	0.4685	12	114	163
	508 11908N	11.908	15/32	0.4688	12	114	163
	508 120N	12	-	0.4724	12	114	163
	508 12304N	12.304	31/64	0.4844	14	133	182
	508 125N	12.5	-	0.4921	14	133	182
	508 127N	12.7	1/2	0.5	14	133	182
	508 128N	12.8	-	0.5039	14	133	182
	508 130N	13	-	0.5118	14	133	182
	508 13494N	13.494	-	0.5313	14	133	182
	508 135N	13.5	-	0.5315	14	133	182
	508 140N	14	-	0.5512	14	133	182
	508 14288N	14.288	9/16	0.5625	16	152	204
	508 145N	14.5	-	0.5709	16	152	204
	508 150N	15	-	0.5906	16	152	204
	508 151N	15.1	-	0.5945	16	152	204
	508 152N	15.2	-	0.5984	16	152	204
	508 153N	15.3	-	0.6024	16	152	204
	508 155N	15.5	-	0.6102	16	152	204
	508 158N	15.8	-	0.622	16	152	204
	508 15875N	15.875	5/8	0.625	16	152	204

HPI508-N

Double margin internal coolant drill - 8×D



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	Through		

P Steel M Stainless steel K Cast iron

(mm)

Designation		DC			DCON-MS	LCF	OAL
		mm	fraction	inch			
HPI	508 160N	16	-	0.6299	16	152	204
	508 16078N	16.078	-	0.633	18	171	223
	508 162N	16.2	-	0.6378	18	171	223
	508 165N	16.5	-	0.6496	18	171	223
	508 170N	17	-	0.6693	18	171	223
	508 17463N	17.463	11/16	0.6875	18	171	223
	508 175N	17.5	-	0.689	18	171	223
	508 180N	18	-	0.7087	18	171	223
	508 185N	18.5	-	0.7283	20	191	244
	508 190N	19	-	0.748	20	191	244
	508 1905N	19.05	3/4	0.75	20	191	244
	508 19253N	19.253	-	0.758	20	191	244
	508 198N	19.8	-	0.7795	20	191	244
	508 200N	20	-	0.7874	20	191	244

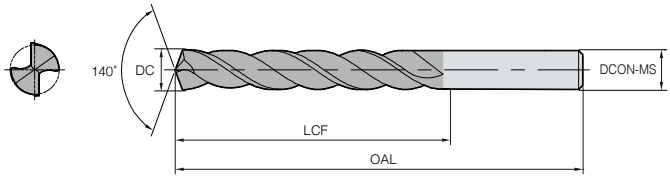
• Applicable Workpiece

Carbon steel ~ HB225	Alloy Steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○	○			◎		○

◎: Excellent ○: Good

P503A(F)

DIN 6537k type drill



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	External		

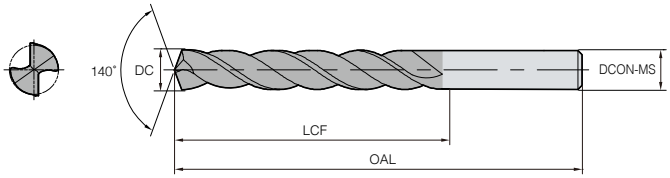
P Steel M Stainless steel K Cast iron

(mm)

Designation		Designation (Weldon shank)		DC	DCON-MS	LCF	OAL
P503A	030	P503F	030	3	6	20	62
	031		031	3.1	6	20	62
	032		032	3.2	6	20	62
	033		033	3.3	6	20	62
	034		034	3.4	6	20	62
	035		035	3.5	6	20	62
	036		036	3.6	6	20	62
	037		037	3.7	6	20	62
	038		038	3.8	6	24	66
	039		039	3.9	6	24	66
	040		040	4	6	24	66
	041		041	4.1	6	24	66
	042		042	4.2	6	24	66
	043		043	4.3	6	24	66
	044		044	4.4	6	24	66
	045		045	4.5	6	24	66
	046		046	4.6	6	24	66
	047		047	4.7	6	24	66
	048		048	4.8	6	28	66
	049		049	4.9	6	28	66
	050		050	5	6	28	66
	051		051	5.1	6	28	66
	052		052	5.2	6	28	66
	053		053	5.3	6	28	66
	054		054	5.4	6	28	66
	055		055	5.5	6	28	66
	056		056	5.6	6	28	66
	057		057	5.7	6	28	66
	058		058	5.8	6	28	66
	059		059	5.9	6	28	66
	060		060	6	6	28	66
	061		061	6.1	8	34	79
	062		062	6.2	8	34	79
	063		063	6.3	8	34	79
	064		064	6.4	8	34	79
	065		065	6.5	8	34	79
	066		066	6.6	8	34	79
	067		067	6.7	8	34	79
	068		068	6.8	8	34	79
	069		069	6.9	8	34	79
	070		070	7	8	34	79
	071		071	7.1	8	41	79
	072		072	7.2	8	41	79
	073		073	7.3	8	41	79
	074		074	7.4	8	41	79
	075		075	7.5	8	41	79
	076		076	7.6	8	41	79
	077		077	7.7	8	41	79
	078		078	7.8	8	41	79
	079		079	7.9	8	41	79
	080		080	8	8	41	79
	081		081	8.1	10	47	89

P503A(F)

DIN 6537k type drill



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	External		

P Steel M Stainless steel K Cast iron

(mm)

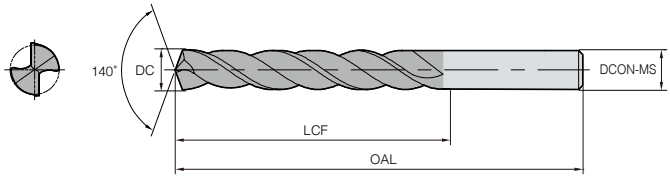
Designation		Designation (Weldon shank)		DC	DCON-MS	LCF	OAL
P503A	082	P503F	082	8.2	10	47	89
	083		083	8.3	10	47	89
	084		084	8.4	10	47	89
	085		085	8.5	10	47	89
	086		086	8.6	10	47	89
	087		087	8.7	10	47	89
	088		088	8.8	10	47	89
	089		089	8.9	10	47	89
	090		090	9	10	47	89
	091		091	9.1	10	47	89
	092		092	9.2	10	47	89
	093		093	9.3	10	47	89
	094		094	9.4	10	47	89
	095		095	9.5	10	47	89
	096		096	9.6	10	47	89
	097		097	9.7	10	47	89
	098		098	9.8	10	47	89
	099		099	9.9	10	47	89
	100		100	10	10	47	89
	101		101	10.1	12	55	102
	102		102	10.2	12	55	102
	103		103	10.3	12	55	102
	104		104	10.4	12	55	102
	105		105	10.5	12	55	102
	106		106	10.6	12	55	102
	107		107	10.7	12	55	102
	108		108	10.8	12	55	102
	109		109	10.9	12	55	102
	110		110	11	12	55	102
	111		111	11.1	12	55	102
	112		112	11.2	12	55	102
	113		113	11.3	12	55	102
	114		114	11.4	12	55	102
	115		115	11.5	12	55	102
	116		116	11.6	12	55	102
	117		117	11.7	12	55	102
	118		118	11.8	12	55	102
	119		119	11.9	12	55	102
	120		120	12	12	55	102
	121		121	12.1	14	60	107
	122		122	12.2	14	60	107
	123		123	12.3	14	60	107
	124		124	12.4	14	60	107
	125		125	12.5	14	60	107
	126		126	12.6	14	60	107
	127		127	12.7	14	60	107
	128		128	12.8	14	60	107
	129		129	12.9	14	60	107
	130		130	13	14	60	107
	131		131	13.1	14	60	107
	132		132	13.2	14	60	107
	133		133	13.3	14	60	107

P503A(F)

DIN 6537k type drill

Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	External		

P Steel M Stainless steel K Cast iron



(mm)

Designation		Designation (Weldon shank)		DC	DCON-MS	LCF	OAL
P503A	134	P503F	134	13.4	14	60	107
	135		135	13.5	14	60	107
	136		136	13.6	14	60	107
	137		137	13.7	14	60	107
	138		138	13.8	14	60	107
	139		139	13.9	14	60	107
	140		140	14	14	60	107
	141		141	14.1	16	65	115
	142		142	14.2	16	65	115
	143		143	14.3	16	65	115
	144		144	14.4	16	65	115
	145		145	14.5	16	65	115
	146		146	14.6	16	65	115
	147		147	14.7	16	65	115
	148		148	14.8	16	65	115
	149		149	14.9	16	65	115
	150		150	15	16	65	115
	151		151	15.1	16	65	115
	152		152	15.2	16	65	115
	153		153	15.3	16	65	115
	154		154	15.4	16	65	115
	155		155	15.5	16	65	115
	156		156	15.6	16	65	115
	157		157	15.7	16	65	115
	158		158	15.8	16	65	115
	159		159	15.9	16	65	115
	160		160	16	16	65	115
	161		161	16.1	18	73	123
	163		163	16.3	18	73	123
	165		165	16.5	18	73	123
	170		170	17	18	73	123
	171		171	17.1	18	73	123
	172		172	17.2	18	73	123
	175		175	17.5	18	73	123
	177		177	17.7	18	73	123
	178		178	17.8	18	73	123
	180		180	18	18	73	123
	181		181	18.1	20	79	131
	182		182	18.2	20	79	131
	185		185	18.5	20	79	131
	190		190	19	20	79	131
	191		191	19.1	20	79	131
	195		195	19.5	20	79	131
	197		197	19.7	20	79	131
	200		200	20	20	79	131

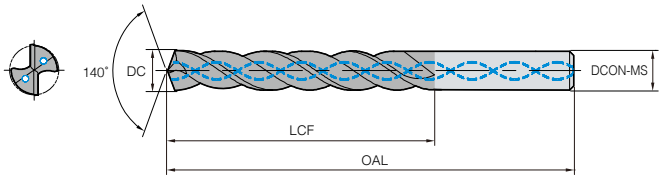
• Applicable Workpiece

Carbon steel ~ HB225	Alloy Steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○	○			◎		○

◎: Excellent ○: Good

PI503A(F)

Din 6537K type internal coolant drill



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	Through		

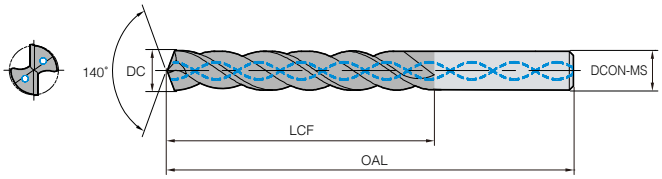
P Steel M Stainless steel K Cast iron

(mm)

Designation		Designation (Weldon shank)		DC	DCON-MS	LCF	OAL
PI503A	030	PI503F	030	3	6	20	62
	031		031	3.1	6	20	62
	032		032	3.2	6	20	62
	033		033	3.3	6	20	62
	034		034	3.4	6	20	62
	035		035	3.5	6	20	62
	036		036	3.6	6	20	62
	037		037	3.7	6	20	62
	038		038	3.8	6	24	66
	039		039	3.9	6	24	66
	040		040	4	6	24	66
	041		041	4.1	6	24	66
	042		042	4.2	6	24	66
	043		043	4.3	6	24	66
	044		044	4.4	6	24	66
	045		045	4.5	6	24	66
	046		046	4.6	6	24	66
	047		047	4.7	6	24	66
	048		048	4.8	6	28	66
	049		049	4.9	6	28	66
	050		050	5	6	28	66
	051		051	5.1	6	28	66
	052		052	5.2	6	28	66
	053		053	5.3	6	28	66
	054		054	5.4	6	28	66
	055		055	5.5	6	28	66
	056		056	5.6	6	28	66
	057		057	5.7	6	28	66
	058		058	5.8	6	28	66
	059		059	5.9	6	28	66
	060		060	6	6	28	66
	061		061	6.1	8	34	79
	062		062	6.2	8	34	79
	063		063	6.3	8	34	79
	064		064	6.4	8	34	79
	065		065	6.5	8	34	79
	066		066	6.6	8	34	79
	067		067	6.7	8	34	79
	068		068	6.8	8	34	79
	069		069	6.9	8	34	79
	070		070	7	8	34	79
	071		071	7.1	8	41	79
	072		072	7.2	8	41	79
	073		073	7.3	8	41	79
	074		074	7.4	8	41	79
	075		075	7.5	8	41	79
	076		076	7.6	8	41	79
	077		077	7.7	8	41	79
	078		078	7.8	8	41	79
	079		079	7.9	8	41	79
	080		080	8	8	41	79
	081		081	8.1	10	47	89

PI503A(F)

Din 6537K type internal coolant drill



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	Through		

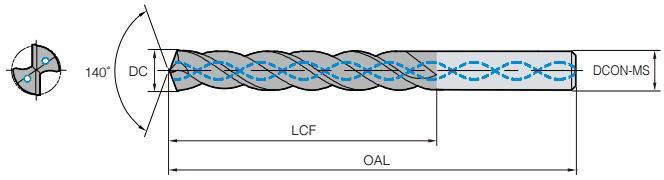
P Steel M Stainless steel K Cast iron

(mm)

Designation		Designation (Weldon shank)		DC	DCON-MS	LCF	OAL
PI503A	082	PI503F	082	8.2	10	47	89
	083		083	8.3	10	47	89
	084		084	8.4	10	47	89
	085		085	8.5	10	47	89
	086		086	8.6	10	47	89
	087		087	8.7	10	47	89
	088		088	8.8	10	47	89
	089		089	8.9	10	47	89
	090		090	9	10	47	89
	091		091	9.1	10	47	89
	092		092	9.2	10	47	89
	093		093	9.3	10	47	89
	094		094	9.4	10	47	89
	095		095	9.5	10	47	89
	096		096	9.6	10	47	89
	097		097	9.7	10	47	89
	098		098	9.8	10	47	89
	099		099	9.9	10	47	89
	100		100	10	10	47	89
	101		101	10.1	12	55	102
	102		102	10.2	12	55	102
	103		103	10.3	12	55	102
	104		104	10.4	12	55	102
	105		105	10.5	12	55	102
	106		106	10.6	12	55	102
	107		107	10.7	12	55	102
	108		108	10.8	12	55	102
	109		109	10.9	12	55	102
	110		110	11	12	55	102
	111		111	11.1	12	55	102
	112		112	11.2	12	55	102
	113		113	11.3	12	55	102
	114		114	11.4	12	55	102
	115		115	11.5	12	55	102
	116		116	11.6	12	55	102
	117		117	11.7	12	55	102
	118		118	11.8	12	55	102
	119		119	11.9	12	55	102
	120		120	12	12	55	102
	121		121	12.1	14	60	107
	122		122	12.2	14	60	107
	123		123	12.3	14	60	107
	124		124	12.4	14	60	107
	125		125	12.5	14	60	107
	126		126	12.6	14	60	107
	127		127	12.7	14	60	107
	128		128	12.8	14	60	107
	129		129	12.9	14	60	107
	130		130	13	14	60	107
	131		131	13.1	14	60	107
	132		132	13.2	14	60	107
	133		133	13.3	14	60	107

PI503A(F)

Din 6537K type internal coolant drill



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	Through		

P Steel M Stainless steel K Cast iron

(mm)

Designation		Designation (Weldon shank)		DC	DCON-MS	LCF	OAL
PI503A	134	PI503F	134	13.4	14	60	107
	135		135	13.5	14	60	107
	136		136	13.6	14	60	107
	137		137	13.7	14	60	107
	138		138	13.8	14	60	107
	139		139	13.9	14	60	107
	140		140	14	14	60	107
	141		141	14.1	16	65	115
	142		142	14.2	16	65	115
	143		143	14.3	16	65	115
	144		144	14.4	16	65	115
	145		145	14.5	16	65	115
	146		146	14.6	16	65	115
	147		147	14.7	16	65	115
	148		148	14.8	16	65	115
	149		149	14.9	16	65	115
	150		150	15	16	65	115
	151		151	15.1	16	65	115
	152		152	15.2	16	65	115
	153		153	15.3	16	65	115
	154		154	15.4	16	65	115
	155		155	15.5	16	65	115
	156		156	15.6	16	65	115
	157		157	15.7	16	65	115
	158		158	15.8	16	65	115
	159		159	15.9	16	65	115
	160		160	16	16	65	115
	161		161	16.1	18	73	123
	163		163	16.3	18	73	123
	165		165	16.5	18	73	123
	170		170	17	18	73	123
	171		171	17.1	18	73	123
	172		172	17.2	18	73	123
	175		175	17.5	18	73	123
	177		177	17.7	18	73	123
	178		178	17.8	18	73	123
	180		180	18	18	73	123
	181		181	18.1	20	79	131
	182		182	18.2	20	79	131
	185		185	18.5	20	79	131
	190		190	19	20	79	131
	191		191	19.1	20	79	131
	195		195	19.5	20	79	131
	197		197	19.7	20	79	131
	200		200	20	20	79	131

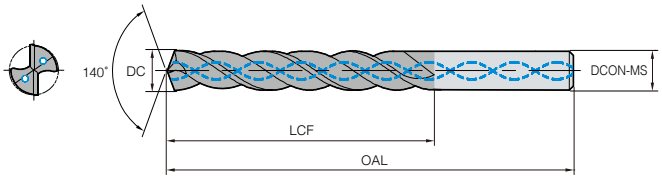
• Applicable Workpiece

Carbon steel ~ HB225	Alloy Steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○	○			◎		○

◎: Excellent ○: Good

PI505A(F)

DIN 6537L type internal coolant drill



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	Through		

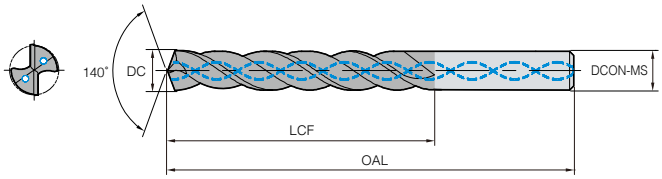
P Steel M Stainless steel K Cast iron

(mm)

Designation		Designation (Weldon shank)		DC	DCON-MS	LCF	OAL
PI505A	040	PI505F	040	4	6	36	74
	041		041	4.1	6	36	74
	042		042	4.2	6	36	74
	043		043	4.3	6	36	74
	044		044	4.4	6	36	74
	045		045	4.5	6	36	74
	046		046	4.6	6	36	74
	047		047	4.7	6	36	74
	048		048	4.8	6	44	82
	049		049	4.9	6	44	82
	050		050	5	6	44	82
	051		051	5.1	6	44	82
	052		052	5.2	6	44	82
	053		053	5.3	6	44	82
	054		054	5.4	6	44	82
	055		055	5.5	6	44	82
	056		056	5.6	6	44	82
	057		057	5.7	6	44	82
	058		058	5.8	6	44	82
	059		059	5.9	6	44	82
	060		060	6	6	44	82
	061		061	6.1	8	53	91
	062		062	6.2	8	53	91
	063		063	6.3	8	53	91
	064		064	6.4	8	53	91
	065		065	6.5	8	53	91
	066		066	6.6	8	53	91
	067		067	6.7	8	53	91
	068		068	6.8	8	53	91
	069		069	6.9	8	53	91
	070		070	7	8	53	91
	071		071	7.1	8	53	91
	072		072	7.2	8	53	91
	073		073	7.3	8	53	91
	074		074	7.4	8	53	91
	075		075	7.5	8	53	91
	076		076	7.6	8	53	91
	077		077	7.7	8	53	91
	078		078	7.8	8	53	91
	079		079	7.9	8	53	91
	080		080	8	8	53	91
	081		081	8.1	10	61	103
	082		082	8.2	10	61	103
	083		083	8.3	10	61	103
	084		084	8.4	10	61	103
	085		085	8.5	10	61	103
	086		086	8.6	10	61	103
	087		087	8.7	10	61	103
	088		088	8.8	10	61	103
	089		089	8.9	10	61	103
	090		090	9	10	61	103
	091		091	9.1	10	61	103

PI505A(F)

DIN 6537L type internal coolant drill



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	Through		

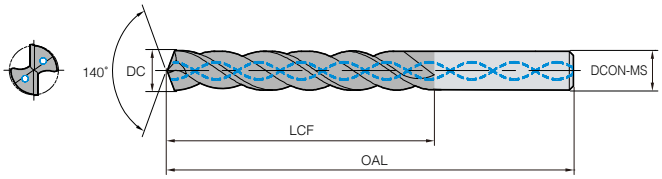
P Steel M Stainless steel K Cast iron

(mm)

Designation		Designation (Weldon shank)		DC	DCON-MS	LCF	OAL
PI505A	092	PI505F	092	9.2	10	61	103
	093		093	9.3	10	61	103
	094		094	9.4	10	61	103
	095		095	9.5	10	61	103
	096		096	9.6	10	61	103
	097		097	9.7	10	61	103
	098		098	9.8	10	61	103
	099		099	9.9	10	61	103
	100		100	10	10	61	103
	101		101	10.1	12	71	118
	102		102	10.2	12	71	118
	103		103	10.3	12	71	118
	104		104	10.4	12	71	118
	105		105	10.5	12	71	118
	106		106	10.6	12	71	118
	107		107	10.7	12	71	118
	108		108	10.8	12	71	118
	109		109	10.9	12	71	118
	110		110	11	12	71	118
	111		111	11.1	12	71	118
	112		112	11.2	12	71	118
	113		113	11.3	12	71	118
	114		114	11.4	12	71	118
	115		115	11.5	12	71	118
	116		116	11.6	12	71	118
	117		117	11.7	12	71	118
	118		118	11.8	12	71	118
	119		119	11.9	12	71	118
	120		120	12	12	71	118
	121		121	12.1	14	77	124
	122		122	12.2	14	77	124
	123		123	12.3	14	77	124
	124		124	12.4	14	77	124
	125		125	12.5	14	77	124
	126		126	12.6	14	77	124
	127		127	12.7	14	77	124
	128		128	12.8	14	77	124
	129		129	12.9	14	77	124
	130		130	13	14	77	124
	131		131	13.1	14	77	124
	132		132	13.2	14	77	124
	133		133	13.3	14	77	124
	134		134	13.4	14	77	124
	135		135	13.5	14	77	124
	136		136	13.6	14	77	124
	137		137	13.7	14	77	124
	138		138	13.8	14	77	124
	139		139	13.9	14	77	124
	140		140	14	14	77	124
	141		141	14.1	16	83	133
	142		142	14.2	16	83	133
	143		143	14.3	16	83	133

PI505A(F)

DIN 6537L type internal coolant drill



Terminology	P	M	K
Grade	TiAlN		
Tolerance(drill Dia.)	m7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	30°		
Thinning	XR type		
Coolant	Through		

P Steel M Stainless steel K Cast iron

(mm)

Designation		Designation (Weldon shank)		DC	DCON-MS	LCF	OAL
PI505A	144	PI505F	144	14.4	16	83	133
	145		145	14.5	16	83	133
	146		146	14.6	16	83	133
	147		147	14.7	16	83	133
	148		148	14.8	16	83	133
	149		149	14.9	16	83	133
	150		150	15	16	83	133
	151		151	15.1	16	83	133
	152		152	15.2	16	83	133
	153		153	15.3	16	83	133
	154		154	15.4	16	83	133
	155		155	15.5	16	83	133
	156		156	15.6	16	83	133
	157		157	15.7	16	83	133
	158		158	15.8	16	83	133
	159		159	15.9	16	83	133
	160		160	16	16	83	133
	161		161	16.1	18	93	143
	163		163	16.3	18	93	143
	165		165	16.5	18	93	143
	170		170	17	18	93	143
	171		171	17.1	18	93	143
	172		172	17.2	18	93	143
	175		175	17.5	18	93	143
	177		177	17.7	18	93	143
	178		178	17.8	18	93	143
	180		180	18	18	93	143
	181		181	18.1	20	101	153
	182		182	18.2	20	101	153
	185		185	18.5	20	101	153
	190		190	19	20	101	153
	191		191	19.1	20	101	153
	195		195	19.5	20	101	153
	197		197	19.7	20	101	153
	200		200	20	20	101	153

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy Steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○	○			◎		○

◎: Excellent ○: Good

Economical coated carbide solid drill

W-Star Drill

- Better cutting performance with an improved thinning shape which lessens cutting load
- High rigidity and good chip evacuation from the optimally designed flute
- Excellent cutting performance in stainless machining

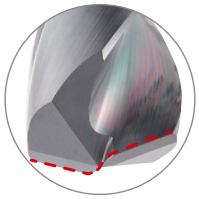
Code system

Special type

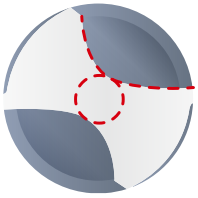
WSDP	040	-	5D	-	100L	-	5S
W-Star Drill Plus	Drill dia. (DC) 040 = Ø4.0mm		Aspect ratio (L/D) 5D, 7D		Overall length 100L: 100mm		Shank dia. 5S: Ø5.0mm

Special type
Flutelength
100: 100mm

Features

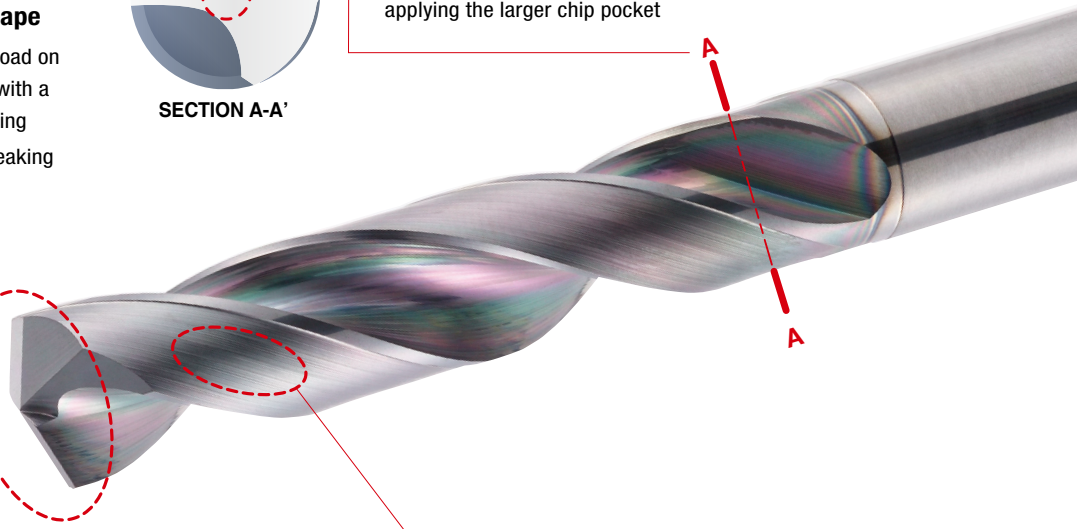


- **XR Thinning shape**
  - Reduced cutting load on the cutting edge with a streamlined thinning
  - Improved chip breaking

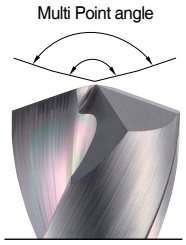


SECTION A-A'

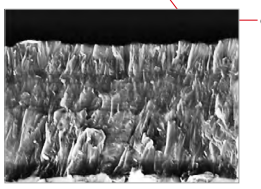
- **Optimal flute**
  - Good chip evacuation due to applying the larger chip pocket



Multi Point angle



- **Multi Point angle**
  - Separated cutting load by optimal point angle
  - Streamlined 1st point angle



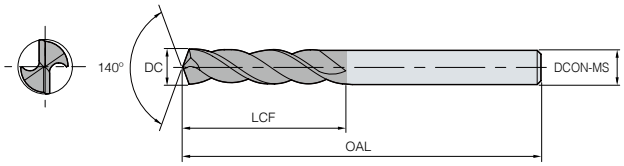
- **New AlCrN coating**
  - Improved chip evacuation with enhanced flute lubrication
  - Enhanced wear resistance and oxidation resistance by multi-layer coating

Application range

◎: 1st recommendation ○: 2nd recommendation

P					M	K
Carbon steel	Alloy steel	Pre-hardened steel	Heat-treated steel		Stainless steel	Cast iron
			STD61(~HRC55)	STD11(HRC55~63)		
◎	◎	○	-	-	◎	○

WSDP-□D



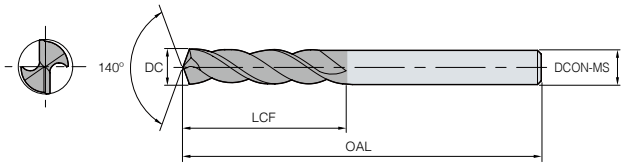
Terminology	P	M	K
Grade	PC320W		
Tolerance(drill Dia.)	h7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	streamlined		
Thinning	X type		
Coolant	External		

P Steel M Stainless steel K Cast iron

(mm)

Designation		DC	DCON-MS	5D		7D	
				LCF	OAL	LCF	OAL
WSDP	010 - □D	1	3	8	38	12	60
	011 - □D	1.1	3	9	42	12	60
	012 - □D	1.2	3	10	42	12	60
	013 - □D	1.3	3	10	42	15	60
	014 - □D	1.4	3	11	42	15	60
	015 - □D	1.5	3	11	42	15	60
	016 - □D	1.6	3	12	42	20	60
	017 - □D	1.7	3	12	42	20	60
	018 - □D	1.8	3	13	42	20	60
	019 - □D	1.9	3	13	42	20	60
	020 - □D	2	3	18	50	25	66
	021 - □D	2.1	3	18	50	25	66
	022 - □D	2.2	3	18	50	25	66
	023 - □D	2.3	3	18	50	25	66
	024 - □D	2.4	3	18	50	30	66
	025 - □D	2.5	3	18	50	30	66
	026 - □D	2.6	3	18	50	30	66
	027 - □D	2.7	3	18	50	30	66
	028 - □D	2.8	3	18	50	30	66
	029 - □D	2.9	3	18	50	30	66
	030 - □D	3	3	20	55	45	80
	031 - □D	3.1	4	20	55	45	80
	032 - □D	3.2	4	20	55	45	80
	033 - □D	3.3	4	20	55	45	80
	034 - □D	3.4	4	20	55	45	80
	035 - □D	3.5	4	20	55	45	80
	036 - □D	3.6	4	25	55	45	80
	037 - □D	3.7	4	25	55	45	80
	038 - □D	3.8	4	25	55	45	80
	039 - □D	3.9	4	25	55	45	80
	040 - □D	4	4	25	55	45	80
	041 - □D	4.1	5	25	55	45	80
	042 - □D	4.2	5	33	63	45	80
	043 - □D	4.3	5	33	63	45	80
	044 - □D	4.4	5	33	63	45	80
	045 - □D	4.5	5	33	63	45	80
	046 - □D	4.6	5	33	63	45	80
	047 - □D	4.7	5	33	63	45	80
	048 - □D	4.8	5	33	63	45	80
	049 - □D	4.9	5	33	63	45	80
	050 - □D	5	5	33	63	45	80
	051 - □D	5.1	6	33	63	45	80
	052 - □D	5.2	6	36	66	50	83
	053 - □D	5.3	6	36	66	50	83
	054 - □D	5.4	6	36	66	50	83
	055 - □D	5.5	6	36	66	50	83
	056 - □D	5.6	6	36	66	50	83
	057 - □D	5.7	6	36	66	50	83

WSDP-□D



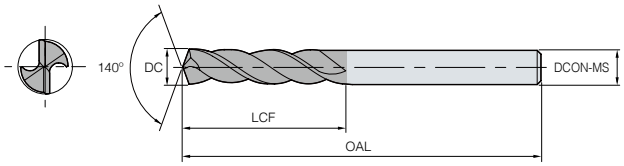
Terminology	P	M	K
Grade	PC320W		
Tolerance(drill Dia.)	h7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	streamlined		
Thinning	X type		
Coolant	External		

P Steel M Stainless steel K Cast iron

(mm)

Designation		DC	DCON-MS	5D		7D	
				LCF	OAL	LCF	OAL
WSDP	058 - □D	5.8	6	36	66	50	83
	059 - □D	5.9	6	36	66	50	83
	060 - □D	6	6	36	66	50	83
	061 - □D	6.1	7	36	66	50	83
	062 - □D	6.2	7	42	75	53	85
	063 - □D	6.3	7	42	75	53	85
	064 - □D	6.4	7	42	75	53	85
	065 - □D	6.5	7	42	75	53	85
	066 - □D	6.6	7	42	75	53	85
	067 - □D	6.7	7	42	75	53	85
	068 - □D	6.8	7	42	75	53	85
	069 - □D	6.9	7	42	75	53	85
	070 - □D	7	7	42	75	53	85
	071 - □D	7.1	8	42	75	53	85
	072 - □D	7.2	8	46	80	58	90
	073 - □D	7.3	8	46	80	58	90
	074 - □D	7.4	8	46	80	58	90
	075 - □D	7.5	8	46	80	58	90
	076 - □D	7.6	8	46	80	58	90
	077 - □D	7.7	8	46	80	58	90
	078 - □D	7.8	8	46	80	58	90
	079 - □D	7.9	8	46	80	58	90
	080 - □D	8	8	46	80	58	90
	081 - □D	8.1	9	46	80	58	90
	082 - □D	8.2	9	50	85	64	98
	083 - □D	8.3	9	50	85	64	98
	084 - □D	8.4	9	50	85	64	98
	085 - □D	8.5	9	50	85	64	98
	086 - □D	8.6	9	50	85	64	98
	087 - □D	8.7	9	50	85	64	98
	088 - □D	8.8	9	50	85	64	98
	089 - □D	8.9	9	50	85	64	98
	090 - □D	9	9	50	85	64	98
	091 - □D	9.1	10	50	85	64	98
	092 - □D	9.2	10	55	90	68	105
	093 - □D	9.3	10	55	90	68	105
	094 - □D	9.4	10	55	90	68	105
	095 - □D	9.5	10	55	90	68	105
	096 - □D	9.6	10	55	90	68	105
	097 - □D	9.7	10	55	90	68	105
	098 - □D	9.8	10	55	90	68	105
	099 - □D	9.9	10	55	90	68	105
	100 - □D	10	10	55	90	68	105
	101 - □D	10.1	11	55	90	68	105
	102 - □D	10.2	11	57	95	73	110
	103 - □D	10.3	11	57	95	73	110
	104 - □D	10.4	11	57	95	73	110
	105 - □D	10.5	11	57	95	73	110

WSDP-□D



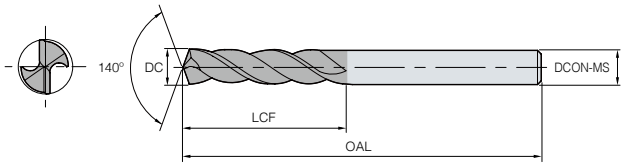
Terminology	P	M	K
Grade	PC320W		
Tolerance(drill Dia.)	h7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	streamlined		
Thinning	X type		
Coolant	External		

P Steel M Stainless steel K Cast iron

(mm)

Designation		DC	DCON-MS	5D		7D	
				LCF	OAL	LCF	OAL
WSDP	106 - □D	10.6	11	57	95	73	110
	107 - □D	10.7	11	57	95	73	110
	108 - □D	10.8	11	57	95	73	110
	109 - □D	10.9	11	57	95	73	110
	110 - □D	11	11	57	95	73	110
	111 - □D	11.1	12	57	95	73	110
	112 - □D	11.2	12	63	102	80	120
	113 - □D	11.3	12	63	102	80	120
	114 - □D	11.4	12	63	102	80	120
	115 - □D	11.5	12	63	102	80	120
	116 - □D	11.6	12	63	102	80	120
	117 - □D	11.7	12	63	102	80	120
	118 - □D	11.8	12	63	102	80	120
	119 - □D	11.9	12	63	102	80	120
	120 - □D	12	12	63	102	80	120
	121 - □D	12.1	13	63	102	80	120
	122 - □D	12.2	13	63	102	90	137
	123 - □D	12.3	13	63	102	90	137
	124 - □D	12.4	13	63	102	90	137
	125 - □D	12.5	13	63	102	90	137
	126 - □D	12.6	13	63	102	90	137
	127 - □D	12.7	13	63	102	90	137
	128 - □D	12.8	13	63	102	90	137
	129 - □D	12.9	13	63	102	90	137
	130 - □D	13	13	63	102	90	137
	131 - □D	13.1	14	63	102	90	137
	132 - □D	13.2	14	65	107	96	147
	133 - □D	13.3	14	65	107	96	147
	134 - □D	13.4	14	65	107	96	147
	135 - □D	13.5	14	65	107	96	147
	136 - □D	13.6	14	65	107	96	147
	137 - □D	13.7	14	65	107	96	147
	138 - □D	13.8	14	65	107	96	147
	139 - □D	13.9	14	65	107	96	147
	140 - □D	14	14	65	107	96	147
	141 - □D	14.1	15	65	107	96	147
	142 - □D	14.2	15	67	111	100	153
	143 - □D	14.3	15	67	111	100	153
	144 - □D	14.4	15	67	111	100	153
	145 - □D	14.5	15	67	111	100	153
	146 - □D	14.6	15	67	111	100	153
	147 - □D	14.7	15	67	111	100	153
	148 - □D	14.8	15	67	111	100	153
	149 - □D	14.9	15	67	111	100	153
	150 - □D	15	15	67	111	100	153
	151 - □D	15.1	16	67	111	100	153
	152 - □D	15.2	16	69	115	112	160
	153 - □D	15.3	16	69	115	112	160

WSDP-□D



Terminology	P	M	K
Grade	PC320W		
Tolerance(drill Dia.)	h7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	streamlined		
Thinning	X type		
Coolant	External		

P Steel M Stainless steel K Cast iron

(mm)

Designation		DC	DCON-MS	5D		7D	
				LCF	OAL	LCF	OAL
WSDP	154 - □D	15.4	16	69	115	112	160
	155 - □D	15.5	16	69	115	112	160
	156 - □D	15.6	16	69	115	112	160
	157 - □D	15.7	16	69	115	112	160
	158 - □D	15.8	16	69	115	112	160
	159 - □D	15.9	16	69	115	112	160
	160 - □D	16	16	69	115	112	160
	161 - □D	16.1	17	69	115	112	160
	162 - □D	16.2	17	71	119	112	160
	163 - □D	16.3	17	71	119	112	160
	164 - □D	16.4	17	71	119	112	160
	165 - □D	16.5	17	71	119	112	160
	166 - □D	16.6	17	71	119	112	160
	167 - □D	16.7	17	71	119	112	160
	168 - □D	16.8	17	71	119	112	160
	169 - □D	16.9	17	71	119	112	160
	170 - □D	17	17	71	119	112	160
	171 - □D	17.1	18	71	119	112	160
	172 - □D	17.2	18	74	123	112	160
	173 - □D	17.3	18	74	123	112	160
	174 - □D	17.4	18	74	123	112	160
	175 - □D	17.5	18	74	123	112	160
	176 - □D	17.6	18	74	123	112	160
	177 - □D	17.7	18	74	123	112	160
	178 - □D	17.8	18	74	123	112	160
	179 - □D	17.9	18	74	123	112	160
	180 - □D	18	18	74	123	112	160
	181 - □D	18.1	19	74	123	112	160
	182 - □D	18.2	19	76	127	112	160
	183 - □D	18.3	19	76	127	112	160
	184 - □D	18.4	19	76	127	112	160
	185 - □D	18.5	19	76	127	112	160
	186 - □D	18.6	19	76	127	112	160
	187 - □D	18.7	19	76	127	112	160
	188 - □D	18.8	19	76	127	112	160
	189 - □D	18.9	19	76	127	112	160
	190 - □D	19	19	76	127	112	160
	191 - □D	19.1	20	76	127	112	160
	192 - □D	19.2	20	80	131	112	160
	193 - □D	19.3	20	80	131	112	160
	194 - □D	19.4	20	80	131	112	160
	195 - □D	19.5	20	80	131	112	160
	196 - □D	19.6	20	80	131	112	160
	197 - □D	19.7	20	80	131	112	160
	198 - □D	19.8	20	80	131	112	160
	199 - □D	19.9	20	80	131	112	160
	200 - □D	20	20	80	131	112	160

Carbide solid drill for non-ferrous metals and mild steel machining

SSD-N

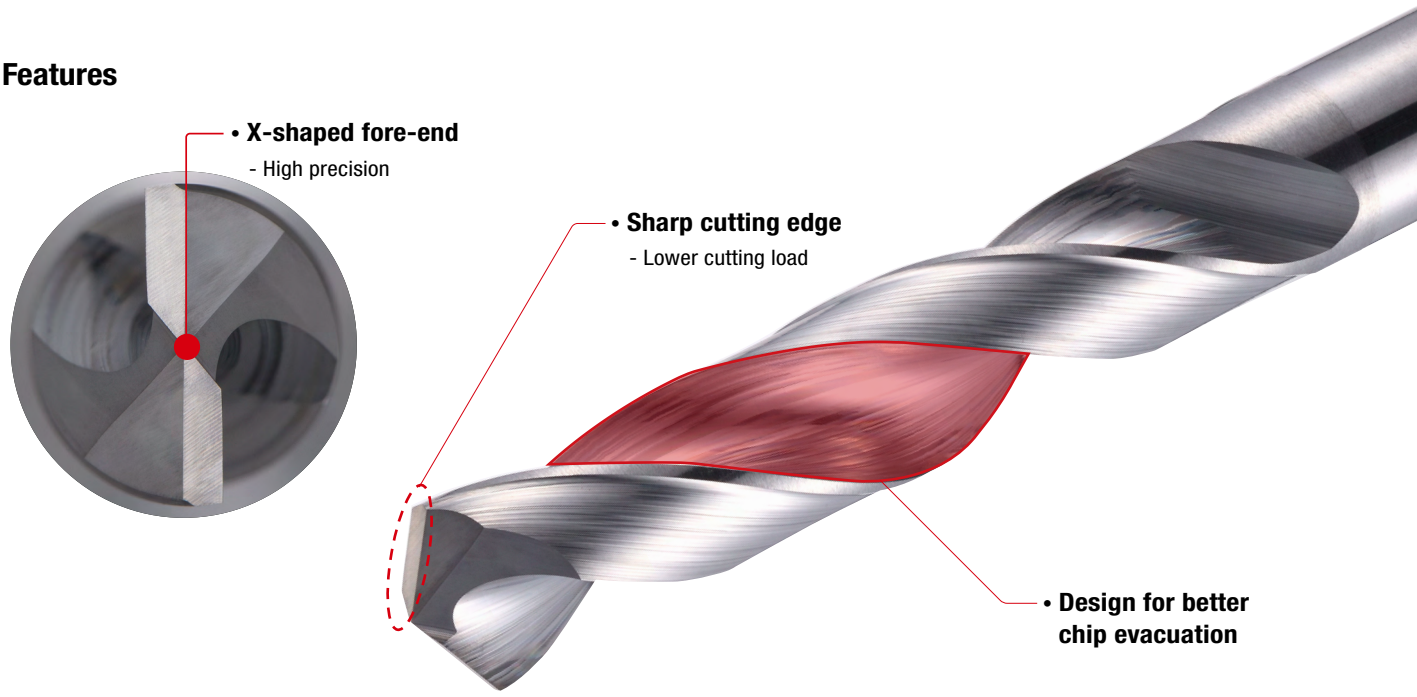
- Stable drilling for high productivity
- Available for various workpieces such as mild steel and non-ferrous metals

Code system

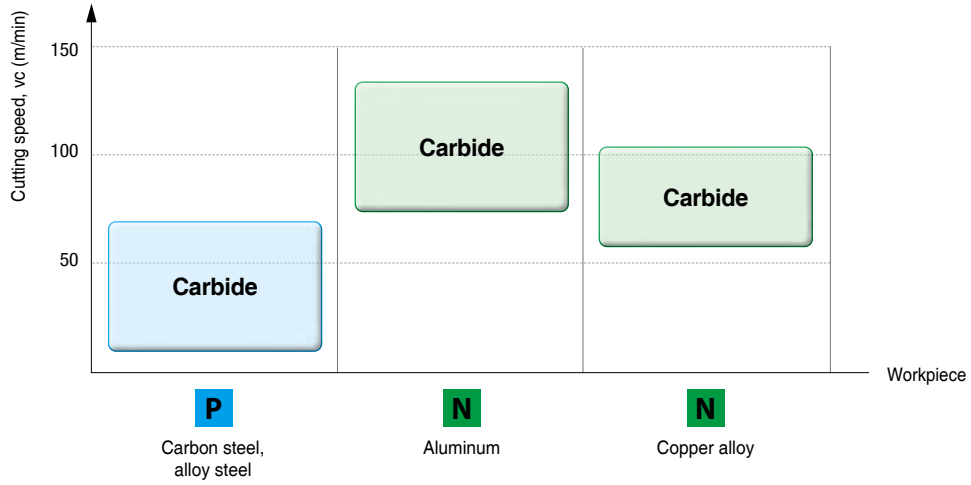
Special type

SSD	010	-	N	10	-	60L	-	6S
Solid Spiral Drill	Drill dia. (ØD)		Non-ferrous	Flute length		Overall length		Shank dia.
	010 = Ø1.0mm			10: 10mm		60L: 60mm		6S: Ø6.0mm

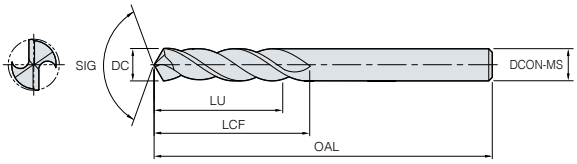
Features



Application range



SSD-N



Coating	x
Tolerance (Drill Dia.)	h8
Tolerance (Shank Dia.)	h7
Point angle (SIG)	118°
Twist angle	30°
Twist angle	X type
Coolant	External

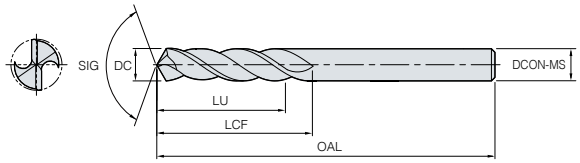
(mm)

Designation		DC	DCON-MS	LCF	OAL
SSD	010-N	1	1	10	38
	011-N	1.1	1.1	10	38
	012-N	1.2	1.2	10	38
	013-N	1.3	1.3	13	38
	014-N	1.4	1.4	13	38
	015-N	1.5	1.5	13	38
	016-N	1.6	1.6	13	38
	017-N	1.7	1.7	13	38
	018-N	1.8	1.8	13	38
	019-N	1.9	1.9	13	38
	020-N	2	2	16	45
	021-N	2.1	2.1	16	45
	022-N	2.2	2.2	16	45
	023-N	2.3	2.3	16	45
	024-N	2.4	2.4	18	50
	025-N	2.5	2.5	20	50
	026-N	2.6	2.6	20	50
	027-N	2.7	2.7	22	50
	028-N	2.8	2.8	22	50
	029-N	2.9	2.9	22	50
	030-N	3	3	22	50
	031-N	3.1	3.1	25	50
	032-N	3.2	3.2	25	50
	033-N	3.3	3.3	25	50
	034-N	3.4	3.4	25	50
	035-N	3.5	3.5	25	50
	036-N	3.6	3.6	28	55
	037-N	3.7	3.7	28	55
	038-N	3.8	3.8	28	55
	039-N	3.9	3.9	28	55
	040-N	4	4	28	55
	041-N	4.1	4.1	30	60
	042-N	4.2	4.2	30	60
	043-N	4.3	4.3	30	60
	044-N	4.4	4.4	30	60
	045-N	4.5	4.5	30	60
	046-N	4.6	4.6	33	65
	047-N	4.7	4.7	33	65
	048-N	4.8	4.8	35	65
	049-N	4.9	4.9	35	65
	050-N	5	5	35	65
	051-N	5.1	5.1	35	65
	052-N	5.2	5.2	35	65
	053-N	5.3	5.3	35	65

Designation		DC	DCON-MS	LCF	OAL
SSD	054-N	5.4	5.4	35	65
	055-N	5.5	5.5	35	65
	056-N	5.6	5.6	38	75
	057-N	5.7	5.7	38	75
	058-N	5.8	5.8	38	75
	059-N	5.9	5.9	38	75
	060-N	6	6	38	75
	061-N	6.1	6.1	38	75
	062-N	6.2	6.2	38	75
	063-N	6.3	6.3	38	75
	064-N	6.4	6.4	38	75
	065-N	6.5	6.5	38	75
	066-N	6.6	6.6	45	80
	067-N	6.7	6.7	45	80
	068-N	6.8	6.8	45	80
	069-N	6.9	6.9	45	80
	070-N	7	7	45	80
	071-N	7.1	7.1	45	80
	072-N	7.2	7.2	45	80
	073-N	7.3	7.3	45	80
	074-N	7.4	7.4	45	80
	075-N	7.5	7.5	45	80
	076-N	7.6	7.6	50	85
	077-N	7.7	7.7	50	85
	078-N	7.8	7.8	50	85
	079-N	7.9	7.9	50	85
	080-N	8	8	50	85
	081-N	8.1	8.1	50	85
	082-N	8.2	8.2	50	85
	083-N	8.3	8.3	50	85
	084-N	8.4	8.4	50	85
	085-N	8.5	8.5	50	85
	086-N	8.6	8.6	50	95
	087-N	8.7	8.7	50	95
	088-N	8.8	8.8	50	95
	089-N	8.9	8.9	50	95
	090-N	9	9	50	95
	091-N	9.1	9.1	50	95
	092-N	9.2	9.2	50	95
	093-N	9.3	9.3	50	95
	094-N	9.4	9.4	50	95
	095-N	9.5	9.5	50	95
	096-N	9.6	9.6	50	95
	097-N	9.7	9.7	50	95

SSD-N

Coating	×
Tolerance (Drill Dia.)	h8
Tolerance (Shank Dia.)	h7
Point angle (SIG)	118°
Twist angle	30°
Twist angle	X type
Coolant	External



(mm)

Designation		DC	DCON-MS	LCF	OAL
SSD	098-N	9.8	9.8	50	95
	099-N	9.9	9.9	55	100
	100-N	10	10	55	100
	101-N	10.1	10.1	55	115
	102-N	10.2	10.2	55	115
	103-N	10.3	10.3	55	115
	104-N	10.4	10.4	55	115
	105-N	10.5	10.5	55	115
	106-N	10.6	10.6	60	115
	107-N	10.7	10.7	60	115
	108-N	10.8	10.8	60	115
	109-N	10.9	10.9	60	115

Designation		DC	DCON-MS	LCF	OAL
SSD	110-N	11	11	65	115
	111-N	11.1	11.1	65	120
	112-N	11.2	11.2	75	120
	113-N	11.3	11.3	75	120
	115-N	11.5	11.5	75	120
	118-N	11.8	11.8	75	120
	119-N	11.9	11.9	75	120
	120-N	12	12	75	120
	124-N	12.4	12.4	75	125
	125-N	12.5	12.5	75	125
	130-N	13	13	75	130

Burnishing Drill

BDS

Burnishing Drill

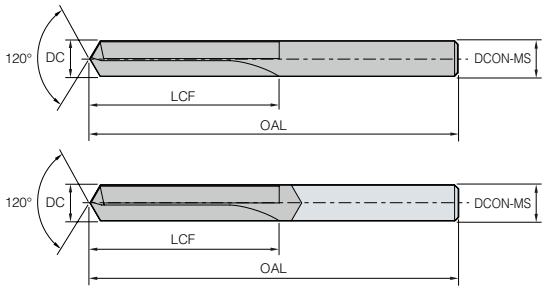


Fig. 1

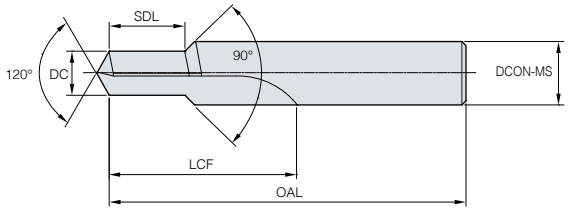
Fig. 2

(mm)

Designation		DC	DCON-MS	LCF	OAL	Fig.
BDS	040S	4	4	35	80	1
	050S	5	5	40	85	1
	060S	6	6	50	95	1
	070S	7	7	55	100	1
	080S	8	8	65	110	1
	090S	9	9	70	120	1
	100S	10	10	80	130	1
	110S	11	11	90	140	1
	120B	12	12	95	150	2
	130B	13	16	105	160	2
	140B	14	16	110	170	2
	150B	15	16	120	185	2
	160B	16	16	125	190	2

BDT

For tapping a foundation hole



(mm)

Designation		DC	DCON-MS	SDL	LCF	OAL	Tap
BDT	M05080 - ℓ1	4.2	6	35	9~15	90	M5XP0.8
	M06100 - ℓ1	5.0	7	40	11~18	95	M6XP1.0
	M08125 - ℓ1	6.8	10	50	15~24	105	M8XP1.25
	M10125 - ℓ1	8.8	12	55	17~30	110	M10XP1.25
	M10150 - ℓ1	8.5	12	55	17~30	110	M10XP1.5
	M12125 - ℓ1	10.8	14	60	19~36	120	M12XP1.25
	M12150 - ℓ1	10.5	14	60	19~36	120	M12XP1.5
	M12175 - ℓ1	10.3	14	60	19~36	120	M12XP1.75

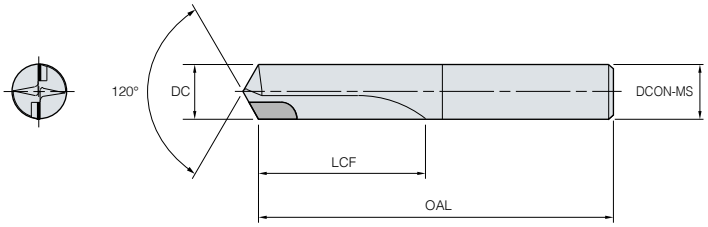
High accuracy hole machining for Aluminum alloy

PCD Drill

- High accuracy hole machining for aluminum alloy
- Drilling tolerance : IT7~8 class
- Recommended for high accuracy and high spindle machine

PDD

Brazing type

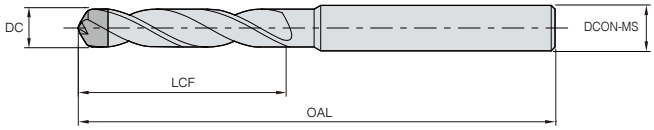


(mm)

Designation		DC	DCON-MS	LCF	OAL
PDD	0500	5.0	5.0	30	80
	0550	5.5	5.5	30	80
	0600	6.0	6.0	30	80
	0650	6.5	6.5	40	95
	0700	7.0	7.0	40	95
	0750	7.5	7.5	45	100
	0800	8.0	8.0	45	100
	0850	8.5	8.5	50	110
	0900	9.0	9.0	50	110
	0950	9.5	9.5	55	115
	1000	10.0	10.0	55	115
	1050	10.5	10.5	60	120
	1100	11.0	11.0	60	120
	1150	11.5	11.5	65	125
	1200	12.0	12.0	65	125

CPD

Standard Cone type

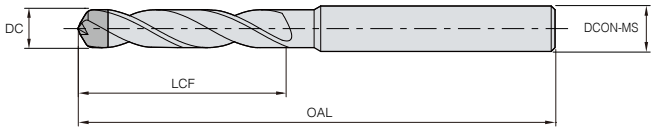


(mm)

Designation		DC	DCON-MS	LCF	OAL
CPD	020~030	2.0~3.0	4	10	43
	031~035	3.1~3.5	4	15	43
	036~040	3.6~4.0	4	15	43
	041~050	4.1~5.0	6	20	53
	051~060	5.1~6.0	6	25	63
	061~070	6.1~7.0	8	30	79
	071~080	7.1~8.0	8	35	79

CPDL

Long Cone type



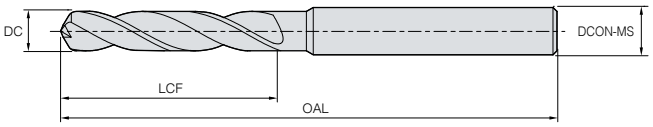
(mm)

Designation		DC	DCON-MS	LCF	OAL
CPDL	020~030	2.0~3.0	4	90	160
	031~035	3.1~3.5	4	90	160
	036~040	3.6~4.0	4	90	160
	041~050	4.1~5.0	6	90	160
	051~060	5.1~6.0	6	90	160
	061~070	6.1~7.0	8	90	160
	071~080	7.1~8.0	8	90	160

- High functional drill for machining in various cutting range : Cone type drill(CPD)
- Realizing excellent accuracy and surface finish
- High precision premium PCD drill

SPD

Standard Sandwich type



(mm)

Designation		DC	DCON-MS	LCF	OAL
SPD	040	4.0	4	20	43
	045	4.5	6	20	53
	050	5.0	6	25	63
	055	5.5	6	25	63
	060	6.0	6	25	63
	065	6.5	8	30	79
	070	7.0	8	35	79
	075	7.5	8	35	79
	080	8.0	8	35	79
	085	8.5	10	60	110
	090	9.0	10	60	110
	095	9.5	10	60	110
	100	10.0	10	60	110
	105	10.5	10	60	110
	110	11.0	12	70	110
	115	11.5	12	70	110
	120	12.0	12	80	150
	125	12.5	12	80	150
	130	13.0	14	80	150
	135	13.5	14	80	150
	140	14.0	14	80	150
	145	14.5	14	80	150
	150	15.0	16	80	150
	160	16.0	16	80	150

- High functional drill for machining in various cutting range : Cone type drill(CPD)
- Realizing excellent accuracy and surface finish
- High precision premium PCD drill

Stable performance and hole quality with our unique cutting edge and guide pad available regrinding

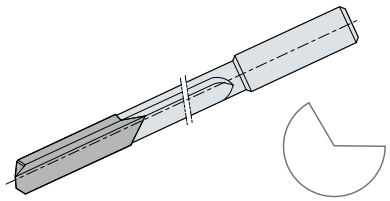
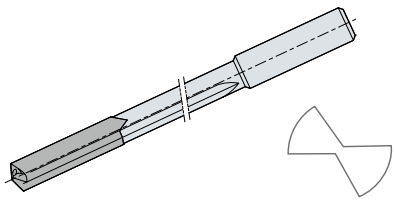
Gun Drill

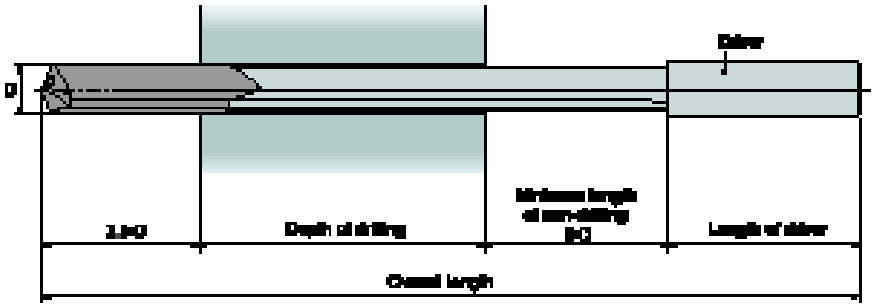
- High efficiency in deep hole machining
- High accuracy (Hole tolerance: IT9, surface finish: Ra0.1~3.0S)
- Stable Quality due to unique cutting edge and guide pad available regrinding
- Used drill can be recycled by exchanging the carbide part
- Depending on request, the drills can change geometry of cutting edge and drive specification
- For ordering, please check length of drill

Code system

KGD	S	12.05	-	1500	/	D30
KORLOY Gun Drill	**Lib type** S: Single T: Twin	**Drill dia. (ØD)** Ø12.05mm		**Length of drill** 1500mm		**Drive no.** D30

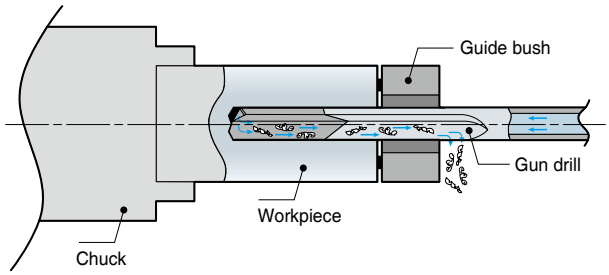
Features

	Single Lip type	Twin Lip type
Shape		
Drill Dia.	Ø3.0~Ø30.0	Ø8.0~Ø24.0
Depth of drilling	≥ 2,000mm	≥ 1,000mm
Tolerance	IT9	IT10
Surface finish	Ra 0.1~3.0μm	Ra 1.0~4.0μm
Application	For all kinds of workpiece machining	• Workpieces with good chip evacuation • Machining of at higher feed than single lip type's



- Refer to the code system and the above drawing when ordering
- The overall length can be chosen by order

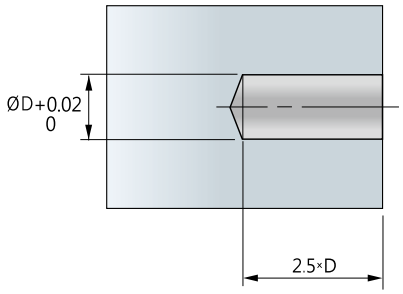
Application of Gun Drill on exclusive machine



- The guide bush is necessary for centering before gun-drilling

Application of Gun Drill on machining center

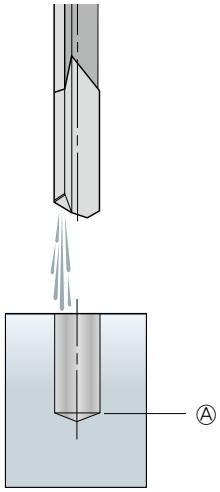
1 Machining of a pilot hole



1. A pilot hole is necessary in machining on a machining center instead of a guide bush
2. The diameter of the pilot hole should be 0.01~0.02 (H7) larger bigger than one of the Gun Drill diameter and the depth of drilling should be about 2.5×D
3. Use Mach Drill (MSD) for machining of a pilot hole

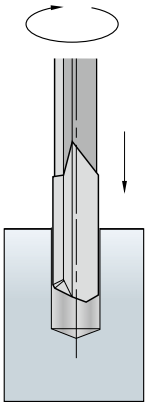
MSD

2 Moving the Gun Drill to the pilot hole



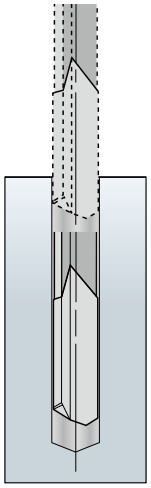
1. The Gun Drill should not drill before entering the pilot hole
2. Coolant is necessary for gun drilling

3 Start Gun Drilling



1. Rotate the spindle
2. Machine with drilling to vertical axis

4 After Gun Drilling



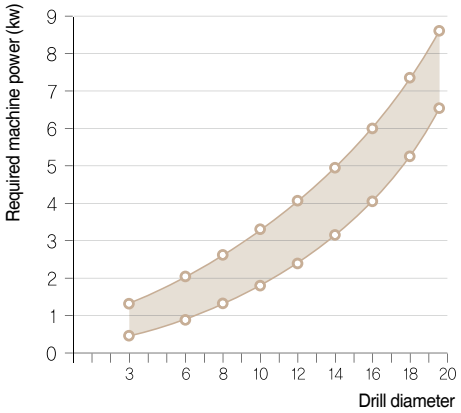
1. Return the drill
2. Stop drilling and supplying coolant
3. Remove the Gun Drill

Technical information

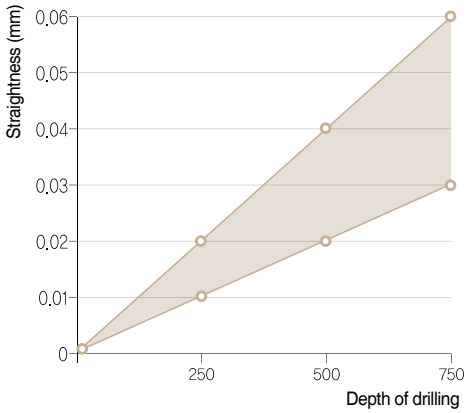
The factors below determine the straightness of hole

- Drill diameter and depth of drilling
- Cutting condition and kind of application
- Kind of workpiece and machine
- Drill bush

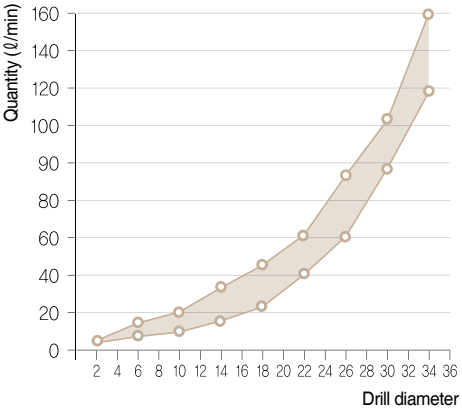
Required machine power



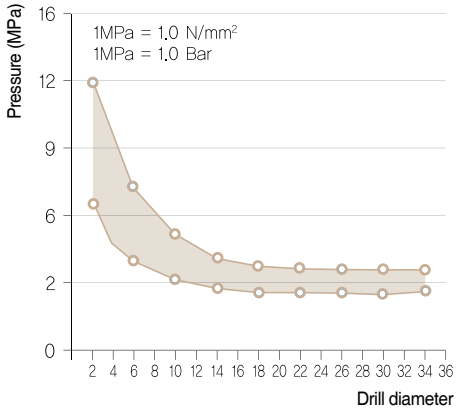
Straightness



Quantity of coolant



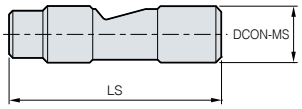
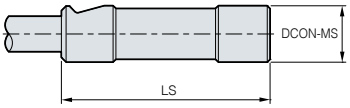
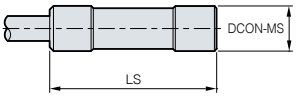
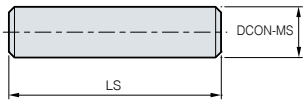
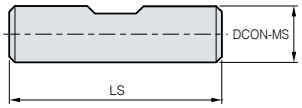
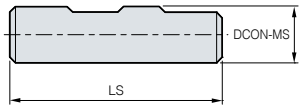
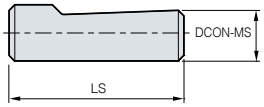
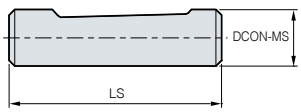
Pressure of coolant



※ The above graph shows general information and it is changeable depending on kind of tool, workpieces, and cutting conditions etc.

- **Pressure and quantity of coolant** - High pressure of coolant ensures excellent chip evacuation and cooling the cutting edge
- **Use a filter for removing impurities** - The diameter of a filter should be less than 20㎛. Impurities could make bad flow of coolant, wear on a tool, and high load on the cooling pump
- **Temperature of coolant** - Proper temperature of coolant: 20°C~22°C / Do not use coolant at 50°C above

Driver standard

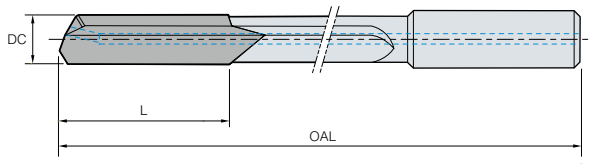
Type	Shape	No.	ØD×L		Carbide type	
			ØD×L	Thread	Tipped	Solid
Central Clamping Surface 15˚		D01	10*40		●	●
		D02	16*45		●	
		D03	19.05*69.8		●	
		D04	25*70		●	
		D05	25.4*69.8		●	
Frontal Clamping Surface 15˚		D06	16*50		●	
Central Clamping Tapered		D07	12.7*38.1		●	●
		D08	16*70			
		D09	19.05*69.8		●	
		D10	20*70			
Cylindrical DIN1835A DIN6535HA		D11	4*28		●	●
		D12	6*36		●	●
		D13	10*40		●	●
		D14	16*48		●	●
		D15	20*50		●	
		D16	25*56		●	
Weldon DIN1835B		D17	10*40		●	●
		D18	12*45		●	●
		D19	16*48		●	●
		D20	20*50		●	●
Weldon DIN6535HB		D21	25*56		●	
		D22	32*60		●	
		D23	40*70			
Whistle Notch DIN1835E		D24	10*40		●	●
		D25	12*45		●	●
		D26	16*48		●	●
		D27	20*50		●	●
		D28	25*56		●	
		D29	32*60		●	
Whistle Notch DIN6535HE		D30	10*40		●	●
		D31	12*45		●	●
		D32	16*48		●	●
		D33	20*50		●	●

※ Special types are available for quotation with shape and size information

KGDS

Single lip type

Designation description	
O.OO	Diameter
□□□□	Length
D□□	Driver code no.



(mm)

Designation		DC	L
KGDS	O.OO-□□□□/D□□	3.00~3.49	19
	O.OO-□□□□/D□□	3.50~3.99	19
	O.OO-□□□□/D□□	4.00~4.49	23
	O.OO-□□□□/D□□	4.50~4.99	23
	O.OO-□□□□/D□□	5.00~5.49	24
	O.OO-□□□□/D□□	5.50~5.99	26
	O.OO-□□□□/D□□	6.00~6.49	27
	O.OO-□□□□/D□□	6.50~6.99	28
	O.OO-□□□□/D□□	7.00~7.49	29
	O.OO-□□□□/D□□	7.50~7.99	30
	O.OO-□□□□/D□□	8.00~8.49	31
	O.OO-□□□□/D□□	8.50~8.99	31
	O.OO-□□□□/D□□	9.00~8.49	31
	O.OO-□□□□/D□□	9.50~9.99	31
	O.OO-□□□□/D□□	10.00~10.49	31
	O.OO-□□□□/D□□	10.50~10.99	32
	O.OO-□□□□/D□□	11.00~11.49	35
	O.OO-□□□□/D□□	11.50~11.99	35
	O.OO-□□□□/D□□	12.00~12.49	38
	O.OO-□□□□/D□□	12.50~12.99	38
	O.OO-□□□□/D□□	13.00~13.99	38
	O.OO-□□□□/D□□	14.00~14.99	38
	O.OO-□□□□/D□□	15.00~15.99	39
	O.OO-□□□□/D□□	16.00~16.99	39
	O.OO-□□□□/D□□	17.00~17.99	40
	O.OO-□□□□/D□□	18.00~18.99	41
	O.OO-□□□□/D□□	19.00~19.99	41
	O.OO-□□□□/D□□	20.00~20.99	44
	O.OO-□□□□/D□□	21.00~21.99	46
	O.OO-□□□□/D□□	22.00~22.99	49
	O.OO-□□□□/D□□	23.00~23.99	51
	O.OO-□□□□/D□□	24.00~24.99	52
	O.OO-□□□□/D□□	25.00~25.99	54
	O.OO-□□□□/D□□	26.00~26.99	54
	O.OO-□□□□/D□□	27.00~27.99	54
	O.OO-□□□□/D□□	28.00~28.99	54
	O.OO-□□□□/D□□	29.00~29.99	56
	O.OO-□□□□/D□□	30.00~30.99	59
	O.OO-□□□□/D□□	31.00~31.99	61
	O.OO-□□□□/D□□	32.00~32.99	61

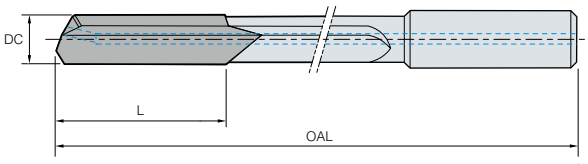
※ When ordering, please mark the overall length(L) and driver number(or drawing)

Available overall length

Designation	Drill dia.	Overall length				
		250mm	500mm	1000mm	1500mm	2000mm
KGDS	3.00~3.49	○	○	○		
	3.50~32.99	○	○	○	○	○

KGDT

Single lip type



Designation description	
O.OO	Diameter
□□□□	Length
D□□	Driver code no.

(mm)

Designation		DC	L
KGDT	O.OO-□□□□/D□□	8.00~8.49	38
	O.OO-□□□□/D□□	8.50~8.99	38
	O.OO-□□□□/D□□	9.00~8.49	40
	O.OO-□□□□/D□□	9.50~9.99	40
	O.OO-□□□□/D□□	10.00~10.49	40
	O.OO-□□□□/D□□	10.50~10.99	40
	O.OO-□□□□/D□□	11.00~11.49	45
	O.OO-□□□□/D□□	11.50~11.99	45
	O.OO-□□□□/D□□	12.00~12.49	45
	O.OO-□□□□/D□□	12.50~12.99	48
	O.OO-□□□□/D□□	13.00~13.99	48
	O.OO-□□□□/D□□	14.00~14.99	48
	O.OO-□□□□/D□□	15.00~15.99	48
	O.OO-□□□□/D□□	16.00~16.99	50
	O.OO-□□□□/D□□	17.00~17.99	50
	O.OO-□□□□/D□□	18.00~18.99	50
	O.OO-□□□□/D□□	19.00~19.99	50
	O.OO-□□□□/D□□	20.00~20.99	55
	O.OO-□□□□/D□□	21.00~21.99	55
	O.OO-□□□□/D□□	22.00~22.99	55
	O.OO-□□□□/D□□	23.00~23.99	60

※When ordering, please mark the overall length(L) and driver number(or drawing)

Overall length

Designation	Drill dia.	Overall length				
		250mm	500mm	1000mm	1500mm	2000mm
KGDT	8.00~23.99	○	○	○		

Chucking / Machine Reamer

SCRS

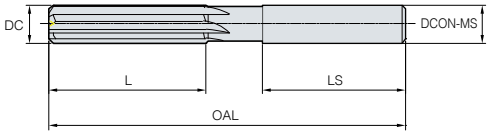


Fig. 1

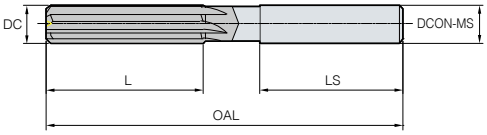


Fig. 2

(mm)

Designation		NOF	DC	DCON-MS	L	LS	OAL	Fig.
SCRS	050S	4	5	6	20	40	100	1
	060S	4	6	6	20	40	115	1
	070S	4	7	8	20	40	125	1
	080S	4	8	8	20	40	135	1
	090S	4	9	10	20	45	140	1
	100B	4	10	10	25	50	145	2
	110B	4	11	12	25	50	150	2
	120B	4	12	12	25	50	160	2
	130B	4	13	16	25	50	165	2
	140B	6	14	16	25	50	170	2
	150B	6	15	16	30	50	180	2
	160B	6	16	16	30	50	190	2
	180B	6	18	20	30	55	210	2
	200B	6	20	20	40	60	230	2

※SCRS___S : Solid type, SCRS___B : Brazing type

SCRH

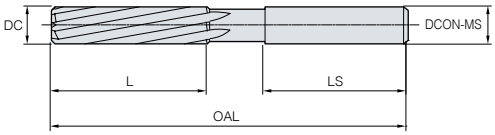


Fig. 1

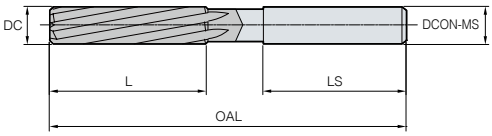


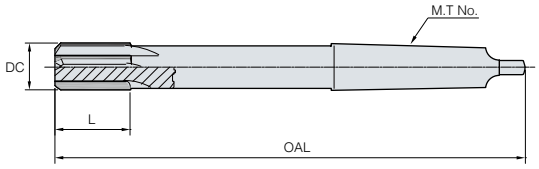
Fig. 2

(mm)

Designation		NOF	DC	DCON-MS	L	LS	OAL	Fig.
SCRH	050S	4	5	6	20	40	100	1
	060S	4	6	6	20	40	115	1
	070S	4	7	8	20	40	125	1
	080S	4	8	8	20	40	135	1
	090S	4	9	10	20	45	140	1
	100B	4	10	10	25	50	145	2
	110B	4	11	12	25	50	150	2
	120B	4	12	12	25	50	160	2
	130B	4	13	16	25	50	165	2
	140B	6	14	16	25	50	170	2
	150B	6	15	16	30	50	180	2
	160B	6	16	16	30	50	190	2
	180B	6	18	20	30	55	210	2
	200B	6	20	20	40	60	230	2

※SCRS___S : Solid type, SCRS___B : Brazing type

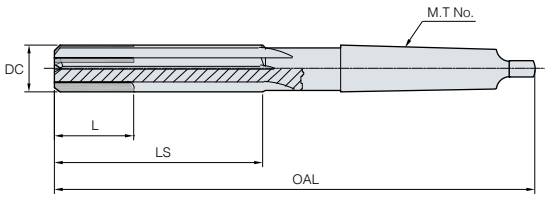
TCRS



(mm)

Designation		NOF	DC	L	OAL	M.T No.
TCRS	070	4	7	20	150	1
	080	4	8	20	150	1
	090	4	9	20	160	1
	100	4	10	25	160	1
	110	4	11	25	170	1
	120	4	12	25	170	1
	130	4	13	25	180	1
	140	6	14	25	190	1
	150	6	15	30	200	2
	160	6	16	30	200	2
	180	6	18	30	220	2
	200	6	20	40	230	2
	250	6	25	40	260	3
	280	8	28	40	270	3
	300	8	30	50	290	3

TMRS

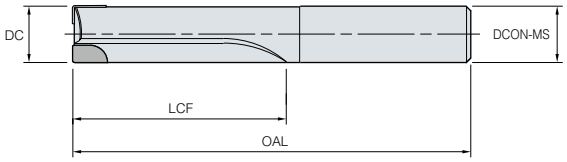


(mm)

Designation		NOF	DC	L	LS	OAL	M.T No.
TMRS	070	4	7	60	60	150	1
	080	4	8	70	70	150	1
	090	4	9	70	70	160	1
	100	4	10	75	75	170	1
	110	4	11	75	75	170	1
	120	4	12	80	40	180	1
	130	4	13	85	40	190	1
	140	6	14	90	45	210	1
	150	6	15	90	45	215	2
	160	6	16	100	50	220	2
	180	6	18	105	50	225	2
	200	6	20	120	50	240	2
	250	6	25	130	50	270	3
	280	8	28	140	50	280	3
	300	8	30	150	50	290	3

PCD Reamer

PDR

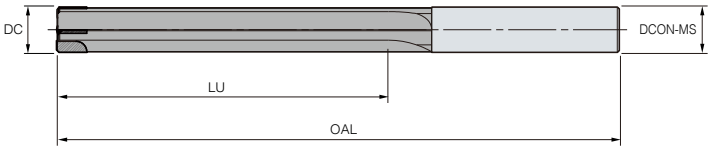


(mm)

Designation		NOF	DC	DCON-MS	LCF	OAL
PDR	2050	2	5	6	30	65
	2060	2	6	6	40	75
	2070	2	7	8	40	75
	2080	2	8	8	40	75
	2090	2	9	10	40	85
	2100	2	10	10	40	85
	2120	2	12	12	50	95
	2140	2	14	16	50	95
	2150	2	15	16	50	100
	4160	4	16	16	50	100
	4180	4	18	20	60	110
	4200	4	20	20	60	110

Cermet Reamer

KCR



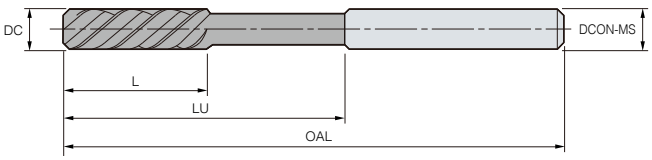
(mm)

Designation		NOF	DC	DCON-MS	LU	OAL
KCR	060~079-25-70L	2	6.0~7.9	8	25	70
	080~099-035-90L	2	8.0~9.9	10	35	90
	100~119-050-100L	4	10.0~11.9	12	50	100
	120~159-060-110L	4	12.0~15.9	12	60	110
	160~199-060-110L	4	16.0~19.9	16	60	110
	200~259-060-110L	4	20.0~25.9	20	60	110
	260~300-070-130L	4	26.0~30.0	25	70	130

※ Customizing tools are available (Maximum overhang length should be less than 150mm.)

Broach Reamer

HBRE

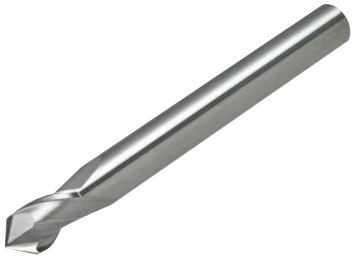


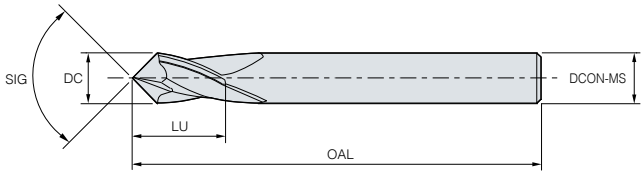
(mm)

Designation		NOF	DC	DCON-MS	L	LU	OAL	Type
HBRE	030	3	3	3	20	40	70	Solid
	040	3	4	4	25	40	70	Solid
	060	4	6	6	30	50	80	Solid
	080	4	8	8	30	60	100	Solid
	100	4	10	10	30	60	100	Solid
	120	4	12	12	40	70	120	Top Solid
	160	6	16	16	40	80	130	Top Solid
	200	6	20	20	50	90	150	Top Solid
	250	6	25	25	50	90	150	Top Solid

Chamfer Tool

CET





(mm)

Designation		DC	DCON-MS	LU	OAL	SIG
CET	060-030	3	3	5.5	50	60°
	060-040	4	4	7	50	60°
	060-060	6	6	10	60	60°
	060-080	8	8	13	70	60°
	060-100	10	10	16	70	60°
	060-120	12	12	18	80	60°
	060-160	16	16	24	100	60°
	090-030	3	3	5.5	50	90°
	090-040	4	4	7	50	90°
	090-060	6	6	10	60	90°
	090-080	8	8	13	70	90°
	090-100	10	10	16	70	90°
	090-120	12	12	18	80	90°
	090-160	16	16	24	100	90°
	120-030	3	3	5.5	50	120°
	120-040	4	4	7	50	120°
	120-060	6	6	10	60	120°
	120-080	8	8	13	70	120°
	120-100	10	10	16	70	120°
	120-120	12	12	18	80	120°
	120-160	16	16	24	100	120°

CCT

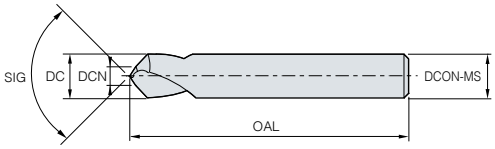


Fig. 1

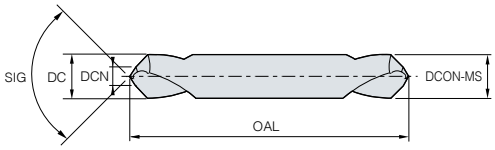


Fig. 2

(mm)

Designation		DC = DCON-MS	DCN	OAL	SIG	Fig.
CCT	060-030	3	1	40	60°	1
	060-040	4	1.5	40	60°	1
	060-060	6	2	50	60°	1
	060-080	8	2.5	60	60°	1
	060-100	10	3	70	60°	1
	060-120	12	4	80	60°	1
	060-160	16	5	100	60°	1
	060T-030	3	1	40	60°	2
	060T-040	4	1.5	40	60°	2
	060T-060	6	2	50	60°	2
	060T-080	8	2.5	60	60°	2
	060T-100	10	3	70	60°	2
	060T-120	12	4	80	60°	2
	060T-160	16	5	100	60°	2
	060T-030L	3	1	100	60°	2
	060T-040L	4	1.5	100	60°	2
	060T-060L	6	2	100	60°	2
	060T-080L	8	2.5	120	60°	2
	060T-100L	10	3	120	60°	2
	060T-120L	12	4	150	60°	2
	090-030	3	1	40	90°	1
	090-040	4	1.5	40	90°	1
	090-060	6	2	50	90°	1
	090-080	8	2.5	60	90°	1
	090-100	10	3	70	90°	1
	090-120	12	4	80	90°	1
	090-160	16	5	100	90°	1
	090T-030	3	1	40	90°	2
	090T-040	4	1.5	40	90°	2
	090T-060	6	2	50	90°	2
	090T-080	8	2.5	60	90°	2
	090T-100	10	3	70	90°	2
	090T-120	12	4	80	90°	2
	090T-160	16	5	100	90°	2
	090T-030L	3	1	100	90°	2
	090T-040L	4	1.5	100	90°	2
	090T-060L	6	2	100	90°	2
	090T-080L	8	2.5	120	90°	2
	090T-100L	10	3	120	90°	2
	090T-120L	12	4	150	90°	2

CCT

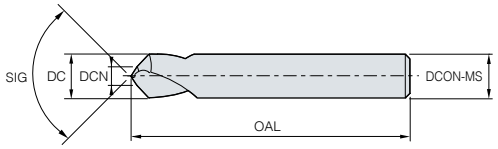


Fig. 1

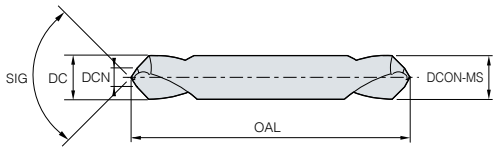


Fig. 2

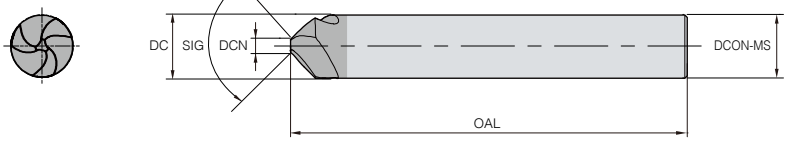
(mm)

Designation		DC = DCON-MS	DCN	OAL	SIG	Fig.
CCT	120-030	3	1	40	120°	1
	120-040	4	1.5	40	120°	1
	120-060	6	2	50	120°	1
	120-080	8	2.5	60	120°	1
	120-100	10	3	70	120°	1
	120-120	12	4	80	120°	1
	120-160	16	5	100	120°	1
	120T-030	3	1	40	120°	2
	120T-040	4	1.5	40	120°	2
	120T-060	6	2	50	120°	2
	120T-080	8	2.5	60	120°	2
	120T-100	10	3	70	120°	2
	120T-120	12	4	80	120°	2
	120T-160	16	5	100	120°	2
	120T-030L	3	1	100	120°	2
	120T-040L	4	1.5	100	120°	2
	120T-060L	6	2	100	120°	2
	120T-080L	8	2.5	120	120°	2
	120T-100L	10	3	120	120°	2
	120T-120L	12	4	150	120°	2

Counter Sink

CSPC3000

3 | Unequal Division /Lead | h6 shank | Grade PC40T | DC ±0.5mm

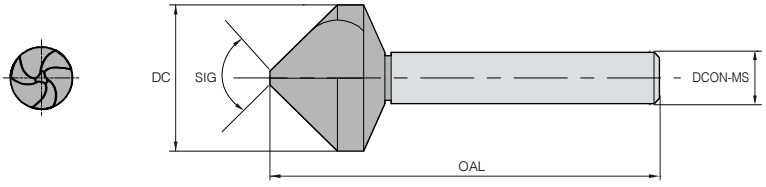


(mm)

Designation		DC	DCON-MS	DCN	OAL	SIG
CSPC	3060-050	6	6	1.5	50	90˚
	3080-060	8	8	2	60	90˚
	3100-070	10	10	2.5	70	90˚
	3120-075	12	12	2.8	75	90˚
	3160-080	16	16	3.2	80	90˚
	3200-090	20	20	3.5	90	90˚

CSNC3000

3 | Straight Type | h9 shank | Grade PC20T | DC ±1.0mm



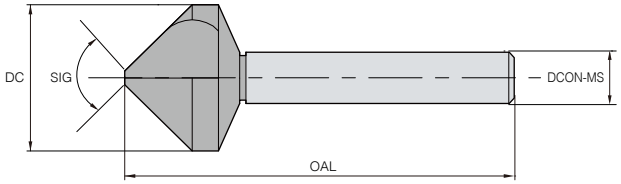
(mm)

Designation		DC	DCON-MS	Range of dia	OAL	SIG
CSNC	3100-047	10	6	2.0~9.0	47	90˚
	3150-053	15	8	3.0~14.0	53	90˚
	3200-057	20	10	4.0~19.0	57	90˚
	3250-067	25	12	5.0~24.0	67	90˚
	3300-075	30	12	6.0~29.0	75	90˚

※ Order made available

CSNC1000

1 | Straight Type | h9 shank | Grade PC20T | DC ±1.0mm

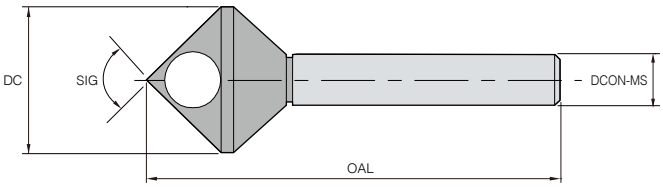


(mm)

Designation		DC	DCON-MS	Range of dia	OAL	SIG
CSNC	1100-048	10.0	6	2.0~9.0	48	90°
	1150-054	15.0	8	2.0~14.0	54	90°
	1200-059	20.0	10	2.0~19.0	59	90°
	1250-069	25.0	12	3.0~24.0	69	90°
	1300-077	30.0	12	4.0~29.0	77	90°

CSHC1000

1 | Hole Type | h9 shank | Grade PC20T | DC ±1.0mm



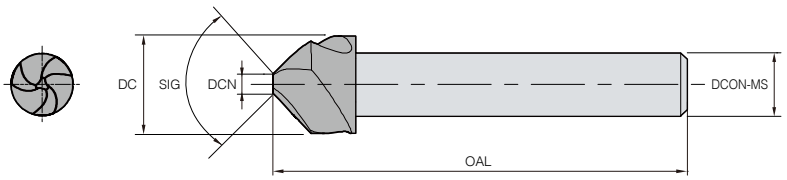
(mm)

Designation		DC	DCON-MS	Range of dia	OAL	SIG
CSHC	1100-045	10.0	6	4.0~8.0	45	90°
	1150-055	15.0	8	5.0~12.0	55	90°
	1200-070	20.0	10	8.0~15.0	70	90°
	1250-075	25.0	12	10.0~20.0	75	90°
	1300-085	30.0	12	12.0~25.0	85	90°

※ Order made available

CSPH3000

3 | Unequal Division /Lead | h8 shank | Grade HC40T | DC ±0.5mm

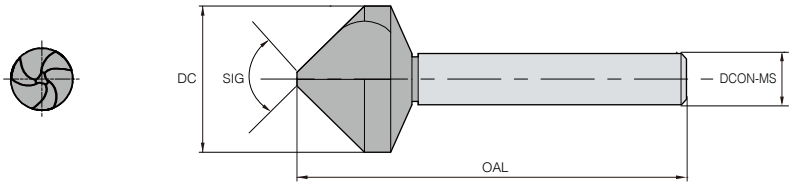


(mm)

Designation		DC	DCON-MS	DCN	OAL	SIG
CSPH	3063-045	6.3	5	1.5	45	90°
	3083-050	8.3	6	2	50	90°
	3104-050	10.4	6	2.5	50	90°
	3124-056	12.4	8	2.8	56	90°
	3165-060	16.5	10	3.2	60	90°
	3205-063	20.5	10	3.5	63	90°
	3250-068	25	10	3.8	68	90°

CSNH3000

3 | Straight Type | h9 shank | Grade HC10T HC20T | DC ±1.0mm ±1°



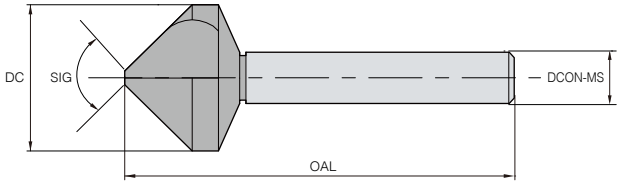
(mm)

Designation		DC	DCON-MS	Range of dia	OAL	SIG
CSNH	3100-050	10	6	3~9	50	90°
	3150-055	15	8	3~14	55	90°
	3200-060	20	10	4~19	60	90°
	3250-070	25	12	5~24	70	90°
	3300-075	30	12	6~29	75	90°
	3350-080	35	12	7~34	80	90°
	3400-085	40	12	8~39	85	90°
	3450-087	45	12	9~44	87	90°
	3500-090	50	12	12~49	90	90°

※ Order made available

CSNH1000

1 | Straight Type | h9 shank | Grade HC10T HC20T | DC ±1.0mm

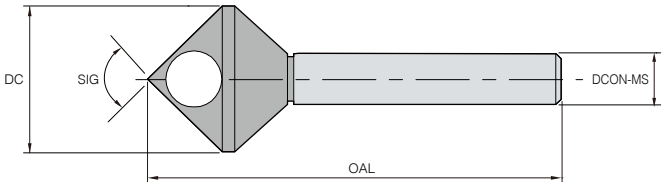


(mm)

Designation		DC	DCON-MS	Range of dia	OAL	SIG
CSNH	1100-070	10	6	2~9	50	90°
	1150-075	15	8	2~14	55	90°
	1200-090	20	10	2~19	60	90°
	1250-080	25	12	2~24	70	90°
	1300-090	30	12	6~29	75	90°
	1350-080	35	12	7~34	80	90°
	1400-085	40	12	8~39	85	90°
	1450-087	45	12	9~44	87	90°
	1500-090	50	12	12~49	90	90°

CSHH1000

1 | Hole Type | h9 shank | Grade HC10T HC20T | DC ±1.0mm



(mm)

Designation		DC	DCON-MS	Range of dia	OAL	SIG
CSHH	1100-070	10	6	3~9	50	90°
	1150-075	15	8	5~12	60	90°
	1200-090	20	10	8~15	65	90°
	1250-080	25	12	10~20	74	90°
	1300-085	30	12	12~25	85	90°
	1350-095	35	16	14~30	95	90°
	1400-105	40	16	16~35	105	90°
	1450-120	45	16	18~40	120	90°
	1500-130	50	16	20~45	130	90°

※ Order made available

PART

THREADING

Korloy threading tools are available for machining various shapes of thread at various pitches while ensuring high quality performances

Technical information for THREADING

D3 Solid threading endmills code system
D4 Technical Information for Threading

Helical flutes with thru-hole coolant / Helical flutes

D5 ISO Metric
D6 American UN (UNC,UNF,UNEF)
D7 Whitworth (BSW,BSF)
D8 British Standard Pipe Thread (BSP)
D9 National Pipe Thread (NPT)
D9 National Pipe Thread (NPTF)
D10 British Standard Pipe Thread (BSPT)
D10 UNJ (Unified Constant Thread)

Helical flutes with radial cooling / Helical flutes

D11 ISO Metric
D14 American UN (UNC,UNF,UNEF)
D15 British Standard Pipe Thread (BSP(G))
D15 British Standard Pipe Thread (BSPT)
D16 National Pipe Thread (NPT)
D16 National Pipe Thread (NPTF)

Helical flutes with radial cooling / Straight flutes

D17 ISO Metric
D18 British Standard Pipe Thread (BSP)
D18 British Standard Pipe Thread (BSPT)
D19 National Pipe Thread (NPT)
D19 National Pipe Thread (NPTF)

Deep threading / Long-type tool

D20 ISO Metric
D20 TP60

Deep threading for general

D21 ISO Metric
D22 American UN (UNC,UNF)
D23 UNJ (UNJC,UNJF)
D23 MJ

Deep threading for dental

D24 ISO Metric
D24 American UN (UNF)

Deep threading for hard materials

D25 ISO Metric
D26 American UN (UNC,UNF)

D27 Tap-Star

Solid threading endmills code system

STM D 3T 03 012 L034 - I 0.35 ISO TM3

1	2	3	4	5	6	7	8	9	10
Type	Flute style	No. of flutes	No. of flutes	Cutting dia.	Cutting edge length	Type of tool	Pitch	Type	Flutes

1 Type
STM D 3T 03 012 L034 - I 0.35 ISO TM3

Solid Threading Endmill

2 Flute style
STM D 3T 03 012 L034 - I 0.35 ISO TM3

HC : Heli Cool
HCR : Heli Cool Radial
HCC : Heli Cool Chamfering
HCD : Heli Cool C/F & Drilling
H : Helical
S : Straight
D : Deep Threading

3 No. of flutes
STM D 3T 03 012 L034 - I 0.35 ISO TM3

1T : 1 flute
3T : 3 flutes
2L : 2 flutes, Left flutes

4 Shank dia.
STM D 3T 03 012 L034 - I 0.35 ISO TM3

03 : 3.0

5 Cutting dia.
STM D 3T 03 012 L034 - I 0.35 ISO TM3

012 : 1.20

6 Cutting edge length
STM D 3T 03 012 L034 - I 0.35 ISO TM3

L034 : 3.4

7 Type of tool
STM D 3T 03 012 L034 - I 0.35 ISO TM3

I: Internal
EI : External/Internal

8 Pitch
STM D 3T 03 012 L034 - I 0.35 ISO TM3

mm : 0.35 ~ 3.0 tpi : 72 ~ 12

9 Type
STM D 3T 03 012 L034 - I 0.35 ISO TM3

ISO Metric
American UN (UNC, UNF, UNEF)
Whitworth (BSW, BSP)
British Standard Pipe Thread (BSP)
National Pipe Thread (NPT)
National Pipe Thread (NPTF)
British Standard Pipe Thread (BSPT)
UNJ (Unifide Constant Thread)

10 Flutes
STM D 3T 03 012 L034 - I 0.35 ISO TM3

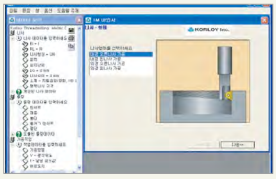
TM3-3 flutes
TM5-5 flutes

TM-INFO
User guide

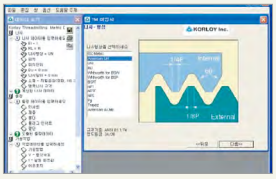
CNC Program composition
TM-INFO composes CNC program for thread milling process in a short time

▶ **Multilingual**
▶ **Window operation**

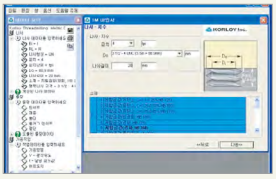
1 Select thread type



2 Select thread standard

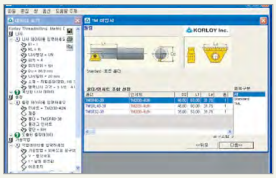


3 Select thread type



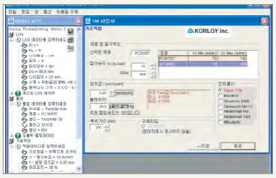
4 Input thread parameter

5 Select working way



6 Select tool

7 Confirm the working data & controler



download
Pls. visit our web-site to download.
http://www.korloy.com

Technical Information for Threading

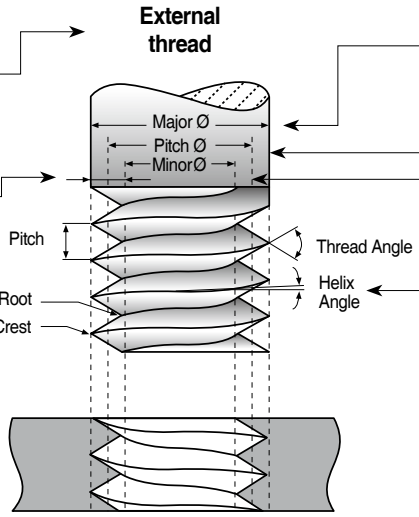
Special features

External thread
A thread on the external surface of a cylinder screw or cone

Depth of thread
The distance between the crest and root measured from normal to the axis

Pitch
The distance between the corresponding points on adjacent thread forms measured parallel to the axis. This distance can be defined in millimeters or by the tpi (threads per inch), which is the reciprocal of the pitch

Nominal diameter
The diameter of which the diameter limits are derived by the application of deviation allowances and tolerances



Internal thread
A thread on the internal surface of a cylinder or cone

Major diameter
The largest diameter of a screw thread

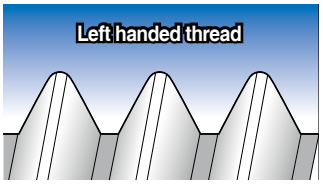
Pitch diameter
On a straight thread, the diameter of an imaginary cylinder, the surface of which cuts the thread forms where the width of the thread and groove are equal

Minor diameter
The smallest diameter of a screw thread

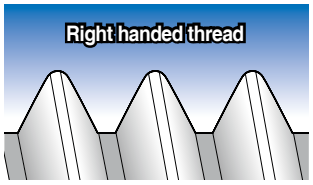
Helix angle
For a straight thread, where the lead of the thread and the pitch diameter circle circumference form a right angled triangle, the helix angle is the angle opposite of the lead

Straight thread
A thread formed on a cylinder

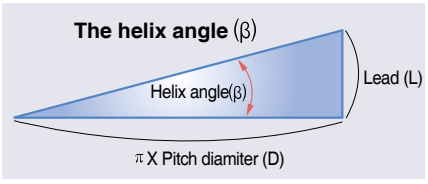
Taper thread
A thread formed on a cone



A thread which, when viewed axially, winds in a counter clockwise and receding direction. All left handed threads are designated LH



A thread which, when viewed axially, winds in a clockwise and receding direction. Threads are always right handed unless they are specified

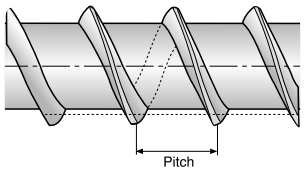


For a straight thread, where the lead of the thread and the pitch diameter circle circumference form a right angled triangle, the helix angle is the angle opposite of the lead

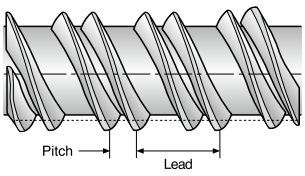
Machining a multi-start thread

- A thread in which the lead is an integral multiple, greater than one, of the pitch. A multi-start thread permits a more rapid advance without a coarser (larger) thread form

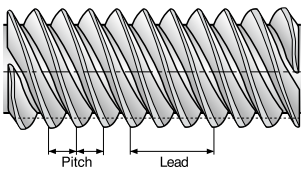
First start machined



Second start machined



Third start machined (Final, 3 starts thread)



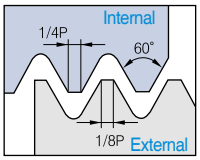
Application grade

Grade	Feature		Application
PC9070M	Solid	• For general cutting including medium cutting - TiCN series for higher wear resistance	Helix flute for deep cutting
PC9060M	Solid	• Optimal coating for straight flute - TiCN series for higher wear resistance	Straight flutes

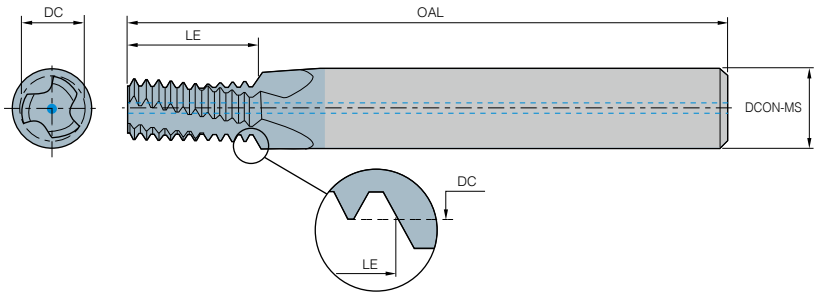
ISO Metric

Helical flutes with thru-hole coolant

Internal



Defined by : R262(DIN 13)
TCTR : 6H



(LE≤1.5×Thread Diameter)

Thread		Pitch (mm)	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine					DC	DCON-MS	LE	OAL	NOF	NT	PHD
M3×0.5	M3.5~M16×0.5	0.50	STMHC	04024L04-I0.50ISO		2.40	4	4.7	45	3	9	2.5
M4×0.7		0.70		04031L06-I0.70ISO		3.15	4	6.6	45	3	9	3.3
M5×0.8		0.80		04039L07-I0.80ISO		3.90	4	7.6	45	3	9	4.2
M6×1.0	M8~M40×1.0	1.00		06048L09-I1.00ISO	●	4.80	6	9.5	57	3	9	5.0
M8×1.25		1.25		08065L13-I1.25ISO		6.50	8	13.1	61	3	10	6.8
M10×1.5	M12~M48×1.5	1.50		10082L15-I1.50ISO		8.20	10	15.7	73	3	10	8.5
M12×1.75		1.75		10099L18-I1.75ISO		9.90	10	18.4	73	4	10	10.2
M14×2.0	M17~M80×2.0	2.00		12116L21-I2.00ISO		11.60	12	21.0	73	4	10	12.0
M16×2.0	M17~M80×2.0	2.00		14136L25-I2.00ISO		13.60	14	25.0	92	4	12	14.0

(LE≤2×Thread Diameter)

Thread		Pitch (mm)	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine					DC	DCON-MS	LE	OAL	NOF	NT	PHD
M3×0.5	M3.5~M16×0.5	0.50	STMHC	04024L06-I0.50ISO		2.40	4	6.2	45	3	12	2.5
	M4×0.5	0.50		04032L08-I0.50ISO		3.20	4	8.2	45	3	16	3.5
	M5×0.5	0.50		06042L10-I0.50ISO		4.20	6	10.2	57	3	20	4.5
M4×0.7		0.70		04031L08-I0.70ISO		3.15	4	8.7	45	3	12	3.3
	M6×0.75	0.75		06050L12-I0.75ISO		5.00	6	12.4	57	3	16	5.3
M5×0.8		0.80		04039L10-I0.80ISO		3.90	4	10.8	45	3	13	4.2
M6×1.0	M8~M40×1.0	1.00		06048L12-I1.00ISO	●	4.80	6	12.5	57	3	12	5.0
	M8×1.0	1.00		08067L16-I1.00ISO		6.70	8	16.5	61	3	16	7.0
	M10×1.0	1.00		10087L20-I1.00ISO		8.70	10	20.5	73	3	20	9.0
	M12×1.0	1.00		12107L24-I1.00ISO	●	10.70	12	24.5	73	4	24	11.0
M8×1.25		1.25		08065L16-I1.25ISO	●	6.50	8	16.9	61	3	13	6.8
	M10×1.25	1.25		10085L20-I1.25ISO	●	8.50	10	20.6	73	3	16	8.8
M10×1.5	M12~M48×1.5	1.50		10082L20-I1.50ISO	●	8.20	10	20.2	73	3	13	8.5
	M12×1.5	1.50		10099L24-I1.50ISO	●	9.90	10	24.7	73	4	16	10.5
	M14×1.5	1.50		12119L29-I1.50ISO		11.90	12	29.2	80	4	19	12.5
	M16×1.5	1.50		14139L32-I1.50ISO	●	13.90	14	32.2	92	4	21	14.5
M12×1.75		1.75		10099L25-I1.75ISO		9.90	10	25.4	73	4	14	10.2
M14×2.0	M17~M80×2.0	2.00		12116L29-I2.00ISO		11.60	12	29.0	80	4	14	12.0
M16×2.0	M17~M80×2.0	2.00		14136L33-I2.00ISO		13.60	14	33.0	92	4	16	14.0
M18×2.5		2.50		16148L36-I2.50ISO		14.80	16	36.2	92	4	14	15.5
M 20×2.5		2.50		18171L41-I2.50ISO		17.10	18	41.2	102	4	16	17.5
M 24×3.0		3.00		20199L49-I3.00ISO		19.90	20	49.5	102	4	16	21.0

* Bore Diameter applies to smallest thread Dia

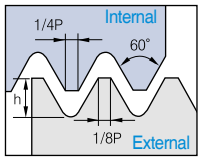
Maximum thread length = $LE - \frac{Pitch}{4}$

● : Stock item

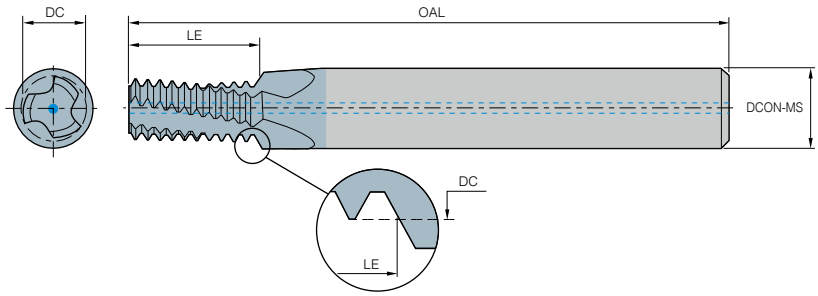
American UN (UNC,UNF,UNEF)

Helical flutes with thru-hole coolant

Internal



Defined by : ANSI B1.1.74
TCTR : 2B



(LE≤1.5×Thread Diameter)

Thread			Pitch (tpi)	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
UNC	UNF	UNEF					DC	DCON-MS	LE	OAL	NOF	NT	PHD
No.10~24	5/16″ ,3/8″x24	9/16″~11/16″x24	24	STMHC	04035L07-I24UNC		3.58	4	7.9	45	3	7	3.8
No.10~24	5/16″ ,3/8″x24	9/16″~11/16″x24	24		06041L08-I24UNC		4.15	6	9.0	57	3	8	4.5
1/4″x20	7/16″ ,1/2″x20	3/4″~1″x20	20		06048L09-I20UNC		4.88	6	9.5	57	3	7	5.2
5/16″x18	9/16″ ,5/8″x18	11/16″~1 11/16″x18	18		08061L11-I18UNC		6.15	8	12.0	61	3	8	6.5
3/8″x16	3/4″x16		16		08076L15-I16UNC		7.65	8	15.1	61	3	9	8.0
7/16″x14	7/8″x14		14		10090L17-I14UNC		9.00	10	17.2	73	3	9	9.3
1/2″x13			13		12104L20-I13UNC		10.35	12	20.5	73	4	10	10.8
9/16″x12	1″~1 1/2″x12		12		12118L22-I12UNC		11.80	12	22.2	73	4	10	12.3

(LE≤2×Thread Diameter)

Thread			Pitch (tpi)	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
UNC	UNF	UNEF					DC	DCON-MS	LE	OAL	NOF	NT	PHD
	No.10~32	No. 12~3/8″x32	32	STMHC	04038L09-I32UNF		3.80	4	9.9	45	3	12	4.0
		No. 12~3/8″x32	32		06044L11-I32UNEF		4.40	6	11.5	57	3	14	4.7
	No.12, 1/4″x28	7/16″; 1/2″x28	28		06043L11-I28UNF		4.30	6	11.3	57	3	12	4.6
	1/4″x28	7/16″; 1/2″x28	28		06052L13-I28UNF		5.15	6	13.1	57	3	14	5.5
		7/16″; 1/2″x28	28		10099L22-I28UNEF		9.90	10	22.2	73	3	24	10.2
No.10~24	5/16″, 3/8″x24	9/16″~11/16″x24	24		04035L10-I24UNC		3.58	4	10.0	45	3	9	3.8
No.12~24	5/16″, 3/8″x24	9/16″~11/16″x24	24		06041L11-I24UNC		4.15	6	11.1	57	3	10	4.5
	5/16″, 3/8″x24	9/16″~11/16″x24	24		08066L16-I24UNF		6.68	8	16.4	61	3	15	6.8
	3/8″x24	9/16″~11/16″x24	24		10082L19-I24UNF		8.20	10	19.6	73	3	18	8.5
		9/16″~11/16″x24	24		14129L29-I24UNEF		12.90	14	29.1	92	4	27	13.2
1/4″x20	7/16″, 1/2″x20	3/4″~1″x20	20		06048L13-I20UNC		4.88	6	13.3	57	3	10	5.2
	7/16″, 1/2″x20	3/4″~1″x20	20		10096L22-I20UNF		9.60	10	22.2	73	3	17	9.8
	1/2″x20	3/4″~1″x20	20		12111L26-I20UNF		11.10	12	26.0	80	3	20	11.5
		3/4″~1″x20	20		18174L38-I20UNEF		17.40	18	38.7	102	4	30	17.8
5/16″x18	9/16″, 5/8″x18	11/16″~1 11/16″x18	18		08061L16-I18UNC		6.15	8	16.2	61	3	11	6.5
	9/16″, 5/8″x18	11/16″~1 11/16″x18	18		14125L28-I18UNF		12.50	14	28.9	92	4	20	12.8
	5/8″x18	11/16″~1 11/16″x18	18		16141L31-I18UNF		14.10	16	31.7	92	4	22	14.5
3/8″x16	3/4″x16		16		08076L19-I16UNC		7.65	8	19.8	61	3	12	8.0
	3/4″x16		16		18170L38-I16UNF		17.00	18	38.8	102	4	24	17.5
7/16″x14	7/8″x14		14		10090L22-I14UNC		9.00	10	22.7	73	3	12	9.3
	7/8″x14		14		20199L44-I14UNF		19.90	20	44.4	102	4	24	20.5
1/2″x13			13		12104L26-I13UNC		10.35	12	26.4	80	4	13	10.8
9/16″x12	1″~1 1/2″x12		12		12118L28-I12UNC		11.80	12	28.6	80	4	13	12.3
	1″~1 1/2″x12		12		20199L51-I12UNF		19.90	20	51.9	102	4	24	23.5
5/8″x11			11		14131L33-I11UNC		13.10	14	33.5	92	4	14	13.5
3/4″x10			10		16159L39-I10UNC		15.90	16	39.4	92	4	15	16.5
7/8″x9			9		20190L46-I9UNC		19.00	20	46.6	102	4	16	19.5
1″x8			8		20199L52-I8UNC		19.90	20	52.4	102	4	16	22.0

* Bore Diameter applies to smallest thread Dia

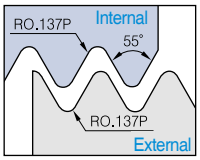
Maximum thread length = LE − $\frac{\text{Pitch}}{4}$

● : Stock item

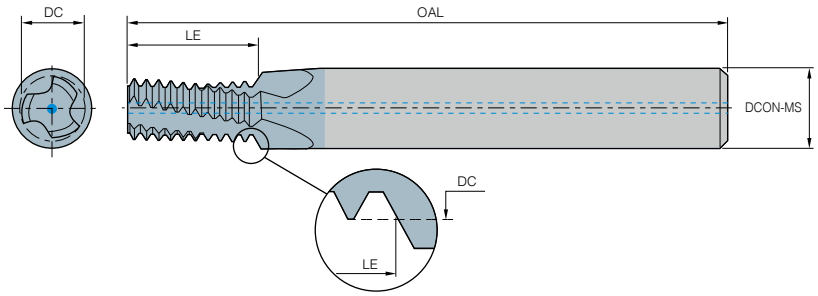
Whitworth (BSW,BSF)

Helical flutes with thru-hole coolant

External/Internal



Defined by : B.S.84:1956,
DIN 259, ISO228/1:1982
TCTR : Medium class A



(LE≤2×Thread Diameter)

Thread		Pitch (tpi)	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
BSW	BSF					DC	DCON-MS	LE	OAL	NOF	NT	PHD
	1/4″×26	26	STMHC	06050L13-EI26BSF		5.00	6	13.2	57	3	13	5.3
	5/16″×22	22		08063L16-EI22BSF		6.35	8	16.7	61	3	14	6.7
1/4″×20	3/8″×20	20		06044L13-EI20BSW		4.45	6	13.3	57	3	10	5.0
	3/8″×20	20		08076L19-EI20BSF		7.65	8	19.7	61	3	15	8.2
5/16″×18	7/16″×18	18		06058L16-EI18BSW		5.85	6	16.2	57	3	11	6.5
	7/16″×18	18		10092L23-EI18BSF		9.20	10	23.3	73	3	16	9.7
3/8″×16	1/2″, 9/16″×16	16		08072L19-EI16BSW		7.20	8	19.8	61	3	12	7.9
	1/2″, 9/16″×16	16		12105L26-EI16BSF		10.50	12	26.2	80	4	16	11.1
	9/16″×16	16		14122L29-EI16BSF		12.15	14	29.4	92	4	18	12.6
7/16″×14	5/8″, 11/16″×14	14		10085L22-EI14BSW		8.50	10	22.7	73	3	12	9.2
	5/8″, 11/16″×14	14		14134L31-EI14BSF		13.40	14	31.7	92	4	17	14.0
	11/16″×14	14		16150L35-EI14BSF		15.00	16	35.4	92	4	19	15.6
1/2″×12	3/4″×12	12		10096L26-EI12BSW		9.65	10	26.5	73	3	12	10.5
9/16″×12	3/4″×12	12		12113L28-EI12BSW		11.25	12	28.6	80	4	13	12.1
	3/4″×12	12		18162L39-EI12BSF		16.20	18	39.2	102	4	18	16.8
5/8″×11	7/8″×11	11		14126L33-EI11BSW		12.60	14	33.5	92	4	14	13.4
11/16″×11		11		16142L35-EI11BSW		14.20	16	35.8	92	4	15	15.0

* Bore Diameter applies to smallest thread Dia

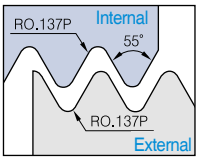
Maximum thread length = LE − $\frac{\text{Pitch}}{4}$

● : Stock item

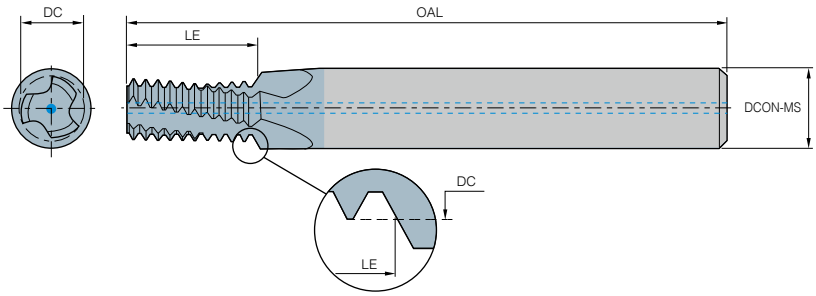
British Standard Pipe Thread (BSP)

Helical flutes with thru-hole coolant

Internal



Defined by : B.S.2779:1956
TCTR : Medium class



(LE≤1.5×Thread Diameter)

Thread Standard	Pitch (tpi)	Designation		PC9070M	Dimensions (mm) DC	DCON-MS	LE	OAL	No.of flute NOF	Tooth NT	*Bore dia. PHD
1/16″, 1/8″x28	28	STMHC	STMHC08064L12-EI28BSP		6.4	8	12.2	61	3	13	6.7
1/8″x28	28		STMHC10082L15-EI28BSP		8.2	10	15.0	73	3	16	8.7
1/4″, 3/8″x19	19		STMHC12110L20-EI19BSP		11.0	12	20.7	80	4	15	11.8
3/8″x19	19		STMHC16145L26-EI19BSP		15.2	16	26.1	92	4	19	15.2
1″-4″x11	11		STMHC20199L42-EI11BSP		30.7	20	42.7	102	4	18	30.7

(LE≤2×Thread Diameter)

Thread Standard	Pitch (tpi)	Designation		PC9070M	Dimensions (mm) DC	DCON-MS	LE	OAL	No.of flute NOF	Tooth NT	*Bore dia. PHD
1/16″, 1/8″x28	28	STMHC	STMHC08064L15-EI28BSP		6.4	8	15.9	61	3	13	6.7
1/8″x28	28		STMHC10082L19-EI28BSP		8.2	10	19.5	73	3	16	8.7
1/4″, 3/8″x19	19		STMHC12110L27-EI19BSP		11.0	12	27.4	80	4	15	11.8
3/8″x19	19		STMHC16145L34-EI19BSP		15.2	16	34.1	92	4	25	15.2
1/2″-7/8″x14	14		STMHC18179L42-EI14BSP		19.0	18	42.6	102	4	23	19.0

* Bore Diameter applies to smallest thread Dia

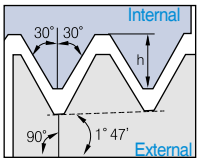
Maximum thread length = $LE - \frac{Pitch}{4}$

● : Stock item

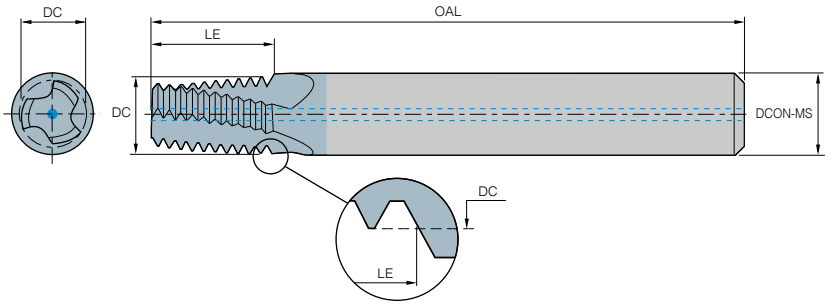
National Pipe Thread (NPT)

Helical flutes with thru-hole coolant

External/Internal



Defined by : USAS B2.1:1968
TCTR : Standard NPT

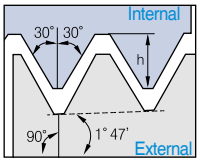


Thread Standard	Pitch (tpi)	Designation		PC9070M	Dimensions (mm) DC	DCON-MS	LE	OAL	No.of flute NOF	Tooth NT	*Bore dia. PHD
1/16″x27	27.0	STMHC	06059L09-EI27NPT		5.90	6	9.9	57	3	10	6.3
1/8″x27	27.0		08076L09-EI27NPT		7.65	8	9.9	61	3	10	8.5
1/4″x18	18.0		10099L14-EI18NPT	●	9.90	10	14.8	73	3	10	11.1
3/8″x18	18.0		12111L14-EI18NPT		11.15	12	14.8	73	4	10	14.5
1/2″, 3/4″x14	14.0		16142L19-EI14NPT		14.25	16	19.0	92	4	10	17.7, 23.0
1″, 1 1/14, 1 1/2″, 2″x11.5	11.5		20196L23-EI11.5NPT		19.60	20	23.2	102	4	10	29.0, 37.7, 44.0, 56.0
2 1/2″x8 ; 3″x8	8.0		20196L33-EI8NPT		19.60	20	33.3	102	4	10	66.5, 82.1

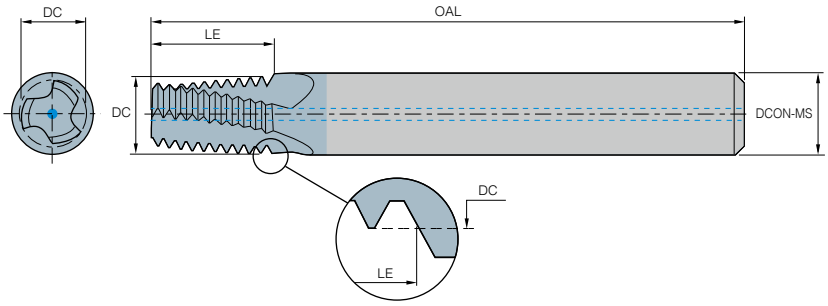
National Pipe Thread (NPTF)

Helical flutes with thru-hole coolant

External/Internal



Defined by : ANSI 1.20.3–1976
TCTR : Standard NPTF



Thread Standard	Pitch (tpi)	Designation		PC9070M	Dimensions (mm) DC	DCON-MS	LE	OAL	No.of flute NOF	Tooth NT	*Bore dia. PHD
1/16″x27	27.0	STMHC	06059L09-EI27NPTF	●	5.90	6	9.9	57	3	10	6.3
1/8″x27	27.0		08076L09-EI27NPTF		7.65	8	9.9	61	3	10	8.5
1/4″x18	18.0		10099L14-EI18NPTF		9.90	10	14.8	73	3	10	11.1
3/8″x18	18.0		12111L14-EI18NPTF		11.15	12	14.8	73	4	10	14.5
1/2″, 3/4″x14	14.0		16142L19-EI14NPTF		14.25	16	19.0	92	4	10	17.7, 23.4
1″, 1 1/14, 1 1/2″, 2″x11.5	11.5		20196L23-EI11.5NPTF		19.60	20	23.2	102	4	10	29.0, 37.7, 43.7, 55.6
2 1/2″x8 ; 3″x8	8.0		20196L33-EI8NPTF		19.60	20	33.3	102	4	10	66.3, 82.1

* Bore Diameter applies to smallest thread Dia

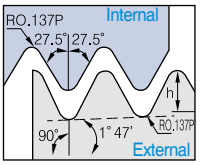
Maximum thread length = LE – $\frac{\text{Pitch}}{4}$

● : Stock item

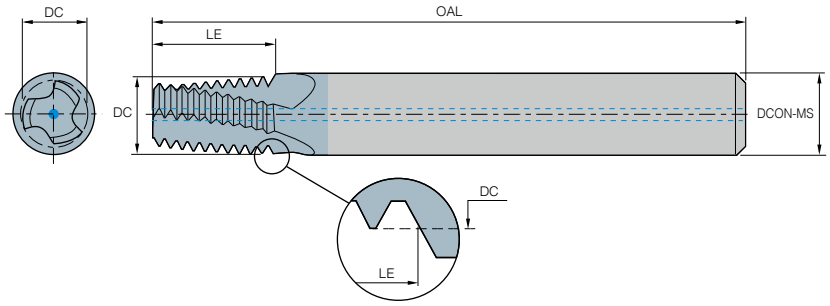
British Standard Pipe Thread (BSPT)

Helical flutes with thru-hole coolant

External/Internal



Defined by : B.S.21:1985
TCTR : Standard BSPT

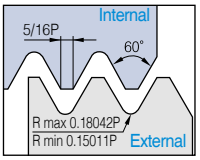


Thread Standard	Pitch (tpi)	Designation		PC9070M	Dimensions (mm) DC	DCON-MS	LE	OAL	No.of flute NOF	Tooth NT	*Bore dia. PHD
1/16″×28	28	STMHC	06059L10-EI28BSPT		5.90	6	10.2	57	3	11	6.7
1/8″×28	28		08076L10-EI28BSPT		7.65	8	10.2	61	3	11	8.7
1/4″×19	19		10099L15-EI19BSPT		9.90	10	15.4	73	3	11	11.8
3/8″×19	19		12111L15-EI19BSPT		11.15	12	15.4	73	4	11	15.2
1/2″, 3/4″×14	14		16142L22-EI14BSPT		14.25	16	22.7	92	4	12	19.0
1″, 1 1/2″, 2″, 2 1/2″×11	11		20196L28-EI11BSPT		19.60	20	28.9	102	4	12	30.7

UNJ (Unified Constant Thread)

Helical flutes with thru-hole coolant

External/Internal



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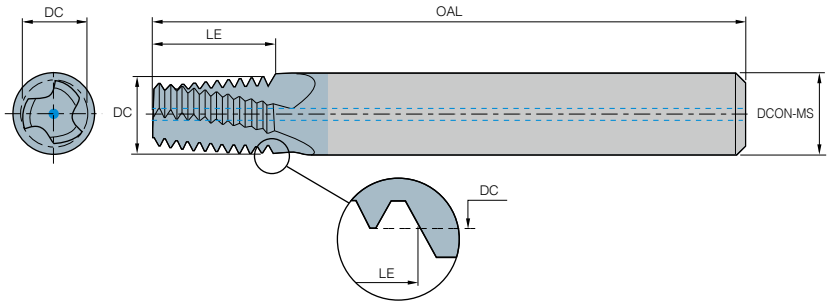
TCTR : 3B



Thread UNJC	UNJF	UNFEF/UNJ	Pitch (tpi)	Designation		PC9070M	Dimensions (mm) DC	DCON-MS	LE	OAL	No.of flute NOF	Tooth NT	*Bore dia. PHD
0.138″(#6)	0.190″(#10)	0.216(#12)/0.4375(7/16″)	32	STMHC	04027L07-I32UNJ		2.7	4	7.5	45	3	9	2.80
-	0.250″(1/4″)	0.4375″(7/16″)/0.5625″(9/16″)	28		06054L13-I28UNJ		5.4	6	13.1	57	3	14	5.60
0.190″(#10)	0.3125″(5/16″)	0.5625″(9/16″)/-	24		04037L09-I24UNJ		3.7	4	10	45	3	9	4.00
-	0.3125″(5/16″)	0.5625″(9/16″)/-	24		08067L15-I24UNJ		6.7	8	16.4	61	3	15	7.00
0.250″(1/4″)	0.4375″(7/16″)	0.750″(3/4″)/0.3125″(5/16″)	20		06050L12-I20UNJ		5.0	6	13.3	57	3	10	5.30
-	0.4375″(7/16″)	0.750″(3/4″)/0.5625″(9/16″)	20		10096L21-I20UNJ		9.6	10	22.2	73	4	17	10.00
0.3125″(5/16″)	0.5625″(9/16″)	1.0625″(1 1/16″)/-	18		08064L15-I18UNJ		6.4	8	16.2	61	3	11	6.75
0.375″(3/8″)	0.750″(3/4″)	-/0.4375″(7/16″)	16		08077L19-I16UNJ		7.7	8	19.8	61	3	12	8.10
0.4375″(7/16″)	0.875″(7/8″)	-	14		10092L21-I14UNJ		9.2	10	22.7	73	4	12	9.50
0.500″(1/2″)	-	-	13		10099L25-I13UNJ		9.9	10	26.4	73	4	13	11.00

* Bore Diameter applies to smallest thread Dia

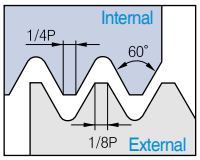
Maximum thread length = LE − $\frac{\text{Pitch}}{4}$

● : Stock item

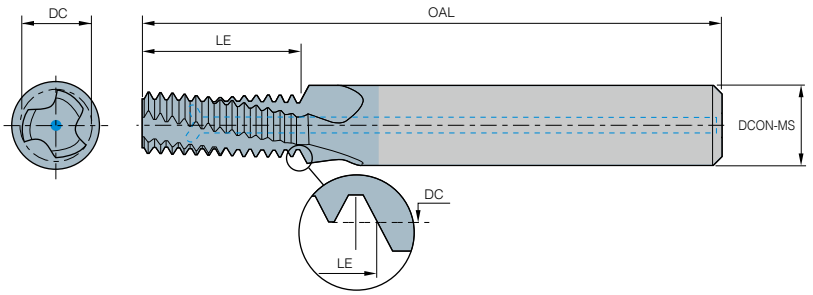
ISO Metric

Helical flutes with radial cooling

Internal



Defined by : R262(DIN 13)
TCTR : 6H



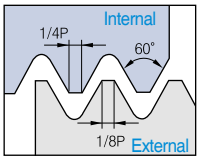
(LE≤2×Thread Diameter)

Thread		Pitch (mm)	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine					DC	DCON-MS	LE	OAL	NOF	NT	PHD
M6×1.0	M8~M40×1.0	1.0	STMHCR	06048L12-I1.00ISO		4.8	6	12.5	57	3	12	5.0
	M10×1.0	1.0		10087L20-I1.00ISO		8.7	10	20.5	73	3	20	9.0
	M12×1.0	1.0		12107L24-I1.00ISO		10.7	12	24.5	73	4	24	11.0
M8×1.25		1.25		08065L16-I1.25ISO		6.5	8	16.9	64	3	13	6.8
M10×1.5	M12~M48×1.5	1.5		10082L20-I1.50ISO		8.2	10	20.3	73	3	13	8.5
	M12×1.5	1.5		10099L24-I1.50ISO		9.9	10	24.8	73	4	16	10.5
	M14×1.5	1.5		12119L29-I1.50ISO		11.9	12	29.3	84	4	19	12.5
	M16×1.5	1.5		14139L32-I1.50ISO		13.9	14	32.3	84	4	21	14.5
M12×1.75		1.75		10099L25-I1.75ISO		9.9	10	25.4	73	4	14	10.2

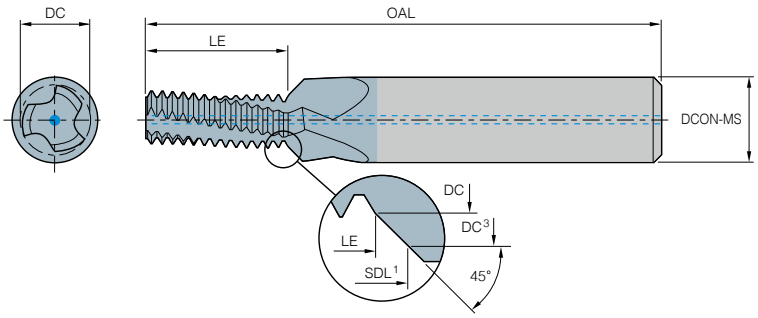
ISO Metric

Helical flutes with radial cooling

Internal



Defined by : R262(DIN 13)
TCTR : 6H



(LE≤2×Thread Diameter)

Thread		Pitch (mm)	Designation		PC9070M	Dimensions (mm)						No.of flute	Tooth	*Bore dia.
M Coarse	M Fine					DC	DCON-MS	LE	DC3	SDL1	OAL	NOF	NT	PHD
M6×1.0	M8~M40×1.0	1.0	STMHCC	08048L12-I1.00ISO		4.8	8	12.5	6.3	13.3	61	3	12	5.0
	M10×1.0	1.0		12087L20-I1.00ISO		8.7	12	20.5	10.3	21.3	73	3	20	9.0
	M12×1.0	1.0		14107L24-I1.00ISO		10.7	14	24.5	12.3	25.3	80	4	24	11.0
M8×1.25		1.25		10065L16-I1.25ISO		6.5	10	16.9	8.3	17.8	73	3	13	6.8
M10×1.5	M12~M48×1.5	1.5		12082L20-I1.50ISO		8.2	12	20.3	10.3	21.3	80	3	13	8.5
	M12×1.5	1.5		14099L24-I1.50ISO		9.9	14	24.8	12.3	26.0	80	4	16	10.5
	M14×1.5	1.5		16119L29-I1.50ISO		11.9	16	29.3	14.3	60.5	92	4	19	12.5
	M16×1.5	1.5		18139L32-I1.50ISO		13.9	18	32.3	16.3	33.5	92	4	21	14.5
M12×1.75		1.75		14099L25-I1.75ISO		9.9	14	24.5	12.3	26.6	80	4	14	10.2

* Bore Diameter applies to smallest thread Dia

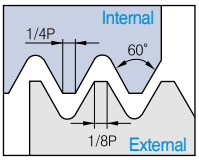
Maximum thread length = LE − $\frac{\text{Pitch}}{4}$

● : Stock item

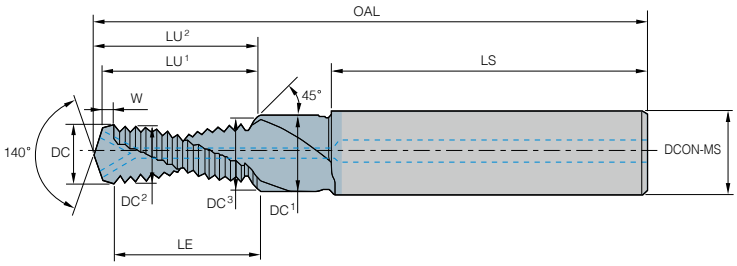
ISO Metric

Helical flutes with radial cooling

Internal



Defined by : R262(DIN 13)
TCTR : 6H



(LE≤2×Thread Diameter)

Thread	Pitch	Designation		PC9070M	Dimensions (mm)											No.of flute	Tooth
ISO 2D M Coarse	(mm)				OAL	LU²	LU¹	LS	W	LE	DC	DCON-MS	DC¹	DC³	DC²	NOF	NT
M6×1.0	1.0	STMHCD	IM6×1.0ISO-2D		62.0	14.5	13.7	36	1.0	12.7	5.0	8	6.6	6.3	4.85	2	11
M8×1.25	1.25		IM8×1.25ISO-2D		74.0	18.2	17.1	40	1.3	15.8	6.8	10	9.0	8.3	6.45	2	11
M10×1.5	1.5		IM10×1.5ISO-2D		79.0	23.4	22.1	45	1.5	20.6	8.5	12	11.0	10.3	8.08	2	12
M12×1.75	1.75		IM12×1.75ISO-2D		89.0	27.1	25.5	45	1.5	24.0	10.3	14	13.5	12.3	9.74	2	12

Thread	Pitch	Designation		PC9070M	Dimensions (mm)											No.of flute	Tooth
ISO 2.5D M Coarse	(mm)				OAL	LU²	LU¹	LS	W	LE	DC	DCON-MS	DC¹	DC³	DC²	NOF	NT
M6×1.0	1.0	STMHCD	IM6×1.0ISO-2.5D		62.0	16.5	15.7	36	1.0	14.7	5.0	8	6.6	6.3	4.85	2	13
M8×1.25	1.25		IM8×1.25ISO-2.5D		74.0	23.2	22.1	40	1.3	20.8	6.8	10	9.0	8.3	6.45	2	15
M10×1.5	1.5		IM10×1.5ISO-2.5D		79.0	27.9	26.6	45	1.5	25.1	8.5	12	11.0	10.3	8.08	2	15

* Bore Diameter applies to smallest thread Dia

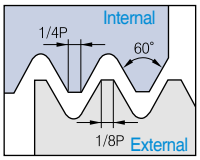
Maximum thread length = LE − $\frac{\text{Pitch}}{4}$

● : Stock item

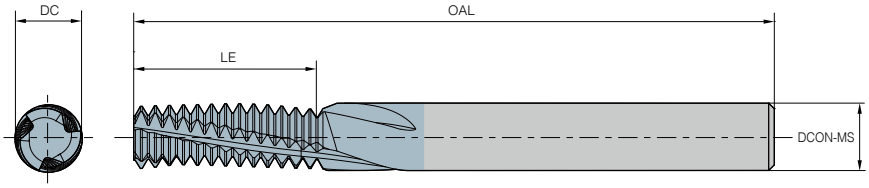
ISO Metric

Helical flutes with radial cooling

External/Internal



Defined by : R262(DIN 13)
TCTR : 6g/6H



External

(LE≤2×Thread Diameter)

Thread		Pitch (mm)	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth
M Coarse	M Fine					DC	DCON-MS	LE	OAL	NOF	NT
M3x0.5		0.50	STMH	04039L06-E0.5ISO		3.9	4	6	45	3	12
M4.5x0.7		0.75		04039L09-E0.75ISO		3.9	4	9	45	3	12
M6x1.0		1.00		04039L12-E1.0ISO		3.9	4	12	45	3	12
M8x1.25		1.25		06059L16-E1.25ISO		5.9	6	16.25	57	3	13
M10x1.5		1.50		08079L21-E1.5ISO	●	7.9	8	21	63	3	14
M14x2.0		2.00		10099L28-E2.0ISO		9.9	10	28	73	4	14

Internal

(LE≤2×Thread Diameter)

Thread		Pitch (mm)	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine					DC	DCON-MS	LE	OAL	NOF	NT	PHD
M3x0.5	M3.5-M16x0.5	0.50	STMH	04022L06-I0.5ISO		2.2	4	6.0	45	3	12	2.5
	M4x0.5	0.50		04030L08-I0.5ISO		3.0	4	8.0	45	3	16	3.5
	M3x0.5	0.50		04039L10-I0.5ISO		3.9	4	6.0	45	3	12	4.5
M4x0.7		0.70		04028L08-I0.7ISO		2.8	4	8.4	45	3	12	3.3
	M6x0.75	0.75		04039L12-I0.75ISO		3.9	4	9.0	45	3	12	5.3
M5x0.8		0.80		04035L10-I0.8ISO		3.5	4	10.4	45	3	13	4.2
M6x1.0	M8-M40x1.0	1.00		04039L12-I1.0ISO		3.9	4	12.0	45	3	12	5.0
	M8x1.0	1.00		06059L16-I1.0ISO		5.9	6	16.0	57	3	16	7.0
	M10x1.0	1.00		08079L20-I1.0ISO	●	7.9	8	20.0	63	3	20	9.0
	M12x1.0	1.00		10099L24-I1.0ISO	●	3.9	10	12.0	45	3	12	11.0
M8x1.25		1.25		06058L16-I1.25ISO		5.8	6	16.25	57	3	13	6.8
	M10x1.25	1.25		08077L20-I1.25ISO	●	5.9	6	16.25	57	3	13	8.8
M10x1.5	M12-M48x1.5	1.50		08077L21-I1.5ISO	●	7.7	8	21.0	63	3	14	8.5
	M12x1.5	1.50		10094L24-I1.5ISO	●	7.9	8	21.0	63	3	14	10.5
	M14x1.5	1.50		12112L28-I1.5ISO	●	9.4	10	24.0	73	4	16	12.5
	M16x1.5	1.50		12119L33-I1.5ISO	●	11.2	12	28.5	83	4	19	14.5
M12x1.75		1.75		10087L24-I1.75ISO	●	8.7	10	24.5	73	4	14	10.2
M14x2.0	M17-M80x2.0	2.00		10099L28-I2.0ISO	●	9.9	10	28.0	73	4	14	12.0
M16x2.0	M17-M80x2.0	2.00		12119L32-I2.0ISO	●	9.9	10	28.0	73	4	14	14.0
M18-M22x2.5		2.50		16139L40-I2.5ISO		13.9	16	40.0	92	5	16	15.5
M24x3.0		3.00		16159L42-I3.0ISO		15.9	16	42.0	92	4	14	21.0

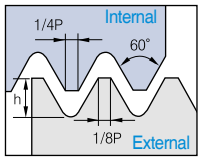
* Bore Diameter applies to smallest thread Dia

● : Stock item

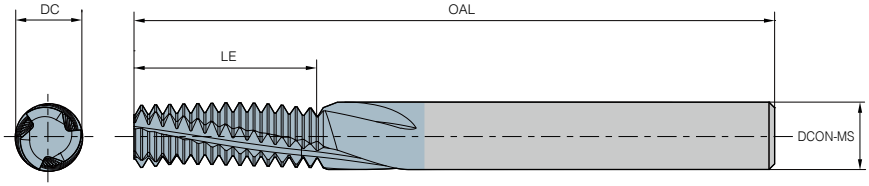
American UN (UNC,UNF,UNEF)

Helical flutes with radial cooling

External/Internal



Defined by : ANSI B1.1.74
TCTR : 2A/2B



External

(LE≤2×Thread Diameter)

Thread		Pitch (tpi)	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth
UNC	UNF					DC	DCON-MS	LE	OAL	NOF	NT
No.8-32		32	STMH	04039L09-E32UNC		3.9	4	8.7	45	3	11
	No.12-28	28		04039L12-E28UNF		3.9	4	11.8	45	3	13
No.12-24		24		04039L12-E24UNC		3.9	4	11.6	45	3	11
1/4″x20		20		04039L13-E20UNC		3.9	4	12.7	45	3	10
5/16″x18		18		06059L17-E18UNC		5.9	6	16.9	57	3	12
3/8″x16		16		08079L19-E16UNC		7.9	8	19.1	63	3	12
9/16″x12		12		12119L30-E12UNC		11.9	12	29.6	83	4	14

Internal

(LE≤2×Thread Diameter)

Thread			Pitch (tpi)	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
UNC	UNF	UNEF					DC	DCON-MS	LE	OAL	NOF	NT	PHD
	No.8-36		36	STMH	04030L09-I36UNF		3.0	4	8.5	45	3	12	3.5
	No.10-32	No.12-3/8″x32	32		04033L11-I32UNF		3.3	4	11.1	45	3	14	4.0
	No.12-28,1/4″x28	7/16″,1/2″x28	28		04038L12-I28UNF		3.8	4	11.8	45	3	13	4.6
	1/4″x28	7/16″,1/2″x28	28		06046L13-I28UNF		4.6	6	12.7	57	3	14	5.5
		7/16″,1/2″x28	28		10092L23-I28UNEF		9.2	10	22.7	73	4	25	10.2
No.10-24	5/16″,3/8″x24	9/16″-11/16″x24	24		04029L11-I24UNC		2.9	4	10.6	45	3	10	3.8
No.12-24	5/16″,3/8″x24	9/16″-11/16″x24	24		04035L12-I24UNC		3.5	4	11.6	45	3	11	4.5
5/16″,	3/8″x24	9/16″-11/16″x24	24		06057L16-I24UNF		5.7	6	15.9	57	3	15	6.8
	3/8″x24	9/16″-11/16″x24	24		08074L19-I24UNF		7.4	8	19.1	63	3	18	8.5
		9/16″-11/16″x24	24		12119L29-I24UNEF		11.9	12	28.6	83	4	27	13.2
1/4″x20	7/16″,1/2″x20	3/4″-1″x20	20		04039L13-I20UNC		3.9	4	12.7	45	3	10	5.2
7/16″,	1/2″x20	3/4″-1″x20	20		10085L23-I20UNF		8.5	10	22.9	73	4	18	9.8
	1/2″x20	3/4″-1″x20	20		10099L26-I20UNF		9.9	10	25.4	73	4	20	11.5
		3/4″-1″x20	20		16159L38-I20UNEF		15.9	16	38.1	92	5	30	17.8
5/16″x18	9/16″,5/8″x18	11/16″-1 11/16″x18	18		06052L17-I18UNC		5.2	6	16.9	57	3	12	6.5
9/16″,	5/8″x18	11/16″-1 11/16″x18	18		12113L30-I18UNF		11.3	12	29.6	83	4	21	12.8
5/8″x18	11/16″-1	11/16″x18	18		12119L33-I18UNF		11.9	12	32.5	83	4	23	14.5
3/8″x16	3/4″x16		16		08067L19-I16UNC		6.7	8	19.1	63	3	12	8.0
	3/4″x16		16		16159L38-I16UNF		15.9	16	38.1	92	4	24	17.5
7/16″x14	7/8″x14		14		08076L24-I14UNC		7.6	8	23.6	63	4	13	9.3
	7/8″x14		14		20187L44-I14UNF		18.7	20	43.5	104	4	24	20.5
1/2″x13			13		10089L26-I13UNC		8.9	10	25.4	73	4	13	10.8
9/16″x12	1″-1 1/2″x12		12		12103L30-I12UNC		10.3	12	29.6	83	4	14	12.3
	1″-1 1/2″x12		12		20199L51-I12UNF		19.9	20	50.8	104	5	24	23.5
5/8″x11			11		12110L32-I11UNC		11.0	12	32.3	83	4	14	13.5
3/4″x10			10		16135L38-I10UNC		13.5	16	38.1	92	5	15	16.5
7/8″x9			9		16152L45-I9UNC		15.2	16	45.2	92	4	16	19.5
1″x8			8		20170L51-I8UNC		17.0	20	50.8	104	4	16	22.0

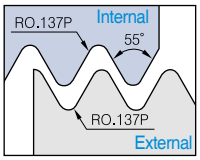
* Bore Diameter applies to smallest thread Dia

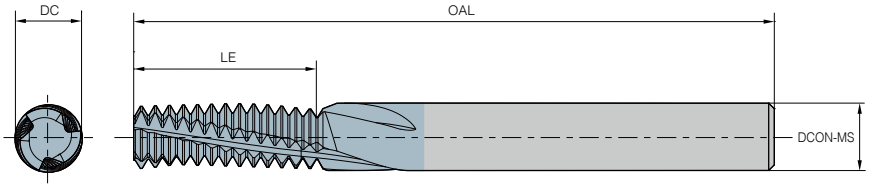
● : Stock item

British Standard Pipe Thread (BSP)

Helical flutes with radial cooling

External/Internal





Defined by : B.S.2779:1956
TCTR : Medium class

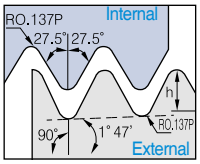
(LE≤2×Thread Diameter)

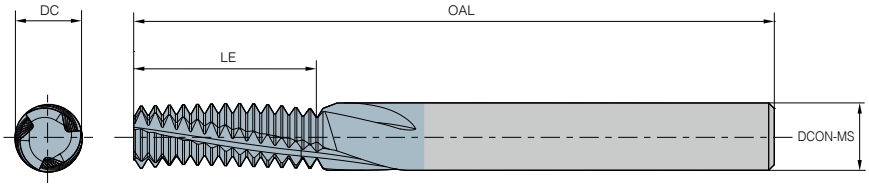
Thread Standard	Pitch (tpi)	Designation		PC9070M	Dimensions (mm) DC	DCON-MS	LE	OAL	No.of flute NOF	Tooth NT	*Bore dia. PHD
1/16″x28,1/8″x28	28	STMH	06058L16-EI28BSP		5.8	6	16.3	57	3	18	6.7
1/8″x28	28		08077L20-EI28BSP		7.7	8	20.0	63	3	22	8.7
1/4″x19, 3/8″x19	19		10099L27-EI19BSP		9.9	10	26.7	73	4	20	11.8
3/8″x19	19		16134L33-EI19BSP		13.4	16	33.4	92	4	25	15.2
1/2″, 3/4″x14	14		16157L44-EI14BSP		15.7	16	43.5	92	5	24	19.0
1″, 1 1/2″, 2″, 2 1/2″x11	11		20199L42-EI11BSP		19.9	20	41.6	104	5	18	30.7

British Standard Pipe Thread (BSPT)

Helical flutes with radial cooling

External/Internal





Defined by : B.S.21:1985
TCTR : Standard BSPT

Thread Standard	Pitch (tpi)	Designation		PC9070M	Dimensions (mm) DC	DCON-MS	LE	OAL	No.of flute NOF	Tooth NT	*Bore dia. PHD
1/16″x28	28	STMH	06058L16-EI28BSPT		5.8	6	16.3	57	3	18	6.7
1/8″x28	28		08077L20-EI28BSPT		7.7	8	20.0	63	3	22	8.7
1/4″x19	19		10099L27-EI19BSPT		9.9	10	26.7	73	4	20	11.8
3/8″x19	19		16134L33-EI19BSPT		13.4	16	33.4	92	4	25	15.2
1/2″, 3/4″x14	14		16157L44-EI14BSPT		15.7	16	43.5	92	5	24	19.0
1″, 1 1/2″, 2″, 2 1/2″x11	11		20199L42-EI11BSPT		19.9	20	41.6	104	5	18	30.7

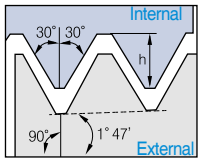
* Bore Diameter applies to smallest thread Dia

● : Stock item

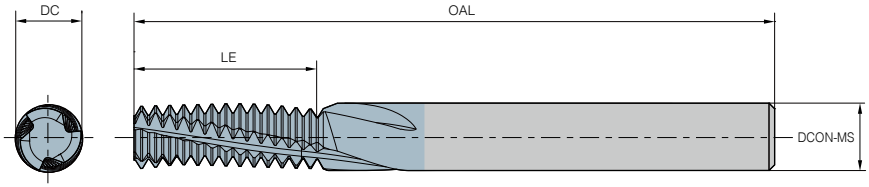
National Pipe Thread (NPT)

Helical flutes with radial cooling

External/Internal



Defined by : USAS B2.1:1968
TCTR : Standard NPT

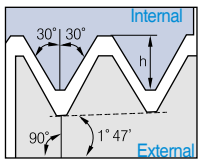


Thread Standard	Pitch (tpi)	Designation		PC9070M	Dimensions (mm) DC	DCON-MS	LE	OAL	No.of flute NOF	Tooth NT	*Bore dia. PHD
1/16″x27	27.0	STMH	06053L09-EI27NPT		5.3	6	9.4	57	3	10	6.3
1/8″x27	27.0		08075L09-EI27NPT		7.5	8	9.4	63	4	10	8.5
1/4″x18	18.0		10094L14-EI18NPT		9.4	10	14.1	73	4	10	11.1
3/8″x18	18.0		12119L14-EI18NPT		11.9	12	14.1	83	4	10	14.5
1/2″, 3/4″x14	14.0		16155L25-EI14NPT		15.5	16	25.4	92	5	14	17.7, 23.0
1″-2″x11.5	11.5		20199L33-EI11.5NPT		19.9	20	33.1	104	5	15	29.0-56.0
2 1/2″, 3″x8	8.0		20199L38-EI8NPT		19.9	20	38.1	104	4	12	66.0

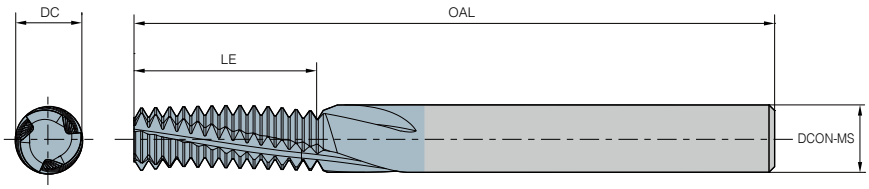
National Pipe Thread (NPTF)

Helical flutes with radial cooling

External/Internal



Defined by : ANSI 1.20.3-1976
TCTR : Standard NPTF



Thread Standard	Pitch (tpi)	Designation		PC9070M	Dimensions (mm) DC	DCON-MS	LE	OAL	No.of flute NOF	Tooth NT	*Bore dia. PHD
1/16″x27	27.0	STMH	06053L09-EI27NPTF		5.3	6	9.4	57	3	10	6.3
1/8″x27	27.0		08075L09-EI27NPTF		7.5	8	9.4	63	4	10	8.4
1/4″x18	18.0		10094L14-EI18NPTF		9.4	10	14.1	73	4	10	11.1
3/8″x18	18.0		12119L14-EI18NPTF		11.9	12	14.1	83	4	10	14.7
1/2″, 3/4″x14	14.0		16155L25-EI14NPTF		15.5	16	25.4	92	5	14	17.9, 23.4
1″-2″x11.5	11.5		20199L33-EI11.5NPTF		19.9	20	33.1	104	5	15	29.4-56.2
2 1/2″, 3″x8	8.0		20199L38-EI8NPTF		19.9	20	38.1	104	4	12	67.0

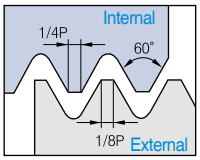
* Bore Diameter applies to smallest thread Dia

● : Stock item

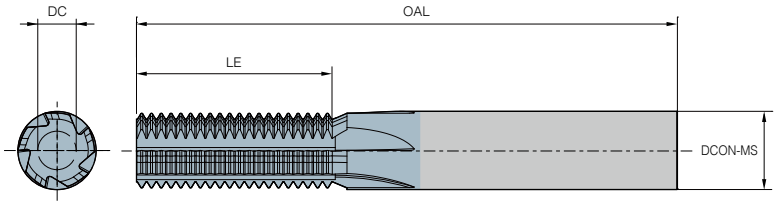
ISO Metric

Straight flutes with radial cooling

External/Internal



Defined by : R262(DIN 13)
TCTR : 6g/6H



External

Thread Standard	Pitch (mm)	Designation		PC9060M	Dimensions (mm) DC	DCON-MS	LE	OAL	No.of flute NOF	Tooth NT	*Bore dia. PHD
M3	0.50	STMS	06059-E0.5ISO		5.9	6	15.0	57	3	30	0.31
M4.5	0.75		08079-E0.75ISO		7.9	8	19.5	63	3	26	0.46
M4.5	0.75		08079-E0.75ISO-TM5		7.9	8	19.5	63	5	26	0.46
M6	1.00		10099-E1.0ISO		9.9	10	24.0	72	5	24	0.61
M10	1.50		12119-E1.5ISO		11.9	12	30.0	83	5	20	0.92
M14	2.00		12119-E2.0ISO		11.9	12	30.0	83	5	15	1.23
M24	3.00		16159-E3.0ISO		15.9	16	36.0	92	5	12	1.84
M36	4.00		16159-E4.0ISO		15.9	16	40.0	92	5	10	2.45
M64	6.00		20199-E6.0ISO		19.9	20	36.0	104	5	6	3.68

Internal

Thread Standard	Pitch (mm)	Designation		PC9060M	Dimensions (mm) DC	DCON-MS	LE	OAL	No.of flute NOF	Tooth NT	*Bore dia. PHD
M4.5	0.75	STMS	04030-I0.75ISO		3	4	6.75	42	3	9	0.43
M8	0.75		06059-I0.75ISO		5.9	6	15.0	57	3	20	0.43
M5	0.8		04036-I0.8ISO		3.6	4	8.0	42	3	10	0.46
M6	1.0		06040-I1.0ISO		4	6	9.0	57	3	9	0.58
M12	1.0		08079-I1.0ISO		7.9	8	20.0	63	3, 5	20	0.58
M12	1.0		08079-I1.0ISO-TM5		7.9	8	20.0	63	3, 5	20	0.58
M8	1.25		06050-I1.25ISO		5	6	12.5	57	3	10	0.72
M10	1.5		06059-I1.5ISO		5.9	6	15.0	57	3	10	0.87
M14	1.5		10099-I1.5ISO		9.9	10	24.0	72	5	16	0.87
M18	1.5		12119-I1.5ISO		11.9	12	30.0	83	5	20	0.87
M12	1.75		08079-I1.75ISO		7.9	8	19.25	63	3, 5	11	1.01
M12	1.75		08079-I1.75ISO-TM5		7.9	8	19.25	63	3, 5	11	1.01
M16	2.0		10099-I2.0ISO		9.9	10	24.0	72	5	12	1.15
M18	2.0		12119-I2.0ISO		11.9	12	30.0	83	5	15	1.15
M20	2.5		12119-I2.5ISO		11.9	12	30.0	83	5	12	1.44
M24	3.0		16159-I3.0ISO		15.9	16	36.0	92	5	12	1.73
M30	3.5		16159-I3.5ISO		15.9	16	38.5	92	5	11	2.02
M36	4.0		16159-I4.0ISO		15.9	16	40.0	92	5	10	2.31
M48	5.0		20199-I5.0ISO		19.9	20	40.0	104	5	8	2.89
M64	6.0		20199-I6.0ISO		19.9	20	36.0	104	5	6	3.46

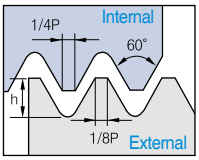
* Bore Diameter applies to smallest thread Dia

● : Stock item

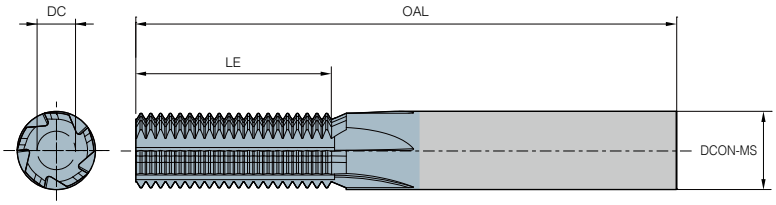
British Standard Pipe Thread (BSP)

Straight flutes with radial cooling

External/Internal



Defined by : B.S.2779:1956
TCTR : Medium class

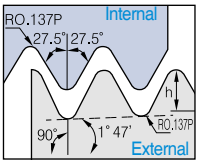


Thread Standard	Pitch (tpi)	Designation		PC9060M	Dimensions (mm) DC	DCON-MS	LE	OAL	No.of flute NOF	Tooth NT	*Bore dia. PHD
1/16″	28	STMS	06059-EI28BSP		5.9	6	14.51	57	3	16	0.58
1/4″	19		08079-EI19BSP		7.9	8	18.72	63	3	14	0.86
1/4″	19		08079-EI19BSP-TM5		7.9	8	18.72	63	5	14	0.86
1/2″	14		12119-EI14BSP		11.9	12	29.03	83	5	16	1.16
1″	11		16159-EI11BSP		15.9	16	34.64	92	5	15	1.48

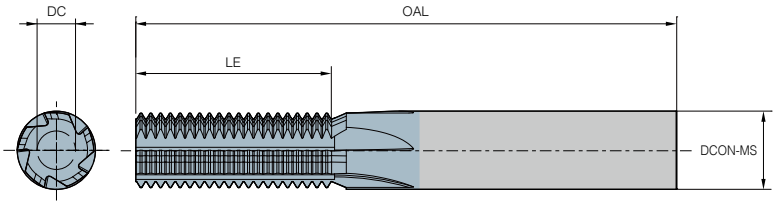
British Standard Pipe Thread (BSPT)

Straight flutes with radial cooling

External/Internal



Defined by : B.S.21 : 1985
TCTR : Standard BSPT



Thread Standard	Pitch (tpi)	Designation		PC9060M	Dimensions (mm) DC	DCON-MS	LE	OAL	No.of flute NOF	Tooth NT	*Bore dia. PHD
1/16″	28	STMS	06059-EI28BSPT		5.9	6	9.98	57	3	11	0.58
1/4″	19		08079-EI19BSPT		7.9	8	14.71	63	3	11	0.86
1/4″	19		08079-EI19BSPT-TM5		7.9	8	14.71	63	5	11	0.86
1/2″	14		12119-EI14BSPT		11.9	12	19.96	83	5	11	1.16
1″	11		16159-EI11BSPT		15.9	16	39.25	92	5	17	1.48

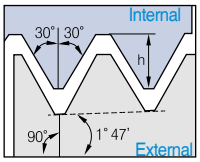
* Bore Diameter applies to smallest thread Dia

● : Stock item

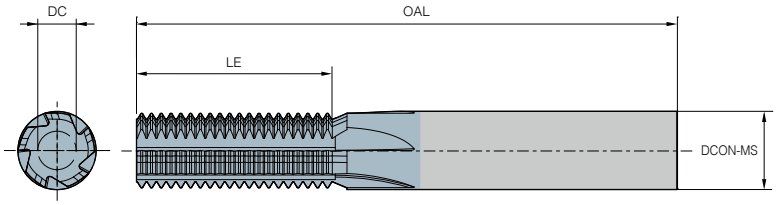
National Pipe Thread (NPT)

Straight flutes with radial cooling

External/Internal



Defined by : USAS B2.1:1968
TCTR : Standard NPT

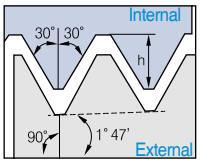


Thread Standard	Pitch (tpi)	Designation		PC9060M	Dimensions (mm) DC	DCON-MS	LE	OAL	No.of flute NOF	Tooth NT	*Bore dia. PHD
1/16″	27.0	STMS	06059-EI27NPT		5.9	6	9.41	57	3	10	0.66
1/4″	18.0		08079-EI18NPT		7.9	8	14.11	63	3	10	1.01
1/4″	18.0		08079-EI18NPT-TM5		7.9	8	14.11	63	5	10	1.01
1/2″	14.0		12119-EI14NPT		11.9	12	19.96	83	5	11	1.33
1″	11.5		16159-EI11.5NPT		15.9	16	26.50	92	5	12	1.64
2 1/2″	8.0		16159-EI8NPT		15.9	16	38.10	92	5	12	2.42

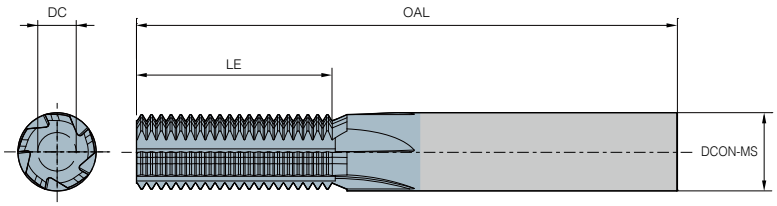
National Pipe Thread (NPTF)

Straight flutes with radial cooling

External/Internal



Defined by : ANSI 1.20.3-1976
TCTR : Standard NPTF



Thread Standard	Pitch (tpi)	Designation		PC9060M	Dimensions (mm) DC	DCON-MS	LE	OAL	No.of flute NOF	Tooth NT	*Bore dia. PHD
1/16″	27	STMS	06059-EI27NPTF		5.9	6	9.41	57	3	10	0.64
1/4″	18		08079-EI18NPTF		7.9	8	14.11	63	3	10	1.00
1/2″	14		12119-EI14NPTF		11.9	12	19.96	83	5	11	1.35
1″	11.5		16159-EI11.5NPTF		15.9	16	26.50	92	5	12	1.63
2 1/2″	8		16159-EI8NPTF		15.9	16	38.10	92	5	12	2.38

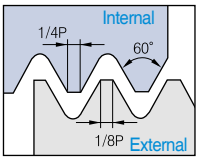
* Bore Diameter applies to smallest thread Dia

● : Stock item

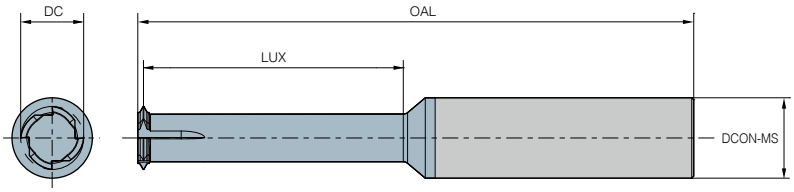
ISO Metric

Deep threading/Long-type tool

Internal



Defined by : R262(DIN 13)
TCTR : 6H



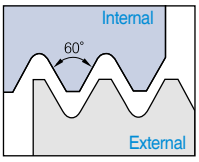
(LE≤3×Thread Diameter)

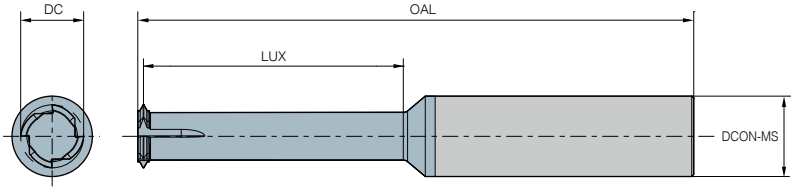
Thread Standard	Pitch (tpi)	Designation		PC9070M	Dimensions (mm) DC	DCON-MS	LE	LUX	OAL	No.of flute NOF	Tooth NT	*Bore dia. PHD
M6x1	1.00	STMD1T	08041-I1.0ISO		4.1	8	1.0	19	63	3	1	5.0
M8x1.25	1.25		10058-I1.25ISO		5.8	10	1.25	26	73	3	1	6.8
M10x1.5	1.50		10077-I1.50ISO		7.7	10	1.5	32	73	3	1	8.5
M12x1.5	1.50		12094-I1.50ISO		9.4	12	1.5	38	83	4	1	10.5
M12x1.75	1.75		12087-I1.75ISO		8.7	12	1.75	38	83	4	1	10.2
M14x2	2.00		16102-I2.0ISO		10.2	16	2	44	92	4	1	12.0
M16x2	2.00		16122-I2.0ISO		12.2	16	2.0	50	100	4	1	14.0
M18x2.5	2.50		16129-I2.5ISO		12.9	16	2.5	57	108	5	1	15.5
M20x2.5	2.50		16148-I2.5ISO		14.8	16	2.5	63	114	5	1	17.5

TP60

Deep threading/Long-type tool

Internal





Thread M Coarse	Thread M Fine	Thread UN, UNF, UNEF	Pitch TP	Pitch tpi	Designation		PC9070M	Dimensions (mm) DC	DCON-MS	LUX	OAL	No.of flute NOF	Tooth NT
M5x0.8	M5x0.5, M5X0.75	No.10-56UNS, No.10-48UNS, No.10-40UNS, No.10-36UNS, No.10-32UNF	0.5-0.8	32-56	STMD1T	04390L160-ITA60		3.9	4	16	45	4	1
M6x1.0	M6x0.5, M6X0.75	No.12-56UNS, No.12-48UNS, 1/4 -40UNS, 1/4 -36UNS, 1/4 -32UNEF, 1/4 -28UNF, 1/4 -27UNS, 1/4 -24UNS	0.5-1.0	24-56		06485L200-ITB60		4.85	6	20	51	5	1
M8x1.25	M7x0.5, M7x0.75, M7.5x1.0	5/16 -48UNS, 5/16 -40UNS, 5/16 -36UNS, 5/16 -32UNEF, 5/16 -28UN, 5/16 -27UNS, 5/16 -24UNS, 5/16 -20UN	0.5-1.25	20-48		06590L250-ITF60		5.9	6	25	64	5	1
	M10.5x0.5, M11x0.75, M11x1.0	7/16 -32UN, 7/16 -28UNEF, 7/16 -27UNS, 7/16 -24UNS	0.5-1.0	24-56		10990L350-ITB60		9.9	10	35	73	6	1
M10x1.5	M10x1.0, M10X1.25	3/8 -24UNF, 3/8 -20UN, 7/16 -18UNS, 7/16 -16UN	1.0-1.50	16-24		08790L320-ITC60		7.9	8	32	63	6	1
M12x1.75	M12x1.0, M12X1.25, M12x1.5	1/2 -24UNS, 1/2 -20UNS, 1/2 -18UNS, 1/2 -16UNS, 1/2 -14UNS	1.0-1.75	14-24		10990L380-ITD60		9.9	10	38	73	6	1
	M13.5x1.0, M14x1.25, M14x1.5	9/16 -24UNEF	1.0-1.75	14-24		12119L450-ITD60		11.9	12	45	83	6	1

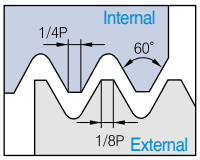
* Bore Diameter applies to smallest thread Dia

● : Stock item

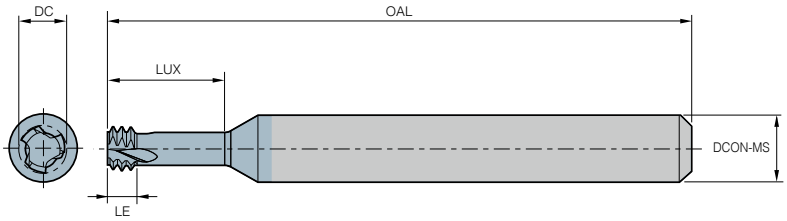
ISO Metric

Deep threading for general

Internal



Defined by : R262(DIN 13)
TCTR : 6H



(LE≤2×Thread Diameter)

Thread		Pitch (mm)	Designation		PC9070M	Dimensions (mm)					No.of flute	Tooth	*Bore dia.
M Coarse	M Fine					DC	DCON-MS	LE	LUX	OAL	NOF	NT	PHD
M1.6x0.35		0.35	STMD3T	03012L034-I0.35ISO		1.20	3	1.05	3.4	30	3	3	1.25
M2x0.4		0.40		06015L042-I0.40ISO		1.55	6	1.2	4.2	57	3	3	1.60
M2.2x0.45		0.45		06016L046-I0.45ISO		1.65	6	1.35	4.6	57	3	3	1.75
M2.5x0.45		0.45		06019L052-I0.45ISO		1.95	6	1.35	5.2	57	3	3	2.05
M3x0.5	M3.5-M16x0.5	0.50		06024L062-I0.50ISO		2.40	6	1.5	6.2	57	3	3	2.50
M3.5x0.6		0.60		06027L073-I0.60ISO		2.75	6	1.8	7.3	57	3	3	2.90
M4x0.7		0.70		06031L083-I0.70ISO		3.15	6	2.1	8.3	57	3	3	3.30
M5x0.8		0.80		06040L104-I0.80ISO		4.05	6	2.4	10.4	57	3	3	4.20
M6x1.0	M8-M40x1.0	1.00		06048L125-I1.00ISO		4.80	6	3.0	12.5	57	3	3	5.00
M8x1.25		1.25		08065L166-I1.25ISO		6.50	8	3.75	16.6	63	3	3	6.80
M10x1.5	M12-M48x1.50	1.50		10082L208-I1.50ISO		8.20	10	4.5	20.8	73	3	3	8.50
M12x1.75		1.75		10099L250-I1.75ISO		9.90	10	5.25	25.0	73	3	3	10.30
M16x2.0		2.00		12119L330-I2.00ISO		11.90	12	6.0	33.0	83	3	3	14.00
M20x2.5		2.50		16159L413-I2.50ISO		15.90	16	7.5	41.3	92	3	3	17.50

(LE≤3×Thread Diameter)

Thread		Pitch (mm)	Designation		PC9070M	Dimensions (mm)					No.of flute	Tooth	*Bore dia.
M Coarse	M Fine					DC	DCON-MS	LE	LUX	OAL	NOF	NT	PHD
M1.6X0.35		0.35	STMD3T	03012L050-I0.35ISO		1.20	3	1.05	5.0	30	3	3	1.25
M2x0.4		0.40		03015L062-I0.40ISO		1.55	3	1.2	6.2	30	3	3	1.60
M2X0.4		0.40		06015L062-I0.40ISO		1.55	6	1.2	6.2	57	3	3	1.60
M2.5x0.45		0.45		03019L077-I0.45ISO		1.95	3	1.35	7.7	30	3	3	2.05
M2.5x0.45		0.45		06019L077-I0.45ISO		1.95	6	1.35	7.7	57	3	3	2.05
M3X0.5	M3.5-M16x0.5	0.50		03024L092-I0.50ISO		2.40	3	1.5	9.2	30	3	3	2.50
M3x0.5	M3.5-M16x0.5	0.50		06024L092-I0.50ISO		2.40	6	1.5	9.2	57	3	3	2.50
M4x0.7		0.70		06031L123-I0.70ISO		3.15	6	2.1	12.3	57	3	3	3.30
M5x0.8		0.80		06040L154-I0.80ISO		4.05	6	2.4	15.4	57	3	3	4.20
M6x1.0	M8-M40x1.0	1.00		06048L185-I1.00ISO		4.80	6	3	18.5	57	3	3	5.00
M8x1.25		1.25		08065L246-I1.25ISO		6.50	8	3.75	24.6	63	3	3	6.80

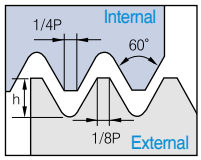
* Bore Diameter applies to smallest thread Dia

● : Stock item

American UN (UNC,UNF)

Deep threading for general

External/Internal



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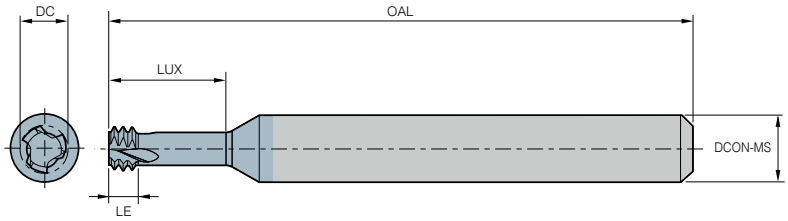
TCTR : 2B



(LE≤2×Thread Diameter)

Thread		Pitch (tpi)	Designation		PC9070M	Dimensions (mm)					No.of flute	Tooth	*Bore dia.
UNC	UNF					DC	DCON-MS	LE	LUX	OAL	NOF	NT	PHD
	No.1-72	72	STMD3T	06014L039-I72UN		1.45	6	1.06	3.9	57	3	3	1.6
No.1-64	No.2-64	64		06014L042-I64UN		1.40	6	1.19	4.2	57	3	3	1.5
No.2-56	No.3-56	56		06016L050-I56UN		1.65	6	1.36	5.0	57	3	3	1.8
No.3-48	No.4-48	48		06019L060-I48UN		1.90	6	1.59	6.0	57	3	3	2.1
No.4,No.5-40	No.6-40	40		06021L060-I40UN		2.10	6	1.91	6.0	57	3	3	2.3
No.5-40	No.6-40	40		06024L072-I40UN		2.45	6	1.91	7.2	57	3	3	2.6
	No.8-36	36		06033L087-I36UN		3.30	6	2.12	8.7	57	3	3	3.5
No.6,No.8-32	No.10-32	32		06025L074-I32UN		2.55	6	2.38	7.4	57	3	3	2.8
No.8-32	No.10-32	32		06032L100-I32UN		3.20	6	2.38	10.0	57	3	3	3.5
	No.10-32	32		06038L103-I32UN		3.80	6	2.38	10.3	57	3	3	4.0
	1/4″x28	28		06052L132-I28UN		5.25	6	2.72	13.2	57	3	3	5.5
No.10-24	5/16″x24	24		06035L102-I24UN		3.58	6	3.18	10.2	57	3	3	3.9
	5/16″x24	24		08066L165-I24UN		6.68	8	3.18	16.5	63	3	3	6.9
1/4″x20	7/16″x20	20		06048L134-I20UN		4.88	6	3.81	13.4	57	3	3	5.2
	7/16″x20	20		10095L230-I20UN		9.55	10	3.81	23.0	73	3	3	9.9
5/16″x18		18		08061L169-I18UN		6.15	8	4.23	16.9	63	3	3	6.6
3/8″x16		16		08067L191-I16UN		6.70	8	4.76	19.1	63	3	3	8.0
7/16″x14		14		10090L233-I14UN		9.00	10	5.44	23.3	73	3	3	9.4

(LE≤3×Thread Diameter)

Thread		Pitch (tpi)	Designation		PC9070M	Dimensions (mm)					No.of flute	Tooth	*Bore dia.
M Coarse	M Fine					DC	DCON-MS	LE	LUX	OAL	NOF	NT	PHD
	No.1-72	72	STMD3T	03014L057-I72UN		1.45	3	1.06	5.75	30	3	3	1.6
	No.1-72	72		06014L057-I72UN		1.45	6	1.06	5.75	57	3	3	1.6
No.2-56	No.3-56	56		03016L070-I56UN		1.65	3	1.36	7.00	30	3	3	1.8
No.4, No.5-40	No.6-40	40		03021L090-I40UN		2.10	3	1.91	9.00	30	3	3	2.3
No.4, No.5-40	No.6-40	40		06021L090-I40UN		2.10	6	1.91	9.00	57	3	3	2.3
No.5-40	No.6-40	40		06024L100-I40UN		2.45	6	1.91	10.00	57	3	3	2.6
No.6, No.8-32	No.10-32	32		03025L110-I32UN		2.55	3	2.38	11.00	30	3	3	2.8
No.6, No.8-32	No.10-32	32		06025L110-I32UN		2.55	6	2.38	11.00	57	3	3	2.8
No.8-32	No.10-32	32		06032L130-I32UN		3.20	6	2.38	13.00	57	3	3	3.4
	No.10-32	32		06038L150-I32UN		3.80	6	2.38	15.10	57	3	3	4.0
	1/4″x28	28		06052L196-I28UN		5.25	6	2.72	19.60	57	3	3	5.5
	5/16″x24	24		08066L245-I24UN		6.68	8	3.18	24.50	63	3	3	6.9
1/4″x20	7/16″x20	20		06048L198-I20UN		4.88	6	3.81	19.80	57	3	3	5.1
5/16″x18		18		08061L239-I18UN		6.15	8	4.23	24.00	63	3	3	6.6

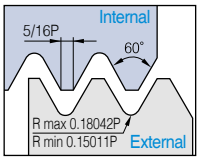
* Bore Diameter applies to smallest thread Dia

● : Stock item

UNJ (UNJC,UNJF)

Deep threading for general

Internal



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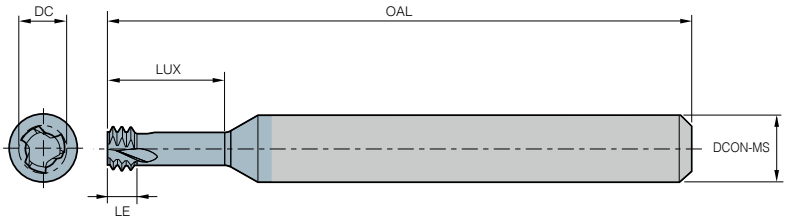
TCTR : 3B



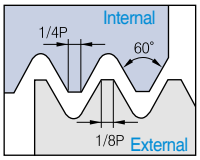
(LE≤3×Thread Diameter)

Thread		Pitch (tpi)	Designation		PC9070M	Dimensions (mm)					No.of flute	Tooth	*Bore dia.
UNJC	UNJF					DC	DCON-MS	LE	LUX	OAL	NOF	NT	PHD
0.138″(#6)	0.190″(#10)	32	STMD3T	06027L110-I32UNJ		2.7	6	2.38	11.0	57	3	3	2.80
	0.250″(1/4″)	28		06054L195-I28UNJ		5.4	6	2.72	19.5	57	3	3	5.60
0.190″(#10)		24		06037L149-I24UNJ		3.7	6	3.18	14.9	57	3	3	4.00
	0.3125″(5/16″)	24		08067L241-I24UNJ		6.7	8	3.18	24.1	63	3	3	7.00
0.250″(1/4″)		20		06050L195-I20UNJ		5.0	6	3.81	19.5	57	3	3	5.30
	0.4375″(7/16″)	20		10096L335-I20UNJ		9.6	10	3.81	33.5	73	3	3	10.00
0.3125″(5/16″)	0.5625″(9/16″)	18		08064L241-I18UNJ		6.4	8	4.23	24.1	63	3	3	6.75
0.375″(3/8″)	0.750″(3/4″)	16		08077L290-I16UNJ		7.7	8	4.76	29.0	63	3	3	8.10
0.4375″(7/16″)	0.875″(7/8″)	14		10092L335-I14UNJ		9.2	10	5.44	33.5	73	3	3	9.50
0.500″(1/2″)		13		10099L385-I13UNJ		9.9	10	5.86	38.5	73	3	3	11.00

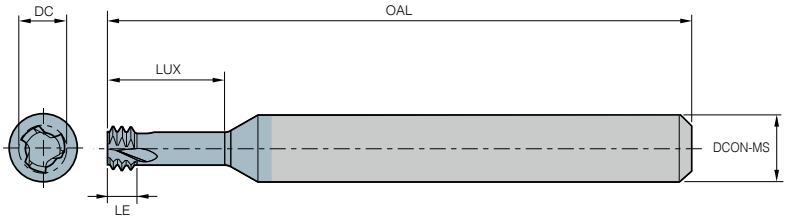
MJ

Deep threading for general

Internal



Defined by : ISO 5855
TCTR : 4h/6h-4H/5H



(LE≤3×Thread Diameter)

Thread	Pitch (mm)	Designation		PC9070M	Dimensions (mm)					No.of flute	Tooth	*Bore dia.
Standard					DC	DCON-MS	LE	LUX	OAL	NOF	NT	PHD
MJ3x0.5	0.5	STMD3T	06024L092-I0.5MJ		2.40	6	1.5	9.2	57	3	3	2.60
MJ3.5x0.6	0.6		06028L110-I0.6MJ		2.85	6	1.8	11.0	57	3	3	3.00
MJ4x0.7	0.7		06031L123-I0.7MJ		3.15	6	2.1	12.3	57	3	3	3.40
MJ5x0.8	0.8		06040L154-I0.8MJ		4.05	6	2.4	15.4	57	3	3	4.30
MJ6x1.0	1		06048L185-I1.0MJ		4.80	6	3	18.5	57	3	3	5.10
MJ8x1.25	1.25		08065L246-I1.25MJ		6.50	8	3.75	24.6	63	3	3	6.90
MJ10x1.5	1.5		10082L308-I1.50MJ		8.20	10	4.5	30.8	73	3	3	8.70
MJ12x1.75	1.75		10099L370-I1.75MJ		9.90	10	5.25	37.0	73	3	3	10.40
MJ14x2	2		12119L425-I2.0MJ		11.90	12	6.0	42.5	83	3	3	12.25

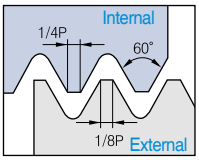
* Bore Diameter applies to smallest thread Dia

● : Stock item

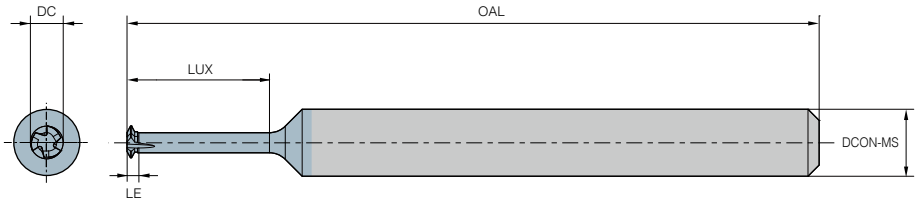
ISO Metric

Deep threading for dental

Internal



Defined by : R262(DIN 13)
TCTR : 6H



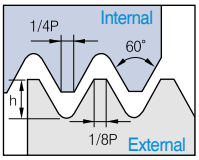
(LE≤3×Thread Diameter)

Thread		Pitch (mm)	Designation		PC9070M	Dimensions (mm)					No.of flute	Tooth	*Bore dia.
M Coarse	M Fine					DC	DCON-MS	LE	LUX	OAL	NOF	NT	PHD
M1.0x0.25	M1.4x0.25	0.25	STMD1T	03007L031-I0.25ISO		0.70	3	0.25	3.1	31	3	1	0.75
M1.2x0.25	M1.4x0.25	0.25		03009L038-I0.25ISO		0.90	3	0.25	3.8	31	3	1	0.95
M1.4x0.3	-	0.3		03011L044-I0.30ISO		1.05	3	0.30	4.4	31	3	1	1.15
M1.6x0.35	-	0.35		03012L050-I0.35ISO		1.20	3	0.35	5.0	31	3	1	1.30
M1.8x0.35	M2.0x0.35	0.35		03014L056-I0.35ISO		1.40	3	0.35	5.6	31	3	1	1.50
M2.0x0.4	-	0.4		03015L062-I0.40ISO		1.50	3	0.40	6.2	31	3	1	1.65
M2.5x0.45	-	0.45		03019L077-I0.45ISO		1.95	3	0.45	7.7	31	3	1	2.10

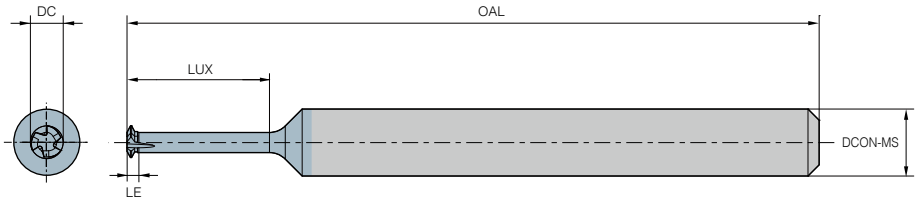
American UN (UNF)

Deep threading for dental

Internal



Defined by : ANSI B1.1.74
TCTR : 2B



(LE≤3×Thread Diameter)

Thread	Pitch (tpi)	Designation		PC9070M	Dimensions (mm)					No.of flute	Tooth	*Bore dia.
UNF					DC	DCON-MS	LE	LUX	OAL	NOF	NT	PHD
0-80	80	STMD1T	03011L046-I80UN		1.15	3	0.32	4.6	31	3	1	1.3
1-72	72		03014L065-I72UN		1.45	3	0.35	6.5	31	3	1	1.6

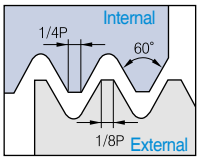
* Bore Diameter applies to smallest thread Dia

● : Stock item

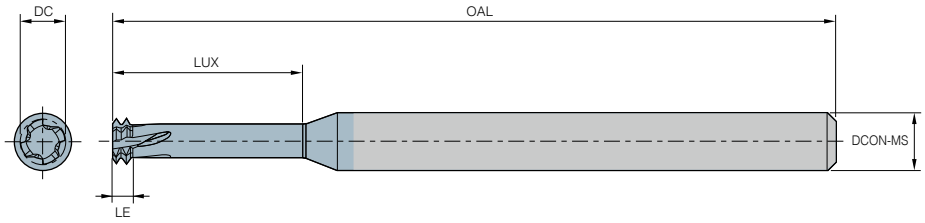
ISO Metric

Deep threading for hard materials

Internal



Defined by : R262(DIN 13)
TCTR : 6H

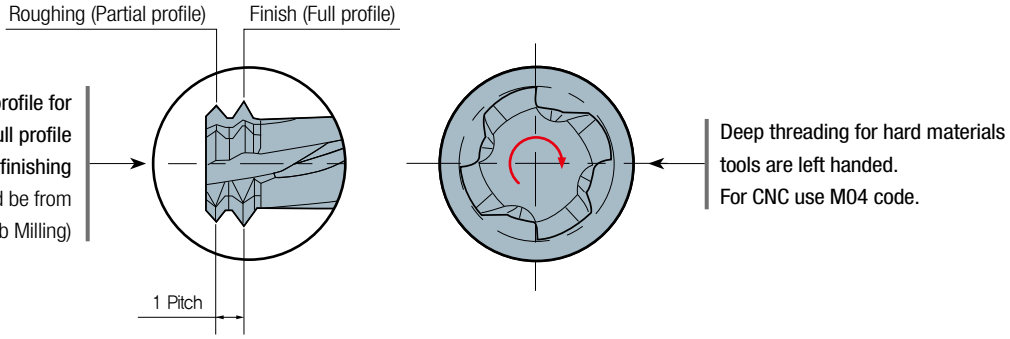


(LE≤2×Thread Diameter)

Thread		Pitch (mm)	Designation		PC9070M	Dimensions (mm)					No.of flute	Tooth	*Bore dia.
M Coarse	M Fine					DC	DCON-MS	LE	LUX	OAL	NOF	NT	PHD
M2x0.4		0.40	STMD2L	06015L042-I0.4ISO		1.55	6	0.40	4.60	76	4	2	1.60
M2.2x0.45		0.45		06016L046-I0.45ISO		1.65	6	0.45	5.05	76	4	2	1.80
M2.5x0.45		0.45		06019L052-I0.45ISO		1.95	6	0.45	5.65	76	4	2	2.05
M3x0.5	M3.5-M16x0.5	0.50		06024L062-I0.5ISO		2.40	6	0.50	6.75	76	4	2	2.55
M3.5x0.6		0.60		06027L073-I0.6ISO		2.75	6	0.60	7.90	76	4	2	2.95
M4x0.7		0.70		06031L083-I0.7ISO		3.15	6	0.70	9.05	76	4	2	3.35
M5x0.8		0.80		06040L104-I0.8ISO		4.05	6	0.80	11.20	76	4	2	4.30
M6x1.0	M8-M40x1.0	1.00		06048L125-I1.0ISO		4.80	6	1.00	13.5	76	5	2	5.10
M8x1.25		1.25		08065L166-I1.25ISO		6.50	8	1.25	17.85	80	5	2	6.80
M10x1.5	M12-M48x1.50	1.50		08079L208-I1.50ISO		7.90	8	1.50	22.30	80	6	2	8.60
M12x1.75		1.75		10099L250-I1.75ISO		9.90	10	1.75	26.75	101	6	2	10.40

(LE≤3×Thread Diameter)

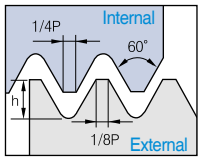
Thread		Pitch (mm)	Designation		PC9070M	Dimensions (mm)					No.of flute	Tooth	*Bore dia.
M Coarse	M Fine					DC	DCON-MS	LE	LUX	OAL	NOF	NT	PHD
M2x0.4		0.40	STMD2L	06015L062-I0.4ISO		1.55	6	0.40	6.60	76	4	2	1.60
M2.5x0.45		0.45		06019L077-I0.45ISO		1.95	6	0.45	8.15	76	4	2	2.05
M3x0.5	M3.5-M16x0.5	0.50		06024L092-I0.5ISO		2.40	6	0.50	9.75	76	4	2	2.55
M4x0.7		0.70		06031L123-I0.7ISO		3.15	6	0.70	13.05	76	4	2	3.35
M5x0.8		0.80		06040L154-I0.8ISO		4.05	6	0.80	16.20	76	4	2	4.30
M6x1.0	M8-M40x1.0	1.00		06048L185-I1.0ISO		4.80	6	1.00	19.50	76	5	2	5.10
M8x1.25		1.25		08065L246-I1.25ISO		6.50	8	1.25	25.85	80	5	2	6.80



American UN (UNC,UNF)

Deep threading for hard materials

Internal



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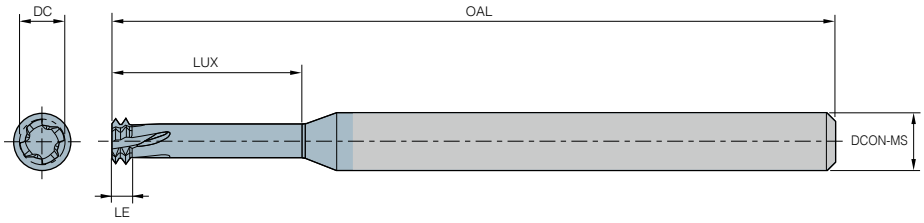


(LE≤2×Thread Diameter)

Thread		Pitch (tpi)	Designation		PC9070M	Dimensions (mm)					No.of flute	Tooth	*Bore dia.
UNC	UNF					DC	DCON-MS	LE	LUX	OAL	NOF	NT	PHD
No.2-56	No.3-56	56	STMD2L	06016L050-I56UN		1.65	6	0.45	5.45	76	4	2	1.80
No.3-48	No.4-48	48		06019L060-I48UN		1.90	6	0.53	6.53	76	4	2	2.10
No.4-40, No.5-40	No.6-40	40		06021L060-I40UN		2.10	6	0.64	6.64	76	4	2	2.35
No.5-40	No.6-40	40		06024L072-I40UN		2.45	6	0.64	7.84	76	4	2	2.65
	No.8-36	36		06033L087-I36UN		3.30	6	0.71	9.41	76	4	2	3.55
No.6-32, No.8-32	No.10-32	32		06025L074-I32UN		2.55	6	0.79	8.20	76	4	2	2.85
No.8-32	No.10-32	32		06032L100-I32UN		3.20	6	0.79	10.79	76	4	2	3.50
	No.10-32	32		06037L100-I32UN		3.70	6	0.79	10.80	76	4	2	4.17
	1/4″x28	28		06052L132-I28UN		5.25	6	0.91	14.11	76	5	2	5.55
No.10-24	5/16″x24	24		06035L102-I24UN		3.58	6	1.06	11.26	76	4	2	3.90
	5/16″x24	24		08066L165-I24UN		6.68	8	1.06	17.56	80	5	2	7.00
1/4″-20	7/16″x20	20		06048L134-I20UN		4.88	6	1.27	14.67	76	5	2	5.20
	7/16″x20	20		10095L230-I20UN		9.55	10	1.27	24.27	101	6	2	9.90
5/16″x18		18		08061L160-I18UN		6.15	8	1.42	18.17	80	4	2	6.50
3/8″x16		16		08076L197-I16UN		7.65	8	1.59	21.29	80	5	2	8.00
7/16″x14		14		10090L233-I14UN		9.00	10	1.82	25.11	101	6	2	9.50
1/2″x13		13		10099L256-I13UN		9.90	10	1.95	27.55	101	6	2	10.90

(LE≤3×Thread Diameter)

Thread		Pitch (tpi)	Designation		PC9070M	Dimensions (mm)					No.of flute	Tooth	*Bore dia.
UNC	UNF					DC	DCON-MS	LE	LUX	OAL	NOF	NT	PHD
No.4-40, No.5-40	No.6-40	40	STMD2L	06021L090-I40UN		2.10	6	0.64	9.64	76	4	2	2.35
No.5-40	No.6-40	40		06024L100-I40UN		2.45	6	0.64	10.64	76	4	2	2.65
No.6-32, No.8-32	No.10-32	32		06025L110-I32UN		2.55	6	0.79	11.79	76	4	2	2.85
No.8-32	No.10-32	32		06032L130-I32UN		3.20	6	0.79	13.79	76	4	2	3.50
	1/4″x28	28		06052L196-I28UN		5.25	6	0.91	20.51	76	5	2	5.55
	5/16″x24	24		08066L245-I24UN		6.68	8	1.06	25.56	80	5	2	7.00
1/4″x20	7/16″x20	20		06048L198-I20UN		4.88	6	1.27	21.07	76	5	2	5.20
5/16″x18		18		08061L240-I18UN		6.15	8	1.42	26.17	80	4	2	6.50
7/16″x14		14		10090L335-I14UN		9.00	10	1.82	35.31	101	6	2	9.50

* Bore Diameter applies to smallest thread Dia

● : Stock item

High preformance threading Tap

Tap-Star

- High toughness HSS substrate for improved chipping resistace
- Optimally designed shape for various workpiece cutting

Code system

S	V	Q	A	M	06	100	25	(S)

Tap-Star

Substrate
V: HSSE

Type
G: Straight (DIN)
D: Point (DIN)
Q: Spiral (DIN)
M: Roll (DIN)
S: Straight (JIS)
P: Spiral (JIS)
N: Point (JIS)
R: Roll (JIS)
F: Spiral Roll (JIS)

Surface treatment
A: TiAlN
N: Nitride
H: Homo
O: Bright
T: TiN
C: TiCN

Thread
M: Meter thread

Size
06: M6
12: M12

Pitch
050: 0.5
100: 1.0
150: 1.5

Chamfer length
15: 1.5P
20: 2.0P
25: 2.5P
40: 4.0P
50: 5.0P

Oil groove
S: 1 oil groove
M: 4 oil grooves

Features

Higher chipping resistance
- Chipping reduced by applying high toughness substrate
- Special chamfer edge treatment

Higher wear resistance
- TiAlN coating with high temperature oxidation resistance

Optimal shape
- Flute shape for smooth chip evacuation
- Designed with optimal relief angle for high chipping resistance

Cost efficiency of tool
- Providing the best performance and quality

Optimal flute shape
- Smooth chip flow

High toughness substrate
- Enhanced chipping resistance

TiAlN coating
- Increased oxidation resistance and wear resistance

Special treatment on cutting edge of chamfer part
- Enhanced chipping resistance

Icon guide

Shank type		Tool type		Coating		Workpiece		Chamfer lead		Thread type		Class of thread		Substrate	
DIN	DIN	Spiral flute	SFT	Un-coated	Bright	Black ring	P(K)	Form C (chamfer lead 2 ~ 3 Thread)	C form	M	M	6H	6H	HSSE	HSSE
JIS	JIS	Spiral point	SPT	HOMO	HOMO	Green ring	K	Form B (chamfer lead 4 ~ 5 Thread)	B form	MF	MF	6HX	6HX	-	-
-	-	Straight	STT	Nitride	Nitride	Blue ring	M(H)	Form E (chamfer lead 1.5 ~ 2 Thread)	E form	-	-	ISO H2~4	H2~4	-	-
-	-	Roll	RT	TiN	TiN	Yellow ring	N	-	-	-	-	ISO H5~8	H5~8	-	-
-	-	Spiral Roll	SRT	TiCN	TiCN	-	-	-	-	-	-	ISO H6~7	H6~7	-	-
-	-	-	-	TiAlN	TiAlN	-	-	-	-	-	-	-	-	-	-

Recommended cutting conditions

Workpiece				Cutting speed, vc (m/min)					Cutting fluid			
ISO	Workpiece material	DIN	JIS	Straight Tap	Spiral Tap	Point Tap	Carbide Tap	Roll Tap	Insoluble	Water soluble (emulsion)	Semi dry	Dry
P	Low carbon steel	< C25	< S25C	8~13	8~13	15~25	-	8~13	◎	○	△	△
	Medium carbon steel	C25~C45	S25C~S45C	7~12	7~12	10~15	-	7~10	◎	○	△	△
	High carbon steel	> C45	> S45C	6~9	6~9	8~13	-	5~8	◎	○	△	△
	Alloy steel	CrMoS4	SCM	7~12	7~12	10~15	-	5~8	◎	△	△	△
	Quenched and tempered steel	25~45HRC		3~5	3~5	4~6	-	-	◎	△	-	-
	Tool steel	X30WCrV9.3	SKD	6~9	6~9	7~10	-	-	◎	-	-	-
	Cast steel	GS	SC	6~11	6~11	10~15	-	-	◎	○	-	-
M	Stainless steel	CrNi	SUS	4~7	5~8	8~13	-	5~10	◎	○	-	-
	Precipitation hardened stainless steel	X5CrNiCuNb16-4 X7CrNiAl7-\	SUS630 SUS631	3~5	3~5	4~6	-	-	◎	-	-	-
K	Cast iron	GG	FC	10~15	-	-	10~20	-	◎	○	○	○
	Ductile cast iron	GGG	FCD	7~12	7~12	10~20	10~20	-	◎	○	○	-
N	Copper	Cu	Cu	6~9	6~11	7~12	10~20	7~12	○	○	-	-
	Brass, brass-cast	17660	Bs BsC	10~15	10~20	15~25	15~25	7~12	○	○		
	Bronze, bronze-cast	-	CAC	6~11	6~11	10~20	10~20	7~12	○	○	-	-
	Rolled aluminum	Awxx	Axx	10~20	10~20	15~25	-	10~20	◎	○	△	-
	Aluminum-cast, alloyed	G-AlSi, GD-AlMg	AC, ALDC	10~15	10~15	15~20	10~20	10~25	◎	○	△	-
	Magnesium-cast, alloyed	MC	MC	7~12	7~12	10~15	10~20	-	◎	○	○	-
	Zinc-cast, alloyed	-	ZDC	1~12	7~12	10~15	10~20	7~12	◎	○	△	-
	Thermosetting plastic	Bakelite phenol epoxy		10~20	-	-	15~25	-	-	○	○	○
	Thermoplastic	Nylon vinyl chloride		10~20	10~15	10~20	10~20	-	-	○	○	○

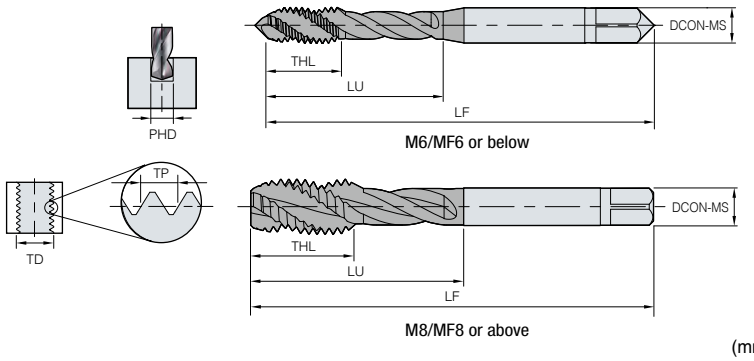
◎ : Recommended ○ : Applicable △ : Usable - : unusable

Line-up

Type		Designation	Picture	Product name	Coated	Size	
						Min.	Max.
DIN	Spiral	SVQAM		Spiral flute Tap	TiAlN	M2	M24
		SVQNM			Nitride	M2	M24
		SVQHM			Homo	M2	M24
		SVQOM			-	M2	M24
	Point	SVDAM		Spiral point Tap	TiAlN	M2	M24
		SVDNM			Nitride	M2	M24
		SVDHM			Homo	M2	M24
		SVDOM			-	M2	M24
	Straight	SVGAM		Straight flute Tap	TiAlN	M3	M24
	Roll	SVMOM		Roll Tap	-	M3	M12
		SVMTM			TiN	M3	M12
		SVMCM			TiCN	M3	M12
JIS	Spiral	SVPAM		Spiral flute Tap	TiAlN	M2	M24
		SVPNM			Nitride	M2	M24
		SVPHM			Homo	M2	M24
		SVPOM			-	M2	M24
	Point	SVNAM		Spiral point Tap	TiAlN	M2	M24
		SVNNM			Nitride	M2	M24
		SVNHM			Homo	M2	M24
		SVNOM			-	M2	M24
	Straight	SVSAM		Straight flute Tap	TiAlN	M3	M24
	Roll	SVROM		Roll Tap	-	M3	M12
		SVRTM			TiN	M3	M12
		SVRCM			TiCN	M3	M12
	Spiral	SVFOM		Spiral roll Tap	-	M3	M6
		SVFTM			TiN	M3	M6
		SVFCM			TiCN	M3	M6

SVQAM

Spiral flute Tap



DIN | SFT | TiAlN | P(K) | C form | M MF | 6H | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD	BSG
SVQAM	0204025	M2	0.4	13.5	2.8 x 2.1	2.8	2	45	8	3	1.6	DIN371
	025045025	M2.5	0.45	15	2.8 x 2.1	2.8	2.5	50	9	3	2.1	DIN371
	0305025	M3	0.5	17	3.5 x 2.7	3.5	3	56	6	3	2.5	DIN371
	0407025	M4	0.7	20.5	4.5 x 3.4	4.5	4	63	7.5	3	3.3	DIN371
	0508025	M5	0.8	25	6 x 4.9	6	5	70	9	3	4.2	DIN371
	0610025	M6	1	26	6 x 4.9	6	6	80	11	3	5	DIN371
	0812525	M8	1.25	34	8 x 6.2	8	8	90	13	3	6.8	DIN371
	1015025	M10	1.5	38	10 x 8	10	10	100	16	3	8.5	DIN371
	1217525	M12	1.75	40	9 x 7	9	12	110	18	3	10.2	DIN376
	1420025	M14	2	45	11 x 9	11	14	110	20	4	12	DIN376
	1620025	M16	2	52	12 x 9	12	16	110	20	4	14	DIN376
	1825025	M18	2.5	55	14 x 11	14	18	125	22	4	15.5	DIN376
	2025025	M20	2.5	58	16 x 12	16	20	140	25	4	17.5	DIN376
	2225025	M22	2.5	63	18 x 14.5	18	22	140	25	4	19.5	DIN376
	2430025	M24	3	66	18 x 14.5	18	24	160	28	4	21	DIN376
	0405025	MF4	0.5	20.5	2.8 x 2.1	2.8	4	63	7.5	3	3.5	DIN374
	0505025	MF5	0.5	24	3.5 x 2.7	3.5	5	70	8	3	4.5	DIN374
	0507525	MF5	0.75	24	3.5 x 2.7	3.5	5	70	8	3	4.8	DIN374
	0605025	MF6	0.5	26	4.5 x 3.4	4.5	6	80	8	3	5.5	DIN374
	0607525	MF6	0.75	29	4.5 x 3.4	4.5	6	80	8	3	5.3	DIN374
	0807525	MF8	0.75	34	6 x 4.9	6	8	80	10	3	7.3	DIN374
	0810025	MF8	1	34	6 x 4.9	6	8	90	10	3	7	DIN374
	1007525	MF10	0.75	38	7 x 5.5	7	10	90	14	3	9.3	DIN374
	1010025	MF10	1	38	7 x 5.5	7	10	90	14	3	9	DIN374
	1012525	MF10	1.25	38	7 x 5.5	7	10	100	14	3	8.8	DIN374
	1210025	MF12	1	48	9 x 7	9	12	100	14	3	11	DIN374
	1212525	MF12	1.25	48	9 x 7	9	12	100	14	3	10.8	DIN374
	1215025	MF12	1.5	48	9 x 7	9	12	100	14	3	10.5	DIN374
	1410025	MF14	1	48	11 x 9	11	14	100	18	3	13	DIN374
	1412525	MF14	1.25	48	11 x 9	11	14	100	18	3	12.8	DIN374
	1415025	MF14	1.5	48	11 x 9	11	14	100	18	3	12.5	DIN374
	1610025	MF16	1	52	12 x 9	12	16	100	18	3	15	DIN374
	1612525	MF16	1.25	52	12 x 9	12	16	100	18	3	14.8	DIN374
	1615025	MF16	1.5	52	12 x 9	12	16	100	18	3	14.5	DIN374
	1815025	MF18	1.5	55	14 x 11	14	18	110	18	4	16.5	DIN374
	1820025	MF18	2	55	14 x 11	14	18	125	22	4	16	DIN374
	2015025	MF20	1.5	58	16 x 12	16	20	125	25	4	18.5	DIN374
	2020025	MF20	2	58	16 x 12	16	20	140	25	4	18	DIN374
	2215025	MF22	1.5	63	18 x 14.5	18	22	125	25	4	20.5	DIN374
	2415025	MF24	1.5	66	18 x 14.5	18	24	140	25	4	22.5	DIN374
	2420025	MF24	2	66	18 x 14.5	18	24	140	27	4	22	DIN374

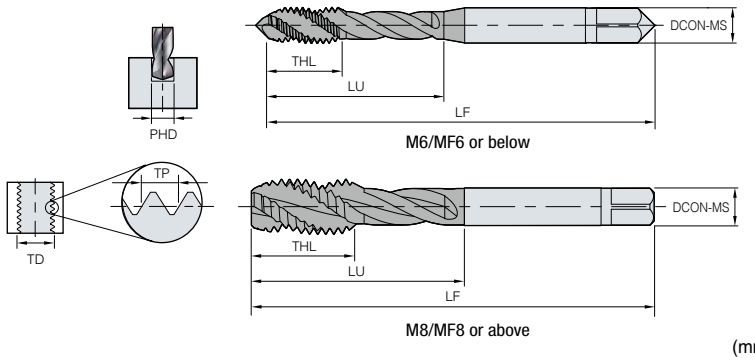
• Applicable workpiece range

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
	◎	◎	◎	◎	○					◎	○	○						◎						

SVQNM

Spiral flute Tap



DIN | SFT | Nitride | M(H) | C form | M MF | 6H | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD	BSG
SVQNM	0204025	M2	0.4	13.5	2.8 x 2.1	2.8	2	45	8	3	1.6	DIN371
	025045025	M2.5	0.45	15	2.8 x 2.1	2.8	2.5	50	9	3	2.1	DIN371
	0305025	M3	0.5	17	3.5 x 2.7	3.5	3	56	6	3	2.5	DIN371
	0407025	M4	0.7	20.5	4.5 x 3.4	4.5	4	63	7.5	3	3.3	DIN371
	0508025	M5	0.8	25	6 x 4.9	6	5	70	9	3	4.2	DIN371
	0610025	M6	1	26	6 x 4.9	6	6	80	11	3	5	DIN371
	0812525	M8	1.25	34	8 x 6.2	8	8	90	13	3	6.8	DIN371
	1015025	M10	1.5	38	10 x 8	10	10	100	16	3	8.5	DIN371
	1217525	M12	1.75	40	9 x 7	9	12	110	18	3	10.2	DIN376
	1420025	M14	2	45	11 x 9	11	14	110	20	4	12	DIN376
	1620025	M16	2	52	12 x 9	12	16	110	20	4	14	DIN376
	1825025	M18	2.5	55	14 x 11	14	18	125	22	4	15.5	DIN376
	2025025	M20	2.5	58	16 x 12	16	20	140	25	4	17.5	DIN376
	2225025	M22	2.5	63	18 x 14.5	18	22	140	25	4	19.5	DIN376
	2430025	M24	3	66	18 x 14.5	18	24	160	28	4	21	DIN376
	0405025	MF4	0.5	20.5	2.8 x 2.1	2.8	4	63	7.5	3	3.5	DIN374
	0505025	MF5	0.5	24	3.5 x 2.7	3.5	5	70	8	3	4.5	DIN374
	0607525	MF6	0.75	29	4.5 x 3.4	4.5	6	80	8	3	5.3	DIN374
	0807525	MF8	0.75	34	6 x 4.9	6	8	80	10	3	7.3	DIN374
	0810025	MF8	1	34	6 x 4.9	6	8	90	10	3	7	DIN374
	1007525	MF10	0.75	38	7 x 5.5	7	10	90	14	3	9.3	DIN374
	1010025	MF10	1	38	7 x 5.5	7	10	90	14	3	9	DIN374
	1012525	MF10	1.25	38	7 x 5.5	7	10	100	14	3	8.8	DIN374
	1210025	MF12	1	48	9 x 7	9	12	100	14	3	11	DIN374
	1212525	MF12	1.25	48	9 x 7	9	12	100	14	3	10.8	DIN374
	1215025	MF12	1.5	48	9 x 7	9	12	100	14	3	10.5	DIN374
	1410025	MF14	1	48	11 x 9	11	14	100	18	3	13	DIN374
	1415025	MF14	1.5	48	11 x 9	11	14	100	18	3	12.5	DIN374
	1610025	MF16	1	52	12 x 9	12	16	100	18	3	15	DIN374
	1615025	MF16	1.5	52	12 x 9	12	16	100	18	3	14.5	DIN374
	1815025	MF18	1.5	55	14 x 11	14	18	110	18	4	16.5	DIN374
	1820025	MF18	2	55	14 x 11	14	18	125	22	4	16	DIN374
	2015025	MF20	1.5	58	16 x 12	16	20	125	25	4	18.5	DIN374
	2215025	MF22	1.5	63	18 x 14.5	18	22	125	25	4	20.5	DIN374
	2415025	MF24	1.5	66	18 x 14.5	18	24	140	25	4	22.5	DIN374
	2420025	MF24	2	66	18 x 14.5	18	24	140	27	4	22	DIN374

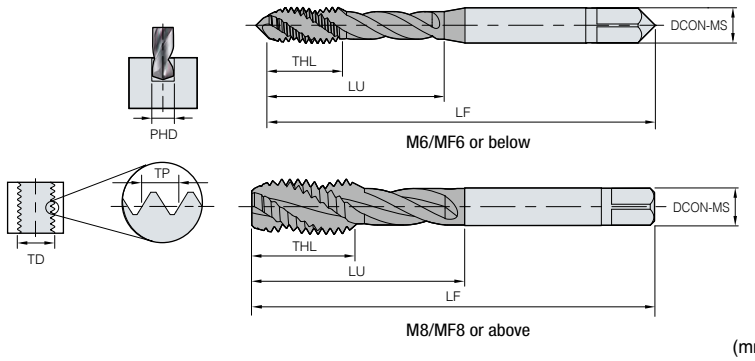
• **Applicable workpiece range**

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
	○	○	○	○	○			◎	○	○	○	◎						○			○	○	○	

SVQHM

Spiral flute Tap



DIN | SFT | HOMO | P(K) | C form | M MF | 6H | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD	BSG
SVQHM	0204025	M2	0.4	13.5	2.8 x 2.1	2.8	2	45	8	3	1.6	DIN371
	025045025	M2.5	0.45	15	2.8 x 2.1	2.8	2.5	50	9	3	2.1	DIN371
	0305025	M3	0.5	17	3.5 x 2.7	3.5	3	56	6	3	2.5	DIN371
	0407025	M4	0.7	20.5	4.5 x 3.4	4.5	4	63	7.5	3	3.3	DIN371
	0508025	M5	0.8	25	6 x 4.9	6	5	70	9	3	4.2	DIN371
	0610025	M6	1	26	6 x 4.9	6	6	80	11	3	5	DIN371
	0812525	M8	1.25	34	8 x 6.2	8	8	90	13	3	6.8	DIN371
	1015025	M10	1.5	38	10 x 8	10	10	100	16	3	8.5	DIN371
	1217525	M12	1.75	40	9 x 7	9	12	110	18	3	10.2	DIN376
	1420025	M14	2	45	11 x 9	11	14	110	20	4	12	DIN376
	1620025	M16	2	52	12 x 9	12	16	110	20	4	14	DIN376
	1825025	M18	2.5	55	14 x 11	14	18	125	22	4	15.5	DIN376
	2025025	M20	2.5	58	16 x 12	16	20	140	25	4	17.5	DIN376
	2225025	M22	2.5	63	18 x 14.5	18	22	140	25	4	19.5	DIN376
	2430025	M24	3	66	18 x 14.5	18	24	160	28	4	21	DIN376
	0405025	MF4	0.5	20.5	2.8 x 2.1	2.8	4	63	7.5	3	3.5	DIN374
	0505025	MF5	0.5	24	3.5 x 2.7	3.5	5	70	8	3	4.5	DIN374
	0607525	MF6	0.75	29	4.5 x 3.4	4.5	6	80	8	3	5.3	DIN374
	0807525	MF8	0.75	34	6 x 4.9	6	8	80	10	3	7.3	DIN374
	0810025	MF8	1	34	6 x 4.9	6	8	90	10	3	7	DIN374
	1007525	MF10	0.75	38	7 x 5.5	7	10	90	14	3	9.3	DIN374
	1010025	MF10	1	38	7 x 5.5	7	10	90	14	3	9	DIN374
	1012525	MF10	1.25	38	7 x 5.5	7	10	100	14	3	8.8	DIN374
	1210025	MF12	1	48	9 x 7	9	12	100	14	3	11	DIN374
	1212525	MF12	1.25	48	9 x 7	9	12	100	14	3	10.8	DIN374
	1215025	MF12	1.5	48	9 x 7	9	12	100	14	3	10.5	DIN374
	1410025	MF14	1	48	11 x 9	11	14	100	18	3	13	DIN374
	1415025	MF14	1.5	48	11 x 9	11	14	100	18	3	12.5	DIN374
	1610025	MF16	1	52	12 x 9	12	16	100	18	3	15	DIN374
	1615025	MF16	1.5	52	12 x 9	12	16	100	18	3	14.5	DIN374
	1815025	MF18	1.5	55	14 x 11	14	18	110	18	4	16.5	DIN374
	1820025	MF18	2	55	14 x 11	14	18	125	22	4	16	DIN374
	2015025	MF20	1.5	58	16 x 12	16	20	125	25	4	18.5	DIN374
	2215025	MF22	1.5	63	18 x 14.5	18	22	125	25	4	20.5	DIN374
	2415025	MF24	1.5	66	18 x 14.5	18	24	140	25	4	22.5	DIN374
	2420025	MF24	2	66	18 x 14.5	18	24	140	27	4	22	DIN374

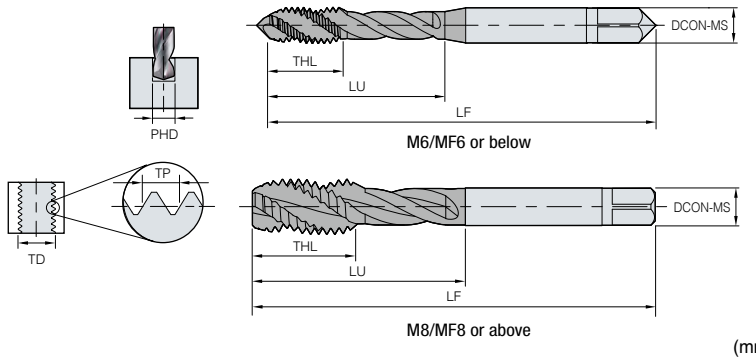
• **Applicable workpiece range**

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
	◎	◎	◎	◎	○					◎	○	○						◎						

SVQOM

Spiral flute Tap



DIN | SFT | Bright | N | C form | M MF | 6H | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD	BSG
SVQOM	0204025	M2	0.4	13.5	2.8 x 2.1	2.8	2	45	8	3	1.6	DIN371
	025045025	M2.5	0.45	15	2.8 x 2.1	2.8	2.5	50	9	3	2.1	DIN371
	0305025	M3	0.5	17	3.5 x 2.7	3.5	3	56	6	3	2.5	DIN371
	0407025	M4	0.7	20.5	4.5 x 3.4	4.5	4	63	7.5	3	3.3	DIN371
	0508025	M5	0.8	25	6 x 4.9	6	5	70	9	3	4.2	DIN371
	0610025	M6	1	26	6 x 4.9	6	6	80	11	3	5	DIN371
	0812525	M8	1.25	34	8 x 6.2	8	8	90	13	3	6.8	DIN371
	1015025	M10	1.5	38	10 x 8	10	10	100	16	3	8.5	DIN371
	1217525	M12	1.75	40	9 x 7	9	12	110	18	3	10.2	DIN376
	1420025	M14	2	45	11 x 9	11	14	110	20	4	12	DIN376
	1620025	M16	2	52	12 x 9	12	16	110	20	4	14	DIN376
	1825025	M18	2.5	55	14 x 11	14	18	125	22	4	15.5	DIN376
	2025025	M20	2.5	58	16 x 12	16	20	140	25	4	17.5	DIN376
	2225025	M22	2.5	63	18 x 14.5	18	22	140	25	4	19.5	DIN376
	2430025	M24	3	66	18 x 14.5	18	24	160	28	4	21	DIN376
	0405025	MF4	0.5	20.5	2.8 x 2.1	2.8	4	63	7.5	3	3.5	DIN374
	0505025	MF5	0.5	24	3.5 x 2.7	3.5	5	70	8	3	4.5	DIN374
	0607525	MF6	0.75	29	4.5 x 3.4	4.5	6	80	8	3	5.3	DIN374
	0807525	MF8	0.75	34	6 x 4.9	6	8	80	10	3	7.3	DIN374
	0810025	MF8	1	34	6 x 4.9	6	8	90	10	3	7	DIN374
	1007525	MF10	0.75	38	7 x 5.5	7	10	90	14	3	9.3	DIN374
	1010025	MF10	1	38	7 x 5.5	7	10	90	14	3	9	DIN374
	1012525	MF10	1.25	38	7 x 5.5	7	10	100	14	3	8.8	DIN374
	1210025	MF12	1	48	9 x 7	9	12	100	14	3	11	DIN374
	1212525	MF12	1.25	48	9 x 7	9	12	100	14	3	10.8	DIN374
	1215025	MF12	1.5	48	9 x 7	9	12	100	14	3	10.5	DIN374
	1410025	MF14	1	48	11 x 9	11	14	100	18	3	13	DIN374
	1415025	MF14	1.5	48	11 x 9	11	14	100	18	3	12.5	DIN374
	1610025	MF16	1	52	12 x 9	12	16	100	18	3	15	DIN374
	1615025	MF16	1.5	52	12 x 9	12	16	100	18	3	14.5	DIN374
	1815025	MF18	1.5	55	14 x 11	14	18	110	18	4	16.5	DIN374
	1820025	MF18	2	55	14 x 11	14	18	125	22	4	16	DIN374
	2015025	MF20	1.5	58	16 x 12	16	20	125	25	4	18.5	DIN374
	2215025	MF22	1.5	63	18 x 14.5	18	22	125	25	4	20.5	DIN374
	2415025	MF24	1.5	66	18 x 14.5	18	24	140	25	4	22.5	DIN374
	2420025	MF24	2	66	18 x 14.5	18	24	140	27	4	22	DIN374

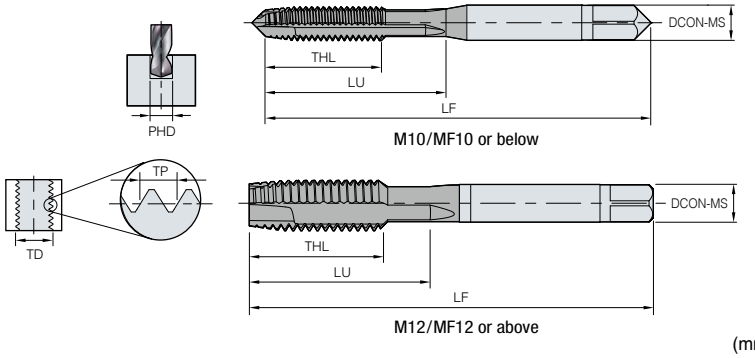
• **Applicable workpiece range**

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
													◎	◎	◎	◎	◎	◎	○	○			◎	

SVDAM

Spiral point Tap



DIN | SPT | TiAlN | P(K) | B form | M MF | 6H | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD	BSG
SVDAM	0204050	M2	0.4	13.5	2.8 x 2.1	2.8	2	45	8	3	1.6	DIN371
	022045050	M2.2	0.45	15	2.8 x 2.1	2.8	2.2	45	9	3	1.8	DIN371
	025045050	M2.5	0.45	15	2.8 x 2.1	2.8	2.5	50	9	3	2.1	DIN371
	0305050	M3	0.5	18	3.5 x 2.7	3.5	3	56	11	3	2.5	DIN371
	03506050	M3.5	0.6	20	4 x 3	4	3.5	56	13	3	2.9	DIN371
	0407050	M4	0.7	21	4.5 x 3.4	4.5	4	63	13	3	3.3	DIN371
	0508050	M5	0.8	25	6 x 4.9	6	5	70	16	3	4.2	DIN371
	0610050	M6	1	30	6 x 4.9	6	6	80	19	3	5	DIN371
	0812550	M8	1.25	35	8 x 6.2	8	8	90	22	3	6.8	DIN371
	1015050	M10	1.5	39	10 x 8	10	10	100	24	3	8.5	DIN371
	1217550	M12	1.75	40	9 x 7	9	12	110	29	3	10.2	DIN376
	1420050	M14	2	45	11 x 9	11	14	110	30	3	12	DIN376
	1620050	M16	2	52	12 x 9	12	16	110	32	3	14	DIN376
	1825050	M18	2.5	55	14 x 11	14	18	125	34	3	15.5	DIN376
	2025050	M20	2.5	58	16 x 12	16	20	140	34	4	17.5	DIN376
	2225050	M22	2.5	63	18 x 14.5	18	22	140	34	4	19.5	DIN376
	2430050	M24	3	66	18 x 14.5	18	24	160	38	4	21	DIN376
	0405050	MF4	0.5	18	2.8 x 2.1	2.8	4	63	10	3	3.5	DIN374
	0505050	MF5	0.5	25	3.5 x 2.7	3.5	5	70	12	3	4.5	DIN374
	0507550	MF5	0.75	25	3.5 x 2.7	3.5	5	70	12	3	4.8	DIN374
	0605050	MF6	0.5	25	4.5 x 3.4	4.5	6	80	14	3	5.5	DIN374
	0607550	MF6	0.75	25	4.5 x 3.4	4.5	6	80	14	3	5.3	DIN374
	0807550	MF8	0.75	35	6 x 4.9	6	8	80	19	3	7.3	DIN374
	0810050	MF8	1	35	6 x 4.9	6	8	90	22	3	7	DIN374
	1007550	MF10	0.75	39	7 x 5.5	7	10	90	20	3	9.3	DIN374
	1010050	MF10	1	39	7 x 5.5	7	10	90	20	3	9	DIN374
	1012550	MF10	1.25	39	7 x 5.5	7	10	100	24	3	8.8	DIN374
	1210050	MF12	1	48	9 x 7	9	12	100	22	3	11	DIN374
	1212550	MF12	1.25	48	9 x 7	9	12	100	22	3	10.8	DIN374
	1215050	MF12	1.5	48	9 x 7	9	12	100	22	3	10.5	DIN374
	1410050	MF14	1	48	11 x 9	11	14	100	22	3	13	DIN374
	1412550	MF14	1.25	48	11 x 9	11	14	100	22	3	12.8	DIN374
	1415050	MF14	1.5	48	11 x 9	11	14	100	22	3	12.5	DIN374
	1610050	MF16	1	52	12 x 9	12	16	100	22	3	15	DIN374
	1612550	MF16	1.25	52	12 x 9	12	16	100	22	3	14.8	DIN374
	1615050	MF16	1.5	52	12 x 9	12	16	100	22	3	14.5	DIN374
	1815050	MF18	1.5	55	14 x 11	14	18	110	25	4	16.5	DIN374
	1820050	MF18	2	55	14 x 11	14	18	125	34	4	16	DIN374
	2015050	MF20	1.5	58	16 x 12	16	20	125	25	4	18.5	DIN374
	2020050	MF20	2	58	16 x 12	16	20	140	34	4	18	DIN374
	2215050	MF22	1.5	63	18 x 14.5	18	22	125	25	4	20.5	DIN374
	2415050	MF24	1.5	66	18 x 14.5	18	24	140	28	4	22.5	DIN374
	2420050	MF24	2	66	18 x 14.5	18	24	140	28	4	22	DIN374

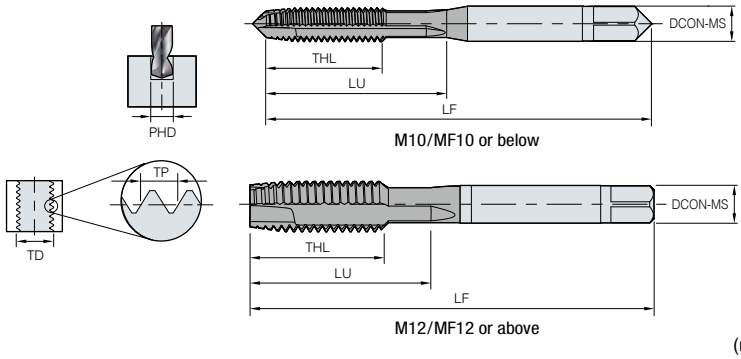
• Applicable workpiece range

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
	◎	◎	◎	◎	○					◎	○	○						◎						

SVDNM

Spiral point Tap



DIN | SPT | Nitride | M(H) | B form | M MF | 6H | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD	BSG
SVDNM	0204050	M2	0.4	13.5	2.8 x 2.1	2.8	2	45	8	3	1.6	DIN371
	025045050	M2.5	0.45	15	2.8 x 2.1	2.8	2.5	50	9	3	2.1	DIN371
	0305050	M3	0.5	18	3.5 x 2.7	3.5	3	56	11	3	2.5	DIN371
	0407050	M4	0.7	21	4.5 x 3.4	4.5	4	63	13	3	3.3	DIN371
	0508050	M5	0.8	25	6 x 4.9	6	5	70	16	3	4.2	DIN371
	0610050	M6	1	30	6 x 4.9	6	6	80	19	3	5	DIN371
	0812550	M8	1.25	35	8 x 6.2	8	8	90	22	3	6.8	DIN371
	1015050	M10	1.5	39	10 x 8	10	10	100	24	3	8.5	DIN371
	1217550	M12	1.75	40	9 x 7	9	12	110	29	3	10.2	DIN376
	1420050	M14	2	45	11 x 9	11	14	110	30	3	12	DIN376
	1620050	M16	2	52	12 x 9	12	16	110	32	3	14	DIN376
	1825050	M18	2.5	55	14 x 11	14	18	125	34	3	15.5	DIN376
	2025050	M20	2.5	58	16 x 12	16	20	140	34	4	17.5	DIN376
	2225050	M22	2.5	63	18 x 14.5	18	22	140	34	4	19.5	DIN376
	2430050	M24	3	66	18 x 14.5	18	24	160	38	4	21	DIN376
	0405050	MF4	0.5	18	2.8 x 2.1	2.8	4	63	10	3	3.5	DIN374
	0505050	MF5	0.5	25	3.5 x 2.7	3.5	5	70	12	3	4.5	DIN374
	0607550	MF6	0.75	25	4.5 x 3.4	4.5	6	80	14	3	5.3	DIN374
	0807550	MF8	0.75	35	6 x 4.9	6	8	80	19	3	7.3	DIN374
	0810050	MF8	1	35	6 x 4.9	6	8	90	22	3	7	DIN374
	1007550	MF10	0.75	39	7 x 5.5	7	10	90	20	3	9.3	DIN374
	1010050	MF10	1	39	7 x 5.5	7	10	90	20	3	9	DIN374
	1012550	MF10	1.25	39	7 x 5.5	7	10	100	24	3	8.8	DIN374
	1210050	MF12	1	48	9 x 7	9	12	100	22	3	11	DIN374
	1212550	MF12	1.25	48	9 x 7	9	12	100	22	3	10.8	DIN374
	1215050	MF12	1.5	48	9 x 7	9	12	100	22	3	10.5	DIN374
	1410050	MF14	1	48	11 x 9	11	14	100	22	3	13	DIN374
	1415050	MF14	1.5	48	11 x 9	11	14	100	22	3	12.5	DIN374
	1610050	MF16	1	52	12 x 9	12	16	100	22	3	15	DIN374
	1615050	MF16	1.5	52	12 x 9	12	16	100	22	3	14.5	DIN374
	1815050	MF18	1.5	55	14 x 11	14	18	110	25	4	16.5	DIN374
	1820050	MF18	2	55	14 x 11	14	18	125	34	4	16	DIN374
	2015050	MF20	1.5	58	16 x 12	16	20	125	25	4	18.5	DIN374
	2215050	MF22	1.5	63	18 x 14.5	18	22	125	25	4	20.5	DIN374
	2415050	MF24	1.5	66	18 x 14.5	18	24	140	28	4	22.5	DIN374
	2420050	MF24	2	66	18 x 14.5	18	24	140	28	4	22	DIN374

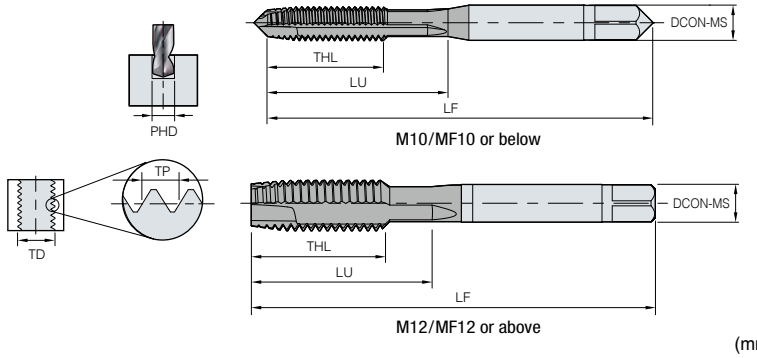
• **Applicable workpiece range**

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
	○	○	○	○	○			◎	○	○	○	◎						○			○	○	○	

SVDHM

Spiral point Tap



DIN | SPT | HOMO | P(K) | B form | M MF | 6H | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD	BSG
SVDHM	0204050	M2	0.4	13.5	2.8 x 2.1	2.8	2	45	8	3	1.6	DIN371
	025045050	M2.5	0.45	15	2.8 x 2.1	2.8	2.5	50	9	3	2.1	DIN371
	0305050	M3	0.5	18	3.5 x 2.7	3.5	3	56	11	3	2.5	DIN371
	0407050	M4	0.7	21	4.5 x 3.4	4.5	4	63	13	3	3.3	DIN371
	0508050	M5	0.8	25	6 x 4.9	6	5	70	16	3	4.2	DIN371
	0610050	M6	1	30	6 x 4.9	6	6	80	19	3	5	DIN371
	0812550	M8	1.25	35	8 x 6.2	8	8	90	22	3	6.8	DIN371
	1015050	M10	1.5	39	10 x 8	10	10	100	24	3	8.5	DIN371
	1217550	M12	1.75	40	9 x 7	9	12	110	29	3	10.2	DIN376
	1420050	M14	2	45	11 x 9	11	14	110	30	3	12	DIN376
	1620050	M16	2	52	12 x 9	12	16	110	32	3	14	DIN376
	1825050	M18	2.5	55	14 x 11	14	18	125	34	3	15.5	DIN376
	2025050	M20	2.5	58	16 x 12	16	20	140	34	4	17.5	DIN376
	2225050	M22	2.5	63	18 x 14.5	18	22	140	34	4	19.5	DIN376
	2430050	M24	3	66	18 x 14.5	18	24	160	38	4	21	DIN376
	0405050	MF4	0.5	18	2.8 x 2.1	2.8	4	63	10	3	3.5	DIN374
	0505050	MF5	0.5	25	3.5 x 2.7	3.5	5	70	12	3	4.5	DIN374
	0607550	MF6	0.75	25	4.5 x 3.4	4.5	6	80	14	3	5.3	DIN374
	0807550	MF8	0.75	35	6 x 4.9	6	8	80	19	3	7.3	DIN374
	0810050	MF8	1	35	6 x 4.9	6	8	90	22	3	7	DIN374
	1007550	MF10	0.75	39	7 x 5.5	7	10	90	20	3	9.3	DIN374
	1010050	MF10	1	39	7 x 5.5	7	10	90	20	3	9	DIN374
	1012550	MF10	1.25	39	7 x 5.5	7	10	100	24	3	8.8	DIN374
	1210050	MF12	1	48	9 x 7	9	12	100	22	3	11	DIN374
	1212550	MF12	1.25	48	9 x 7	9	12	100	22	3	10.8	DIN374
	1215050	MF12	1.5	48	9 x 7	9	12	100	22	3	10.5	DIN374
	1410050	MF14	1	48	11 x 9	11	14	100	22	3	13	DIN374
	1415050	MF14	1.5	48	11 x 9	11	14	100	22	3	12.5	DIN374
	1610050	MF16	1	52	12 x 9	12	16	100	22	3	15	DIN374
	1615050	MF16	1.5	52	12 x 9	12	16	100	22	3	14.5	DIN374
	1815050	MF18	1.5	55	14 x 11	14	18	110	25	4	16.5	DIN374
	1820050	MF18	2	55	14 x 11	14	18	125	34	4	16	DIN374
	2015050	MF20	1.5	58	16 x 12	16	20	125	25	4	18.5	DIN374
	2215050	MF22	1.5	63	18 x 14.5	18	22	125	25	4	20.5	DIN374
	2415050	MF24	1.5	66	18 x 14.5	18	24	140	28	4	22.5	DIN374
	2420050	MF24	2	66	18 x 14.5	18	24	140	28	4	22	DIN374

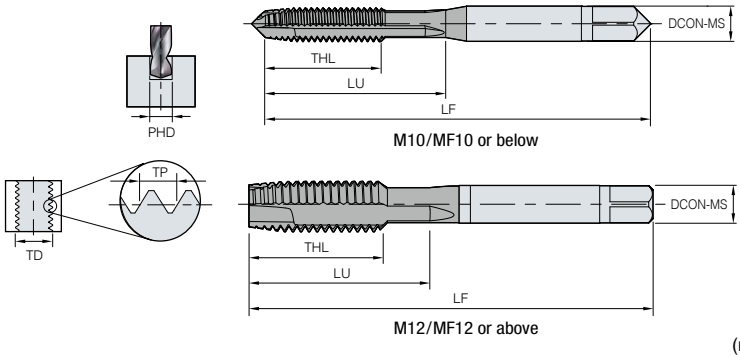
• Applicable workpiece range

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
	◎	◎	◎	◎	○					◎	○	○						◎						

SVDOM

Spiral point Tap



DIN | SPT | Bright | N | B form | M MF | 6H | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD	BSG
SVDOM	0204050	M2	0.4	13.5	2.8 x 2.1	2.8	2	45	8	3	1.6	DIN371
	025045050	M2.5	0.45	15	2.8 x 2.1	2.8	2.5	50	9	3	2.1	DIN371
	0305050	M3	0.5	18	3.5 x 2.7	3.5	3	56	11	3	2.5	DIN371
	0407050	M4	0.7	21	4.5 x 3.4	4.5	4	63	13	3	3.3	DIN371
	0508050	M5	0.8	25	6 x 4.9	6	5	70	16	3	4.2	DIN371
	0610050	M6	1	30	6 x 4.9	6	6	80	19	3	5	DIN371
	0812550	M8	1.25	35	8 x 6.2	8	8	90	22	3	6.8	DIN371
	1015050	M10	1.5	39	10 x 8	10	10	100	24	3	8.5	DIN371
	1217550	M12	1.75	40	9 x 7	9	12	110	29	3	10.2	DIN376
	1420050	M14	2	45	11 x 9	11	14	110	30	3	12	DIN376
	1620050	M16	2	52	12 x 9	12	16	110	32	3	14	DIN376
	1825050	M18	2.5	55	14 x 11	14	18	125	34	3	15.5	DIN376
	2025050	M20	2.5	58	16 x 12	16	20	140	34	4	17.5	DIN376
	2225050	M22	2.5	63	18 x 14.5	18	22	140	34	4	19.5	DIN376
	2430050	M24	3	66	18 x 14.5	18	24	160	38	4	21	DIN376
	0405050	MF4	0.5	18	2.8 x 2.1	2.8	4	63	10	3	3.5	DIN374
	0505050	MF5	0.5	25	3.5 x 2.7	3.5	5	70	12	3	4.5	DIN374
	0607550	MF6	0.75	25	4.5 x 3.4	4.5	6	80	14	3	5.3	DIN374
	0807550	MF8	0.75	35	6 x 4.9	6	8	80	19	3	7.3	DIN374
	0810050	MF8	1	35	6 x 4.9	6	8	90	22	3	7	DIN374
	1007550	MF10	0.75	39	7 x 5.5	7	10	90	20	3	9.3	DIN374
	1010050	MF10	1	39	7 x 5.5	7	10	90	20	3	9	DIN374
	1012550	MF10	1.25	39	7 x 5.5	7	10	100	24	3	8.8	DIN374
	1210050	MF12	1	48	9 x 7	9	12	100	22	3	11	DIN374
	1212550	MF12	1.25	48	9 x 7	9	12	100	22	3	10.8	DIN374
	1215050	MF12	1.5	48	9 x 7	9	12	100	22	3	10.5	DIN374
	1410050	MF14	1	48	11 x 9	11	14	100	22	3	13	DIN374
	1415050	MF14	1.5	48	11 x 9	11	14	100	22	3	12.5	DIN374
	1610050	MF16	1	52	12 x 9	12	16	100	22	3	15	DIN374
	1615050	MF16	1.5	52	12 x 9	12	16	100	22	3	14.5	DIN374
	1815050	MF18	1.5	55	14 x 11	14	18	110	25	4	16.5	DIN374
	1820050	MF18	2	55	14 x 11	14	18	125	34	4	16	DIN374
	2015050	MF20	1.5	58	16 x 12	16	20	125	25	4	18.5	DIN374
	2215050	MF22	1.5	63	18 x 14.5	18	22	125	25	4	20.5	DIN374
	2415050	MF24	1.5	66	18 x 14.5	18	24	140	28	4	22.5	DIN374
	2420050	MF24	2	66	18 x 14.5	18	24	140	28	4	22	DIN374

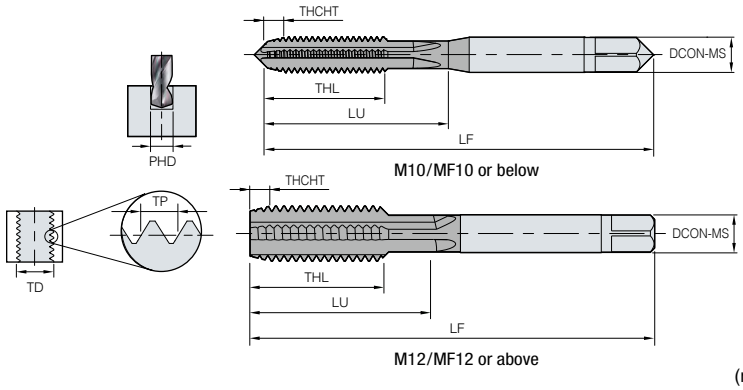
• **Applicable workpiece range**

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
													◎	◎	◎	◎	◎	◎	○	○			◎	

SVGAM

Straight flute Tap



DIN | STT | TiAlN | K | B/E form | M MF | 6H | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD	BSG	THCHT
SVGAM	0305015	M3	0.5	18	3.5 x 2.7	3.5	3	56	11	3	2.5	DIN371	E
	0407015	M4	0.7	21	4.5 x 3.4	4.5	4	63	13	3	3.3	DIN371	E
	0508015	M5	0.8	25	6 x 4.9	6	5	70	15	3	4.2	DIN371	E
	0610015	M6	1	30	6 x 4.9	6	6	80	17	4	5	DIN371	E
	0812515	M8	1.25	35	8 x 6.2	8	8	90	20	4	6.8	DIN371	E
	1015015	M10	1.5	39	10 x 8	10	10	100	22	4	8.5	DIN371	E
	1217515	M12	1.75	40	9 x 7	9	12	110	24	4	10.2	DIN376	E
	1420015	M14	2	45	11 x 9	11	14	110	26	4	12	DIN376	E
	1620015	M16	2	52	12 x 9	12	16	110	27	4	14	DIN376	E
	1825015	M18	2.5	55	14 x 11	14	18	125	30	4	15.5	DIN376	E
	2025015	M20	2.5	58	16 x 12	16	20	140	32	4	17.5	DIN376	E
	2225015	M22	2.5	63	18 x 14.5	18	22	140	32	4	19.5	DIN376	E
	2430015	M24	3	66	18 x 14.5	18	24	160	34	4	21	DIN376	E
	0810015	MF8	1	35	6 x 4.9	6	8	90	17	4	7	DIN374	E
	1010015	MF10	1	39	7 x 5.5	7	10	90	18	4	9	DIN374	E
	1012515	MF10	1.25	39	7 x 5.5	7	10	100	22	4	8.8	DIN374	E
	1210015	MF12	1	48	9 x 7	9	12	100	18	4	11	DIN374	E
	1212515	MF12	1.25	48	9 x 7	9	12	100	22	4	10.8	DIN374	E
	1215015	MF12	1.5	48	9 x 7	9	12	100	22	4	10.5	DIN374	E
	1415015	MF14	1.5	48	11 x 9	11	14	100	22	4	12.5	DIN374	E
	1615015	MF16	1.5	52	12 x 9	12	16	100	22	4	14.5	DIN374	E
	1815015	MF18	1.5	55	14 x 11	14	18	110	25	4	16.5	DIN374	E
	2015015	MF20	1.5	58	16 x 12	16	20	125	25	4	18.5	DIN374	E
	2215015	MF22	1.5	63	18 x 14.5	18	22	125	25	4	20.5	DIN374	E
	2415015	MF24	1.5	66	18 x 14.5	18	24	140	27	4	22.5	DIN374	E
	2420015	MF24	2	66	18 x 14.5	18	24	140	27	4	22	DIN374	E
	0305050	M3	0.5	18	3.5 x 2.7	3.5	3	56	11	3	2.5	DIN371	B
	0407050	M4	0.7	21	4.5 x 3.4	4.5	4	63	13	3	3.3	DIN371	B
	0508050	M5	0.8	25	6 x 4.9	6	5	70	15	3	4.2	DIN371	B
	0610050	M6	1	30	6 x 4.9	6	6	80	17	4	5	DIN371	B
	0812550	M8	1.25	35	8 x 6.2	8	8	90	20	4	6.8	DIN371	B
	1015050	M10	1.5	39	10 x 8	10	10	100	22	4	8.5	DIN371	B
	1217550	M12	1.75	40	9 x 7	9	12	110	24	4	10.2	DIN376	B
	1420050	M14	2	45	11 x 9	11	14	110	26	4	12	DIN376	B
	1620050	M16	2	52	12 x 9	12	16	110	27	4	14	DIN376	B
	1825050	M18	2.5	55	14 x 11	14	18	125	30	4	15.5	DIN376	B
	2025050	M20	2.5	58	16 x 12	16	20	140	32	4	17.5	DIN376	B
	2225050	M22	2.5	63	18 x 14.5	18	22	140	32	4	19.5	DIN376	B
	2430050	M24	3	66	18 x 14.5	18	24	160	34	4	21	DIN376	B
	0810050	MF8	1	35	6 x 4.9	6	8	90	17	4	7	DIN374	B
	1010050	MF10	1	39	7 x 5.5	7	10	90	18	4	9	DIN374	B
	1012550	MF10	1.25	39	7 x 5.5	7	10	100	22	4	8.8	DIN374	B
	1210050	MF12	1	48	9 x 7	9	12	100	18	4	11	DIN374	B
	1212550	MF12	1.25	48	9 x 7	9	12	100	22	4	10.8	DIN374	B
	1215050	MF12	1.5	48	9 x 7	9	12	100	22	4	10.5	DIN374	B
	1415050	MF14	1.5	48	11 x 9	11	14	100	22	4	12.5	DIN374	B
	1615050	MF16	1.5	52	12 x 9	12	16	100	22	4	14.5	DIN374	B
	1815050	MF18	1.5	55	14 x 11	14	18	110	25	4	16.5	DIN374	B
	2015050	MF20	1.5	58	16 x 12	16	20	125	25	4	18.5	DIN374	B
	2215050	MF22	1.5	63	18 x 14.5	18	22	125	25	4	20.5	DIN374	B
	2415050	MF24	1.5	66	18 x 14.5	18	24	140	27	4	22.5	DIN374	B
	2420050	MF24	2	66	18 x 14.5	18	24	140	27	4	22	DIN374	B

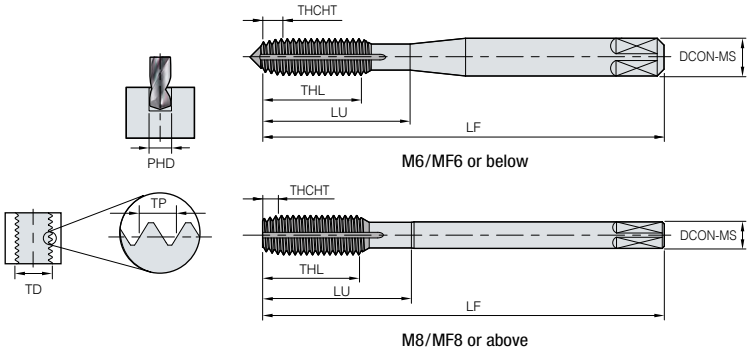
- **Applicable workpiece range**

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
						○					◎													

SVMOM

Roll Tap



DIN | RT | Bright | P(K) | C/B form | M | 6HX | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD		BSG	THCHT	Oil groove
SVMOM	0305020S	M3	0.5	18	3.5 x 2.7	3.5	3	56	11	4	2.76	2.81	DIN	C	S
	0305020M	M3	0.5	18	3.5 x 2.7	3.5	3	56	11	4	2.76	2.81	DIN	C	M
	0407020S	M4	0.7	21	4.5 x 3.4	4.5	4	63	13	4	3.65	3.7	DIN	C	S
	0407020M	M4	0.7	21	4.5 x 3.4	4.5	4	63	13	4	3.65	3.7	DIN	C	M
	0508020S	M5	0.8	25	6 x 4.9	6	5	70	15	4	4.59	4.66	DIN	C	S
	0508020M	M5	0.8	25	6 x 4.9	6	5	70	15	4	4.59	4.66	DIN	C	M
	0610020S	M6	1	30	6 x 4.9	6	6	80	17	4	5.48	5.57	DIN	C	S
	0610020M	M6	1	30	6 x 4.9	6	6	80	17	4	5.48	5.57	DIN	C	M
	0810020S	M8	1	34	8 x 6.2	8	8	90	17	4	7.48	7.57	DIN	C	S
	0810020M	M8	1	34	8 x 6.2	8	8	90	17	4	7.48	7.57	DIN	C	M
	0812520S	M8	1.25	40	8 x 6.2	8	8	90	20	4	7.34	7.41	DIN	C	S
	0812520M	M8	1.25	40	8 x 6.2	8	8	90	20	4	7.34	7.41	DIN	C	M
	1010020S	M10	1	39	10 x 8	10	10	90	18	4	9.48	9.57	DIN	C	S
	1010020M	M10	1	39	10 x 8	10	10	90	18	4	9.48	9.57	DIN	C	M
	1012520S	M10	1.25	44	10 x 8	10	10	100	22	4	9.34	9.41	DIN	C	S
	1012520M	M10	1.25	44	10 x 8	10	10	100	22	4	9.34	9.41	DIN	C	M
	1015020S	M10	1.5	44	10 x 8	10	10	100	22	4	9.18	9.28	DIN	C	S
	1015020M	M10	1.5	44	10 x 8	10	10	100	22	4	9.18	9.28	DIN	C	M
	1210020S	M12	1	36	9 x 7	9	12	100	18	4	11.48	11.57	DIN	C	S
	1210020M	M12	1	36	9 x 7	9	12	100	18	4	11.48	11.57	DIN	C	M
	1212520S	M12	1.25	44	9 x 7	9	12	100	22	4	11.34	11.41	DIN	C	S
	1212520M	M12	1.25	44	9 x 7	9	12	100	22	4	11.34	11.41	DIN	C	M
	1215020S	M12	1.5	44	9 x 7	9	12	100	22	4	11.18	11.28	DIN	C	S
	1215020M	M12	1.5	44	9 x 7	9	12	100	22	4	11.18	11.28	DIN	C	M
	1217520S	M12	1.75	48	9 x 7	9	12	110	24	4	11.05	11.15	DIN	C	S
	1217520M	M12	1.75	48	9 x 7	9	12	110	24	4	11.05	11.15	DIN	C	M
	0305040M	M3	0.5	18	3.5 x 2.7	4	3.5	56	11	4	2.76	2.81	DIN	B	M
	0407040M	M4	0.7	21	4.5 x 3.4	5	4.5	63	13	4	3.65	3.7	DIN	B	M
	0508040M	M5	0.8	25	6 x 4.9	6	5	70	15	4	4.59	4.66	DIN	B	M
	0610040M	M6	1	30	6 x 4.9	6	6	80	17	4	5.48	5.57	DIN	B	M
	0810040M	M8	1	34	8 x 6.2	8	8	90	17	4	7.48	7.57	DIN	B	M
	0812540M	M8	1.25	40	8 x 6.2	8	8	90	20	4	7.34	7.41	DIN	B	M
	1010040M	M10	1	39	10 x 8	10	10	90	18	4	9.48	9.57	DIN	B	M
	1012540M	M10	1.25	44	10 x 8	10	10	100	22	4	9.34	9.41	DIN	B	M
	1015040M	M10	1.5	44	10 x 8	10	10	100	22	4	9.18	9.28	DIN	B	M
	1210040M	M12	1	36	9 x 7	9	12	100	18	4	11.48	11.57	DIN	B	M
	1212540M	M12	1.25	44	9 x 7	9	12	100	22	4	11.34	11.41	DIN	B	M
	1215040M	M12	1.5	44	9 x 7	9	12	100	22	4	11.18	11.28	DIN	B	M
	1217540M	M12	1.75	48	9 x 7	9	12	110	24	4	11.05	11.15	DIN	B	M

Oil groove S: 1 oil groove
Oil groove M: 4 oil groove

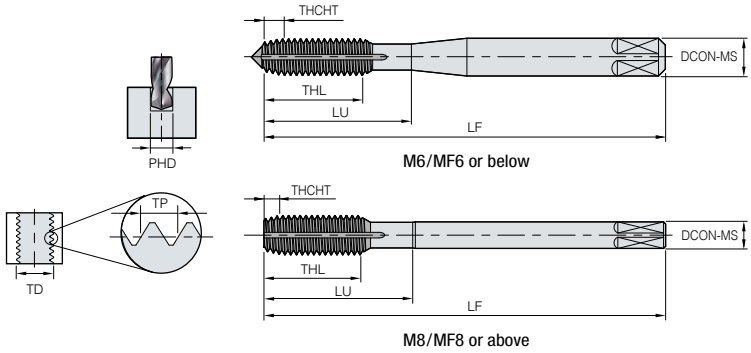
• Applicable workpiece range

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
	○	○						○					○	○	○	○	○	○		○				

SVMTM

Roll Tap



DIN | RT | TiN | P(K) | C/B form | M | 6HX | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD		BSG	THCHT	Oil groove
SVMTM	0305020S	M3	0.5	18	3.5 x 2.7	3.5	3	56	11	4	2.76	2.81	DIN	C	S
	0305020M	M3	0.5	18	3.5 x 2.7	3.5	3	56	11	4	2.76	2.81	DIN	C	M
	0407020S	M4	0.7	21	4.5 x 3.4	4.5	4	63	13	4	3.65	3.7	DIN	C	S
	0407020M	M4	0.7	21	4.5 x 3.4	4.5	4	63	13	4	3.65	3.7	DIN	C	M
	0508020S	M5	0.8	25	6 x 4.9	6	5	70	15	4	4.59	4.66	DIN	C	S
	0508020M	M5	0.8	25	6 x 4.9	6	5	70	15	4	4.59	4.66	DIN	C	M
	0610020S	M6	1	30	6 x 4.9	6	6	80	17	4	5.48	5.57	DIN	C	S
	0610020M	M6	1	30	6 x 4.9	6	6	80	17	4	5.48	5.57	DIN	C	M
	0810020S	M8	1	34	8 x 6.2	8	8	90	17	4	7.48	7.57	DIN	C	S
	0810020M	M8	1	34	8 x 6.2	8	8	90	17	4	7.48	7.57	DIN	C	M
	0812520S	M8	1.25	40	8 x 6.2	8	8	90	20	4	7.34	7.41	DIN	C	S
	0812520M	M8	1.25	40	8 x 6.2	8	8	90	20	4	7.34	7.41	DIN	C	M
	1010020S	M10	1	39	10 x 8	10	10	90	18	4	9.48	9.57	DIN	C	S
	1010020M	M10	1	39	10 x 8	10	10	90	18	4	9.48	9.57	DIN	C	M
	1012520S	M10	1.25	44	10 x 8	10	10	100	22	4	9.34	9.41	DIN	C	S
	1012520M	M10	1.25	44	10 x 8	10	10	100	22	4	9.34	9.41	DIN	C	M
	1015020S	M10	1.5	44	10 x 8	10	10	100	22	4	9.18	9.28	DIN	C	S
	1015020M	M10	1.5	44	10 x 8	10	10	100	22	4	9.18	9.28	DIN	C	M
	1210020S	M12	1	36	9 x 7	9	12	100	18	4	11.48	11.57	DIN	C	S
	1210020M	M12	1	36	9 x 7	9	12	100	18	4	11.48	11.57	DIN	C	M
	1212520S	M12	1.25	44	9 x 7	9	12	100	22	4	11.34	11.41	DIN	C	S
	1212520M	M12	1.25	44	9 x 7	9	12	100	22	4	11.34	11.41	DIN	C	M
	1215020S	M12	1.5	44	9 x 7	9	12	100	22	4	11.18	11.28	DIN	C	S
	1215020M	M12	1.5	44	9 x 7	9	12	100	22	4	11.18	11.28	DIN	C	M
	1217520S	M12	1.75	48	9 x 7	9	12	110	24	4	11.05	11.15	DIN	C	S
	1217520M	M12	1.75	48	9 x 7	9	12	110	24	4	11.05	11.15	DIN	C	M
	0305040M	M3	0.5	18	3.5 x 2.7	4	3.5	56	11	4	2.76	2.81	DIN	B	M
	0407040M	M4	0.7	21	4.5 x 3.4	5	4.5	63	13	4	3.65	3.7	DIN	B	M
	0508040M	M5	0.8	25	6 x 4.9	6	5	70	15	4	4.59	4.66	DIN	B	M
	0610040M	M6	1	30	6 x 4.9	6	6	80	17	4	5.48	5.57	DIN	B	M
	0810040M	M8	1	34	8 x 6.2	8	8	90	17	4	7.48	7.57	DIN	B	M
	0812540M	M8	1.25	40	8 x 6.2	8	8	90	20	4	7.34	7.41	DIN	B	M
	1010040M	M10	1	39	10 x 8	10	10	90	18	4	9.48	9.57	DIN	B	M
	1012540M	M10	1.25	44	10 x 8	10	10	100	22	4	9.34	9.41	DIN	B	M
	1015040M	M10	1.5	44	10 x 8	10	10	100	22	4	9.18	9.28	DIN	B	M
	1210040M	M12	1	36	9 x 7	9	12	100	18	4	11.48	11.57	DIN	B	M
	1212540M	M12	1.25	44	9 x 7	9	12	100	22	4	11.34	11.41	DIN	B	M
	1215040M	M12	1.5	44	9 x 7	9	12	100	22	4	11.18	11.28	DIN	B	M
	1217540M	M12	1.75	48	9 x 7	9	12	110	24	4	11.05	11.15	DIN	B	M

Oil groove S: 1 oil groove
Oil groove M: 4 oil groove

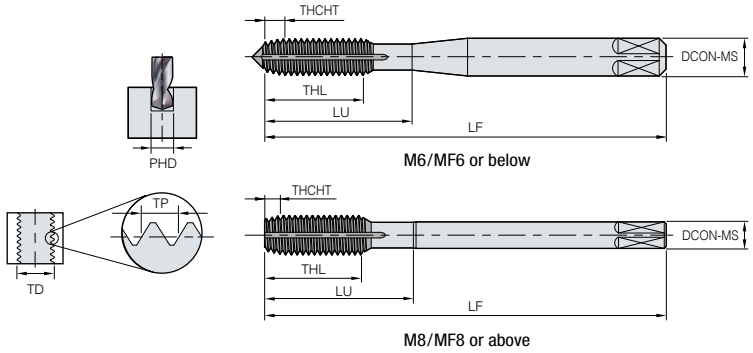
• Applicable workpiece range

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
	○	○						○					○	○	○	○	○	○		○				

SVMCM

Roll Tap



DIN | RT | TiCN | P(K) | C/B form | M | 6HX | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD		BSG	THCHT	Oil groove
SVMCM	0305020S	M3	0.5	18	3.5 x 2.7	3.5	3	56	11	4	2.76	2.81	DIN	C	S
	0305020M	M3	0.5	18	3.5 x 2.7	3.5	3	56	11	4	2.76	2.81	DIN	C	M
	0407020S	M4	0.7	21	4.5 x 3.4	4.5	4	63	13	4	3.65	3.7	DIN	C	S
	0407020M	M4	0.7	21	4.5 x 3.4	4.5	4	63	13	4	3.65	3.7	DIN	C	M
	0508020S	M5	0.8	25	6 x 4.9	6	5	70	15	4	4.59	4.66	DIN	C	S
	0508020M	M5	0.8	25	6 x 4.9	6	5	70	15	4	4.59	4.66	DIN	C	M
	0610020S	M6	1	30	6 x 4.9	6	6	80	17	4	5.48	5.57	DIN	C	S
	0610020M	M6	1	30	6 x 4.9	6	6	80	17	4	5.48	5.57	DIN	C	M
	0810020S	M8	1	34	8 x 6.2	8	8	90	17	4	7.48	7.57	DIN	C	S
	0810020M	M8	1	34	8 x 6.2	8	8	90	17	4	7.48	7.57	DIN	C	M
	0812520S	M8	1.25	40	8 x 6.2	8	8	90	20	4	7.34	7.41	DIN	C	S
	0812520M	M8	1.25	40	8 x 6.2	8	8	90	20	4	7.34	7.41	DIN	C	M
	1010020S	M10	1	39	10 x 8	10	10	90	18	4	9.48	9.57	DIN	C	S
	1010020M	M10	1	39	10 x 8	10	10	90	18	4	9.48	9.57	DIN	C	M
	1012520S	M10	1.25	44	10 x 8	10	10	100	22	4	9.34	9.41	DIN	C	S
	1012520M	M10	1.25	44	10 x 8	10	10	100	22	4	9.34	9.41	DIN	C	M
	1015020S	M10	1.5	44	10 x 8	10	10	100	22	4	9.18	9.28	DIN	C	S
	1015020M	M10	1.5	44	10 x 8	10	10	100	22	4	9.18	9.28	DIN	C	M
	1210020S	M12	1	36	9 x 7	9	12	100	18	4	11.48	11.57	DIN	C	S
	1210020M	M12	1	36	9 x 7	9	12	100	18	4	11.48	11.57	DIN	C	M
	1212520S	M12	1.25	44	9 x 7	9	12	100	22	4	11.34	11.41	DIN	C	S
	1212520M	M12	1.25	44	9 x 7	9	12	100	22	4	11.34	11.41	DIN	C	M
	1215020S	M12	1.5	44	9 x 7	9	12	100	22	4	11.18	11.28	DIN	C	S
	1215020M	M12	1.5	44	9 x 7	9	12	100	22	4	11.18	11.28	DIN	C	M
	1217520S	M12	1.75	48	9 x 7	9	12	110	24	4	11.05	11.15	DIN	C	S
	1217520M	M12	1.75	48	9 x 7	9	12	110	24	4	11.05	11.15	DIN	C	M
	0305040M	M3	0.5	18	3.5 x 2.7	3.5	3	56	11	4	2.76	2.81	DIN	B	M
	0407040M	M4	0.7	21	4.5 x 3.4	4.5	4	63	13	4	3.65	3.7	DIN	B	M
	0508040M	M5	0.8	25	6 x 4.9	6	5	70	15	4	4.59	4.66	DIN	B	M
	0610040M	M6	1	30	6 x 4.9	6	6	80	17	4	5.48	5.57	DIN	B	M
	0810040M	M8	1	34	8 x 6.2	8	8	90	17	4	7.48	7.57	DIN	B	M
	0812540M	M8	1.25	40	8 x 6.2	8	8	90	20	4	7.34	7.41	DIN	B	M
	1010040M	M10	1	39	10 x 8	10	10	90	18	4	9.48	9.57	DIN	B	M
	1012540M	M10	1.25	44	10 x 8	10	10	100	22	4	9.34	9.41	DIN	B	M
	1015040M	M10	1.5	44	10 x 8	10	10	100	22	4	9.18	9.28	DIN	B	M
	1210040M	M12	1	36	9 x 7	9	12	100	18	4	11.48	11.57	DIN	B	M
	1212540M	M12	1.25	44	9 x 7	9	12	100	22	4	11.34	11.41	DIN	B	M
	1215040M	M12	1.5	44	9 x 7	9	12	100	22	4	11.18	11.28	DIN	B	M
	1217540M	M12	1.75	48	9 x 7	9	12	110	24	4	11.05	11.15	DIN	B	M

Oil groove S: 1 oil groove
Oil groove M: 4 oil groove

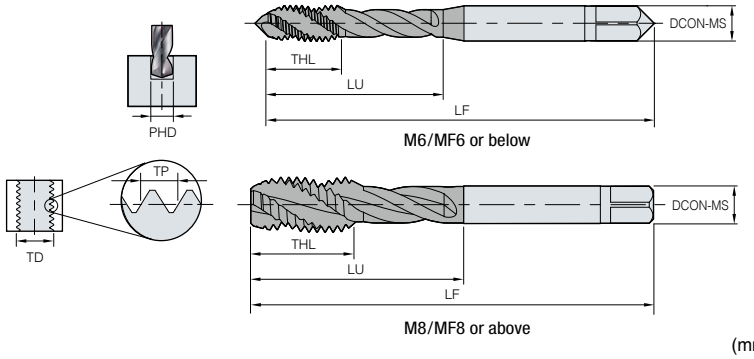
• Applicable workpiece range

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
	○	○						○					○	○	○	○	○	○		○				

SVPAM

Spiral flute Tap



JIS | SFT | TiAlN | P(K) | C form | M MF | H2~4 | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD	BSG	TCTR
SVPAM	0204025	M2	0.4	13.5	3 x 2.5	3	2	40	8	3	1.6	JIS	H2
	025045025	M2.5	0.45	14.5	3 x 2.5	3	2.5	44	9	3	2.1	JIS	H2
	0305025	M3	0.5	17	4 x 3.2	4	3	46	6	3	2.5	JIS	H2
	0407025	M4	0.7	20.5	5 x 4	5	4	52	7.5	3	3.3	JIS	H2
	04507525	M4.5	0.75	20.5	5 x 4	5	4.5	55	13	3	3.8	JIS	H2
	0508025	M5	0.8	25	5.5 x 4.5	5.5	5	60	9	3	4.2	JIS	H2
	0610025	M6	1	29	6 x 4.5	6	6	62	11	3	5	JIS	H2
	0812525	M8	1.25	34	6.2 x 5	6.2	8	70	13	3	6.8	JIS	H3
	1015025	M10	1.5	38	7 x 5.5	7	10	75	16	3	8.5	JIS	H3
	1217525	M12	1.75	48	8.5 x 6.5	8.5	12	82	18	3	10.2	JIS	H4
	1420025	M14	2	45	10.5 x 8	10.5	14	88	20	4	12	JIS	H4
	1620025	M16	2	52	12.5 x 10	12.5	16	95	20	4	14	JIS	H4
	1825025	M18	2.5	55	14 x 11	14	18	100	22	4	15.5	JIS	H4
	2025025	M20	2.5	58	15 x 12	15	20	105	25	4	17.5	JIS	H4
	2225025	M22	2.5	63	17 x 13	17	22	115	25	4	19.5	JIS	H4
	2430025	M24	3	66	19 x 15	19	24	120	29	4	21	JIS	H4
	0405025	MF4	0.5	20.5	5 x 4	5	4	52	7.5	3	3.5	JIS	H2
	0505025	MF5	0.5	25	5.5 x 4.5	5.5	5	60	8	3	4.5	JIS	H2
	0607525	MF6	0.75	29	6 x 4.5	6	6	62	8	3	5.3	JIS	H2
	0807525	MF8	0.75	34	6.2 x 5	6.2	8	70	10	3	7.3	JIS	H3
	0810025	MF8	1	34	6.2 x 5	6.2	8	70	10	3	7	JIS	H3
	1007525	MF10	0.75	38	7 x 5.5	7	10	75	14	3	9.3	JIS	H3
	1010025	MF10	1	38	7 x 5.5	7	10	75	14	3	9	JIS	H3
	1012525	MF10	1.25	38	7 x 5.5	7	10	75	14	3	8.8	JIS	H3
	1210025	MF12	1	48	8.5 x 6.5	8.5	12	82	14	3	11	JIS	H3
	1212525	MF12	1.25	48	8.5 x 6.5	8.5	12	82	14	3	10.8	JIS	H3
	1215025	MF12	1.5	48	8.5 x 6.5	8.5	12	82	14	3	10.5	JIS	H3
	1410025	MF14	1	48	10.5 x 8	10.5	14	88	18	3	13	JIS	H3
	1415025	MF14	1.5	48	10.5 x 8	10.5	14	88	18	3	12.5	JIS	H3
	1615025	MF16	1.5	52	12.5 x 10	12.5	16	95	32	3	14.5	JIS	H3
	1815025	MF18	1.5	55	14 x 11	14	18	100	37	3	16.5	JIS	H4
	2015025	MF20	1.5	58	15 x 12	15	20	105	37	3	18.5	JIS	H4
	2215025	MF22	1.5	63	17 x 13	17	22	115	38	3	20.5	JIS	H4
	2415025	MF24	1.5	66	19 x 15	19	24	120	45	3	22.5	JIS	H4
	2420025	MF24	2	68	19 x 15	19	24	120	45	3	22	JIS	H4

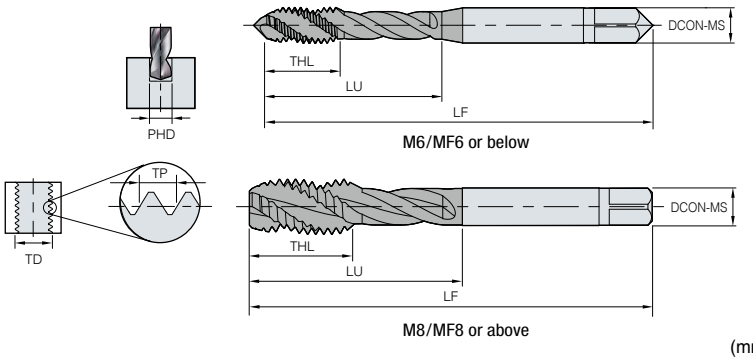
• Applicable workpiece range

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
	◎	◎	◎	◎	○					◎	○	○						◎						

SVPNM

Spiral flute Tap



JIS | SFT | Nitride | M(H) | C form | M MF | H2~4 | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD	BSG	TCTR
SVPNM	0204025	M2	0.4	13.5	3 x 2.5	3	2	40	8	3	1.6	JIS	H2
	025045025	M2.5	0.45	14.5	3 x 2.5	3	2.5	44	9	3	2.1	JIS	H2
	0305025	M3	0.5	17	4 x 3.2	4	3	46	6	3	2.5	JIS	H2
	0407025	M4	0.7	20.5	5 x 4	5	4	52	7.5	3	3.3	JIS	H2
	04507525	M4.5	0.75	20.5	5 x 4	5	4.5	55	13	3	3.8	JIS	H2
	0508025	M5	0.8	25	5.5 x 4.5	5.5	5	60	9	3	4.2	JIS	H2
	0610025	M6	1	29	6 x 4.5	6	6	62	11	3	5	JIS	H2
	0812525	M8	1.25	34	6.2 x 5	6.2	8	70	13	3	6.8	JIS	H3
	1015025	M10	1.5	38	7 x 5.5	7	10	75	16	3	8.5	JIS	H3
	1217525	M12	1.75	48	8.5 x 6.5	8.5	12	82	18	3	10.2	JIS	H4
	1420025	M14	2	45	10.5 x 8	10.5	14	88	20	4	12	JIS	H4
	1620025	M16	2	52	12.5 x 10	12.5	16	95	20	4	14	JIS	H4
	1825025	M18	2.5	55	14 x 11	14	18	100	22	4	15.5	JIS	H4
	2025025	M20	2.5	58	15 x 12	15	20	105	25	4	17.5	JIS	H4
	2225025	M22	2.5	63	17 x 13	17	22	115	25	4	19.5	JIS	H4
	2430025	M24	3	66	19 x 15	19	24	120	29	4	21	JIS	H4
	0405025	MF4	0.5	20.5	5 x 4	5	4	52	7.5	3	3.5	JIS	H2
	0505025	MF5	0.5	25	5.5 x 4.5	5.5	5	60	8	3	4.5	JIS	H2
	0607525	MF6	0.75	29	6 x 4.5	6	6	62	8	3	5.3	JIS	H2
	0807525	MF8	0.75	34	6.2 x 5	6.2	8	70	10	3	7.3	JIS	H3
	0810025	MF8	1	34	6.2 x 5	6.2	8	70	10	3	7	JIS	H3
	1007525	MF10	0.75	38	7 x 5.5	7	10	75	14	3	9.3	JIS	H3
	1010025	MF10	1	38	7 x 5.5	7	10	75	14	3	9	JIS	H3
	1012525	MF10	1.25	38	7 x 5.5	7	10	75	14	3	8.8	JIS	H3
	1210025	MF12	1	48	8.5 x 6.5	8.5	12	82	14	3	11	JIS	H3
	1212525	MF12	1.25	48	8.5 x 6.5	8.5	12	82	14	3	10.8	JIS	H3
	1215025	MF12	1.5	48	8.5 x 6.5	8.5	12	82	14	3	10.5	JIS	H3
	1410025	MF14	1	48	10.5 x 8	10.5	14	88	18	3	13	JIS	H3
	1415025	MF14	1.5	48	10.5 x 8	10.5	14	88	18	3	12.5	JIS	H3
	1615025	MF16	1.5	52	12.5 x 10	12.5	16	95	32	3	14.5	JIS	H3
	1815025	MF18	1.5	55	14 x 11	14	18	100	37	3	16.5	JIS	H4
	2015025	MF20	1.5	58	15 x 12	15	20	105	37	3	18.5	JIS	H4
	2215025	MF22	1.5	63	17 x 13	17	22	115	38	3	20.5	JIS	H4
	2415025	MF24	1.5	66	19 x 15	19	24	120	45	3	22.5	JIS	H4
	2420025	MF24	2	68	19 x 15	19	24	120	45	3	22	JIS	H4

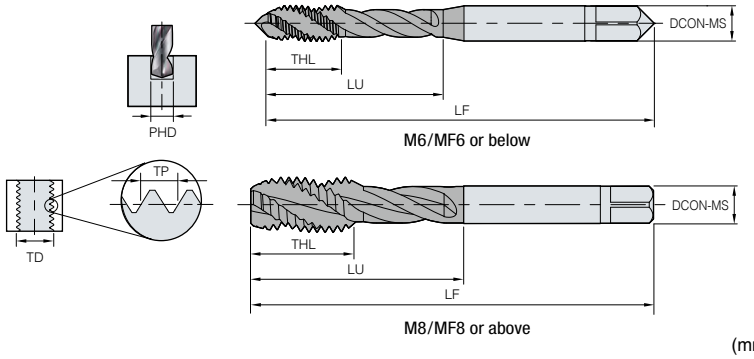
- **Applicable workpiece range**

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
	○	○	○	○	○			◎	○	○	○	◎						○			○	○	○	

SVPHM

Spiral flute Tap



JIS | SFT | HOMO | P(K) | C form | M MF | H2~4 | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD	BSG	TCTR
SVPHM	0204025	M2	0.4	13.5	3 x 2.5	3	2	40	8	3	1.6	JIS	H2
	025045025	M2.5	0.45	14.5	3 x 2.5	3	2.5	44	9	3	2.1	JIS	H2
	0305025	M3	0.5	17	4 x 3.2	4	3	46	6	3	2.5	JIS	H2
	0407025	M4	0.7	20.5	5 x 4	5	4	52	7.5	3	3.3	JIS	H2
	04507525	M4.5	0.75	20.5	5 x 4	5	4.5	55	13	3	3.8	JIS	H2
	0508025	M5	0.8	25	5.5 x 4.5	5.5	5	60	9	3	4.2	JIS	H2
	0610025	M6	1	29	6 x 4.5	6	6	62	11	3	5	JIS	H2
	0812525	M8	1.25	34	6.2 x 5	6.2	8	70	13	3	6.8	JIS	H3
	1015025	M10	1.5	38	7 x 5.5	7	10	75	16	3	8.5	JIS	H3
	1217525	M12	1.75	48	8.5 x 6.5	8.5	12	82	18	3	10.2	JIS	H4
	1420025	M14	2	45	10.5 x 8	10.5	14	88	20	4	12	JIS	H4
	1620025	M16	2	52	12.5 x 10	12.5	16	95	20	4	14	JIS	H4
	1825025	M18	2.5	55	14 x 11	14	18	100	22	4	15.5	JIS	H4
	2025025	M20	2.5	58	15 x 12	15	20	105	25	4	17.5	JIS	H4
	2225025	M22	2.5	63	17 x 13	17	22	115	25	4	19.5	JIS	H4
	2430025	M24	3	66	19 x 15	19	24	120	29	4	21	JIS	H4
	0405025	MF4	0.5	20.5	5 x 4	5	4	52	7.5	3	3.5	JIS	H2
	0505025	MF5	0.5	25	5.5 x 4.5	5.5	5	60	8	3	4.5	JIS	H2
	0607525	MF6	0.75	29	6 x 4.5	6	6	62	8	3	5.3	JIS	H2
	0807525	MF8	0.75	34	6.2 x 5	6.2	8	70	10	3	7.3	JIS	H3
	0810025	MF8	1	34	6.2 x 5	6.2	8	70	10	3	7	JIS	H3
	1007525	MF10	0.75	38	7 x 5.5	7	10	75	14	3	9.3	JIS	H3
	1010025	MF10	1	38	7 x 5.5	7	10	75	14	3	9	JIS	H3
	1012525	MF10	1.25	38	7 x 5.5	7	10	75	14	3	8.8	JIS	H3
	1210025	MF12	1	48	8.5 x 6.5	8.5	12	82	14	3	11	JIS	H3
	1212525	MF12	1.25	48	8.5 x 6.5	8.5	12	82	14	3	10.8	JIS	H3
	1215025	MF12	1.5	48	8.5 x 6.5	8.5	12	82	14	3	10.5	JIS	H3
	1410025	MF14	1	48	10.5 x 8	10.5	14	88	18	3	13	JIS	H3
	1415025	MF14	1.5	48	10.5 x 8	10.5	14	88	18	3	12.5	JIS	H3
	1615025	MF16	1.5	52	12.5 x 10	12.5	16	95	32	3	14.5	JIS	H3
	1815025	MF18	1.5	55	14 x 11	14	18	100	37	3	16.5	JIS	H4
	2015025	MF20	1.5	58	15 x 12	15	20	105	37	3	18.5	JIS	H4
	2215025	MF22	1.5	63	17 x 13	17	22	115	38	3	20.5	JIS	H4
	2415025	MF24	1.5	66	19 x 15	19	24	120	45	3	22.5	JIS	H4
	2420025	MF24	2	68	19 x 15	19	24	120	45	3	22	JIS	H4

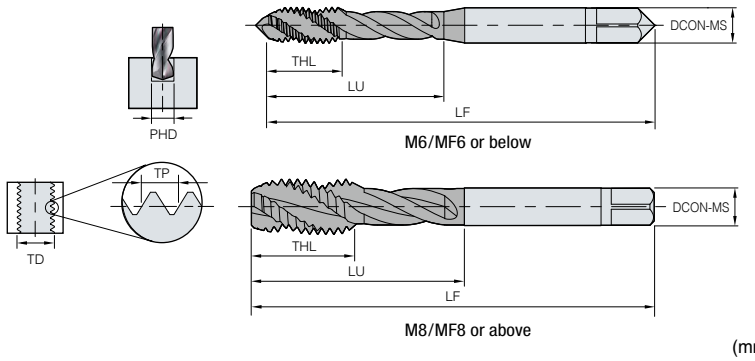
• **Applicable workpiece range**

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
	◎	◎	◎	◎	○					◎	○	○						◎						

SVPOM

Spiral flute Tap



JIS | SFT | Bright | N | C form | M MF | H2~4 | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD	BSG	TCTR
SVPOM	0204025	M2	0.4	13.5	3 x 2.5	3	2	40	8	3	1.6	JIS	H2
	025045025	M2.5	0.45	14.5	3 x 2.5	3	2.5	44	9	3	2.1	JIS	H2
	0305025	M3	0.5	17	4 x 3.2	4	3	46	6	3	2.5	JIS	H2
	0407025	M4	0.7	20.5	5 x 4	5	4	52	7.5	3	3.3	JIS	H2
	04507525	M4.5	0.75	20.5	5 x 4	5	4.5	55	13	3	3.8	JIS	H2
	0508025	M5	0.8	25	5.5 x 4.5	5.5	5	60	9	3	4.2	JIS	H2
	0610025	M6	1	29	6 x 4.5	6	6	62	11	3	5	JIS	H2
	0812525	M8	1.25	34	6.2 x 5	6.2	8	70	13	3	6.8	JIS	H3
	1015025	M10	1.5	38	7 x 5.5	7	10	75	16	3	8.5	JIS	H3
	1217525	M12	1.75	48	8.5 x 6.5	8.5	12	82	18	3	10.2	JIS	H4
	1420025	M14	2	45	10.5 x 8	10.5	14	88	20	4	12	JIS	H4
	1620025	M16	2	52	12.5 x 10	12.5	16	95	20	4	14	JIS	H4
	1825025	M18	2.5	55	14 x 11	14	18	100	22	4	15.5	JIS	H4
	2025025	M20	2.5	58	15 x 12	15	20	105	25	4	17.5	JIS	H4
	2225025	M22	2.5	63	17 x 13	17	22	115	25	4	19.5	JIS	H4
	2430025	M24	3	66	19 x 15	19	24	120	29	4	21	JIS	H4
	0405025	MF4	0.5	20.5	5 x 4	5	4	52	7.5	3	3.5	JIS	H2
	0505025	MF5	0.5	25	5.5 x 4.5	5.5	5	60	8	3	4.5	JIS	H2
	0607525	MF6	0.75	29	6 x 4.5	6	6	62	8	3	5.3	JIS	H2
	0807525	MF8	0.75	34	6.2 x 5	6.2	8	70	10	3	7.3	JIS	H3
	0810025	MF8	1	34	6.2 x 5	6.2	8	70	10	3	7	JIS	H3
	1007525	MF10	0.75	38	7 x 5.5	7	10	75	14	3	9.3	JIS	H3
	1010025	MF10	1	38	7 x 5.5	7	10	75	14	3	9	JIS	H3
	1012525	MF10	1.25	38	7 x 5.5	7	10	75	14	3	8.8	JIS	H3
	1210025	MF12	1	48	8.5 x 6.5	8.5	12	82	14	3	11	JIS	H3
	1212525	MF12	1.25	48	8.5 x 6.5	8.5	12	82	14	3	10.8	JIS	H3
	1215025	MF12	1.5	48	8.5 x 6.5	8.5	12	82	14	3	10.5	JIS	H3
	1410025	MF14	1	48	10.5 x 8	10.5	14	88	18	3	13	JIS	H3
	1415025	MF14	1.5	48	10.5 x 8	10.5	14	88	18	3	12.5	JIS	H3
	1615025	MF16	1.5	52	12.5 x 10	12.5	16	95	32	3	14.5	JIS	H3
	1815025	MF18	1.5	55	14 x 11	14	18	100	37	3	16.5	JIS	H4
	2015025	MF20	1.5	58	15 x 12	15	20	105	37	3	18.5	JIS	H4
	2215025	MF22	1.5	63	17 x 13	17	22	115	38	3	20.5	JIS	H4
	2415025	MF24	1.5	66	19 x 15	19	24	120	45	3	22.5	JIS	H4
	2420025	MF24	2	68	19 x 15	19	24	120	45	3	22	JIS	H4

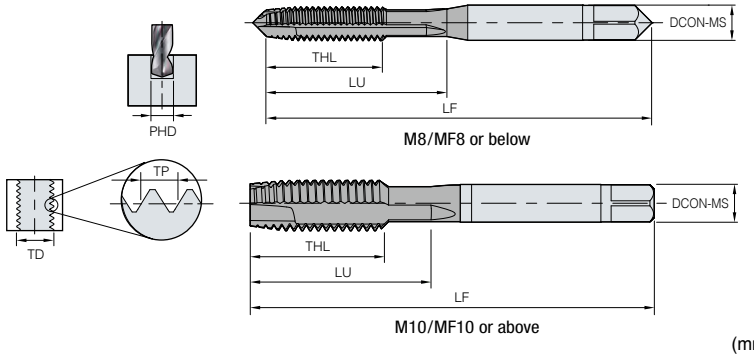
• Applicable workpiece range

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
													◎	◎	◎	◎	◎	◎	○	○			◎	

SVNAM

Spiral point Tap



JIS | SPT | TiAlN | P(K) | B form | M MF | H2~4 | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD	BSG	TCTR
SVNAM	0204050	M2	0.4	14	3 x 2.5	3	2	40	8	3	1.6	JIS	H2
	025045050	M2.5	0.45	15	3 x 2.5	3	2.5	44	9	3	2.1	JIS	H2
	0305050	M3	0.5	18	4 x 3.2	4	3	46	11	3	2.5	JIS	H2
	0407050	M4	0.7	21	5 x 4	5	4	52	13	3	3.3	JIS	H2
	04507550	M4.5	0.75	21	5 x 4	5	4.5	55	13	3	3.8	JIS	H2
	0508050	M5	0.8	25	5.5 x 4.5	5.5	5	60	16	3	4.2	JIS	H2
	0610050	M6	1	30	6 x 4.5	6	6	62	19	3	5	JIS	H2
	0812550	M8	1.25	35	6.2 x 5	6.2	8	70	22	3	6.8	JIS	H3
	1015050	M10	1.5	39	7 x 5.5	7	10	75	24	3	8.5	JIS	H3
	1217550	M12	1.75	48	8.5 x 6.5	8.5	12	82	29	3	10.2	JIS	H4
	1420050	M14	2	48	10.5 x 8	10.5	14	88	30	3	12	JIS	H4
	1620050	M16	2	52	12.5 x 10	12.5	16	95	32	3	14	JIS	H4
	1825050	M18	2.5	55	14 x 11	14	18	100	34	3	15.5	JIS	H4
	2025050	M20	2.5	58	15 x 12	15	20	105	34	4	17.5	JIS	H4
	2225050	M22	2.5	63	17 x 13	17	22	115	34	4	19.5	JIS	H4
	2430050	M24	3	66	19 x 15	19	24	120	38	4	21	JIS	H4
	0405050	MF4	0.5	21	5 x 4	5	4	52	10	3	3.5	JIS	H2
	0505050	MF5	0.5	25	5.5 x 4.5	5.5	5	60	12	3	4.5	JIS	H2
	0607550	MF6	0.75	30	6 x 4.5	6	6	62	14	3	5.3	JIS	H2
	0807550	MF8	0.75	35	6.2 x 5	6.2	8	70	19	3	7.3	JIS	H3
	0810050	MF8	1	35	6.2 x 5	6.2	8	70	19	3	7	JIS	H3
	1007550	MF10	0.75	39	7 x 5.5	7	10	75	20	3	9.3	JIS	H3
	1010050	MF10	1	39	7 x 5.5	7	10	75	20	3	9	JIS	H3
	1012550	MF10	1.25	39	7 x 5.5	7	10	75	20	3	8.8	JIS	H3
	1210050	MF12	1	48	8.5 x 6.5	8.5	12	82	22	3	11	JIS	H3
	1212550	MF12	1.25	48	8.5 x 6.5	8.5	12	82	22	3	10.8	JIS	H3
	1215050	MF12	1.5	48	8.5 x 6.5	8.5	12	82	22	3	10.5	JIS	H3
	1410050	MF14	1	48	10.5 x 8	10.5	14	88	22	3	13	JIS	H3
	1415050	MF14	1.5	48	10.5 x 8	10.5	14	88	22	3	12.5	JIS	H3
	1615050	MF16	1.5	52	12.5 x 10	12.5	16	95	32	3	14.5	JIS	H3
	1815050	MF18	1.5	55	14 x 11	14	18	100	37	3	16.5	JIS	H4
	2015050	MF20	1.5	58	15 x 12	15	20	105	37	3	18.5	JIS	H4
	2215050	MF22	1.5	63	17 x 13	17	22	115	38	3	20.5	JIS	H4
	2415050	MF24	1.5	66	19 x 15	19	24	120	45	3	22.5	JIS	H4
	2420050	MF24	2	66	19 x 15	19	24	120	45	3	22	JIS	H4

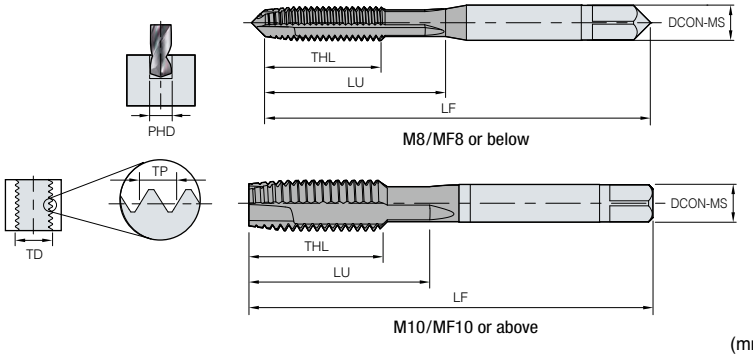
• Applicable workpiece range

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
	◎	◎	◎	◎	○					◎	○	○						◎						

SVNNM

Spiral point Tap



JIS | SPT | Nitride | M(H) | B form | M MF | H2~4 | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD	BSG	TCTR
SVNNM	0204050	M2	0.4	14	3 x 2.5	3	2	40	8	3	1.6	JIS	H2
	025045050	M2.5	0.45	15	3 x 2.5	3	2.5	44	9	3	2.1	JIS	H2
	0305050	M3	0.5	18	4 x 3.2	4	3	46	11	3	2.5	JIS	H2
	0407050	M4	0.7	21	5 x 4	5	4	52	13	3	3.3	JIS	H2
	04507550	M4.5	0.75	21	5 x 4	5	4.5	55	13	3	3.8	JIS	H2
	0508050	M5	0.8	25	5.5 x 4.5	5.5	5	60	16	3	4.2	JIS	H2
	0610050	M6	1	30	6 x 4.5	6	6	62	19	3	5	JIS	H2
	0812550	M8	1.25	35	6.2 x 5	6.2	8	70	22	3	6.8	JIS	H3
	1015050	M10	1.5	39	7 x 5.5	7	10	75	24	3	8.5	JIS	H3
	1217550	M12	1.75	48	8.5 x 6.5	8.5	12	82	29	3	10.2	JIS	H4
	1420050	M14	2	48	10.5 x 8	10.5	14	88	30	3	12	JIS	H4
	1620050	M16	2	52	12.5 x 10	12.5	16	95	32	3	14	JIS	H4
	1825050	M18	2.5	55	14 x 11	14	18	100	34	3	15.5	JIS	H4
	2025050	M20	2.5	58	15 x 12	15	20	105	34	4	17.5	JIS	H4
	2225050	M22	2.5	63	17 x 13	17	22	115	34	4	19.5	JIS	H4
	2430050	M24	3	66	19 x 15	19	24	120	38	4	21	JIS	H4
	0405050	MF4	0.5	21	5 x 4	5	4	52	10	3	3.5	JIS	H2
	0505050	MF5	0.5	25	5.5 x 4.5	5.5	5	60	12	3	4.5	JIS	H2
	0607550	MF6	0.75	30	6 x 4.5	6	6	62	14	3	5.3	JIS	H2
	0807550	MF8	0.75	35	6.2 x 5	6.2	8	70	19	3	7.3	JIS	H3
	0810050	MF8	1	35	6.2 x 5	6.2	8	70	19	3	7	JIS	H3
	1007550	MF10	0.75	39	7 x 5.5	7	10	75	20	3	9.3	JIS	H3
	1010050	MF10	1	39	7 x 5.5	7	10	75	20	3	9	JIS	H3
	1012550	MF10	1.25	39	7 x 5.5	7	10	75	20	3	8.8	JIS	H3
	1210050	MF12	1	48	8.5 x 6.5	8.5	12	82	22	3	11	JIS	H3
	1212550	MF12	1.25	48	8.5 x 6.5	8.5	12	82	22	3	10.8	JIS	H3
	1215050	MF12	1.5	48	8.5 x 6.5	8.5	12	82	22	3	10.5	JIS	H3
	1410050	MF14	1	48	10.5 x 8	10.5	14	88	22	3	13	JIS	H3
	1415050	MF14	1.5	48	10.5 x 8	10.5	14	88	22	3	12.5	JIS	H3
	1615050	MF16	1.5	52	12.5 x 10	12.5	16	95	32	3	14.5	JIS	H3
	1815050	MF18	1.5	55	14 x 11	14	18	100	37	3	16.5	JIS	H4
	2015050	MF20	1.5	58	15 x 12	15	20	105	37	3	18.5	JIS	H4
	2215050	MF22	1.5	63	17 x 13	17	22	115	38	3	20.5	JIS	H4
	2415050	MF24	1.5	66	19 x 15	19	24	120	45	3	22.5	JIS	H4
	2420050	MF24	2	66	19 x 15	19	24	120	45	3	22	JIS	H4

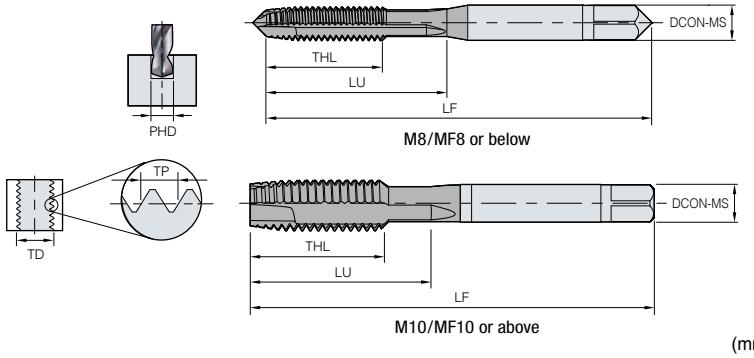
• **Applicable workpiece range**

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
													◎	◎	◎	◎	◎	◎	○	○			◎	

SVNHM

Spiral point Tap



JIS | SPT | HOMO | P(K) | B form | M MF | H2~4 | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD	BSG	TCTR
SVHNM	0204050	M2	0.4	14	3 x 2.5	3	2	40	8	3	1.6	JIS	H2
	025045050	M2.5	0.45	15	3 x 2.5	3	2.5	44	9	3	2.1	JIS	H2
	0305050	M3	0.5	18	4 x 3.2	4	3	46	11	3	2.5	JIS	H2
	0407050	M4	0.7	21	5 x 4	5	4	52	13	3	3.3	JIS	H2
	04507550	M4.5	0.75	21	5 x 4	5	4.5	55	13	3	3.8	JIS	H2
	0508050	M5	0.8	25	5.5 x 4.5	5.5	5	60	16	3	4.2	JIS	H2
	0610050	M6	1	30	6 x 4.5	6	6	62	19	3	5	JIS	H2
	0812550	M8	1.25	35	6.2 x 5	6.2	8	70	22	3	6.8	JIS	H3
	1015050	M10	1.5	39	7 x 5.5	7	10	75	24	3	8.5	JIS	H3
	1217550	M12	1.75	48	8.5 x 6.5	8.5	12	82	29	3	10.2	JIS	H4
	1420050	M14	2	48	10.5 x 8	10.5	14	88	30	3	12	JIS	H4
	1620050	M16	2	52	12.5 x 10	12.5	16	95	32	3	14	JIS	H4
	1825050	M18	2.5	55	14 x 11	14	18	100	34	3	15.5	JIS	H4
	2025050	M20	2.5	58	15 x 12	15	20	105	34	4	17.5	JIS	H4
	2225050	M22	2.5	63	17 x 13	17	22	115	34	4	19.5	JIS	H4
	2430050	M24	3	66	19 x 15	19	24	120	38	4	21	JIS	H4
	0405050	MF4	0.5	21	5 x 4	5	4	52	10	3	3.5	JIS	H2
	0505050	MF5	0.5	25	5.5 x 4.5	5.5	5	60	12	3	4.5	JIS	H2
	0607550	MF6	0.75	30	6 x 4.5	6	6	62	14	3	5.3	JIS	H2
	0807550	MF8	0.75	35	6.2 x 5	6.2	8	70	19	3	7.3	JIS	H3
	0810050	MF8	1	35	6.2 x 5	6.2	8	70	19	3	7	JIS	H3
	1007550	MF10	0.75	39	7 x 5.5	7	10	75	20	3	9.3	JIS	H3
	1010050	MF10	1	39	7 x 5.5	7	10	75	20	3	9	JIS	H3
	1012550	MF10	1.25	39	7 x 5.5	7	10	75	20	3	8.8	JIS	H3
	1210050	MF12	1	48	8.5 x 6.5	8.5	12	82	22	3	11	JIS	H3
	1212550	MF12	1.25	48	8.5 x 6.5	8.5	12	82	22	3	10.8	JIS	H3
	1215050	MF12	1.5	48	8.5 x 6.5	8.5	12	82	22	3	10.5	JIS	H3
	1410050	MF14	1	48	10.5 x 8	10.5	14	88	22	3	13	JIS	H3
	1415050	MF14	1.5	48	10.5 x 8	10.5	14	88	22	3	12.5	JIS	H3
	1615050	MF16	1.5	52	12.5 x 10	12.5	16	95	32	3	14.5	JIS	H3
	1815050	MF18	1.5	55	14 x 11	14	18	100	37	3	16.5	JIS	H4
	2015050	MF20	1.5	58	15 x 12	15	20	105	37	3	18.5	JIS	H4
	2215050	MF22	1.5	63	17 x 13	17	22	115	38	3	20.5	JIS	H4
	2415050	MF24	1.5	66	19 x 15	19	24	120	45	3	22.5	JIS	H4
	2420050	MF24	2	66	19 x 15	19	24	120	45	3	22	JIS	H4

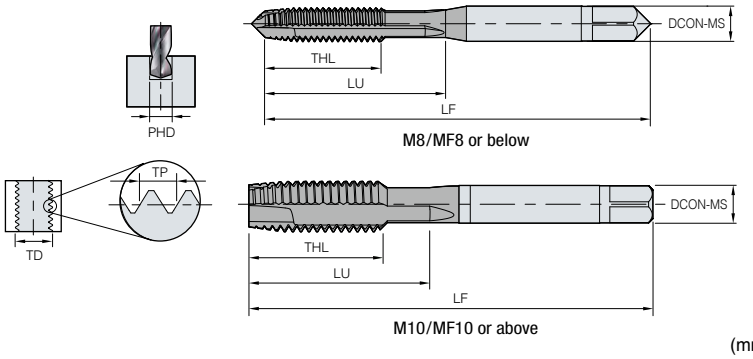
• Applicable workpiece range

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
	◎	◎	◎	◎	○					◎	○	○						◎						

SVNOM

Spiral point Tap



JIS | SPT | Bright | N | B form | M MF | H2~4 | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD	BSG	TCTR
SVNOM	0204050	M2	0.4	14	3 x 2.5	3	2	40	8	3	1.6	JIS	H2
	025045050	M2.5	0.45	15	3 x 2.5	3	2.5	44	9	3	2.1	JIS	H2
	0305050	M3	0.5	18	4 x 3.2	4	3	46	11	3	2.5	JIS	H2
	0407050	M4	0.7	21	5 x 4	5	4	52	13	3	3.3	JIS	H2
	04507550	M4.5	0.75	21	5 x 4	5	4.5	55	13	3	3.8	JIS	H2
	0508050	M5	0.8	25	5.5 x 4.5	5.5	5	60	16	3	4.2	JIS	H2
	0610050	M6	1	30	6 x 4.5	6	6	62	19	3	5	JIS	H2
	0812550	M8	1.25	35	6.2 x 5	6.2	8	70	22	3	6.8	JIS	H3
	1015050	M10	1.5	39	7 x 5.5	7	10	75	24	3	8.5	JIS	H3
	1217550	M12	1.75	48	8.5 x 6.5	8.5	12	82	29	3	10.2	JIS	H4
	1420050	M14	2	48	10.5 x 8	10.5	14	88	30	3	12	JIS	H4
	1620050	M16	2	52	12.5 x 10	12.5	16	95	32	3	14	JIS	H4
	1825050	M18	2.5	55	14 x 11	14	18	100	34	3	15.5	JIS	H4
	2025050	M20	2.5	58	15 x 12	15	20	105	34	4	17.5	JIS	H4
	2225050	M22	2.5	63	17 x 13	17	22	115	34	4	19.5	JIS	H4
	2430050	M24	3	66	19 x 15	19	24	120	38	4	21	JIS	H4
	0405050	MF4	0.5	21	5 x 4	5	4	52	10	3	3.5	JIS	H2
	0505050	MF5	0.5	25	5.5 x 4.5	5.5	5	60	12	3	4.5	JIS	H2
	0607550	MF6	0.75	30	6 x 4.5	6	6	62	14	3	5.3	JIS	H2
	0807550	MF8	0.75	35	6.2 x 5	6.2	8	70	19	3	7.3	JIS	H3
	0810050	MF8	1	35	6.2 x 5	6.2	8	70	19	3	7	JIS	H3
	1007550	MF10	0.75	39	7 x 5.5	7	10	75	20	3	9.3	JIS	H3
	1010050	MF10	1	39	7 x 5.5	7	10	75	20	3	9	JIS	H3
	1012550	MF10	1.25	39	7 x 5.5	7	10	75	20	3	8.8	JIS	H3
	1210050	MF12	1	48	8.5 x 6.5	8.5	12	82	22	3	11	JIS	H3
	1212550	MF12	1.25	48	8.5 x 6.5	8.5	12	82	22	3	10.8	JIS	H3
	1215050	MF12	1.5	48	8.5 x 6.5	8.5	12	82	22	3	10.5	JIS	H3
	1410050	MF14	1	48	10.5 x 8	10.5	14	88	22	3	13	JIS	H3
	1415050	MF14	1.5	48	10.5 x 8	10.5	14	88	22	3	12.5	JIS	H3
	1615050	MF16	1.5	52	12.5 x 10	12.5	16	95	32	3	14.5	JIS	H3
	1815050	MF18	1.5	55	14 x 11	14	18	100	37	3	16.5	JIS	H4
	2015050	MF20	1.5	58	15 x 12	15	20	105	37	3	18.5	JIS	H4
	2215050	MF22	1.5	63	17 x 13	17	22	115	38	3	20.5	JIS	H4
	2415050	MF24	1.5	66	19 x 15	19	24	120	45	3	22.5	JIS	H4
	2420050	MF24	2	66	19 x 15	19	24	120	45	3	22	JIS	H4

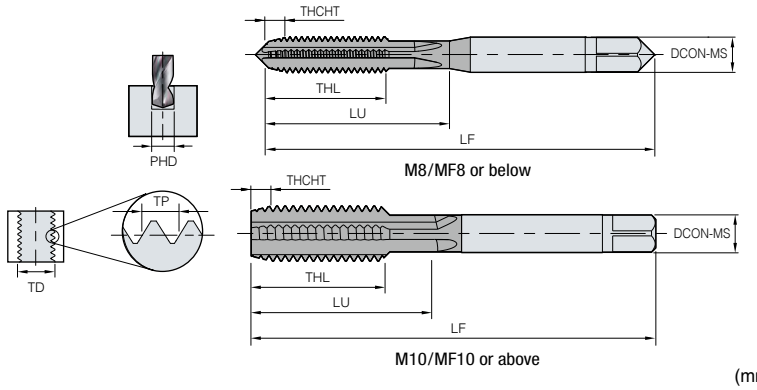
• **Applicable workpiece range**

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
													◎	◎	◎	◎	◎	◎	○	○			◎	

SVSAM

Straight flute Tap



JIS | STT | TiAlN | K | B/E form | M MF | H2~4 | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD	BSG	THCHT	TCTR
SVSAM	0305015	M3	0.5	18	4 x 3.2	4	3	46	11	3	2.5	JIS	E	H2
	0407015	M4	0.7	21	5 x 4	5	4	52	13	3	3.3	JIS	E	H2
	04507515	M4.5	0.75	21	5 x 4	5	4.5	55	13	3	3.8	JIS	E	H2
	0508015	M5	0.8	25	5.5 x 4.5	5.5	5	60	16	3	4.2	JIS	E	H2
	0610015	M6	1	30	6 x 4.5	6	6	62	19	4	5	JIS	E	H2
	0812515	M8	1.25	35	6.2 x 5	6.2	8	70	22	4	6.8	JIS	E	H3
	1015015	M10	1.5	39	7 x 5.5	7	10	75	24	4	8.5	JIS	E	H3
	1217515	M12	1.75	48	8.5 x 6.5	8.5	12	82	29	4	10.2	JIS	E	H4
	1420015	M14	2	48	10.5 x 8	10.5	14	88	30	4	12	JIS	E	H4
	1620015	M16	2	52	12.5 x 10	12.5	16	95	32	4	14	JIS	E	H4
	1825015	M18	2.5	55	14 x 11	14	18	100	37	4	15.5	JIS	E	H4
	2025015	M20	2.5	58	15 x 12	15	20	105	37	4	17.5	JIS	E	H4
	2225015	M22	2.5	63	17 x 13	17	22	115	38	4	19.5	JIS	E	H4
	2430015	M24	3	66	19 x 15	19	24	120	45	4	21	JIS	E	H4
	0810015	MF8	1	35	6.2 x 5	6.2	8	70	22	4	7	JIS	E	H3
	1012515	MF10	1.25	39	7 x 5.5	7	10	75	24	4	8.8	JIS	E	H3
	1210015	MF12	1	48	8.5 x 6.5	8.5	12	82	29	4	11	JIS	E	H3
	1212515	MF12	1.25	48	8.5 x 6.5	8.5	12	82	29	4	10.8	JIS	E	H3
	1215015	MF12	1.5	48	8.5 x 6.5	8.5	12	82	29	4	10.5	JIS	E	H3
	1415015	MF14	1.5	48	10.5 x 8	10.5	14	88	30	4	12.5	JIS	E	H3
	1615015	MF16	1.5	52	12.5 x 10	12.5	16	95	32	4	14.5	JIS	E	H3
	1815015	MF18	1.5	55	14 x 11	14	18	100	37	4	16.5	JIS	E	H4
	2015015	MF20	1.5	58	15 x 12	15	20	105	37	4	18.5	JIS	E	H4
	2215015	MF22	1.5	63	17 x 13	17	22	115	38	4	20.5	JIS	E	H4
	2415015	MF24	1.5	66	19 x 15	19	24	120	45	4	22.5	JIS	E	H4
	2420015	MF24	2	66	19 x 15	19	24	120	45	4	22	JIS	E	H4
	0305050	M3	0.5	18	4 x 3.2	4	3	46	11	3	2.5	JIS	B	H2
	0407050	M4	0.7	21	5 x 4	5	4	52	13	3	3.3	JIS	B	H2
	04507550	M4.5	0.75	21	5 x 4	5	4.5	55	13	3	3.8	JIS	B	H2
	0508050	M5	0.8	25	5.5 x 4.5	5.5	5	60	16	3	4.2	JIS	B	H2
	0610050	M6	1	30	6 x 4.5	6	6	62	19	4	5	JIS	B	H2
	0812550	M8	1.25	35	6.2 x 5	6.2	8	70	22	4	6.8	JIS	B	H3
	1015050	M10	1.5	39	7 x 5.5	7	10	75	24	4	8.5	JIS	B	H3
	1217550	M12	1.75	48	8.5 x 6.5	8.5	12	82	29	4	10.2	JIS	B	H4
	1420050	M14	2	48	10.5 x 8	10.5	14	88	30	4	12	JIS	B	H4
	1620050	M16	2	52	12.5 x 10	12.5	16	95	32	4	14	JIS	B	H4
	1825050	M18	2.5	55	14 x 11	14	18	100	37	4	15.5	JIS	B	H4
	2025050	M20	2.5	58	15 x 12	15	20	105	37	4	17.5	JIS	B	H4
	2225050	M22	2.5	63	17 x 13	17	22	115	38	4	19.5	JIS	B	H4
	2430050	M24	3	66	19 x 15	19	24	120	45	4	21	JIS	B	H4
	0810050	MF8	1	35	6.2 x 5	6.2	8	70	22	4	7	JIS	B	H3
	1012550	MF10	1.25	39	7 x 5.5	7	10	75	24	4	8.8	JIS	B	H3
	1210050	MF12	1	48	8.5 x 6.5	8.5	12	82	29	4	11	JIS	B	H3
	1212550	MF12	1.25	48	8.5 x 6.5	8.5	12	82	29	4	10.8	JIS	B	H3
	1215050	MF12	1.5	48	8.5 x 6.5	8.5	12	82	29	4	10.5	JIS	B	H3
	1415050	MF14	1.5	48	10.5 x 8	10.5	14	88	30	4	12.5	JIS	B	H3
	1615050	MF16	1.5	52	12.5 x 10	12.5	16	95	32	4	14.5	JIS	B	H3
	1815050	MF18	1.5	55	14 x 11	14	18	100	37	4	16.5	JIS	B	H4
	2015050	MF20	1.5	58	15 x 12	15	20	105	37	4	18.5	JIS	B	H4
	2215050	MF22	1.5	63	17 x 13	17	22	115	38	4	20.5	JIS	B	H4
	2415050	MF24	1.5	66	19 x 15	19	24	120	45	4	22.5	JIS	B	H4
	2420050	MF24	2	66	19 x 15	19	24	120	45	4	22	JIS	B	H4

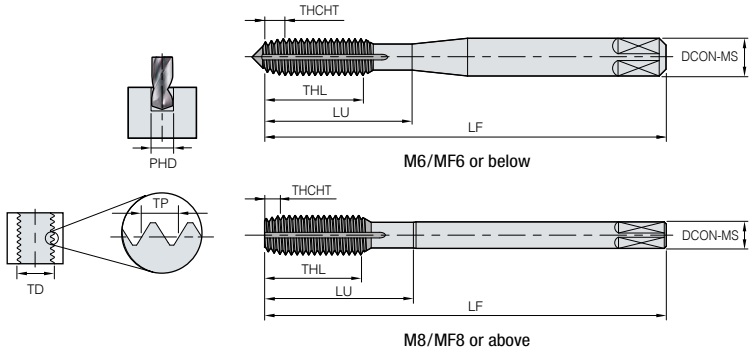
• Applicable workpiece range

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
						○					◎													

SVROM

Roll Tap



JIS | RT | Bright | P(K) | C/B form | M | H5~8 | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD		BSG	THCHT	TCTR	Oil groove
SVROM	0305020S	M3	0.5	17	4 x 3.2	4	3	46	11	4	2.76	2.81	JIS	C	H5	S
	0305020M	M3	0.5	17	4 x 3.2	4	3	46	11	4	2.76	2.81	JIS	C	H5	M
	0407020S	M4	0.7	19.5	5 x 4	5	4	52	13	4	3.65	3.7	JIS	C	H6	S
	0407020M	M4	0.7	19.5	5 x 4	5	4	52	13	4	3.65	3.7	JIS	C	H6	M
	0508020S	M5	0.8	23	5.5 x 4.5	5.5	5	60	16	4	4.59	4.66	JIS	C	H6	S
	0508020M	M5	0.8	23	5.5 x 4.5	5.5	5	60	16	4	4.59	4.66	JIS	C	H6	M
	0610020S	M6	1	27	6 x 4.5	6	6	62	19	4	5.48	5.57	JIS	C	H7	S
	0610020M	M6	1	27	6 x 4.5	6	6	62	19	4	5.48	5.57	JIS	C	H7	M
	0810020S	M8	1	35	6.2 x 5	6.2	8	70	22	4	7.48	7.57	JIS	C	H7	S
	0810020M	M8	1	35	6.2 x 5	6.2	8	70	22	4	7.48	7.57	JIS	C	H7	M
	0812520S	M8	1.25	35	6.2 x 5	6.2	8	70	22	4	7.34	7.41	JIS	C	H7	S
	0812520M	M8	1.25	35	6.2 x 5	6.2	8	70	22	4	7.34	7.41	JIS	C	H7	M
	1012520S	M10	1.25	40	7 x 5.5	7	10	75	24	4	9.34	9.41	JIS	C	H7	S
	1012520M	M10	1.25	40	7 x 5.5	7	10	75	24	4	9.34	9.41	JIS	C	H7	M
	1015020S	M10	1.5	40	7 x 5.5	7	10	75	24	4	9.18	9.28	JIS	C	H7	S
	1015020M	M10	1.5	40	7 x 5.5	7	10	75	24	4	9.18	9.28	JIS	C	H7	M
	1210020S	M12	1	44	8.5 x 6.5	8.5	12	82	29	4	11.48	11.57	JIS	C	H7	S
	1210020M	M12	1	44	8.5 x 6.5	8.5	12	82	29	4	11.48	11.57	JIS	C	H7	M
	1212520S	M12	1.25	44	8.5 x 6.5	8.5	12	82	29	4	11.34	11.41	JIS	C	H7	S
	1212520M	M12	1.25	44	8.5 x 6.5	8.5	12	82	29	4	11.34	11.41	JIS	C	H7	M
	1215020S	M12	1.5	44	8.5 x 6.5	8.5	12	82	29	4	11.18	11.28	JIS	C	H7	S
	1215020M	M12	1.5	44	8.5 x 6.5	8.5	12	82	29	4	11.18	11.28	JIS	C	H7	M
	1217520S	M12	1.75	44	8.5 x 6.5	8.5	12	82	29	4	11.05	11.15	JIS	C	H8	S
	1217520M	M12	1.75	44	8.5 x 6.5	8.5	12	82	29	4	11.05	11.15	JIS	C	H8	M
	0305040M	M3	0.5	17	4 x 3.2	4	3	46	11	4	2.76	2.81	JIS	B	H5	M
	0407040M	M4	0.7	19.5	5 x 4	5	4	52	13	4	3.65	3.7	JIS	B	H6	M
	0508040M	M5	0.8	23	5.5 x 4.5	5.5	5	60	16	4	4.59	4.66	JIS	B	H6	M
	0610040M	M6	1	27	6 x 4.5	6	6	62	19	4	5.48	5.57	JIS	B	H7	M
	0810040M	M8	1	35	6.2 x 5	6.2	8	70	22	4	7.48	7.57	JIS	B	H7	M
	0812540M	M8	1.25	35	6.2 x 5	6.2	8	70	22	4	7.34	7.41	JIS	B	H7	M
	1012540M	M10	1.25	40	7 x 5.5	7	10	75	24	4	9.34	9.41	JIS	B	H7	M
	1015040M	M10	1.5	40	7 x 5.5	7	10	75	24	4	9.18	9.28	JIS	B	H7	M
	1210040M	M12	1	44	8.5 x 6.5	8.5	12	82	29	4	11.48	11.57	JIS	B	H7	M
	1212540M	M12	1.25	44	8.5 x 6.5	8.5	12	82	29	4	11.34	11.41	JIS	B	H7	M
	1215040M	M12	1.5	44	8.5 x 6.5	8.5	12	82	29	4	11.18	11.28	JIS	B	H7	M
	1217540M	M12	1.75	44	8.5 x 6.5	8.5	12	82	29	4	11.05	11.15	JIS	B	H8	M

Oil groove S: 1 oil groove
Oil groove M: 4 oil groove

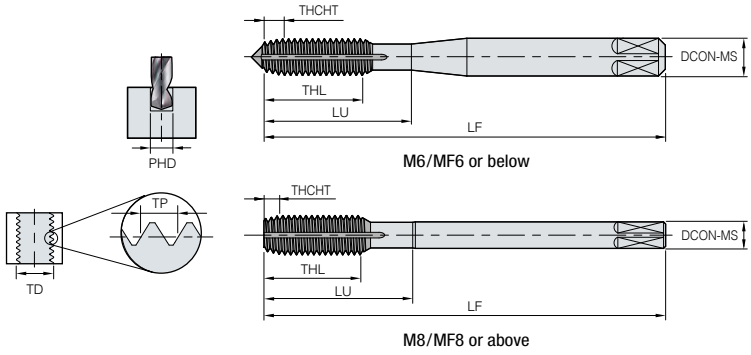
• **Applicable workpiece range**

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
	○	○						○					○	○	○	○	○	○		○				

SVRTM

Roll Tap



JIS | RT | TiN | P(K) | C/B form | M | H5~8 | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD		BSG	THCHT	TCTR	Oil groove
SVRTM	0305020S	M3	0.5	17	4 x 3.2	4	3	46	11	4	2.76	2.81	JIS	C	H5	S
	0305020M	M3	0.5	17	4 x 3.2	4	3	46	11	4	2.76	2.81	JIS	C	H5	M
	0407020S	M4	0.7	19.5	5 x 4	5	4	52	13	4	3.65	3.7	JIS	C	H6	S
	0407020M	M4	0.7	19.5	5 x 4	5	4	52	13	4	3.65	3.7	JIS	C	H6	M
	0508020S	M5	0.8	23	5.5 x 4.5	5.5	5	60	16	4	4.59	4.66	JIS	C	H6	S
	0508020M	M5	0.8	23	5.5 x 4.5	5.5	5	60	16	4	4.59	4.66	JIS	C	H6	M
	0610020S	M6	1	27	6 x 4.5	6	6	62	19	4	5.48	5.57	JIS	C	H7	S
	0610020M	M6	1	27	6 x 4.5	6	6	62	19	4	5.48	5.57	JIS	C	H7	M
	0810020S	M8	1	35	6.2 x 5	6.2	8	70	22	4	7.48	7.57	JIS	C	H7	S
	0810020M	M8	1	35	6.2 x 5	6.2	8	70	22	4	7.48	7.57	JIS	C	H7	M
	0812520S	M8	1.25	35	6.2 x 5	6.2	8	70	22	4	7.34	7.41	JIS	C	H7	S
	0812520M	M8	1.25	35	6.2 x 5	6.2	8	70	22	4	7.34	7.41	JIS	C	H7	M
	1012520S	M10	1.25	40	7 x 5.5	7	10	75	24	4	9.34	9.41	JIS	C	H7	S
	1012520M	M10	1.25	40	7 x 5.5	7	10	75	24	4	9.34	9.41	JIS	C	H7	M
	1015020S	M10	1.5	40	7 x 5.5	7	10	75	24	4	9.18	9.28	JIS	C	H7	S
	1015020M	M10	1.5	40	7 x 5.5	7	10	75	24	4	9.18	9.28	JIS	C	H7	M
	1210020S	M12	1	44	8.5 x 6.5	8.5	12	82	29	4	11.48	11.57	JIS	C	H7	S
	1210020M	M12	1	44	8.5 x 6.5	8.5	12	82	29	4	11.48	11.57	JIS	C	H7	M
	1212520S	M12	1.25	44	8.5 x 6.5	8.5	12	82	29	4	11.34	11.41	JIS	C	H7	S
	1212520M	M12	1.25	44	8.5 x 6.5	8.5	12	82	29	4	11.34	11.41	JIS	C	H7	M
	1215020S	M12	1.5	44	8.5 x 6.5	8.5	12	82	29	4	11.18	11.28	JIS	C	H7	S
	1215020M	M12	1.5	44	8.5 x 6.5	8.5	12	82	29	4	11.18	11.28	JIS	C	H7	M
	1217520S	M12	1.75	44	8.5 x 6.5	8.5	12	82	29	4	11.05	11.15	JIS	C	H8	S
	1217520M	M12	1.75	44	8.5 x 6.5	8.5	12	82	29	4	11.05	11.15	JIS	C	H8	M
	0305040M	M3	0.5	17	4 x 3.2	4	3	46	11	4	2.76	2.81	JIS	B	H5	M
	0407040M	M4	0.7	19.5	5 x 4	5	4	52	13	4	3.65	3.7	JIS	B	H6	M
	0508040M	M5	0.8	23	5.5 x 4.5	5.5	5	60	16	4	4.59	4.66	JIS	B	H6	M
	0610040M	M6	1	27	6 x 4.5	6	6	62	19	4	5.48	5.57	JIS	B	H7	M
	0810040M	M8	1	35	6.2 x 5	6.2	8	70	22	4	7.48	7.57	JIS	B	H7	M
	0812540M	M8	1.25	35	6.2 x 5	6.2	8	70	22	4	7.34	7.41	JIS	B	H7	M
	1012540M	M10	1.25	40	7 x 5.5	7	10	75	24	4	9.34	9.41	JIS	B	H7	M
	1015040M	M10	1.5	40	7 x 5.5	7	10	75	24	4	9.18	9.28	JIS	B	H7	M
	1210040M	M12	1	44	8.5 x 6.5	8.5	12	82	29	4	11.48	11.57	JIS	B	H7	M
	1212540M	M12	1.25	44	8.5 x 6.5	8.5	12	82	29	4	11.34	11.41	JIS	B	H7	M
	1215040M	M12	1.5	44	8.5 x 6.5	8.5	12	82	29	4	11.18	11.28	JIS	B	H7	M
	1217540M	M12	1.75	44	8.5 x 6.5	8.5	12	82	29	4	11.05	11.15	JIS	B	H8	M

Oil groove S: 1 oil groove
Oil groove M: 4 oil groove

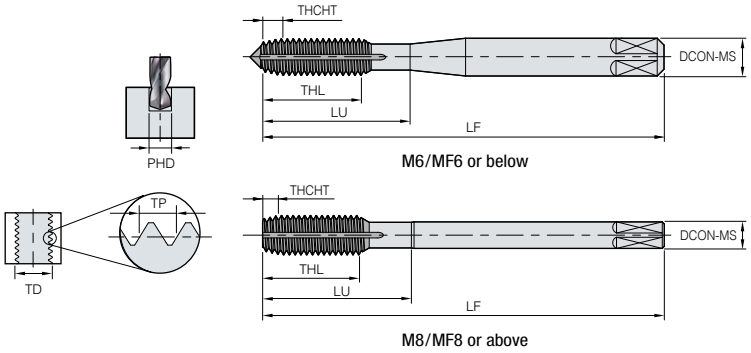
• Applicable workpiece range

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
	○	○						○					○	○	○	○	○	○		○				

SVRCM

Roll Tap



JIS | RT | TiCN | P(K) | C/B form | M | H5~8 | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	NOF	PHD		BSG	THCHT	TCTR	Oil groove
SVRCM	0305020S	M3	0.5	17	4 x 3.2	4	3	46	11	4	2.76	2.81	JIS	C	H5	S
	0305020M	M3	0.5	17	4 x 3.2	4	3	46	11	4	2.76	2.81	JIS	C	H5	M
	0407020S	M4	0.7	19.5	5 x 4	5	4	52	13	4	3.65	3.7	JIS	C	H6	S
	0407020M	M4	0.7	19.5	5 x 4	5	4	52	13	4	3.65	3.7	JIS	C	H6	M
	0508020S	M5	0.8	23	5.5 x 4.5	5.5	5	60	16	4	4.59	4.66	JIS	C	H6	S
	0508020M	M5	0.8	23	5.5 x 4.5	5.5	5	60	16	4	4.59	4.66	JIS	C	H6	M
	0610020S	M6	1	27	6 x 4.5	6	6	62	19	4	5.48	5.57	JIS	C	H7	S
	0610020M	M6	1	27	6 x 4.5	6	6	62	19	4	5.48	5.57	JIS	C	H7	M
	0810020S	M8	1	35	6.2 x 5	6.2	8	70	22	4	7.48	7.57	JIS	C	H7	S
	0810020M	M8	1	35	6.2 x 5	6.2	8	70	22	4	7.48	7.57	JIS	C	H7	M
	0812520S	M8	1.25	35	6.2 x 5	6.2	8	70	22	4	7.34	7.41	JIS	C	H7	S
	0812520M	M8	1.25	35	6.2 x 5	6.2	8	70	22	4	7.34	7.41	JIS	C	H7	M
	1012520S	M10	1.25	40	7 x 5.5	7	10	75	24	4	9.34	9.41	JIS	C	H7	S
	1012520M	M10	1.25	40	7 x 5.5	7	10	75	24	4	9.34	9.41	JIS	C	H7	M
	1015020S	M10	1.5	40	7 x 5.5	7	10	75	24	4	9.18	9.28	JIS	C	H7	S
	1015020M	M10	1.5	40	7 x 5.5	7	10	75	24	4	9.18	9.28	JIS	C	H7	M
	1210020S	M12	1	44	8.5 x 6.5	8.5	12	82	29	4	11.48	11.57	JIS	C	H7	S
	1210020M	M12	1	44	8.5 x 6.5	8.5	12	82	29	4	11.48	11.57	JIS	C	H7	M
	1212520S	M12	1.25	44	8.5 x 6.5	8.5	12	82	29	4	11.34	11.41	JIS	C	H7	S
	1212520M	M12	1.25	44	8.5 x 6.5	8.5	12	82	29	4	11.34	11.41	JIS	C	H7	M
	1215020S	M12	1.5	44	8.5 x 6.5	8.5	12	82	29	4	11.18	11.28	JIS	C	H7	S
	1215020M	M12	1.5	44	8.5 x 6.5	8.5	12	82	29	4	11.18	11.28	JIS	C	H7	M
	1217520S	M12	1.75	44	8.5 x 6.5	8.5	12	82	29	4	11.05	11.15	JIS	C	H8	S
	1217520M	M12	1.75	44	8.5 x 6.5	8.5	12	82	29	4	11.05	11.15	JIS	C	H8	M
	0305040M	M3	0.5	17	4 x 3.2	4	3	46	11	4	2.76	2.81	JIS	B	H5	M
	0407040M	M4	0.7	19.5	5 x 4	5	4	52	13	4	3.65	3.7	JIS	B	H6	M
	0508040M	M5	0.8	23	5.5 x 4.5	5.5	5	60	16	4	4.59	4.66	JIS	B	H6	M
	0610040M	M6	1	27	6 x 4.5	6	6	62	19	4	5.48	5.57	JIS	B	H7	M
	0810040M	M8	1	35	6.2 x 5	6.2	8	70	22	4	7.48	7.57	JIS	B	H7	M
	0812540M	M8	1.25	35	6.2 x 5	6.2	8	70	22	4	7.34	7.41	JIS	B	H7	M
	1012540M	M10	1.25	40	7 x 5.5	7	10	75	24	4	9.34	9.41	JIS	B	H7	M
	1015040M	M10	1.5	40	7 x 5.5	7	10	75	24	4	9.18	9.28	JIS	B	H7	M
	1210040M	M12	1	44	8.5 x 6.5	8.5	12	82	29	4	11.48	11.57	JIS	B	H7	M
	1212540M	M12	1.25	44	8.5 x 6.5	8.5	12	82	29	4	11.34	11.41	JIS	B	H7	M
	1215040M	M12	1.5	44	8.5 x 6.5	8.5	12	82	29	4	11.18	11.28	JIS	B	H7	M
	1217540M	M12	1.75	44	8.5 x 6.5	8.5	12	82	29	4	11.05	11.15	JIS	B	H8	M

Oil groove S: 1 oil groove
Oil groove M: 4 oil groove

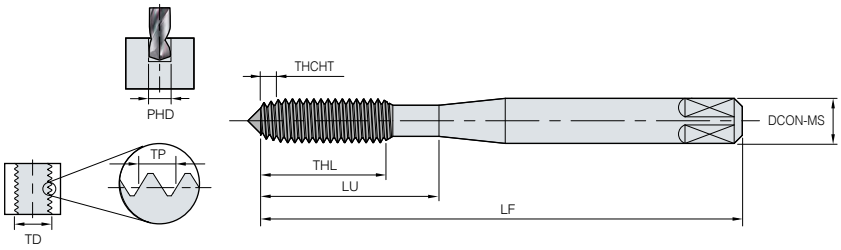
• **Applicable workpiece range**

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
	○	○						○					○	○	○	○	○	○		○				

SVFOM

Spiral roll Tap



JIS | SRT | Bright | P(K) | C/B form | M | H6~7 | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	PHD		BSG	THCHT	TCTR
SVFOM	0305020	M3	0.5	21	4 x 3.2	4	3	46	18	2.76	2.81	JIS	C	H6
	03506020	M3.5	0.6	21	4 x 3.2	4	3.5	46	18	3.2	3.26	JIS	C	H6
	0407020	M4	0.7	22	5 x 4	5	4	52	20	3.65	3.7	JIS	C	H7
	0508020	M5	0.8	27	5.5 x 4.5	5.5	5	60	22	4.59	4.66	JIS	C	H7
	0610020	M6	1	29	6 x 4.5	6	6	62	24	5.48	5.57	JIS	C	H7
	0305040	M3	0.5	21	4 x 3.2	4	3	46	18	2.76	2.81	JIS	B	H6
	03506040	M3.5	0.6	21	4 x 3.2	4	3.5	46	18	3.2	3.26	JIS	B	H6
	0407040	M4	0.7	22	5 x 4	5	4	52	20	3.65	3.7	JIS	B	H7
	0508040	M5	0.8	27	5.5 x 4.5	5.5	5	60	22	4.59	4.66	JIS	B	H7
	0610040	M6	1	29	6 x 4.5	6	6	62	24	5.48	5.57	JIS	B	H7

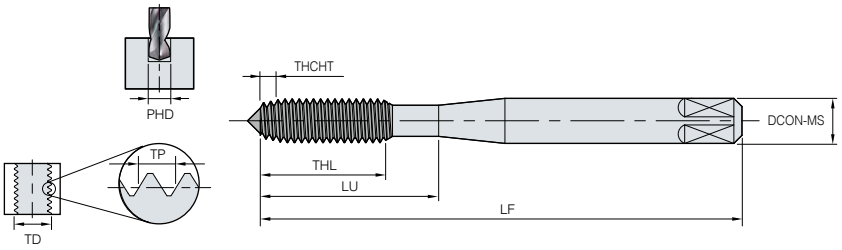
• **Applicable workpiece range**

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
	○	○						○					○	○	○	○	○	○		○				

SVFTM

Spiral roll Tap



JIS | SRT | TiN | P(K) | C/B form | M | H6~7 | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	PHD		BSG	THCHT	TCTR
SVFTM	0305020	M3	0.5	21	4 x 3.2	4	3	46	18	2.76	2.81	JIS	C	H6
	03506020	M3.5	0.6	21	4 x 3.2	4	3.5	46	18	3.2	3.26	JIS	C	H6
	0407020	M4	0.7	22	5 x 4	5	4	52	20	3.65	3.7	JIS	C	H7
	0508020	M5	0.8	27	5.5 x 4.5	5.5	5	60	22	4.59	4.66	JIS	C	H7
	0610020	M6	1	29	6 x 4.5	6	6	62	24	5.48	5.57	JIS	C	H7
	0305040	M3	0.5	21	4 x 3.2	4	3	46	18	2.76	2.81	JIS	B	H6
	03506040	M3.5	0.6	21	4 x 3.2	4	3.5	46	18	3.2	3.26	JIS	B	H6
	0407040	M4	0.7	22	5 x 4	5	4	52	20	3.65	3.7	JIS	B	H7
	0508040	M5	0.8	27	5.5 x 4.5	5.5	5	60	22	4.59	4.66	JIS	B	H7
	0610040	M6	1	29	6 x 4.5	6	6	62	24	5.48	5.57	JIS	B	H7

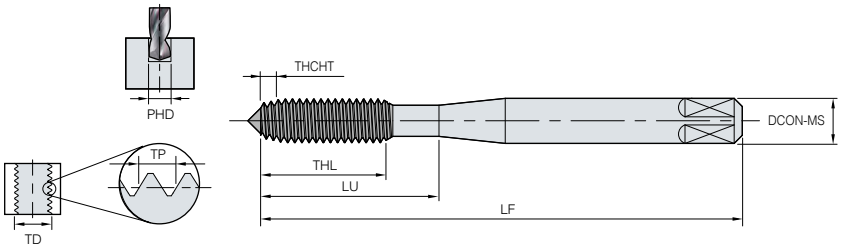
• **Applicable workpiece range**

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
	○	○						○					○	○	○	○	○	○		○				

SVFCM

Spiral roll Tap



JIS | SRT | TiCN | P(K) | C/B form | M | H6~7 | HSSE

(mm)

Designation		TDZ	TP	LU	CZC-MS	DCON-MS	TD	LF	THL	PHD		BSG	THCHT	TCTR
SVFCM	0305020	M3	0.5	21	4 x 3.2	4	3	46	18	2.76	2.81	JIS	C	H6
	03506020	M3.5	0.6	21	4 x 3.2	4	3.5	46	18	3.2	3.26	JIS	C	H6
	0407020	M4	0.7	22	5 x 4	5	4	52	20	3.65	3.7	JIS	C	H7
	0508020	M5	0.8	27	5.5 x 4.5	5.5	5	60	22	4.59	4.66	JIS	C	H7
	0610020	M6	1	29	6 x 4.5	6	6	62	24	5.48	5.57	JIS	C	H7
	0305040	M3	0.5	21	4 x 3.2	4	3	46	18	2.76	2.81	JIS	B	H6
	03506040	M3.5	0.6	21	4 x 3.2	4	3.5	46	18	3.2	3.26	JIS	B	H6
	0407040	M4	0.7	22	5 x 4	5	4	52	20	3.65	3.7	JIS	B	H7
	0508040	M5	0.8	27	5.5 x 4.5	5.5	5	60	22	4.59	4.66	JIS	B	H7
	0610040	M6	1	29	6 x 4.5	6	6	62	24	5.48	5.57	JIS	B	H7

• **Applicable workpiece range**

◎ : Excellent ○ : Good

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	Thermo plastic
DIN	~C25	C25 ~C45	C45~	CrMoS4	25~45 HRC	45~55 HRC	50~60 HRC	CrNi	X30W CrV9.3	GS	GG	GGG	Cu	17660	17660	CAC	AWxx	G-AlSi, GD-AlMg	MC	-	Ti	Ni	Bakelite phenol epoxy	Nylon vinyl chloride
JIS	~S25C	S25C ~S45C	S45C~	SCM				SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	CAC	Axx	AC, ALDC	MC	ZDC	Ti	Ni		
	○	○						○					○	○	○	○	○	○		○				

PART

TOOLING SYSTEM

Technical information for Tooling System

E3	**Tooling System Index**
E5	**DHE** [Hydraulic expansion chuck]
E12	**DHE / S** [Hydraulic expansion chuck]
E15	**DHE / G** [Hydraulic expansion chuck for tool grinding]
E19	**DZC** [Zero fit collet]
E21	**DSC** [Shrinking chuck]
E30	**NPM** [New power milling chuck]
E36	**DCL** [Lock collet for milling chuck]
E37	**DCJ** [Jetcoolant collet]
E41	**SDC / P** [Precision collet chuck for multi purpose machining]
E50	**SDC / PL** [Precision collet chuck(Length adjustment type)]
E53	**GERC** [GER Collet]
E62	**ER / L** [Lock collet for ER collet chuck]
E63	**RTJW** [Jet coolant disk]
E65	**DSK** [Slim type collet chuck]
E68	**GSK** [Great speed slim collet chuck]
E77	**DTN** [Tapping Holder]
E81	**DST** [High speed synchro tapping chuck]
E85	**TEH** [Tap Extension Holder]
E87	**STER PAT.** [DINE Synchro Tapping ER Collet]
E88	**OFH** [Floating holder for brush]
E100	**ANGULAR HEAD**
E102	**BT-KAH** [KAH(90˚ type)]
E104	**BT-KHU** [KHU(Free angle)_Collet Type Angular Head (0°-90°)]
E106	**BT-KAG** [Attachmaent type KAG]
E108	**BT-HRAG** [Attachment type HRAG(Reinforced)]
E110	**BT-MAH** [Rigidity-reinforced Side Lock Type MAH (reinforced series)/Angle Adjustment]
E112	**BT-KAC** [KAC(45˚ type)_Fixed Angle-type]
E114	**BT-SAH** [Slim Angular head]
E116	**POSITIONING BLOCK** [Positioning Block (For BT40)]
E117	**POSITIONING BLOCK** [Positioning Block (For BT50)]
E118	**ATM** [Air Turbine Machine]
E121	**ATM(U) SPARE PART** [Air Turbine Machine]
E122	**ATU** [Universal Type]

E Tooling System Index

DHE

E5

DHE/S

E12

DHE/G

E15

DZC

E19

DSC

E21

NPM

E30

DCL

E36

DCJ

E37

SDC/P

E41

SDC/PL

E50

GERC

E53

ER COLLET

E57

ER/L

E62

RTJW

E63

DSK

E65

GSK

E68

HC COLLET

E73

DTN

E77

TCA

E80

DST

E81

TER

E84

TEH

E85

STER PAT.

E87

OFH

E88

SLA

E89

MD

E93

EXT

E99

RDC

E99

KAH

E102

KHU

E104

KAG

E106

HRAG

E108

MAH

E110

KAC

E112

SAH

E114

ATM

E118

ATU

E122

Hydraulic expansion chuck

DHE

- Ideal for mold making and machining automobile components & precise parts due to high precision machining
- Improved surface roughness due to vibration proof by hydraulic chamber
- Reduced replacement time and tiredness of worker with the use of T wrench for removal
- Applicable shank diameter: Ø4~32

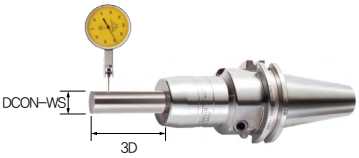
Code system

BT40	-	DHE	20	-	140
Spindle		Hydraulic expansion chuck	Max. Chucking dia.		Length

Features

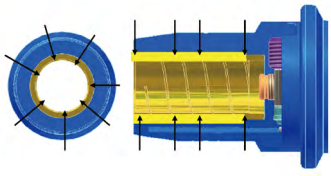
High accuracy provides long tool life due to reduced wear and hydraulic room enhances a surface roughness by lessening vibrations

- Run-out: under 5 μm
- L = 3 x ØD
- Shank: Tolerance of ØD: h6



Internal sealing structure (Durability)

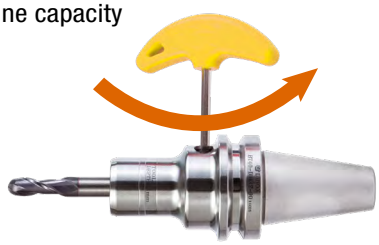
- Internal sealing system protects the chuck against dust, cutting oil, lubricant and chips getting into it
  - Maintaining clamping force and accuracy for a long time



Shank	Grade	RPMX
BT50, HSK100A	G6.3	15,000
BT40, HSK63A		20,000
BT30, HSK50A		25,000

With simple T-wrench, very easy to change a tool

- Clamping structure for easy operation (Convenience)
  - Decrease of worker's fatigue
  - Improving machine capacity



Stable clamping

The clearance between holder and tool is fixed by hydraulic pressure

DBT-DHE

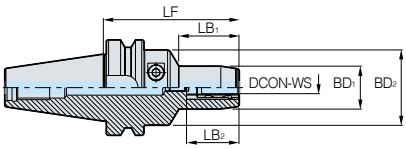


Fig. 1

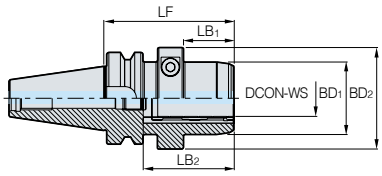


Fig. 2

(mm)

Designation		DCON-WS	LF	BD_1	BD_2	LB_1	LB_2	ADJ	RPMX	Fig.	kg
DBT30 -	**DHE6-65**	6	65	29	46	33	30~40	M5	25,000	1	0.7
	DHE8-65	8	65	31	46	33	30~40	M5	25,000	1	0.7
	DHE10-65	10	65	32	46	34	35~45	M5	25,000	1	0.7
	DHE12-70	12	70	35	46	34	41~51	M5	25,000	1	0.8
	DHE14-90	14	90	36	46	40	43~53	M5	25,000	1	1
	DHE16-90	16	90	40	46	45	46~56	M5	25,000	1	1
	DHE18-90	18	90	42	46	40	49~59	M5	25,000	1	1.1
	DHE20-90	20	90	44	46	45	49~59	M5	25,000	1	1.1
DBT40 -	**DHE6-90**	6	90	29	50	40	30~40	M5	20,000	1	1.4
	DHE6-140	6	140	29	50	40	30~40	M5	20,000	1	2.2
	DHE8-90	8	90	31	50	40	30~40	M5	20,000	1	1.4
	DHE8-140	8	140	31	50	40	30~40	M5	20,000	1	2.2
	DHE10-90	10	90	33	50	40	35~45	M5	20,000	1	1.5
	DHE10-140	10	140	33	50	40	35~45	M5	20,000	1	2.2
	DHE12-90	12	90	35	50	40	41~51	M10	20,000	1	1.5
	DHE12-140	12	140	35	50	40	41~51	M10	20,000	1	2.3
	DHE14-90	14	90	36	50	40	43~53	M10	20,000	1	1.5
	DHE14-140	14	140	36	50	40	43~53	M10	20,000	1	2.2
	DHE16-90	16	90	40	50	45	46~56	M10	20,000	1	1.5
	DHE16-140	16	140	40	50	45	46~56	M10	20,000	1	2.2
	DHE18-90	18	90	42	50	45	49~59	M10	20,000	1	1.5
	DHE18-140	18	140	42	50	45	49~59	M10	20,000	1	2.2
	DHE20-90	20	90	44	50	47	49~59	M10	20,000	1	1.5
	DHE20-140	20	140	44	50	50	49~59	M10	20,000	1	2.3
	DHE25-90	25	90	50	50	35	58~68	M16	20,000	2	2
	DHE32-90	32	90	63	50	35	58~68	M16	20,000	2	2.3
DBT50 -	**DHE6-90**	6	90	29	50	34	30~40	M5	15,000	1	3.9
	DHE6-140	6	140	29	50	40	30~40	M5	15,000	1	4.5
	DHE8-90	8	90	31	50	34	30~40	M5	15,000	1	4.2
	DHE8-140	8	140	31	50	40	30~40	M5	15,000	1	4.6
	DHE10-90	10	90	33	50	34	35~45	M5	15,000	1	3.9
	DHE10-140	10	140	33	50	34	35~45	M5	15,000	1	4.5
	DHE12-90	12	90	35	50	34	41~51	M10	15,000	1	4
	DHE12-140	12	140	35	50	34	41~51	M10	15,000	1	4.6
	DHE14-90	14	90	36	50	34	43~53	M10	15,000	1	3.9
	DHE14-140	14	140	36	50	34	43~53	M10	15,000	1	4.5
	DHE16-90	16	90	40	50	34	46~56	M10	15,000	1	4.1
	DHE16-140	16	140	40	50	34	46~56	M10	15,000	1	4.7
	DHE18-90	18	90	42	50	40	49~59	M10	15,000	1	4
	DHE18-140	18	140	42	50	45	49~59	M10	15,000	1	4.5
	DHE20-90	20	90	44	50	34	49~59	M10	15,000	1	4.2
	DHE20-140	20	140	44	50	47	49~59	M10	15,000	1	4.5
	DHE25-90	25	90	66	-	52	58~68	M16	15,000	2	4.7
	DHE32-90	32	90	72	-	52	58~68	M16	15,000	2	4.8

Spare Part **E10**

• LB_2: Insertion depth of tool (Min.~Max.) Through coolant system is installed

BT-DHE

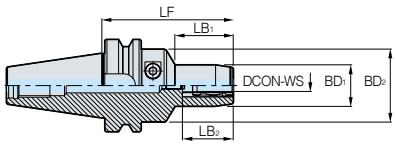


Fig. 1

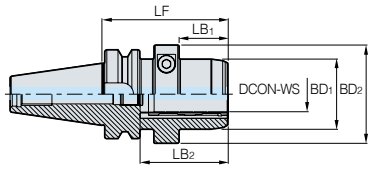


Fig. 2

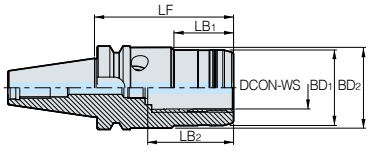


Fig. 3

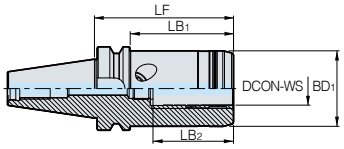


Fig. 4

(mm)

Designation		DCON-WS	LF	BD_1	BD_2	LB_1	LB_2	ADJ	RPMX	Fig.	kg
BT30 -	**DHE4-65**	4	65	29	46	33	40	-	25,000	1	0.7
	DHE5-65	5	65	29	46	33	40	-	25,000	1	0.7
	DHE6-65	6	65	29	46	33	30~40	M5	25,000	1	0.7
	DHE8-65	8	65	31	46	33	30~40	M5	25,000	1	0.7
	DHE10-65	10	65	32	46	34	35~45	M5	25,000	1	0.7
	DHE12-70	12	70	35	46	34	36~46	M5	25,000	1	0.8
	DHE14-90	14	90	36	46	40	43~53	M5	25,000	1	1
	DHE16-90	16	90	40	46	45	46~56	M5	25,000	1	1
	DHE18-90	18	90	42	46	40	49~59	M5	25,000	1	1.1
	DHE20-90	20	90	44	46	45	49~59	M5	25,000	1	1.1
BT40 -	**DHE4-90**	4	90	29	50	40	40	-	20,000	1	1.4
	DHE5-90	5	90	29	50	40	40	-	20,000	1	1.4
	DHE6-90	6	90	29	50	40	30~40	M5	20,000	1	1.4
	DHE6-140	6	140	29	50	40	30~40	M5	20,000	1	2.2
	DHE8-90	8	90	31	50	40	30~40	M5	20,000	1	1.4
	DHE8-140	8	140	31	50	40	30~40	M5	20,000	1	2.2
	DHE10-90	10	90	33	50	40	35~45	M5	20,000	1	1.5
	DHE10-140	10	140	33	50	40	35~45	M5	20,000	1	2.2
	DHE12-90	12	90	35	50	40	41~51	M10	20,000	1	1.5
	DHE12-140	12	140	35	50	40	41~51	M10	20,000	1	2.3
	DHE14-90	14	90	36	50	40	43~53	M10	20,000	1	1.5
	DHE14-140	14	140	36	50	40	43~53	M10	20,000	1	2.2
	DHE16-90	16	90	40	50	45	46~56	M10	20,000	1	1.5
	DHE16-140	16	140	40	50	45	46~56	M10	20,000	1	2.2
	DHE18-90	18	90	42	50	45	49~59	M10	20,000	1	1.5
	DHE18-140	18	140	42	50	45	49~59	M10	20,000	1	2.2
	DHE20-90	20	90	44	50	47	49~59	M10	20,000	1	1.5
	DHE20-140	20	140	44	50	50	49~59	M10	20,000	1	2.3
	DHE25-90	25	90	50	70	35	58~68	M16	20,000	2	2
	DHE25-105	25	105	57	-	78	51~61	M16	20,000	4	2
	DHE25-140	25	140	57	-	113	51~61	M16	20,000	4	2.6
	DHE32-90	32	90	63	75	35	58~68	M16	20,000	2	2.3
	DHE32-105	32	105	57	61	45	55~65	M16	20,000	3	2.4
	DHE32-140	32	140	57	61	45	55~65	M16	20,000	3	3

Spare Part E10

• LB_2: Insertion depth of tool (Min.~Max.) Through coolant system is installed

BT-DHE

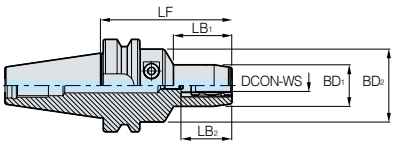


Fig. 1

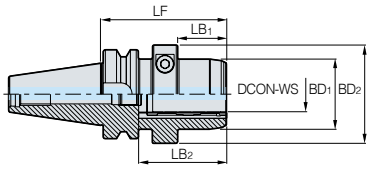


Fig. 2

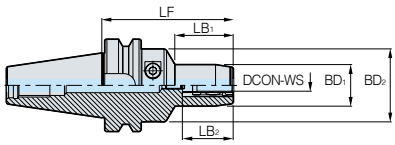


Fig. 3

(mm)

Designation		DCON-WS	LF	BD_1	BD_2	LB_1	LB_2	ADJ	RPMX	Fig.	kg
BT50 -	**DHE4-90**	4	90	29	50	34	40	-	15,000	1	3.9
	DHE5-90	5	90	29	50	34	40	-	15,000	1	3.9
	DHE6-90	6	90	29	50	34	30~40	M5	15,000	1	3.9
	DHE6-140	6	140	29	50	40	30~40	M5	15,000	1	4.4
	DHE8-90	8	90	31	50	34	30~40	M5	15,000	1	4.2
	DHE8-140	8	140	31	50	40	30~40	M5	15,000	1	4.6
	DHE10-90	10	90	33	50	34	35~45	M5	15,000	1	3.9
	DHE10-140	10	140	33	50	34	35~45	M5	15,000	1	4.5
	DHE12-90	12	90	35	50	34	41~51	M10	15,000	1	4
	DHE12-140	12	140	35	50	34	41~51	M10	15,000	1	4.6
	DHE14-90	14	90	36	50	34	43~53	M10	15,000	1	3.9
	DHE14-140	14	140	36	50	34	43~53	M10	15,000	1	4.5
	DHE16-90	16	90	40	50	34	46~56	M10	15,000	1	4.1
	DHE16-140	16	140	40	50	34	46~56	M10	15,000	1	4.7
	DHE18-90	18	90	42	50	40	49~59	M10	15,000	1	4
	DHE18-140	18	140	42	50	45	49~59	M10	15,000	1	4.5
	DHE20-90	20	90	44	50	34	49~59	M10	15,000	1	4
	DHE20-140	20	140	44	50	47	49~59	M10	15,000	1	4.5
	DHE25-90	25	90	66	-	52	58~68	M16	15,000	2	4.7
	DHE25-150	25	150	57	-	112	51~61	M16	15,000	3	4.5
	DHE32-90	32	90	72	-	52	58~68	M16	15,000	2	5.8

Spare Part E10

• LB_2: Insertion depth of tool (Min.~Max.) Through coolant system is installed

HSK-DHE

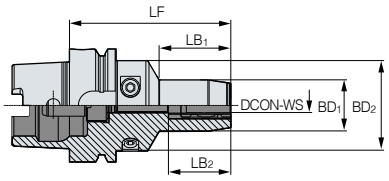


Fig. 1

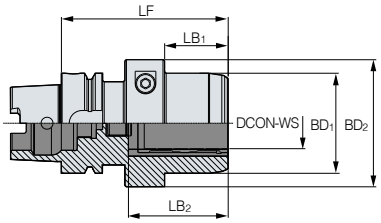


Fig. 2

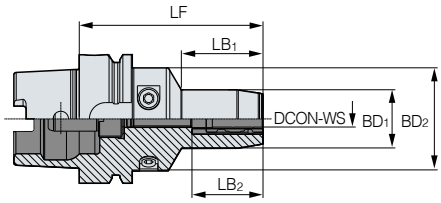
(mm)

Designation		DCON-WS	LF	BD_1	BD_2	LB_1	LB_2	ADJ	RPMX	Fig.	kg
HSK50A -	**DHE6-70**	6	70	29	40	28	30~40	M5	20,000	1	0.7
	DHE8-70	8	70	31	40	28	30~40	M5	20,000	1	0.7
	DHE10-80	10	80	33	40	35	35~45	M5	20,000	1	0.8
	DHE12-90	12	90	35	40	40	41~51	M5	20,000	1	0.8
	DHE14-95	14	95	36	53	28	43~53	M10	20,000	2	0.8
	DHE16-95	16	95	40	53	28	46~56	M10	20,000	2	0.9
	DHE18-100	18	100	42	60	28	49~59	M10	20,000	2	0.9
	DHE20-100	20	100	44	60	28	49~59	M10	20,000	2	0.9
HSK63A -	**DHE4-75**	4	75	29	50	34	40	-	20,000	1	1
	DHE5-75	5	75	29	50	34	40	-	20,000	1	1
	DHE6-75	6	75	29	50	34	30~40	M5	20,000	1	1
	DHE6-150	6	150	29	50	34	30~40	M5	20,000	1	2.2
	DHE8-75	8	75	31	50	34	30~40	M5	20,000	1	1
	DHE8-150	8	150	31	50	34	30~40	M5	20,000	1	2.2
	DHE10-85	10	85	33	50	34	35~45	M5	20,000	1	1.2
	DHE10-150	10	150	33	51	34	35~45	M5	20,000	1	2.2
	DHE12-90	12	90	35	51	40	41~51	M10	20,000	1	1.2
	DHE12-150	12	150	35	51	40	41~51	M10	20,000	1	2.2
	DHE14-95	14	95	36	52	40	42~53	M10	20,000	1	1.3
	DHE14-150	14	150	36	52	40	43~53	M10	20,000	1	2.2
	DHE16-95	16	95	40	52	45	46~56	M10	20,000	1	1.3
	DHE16-150	16	150	40	53	45	46~56	M10	20,000	1	2.2
	DHE18-100	18	100	42	53	45	49~59	M10	20,000	1	1.4
	DHE18-150	18	150	42	53	45	49~59	M10	20,000	1	2.2
	DHE20-100	20	100	44	50	50	49~59	M10	20,000	1	1.4
	DHE20-150	20	150	44	50	50	49~59	M10	20,000	1	2.2
	DHE25-110	25	110	50	70	48	56~68	M16	20,000	2	1.9
	DHE32-110	32	110	63	80	48	56~68	M16	20,000	2	2.3

Spare Part E10

• LB_2: Insertion depth of tool (Min.~Max.) Through coolant system is installed

HSK-DHE



(mm)

Designation		DCON-WS	LF	BD_1	BD_2	LB_1	LB_2	ADJ	RPMX	kg
HSK100A -	DHE6-80	6	80	29	50	34	30~40	M5	15,000	2.4
	DHE6-150	6	150	29	50	34	30~40	M5	15,000	2.8
	DHE8-80	8	80	31	50	34	30~40	M5	15,000	2.4
	DHE8-150	8	150	31	50	34	30~40	M5	15,000	2.8
	DHE10-90	10	90	33	50	34	35~45	M5	15,000	2.5
	DHE10-150	10	150	33	50	34	35~45	M5	15,000	3
	DHE12-95	12	95	35	50	34	41~51	M10	15,000	2.5
	DHE12-150	12	150	35	50	34	41~52	M10	15,000	3
	DHE14-100	14	100	36	50	40	43~53	M10	15,000	2.6
	DHE14-150	14	150	36	50	40	43~54	M10	15,000	3.1
	DHE16-100	16	100	40	50	45	46~56	M10	15,000	2.6
	DHE16-150	16	150	40	50	45	46~56	M10	15,000	3.1
	DHE18-100	18	100	42	50	45	49~59	M10	15,000	2.7
	DHE18-150	18	150	42	50	45	49~59	M10	15,000	3.2
	DHE20-105	20	105	44	50	50	49~59	M10	15,000	2.8
	DHE20-150	20	150	44	50	50	49~59	M10	15,000	3.4
	DHE25-115	25	115	50	63	62	58~68	M16	15,000	3.3
	DHE32-115	32	115	63	75	62	58~68	M16	15,000	3.8

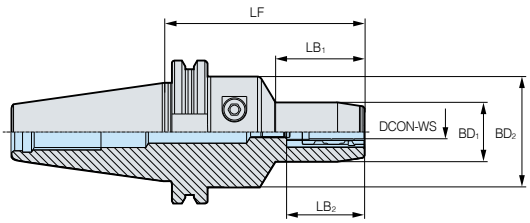
Spare Part E10

• LB_2: Insertion depth of tool (Min.~Max.) Through coolant system is installed

Parts

Basic					
Division		Clamp bolt	Wrench	Division	Adjust screw
Designation \ Parts				Designation \ Parts	
BT30/SK30/HSK50A	DHE4.5, 6, 8, 10, 12, 14, 16, 18, 20	BTF1010	DHETW-5	DHE 6, 8, 10	DHE-M5 (ADJ)
BT40/BT50/SK40/ SK50/HSK63A/ HSK100A	DHE4.5, 6, 8, 10, 12, 14, 16, 18, 20	BTF1010	DHETW-5	DHE 12, 14, 16, 18, 20	DHE-M10 (ADJ)
	DHE 25, 32	BTF1212-1.5	DHETW-6	DHE 25, 32	DHE-M16 (ADJ)

SK-DHE



(mm)

Designation		DCON-WS	LF	BD_1	BD_2	LB_1	LB_2	ADJ	RPMX	kg
SK40 -	DHE6-90	6	90	29	50	40	30-40	M5	20,000	1.4
	DHE8-90	8	90	31	50	40	30-40	M5	20,000	1.4
	DHE10-90	10	90	33	50	40	35-45	M5	20,000	1.5
	DHE12-90	12	90	35	50	40	41~51	M10	20,000	1.5
	DHE12-140	12	140	35	50	40	41~51	M10	20,000	2.1
	DHE14-90	14	90	36	50	40	43~53	M10	20,000	1.4
	DHE16-90	16	90	40	50	45	46~56	M5	20,000	1.5
	DHE18-90	18	90	42	50	45	49~59	M5	20,000	1.5
	DHE20-90	20	90	44	50	50	49~59	M10	20,000	1.5
	DHE20-140	20	140	44	50	50	49~59	M10	20,000	2.1
SK50 -	DHE12-90	12	90	35	50	40	41~51	M10	15,000	3.2
	DHE14-90	14	90	36	50	40	43~53	M10	15,000	3.2
	DHE16-90	16	90	40	50	45	46~56	M10	15,000	3.3
	DHE18-90	18	90	42	50	40	49~59	M10	15,000	3.2
	DHE20-90	20	90	44	50	47	49~59	M10	15,000	3.2

Spare Part **E11**

• LB_2: Insertion depth of tool (Min.~Max.) Through coolant system is installed

Parts

Basic					
Division		Clamp bolt	Wrench	Division	Adjust screw
Designation \ Parts				Designation \ Parts	
BT30/SK30/HSK50A	DHE4.5, 6, 8, 10, 12, 14, 16, 18, 20	BTF1010	DHETW-5	DHE 6, 8, 10	DHE-M5 (ADJ)
BT40/BT50/SK40/ SK50/HSK63A/ HSK100A	DHE4.5, 6, 8, 10, 12, 14, 16, 18, 20	BTF1010	DHETW-5	DHE 12, 14, 16, 18, 20	DHE-M10 (ADJ)
	DHE 25, 32	BTF1212-1.5	DHETW-6	DHE 25, 32	DHE-M16 (ADJ)

※ DBT30, BT30, HSK50A is Exception

Slim hydraulic expansion chuck

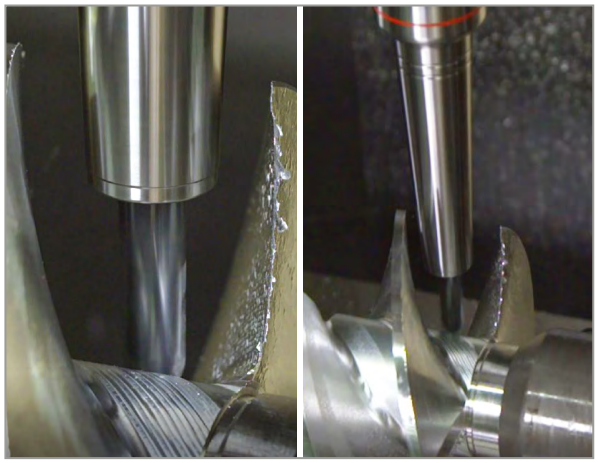
DHE/S

- Optimized chuck for machining that requires high-quality surface roughness and accuracy
- Suitable for challenging mold and automotive parts machining that involves complicated shapes and a lot of interferences
- Ideal for metal impeller machining, which requires deep penetration
- Enables easy tool connection without any additional connecting device
- Easy to perform fine boring operations (0.02-0.2 mm)
- Application scope: milling, drilling, reaming

Code system

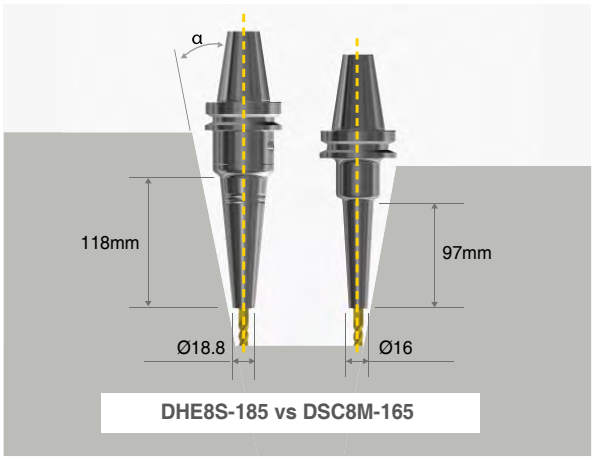
BT30	-	DHE	8	S	-	115
Spindle		Hydraulic expansion chuck	Tool Dia.	Type S: Slim		Length

Recommended Machining Works



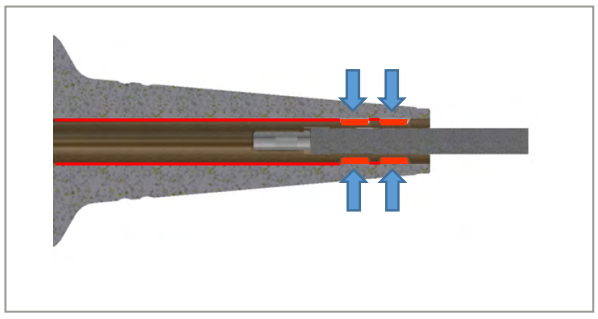
- Optimized for machining that requires high precision
- Enables challenging narrow and deep machining
- Products that require fine boring operations

Product Comparison



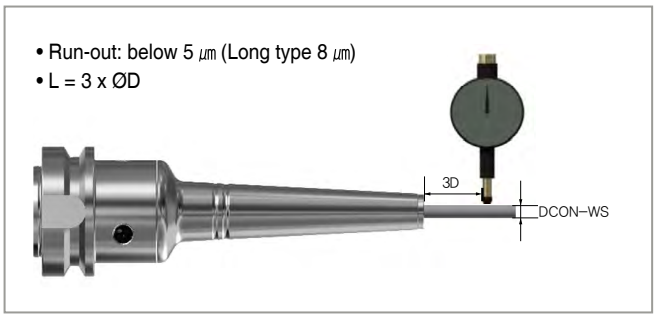
- Length and thickness are the same as those of DSC/M Type (if the tool projection length is 40 mm, difference of α= around 2°)
- Longer gauge line and higher rigidity (versus the DSC/M Type)
- Ideal for mold machining due to its 3-degree taper shape

Stable Clamping Force

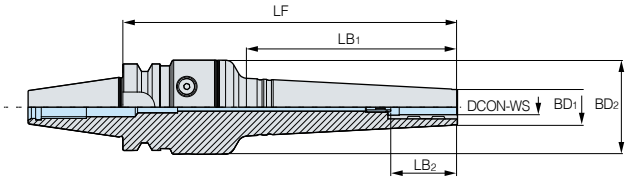


- Maintains high clamping force and good accuracy by holding the tool at two points

High-Precision



BT-DHE/S



(mm)

Designation		DCON-WS	LF	BD_1	BD_2	LB_1	LB_2	RPMX	Run-out	kg
BT30 -	DHE4S-115	4	115	16.8	50	50	19	25,000	5㎛	1.1
	DHE5S-115	5	115	16.8	50	50	19	25,000	5㎛	1.1
	DHE6S-115	6	115	17	50	50	23	25,000	5㎛	1.1
	DHE6S-180	6	180	17	50	115	23	25,000	8㎛	1.4
	DHE8S-115	8	115	19	50	50	31	25,000	5㎛	1.1
	DHE8S-180	8	180	19	50	115	31	25,000	8㎛	1.4
	DHE10S-120	10	120	21	50	55	36	25,000	5㎛	1.4
	DHE10S-180	10	180	21	50	115	36	25,000	8㎛	1.9
	DHE12S-130	12	130	23	50	65	38	25,000	5㎛	1.2
	DHE12S-180	12	180	23	50	115	38	25,000	8㎛	1.6
BT40 -	DHE4S-120	4	120	16.8	50	50	19	20,000	5㎛	1.7
	DHE5S-120	5	120	16.8	50	50	19	20,000	5㎛	1.7
	DHE6S-120	6	120	17	50	50	23	20,000	5㎛	1.7
	DHE6S-185	6	185	17	50	115	23	20,000	8㎛	2.0
	DHE8S-120	8	120	19	50	50	31	20,000	5㎛	2.0
	DHE8S-185	8	185	19	50	115	31	20,000	8㎛	2.0
	DHE10S-125	10	125	21	50	55	36	20,000	5㎛	1.6
	DHE10S-185	10	185	21	50	115	36	20,000	8㎛	2.0
	DHE12S-135	12	135	23	50	65	38	20,000	5㎛	1.8
	DHE12S-185	12	185	23	50	115	38	20,000	8㎛	2.2
	DHE16S-190	16	190	26.8	50	115	41	20,000	8㎛	2.3
	DHE20S-190	20	190	30.8	50	115	44	20,000	8㎛	2.4
BT50 -	DHE6S-200	6	200	16.8	50	115	22	15,000	8㎛	4.6
	DHE8S-200	8	200	18.8	50	115	30	15,000	8㎛	4.6
	DHE10S-200	10	200	20.8	50	115	35	15,000	8㎛	4.8
	DHE12S-200	12	200	22.8	50	115	37	15,000	8㎛	4.9
	DHE16S-200	16	200	26.8	50	115	41	15,000	8㎛	5.0
	DHE20S-200	20	200	30.8	50	115	44	15,000	8㎛	5.0

Spare Part **E14**

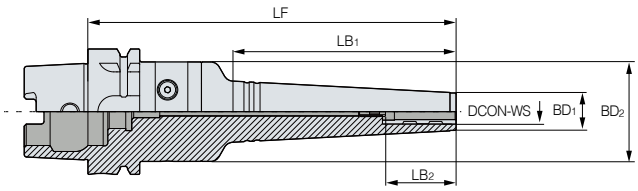
• LB_2: Insertion depth of tool (Min.) Through coolant system is installed

Parts

Division	For separate purchase
Internal coolant system	

Classification by shank	
HSK63A	HSK63A-CNS
HSK100A	HSK100A-CNS

HSK-DHE/S



(mm)

Designation		DCON-WS	LF	BD_1	BD_2	LB_1	LB_2	RPMX	Run-out	kg
HSK63A -	DHE4S-120	4	120	16.8	50	50	19	20,000	5㎛	1.4
	DHE5S-120	5	120	16.8	50	50	19	20,000	5㎛	1.4
	DHE6S-120	6	120	17	50	50	23	20,000	5㎛	1.4
	DHE6S-185	6	185	17	50	115	23	20,000	8㎛	1.7
	DHE8S-120	8	120	19	50	50	31	20,000	5㎛	1.4
	DHE8S-185	8	185	19	50	115	31	20,000	8㎛	1.8
	DHE10S-125	10	125	21	50	55	36	20,000	5㎛	1.5
	DHE10S-185	10	185	21	50	115	36	20,000	8㎛	1.8
	DHE12S-135	12	135	23	50	65	38	20,000	5㎛	1.8
	DHE12S-185	12	185	23	50	115	38	20,000	8㎛	1.8
	DHE16S-190	16	190	26.8	50	115	41	20,000	8㎛	2.2
	DHE20S-190	20	190	30.8	50	115	44	20,000	8㎛	2.3
HSK100A -	DHE16S-190	16	190	26.8	50	115	41	15,000	8㎛	3.1
	DHE20S-190	20	190	30.8	50	115	44	15,000	8㎛	3.3

Spare Part **E14**

• LB_2: Insertion depth of tool (Min.) Through coolant system is installed

Parts

Basic					
Division		Clamp bolt	Wrench	Division	Adjust screw
Designation \ Parts				Designation \ Parts	
BT30	DHE/S 4, 5, 6, 8, 10, 12	BTF1010	DHETW-5	DHE/S 6, 8, 10, 12	DHE-M5 (ADJ)
BT40	DHE/S 4, 5, 6, 8, 10, 12, 16, 20	BTF1010	DHETW-5	DHE/S 16, 20	DHE-M10 (ADJ)
BT50	DHE/S 6, 8, 10, 12, 16, 20	BTF1010	DHETW-5		
HSK63A	DHE/S 4, 5, 6, 8, 10, 12, 16, 20	BTF1010	DHETW-5		
HSK100A	DHE/S 16, 20	BTF1010	DHETW-5		

Hydraulic expansion chuck for tool grinding

DHE/G

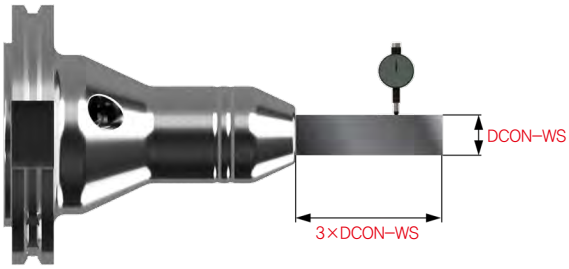
- Minimized wheel interference thanks to the application of 25 degrees to the entrance unit
- Stable run-out within 3μm in 3x0D
- Stable clamping force with 2-point clamping

Code system

SK50	DHE	12	G	-	110
Spindle	Hydraulic Expansion Chuck	Tool Dia.	Grinding		Length

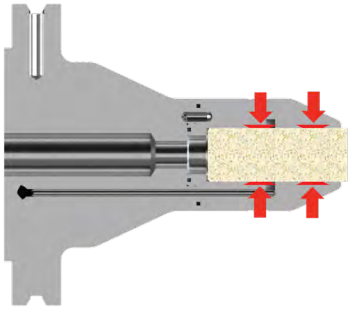
High Precision

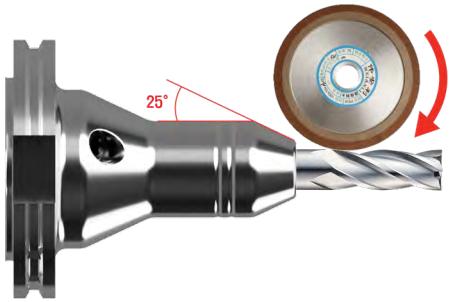
- Run-out within 3μm in 3xDCON-WS achieved by the application of high-precision.



Stable Clamping

- Achieve high-precision due to the stable clamping of 2 points on the upper side and the lower side. application of high-precision.



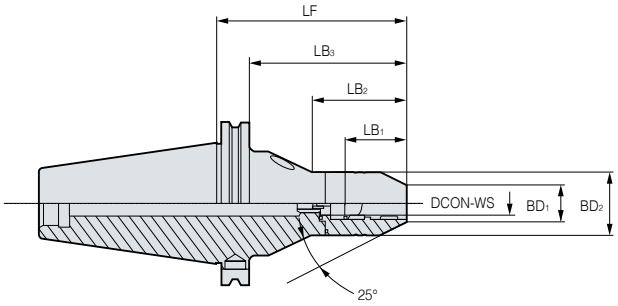


Minimized Wheel Interference

- The front-end unit employs 25° of angle and minimizes wheel interference during machining.

- Used as a jig for fixing an end tool when grinding the tools.

DHE/G



(mm)

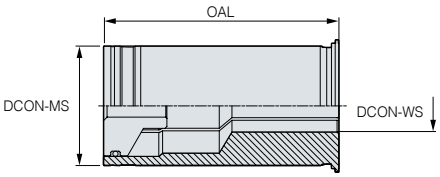
Designation		DCON-WS	LF	BD1	BD2	LB1	LB2	LB3	ADJ	kg
SK50 -	DHE6G-110	6	110	15	32	25	55	90.9	M5	3.2
	DHE8G-110	8	110	17	33.5	25	55	90.9	M5	3.4
	DHE10G-110	10	110	19	35	30	55	90.9	M5	3.4
	DHE12G-110	12	110	21.5	36.5	36	55	90.9	M10	3.6
	DHE14G-110	14	110	23.5	38	38	60	90.9	M10	3.6
	DHE16G-110	16	110	25.5	39.5	41	60	90.9	M10	3.7
	DHE18G-110	18	110	27.5	41	44	60	90.9	M10	3.8
	DHE20G-110	20	110	28	42	44	47	90.9	M10	3.8
	DHE25G-110	25	110	33	47	53	49	90.9	M16	4
	DHE32G-110	32	110	40	54	53	63	90.9	M16	4.2

Parts

Basic					
Division		Clamp bolt	Wrench	Division	Adjust screw
Designation \ Parts				Designation \ Parts	
SK50	DHE6,8,10,12,14,16,18,20	BTF1010	DHETW-5	DHE 6,8,10	DHE-M5 (ADJ)
	DHE25,32	BTF1212-1.5	DHETW-6	DHE 12,14,16,18,20	DHE-M10 (ADJ)
				DHE 25,32	DHE-M16 (ADJ)

DHC Collet

General type



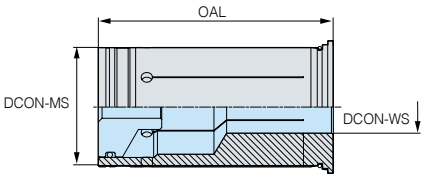
(mm)

Designation		DCON-WS	OAL	DCON-MS	kg
DHC12 -	3	3	47	12	0.06~0.08
	4	4	47	12	0.06~0.08
	5	5	47	12	0.06~0.08
	6	6	47	12	0.06~0.08
	8	8	47	12	0.06~0.08
DHC20 -	3	3	52	20	0.04~0.06
	4	4	52	20	0.04~0.06
	5	5	52	20	0.04~0.06
	6	6	52	20	0.04~0.06
	7	7	52	20	0.04~0.06
	8	8	52	20	0.04~0.06
	9	9	52	20	0.04~0.06
	10	10	52	20	0.04~0.06
	11	11	52	20	0.04~0.06
	12	12	52	20	0.04~0.06
	14	14	52	20	0.04~0.06
	16	16	52	20	0.04~0.06
DHC32 -	6	6	63	32	0.2~0.5
	8	8	63	32	0.2~0.5
	10	10	63	32	0.2~0.5
	12	12	63	32	0.2~0.5
	14	14	63	32	0.2~0.5
	16	16	63	32	0.2~0.5
	18	18	63	32	0.2~0.5
	19	19	63	32	0.2~0.5
	20	20	63	32	0.2~0.5
	25	25	63	32	0.2~0.5

• Through coolant system is not available

DHC-(P) Collet

Sealed type



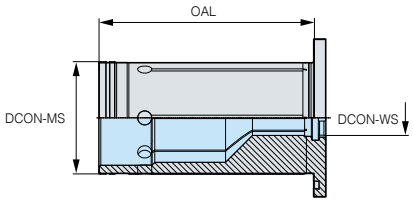
(mm)

Designation		DCON-WS	OAL	DCON-MS	kg
DHC12 -	3(P)	3	47	12	0.04
	4(P)	4	47	12	0.04
	5(P)	5	47	12	0.04
	6(P)	6	47	12	0.04
	8(P)	8	47	12	0.04
DHC20 -	3(P)	3	52	20	0.06~0.1
	4(P)	4	52	20	0.06~0.1
	5(P)	5	52	20	0.06~0.1
	6(P)	6	52	20	0.06~0.1
	7(P)	7	52	20	0.06~0.1
	8(P)	8	52	20	0.06~0.1
	9(P)	9	52	20	0.06~0.1
	10(P)	10	52	20	0.06~0.1
	11(P)	11	52	20	0.06~0.1
	12(P)	12	52	20	0.06~0.1
	14(P)	14	52	20	0.06~0.1
	16(P)	16	52	20	0.06~0.1
DHC32 -	6(P)	6	63	32	0.2~0.3
	8(P)	8	63	32	0.2~0.3
	10(P)	10	63	32	0.2~0.3
	12(P)	12	63	32	0.2~0.3
	14(P)	14	63	32	0.2~0.3
	16(P)	16	63	32	0.2~0.3
	18(P)	18	63	32	0.2~0.3
	19(P)	19	63	32	0.2~0.3
	20(P)	20	63	32	0.2~0.3
	25(P)	25	63	32	0.2~0.3

• Through coolant system is installed

DHJ Collet

Jet coolant



(mm)

Designation		DCON-WS	OAL	DCON-MS	kg
DHJ20 -	6	6	50	20	0.1
	8	8	50	20	0.1
	10	10	50	20	0.1
	12	12	50	20	0.1
	14	14	50	20	0.08
	16	16	50	20	0.08

• Through coolant system is installed

Zero fit collet

DZC

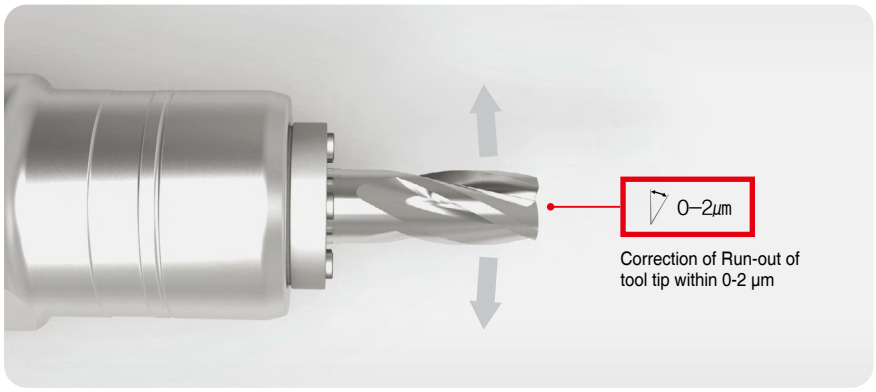
Correcting 10 - 20 μm Run-out generated at tool tip to 0-2 μm

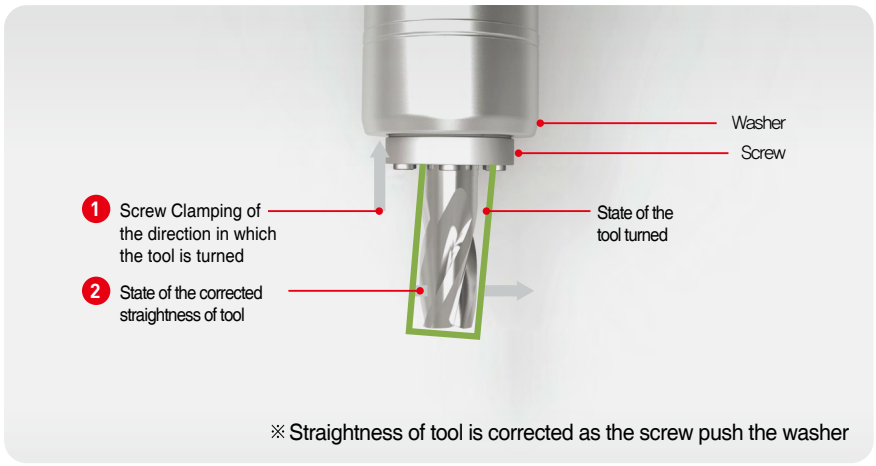
- Improves the Run-out and straightness of end tools
- Improves the surface roughness and quality of the machining area
- Improves the accuracy of boring hole dimension
- Improves the tool life of end tools

Code system

DZC	20	-	10
Zero fit collet	Collet size		Tool dia.

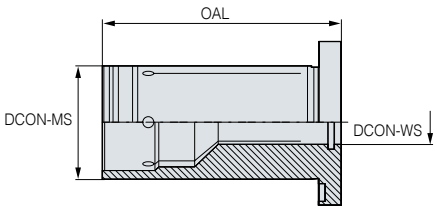
Features





※ Straightness of tool is corrected as the screw push the washer

DZC



(mm)

Designation		DCON-WS	OAL	DCON-MS
DZC20 -	6	6	57	20
	8	8	57	20
	10	10	57	20
	12	12	57	20
	14	14	57	20
	16	16	57	20
DZC32 -	6	6	68	32
	8	8	68	32
	10	10	68	32
	12	12	68	32
	16	16	68	32
	20	20	68	32
	25	25	68	32

• Through coolant system is not available

Precautions

- Run-out can be adjusted with small force.
- Excessive clamping of the adjustment screw may result in deformation of the product.
  (suggested clamping torque : less than 600cN•M)
- If the run-out adjustment screw is clamped using excessive force, all six screws must be completely unclamped and adjusted again.

Shrinking Chuck

DSC

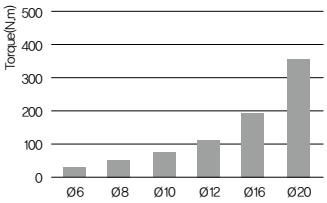
- Use of specially heat-treated steel
- High precision machining and clamping
- Increased precision and longer tool life due to minimized overhang when machining deep grooves
- Applicable shank diameter: Ø3~20

Code system

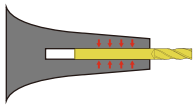
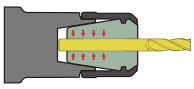
BT50	-	DSC	6	-	S	-	16S	-	S
Shank type		**Holder type**	**Tool Dia.**		**Type**		**Length**		**Special**
		DSC: Shrinking chuck SLK: 2-piece holder Collet			S: Silm M: Middle None: General				S: Curve type None: General

High Clamping Force

- Increase of 30% clamping force versus hydraulic expansion chuck
- Definite power transmission
- Run-out(≤0.003mm)



Symmetric design

Shrinking chuck	Collet chuck
Fix the clearance between holder and tool by heat shrinking	Fix the tool by elasticity of collet
	
Thermal expansion ▶ Thermal shrinking	Elastic deformation
Highly strong clamping	Strong clamping

Slim type series

Straight type

Used by combining with various holders such as hydraulic expansion chuck, milling chuck, and collet chuck etc.

Mono type

Used with high precision as integral types

Tool tightening tolerance

(mm)

Tool Shank	Tool Shank Tolerance(h6)	Tool Shank	Tool Shank Tolerance(h6)	Tool Shank	Tool Shank Tolerance(h6)	Tool Shank	Tool Shank Tolerance(h6)
Ø3	0~-0.008	Ø6	0~-0.008	Ø12	0~-0.011	Ø25	0~-0.013
Ø4	0~-0.009	Ø8	0~-0.009	Ø16	0~-0.011	Ø32	0~-0.016
Ø5	0~-0.011	Ø10	0~-0.011	Ø20	0~-0.013		

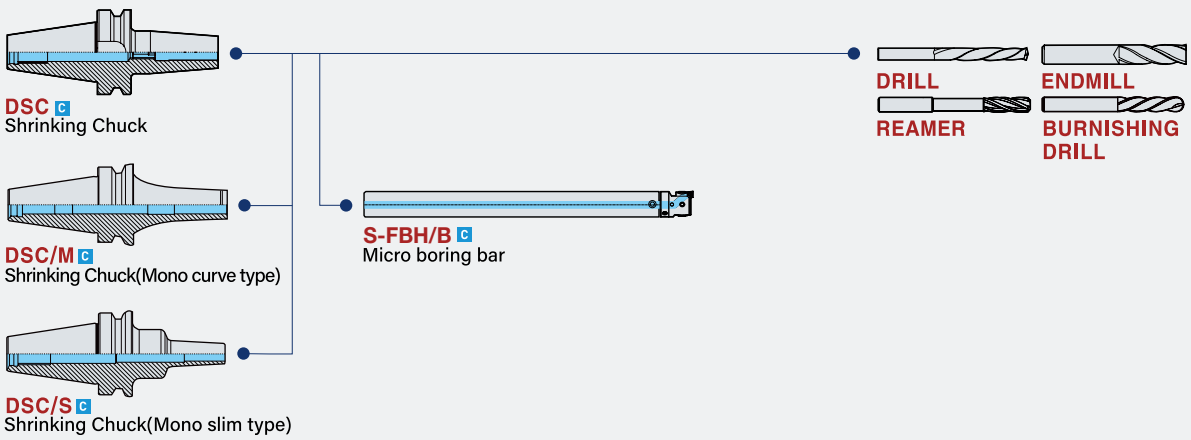
Min. tool insertion depth

(mm)

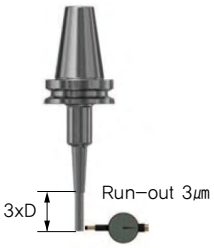
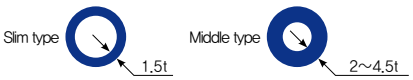
Inner Diameter	Type	Ø6	Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
Min. tool insertion depth	Slim	18	24	30	30	-	-	-	-
	Medium	18	24	30	30	32	40	-	-
	General	26	26	32	37	37	40	42	52

DSC MAP

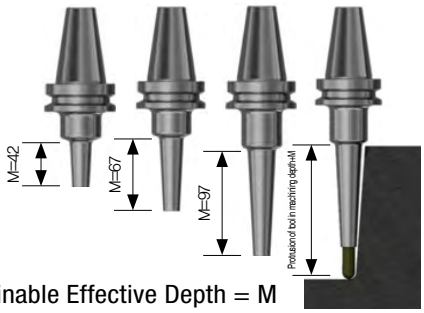
Shrinking Chuck



Mono type

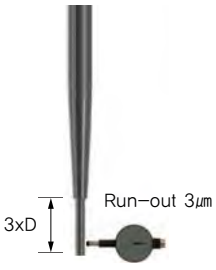
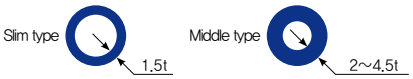
Figure	Accuracy	Type
		

- Ensures good rigidity by using special steel instead of general steel and maintains high-precision due to its excellent thermal resistance even when it is used moer than 5,000 times
- Enables stable cutting and good surface roughness due to its high rigidity
- Provides a long tool life due to its high-precision

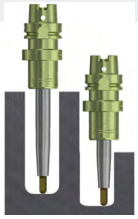


Machinable Effective Depth = M

Straight Type

Figure	Accuracy	Type
Collet Chuck / Hydraulic Expansion Chuck / Milling Chuck		 Used by combining with various holders such as hydraulic expansion chuck, milling chuck, and collet chuck, etc.

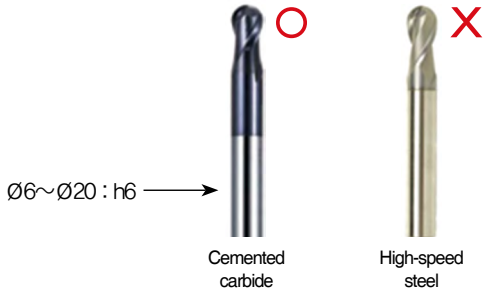
- Straight types used by combining with various holders such as hydraulic expansion chuck and collet chuck, etc. maintain high-precision and help enable various machining operations at an affordable price
- There are 20 types of shanks that can be used according to work situations

Examples	
	
Ø6~Ø12 tools can be tightened Various lengths and shank sizes	Lengths can be adjusted and used a=rding to machining situations

Precautions in Use

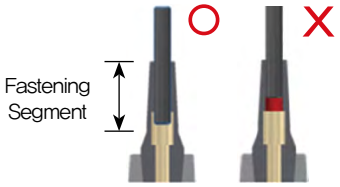
Tools to Use

- Use cemented carbide tools
- High-speed steel may not be disassembled
- Using an excessive tolerance tool affects clamping force, causing an accident



Precautions for Fastening Tools

- Maintain clean state by removing rust, dust, cutting oil, etc. generated by corrosion of the inner diameter of the chuck before tool tightening
- When tightening a tool, tighten it under the tightening section
- Tool tightening in the middle of the tightening section affects accuracy and durability
- When tightening a tool, touching the bottom surface affects accuracy



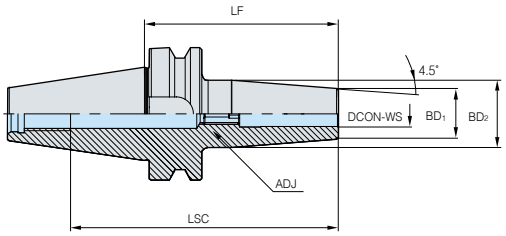
High-frequency Heating-related Precautions

- When tightening/disassembling a tool, it is recommended that slim-type programmed shrink fit devices be used
- Using devices with no slim-type program may cause overheating.(Overheating may affect the product durability, service life, and accuracy.)

Storage Method

- When the shrink fit chuck is not used, the tool should be separated from the chuck. (Long-time connection may affect the service life of the product.)
- After using the shrink fit chuck, be sure to remove moisture and use inhibited oil and rust-preventing spray to prevent rust from occurring. (Less rust occurs compared to general steel as special steel is used; however, long-time non-use may cause rust occurrence.)

BT-DSC



(mm)

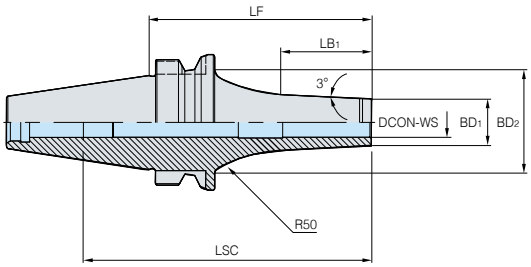
Designation		DCON-WS	LF	BD_1	BD_2	LSC	ADJ	RPMX	kg
BT30 -	DSC3-60	3	60	11	18.5	82	-	25,000	0.4
	DSC4-60	4	60	13	20.5	82	-	25,000	0.4
BT40 -	DSC6-90	6	90	21	27	36	M5	20,000	1.1
	DSC6-120	6	120	21	27	36	M5	20,000	1.2
	DSC6-160	6	160	21	27	36	M5	20,000	1.4
	DSC8-90	8	90	21	27	36	M5	20,000	1.1
	DSC8-120	8	120	21	27	36	M5	20,000	1.2
	DSC8-160	8	160	21	27	36	M5	20,000	1.4
	DSC10-90	10	90	24	32	42	M8	20,000	1.1
	DSC10-120	10	120	24	32	42	M8	20,000	1.3
	DSC10-160	10	160	24	32	42	M8	20,000	1.6
	DSC12-90	12	90	24	32	47	M8	20,000	1.1
	DSC12-120	12	120	24	32	47	M8	20,000	1.3
	DSC12-160	12	160	24	32	47	M8	20,000	1.6
	DSC16-90	16	90	27	34	50	M12	20,000	1.2
	DSC16-120	16	120	27	34	50	M12	20,000	1.3
	DSC16-160	16	160	27	34	50	M12	20,000	1.7
	DSC20-90	20	90	33	42	52	M12	20,000	1.3
	DSC20-120	20	120	33	42	52	M12	20,000	1.5
	DSC20-160	20	160	33	42	52	M12	20,000	2.0

Spare Part **E25**

• LSC : Insertion depth of tool

BT-DSC/M

Mono Curve type



(mm)

Designation		DCON-WS	LF	BD_1	BD_2	LB_1	LSC	RPMX	kg
BT30 -	DSC3M-75S	3	75	8	25	30	97	25,000	0.4
	DSC4M-75S	4	75	10	25	32	97	25,000	0.4
	DSC6M-75S	6	75	12	30	29	97	25,000	0.5
	DSC8M-75S	8	75	14	32	29	97	25,000	0.5
	DSC10M-75S	10	75	16	32	31	45	25,000	0.5
	DSC12M-75S	12	75	19	32	34	45	25,000	0.5

Spare Part **E25**

• LSC : Insertion depth of tool • Through coolant system is installed

BT-DSC/M

Mono type

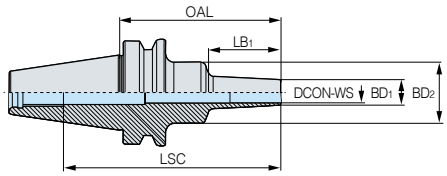


Fig. 1

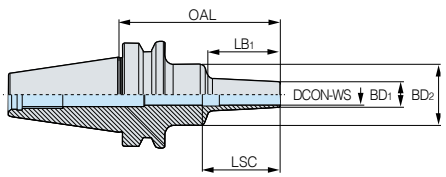


Fig. 2

(mm)

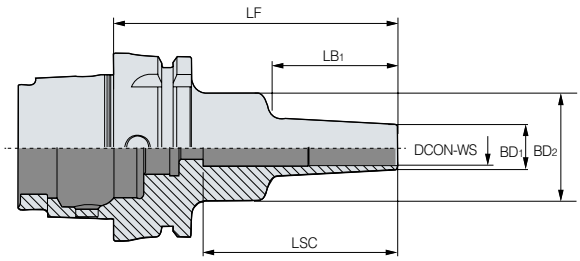
Designation		DCON-WS	LF	BD_1	BD_2	LB_1	LSC	RPMX	Fig.	kg
BT40 -	DSC3M-95	3	95	8	26	42	128	20,000	1	1.1
	DSC4M-95	4	95	8	26	42	128	20,000	1	1.1
	DSC6M-95	6	95	10	26	42	128	20,000	1	1.0
	DSC6M-120	6	120	10	26	67	153	20,000	1	1.0
	DSC6M-160	6	160	10	36	97	193	20,000	1	1.2
	DSC8M-95	8	95	13	36	42	128	20,000	1	1.3
	DSC8M-120	8	120	13	36	67	153	20,000	1	1.3
	DSC8M-160	8	160	13	36	97	193	20,000	1	1.3
	DSC10M-95	10	95	16	36	42	128	20,000	1	1.1
	DSC10M-120	10	120	16	36	67	153	20,000	1	1.1
	DSC10M-160	10	160	16	36	97	193	20,000	1	1.3
	DSC12M-95	12	95	19	36	42	128	20,000	1	1.1
	DSC12M-120	12	120	19	36	67	153	20,000	1	1.2
	DSC12M-160	12	160	19	36	97	193	20,000	1	1.4
	DSC16M-95	16	95	24	50	42	47	20,000	2	1.3
	DSC16M-120	16	120	24	50	67	47	20,000	2	1.4
	DSC16M-160	16	160	24	50	97	47	20,000	2	1.7
	DSC20M-95	20	95	29	50	42	55	20,000	2	1.3
	DSC20M-120	20	120	29	50	67	55	20,000	2	1.5
	DSC20M-160	20	160	29	50	97	55	20,000	2	1.9
BT50 -	DSC6M-110	6	110	10	26	42	163	15,000	1	3.5
	DSC6M-160	6	160	10	36	97	213	15,000	1	3.6
	DSC8M-110	8	110	13	36	42	163	15,000	1	3.7
	DSC8M-160	8	160	13	36	97	213	15,000	1	3.7
	DSC10M-110	10	110	16	36	42	163	15,000	1	3.7
	DSC10M-160	10	160	16	36	97	213	15,000	1	3.7
	DSC12M-110	12	110	19	36	42	163	15,000	1	3.7
	DSC12M-160	12	160	19	50	97	213	15,000	1	4.0
	DSC16M-110	16	110	24	50	42	163	15,000	1	3.9
	DSC16M-160	16	160	24	50	97	213	15,000	1	4.1
	DSC20M-110	20	110	29	50	42	55	15,000	2	3.9
	DSC20M-160	20	160	29	50	97	55	15,000	2	4.2

Spare Part **E25**

• LSC: Insertion depth of tool

HSK-DSC/M

Mono type



(mm)

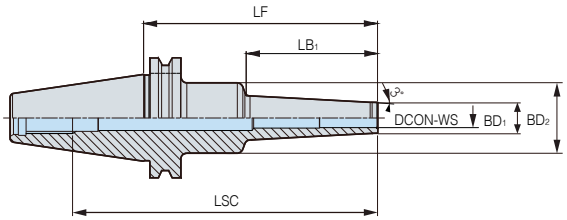
Designation		DCON-WS	LF	BD_1	BD_2	LB_1	LSC	RPMX	kg
HSK63A -	DSC6M-95	6	95	10	26	42	73	20,000	0.7
	DSC8M-95	8	95	13	36	42	39	20,000	0.8
	DSC10M-120	10	120	16	36	67	45	20,000	0.8
	DSC12M-120	12	120	19	36	67	45	20,000	0.9
	DSC16M-120	16	120	24	50	67	47	20,000	1.1

Spare Part **E25**

• LSC : Insertion depth of tool • Through coolant system is installed

SK-DSC/M

Mono type



(mm)

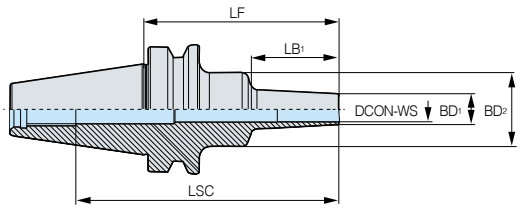
Designation		DCON-WS	LF	BD_1	BD_2	LB_1	LSC	RPMX	kg
SK40-	DSC6M-95	6	95	10	26	42	131	20,000	0.8
	DSC6M-120	6	120	10	26	67	156	20,000	1.0
	DSC8M-95	8	95	13	36	42	131	20,000	1.4
	DSC8M-120	8	120	13	36	67	156	20,000	1.0
	DSC10M-95	10	95	16	36	42	131	20,000	1.0
	DSC10M-120	10	120	16	36	67	156	20,000	1.0
	DSC12M-95	12	95	19	36	42	131	20,000	1.0
	DSC12M-120	12	120	19	36	67	156	20,000	1.1
	DSC16M-95	16	95	24	50	42	47	20,000	1.3
	DSC16M-120	16	120	24	50	67	47	20,000	1.4
	DSC20M-95	20	95	29	50	42	55	20,000	1.3
	DSC20M-120	20	120	29	50	67	55	20,000	1.4

Spare Part **E25**

• LSC : Insertion depth of tool • Through coolant system is installed

BT-DSC/S

Mono Slim type



(mm)

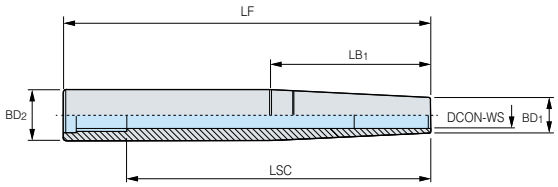
Designation		DCON-WS	LF	BD_1	BD_2	LB_1	LSC	RPMX	kg
BT30 -	**DSC6S-60**	6	60	9	20	22	82	25,000	0.4
	DSC6S-80	6	80	9	20	42	102	25,000	0.5
	DSC6S-120	6	120	9	25	67	142	25,000	0.5
BT40 -	**DSC6S-95**	6	95	9	26	42	128	20,000	1.0
	DSC6S-120	6	120	9	26	67	153	20,000	1.0
	DSC6S-160	6	160	9	36	97	193	20,000	1.2
	DSC8S-95	8	95	11	36	42	128	20,000	1.1
	DSC8S-120	8	120	11	36	67	153	20,000	1.1
	DSC8S-160	8	160	11	36	97	193	20,000	1.2
	DSC10S-95	10	95	13	36	42	128	20,000	1.0
	DSC10S-120	10	120	13	36	67	153	20,000	1.1
	DSC10S-160	10	160	13	36	97	193	20,000	1.2
	DSC12S-95	12	95	15	36	42	128	20,000	1.1
	DSC12S-120	12	120	15	36	67	153	20,000	1.1
	DSC12S-160	12	160	15	36	97	193	20,000	1.2
BT50 -	**DSC6S-110**	6	110	9	26	42	166	15,000	3.5
	DSC6S-160	6	160	9	36	97	216	15,000	3.6
	DSC8S-110	8	110	11	36	42	166	15,000	3.6
	DSC8S-160	8	160	11	36	97	216	15,000	3.6
	DSC10S-110	10	110	13	36	42	166	15,000	3.6
	DSC10S-160	10	160	13	36	97	216	15,000	3.6
	DSC12S-110	12	110	15	36	42	166	15,000	3.6
	DSC12S-160	12	160	15	36	97	216	15,000	3.7

Spare Part **E25**

• LSC : Insertion depth of tool • Through coolant system is installed

ST-DSC/M

Straight Shank Shrinking Chuck



(mm)

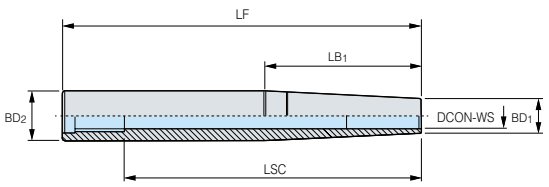
Designation		DCON-WS	LF	BD_1	BD_2	LB_1	LSC	kg
ST16 -	DSC6M-115	6	115	10	16	50	95	0.1
	DSC6M-140	6	140	10	16	60	120	0.1
ST20 -	DSC6M-175	6	175	10	20	95	155	0.2
	DSC8M-145	8	145	13	20	70	125	0.2
	DSC10M-120	10	120	16	20	50	45	0.2
ST25 -	DSC8M-175	8	175	13	25	105	155	0.4
	DSC10M-145	10	145	16	25	75	45	0.4
	DSC10M-175	10	175	16	25	105	45	0.4
	DSC12M-120	12	120	19	25	50	45	0.3
	DSC12M-150	12	150	19	25	80	45	0.4
	DSC16M-175	16	175	24	25	50	47	0.5
ST32 -	DSC20M-175	20	175	29	32	50	55	0.8

Spare Part **E25**

• LSC : Insertion depth of tool • Through coolant system is optional

ST-DSC/S

Straight Shank Shrinking Chuck



(mm)

Designation		DCON-WS	LF	BD_1	BD_2	LB_1	LSC	kg
ST16 -	DSC6S-115	6	115	9	16	55	95	0.1
	DSC6S-140	6	140	9	16	70	120	0.1
	DSC8S-115	8	115	11	16	50	95	0.1
ST20 -	DSC6S-175	6	175	9	20	105	155	0.2
	DSC8S-175	8	175	11	20	85	155	0.2
	DSC10S-145	10	145	13	20	75	77	0.2
	DSC12S-120	12	120	15	20	50	52	0.2
ST32 -	DSC12S-315	12	315	15	32	185	295	1.2

Spare Part **E25**

• LSC : Insertion depth of tool • Through coolant system is optional

Parts

Basic											
Type		DSC6	DSC8	DSC10	DSC12	DSC14	DSC16	DSC18	DSC20	DSC25	DSC32
Adjust screw		M520C		M820C		M1230C					

New power milling chuck

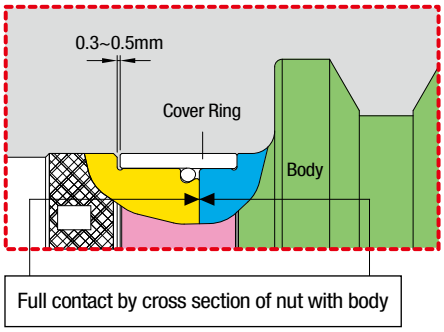
NPM

- Strong clamping over 500kgf·m (on NPM42 basis)
- DUST BLOCK functions for blocking foreign substance
- Jet coolant available
- High precision within 15 at L/D = 3
- Boring range: Ø20~42

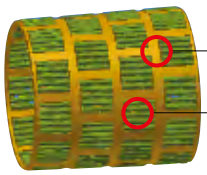
Code system

BT50	-	NPM	6	-	S
Spindle		Hydraulic expansion chuck	Tool Dia.		Type S: Slim

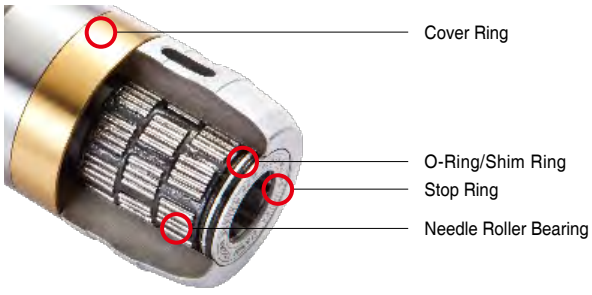
Improvement of durability by preventing minute dust, chips and coolant



Adopted Stop Ring on Head parts
- Preventing minute dust by Shim & O-Ring



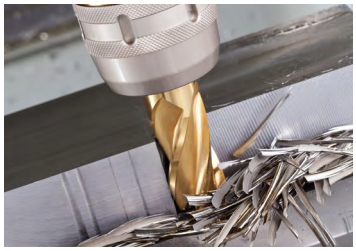
- Specially designed Steel Bearing for prevention of damage
- Strong clamping by spreading the force

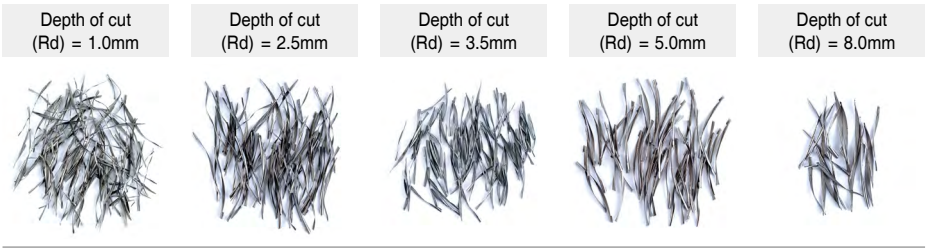


Needle Roller Bearing

Stable machining from heavy to fine

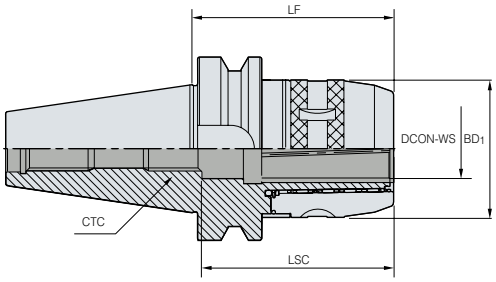
Perfect face contact and Powerful clamping force strengthen both Cutting force and Absorbtion of vibration.





Possible machining from heavy milling to fine finishing

DBT-NPM



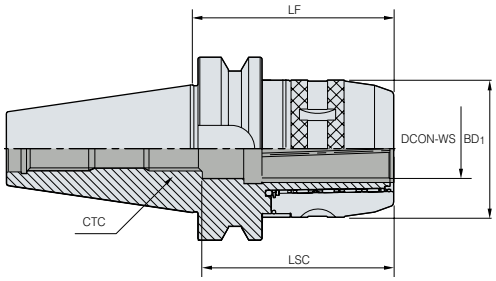
(mm)

Designation		DCON-WS	LF	BD_1	LSC	CTC	COLLET	kg
DBT30 -	**NPM20-85**	20	85	54	85	M16	DC20, DSC20, DCJ20	1.1
DBT40 -	**NPM20-85**	20	85	54	85	M16	DC20, DSC20, DCJ20	2.3
	NPM20-100	20	100	54	85	M16	DC20, DSC20, DCJ20	2.4
	NPM20-135	20	135	54	85	M16	DC20, DSC20, DCJ20	2.5
	NPM25-85	25	85	61	83	M16	DC25,DCS25	1.8
	NPM32-90	32	90	75	85	M16	DC32, DCS32, DCJ32	2.4
	NPM32-110	32	110	75	95	M16	DC32, DCS32, DCJ32	2.9
	NPM32-120	32	120	75	95	M16	DC32, DCS32, DCJ32	3.1
	NPM32-135	32	135	75	95	M16	DC32, DCS32, DCJ32	3.4
DBT50 -	**NPM20-95**	20	95	54	85	M16	DC20, DCS20, DCJ20	4.3
	NPM20-105	20	105	54	85	M16	DC20, DCS20, DCJ20	4.5
	NPM20-125	20	125	54	85	M16	DC20, DCS20, DCJ20	4.8
	NPM20-165	20	165	54	85	M16	DC20, DCS20, DCJ20	5.3
	NPM25-95	25	95	61	83	M16	DC25,DCS25	4.6
	NPM32-90	32	90	75	93	M24	DC32, DCS32, DCJ32	4.9
	NPM32-110	32	110	75	93	M24	DC32, DCS32, DCJ32	5
	NPM32-135	32	135	75	105	M24	DC32, DCS32, DCJ32	5.8
	NPM32-165	32	165	75	105	M24	DC32, DCS32, DCJ32	6.9
	NPM42-110	42	110	90	125	M24	DC42, DCS42	5.6
	NPM42-135	42	135	90	125	M24	DC42, DCS42	6.6
	NPM42-165	42	165	90	125	M24	DC42, DCS42	8

Spare Part **E28**

• LSC: Insertion depth of tool • Through coolant system is optional
• In case of L ≤ 90, chucks with over 90mm are recommended for roughing by short cap

BT-NPM



(mm)

Designation		DCON-WS	LF	BD_1	LSC	CTC	COLLET	kg
BT30 -	**NPM20-85**	20	85	54	85	M16	DC20, DSC20, DCJ20	1.2
BT40 -	**NPM20-85**	20	85	54	85	M16	DC20, DSC20, DCJ20	2.3
	NPM20-100	20	100	54	85	M16	DC20, DSC20, DCJ20	2.3
	NPM20-135	20	135	54	83	M16	DC20, DSC20, DCJ20	2.4
	NPM25-85	25	85	61	85	M16	DC25, DCS25	1.7
	NPM32-90	32	90	75	87	M16	DC32, DCS32, DCJ32	2.3
	NPM32-110	32	110	75	95	M16	DC32, DCS32, DCJ32	2.8
	NPM32-120	32	120	75	95	M16	DC32, DCS32, DCJ32	3
	NPM32-135	32	135	75	95	M16	DC32, DCS32, DCJ32	3.5
BT50 -	**NPM20-95**	20	95	54	85	M16	DC20, DCS20, DCJ20	4.3
	NPM20-125	20	125	54	85	M16	DC20, DCS20, DCJ20	4.7
	NPM20-165	20	165	54	85	M16	DC20, DCS20, DCJ20	5.2
	NPM25-95	25	95	61	83	M16	DC25,DCS25	4.6
	NPM32-90	32	90	75	93	M24	DC32, DCS32, DCJ32	4.9
	NPM32-110	32	110	75	105	M24	DC32, DCS32, DCJ32	5.0
	NPM32-135	32	135	75	105	M24	DC32, DCS32, DCJ32	5.7
	NPM32-165	32	165	75	105	M24	DC32, DCS32, DCJ32	6.9
	NPM42-110	42	110	90	125	M24	DC42, DCS42	5.4
	NPM42-135	42	135	90	125	M24	DC42, DCS42	6.5
	NPM42-165	42	165	90	125	M24	DC42, DCS42	7.9

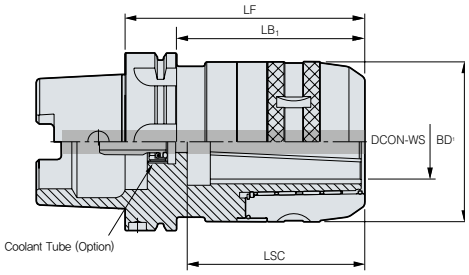
Spare Part **E28**

• LSC: Insertion depth of tool • Through coolant system is optional
• In case of L ≤ 90, chucks with over 90mm are recommended for roughing by short cap

For separate purchase

For separate purchase			
Division	**Collet**	**Spanner**	**Through coolant system**
Parts / Designation			
NPM20	DC20, DCS20, DCJ20	57-60	CTC20-□□
NPM32	DC32, DCS32, DCJ20	75-79	CTC32-□□
NPM42	DC42, DCS42	92-96	CTC42-□□

HSK-NPM



(mm)

Designation		DCON-WS	LF	BD_1	LB_1	LSC	COLLET	kg
HSK63A -	NPM20-100	20	100	54	74	75	DC20, DCS20, DCJ20	1.0
	NPM20-100	20	100	54	74	75	DC20, DCS20, DCJ20	1.6
	NPM25-100	25	100	61	74	75	DC25,DCS25	1.9
	NPM32-110	32	110	75	84	82	DC32, DCS32, DCJ32	2.5
	NPM32-120	32	120	75	84	90	DC32, DCS32, DCJ32	2.9
HSK100A -	NPM20-110	20	110	54	81	75	DC20,DCS20,DCJ20	3.0
	NPM25-110	25	110	61	81	75	DC25,DCS25,DCJ25	3.2
	NPM32-115	32	115	75	86	82	DC32,DCS32,DCJ32	4.1
	NPM32-130	32	130	75	101	90	DC32,DCS32,DCJ32	4.0
	NPM42-135	42	135	90	106	100	DC42,DCS42	5.7

Spare Part **E29**

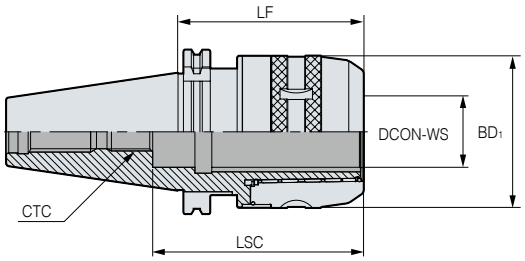
• LSC: Insertion depth of tool • Through coolant system is optional

For separate purchase

Division	For separate purchase
Internal coolant system	

Classification by shank	
HSK50	HSK50A-CNS
HSK63	HSK63A-CNS
HSK100	HSK100A-CNS

SK-NPM



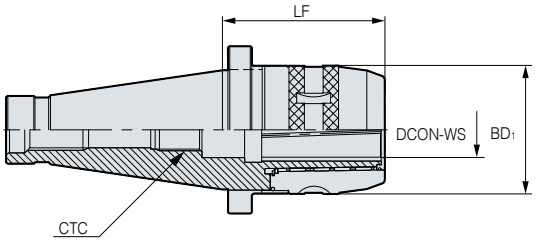
(mm)

Designation		DCON-WS	LF	BD1	LSC	CTC	COLLET	kg
SK40 -	NPM20-95	20	95	54	85	M16	DC20, DCS20, DCJ20	2.4
	NPM32-95	32	95	75	85	M16	DC32, DCS32, DCJ32	2.4
	NPM32-110	32	110	75	95	M16	DC32, DCS32, DCJ32	2.8
	NPM32-135	32	135	75	95	M16	DC32, DCS32, DCJ32	3.2
SK50 -	NPM20-100	20	100	54	85	M16	DC20, DCS20, DCJ20	3.6
	NPM32-100	32	100	75	105	M24	DC32, DCS32, DCJ32	4.3
	NPM32-130	32	130	75	105	M24	DC32, DCS32, DCJ32	5.2
	NPM42-110	42	110	90	125	M24	DC42, DCS42	5.2
	NPM42-135	42	135	90	125	M24	DC42, DCS42	6.1

Spare Part **E28**

• LSC: Insertion depth of tool • Through coolant system is optional

NT-NPM



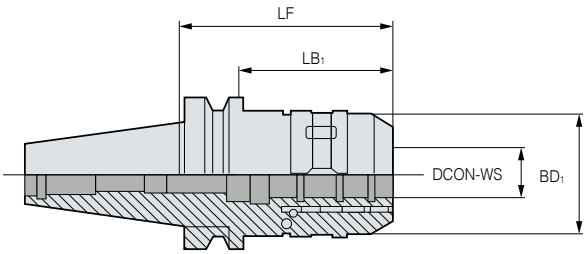
(mm)

Designation		DCON-WS	LF	BD1	CTC	COLLET	kg
NT40 -	NPM32-95	32	95	75	M16	DC32, DCS32, DCJ32	2.7
NT50 -	NPM32-95	32	95	75	M24	DC32, DCS32, DCJ32	4.3
	NPM42-95	42	95	90	M24	DC42, DCS42	4.8
NT50M -	NPM32-95	32	95	75	M24	DC32, DCS32, DCJ32	4.4
	NPM42-95	42	95	90	M24	DC42, DCS42	4.9

Spare Part **E28**

• Through coolant system is not available

BT-DMC



(mm)

Designation		DCON-WS	LF	BD1	LB1	COLLET	kg
BT30 -	DMC20-80	20	80	54	80	DC20, DCS20	1
BT30 -	DMC20-90	20	90	54	80	DC20, DCS20	2.3
	DMC32-105	32	105	75	95	DC32, DCS32	2.9
BT30 -	DMC32-105	32	105	75	95	DC32, DCS32	4.9
	DMC32-165	32	165	75	95	DC32, DCS32	6.7
	DMC42-105	42	105	90	125	DC42, DCS42	5.2
	DMC42-165	42	165	90	125	DC42, DCS42	8

Spare Part **E28**

• Through coolant system is optional

For separate purchase

Division	For separate purchase
Spanner	

Classification by shank	
DMC 20	57-60
DMC 32	75-79
DMC 42	92-96

Lock collet for milling chuck

DCL

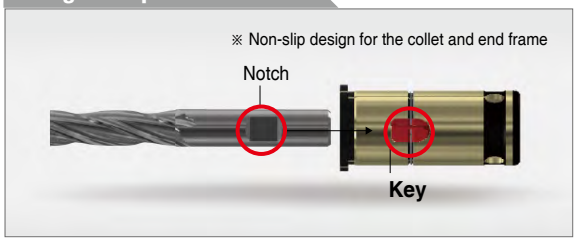
- The mechanical fastening method enables the prevention of tool deviation
- Stable tool fastening force even under extreme machining conditions

Code system

DCL	32	-	20
DINE lock-collet	Collet size		Tool dia.

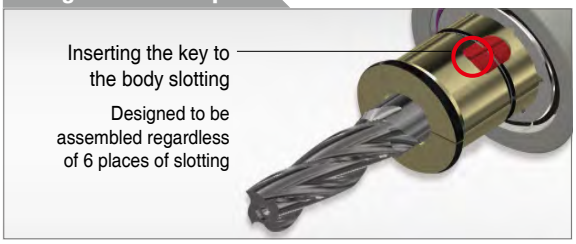
Features

Designed to prevent fallout



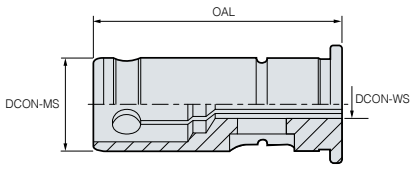
- Designed especially for extreme machining with a lot of mechanical actions, prevents the tool from deviating or falling out
- Weldon flat (DINE 6535HB) end mill used

Designed as non-slip



- Closely adhered to the grooves of the milling chuck - No slip occurring even under high torque

Detailed Specifications



Designation	DCON-WS	OAL	DCON-MS
DCL20-6	6	53	20
DCL20-8	8	53	20
DCL20-10	10	53	20
DCL20-12	12	53	20
DCL20-14	14	53	20
DCL20-16	16	53	20
DCL32-6	6	65	32
DCL32-8	8	65	32

Designation	DCON-WS	OAL	DCON-MS
DCL32-10	10	65	32
DCL32-12	12	65	32
DCL32-14	14	65	32
DCL32-16	16	65	32
DCL32-18	18	65	32
DCL32-20	20	65	32
DCL32-25	25	65	32

Parts

Basic		
Division	Key	C-Grip
Parts / Designation		
DCL20-6	DCL20-6K	DCL-CG20
DCL20-8	DCL20-8K	DCL-CG20
DCL20-10	DCL20-10K	DCL-CG20
DCL20-12	DCL20-12K	DCL-CG20
DCL20-14	DCL20-14K	DCL-CG20
DCL20-16	DCL20-16K	DCL-CG20
DCL32-6	DCL32-6K	DCL-CG32
DCL32-8	DCL32-8K	DCL-CG32

Basic		
Division	Key	C-Grip
Parts / Designation		
DCL32-10	DCL32-10K	DCL-CG32
DCL32-12	DCL32-12K	DCL-CG32
DCL32-14	DCL32-14K	DCL-CG32
DCL32-16	DCL32-16K	DCL-CG32
DCL32-18	DCL32-18K	DCL-CG32
DCL32-20	DCL32-20K	DCL-CG32
DCL32-25	DCL32-25K	DCL-CG32

Jetcoolant collet (for milling chuck)

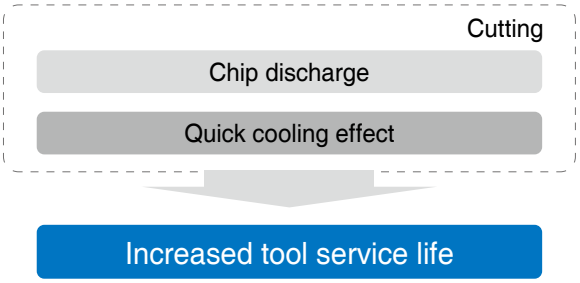
DCJ

- Ensures a longer service life of cutting tools by preventing chips from adhering to tools
- Improveds chip breakability/breaking strong jet injection
- Maintains the performance of the conventional milling chuck
- Enables a fast change of the inside jet coolant by collet replacement
- Available an ultrahigh-pressure inside coolant

Designation	Ø6	Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
NPM20	●	●	●	●	●			
NPM32	●	●	●	●	●	●	●	
NPM42	●	●	●	●	●	●	●	●

• Can be used for an ultrahigh–pressure inside coolant

NPM + Jet coolant Collet



Easy assembly

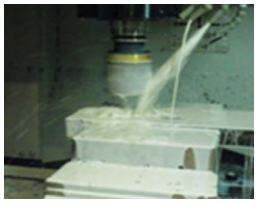
※ Can be used by only combining a collet with the conventional chuck (NPM)

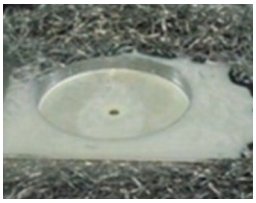
Coolant type

• Jet coolant

• Inside coolant

Chip evacuation



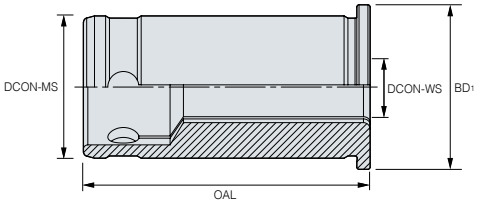


Coolant type

Designation	
DCJ20	DCJ20-6
	DCJ20-8
	DCJ20-10
	DCJ20-12
	DCJ20-16
DCJ32	DCJ32-6
	DCJ32-8
	DCJ32-10
	DCJ32-12
	DCJ32-16
	DCJ32-20
	DCJ32-25

DC Collet

Straight Collet

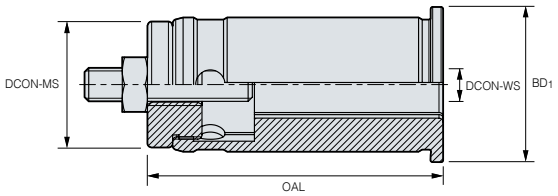


(mm)

Designation		DCON-WS	OAL	DCON-MS	BD_1	kg
DC	20-6	6	53	20	25	0.1
	20-8	8	53	20	25	0.1
	20-10	10	53	20	25	0.1
	20-12	12	53	20	25	0.1
	20-14	14	53	20	25	0.1
	20-16	16	53	20	25	0.1
	25-6	6	62	25	29	0.2
	25-8	8	62	25	29	0.2
	25-10	10	62	25	29	0.2
	25-12	12	62	25	29	0.2
	25-16	16	62	25	29	0.2
	32-6	6	65	32	37	0.2
	32-8	8	65	32	37	0.2
	32-10	10	65	32	37	0.2
	32-12	12	65	32	37	0.2
	32-14	14	65	32	37	0.2
	32-16	16	65	32	37	0.2
	32-19	19	65	32	37	0.2
	32-20	20	65	32	37	0.2
	32-25	25	65	32	37	0.2
	42-6	6	73	42	47	0.5
	42-8	8	73	42	47	0.5
	42-10	10	73	42	47	0.5
	42-12	12	73	42	47	0.5
	42-16	16	73	42	47	0.5
	42-20	20	73	42	47	0.5
	42-25	25	73	42	47	0.5
	42-32	32	73	42	47	0.5

DCS Collet

Straight Collet

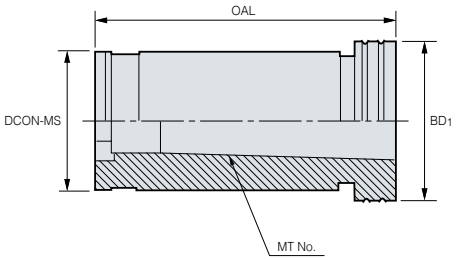


(mm)

Designation		DCON-WS	OAL	DCON-MS	BD1	kg
DCS	20-6	6	57	20	25	0.1
	20-8	8	57	20	25	0.1
	20-10	10	57	20	25	0.1
	20-12	12	57	20	25	0.1
	20-16	16	57	20	25	0.1
	32-6	6	70.5	32	37	0.2
	32-8	8	70.5	32	37	0.2
	32-10	10	70.5	32	37	0.2
	32-12	12	70.5	32	37	0.2
	32-14	14	70.5	32	37	0.2
	32-16	16	70.5	32	37	0.2
	32-19	19	70.5	32	37	0.2
	32-20	20	70.5	32	37	0.2
	32-25	25	70.5	32	37	0.2
	42-6	6	80	42	47	0.5
	42-8	8	80	42	47	0.5
	42-10	10	80	42	47	0.5
	42-12	12	80	42	47	0.5
	42-16	16	80	42	47	0.5
	42-20	20	80	42	47	0.5
	42-25	25	80	42	47	0.5
	42-32	32	80	42	47	0.5

TC Collet

Taper Collet

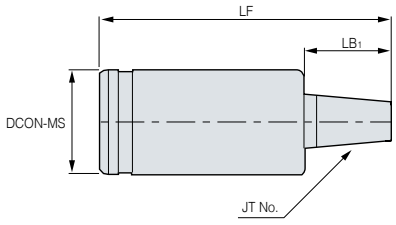


(mm)

Designation		MT No.	OAL	BD_1	DCON-MS	kg
TC	20-1	MT1	60	26	20	0.1
	20-2	MT2	72	26	20	0.1
	25-1	MT1	60	32	25	0.2
	25-2	MT2	72	32	25	0.2
	32-1	MT1	60	38	32	0.4
	32-2	MT2	72	38	32	0.4
	32-3	MT3	90	38	32	0.4
	42-1	MT1	60	48	42	0.6
	42-2	MT2	72	48	42	0.7
	42-3	MT3	90	48	42	0.8
	42-4	MT4	113	48	42	0.9

DJT

Drill Chuck Arbor



(mm)

Designation		JT No.	LF	DCON-MS	LB_1	kg
DJT	20-6	JT6	83	20	28	0.2
	32-6	JT6	93	32	28	0.5
	42-6	JT6	103	42	28	0.9

Precision collet chuck for multi purpose machining

SDC/P

- Superior efficiency for general machining due to affordable pricing and stable performance
- The sleeve nuts allows stable run-out when compared to other companies
- Wide fastening range applicable
- Various machining available just by replacing the collet
- Chucking range : Ø1~Ø26

Code system

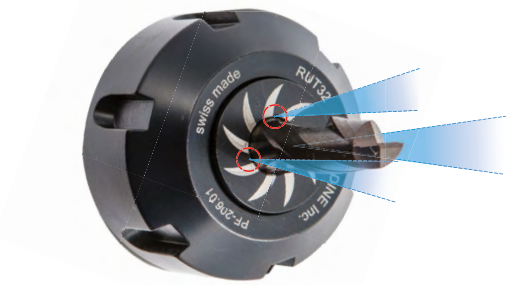
BT30	-	SDC	10	-	P	100
Spindle		Collet chuck	Tool Dia.		Precision	Length

Bearing nuts designed for improved precision (SWISS Made)

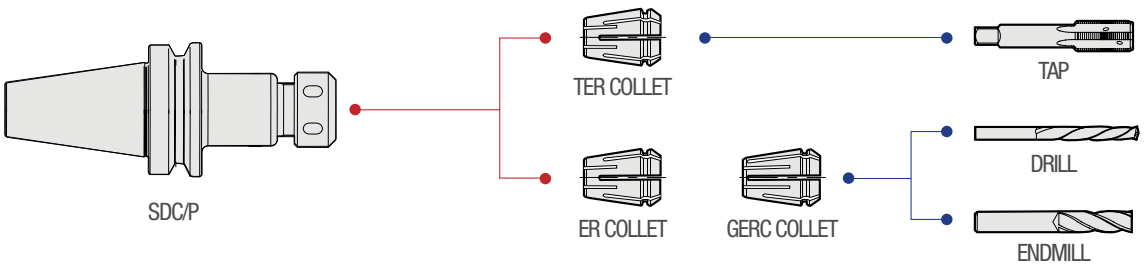
- Soft sleeve bearing RN Nut

Jet coolant disk Applicable

- After replacing with RT/RUT nut, connect RTJW to use jet coolant - internal coolant



SDC/P Application



DBT-SDC/P

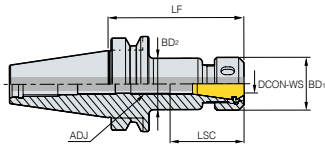


Fig. 1

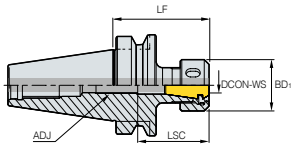


Fig. 2

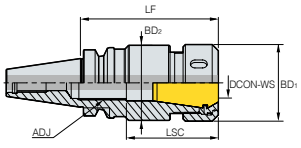


Fig. 3

(mm)

Designation		DCON-WS	LF	BD_1	BD_2	LSC	Collet/ STEP	ADJ	Fig.	kg
DBT30 -	**SDC7P-70**	1.0~7.0	70	18	17	33	GERC11/0.5	M7	1	0.5
	SDC7P-100	1.0~7.0	100	18	17	33	GERC11/0.5	M7	1	0.5
	SDC10P-50	1.0~10.0	50	32	-	44.5	GERC16/1.0	M10	2	0.5
	SDC10P-70	1.0~10.0	70	32	31	44.5	GERC16/1.0	M10	1	0.6
	SDC10P-100	1.0~10.0	100	32	31	44.5	GERC16/1.0	M10	1	0.7
	SDC13P-50	1.0~13.0	50	35	-	49	GERC20/1.0	M13	2	0.5
	SDC13P-70	1.0~13.0	70	35	34	49	GERC20/1.0	M13	1	0.6
	SDC13P-100	1.0~13.0	100	35	34	49	GERC20/1.0	M13	1	0.8
	SDC16P-50	2.0~16.0	50	42	-	50	GERC25/1.0	M18	2	0.5
	SDC16P-70	2.0~16.0	70	42	41	50	GERC25/1.0	M18	1	0.7
	SDC16P-100	2.0~16.0	100	42	41	50	GERC25/1.0	M18	1	1.0
	SDC20P-60	2.0~20.0	60	50	-	60	GERC32/1.0	M22	2	0.6
	SDC20P-90	2.0~20.0	90	50	49	60	GERC32/1.0	M22	3	1.0
	SDC20P-120	2.0~20.0	120	50	49	60	GERC32/1.0	M22	3	1.4
DBT40 -	**SDC7P-70**	1.0~7.0	70	18	17	33	GERC11/0.5	M7	1	0.9
	SDC7P-90	1.0~7.0	90	18	17	33	GERC11/0.5	M7	1	0.9
	SDC7P-130	1.0~7.0	130	18	17	33	GERC11/0.5	M7	1	1.0
	SDC10P-70	1.0~10.0	70	32	31	44.5	GERC16/1.0	M10	1	1.0
	SDC10P-90	1.0~10.0	90	32	31	44.5	GERC16/1.0	M10	1	1.2
	SDC10P-130	1.0~10.0	130	32	31	44.5	GERC16/1.0	M10	2	1.4
	SDC13P-70	1.0~13.0	70	35	34	49	GERC20/1.0	M13	1	1.1
	SDC13P-90	1.0~13.0	90	35	34	49	GERC20/1.0	M13	1	1.2
	SDC13P-130	1.0~13.0	130	35	34	49	GERC20/1.0	M13	1	1.4
	SDC13P-150	1.0~13.0	150	35	34	49	GERC20/1.0	M13	1	1.6
	SDC16P-70	2.0~16.0	70	42	41	50	GERC25/1.0	M18	1	1.1
	SDC16P-90	2.0~16.0	90	42	41	50	GERC25/1.0	M18	1	1.3
	SDC16P-130	2.0~16.0	130	42	41	50	GERC25/1.0	M18	1	1.7
	SDC20P-70	2.0~20.0	70	50	-	60	GERC32/1.0	M22	2	1.1
	SDC20P-90	2.0~20.0	90	50	49	60	GERC32/1.0	M22	1	1.4
	SDC20P-130	2.0~20.0	130	50	49	60	GERC32/1.0	M22	1	1.9
	SDC20P-150	2.0~20.0	150	50	49	60	GERC32/1.0	M22	1	2.2
	SDC26P-90	4.0~26.0	90	63	62	71	GERC40/1.0	M28	1	1.7

Spare Part **E43** Application Collet **E54**

• LSC: Insertion depth of tool • Through coolant system is optional
• Collets in the right size are recommended for oil hole type

DBT-SDC/P

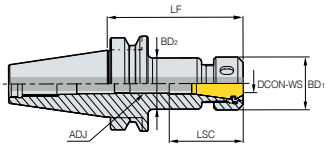


Fig. 1

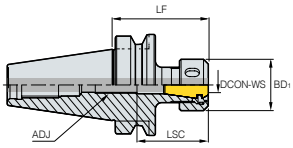


Fig. 2

(mm)

Designation		DCON-WS	LF	BD_1	BD_2	LSC	Collet/ STEP	ADJ	Fig.	kg
DBT50 -	SDC10P-100	1.0~10.0	100	32	31	44.5	GERC16/1.0	M10	1	3.7
	SDC10P-120	1.0~10.0	120	32	31	44.5	GERC16/1.0	M10	1	3.7
	SDC10P-160	1.0~10.0	160	32	31	44.5	GERC16/1.0	M10	1	3.8
	SDC13P-100	1.0~13.0	100	35	34	49	GERC20/1.0	M13	1	3.8
	SDC13P-130	1.0~13.0	130	35	34	49	GERC20/1.0	M13	1	3.8
	SDC13P-160	1.0~13.0	160	35	34	49	GERC20/1.0	M13	1	4.1
	SDC13P-180	1.0~13.0	180	35	34	49	GERC20/1.0	M13	1	4.2
	SDC16P-100	2.0~16.0	100	42	41	50	GERC25/1.0	M18	1	3.9
	SDC16P-160	2.0~16.0	160	42	41	50	GERC25/1.0	M18	1	4.3
	SDC20P-70	2.0~20.0	70	50	-	60	GERC32/1.0	M22	2	1.7
	SDC20P-100	2.0~20.0	100	50	49	60	GERC32/1.0	M22	1	4.0
	SDC20P-130	2.0~20.0	130	50	49	60	GERC32/1.0	M22	1	4.3
	SDC20P-160	2.0~20.0	160	50	49	60	GERC32/1.0	M22	1	4.7
	SDC20P-180	2.0~20.0	180	50	49	60	GERC32/1.0	M22	1	5.0
	SDC26P-160	4.0~26.0	160	63	62	71	GERC40/1.0	M28	1	5.5

Spare Part **E43** Application Collet **E54**

• LSC: Insertion depth of tool • Through coolant system is optional
• Collets in the right size are recommended for oil hole type

Parts

Basic			For separate purchase	
Division	Sleeve bearing nut	Adjust screw	Spanner	Collet
Parts / Designation				
SDC7P	RN11	BN0716F	20-22	GERC/ER 11-ØD
SDC10P	RN16	BN1025F	32-35	GERC/ER 16-ØD
SDC13P	RN20	BN1325F	35-38	GERC/ER 20-ØD
SDC16P	RN25	BN1830F	42-46	GERC/ER 25-ØD
SDC20P	RN32	BN2230F	48-52	GERC/ER 32-ØD
SDC26P	RN40	BN2838F	62-65	GERC/ER 40-ØD

BT30-SDC13P-50/HSK63A-SDC13P-100 is applide with BN0716F screw.

BT-SDC/P

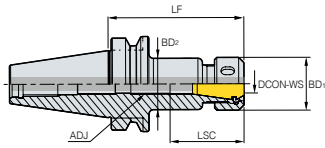


Fig. 1

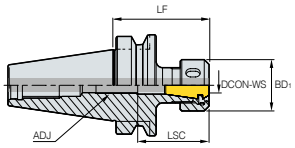


Fig. 2

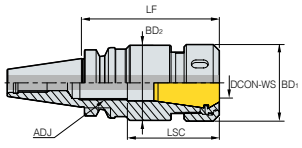


Fig. 3

(mm)

Designation		DCON-WS	LF	BD_1	BD_2	LSC	Collet/ STEP	ADJ	Fig.	kg
BT30 -	**SDC7P-70**	1.0~7.0	70	18	17	33	GERC11/0.5	M7	1	0.5
	SDC7P-100	1.0~7.0	100	18	17	33	GERC11/0.5	M7	1	0.5
	SDC10P-50	1.0~10.0	50	32	-	44.5	GERC16/1.0	M10	2	0.5
	SDC10P-70	1.0~10.0	70	32	31	44.5	GERC16/1.0	M10	1	0.6
	SDC10P-100	1.0~10.0	100	32	31	44.5	GERC16/1.0	M10	1	0.7
	SDC13P-50	1.0~13.0	50	35	-	49	GERC20/1.0	M13	2	0.5
	SDC13P-70	1.0~13.0	70	35	34	49	GERC20/1.0	M13	1	0.6
	SDC13P-100	1.0~13.0	100	35	34	49	GERC20/1.0	M13	1	0.8
	SDC16P-50	2.0~16.0	50	42	-	50	GERC25/1.0	M18	2	0.5
	SDC16P-70	2.0~16.0	70	42	41	50	GERC25/1.0	M18	1	0.7
	SDC16P-100	2.0~16.0	100	42	41	50	GERC25/1.0	M18	1	1.0
	SDC20P-60	2.0~20.0	60	50	-	60	GERC32/1.0	M22	2	0.6
	SDC20P-90	2.0~20.0	90	50	49	60	GERC32/1.0	M22	3	1.0
	SDC20P-120	2.0~20.0	120	50	49	60	GERC32/1.0	M22	3	1.4
BT40 -	**SDC7P-70**	1.0~7.0	70	18	17	33	GERC11/0.5	M7	1	0.9
	SDC7P-90	1.0~7.0	90	18	17	33	GERC11/0.5	M7	1	0.9
	SDC7P-130	1.0~7.0	130	18	17	33	GERC11/0.5	M7	1	1.0
	SDC10P-70	1.0~10.0	70	32	31	44.5	GERC16/1.0	M10	1	1.0
	SDC10P-90	1.0~10.0	90	32	31	44.5	GERC16/1.0	M10	1	1.2
	SDC10P-130	1.0~10.0	130	32	31	44.5	GERC16/1.0	M10	2	1.4
	SDC13P-70	1.0~13.0	70	35	34	49	GERC20/1.0	M13	1	1.1
	SDC13P-90	1.0~13.0	90	35	34	49	GERC20/1.0	M13	1	1.2
	SDC13P-130	1.0~13.0	130	35	34	49	GERC20/1.0	M13	1	1.4
	SDC13P-150	1.0~13.0	150	35	34	49	GERC20/1.0	M13	1	1.6
	SDC16P-70	2.0~16.0	70	42	41	50	GERC25/1.0	M18	1	1.1
	SDC16P-90	2.0~16.0	90	42	41	50	GERC25/1.0	M18	1	1.3
	SDC16P-130	2.0~16.0	130	42	41	50	GERC25/1.0	M18	1	1.7
	SDC20P-70	2.0~20.0	70	50	-	60	GERC32/1.0	M22	2	1.1
	SDC20P-90	2.0~20.0	90	50	49	60	GERC32/1.0	M22	1	1.4
	SDC20P-130	2.0~20.0	130	50	49	60	GERC32/1.0	M22	1	1.9
	SDC20P-150	2.0~20.0	150	50	49	60	GERC32/1.0	M22	1	2.2
	SDC26P-90	4.0~26.0	90	63	62	71	GERC40/1.0	M28	1	1.7

Spare Part **E45** Application Collet **E54**

• LSC: Insertion depth of tool • Through coolant system is optional
• Collets in the right size are recommended for oil hole type

BT-SDC/P

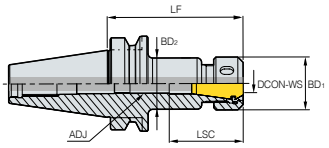


Fig. 1

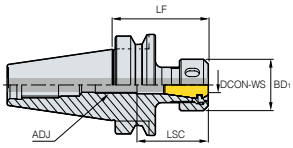


Fig. 2

(mm)

Designation		DCON-WS	LF	BD_1	BD_2	LSC	Collet/ STEP	ADJ	Fig.	kg
BT50 -	SDC10P-100	1.0~10.0	100	32	31	44.5	GERC16/1.0	M10	1	3.7
	SDC10P-120	1.0~10.0	120	32	31	44.5	GERC16/1.0	M10	1	3.7
	SDC10P-160	1.0~10.0	160	32	31	44.5	GERC16/1.0	M10	1	3.8
	SDC13P-100	1.0~13.0	100	35	34	49	GERC20/1.0	M13	1	3.8
	SDC13P-130	1.0~13.0	130	35	34	49	GERC20/1.0	M13	1	3.8
	SDC13P-160	1.0~13.0	160	35	34	49	GERC20/1.0	M13	1	4.1
	SDC13P-180	1.0~13.0	180	35	34	49	GERC20/1.0	M13	1	4.2
	SDC16P-100	2.0~16.0	100	42	41	50	GERC25/1.0	M18	1	3.9
	SDC16P-160	2.0~16.0	160	42	41	50	GERC25/1.0	M18	1	4.3
	SDC20P-70	2.0~20.0	70	50	-	60	GERC32/1.0	M22	2	1.7
	SDC20P-100	2.0~20.0	100	50	49	60	GERC32/1.0	M22	1	4.0
	SDC20P-130	2.0~20.0	130	50	49	60	GERC32/1.0	M22	1	4.3
	SDC20P-160	2.0~20.0	160	50	49	60	GERC32/1.0	M22	1	4.7
	SDC20P-180	2.0~20.0	180	50	49	60	GERC32/1.0	M22	1	5.0
	SDC26P-160	4.0~26.0	160	63	62	71	GERC40/1.0	M28	1	5.5

Spare Part **E45** Application Collet **E54**

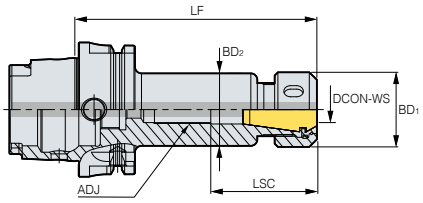
• LSC: Insertion depth of tool • Through coolant system is optional
• Collets in the right size are recommended for oil hole type

Parts

Basic			For separate purchase	
Division	Sleeve bearing nut	Adjust screw	Spanner	Collet
Parts / Designation				
SDC7P	RN11	BN0716F	20-22	GERC/ER 11-ØD
SDC10P	RN16	BN1025F	32-35	GERC/ER 16-ØD
SDC13P	RN20	BN1325F	35-38	GERC/ER 20-ØD
SDC16P	RN25	BN1830F	42-46	GERC/ER 25-ØD
SDC20P	RN32	BN2230F	48-52	GERC/ER 32-ØD
SDC26P	RN40	BN2838F	62-65	GERC/ER 40-ØD

BT30–SDC13P–50/HSK63A–SDC13P–100 is applide with BN0716F screw.

HSK-SDC/P



(mm)

Designation		DCON-WS	LF	BD_1	BD_2	LSC	ADJ	Collet/STEP	kg
HSK63A -	SDC7P-100	1.0~7.0	100	18	17	33	M7	GERC11/0.5	0.9
	SDC7P-120	1.0~7.0	120	18	17	34	M8	GERC11/0.5	0.9
	SDC10P-100	1.0~10.0	100	32	31	44.5	M10	GERC16/1.0	1
	SDC10P-120	1.0~10.0	120	32	31	44.5	M10	GERC16/1.0	1
	SDC13P-100	1.0~13.0	100	35	34	P	M7	GERC20/1.0	1.1
	SDC13P-120	1.0~13.0	120	35	34	49	M7	GERC20/1.0	1.2
	SDC13P-150	1.0~13.0	150	35	34	49	M7	GERC20/1.0	1.2
	SDC16P-100	1.0~16.0	100	42	41	50	M7	GERC25/1.0	1.2
	SDC20P-110	1.0~20.0	110	50	49	60	M7	GERC32/1.0	1.5
	SDC26P-130	4.0~26.0	130	63	62	71	M10	GERC40/1.0	1.6
HSK100A -	SDC7P-100	1.0~7.0	100	18	17	33	M7	GERC11/0.5	2
	SDC10P-100	1.0~10.0	100	32	31	44.5	M10	GERC16/1.0	2.2
	SDC13P-100	1.0~13.0	100	35	34	49	M7	GERC20/1.0	2.4
	SDC16P-110	2.0~16.0	100	42	41	50	M13	GERC25/1.0	2.6
	SDC20P-120	2.0~20.0	120	50	49	60	M10	GERC32/1.0	2.9
	SDC26P-130	4.0~26.0	130	63	62	71	M28	GERC40/1.0	3.8

Spare Part **E47** Application Collet **E54**

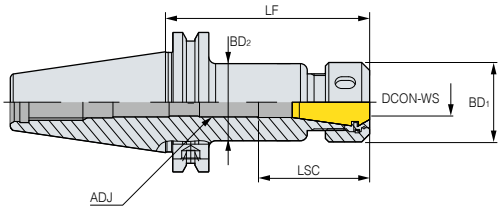
• LSC: Insertion depth of tool • Through coolant system is optional
• Collets in the right size are recommended for oil hole type

For separate purchase

Division	For separate purchase
Internal coolant system	

Classification by shank	
HSK63A	HSK63A-CNS
HSK100A	HSK100A-CNS

SK-SDC/P



(mm)

Designation		DCON-WS	LF	BD_1	BD_2	LSC	ADJ	Collet/STEP	kg
SK40 -	SDC10P-90	1.0~10.0	90	32	31	44.5	GERC16/1.0	M10	1.1
	SDC13P-90	1.0~13.0	90	35	34	49	GERC20/1.0	M13	1.2
	SDC13P-120	1.0~13.0	120	35	34	49	GERC20/1.0	M13	1.3
	SDC16P-90	2.0~16.0	90	42	41	50	GERC25/1.0	M18	1.4
	SDC20P-90	2.0~20.0	90	50	49	60	GERC32/1.0	M13	1.5

Spare Part **E47** Application Collet **E54**

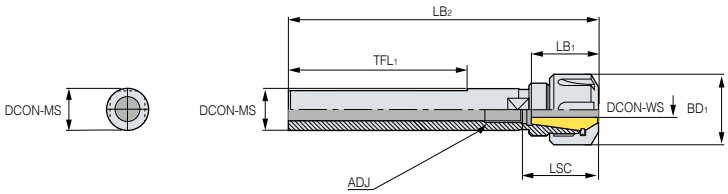
• LSC: Insertion depth of tooll • Through coolant system is optional
• Collets in the right size are recommended for oil hole type

Parts

Basic			For separate purchase	
Division	Sleeve bearing nut	Adjust screw	Spanner	Collet
Parts / Designation				
SDC7P	RN11	BN0716F	20-22	GERC/ER 11-ØD
SDC10P	RN16	BN1025F	32-35	GERC/ER 16-ØD
SDC13P	RN20	BN1325F	35-38	GERC/ER 20-ØD
SDC16P	RN25	BN1830F	42-46	GERC/ER 25-ØD
SDC20P	RN32	BN2230F	48-52	GERC/ER 32-ØD
SDC26P	RN40	BN2838F	62-65	GERC/ER 40-ØD

BT30–SDC13P–50/HSK63A–SDC13P–100 is applide with BN0716F screw.

S-SDC



(mm)

	Designation	DCON-WS	LB2	BD1	DCON-MS	LB1	TFL1	LSC	Collet/STEP	ADJ	kg
S16 -	**SDC7-120M**	1.0~7.0	120	19	16	-	-	33	GERC11/0.5	M7	0.1
	SDC7-120T	1.0~7.0	120	19	16	-	73	33	GERC11/0.5	M7	0.1
	SDC10-150T	1.0~10.0	150	28	16	46.5	83	34.5	GERC16/1.0	M10	0.2
S20 -	**SDC10-150M**	1.0~10.0	150	28	20	26.5	-	34.5	GERC16/1.0	M10	0.3
	SDC10-150T	1.0~10.0	150	28	20	26.5	83	34.5	GERC16/1.0	M10	0.3
	SDC13-150M	1.0~13.0	150	35	20	50	-	49	GERC20/1.0	M13	0.3
	SDC13-150T	1.0~13.0	150	35	20	50	83	49	GERC20/1.0	M13	0.3
S25 -	**SDC10-150M**	1.0~10.0	150	28	25	-	-	34.5	GERC16/1.0	M10	0.4
	SDC10-150T	1.0~10.0	150	28	25	-	83	34.5	GERC16/1.0	M10	0.4
	SDC13-150M	1.0~13.0	150	35	25	-	-	49	GERC20/1.0	M13	0.4
	SDC13-150T	1.0~13.0	150	35	25	-	83	49	GERC20/1.0	M13	0.4
S32 -	**SDC13-150M**	1.0~13.0	150	35	32	-	-	49	GERC20/1.0	M13	0.7
	SDC13-150T	1.0~13.0	150	35	32	-	83	49	GERC20/1.0	M13	0.7
	SDC20-165M	2.0~20.0	165	50	32	-	-	60	GERC32/1.0	M22	0.9
	SDC20-165T	2.0~20.0	165	50	32	-	83	60	GERC32/1.0	M22	0.9

Spare Part **E49** Application Collet **E54**

• LSC: Insertion depth of tool • Through coolant system is optional

S-SDC/S

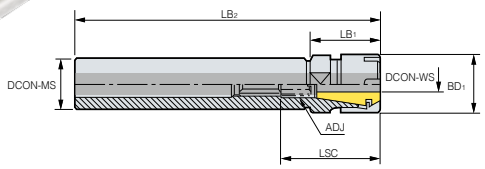


Fig. 1

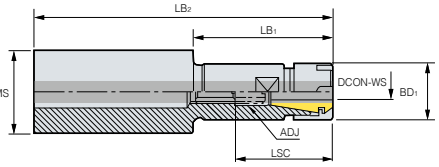


Fig. 2

(mm)

Designation		DCON-WS	LB2	BD1	DCON-MS	LB1	LSC	Collet/STEP	ADJ	Fig.	kg
S16 -	SDC7S-100M	1.0~7.0	100	16	16	21	33	GERC11/0.5	M7	1	0.1
	SDC7S-150M	1.0~7.0	150	16	16	21	33	GERC11/0.5	M7	1	0.1
	SDC10S-100M	1.0~10.0	100	22	16	50	44.5	GERC16/1.0	M10	1	0.1
	SDC10S-150M	1.0~10.0	150	22	16	50	44.5	GERC16/1.0	M10	1	0.1
S20 -	SDC7S-100M	1.0~7.0	100	16	20	30	35	GERC11/0.5	M7	2	0.1
	SDC7S-150M	1.0~7.0	150	16	20	80	35	GERC11/0.5	M7	2	0.2
	SDC10S-100M	1.0~10.0	100	22	20	50	44.5	GERC16/1.0	M10	1	0.1
	SDC10S-150M	1.0~10.0	150	22	20	50	44.5	GERC16/1.0	M10	1	0.2
	SDC10S-200M	1.0~10.0	200	22	20	50	44.5	GERC16/1.0	M10	1	0.3
	SDC13S-100M	1.0~13.0	100	28	20	50	49	GERC20/1.0	M13	1	0.1
	SDC13S-150M	1.0~13.0	150	28	20	50	49	GERC20/1.0	M13	1	0.2
S25 -	SDC7S-100M	1.0~7.0	100	16	25	30	33	GERC11/0.5	M7	2	0.2
	SDC7S-150M	1.0~7.0	150	16	25	80	33	GERC11/0.5	M7	2	0.2
	SDC10S-100M	1.0~10.0	100	22	25	30	44.5	GERC16/1.0	M10	2	0.2
	SDC10S-150M	1.0~10.0	150	22	25	80	44.5	GERC16/1.0	M10	2	0.3
	SDC13S-100M	1.0~13.0	100	28	25	50	49	GERC20/1.0	M13	1	0.2
	SDC13S-150M	1.0~13.0	150	28	25	50	49	GERC20/1.0	M13	1	0.4
	SDC16S-100M	2.0~16.0	100	35	25	50	50	GERC25/1.0	M18	1	0.3
	SDC16S-150M	2.0~16.0	150	35	25	50	50	GERC25/1.0	M18	1	0.4
	SDC16S-200M	2.0~16.0	200	35	25	50	50	GERC25/1.0	M18	1	0.6
S32 -	SDC16S-120M	2.0~16.0	120	35	32	50	50	GERC25/1.0	M18	1	0.5
	SDC16S-150M	2.0~16.0	150	35	32	50	50	GERC25/1.0	M18	1	0.6

Spare Part **E49** Application Collet **E54**

• LSC: Insertion depth of tool • Through coolant system is optional

Parts

Basic		For separate purchase	
Division	Nut	Spanner	Collet
Parts / Designation			
SDC7S	R11M	M11M	GERC/ER 11-ØD
SDC10S	R16M	M16M	GERC/ER 16-ØD
SDC13S	R20M	M20M	GERC/ER 20-ØD
SDC16S	R25M	M25M	GERC/ER 25-ØD

BT30-SDC13P-50/HSK63A-SDC13P-100 is applide with BN0716F screw.

Precision collet chuck(Length adjustment type)

SDC/PL

- Precise tool length adjustment
- Improved production efficiency by reducing tool setup time

Code system

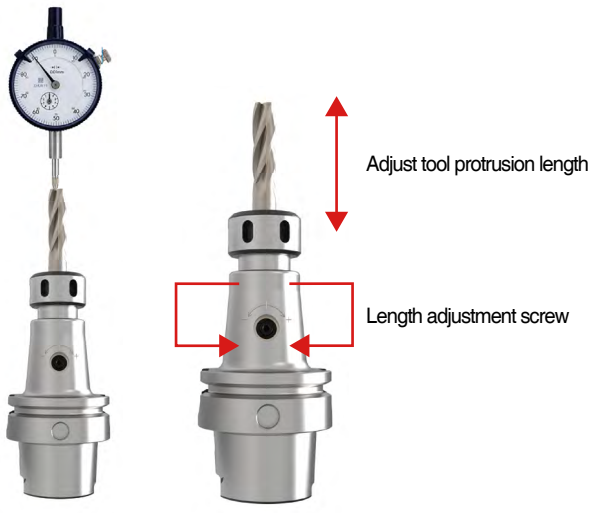
BT30	-	SDC	16	P	L	-	130
Spindle		Collet chuck	Tool Dia.	Precision	Length adjustment		Length

What is SDC/PL?

Reduced tool setting time by designing the length to be adjustable from the outside.

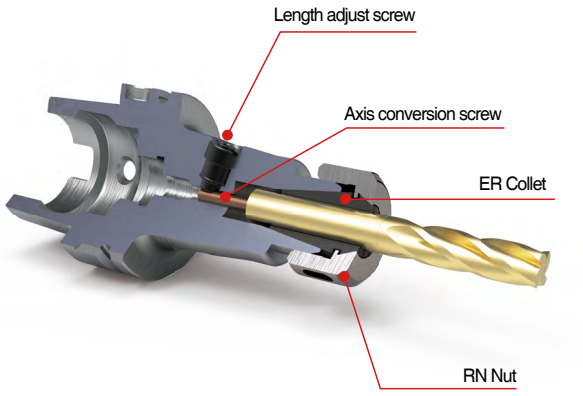
How to adjust length

- Rotate the adjustment screw to adjust the tool length



Part name

- Internal coolant system is basic



BT-SDC/PL

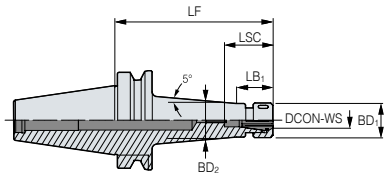


Fig. 1

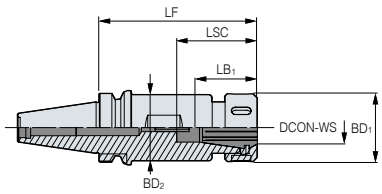


Fig. 2

(mm)

Designation		DCON-WS	LF	BD1	BD2	LSC		LB1	Collet/STEP	Fig.
BT30 -	**SDC13PL-100**	1.0~13.0	100	35	34	49	39~49	37	GERC20/1.0	1
	SDC16PL-100	2.0~16.0	100	42	41	50	40~50	45	GERC25/1.0	2
	SDC20PL-100	2.0~20.0	120	50	49	60	50~60	55	GERC32/1.0	2
BT40 -	**SDC13PL-90**	1.0~13.0	90	35	34	49	39~49	37	GERC20/1.0	1
	SDC13PL-130	1.0~13.0	130	35	34	49	39~49	37	GERC20/1.0	1
	SDC13PL-150	1.0~13.0	150	35	34	49	39~49	37	GERC20/1.0	1
	SDC16PL-90	2.0~16.0	90	42	41	50	40~50	37	GERC25/1.0	1
	SDC16PL-130	2.0~16.0	130	42	41	50	40~50	57	GERC25/1.0	1
	SDC20PL-130	2.0~20.0	130	50	49	60	50~60	58	GERC32/1.0	1
	SDC20PL-150	2.0~20.0	150	50	49	60	50~60	68	GERC32/1.0	1
BT50 -	**SDC13PL-100**	1.0~13.0	100	35	34	49	39~49	37	GERC20/1.0	1
	SDC13PL-130	1.0~13.0	130	35	34	49	39~49	37	GERC20/1.0	1
	SDC13PL-160	1.0~13.0	160	35	34	49	39~49	37	GERC20/1.0	1
	SDC13PL-180	1.0~13.0	180	35	34	49	39~49	37	GERC20/1.0	1
	SDC16PL-100	2.0~16.0	100	42	41	50	40~50	37	GERC25/1.0	1
	SDC16PL-160	2.0~16.0	160	42	41	50	40~50	67	GERC25/1.0	1
	SDC20PL-130	2.0~20.0	130	50	49	60	50~60	52	GERC32/1.0	1
	SDC20PL-160	2.0~20.0	160	50	49	60	50~60	67	GERC32/1.0	1
	SDC20PL-180	2.0~20.0	180	50	49	60	50~60	77	GERC32/1.0	1
	SDC20PL-160	4.0~26.0	160	63	62	71	61~71	68	GERC40/1.0	1

Spare Part **E52** Application Collet **E54**

• LSC: Insertion depth of tool • Through coolant system is optional
• Collets in the right size are recommended for oil hole type

HSK-SDC/PL

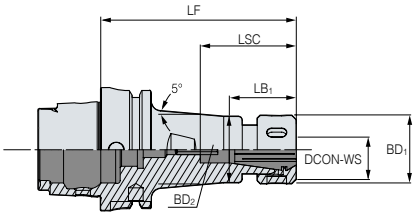


Fig. 1

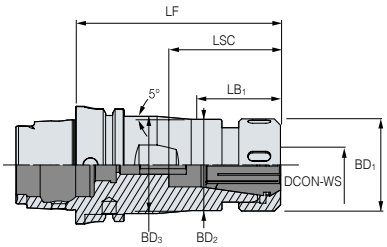


Fig. 2

(mm)

Designation		DCON-WS	LF	BD1	BD2	BD3	LSC		LB1	Collet/STEP	Fig.
HSK63A -	SDC13PL-100	1.0~13.0	100	35	34	-	49	39~49	37	GERC20/1.0	1
	SDC16PL-100	2.0~16.0	100	42	41	-	50	40~50	43	GERC25/1.0	1
	SDC20PL-110	2.0~20.0	110	50	49	52	60	50~60	48	GERC32/1.0	2
HSK100A -	SDC16PL-110	2.0~16.0	110	42	41	-	50	40~50	46	GERC25/1.0	1
	SDC20PL-120	2.0~20.0	120	50	49	-	60	50~60	52	GERC32/1.0	1

Spare Part **E47** Application Collet **E49**

• LSC: Insertion depth of tool • Through coolant system is optional
• Collets in the right size are recommended for oil hole type

Parts

Division	For separate purchase
Internal coolant system	

Classification by shank	
HSK63A	HSK63A-CNS
HSK100A	HSK100A-CNS

GER Collet

GERC

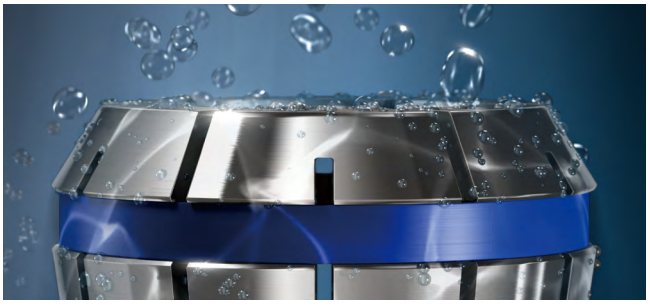
- Corrosion resistant collet to micro unit
- High tech coating for long lasting precision
- Longer tool life and higher productivity

Code system

GREC	-	14	4	-	HP
GERC Collet		Clamping range	Tool Dia		HP: Precision None: General

Special coating technology

Unlike GERC collets, Conventional non-coated collets have the following features:
Non-coated collets are affected by corrosion due to high humidity, cutting fluid, cleaner, salt, gas and many other factors, which in result deteriorates whole quality of machining



When a collet gets rusty, the tool life is shortened and precision considerably decreases. To prevent this problem, surface treatment by micro unit was applied to GERC collets for effective protection and long lasting precision

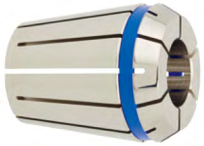
GERC

Competitor

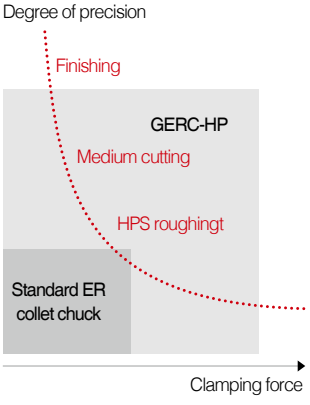
Two samples of collets after 4 months of use:
Left: GERC collet, Right: Non-coated

GERC-HP

A precision type collet chuck is expensive than standard one, but still it has more advantages in long term cost and efficiency. Using GERC-HP can minimize pricy reworking due to smaller tolerance with maximum precision

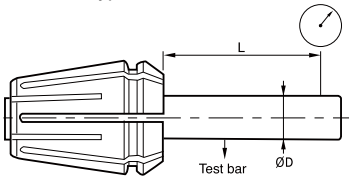


Precision type collet 2 ㎛



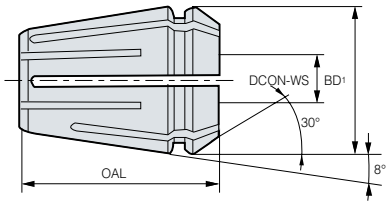
Precision (L/D = 3)

Standard type = 5 ㎛
Precision type = 2 ㎛



GERC Collet

General type



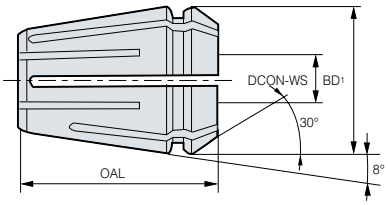
(mm)

Designation		ER size	DCON-WS	OAL	BD1	Accuracy
GERC11 -	1.0	11	1.0	18.0	11.5	5μm
	1.5	11	1.5	18.0	11.5	5μm
	2.0	11	2.0	18.0	11.5	5μm
	2.5	11	2.5	18.0	11.5	5μm
	3.0	11	3.0	18.0	11.5	5μm
	3.5	11	3.5	18.0	11.5	5μm
	4.0	11	4.0	18.0	11.5	5μm
	4.5	11	4.5	18.0	11.5	5μm
	5.0	11	5.0	18.0	11.5	5μm
	5.5	11	5.5	18.0	11.5	5μm
	6.0	11	6.0	18.0	11.5	5μm
	6.5	11	6.5	18.0	11.5	5μm
	7.0	11	7.0	18.0	11.5	5μm
GERC16 -	1.0	16	1.0	27.5	17.0	5μm
	2.0	16	2.0	27.5	17.0	5μm
	3.0	16	3.0	27.5	17.0	5μm
	4.0	16	4.0	27.5	17.0	5μm
	4.5	16	4.5	27.5	17.0	5μm
	5.0	16	5.0	27.5	17.0	5μm
	6.0	16	6.0	27.5	17.0	5μm
	7.0	16	7.0	27.5	17.0	5μm
	8.0	16	8.0	27.5	17.0	5μm
	9.0	16	9.0	27.5	17.0	5μm
	10.0	16	10.0	27.5	17.0	5μm
GERC20 -	1.0	20	1.0	31.5	21.0	5μm
	2.0	20	2.0	31.5	21.0	5μm
	3.0	20	3.0	31.5	21.0	5μm
	4.0	20	4.0	31.5	21.0	5μm
	5.0	20	5.0	31.5	21.0	5μm
	6.0	20	6.0	31.5	21.0	5μm
	7.0	20	7.0	31.5	21.0	5μm
	8.0	20	8.0	31.5	21.0	5μm
	9.0	20	9.0	31.5	21.0	5μm
	10.0	20	10.0	31.5	21.0	5μm
	11.0	20	11.0	31.5	21.0	5μm
	12.0	20	12.0	31.5	21.0	5μm
	13.0	20	13.0	31.5	21.0	5μm

Designation		ER size	DCON-WS	OAL	BD1	Accuracy
GERC25-	2.0	25	2.0	34.0	26.0	5μm
	3.0	25	3.0	34.0	26.0	5μm
	4.0	25	4.0	34.0	26.0	5μm
	5.0	25	5.0	34.0	26.0	5μm
	6.0	25	6.0	34.0	26.0	5μm
	7.0	25	7.0	34.0	26.0	5μm
	8.0	25	8.0	34.0	26.0	5μm
	9.0	25	9.0	34.0	26.0	5μm
	10.0	25	10.0	34.0	26.0	5μm
	11.0	25	11.0	34.0	26.0	5μm
	12.0	25	12.0	34.0	26.0	5μm
	13.0	25	13.0	34.0	26.0	5μm
	14.0	25	14.0	34.0	26.0	5μm
	15.0	25	15.0	34.0	26.0	5μm
	16.0	25	16.0	34.0	26.0	5μm
GERC32-	2.0	32	2.0	40.0	33.0	5μm
	3.0	32	3.0	40.0	33.0	5μm
	4.0	32	4.0	40.0	33.0	5μm
	5.0	32	5.0	40.0	33.0	5μm
	6.0	32	6.0	40.0	33.0	5μm
	7.0	32	7.0	40.0	33.0	5μm
	8.0	32	8.0	40.0	33.0	5μm
	9.0	32	9.0	40.0	33.0	5μm
	10.0	32	10.0	40.0	33.0	5μm
	11.0	32	11.0	40.0	33.0	5μm
	12.0	32	12.0	40.0	33.0	5μm
	13.0	32	13.0	40.0	33.0	5μm
	14.0	32	14.0	40.0	33.0	5μm
	15.0	32	15.0	40.0	33.0	5μm
	16.0	32	16.0	40.0	33.0	5μm
	17.0	32	17.0	40.0	33.0	5μm
	18.0	32	18.0	40.0	33.0	5μm
	19.0	32	19.0	40.0	33.0	5μm
	20.0	32	20.0	40.0	33.0	5μm
GERC40-	16.0	40	16.0	46.0	41.0	5μm
	20.0	40	20.0	46.0	41.0	5μm
	25.0	40	25.0	46.0	41.0	5μm

GERC Collet

Precision type

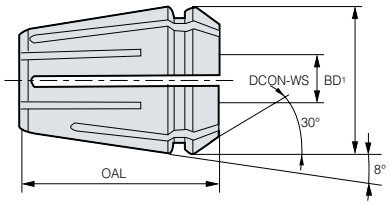


(mm)

Designation		ER size	DCON-WS	OAL	BD1	Accuracy
GERC11 -	3.0HP	11.0	3.0	18.0	11.5	2μm
	4.0HP	11.0	4.0	18.0	11.5	2μm
	5.0HP	11.0	5.0	18.0	11.5	2μm
	6.0HP	11.0	6.0	18.0	11.5	2μm
GERC16 -	3.0HP	16.0	3.0	27.5	17.0	2μm
	4.0HP	16.0	4.0	27.5	17.0	2μm
	5.0HP	16.0	5.0	27.5	17.0	2μm
	6.0HP	16.0	6.0	27.5	17.0	2μm
	7.0HP	16.0	7.0	27.5	17.0	2μm
	8.0HP	16.0	8.0	27.5	17.0	2μm
	9.0HP	16.0	9.0	27.5	17.0	2μm
	10.0HP	16.0	10.0	27.5	17.0	2μm
GERC20 -	3.0HP	20.0	3.0	31.5	21.0	2μm
	4.0HP	20.0	4.0	31.5	21.0	2μm
	5.0HP	20.0	5.0	31.5	21.0	2μm
	6.0HP	20.0	6.0	31.5	21.0	2μm
	8.0HP	20.0	8.0	31.5	21.0	2μm
	9.0HP	20.0	9.0	31.5	21.0	2μm
	10.0HP	20.0	10.0	31.5	21.0	2μm
	11.0HP	20.0	11.0	31.5	21.0	2μm
	12.0HP	20.0	12.0	31.5	21.0	2μm
	13.0HP	20.0	13.0	31.5	21.0	2μm
GERC25 -	6.0HP	25.0	6.0	34.0	26.0	2μm
	10.0HP	25.0	10.0	34.0	26.0	2μm
	12.0HP	25.0	12.0	34.0	26.0	2μm
	14.0HP	25.0	14.0	34.0	26.0	2μm
	16.0HP	25.0	16.0	34.0	26.0	2μm
GERC32 -	6.0HP	32.0	6.0	40.0	33.0	2μm
	10.0HP	32.0	10.0	40.0	33.0	2μm
	12.0HP	32.0	12.0	40.0	33.0	2μm
	16.0HP	32.0	16.0	40.0	33.0	2μm
	18.0HP	32.0	18.0	40.0	33.0	2μm
	20.0HP	32.0	20.0	40.0	33.0	2μm

GERC Collet

General Sealed type



(mm)

Designation		ER size	DCON-WS	OAL	BD1	Accuracy
GERC16 -	5.0C	16	5.0	27.5	17.0	5μm
	6.0C	16	6.0	27.5	17.0	5μm
	8.0C	16	8.0	27.5	17.0	5μm
	10.0C	16	10.0	27.5	17.0	5μm
GERC20 -	6.0C	20	6.0	31.5	21.0	5μm
	8.0C	20	8.0	31.5	21.0	5μm
	10.0C	20	10.0	31.5	21.0	5μm
	12.0C	20	12.0	31.5	21.0	5μm
GERC25 -	6.0C	25	6.0	34.0	26.0	5μm
	8.0C	25	8.0	34.0	26.0	5μm
	10.0C	25	10.0	34.0	26.0	5μm
	12.0C	25	12.0	34.0	26.0	5μm
	14.0C	25	14.0	34.0	26.0	5μm
	16.0C	25	16.0	34.0	26.0	5μm

Designation		ER size	DCON-WS	OAL	BD1	Accuracy
GERC32-	8.0C	32	8.0	40.0	33.0	5μm
	9.0C	32	9.0	40.0	33.0	5μm
	10.0C	32	10.0	40.0	33.0	5μm
	11.0C	32	11.0	40.0	33.0	5μm
	12.0C	32	12.0	40.0	33.0	5μm
	13.0C	32	13.0	40.0	33.0	5μm
	14.0C	32	14.0	40.0	33.0	5μm
	15.0C	32	15.0	40.0	33.0	5μm
	16.0C	32	16.0	40.0	33.0	5μm
	18.0C	32	18.0	40.0	33.0	5μm
	20.0C	32	20.0	40.0	33.0	5μm

GERC Collet set

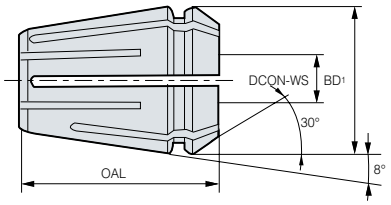
General type

(mm)

Designation		DCON-WS	Distance	Collet amount	Accuracy	kg
GERC	11 (SET)	1.0-7.0	0.5	13pcs	5μm	0.1
	16 (SET)	1.0-10.0	1.0	10pcs	5μm	0.2
	20 (SET)	2.0-13.0	1.0	12pcs	5μm	0.5
	25 (SET)	2.0-16.0	1.0	15pcs	5μm	1.1
	32 (SET)	3.0-20.0	1.0	18pcs	5μm	2.6
	40 (SET)	4.0-26.0	1.0	23pcs	5μm	5.8

ER Collet

General type



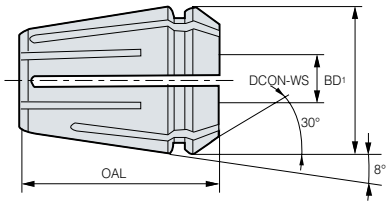
(mm)

Designation		ER size	DCON-WS	OAL	BD1	Accuracy
ER11 -	1.0	11	1.0	18.0	11.5	10μm
	1.5	11	1.5	18.0	11.5	10μm
	2.0	11	2.0	18.0	11.5	10μm
	2.5	11	2.5	18.0	11.5	10μm
	3.0	11	3.0	18.0	11.5	10μm
	3.5	11	3.5	18.0	11.5	10μm
	4.0	11	4.0	18.0	11.5	10μm
	4.5	11	4.5	18.0	11.5	10μm
	5.0	11	5.0	18.0	11.5	10μm
	5.5	11	5.5	18.0	11.5	10μm
	6.0	11	6.0	18.0	11.5	10μm
	6.5	11	6.5	18.0	11.5	10μm
	7.0	11	7.0	18.0	11.5	10μm
ER16 -	1.0	16	1.0	27.5	17.0	10μm
	2.0	16	2.0	27.5	17.0	10μm
	3.0	16	3.0	27.5	17.0	10μm
	4.0	16	4.0	27.5	17.0	10μm
	5.0	16	5.0	27.5	17.0	10μm
	6.0	16	6.0	27.5	17.0	10μm
	7.0	16	7.0	27.5	17.0	10μm
	8.0	16	8.0	27.5	17.0	10μm
	9.0	16	9.0	27.5	17.0	10μm
	10.0	16	10.0	27.5	17.0	10μm
ER20 -	1.0	20	1.0	31.5	21.0	10μm
	2.0	20	2.0	31.5	21.0	10μm
	3.0	20	3.0	31.5	21.0	10μm
	4.0	20	4.0	31.5	21.0	10μm
	5.0	20	5.0	31.5	21.0	10μm
	6.0	20	6.0	31.5	21.0	10μm
	7.0	20	7.0	31.5	21.0	10μm
	8.0	20	8.0	31.5	21.0	10μm
	9.0	20	9.0	31.5	21.0	10μm
	10.0	20	10.0	31.5	21.0	10μm
	11.0	20	11.0	31.5	21.0	10μm
	12.0	20	12.0	31.5	21.0	10μm
	13.0	20	13.0	31.5	21.0	10μm

Designation		ER size	DCON-WS	OAL	BD1	Accuracy
ER25 -	2.0	25	2.0	34.0	26.0	10μm
	3.0	25	3.0	34.0	26.0	10μm
	4.0	25	4.0	34.0	26.0	10μm
	5.0	25	5.0	34.0	26.0	10μm
	6.0	25	6.0	34.0	26.0	10μm
	7.0	25	7.0	34.0	26.0	10μm
	8.0	25	8.0	34.0	26.0	10μm
	9.0	25	9.0	34.0	26.0	10μm
	10.0	25	10.0	34.0	26.0	10μm
	11.0	25	11.0	34.0	26.0	10μm
	12.0	25	12.0	34.0	26.0	10μm
	13.0	25	13.0	34.0	26.0	10μm
	14.0	25	14.0	34.0	26.0	10μm
	15.0	25	15.0	34.0	26.0	10μm
	16.0	25	16.0	34.0	26.0	10μm
ER32 -	2.0	32	2.0	40.0	33.0	10μm
	3.0	32	3.0	40.0	33.0	10μm
	4.0	32	4.0	40.0	33.0	10μm
	5.0	32	5.0	40.0	33.0	10μm
	6.0	32	6.0	40.0	33.0	10μm
	7.0	32	7.0	40.0	33.0	10μm
	8.0	32	8.0	40.0	33.0	10μm
	9.0	32	9.0	40.0	33.0	10μm
	10.0	32	10.0	40.0	33.0	10μm
	11.0	32	11.0	40.0	33.0	10μm
	12.0	32	12.0	40.0	33.0	10μm
	13.0	32	13.0	40.0	33.0	10μm
	14.0	32	14.0	40.0	33.0	10μm
	15.0	32	15.0	40.0	33.0	10μm
	16.0	32	16.0	40.0	33.0	10μm
	17.0	32	17.0	40.0	33.0	10μm
	18.0	32	18.0	40.0	33.0	10μm
	19.0	32	19.0	40.0	33.0	10μm
	20.0	32	20.0	40.0	33.0	10μm

ER Collet

Precision type



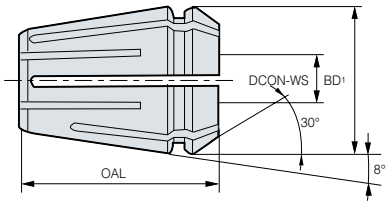
(mm)

Designation		ER size	DCON-WS	OAL	BD1	Accuracy
ER11 -	2.0P	11	2.0	18.0	11.3	5μm
	3.0P	11	3.0	18.0	11.3	5μm
	4.0P	11	4.0	18.0	11.3	5μm
	5.0P	11	5.0	18.0	11.3	5μm
	6.0P	11	6.0	18.0	11.3	5μm
	7.0P	11	7.0	18.0	11.3	5μm
ER16 -	2.0P	16	2.0	27.5	16.7	5μm
	3.0P	16	3.0	27.5	16.7	5μm
	4.0P	16	4.0	27.5	16.7	5μm
	5.0P	16	5.0	27.5	16.7	5μm
	6.0P	16	6.0	27.5	16.7	5μm
	7.0P	16	7.0	27.5	16.7	5μm
	8.0P	16	8.0	27.5	16.7	5μm
	9.0P	16	9.0	27.5	16.7	5μm
	10.0P	16	10.0	27.5	16.7	5μm
ER20 -	2.0P	20	2.0	31.5	20.7	5μm
	3.0P	20	3.0	31.5	20.7	5μm
	4.0P	20	4.0	31.5	20.7	5μm
	5.0P	20	5.0	31.5	20.7	5μm
	6.0P	20	6.0	31.5	20.7	5μm
	7.0P	20	7.0	31.5	20.7	5μm
	8.0P	20	8.0	31.5	20.7	5μm
	9.0P	20	9.0	31.5	20.7	5μm
	10.0P	20	10.0	31.5	20.7	5μm
	11.0P	20	11.0	31.5	20.7	5μm
	12.0P	20	12.0	31.5	20.7	5μm
	13.0P	20	13.0	31.5	20.7	5μm

Designation		ER size	DCON-WS	OAL	BD1	Accuracy
ER25 -	2.0P	25	2.0	34.0	25.8	5μm
	3.0P	25	3.0	34.0	25.8	5μm
	4.0P	25	4.0	34.0	25.8	5μm
	5.0P	25	5.0	34.0	25.8	5μm
	6.0P	25	6.0	34.0	25.8	5μm
	7.0P	25	7.0	34.0	25.8	5μm
	8.0P	25	8.0	34.0	25.8	5μm
	9.0P	25	9.0	34.0	25.8	5μm
	10.0P	25	10.0	34.0	25.8	5μm
	11.0P	25	11.0	34.0	25.8	5μm
	12.0P	25	12.0	34.0	25.8	5μm
	13.0P	25	13.0	34.0	25.8	5μm
	14.0P	25	14.0	34.0	25.8	5μm
	15.0P	25	15.0	34.0	25.8	5μm
	16.0P	25	16.0	34.0	25.8	5μm
ER32 -	2.0P	32	2.0	40.0	32.8	5μm
	3.0P	32	3.0	40.0	32.8	5μm
	4.0P	32	4.0	40.0	32.8	5μm
	5.0P	32	5.0	40.0	32.8	5μm
	6.0P	32	6.0	40.0	32.8	5μm
	7.0P	32	7.0	40.0	32.8	5μm
	8.0P	32	8.0	40.0	32.8	5μm
	9.0P	32	9.0	40.0	32.8	5μm
	10.0P	32	10.0	40.0	32.8	5μm
	11.0P	32	11.0	40.0	32.8	5μm
	12.0P	32	12.0	40.0	32.8	5μm
	13.0P	32	13.0	40.0	32.8	5μm
	14.0P	32	14.0	40.0	32.8	5μm
	15.0P	32	15.0	40.0	32.8	5μm
	16.0P	32	16.0	40.0	32.8	5μm
	17.0P	32	17.0	40.0	32.8	5μm
	18.0P	32	18.0	40.0	32.8	5μm
	19.0P	32	19.0	40.0	32.8	5μm
	20.0P	32	20.0	40.0	32.8	5μm

ER Collet

General Sealed type



(mm)

Designation		ER size	DCON-WS	OAL	BD1	Accuracy
ER16 -	5.0C	16	5.0	27.5	17.0	10μm
	6.0C	16	6.0	27.5	17.0	10μm
	8.0C	16	8.0	27.5	17.0	10μm
	10.0C	16	10.0	27.5	17.0	10μm
ER20 -	6.0C	20	6.0	31.5	21.0	10μm
	8.0C	20	8.0	31.5	21.0	10μm
	10.0C	20	10.0	31.5	21.0	10μm
	12.0C	20	12.0	31.5	21.0	10μm
ER25 -	6.0C	25	6.0	34.0	26.0	10μm
	8.0C	25	8.0	34.0	26.0	10μm
	10.0C	25	10.0	34.0	26.0	10μm
	12.0C	25	12.0	34.0	26.0	10μm
	14.0C	25	14.0	34.0	26.0	10μm
	16.0C	25	16.0	34.0	26.0	10μm
ER32 -	8.0C	32	8.0	40.0	33.0	10μm
	9.0C	32	9.0	40.0	33.0	10μm
	10.0C	32	10.0	40.0	33.0	10μm
	11.0C	32	11.0	40.0	33.0	10μm
	12.0C	32	12.0	40.0	33.0	10μm
	13.0C	32	13.0	40.0	33.0	10μm
	14.0C	32	14.0	40.0	33.0	10μm
	15.0C	32	15.0	40.0	33.0	10μm
	16.0C	32	16.0	40.0	33.0	10μm
	18.0C	32	18.0	40.0	33.0	10μm
	20.0C	32	20.0	40.0	33.0	10μm

ER Collet set

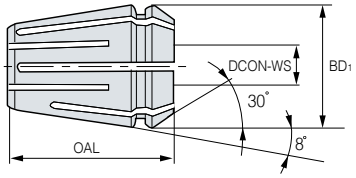
General type

(mm)

Designation		DCON-WS	Distance	Collet amount	Accuracy	kg
ER	11 (SET)	1.0-7.0	0.5	13pcs	10㎛	0.1
	16 (SET)	1.0-10.0	1.0	10pcs	10㎛	0.1
	20 (SET)	2.0-13.0	1.0	12pcs	10㎛	0.4
	25 (SET)	2.0-16.0	1.0	15pcs	10㎛	1.1
	32 (SET)	3.0-20.0	1.0	18pcs	10㎛	2.6

ER-T Collet

General type



(mm)

Designation		ER size	DCON-WS	OAL	BD1	Accuracy
ER11 -	2.0-T	11	2.0	18.0	11.5	8μm
	3.0-T	11	3.0	18.0	11.5	8μm
	4.0-T	11	4.0	18.0	11.5	8μm
	5.0-T	11	5.0	18.0	11.5	8μm
	6.0-T	11	6.0	18.0	11.5	8μm
	7.0-T	11	7.0	18.0	11.5	8μm
ER16 -	2.0-T	16	2.0	27.5	17.0	8μm
	3.0-T	16	3.0	27.5	17.0	8μm
	4.0-T	16	4.0	27.5	17.0	8μm
	5.0-T	16	5.0	27.5	17.0	8μm
	6.0-T	16	6.0	27.5	17.0	8μm
	7.0-T	16	7.0	27.5	17.0	8μm
	8.0-T	16	8.0	27.5	17.0	8μm
	9.0-T	16	9.0	27.5	17.0	8μm
	10.0-T	16	10.0	27.5	17.0	8μm
ER20 -	2.0-T	20	2.0	31.5	21.0	8μm
	3.0-T	20	3.0	31.5	21.0	8μm
	4.0-T	20	4.0	31.5	21.0	8μm
	5.0-T	20	5.0	31.5	21.0	8μm
	6.0-T	20	6.0	31.5	21.0	8μm
	7.0-T	20	7.0	31.5	21.0	8μm
	8.0-T	20	8.0	31.5	21.0	8μm
	9.0-T	20	9.0	31.5	21.0	8μm
	10.0-T	20	10.0	31.5	21.0	8μm
	11.0-T	20	11.0	31.5	21.0	8μm
	12.0-T	20	12.0	31.5	21.0	8μm
	13.0-T	20	13.0	31.5	21.0	8μm

Designation		ER size	DCON-WS	OAL	BD1	Accuracy
ER25 -	2.0-T	25	2.0	34.0	26.0	8μm
	3.0-T	25	3.0	34.0	26.0	8μm
	4.0-T	25	4.0	34.0	26.0	8μm
	5.0-T	25	5.0	34.0	26.0	8μm
	6.0-T	25	6.0	34.0	26.0	8μm
	7.0-T	25	7.0	34.0	26.0	8μm
	8.0-T	25	8.0	34.0	26.0	8μm
	9.0-T	25	9.0	34.0	26.0	8μm
	10.0-T	25	10.0	34.0	26.0	8μm
	11.0-T	25	11.0	34.0	26.0	8μm
	12.0-T	25	12.0	34.0	26.0	8μm
	13.0-T	25	13.0	34.0	26.0	8μm
	14.0-T	25	14.0	34.0	26.0	8μm
	15.0-T	25	15.0	34.0	26.0	8μm
	16.0-T	25	16.0	34.0	26.0	8μm
ER32 -	2.0-T	32	2.0	40.0	33.0	8μm
	3.0-T	32	3.0	40.0	33.0	8μm
	4.0-T	32	4.0	40.0	33.0	8μm
	5.0-T	32	5.0	40.0	33.0	8μm
	6.0-T	32	6.0	40.0	33.0	8μm
	7.0-T	32	7.0	40.0	33.0	8μm
	8.0-T	32	8.0	40.0	33.0	8μm
	9.0-T	32	9.0	40.0	33.0	8μm
	10.0-T	32	10.0	40.0	33.0	8μm
	11.0-T	32	11.0	40.0	33.0	8μm
	12.0-T	32	12.0	40.0	33.0	8μm
	13.0-T	32	13.0	40.0	33.0	8μm
	14.0-T	32	14.0	40.0	33.0	8μm
	15.0-T	32	15.0	40.0	33.0	8μm
	16.0-T	32	16.0	40.0	33.0	8μm
	17.0-T	32	17.0	40.0	33.0	8μm
	18.0-T	32	18.0	40.0	33.0	8μm
	19.0-T	32	19.0	40.0	33.0	8μm
	20.0-T	32	20.0	40.0	33.0	8μm

Lock collet for ER collet chuck

ER/L

- Designed to prevent the end mill from falling out
- Prevents tool fallout, slipping, or idle running
- Uses the Weldon flat (DIN 6535HB) end mill without any special endmill
- Useful for machining large-sized mold or difficult-to-cut materials

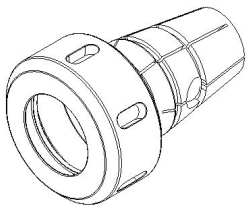
Code system

ER	-	20	12	-	L
ER Collet		Collet Size	Tool Dia		Lock

How to use

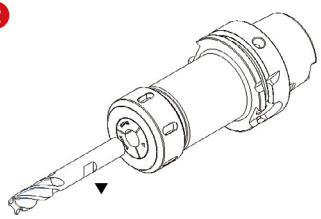
- Assemble the collet with nut (same for general ER collet in use)
- Assemble the end tool (in the direction of assembling notch with key)
- Tighten the nut with the body

❶



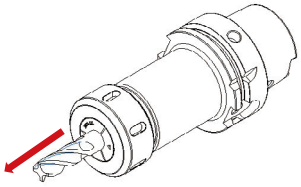
Combine the non-slip ER collet with nut

❷



Clamp the nut after inserting no. ❶into the collet chuck. After that, insert the end mill notch to be aligned with the part ▼ (steel ball position)

❸

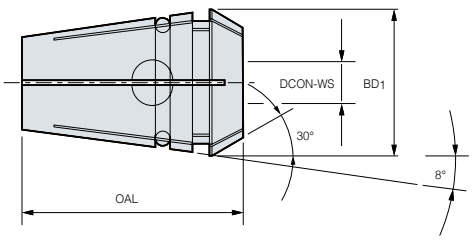


After checking that the steel ball in the collet is caught in the notched part, completely clamp the nut by pulling the end mill in the axial direction (arrow direction)

Note If an auto clamp device is used, skip step❸ (Endmill rotation may cause injury)

ER/L Collet

Lock collet for ER collet chuck



(mm)

Designation		ER size	DCON-WS	OAL	BD_1	BD_2
ER	20-6L	20	6	31.5	20.7	20
	20-8L	20	8	31.5	20.7	20
	20-10L	20	10	31.5	20.7	20
	20-12L	20	12	31.5	20.7	20
	32-12L	32	12	40.0	32.7	32
	32-16L	32	16	40.0	32.7	32
	32-20L	32	20	40.0	32.7	32

Jet coolant disk

RTJW

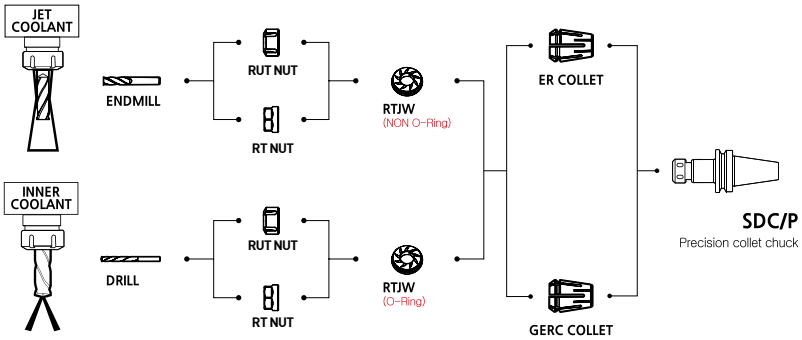
- Provides a longer cutting tool service life by preventing chips from adhering to the tool
- Improveds chip breakability/breaking strong jet injection
- Reduces equipment non-operation time as nozzle position change is not necessary

Code system

RTJW	16	-	6
Jet Coolant Disk	ER Collet Size		Tool Dia.

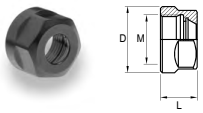
Application

- With one waterproof type (RT, RUT) NUT, the inside jet coolant is simultaneously used
- Enables a fast change of the inside jet coolant only by disk replacement
- Strong jet injection with no scattering even in the high-speed rotation



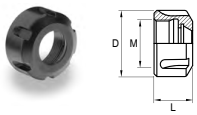
RT NUT

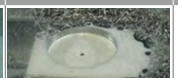
Type	M	D	L
RT16	M22x1.50	28.0	22.5



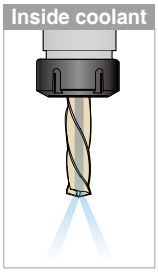
RUT NUT

Type	M	D	L
RUT20	M25x1.50	35.0	24.0
RUT25	M32x1.50	42.0	25.0
RUT32	M40x1.50	50.0	27.5
RUT40	M50x1.50	63.0	30.5

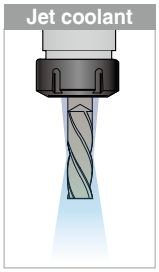


	Pocket machining	After	Remarks
Jet coolant			▶ The chips in the pocket are completely removed by a strong jet injection
Outside coolant			▶ The chips in the pocket are not removed ▶ Chips are accumulated in the collet and nut

Inside coolant

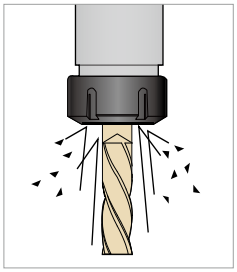


Jet coolant



Coolant method

According to use, inside coolant and jet coolant refueling can be used



Mixing prevention

Effective for vibration proof by preventing mixing of cutting chips by using RTJW

RTJW

(mm)

Designation		ER size	Inner Dia.
RTJW16 -	6	16	6
	7	16	7
	8	16	8
RTJW20 -	6	20	6
	7	20	7
	8	20	8
	9	20	9
	10	20	10
RTJW25 -	6	25	6
	7	25	7
	8	25	8
	9	25	9
	10	25	10
	11	25	11
	12	25	12
	13	25	13
	14	25	14
	15	25	15
	16	25	16

Designation		ER size	Inner Dia.
RTJW32 -	6	32	6
	7	32	7
	8	32	8
	9	32	9
	10	32	10
	11	32	11
	12	32	12
	13	32	13
	14	32	14
	15	32	15
	16	32	16
	17	32	17
	18	32	18
	20	32	20
RTJW40 -	18	40	18
	19	40	19
	20	40	20
	21	40	21
	22	40	22
	24	40	24

Clamping items: **E42~47**

• Less than Ø5 cannot be used for production

Slim type collet chuck

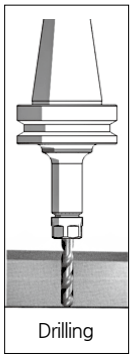
DSK

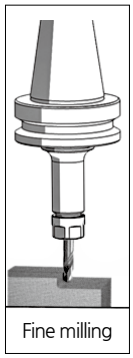
- Available for machining at max.15,000 RPM and balancing of G6.3
- Minimized tool vibration during operation by using collet 8°
- Swiss made high precision nut enhances stability
- Tool clamping range: Ø2~25

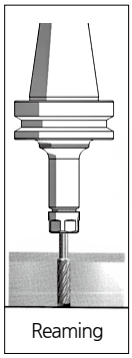
Code system

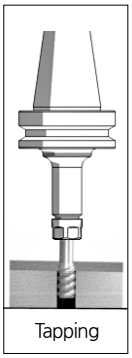
BT30	-	DSK	10	-	90
Spindle		Tapping holder	Tool dia.		Length

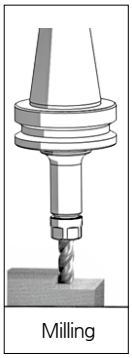
Multipurpose operation

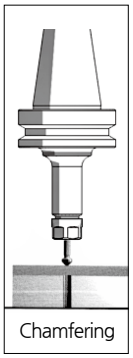

Drilling


Fine milling


Reaming


Tapping


Milling

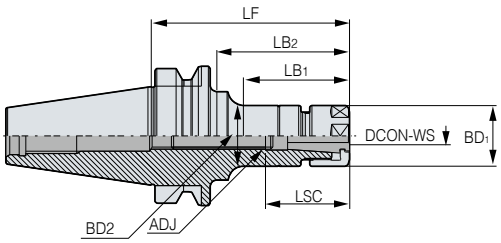

Chamfering

Collet

Standard type & Precision type	Designation	Max Chacking	Run-out
	HC6 - ØD	6.0	Standard type 5 µm Precision type 3 µm
	HC10 - ØD	10.0	
	HC13 - ØD	13.0	
	HC16 - ØD	16.0	
	HC20 - ØD	20.0	
	HC25 - ØD	25.0	

8° HC Collet
Minimized tool vibration during operation

BT-DSK

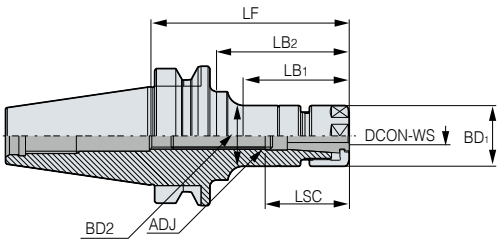


(mm)

Designation		DCON-WS	LF	BD1	BD2	LB1	LB2	LSC	COLLET	ADJ	RPMX	kg
BT30 -	DSK6-60	3.0~6.0	60	20	20	33	33	31	HC6	M8	15,000	0.4
	DSK6-90	3.0~6.0	90	20	32	56	65	31	HC6	M8	15,000	0.5
	DSK10-60	2.0~10.0	60	28	28	35	35	38	HC10	M12	15,000	0.5
	DSK10-90	2.0~10.0	90	28	28	65	65	38	HC10	M12	15,000	0.6
	DSK10-120	2.0~10.0	120	28	28	95	95	38	HC10	M12	15,000	1.1
	DSK13-60	3.0~13.0	60	33	33	36	36	43	HC13	M12	15,000	0.5
	DSK16-60	3.0~16.0	60	40	40	37	37	52	HC16	M12	15,000	0.6
	DSK16-90	3.0~16.0	90	40	40	67	67	52	HC16	M18	15,000	0.8
	DSK16-120	3.0~16.0	120	40	40	97	97	60	HC16	M18	15,000	1.1
	DSK20-75	4.0~20.0	75	48	48	52	52	70	HC20	M12	15,000	1.1
	DSK20-90	4.0~20.0	90	48	48	52	52	70	HC20	M18	15,000	1.2
	DSK25-90	16.0~25.0	90	55	55	67.5	67.5	63.5	HC25	M12	15,000	0.9
BT40 -	DSK6-60	3.0~6.0	60	20	20	30	30	35	HC6	M8	10,000	1.0
	DSK6-90	3.0~6.0	90	19.5	32	51	61	31	HC6	M8	10,000	1.1
	DSK6-120	3.0~6.0	120	19.5	32	60	90	31	HC6	M8	10,000	1.1
	DSK6-150	3.0~6.0	150	19.5	25	60	120	31	HC6	M8	10,000	1.1
	DSK10-60	2.0~10.0	60	28	28	32	32	50	HC10	M12	10,000	1.1
	DSK10-90	2.0~10.0	90	27.5	40	48	60	38	HC10	M12	10,000	1.2
	DSK10-120	2.0~10.0	120	27.5	40	73	90	38	HC10	M12	10,000	1.2
	DSK10-150	2.0~10.0	150	27.5	34.5	73	118	38	HC10	M12	10,000	1.4
	DSK10-180	2.0~10.0	180	28	39	73	148	50	HC10	M12	10,000	1.4
	DSK13-90	3.0~13.0	90	33	33	59	59	43	HC13	M15	10,000	1.3
	DSK16-60	3.0~16.0	90	40	40	58	58	52	HC16	M18	10,000	1.3
	DSK16-90	3.0~16.0	90	40	40	58	58	52	HC16	M18	10,000	1.3
	DSK16-120	3.0~16.0	120	40	40	88	88	52	HC16	M18	10,000	1.5
	DSK16-150	3.0~16.0	150	40	40	118	118	52	HC16	M18	10,000	1.9
	DSK16-180	3.0~16.0	180	40	40	148	148	60	HC16	M18	10,000	1.9
	DSK20-60	4.0~20.0	60	48	48	32	32	70	HC20	M22	10,000	1.5
	DSK20-90	4.0~20.0	90	48.5	48.5	60	60	60	HC20	M22	10,000	1.5
	DSK20-120	4.0~20.0	120	48.5	48.5	90	90	60	HC20	M22	10,000	1.8
	DSK25-90	16.0~25.0	90	55	55	61	61	63.5	HC25	M28	10,000	1.6
	DSK25-120	16.0~25.0	120	55	55	91	91	85	HC25	M28	10,000	2.0

Spare Part **E67** Application Collet **E73**

BT-DSK



(mm)

Designation		DCON-WS	LF	BD1	BD2	LB1	LB2	LSC	COLLET	ADJ	RPMX	kg
BT50 -	DSK6-105	3.0~6.0	105	19.5	32	55	64	31	HC6	M8	8,000	3.6
	DSK6-135	3.0~6.0	135	19.5	32	60	92	31	HC6	M8	8,000	3.7
	DSK6-165	3.0~6.0	165	19.5	32	60	114	31	HC6	M8	8,000	4.1
	DSK10-105	2.0~10.0	105	27.5	27.5	57	57	38	HC10	M12	8,000	3.8
	DSK10-135	2.0~10.0	135	27.5	32	70	92	38	HC10	M12	8,000	3.9
	DSK10-165	2.0~10.0	165	27.5	36	75	114	38	HC10	M12	8,000	4.1
	DSK10-195	2.0~10.0	195	28	36	75	146	38	HC10	M12	8,000	4.5
	DSK13-135	3.0~13.0	135	33	33	92	92	43	HC13	M15	8,000	3.8
	DSK16-105	3.0~16.0	105	40	40	62	62	52	HC16	M18	8,000	4.0
	DSK16-135	3.0~16.0	135	40	40	92	92	52	HC16	M18	8,000	4.2
	DSK16-165	3.0~16.0	165	40	50	40	122	52	HC16	M18	8,000	4.6
	DSK16-195	3.0~16.0	195	40	52	40	152	60	HC16	M18	8,000	4.6
	DSK20-105	4.0~20.0	105	48	40	62	62	60	HC20	M22	8,000	4.2
	DSK20-135	4.0~20.0	135	48	40	92	92	60	HC20	M22	8,000	4.5
	DSK20-165	4.0~20.0	165	48	40	122	122	60	HC20	M22	8,000	4.9
	DSK25-105	16.0~25.0	105	55	55	62	62	63.5	HC25	M28	8,000	4.4
	DSK25-135	16.0~25.0	135	55	55	92	92	63.5	HC25	M28	8,000	4.5
	DSK25-165	16.0~25.0	165	55	55	122	122	63.5	HC25	M28	8,000	5.2

Spare Part **E67** Application Collet **E73**

Parts

	Basic			For separate purchase
Division	Nut	Adjust screw	Collet Extractor	Spanner
Parts / Designation				
DSK6	DN6	BN0825F	DSK-6CE	DSS-6
DSK10	DN10	BN1225F	DSK-10CE	DSS-10
DSK13	DN13	BN1230(BT30)/BN1524F(etc.)	DSK-13CE	DSS-13
DSK16	DN16	BN1830F	DSK-16CE	DSS-16
DSK20	DN20	BN2230F	DSK-20CE	DSS-20
DSK25	DN25	BN2838F	DSK-25CE	DSS-25

Great speed slim collet chuck

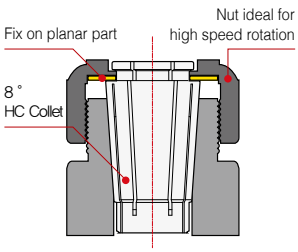
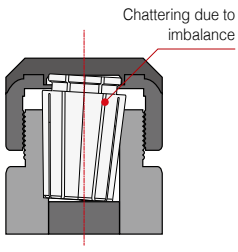
GSK

- Available for machining at max.25,000 RPM and balancing of G6.3
- Increased productivity due to high speed machining
- Minimized tool vibration during operation by using collet 8°
- Swiss made high precision nut enhances stability by pressing collet uniformly
- Tool clamping range: Ø2~25

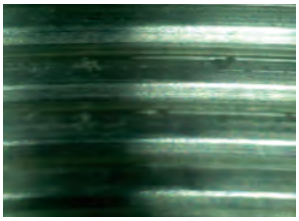
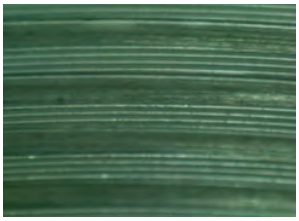
Code system

BT40	-	GSK	10	-	90
Spindle		Tapping holder	Tool dia.		Length

Original design

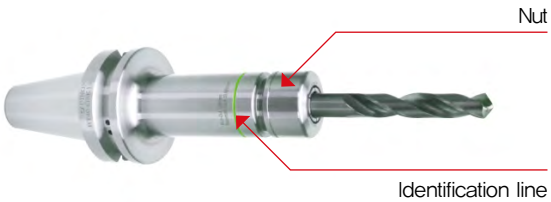
GSK	Competitor
	
Strong clamping by 8° collet and stable fixing with the use of planar part fixing	Imbalance due to centrifugal force during high speed rotation

Comparison of screw polishing points of nut tighetned

GSK	Competitor
	
Provides excellent reproduction precision through screw grinding	Unstable precision due to turning operation

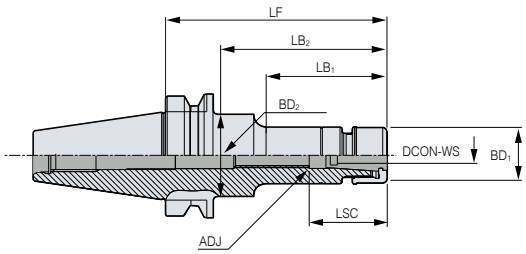
Special design

Optimized for great-speed collet chucks and uniquely designed to enable easy run-out measurement by designating the test area to the product



C Internal coolant system is optional

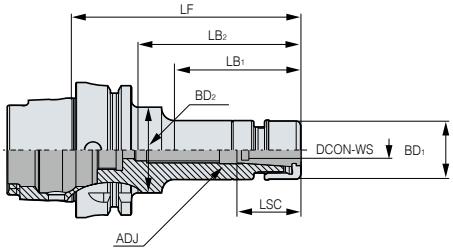
BT-GSK



(mm)

Designation		DCON-WS	LF	BD1	BD2	LB1	LB2	LSC	COLLET	ADJ	RPMX	kg
BT30 -	GSK6-60	3.0~6.0	60	19.5	19.5	33	33	31	HC6	M8	25,000	0.4
	GSK6-90	3.0~6.0	90	19.5	32	56	65	31	HC6	M8	25,000	0.5
	GSK10-60	2.0~10.0	60	27	27	35	35	38	HC10	M12	25,000	0.5
	GSK10-90	2.0~10.0	90	27	27	65	65	38	HC10	M12	25,000	0.6
	GSK13-60	3.0~13.0	60	35	35	36	36	43	HC13	M12	25,000	0.6
	GSK16-60	3.0~16.0	60	40	40	37	37	52	HC16	M12	25,000	0.6
	GSK16-90	3.0~16.0	90	40	40	67	67	52	HC16	M18	25,000	0.8
	GSK25-90	16.0~25.0	90	55	55	67.5	67.5	64	HC25	M12	25,000	1.0
BT40 -	GSK6-90	3.0~6.0	90	20	32	51	61	31	HC6	M8	20,000	1.0
	GSK6-120	3.0~6.0	120	20	32	60	90	31	HC6	M8	20,000	1.2
	GSK6-150	3.0~6.0	150	20	25	60	120	31	HC6	M8	20,000	1.2
	GSK10-90	2.0~10.0	90	27	40	48	60	38	HC10	M12	20,000	1.1
	GSK10-120	2.0~10.0	120	27	40	73	90	38	HC10	M12	20,000	1.3
	GSK10-150	2.0~10.0	150	27	35	73	118	38	HC10	M12	20,000	1.4
	GSK13-90	3.0~13.0	90	35	35	59	59	43	HC13	M15	20,000	1.2
	GSK16-90	3.0~16.0	90	40	40	58	58	52	HC16	M18	20,000	1.3
	GSK16-120	3.0~16.0	120	40	40	88	88	52	HC16	M18	20,000	1.5
	GSK16-150	3.0~16.0	150	40	40	118	118	52	HC16	M18	20,000	1.8
	GSK20-90	4.0~20.0	90	48	48	60	60	60	HC20	M22	20,000	1.4
	GSK20-120	4.0~20.0	120	48	48	90	90	60	HC20	M22	20,000	1.8
	GSK25-90	16.0~25.0	90	55	55	61	61	64	HC25	M28	20,000	1.6
	GSK25-120	16.0~25.0	120	55	55	91	91	64	HC25	M28	20,000	2.0
BT50 -	GSK6-105	3.0~6.0	105	20	32	55	64	31	HC6	M8	15,000	3.6
	GSK6-135	3.0~6.0	135	20	32	60	92	31	HC6	M8	15,000	3.6
	GSK6-165	3.0~6.0	165	20	32	60	114	31	HC6	M8	15,000	3.9
	GSK10-105	2.0~10.0	105	27	27	57	57	38	HC10	M12	15,000	3.7
	GSK10-135	2.0~10.0	135	27	32	70	92	38	HC10	M12	15,000	3.7
	GSK10-165	2.0~10.0	165	27	36	75	114	38	HC10	M12	15,000	4.0
	GSK13-135	3.0~13.0	135	35	35	92	92	43	HC13	M15	15,000	3.9
	GSK16-105	3.0~16.0	105	40	40	62	62	52	HC16	M18	15,000	3.9
	GSK16-135	3.0~16.0	135	40	40	92	92	52	HC16	M18	15,000	4.1
	GSK16-165	3.0~16.0	165	40	50	40	122	52	HC16	M18	15,000	4.3
	GSK20-105	4.0~20.0	105	48	-	-	62	60	HC20	M22	15,000	4.1
	GSK20-135	4.0~20.0	135	48	-	-	92	60	HC20	M22	15,000	4.4
	GSK20-165	4.0~20.0	165	48	-	-	122	60	HC20	M22	15,000	4.9
	GSK25-105	16.0~25.0	105	55	55	62	62	64	HC25	M28	15,000	4.2
	GSK25-135	16.0~25.0	135	55	55	92	92	64	HC25	M28	15,000	4.6
	GSK25-165	16.0~25.0	165	55	55	122	122	64	HC25	M28	15,000	5.1

HSK-GSK



(mm)

Designation		DCON-WS	LF	BD1	BD2	LB1	LB2	LSC	COLLET	ADJ	RPMX	kg
HSK63A -	GSK6-100	3.0~6.0	100	20	32	51	71	31	HC6	M8	20,000	0.8
	GSK10-105	2.0~10.0	105	27	35	60	76	38	HC10	M12	20,000	0.9
	GSK16-120	3.0~16.0	120	40	40	90	-	52	HC16	M18	20,000	1.3
	GSK20-120	4.0~20.0	120	48	48	92	-	60	HC20	M22	20,000	1.6
HSK100A -	GSK6-120	3.0~6.0	120	19.5	32	70	88	31	HC6	M8	15,000	2.2
	GSK10-120	2.0~10.0	120	27	27	70	88	38	HC10	M12	15,000	2.3
	GSK16-140	3.0~16.0	140	40	40	105	-	52	HC16	M18	15,000	2.8
	GSK25-155	16.0~25.0	155	55	55	120	-	64	HC25	M28	15,000	3.6

SK-GSK

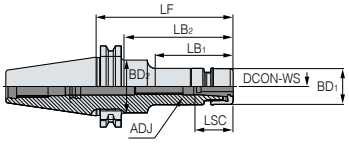


Fig. 1

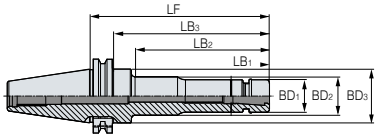


Fig. 2

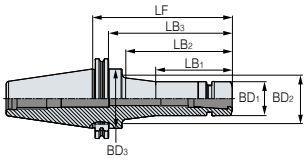
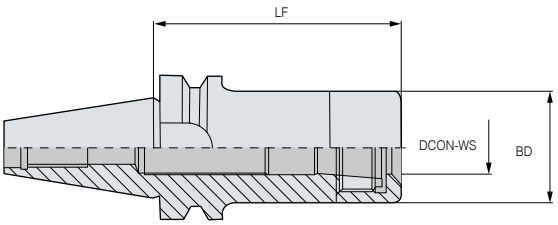


Fig. 3

(mm)

Designation		DCON-WS	LF	BD_1	BD_2	BD_3	LB_1	LB_2	LB_3	LSC	COLLET	ADJ	RPMX	Fig.	kg
SK40 -	**GSK6-60**	3.0~6.0	60	20	-	-	41	-	-	31	HC6	M8	20,000	1	0.8
	GSK6-90	3.0~6.0	90	20	45	-	48	71	-	31	HC6	M8	20,000	1	1.0
	GSK10-90	2.0~10.0	90	27	45	-	50	71	-	38	HC10	M12	20,000	1	1.1
	GSK10-150	2.0~10.0	150	27	32	45	70	112	131	38	HC10	M12	20,000	2	1.3
	GSK16-90	3.0~16.0	90	40	-	-	68	-	-	52	HC16	M18	20,000	1	1.2
	GSK16-150	3.0~16.0	150	40	45	-	114	118	-	52	HC16	M18	20,000	1	1.7
	GSK20-90	4.0~20.0	90	48	-	-	71	-	-	60	HC20	M22	20,000	1	1.3
	GSK25-90	16.0~25.0	90	55	-	-	71	-	-	64	HC25	M28	20,000	1	1.3
SK50 -	**GSK6-105**	3.0~6.0	105	20	70	-	60	86	-	31	HC6	M8	15,000	1	3.1
	GSK6-165	3.0~6.0	165	20	32	70	60	120	15	31	HC6	M8	15,000	2	3.3
	GSK10-105	2.0~10.0	105	27	70	-	65	86	-	38	HC10	M12	15,000	1	3.2
	GSK10-165	2.0~10.0	165	27	32	70	75	120	15	38	HC10	M12	15,000	2	3.4
	GSK16-105	3.0~16.0	105	40	70	-	65	86	-	52	HC16	M18	15,000	1	3.4
	GSK16-165	3.0~16.0	165	40	50	70	90	126	15	52	HC16	M18	15,000	3	3.9
	GSK20-105	4.0~20.0	105	48	70	-	65	86	-	60	HC20	M22	15,000	1	3.6
	GSK20-165	4.0~20.0	165	48	70	-	125	146	-	60	HC20	M22	15,000	1	4.3
	GSK25-105	16.0~25.0	105	55	70	-	65	86	-	64	HC25	M28	15,000	1	3.7
	GSK25-165	16.0~25.0	165	55	70	-	125	146	-	64	HC25	M28	15,000	1	4.6

BT-TSK



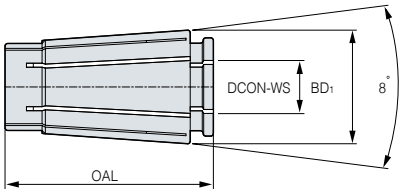
(mm)

Designation		DCON-WS	LF	BD	COLLET
BT30 -	**TSK10-60**	2.0~10.0	60	27.5	HC10
	TSK10-90	2.0~10.0	90	27.5	HC10
	TSK10-120	2.0~10.0	120	27.5	HC10
	TSK16-60	3.0~16.0	60	40	HC16
	TSK16-90	3.0~16.0	90	40	HC16
	TSK16-120	3.0~16.0	120	40	HC16
BT40 -	**TSK10-90**	2.0~10.0	90	27.5	HC10
	TSK16-90	2.0~10.0	90	40	HC10

• Through coolant system is optional

HC Collet

General type



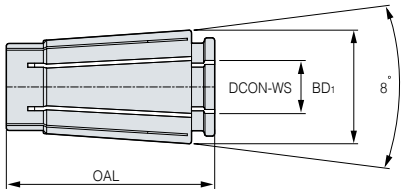
(mm)

Designation		DCON-WS	OAL	BD1	Accuracy
HC6 -	3.0	3.0	25.0	10.5	5μm
	4.0	4.0	25.0	10.5	5μm
	5.0	5.0	25.0	10.5	5μm
	6.0	6.0	25.0	10.5	5μm
HC10 -	2.0	2.0	30.5	15.6	5μm
	3.0	3.0	30.5	15.6	5μm
	4.0	4.0	30.5	15.6	5μm
	5.0	5.0	30.5	15.6	5μm
	6.0	6.0	30.5	15.6	5μm
	7.0	7.0	30.5	15.6	5μm
	8.0	8.0	30.5	15.6	5μm
	9.0	9.0	30.5	15.6	5μm
	10.0	10.0	30.5	15.6	5μm
HC13 -	3.0	3.0	39.0	20.1	5μm
	4.0	4.0	39.0	20.1	5μm
	5.0	5.0	39.0	20.1	5μm
	6.0	6.0	39.0	20.1	5μm
	7.0	7.0	39.0	20.1	5μm
	8.0	8.0	39.0	20.1	5μm
	9.0	9.0	39.0	20.1	5μm
	10.0	10.0	39.0	20.1	5μm
	11.0	11.0	39.0	20.1	5μm
	12.0	12.0	39.0	20.1	5μm
	13.0	13.0	39.0	20.1	5μm
HC16 -	3.0	3.0	45.0	24.6	5μm
	4.0	4.0	45.0	24.6	5μm
	5.0	5.0	45.0	24.6	5μm
	6.0	6.0	45.0	24.6	5μm
	7.0	7.0	45.0	24.6	5μm
	8.0	8.0	45.0	24.6	5μm
	9.0	9.0	45.0	24.6	5μm
	10.0	10.0	45.0	24.6	5μm
	11.0	11.0	45.0	24.6	5μm
	12.0	12.0	45.0	24.6	5μm
	13.0	13.0	45.0	24.6	5μm
	14.0	14.0	45.0	24.6	5μm
	15.0	15.0	45.0	24.6	5μm
	16.0	16.0	45.0	24.6	5μm

Designation		DCON-WS	OAL	BD1	Accuracy
HC20 -	4.0	4.0	54.3	29.2	5μm
	6.0	6.0	54.3	29.2	5μm
	8.0	8.0	54.3	29.2	5μm
	10.0	10.0	54.3	29.2	5μm
	12.0	12.0	54.3	29.2	5μm
	14.0	14.0	54.3	29.2	5μm
	16.0	16.0	54.3	29.2	5μm
	18.0	18.0	54.3	29.2	5μm
	20.0	20.0	54.3	29.2	5μm
HC25 -	16.0	16.0	57.0	35.7	5μm
	17.0	17.0	57.0	35.7	5μm
	18.0	18.0	57.0	35.7	5μm
	19.0	19.0	57.0	35.7	5μm
	20.0	20.0	57.0	35.7	5μm
	21.0	21.0	57.0	35.7	5μm
	22.0	22.0	57.0	35.7	5μm
	23.0	23.0	57.0	35.7	5μm
	24.0	24.0	57.0	35.7	5μm
	25.0	25.0	57.0	35.7	5μm

HC Collet

Precision type

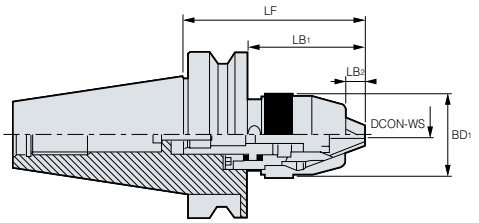


(mm)

Designation		DCON-WS	OAL	BD1	Accuracy
HC6 -	3.0P	3.0	25.0	10.5	3μm
	4.0P	4.0	25.0	10.5	3μm
	5.0P	5.0	25.0	10.5	3μm
	6.0P	6.0	25.0	10.5	3μm
HC10 -	2.0P	2.0	30.5	15.6	3μm
	3.0P	3.0	30.5	15.6	3μm
	4.0P	4.0	30.5	15.6	3μm
	5.0P	5.0	30.5	15.6	3μm
	6.0P	6.0	30.5	15.6	3μm
	7.0P	7.0	30.5	15.6	3μm
	8.0P	8.0	30.5	15.6	3μm
	9.0P	9.0	30.5	15.6	3μm
	10.0P	10.0	30.5	15.6	3μm
HC13 -	3.0P	3.0	39.0	20.1	3μm
	4.0P	4.0	39.0	20.1	3μm
	5.0P	5.0	39.0	20.1	3μm
	6.0P	6.0	39.0	20.1	3μm
	7.0P	7.0	39.0	20.1	3μm
	8.0P	8.0	39.0	20.1	3μm
	9.0P	9.0	39.0	20.1	3μm
	10.0P	10.0	39.0	20.1	3μm
	11.0P	11.0	39.0	20.1	3μm
	12.0P	12.0	39.0	20.1	3μm
	13.0P	13.0	39.0	20.1	3μm
HC16 -	3.0P	3.0	45.0	24.6	3μm
	4.0P	4.0	45.0	24.6	3μm
	5.0P	5.0	45.0	24.6	3μm
	6.0P	6.0	45.0	24.6	3μm
	7.0P	7.0	45.0	24.6	3μm
	8.0P	8.0	45.0	24.6	3μm
	9.0P	9.0	45.0	24.6	3μm
	10.0P	10.0	45.0	24.6	3μm
	11.0P	11.0	45.0	24.6	3μm
	12.0P	12.0	45.0	24.6	3μm
	13.0P	13.0	45.0	24.6	3μm
	14.0P	14.0	45.0	24.6	3μm
	15.0P	15.0	45.0	24.6	3μm
	16.0P	16.0	45.0	24.6	3μm

Designation		DCON-WS	OAL	BD1	Accuracy
HC20 -	4.0P	4.0	54.3	29.2	3μm
	6.0P	6.0	54.3	29.2	3μm
	8.0P	8.0	54.3	29.2	3μm
	10.0P	10.0	54.3	29.2	3μm
	12.0P	12.0	54.3	29.2	3μm
	14.0P	14.0	54.3	29.2	3μm
	16.0P	16.0	54.3	29.2	3μm
	18.0P	18.0	54.3	29.2	3μm
	20.0P	20.0	54.3	29.2	3μm
HC25 -	16.0P	16.0	57.0	35.7	3μm
	17.0P	17.0	57.0	35.7	3μm
	18.0P	18.0	57.0	35.7	3μm
	19.0P	19.0	57.0	35.7	3μm
	20.0P	20.0	57.0	35.7	3μm
	21.0P	21.0	57.0	35.7	3μm
	22.0P	22.0	57.0	35.7	3μm
	23.0P	23.0	57.0	35.7	3μm
	24.0P	24.0	57.0	35.7	3μm
	25.0P	25.0	57.0	35.7	3μm

BT-NPU

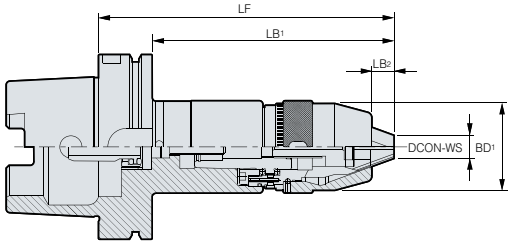


(mm)

Designation		DCON-WS	LF	BD1	LB1	LB2	kg
BT30 -	NPU8-97	1~8	97	38	75	8.0	0.8
	NPU13-125	1~13	125	50	103	12.0	1.4
BT40 -	NPU8-87	1~8	87	38	60	8.0	1.2
	NPU13-105	1~13	105	50	78	12.0	1.6
	NPU13-130	1~13	130	50	103	12.0	1.9
BT50 -	NPU13-130	1~13	130	50	92	12.0	4.5
	NPU13-190	1~13	190	50	152	12.0	5.3

• Through coolant system is not available

HSK-NPU

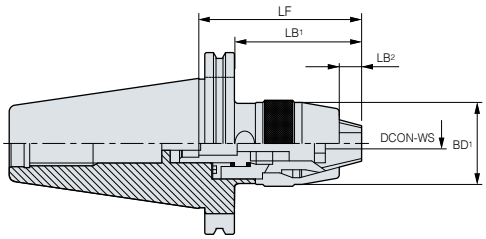


(mm)

Designation		DCON-WS	LF	BD1	LB1	LB2	kg
HSK63A -	NPU13-175	1~13	175	50	149	12.0	2.4
HSK100A -	NPU13-180	1~13	180	50	151	12.0	3.6

• Through coolant system is not available

SK-NPU

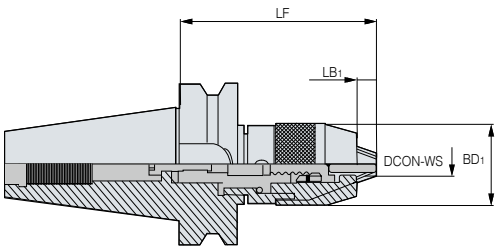


(mm)

Designation		DCON-WS	LF	BD_1	LB_1	LB_2	kg
SK40 -	NPU13-105	1~13	105	50	78	12.5	1.6
SK50 -	NPU13-111	1~13	111	50	84	12.5	3.6

• Through coolant system is not available

BT-TNPU



(mm)

Designation		DCON-WS	BD_1	LF	LB_1
BT30 -	TNPU08-75	0.3-8	38	84.5	7.5
BT40 -	TNPU08-80	0.3-8	38	87.5	7.5
	TNPU13-90	0.3-13	50	102.5	12.5
	TNPU13-130	0.3-13	50	142.5	12.5
BT50 -	TNPU13-110	0.3-13	50	122.5	12.5
	TNPU13-130	0.3-13	50	142.5	12.5
	TNPU13-190	0.3-13	50	202.5	12.5

• Through coolant system is not available

Parts

Basic			For separate purchase
Division	Chuk	Bolt	Spanner
Parts / Designation			
NPU8	NPU08	BX0620	NPU0836
NPU13	NPU13	BX0825	NPU1348

Tapping holder

DTN

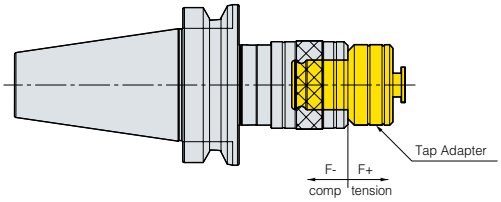
- Compact design and slim type
- Improvement of tapping force
- Tapping range: M3~M38

Code system

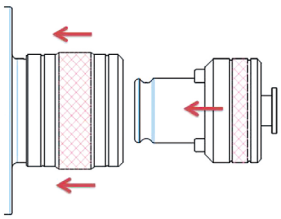
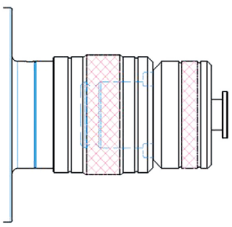
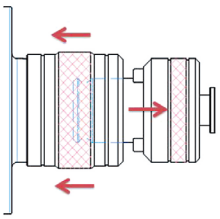
BT40	-	DTN	22	-	130
Spindle		Tapping holder	Max. chucking dia.		Length

Easy exchange of TCA (Tap adaptor)

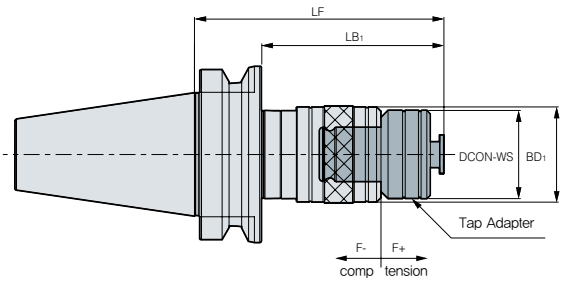
Convenient one-touch exchange type for high precision and longer tool life
Contraction of length is possible by axial floating way



How to clamp TCA and a tap holder

Before installation	After installation	Disassembly
		
1. Insert TCA pushing the cover of tap holder 2. Clamp the TCA in the Key groove and firmly	1. The cover of tap holder is placed correctly	1. Seaparate the TCA pushing the cover of tap holder

BT-DTN



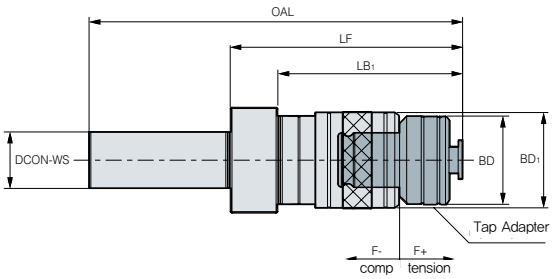
(mm)

Designation		Tapping range	LF	LB1	DCON-WS	BD1	Adaptor	F-	F +	kg
BT30 -	**DTN12-85**	M3~M12	85	63	32	39	TCA1-M	4	10	0.5
BT40 -	**DTN12-90**	M3~M12	90	63	32	39	TCA1-M	4	10	1.2
	DTN12-120	M3~M12	120	93	32	39	TCA1-M	4	10	1.5
	DTN22-130	M8~M24	130	103	50	56	TCA2-M	12.5	12.5	1.7
	DTN22-160	M8~M24	160	133	50	56	TCA2-M	12.5	12.5	2.2
BT50 -	**DTN12-100**	M3~M12	100	62	32	39	TCA1-M	4	10	3.9
	DTN12-130	M3~M12	130	92	32	39	TCA1-M	4	10	3.9
	DTN22-140	M8~M24	140	102	50	56	TCA2-M	12.5	12.5	4.3
	DTN22-170	M8~M24	170	132	50	56	TCA2-M	12.5	12.5	4.7
	DTN38-185	M16~M38	185	147	72	81	TCA3-M	20	20	5.7
	DTN38-215	M16~M38	215	177	72	81	TCA3-M	20	20	6.7

Tap Adapter (TCA) **E80**

• Through coolant system is not available

S-DTN



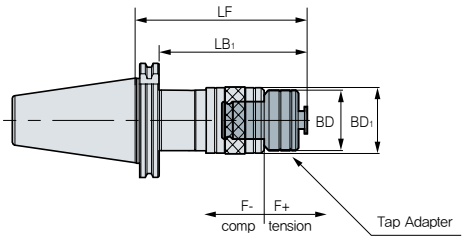
(mm)

Designation		Tapping range	BD	DCON-WS	OAL	BD1	LF	LB1	Adaptor	F-	F+	kg
S32 -	**DTN12-90**	M3-M12	32	32	170	39	90	63	TCA1	4	10	1.0
	DTN22-130	M8-M24	50	32	210	56	130	103	TCA2	12.5	12.5	1.8

Tap Adapter (TCA) **E80**

• Through coolant system is not available

SK-DTN



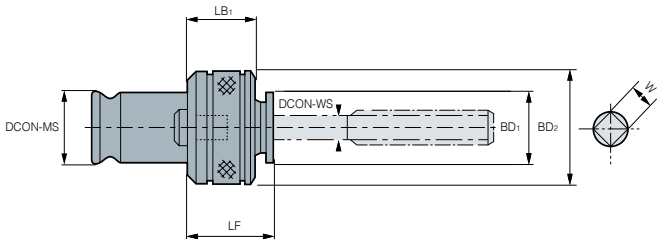
(mm)

Designation		Tapping range	BD	LF	BD1	LB1	Adaptor	F-	F+	kg
SK40 -	**DTN12-90**	M3~M12	32	90	39	70.9	TCA1-M	4	10	1.0
	DTN22-130	M8~M22	50	130	56	110.9	TCA2-M	12.5	12.5	1.6
SK50 -	**DTN12-100**	M3~M12	32	100	39	80.9	TCA1-M	4	10	2.9
	DTN22-140	M8~M22	50	140	56	120.9	TCA2-M	12.5	12.5	3.5

Tap Adapter (TCA) **E80**

• Through coolant system is not available

TCA Tap Adapter



(mm)

Designation		DCON-WS	LF	DCON-MS	LB1	BD1	BD2	W	kg
TCA1 -	M3	4	27	19	25	19	32	3	0.2
	M4	5	27	19	25	19	32	4	0.2
	M5	6	27	19	25	19	32	4	0.2
	M6	6	27	19	25	19	32	4	0.2
	M8	6.2	27	19	25	19	32	5	0.2
	M10	7	27	19	25	19	32	6	0.2
	M11	8	27	19	25	19	32	6	0.2
	M12	9	27	19	25	19	32	7	0.2
TCA2 -	M8	6.2	34	31	31	29	50	5	0.5
	M10	7	34	31	31	29	50	6	0.5
	M12	8.5	34	31	31	29	50	7	0.5
	M14	11	34	31	31	29	50	8	0.5
	P1/4	11	34	31	31	29	50	9	0.5
	M16	13	34	31	31	29	50	10	0.5
	M18	14	34	31	31	29	50	11	0.5
	M20	15	34	31	31	29	50	12	0.5
	M22	17	34	31	31	29	50	13	0.5
	P1/2	18	34	31	31	29	50	14	0.5
	M24	19	34	31	31	29	50	15	0.5
TCA3 -	M16	13	45	48	41	44	72	10	1.4
	M18	14	45	48	41	44	72	11	1.4
	M20	15	45	48	41	44	72	12	1.4
	M22	17	45	48	41	44	72	13	1.4
	M24	19	45	48	41	44	72	15	1.4
	M27	20	45	48	41	44	72	15	1.4
	M30	23	45	48	41	44	72	17	1.4
	M33	25	45	48	41	44	72	19	1.4
	M36	28	45	48	41	44	72	21	1.4

• Through coolant system is not available

High speed synchro tapping chuck

DST

- Tapping chuck for high speed machining
- Specially designed structure for absorbing thrust load and preventing damage on the tap
- Through coolant system available
- Applicable range: M1~M22

Code system

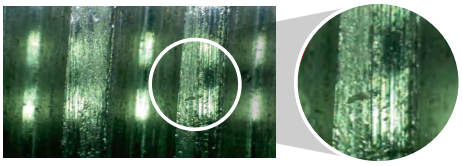
BT40	-	DST	22	-	110
Spindle		Tapping holder	Max. Chucking dia.		Length

Excellent performance, precise machining

Expanded machining area

DST22
(vc = 100 m/min)

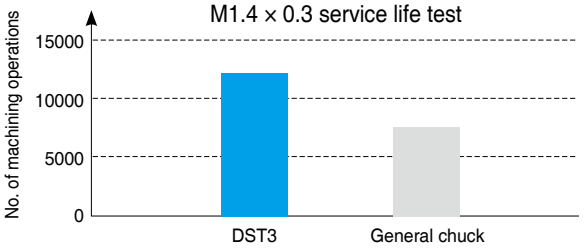
Excellent cutting face



Conventional one

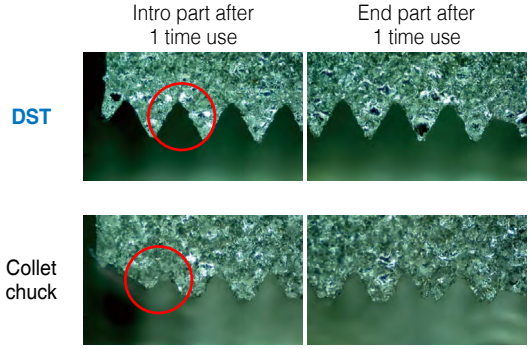
Exclusive collet for tapping

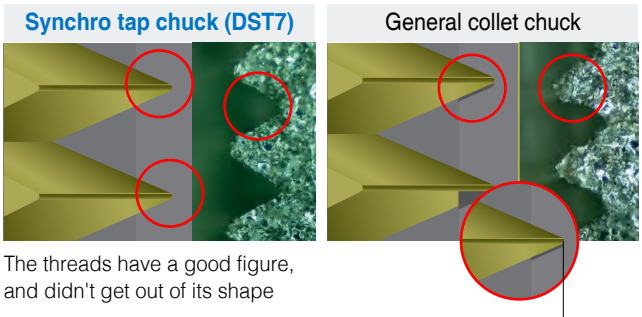
- At tapping work use of TER collet
- DST3: Use of ER11 collet



Increased tool service life versus collet chuck use

Comparison of thread figures

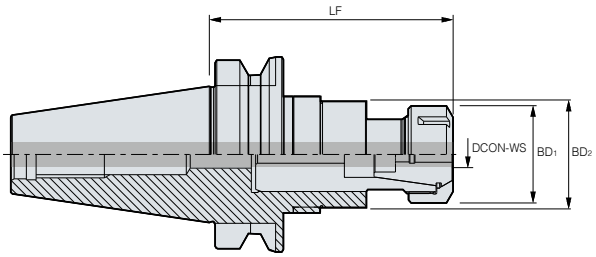




The threads have a good figure, and didn't get out of its shape

The thread is out of its shape due to synchronization error

BT-DST



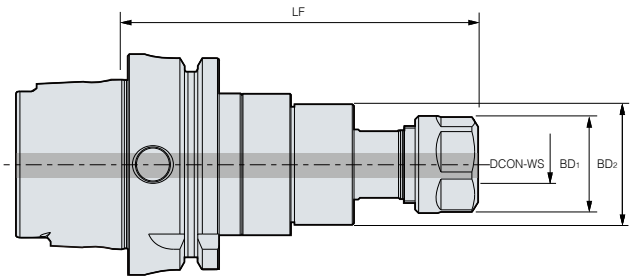
(mm)

Designation		DCON-WS	LF	BD1	BD2	Collet	F-	F+	kg
BT30 -	**DST3-70**	M1~M3	70	20	19	ER11	0.5	0.5	0.5
	DST10-100	M3~M10	100	40.4	28	TER16	0.5	0.5	0.8
BT40 -	**DST3-70**	M1~M3	70	20	19	ER11	0.5	0.5	1.0
	DST10-100	M3~M10	100	40.4	28	TER16	0.5	0.5	1.3
	DST22-110	M6~M22	110	60	50	TER32	0.7	0.7	1.7
BT50 -	**DST10-110**	M3~M10	110	60	50	TER16	0.5	0.5	3.8
	DST22-130	M6~M22	130	60	50	TER32	0.7	0.7	4.5

Application Collet **E57, E84**

• Through coolant system is optional

HSK-DST



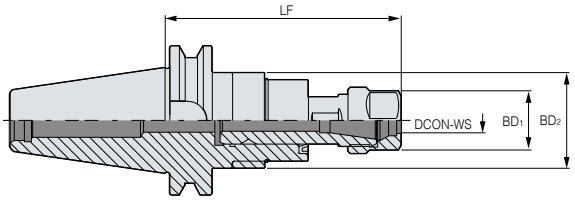
(mm)

Designation		DCON-WS	LF	BD1	BD2	Collet	F-	F+	kg
HSK63A -	**DST3-80**	M1~M3	80	19	20	ER11	0.5	0.5	0.7
	DST10-100	M3~M10	100	28	40.4	TER16	0.5	0.5	0.9
	DST22-130	M6~M22	130	49.5	60	TER32	0.7	0.7	1.8

Application Collet **E57, E84**

• Through coolant system is optional

SK-DST



(mm)

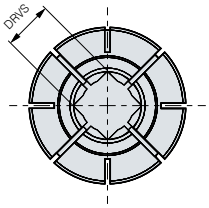
Designation		DCON-WS	LF	BD1	BD2	Collet	F-	F+	kg
SK30 -	**DST3-70**	M1~M3	70	19	20	ER11	0.2	0.2	0.4
SK40 -	**DST3-70**	M1~M3	70	19	20	ER11	0.2	0.2	0.9
	DST10-110	M3~M10	110	28	35	TER16	0.5	0.5	1.2
	DST22-120	M6~M22	120	50	54	TER32	0.7	0.7	1.8
SK50 -	**DST10-110**	M3~M10	110	28	35	TER16	0.5	0.5	3.0
	DST22-120	M6~M22	120	50	54	TER32	0.7	0.7	3.7

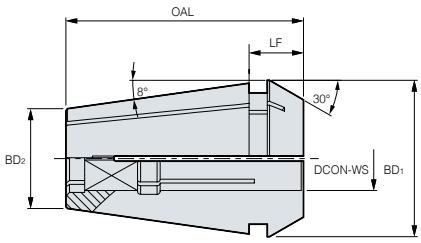
Application Collet **E57, E84**

• Through coolant system is optional

TER

Tap Collet





(mm)

Designation		Tapping Range	DCON-WS	OAL	DRVS	BD_1	BD_2	LF	kg
TER16 -	**4x3.2**	M3	4	27.5	3.2	16.74	10.1	6.3	0.03
	5x4	M4	5	27.5	4	16.74	10.1	6.3	0.03
	5.5x4.5	M5	5.5	27.5	4.5	16.74	10.1	6.3	0.02
	6x4.5	M6,U1/4	6	27.5	4.5	16.74	10.1	6.3	0.02
	6.2x5	M7, M8	6.2	27.5	5	16.74	10.1	6.3	0.02
	7x5.5	M9, M10, U3/8	7	27.5	5.5	16.74	10.1	6.3	0.02
TER20 -	**5x4**	M4	5	31.5	4	20.74	13.2	7.2	0.05
	5.5x4.5	M5	5.5	31.5	4.5	20.74	13.2	7.2	0.05
	6x4.5	M6,U1/4	6	31.5	4.5	20.74	13.2	7.2	0.05
	6.2x5	M7, M8	6.2	31.5	5	20.74	13.2	7.2	0.04
	7x5.5	M9, M10, U3/8	7	31.5	5.5	20.74	13.2	7.2	0.05
	8x6	M11, U7/16, P1/8	8	31.5	6	20.74	13.2	7.2	0.04
	8.5x6.5	M12	8.5	31.5	6.5	20.74	13.2	7.2	0.04
TER25 -	**5x4**	M4	5	34	4	25.74	17.6	7.5	0.9
	5.5x4.5	M5	5.5	34	4.5	25.74	17.6	7.5	0.8
	6x4.5	M6	6	34	4.5	25.74	17.6	7.5	0.8
	6.2x5	M7, M8	6.2	34	5	25.74	17.6	7.5	0.1
	7x5.5	M9, M10, U3/8	7	34	5.5	25.74	17.6	7.5	0.8
	8.5x6.5	M12	8.5	34	6.5	25.74	17.6	7.5	0.8
TER32 -	**6x4.5**	M6,U1/4	6.2	40	4.5	32.74	23.1	8.2	0.2
	6.2x5	M7, M8	M8	40	5	32.74	23.1	8.2	0.2
	7x5.5	M9, M10, U3/8	7	40	5.5	32.74	23.1	8.2	0.2
	8X6	M11, U7/16, P1/8	8	40	6	32.74	23.1	8.2	0.2
	8.5x6.5	M12	8.5	40	6.5	32.74	23.1	8.2	0.2
	10.5x8	M14, U9/16	10.5	40	8	32.74	23.1	8.2	0.2
	12.5x10	M16	12.5	40	10	32.74	23.1	8.2	0.2
	14x11	M18, P3/8	14	40	11	32.74	23.1	8.2	0.1
	15x12	M20	15	40	12	32.74	23.1	8.2	0.1
	17x13	M22, U7/8	17	40	13	32.74	23.1	8.2	0.1
	11x9	P1/4	11	40	9	32.74	23.1	8.2	0.2
	12x9	U5/8	12	40	9	32.74	23.1	8.2	0.2
	9x7	U1/2	9	40	7	32.74	23.1	8.2	0.2

• Water proof tapping is possible with the use of RTJW and nuts (limited to the right sizes)

Tap Extension Holder

TEH

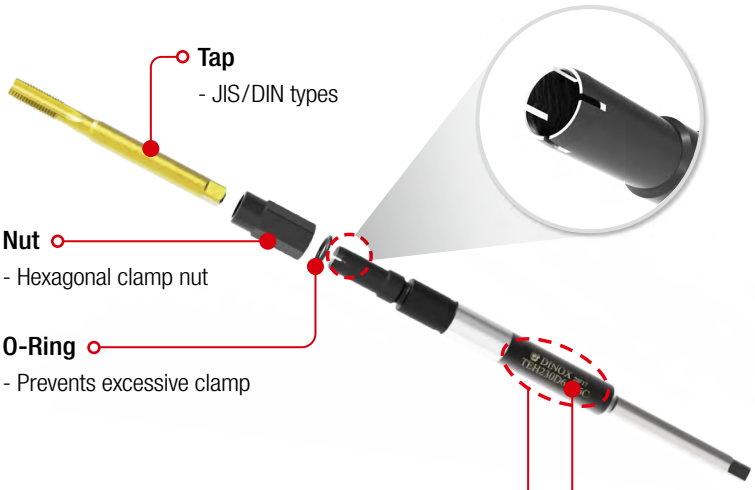
Code system

TEH	230	D6	J	M6	-	C
Tap Extension Holder	Length	Shank dia.	Type J : JIS NON : DIN	Tap size		Type C : Coolant NON : General

Features

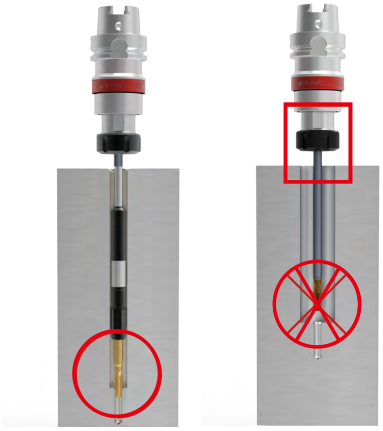
- Product specialized for processing deep, narrow hole taps
- Excellent rigidity and stable run-out due to the short incision unit
- Excellent economic efficiency compared to general long tap
- The application of O-Ring prevents over clamping
- Optimized for processing narrow, deep holes such as the hole of an engine

Structure



※ TEH230D10-M10
- Tap Extension Holder
- 230 : Full length
- D10 : END TOOL ∅ / TEH SHANK ∅
- M10 : Tap size

Processing of deep holes



[TEH] Processing O

[General long Tap] Processing X

Full length comparison	TEH	General long tap
M10	230mm	150mm
M22	330mm	200mm

※ Since the full length is longer than that of the general long tap, it is favorable for processing narrow, deep holes.

TEH Setting Method

DST
High speed synchro tapping chuck

TER Collet

TEH
Tap Extension Holder

Tap
(M4~M22)

TEH (JIS)

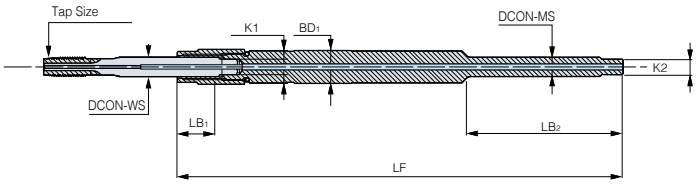


Fig. 1

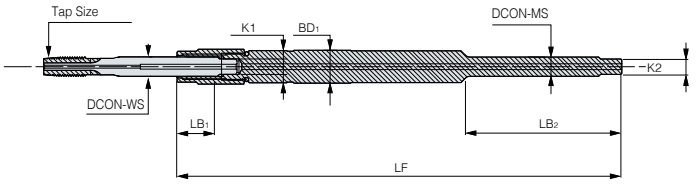


Fig. 2

(mm)

Designation		Tapping range	LB1	LB2	LF	BD1	DCON-WS	DCON-MS	K1	K2	NutØ	Fig.
TEH230	**D5J-M4**	M4	18	50	230	11	5	6	4	4.5	12.1	2
	D6J-M6C	M6	18	50	230	12	6	6	4.5	4.5	13.3	1
	D6.2J-M8C	M8	18	65	230	12	6.2	6.2	5	5	13.3	1
	D7J-M10C	M10	18	65	230	13	7	7	5.5	5.5	14.4	1
	D8.5J-M12C	M12	22	65	230	14	8.5	8.5	6.5	6.5	15.6	1
TEH330	**D10.5J-M14C**	M14	25	70	330	16	10.5	10.5	8	8	17.9	1
	D12.5J-M16C	M16	25	70	330	18	12.5	12.5	10	10	19.9	1
	D14J-M18C	M18	25	70	330	20	14	14	11	11	21.9	1
	D15J-M20C	M20	25	75	330	21	15	15	12	12	22.9	1
	D17J-M22C	M22	25	75	330	23	17	17	13	13	25.9	1

• Through coolant system is installed (Fig.2 Designation is non-coolant type)

TEH (DIN)

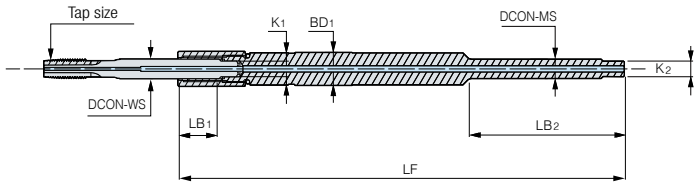


Fig. 1

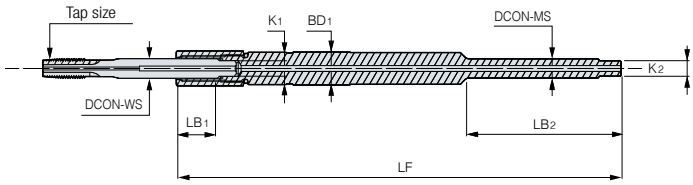


Fig. 2

(mm)

Designation		Tapping range	LB1	LB2	LF	BD1	DCON-WS	DCON-MS	K1	K2	NutØ	Fig.
TEH230	**D4.5-M4**	M4	18	50	230	10	4.5	6	3.4	4.5	11.1	2
	D6-M6C	M6	20	50	230	12	6	7	4.9	5.5	13.3	1
	D8-M8C	M8	23	65	230	14	8	8	6.3	6.2	15.6	1
	D10-M10C	M10	24	65	230	16	10	10	8	8	17.9	1
	D9-M12C	M12	23	65	230	15	9	9	7	7	16.8	1
TEH330	**D11-M14C**	M14	26	70	330	17	11	11	9	9	19.1	1
	D12-M16C	M16	26	70	330	18	12	12	9	9	19.9	1
	D14-M18C	M18	28	70	330	20	14	14	11	11	21.9	1
	D16-M20C	M20	28	75	330	22	16	16	12	12	23.9	1
	D18-M22C	M22	28	75	330	24	18	18	14.5	14.5	25.9	1

• Through coolant system is installed (Fig.2 Designation is non-coolant type)

DINE Synchro Tapping ER Collet

STER PAT.

- Floating function applicable for tap machining just by fastening the ER collet chuck
- Tap size can be converted just by replacing the connector
- Tap : M6~M16

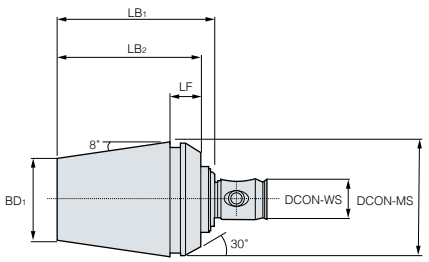
Code system

ST	ER	32C	M6
Synchronizing Tapping Collet	Collet	Collet size	Tool dia.

Details

Detailed specifications

COLLET



CONNECTOR

Fig. 1

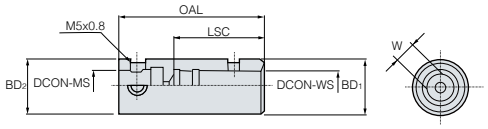
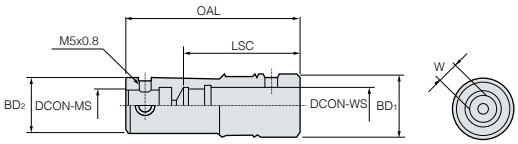


Fig. 2



※COLLET

Designation	DCON-MS	BD1	DCON-WS	LB1	LB2	LF	Fig.
STER32	32	23.1	11	44	40	8.2	1

※CONNECTOR

Designation	BD1	BD2	DCON-WS	DCON-MS	OAL	LSC	W	Fig.
STER32C-M6	19	21	6	11	50	29.5	4.5	2
STER32C-M8	19	21	6.2	11	50	30	5	2
STER32C-M10	19	21	7	11	50	29	5.5	2
STER32C-M12	19	21	8.5	11	50	30.5	6.5	2
STER32C-M14	19	21	10.5	11	50	31	8	2
STER32C-M16	19	21	12.5	11	50	40.5	10	2

PART

BTT0506F

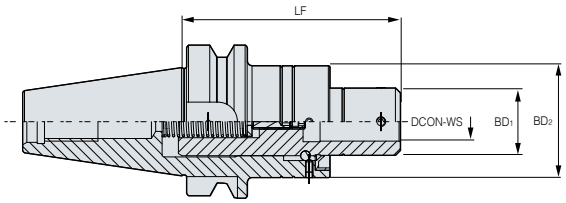
BT0504

PART

LW-2.5

BT-OFH

Floating holder



(mm)

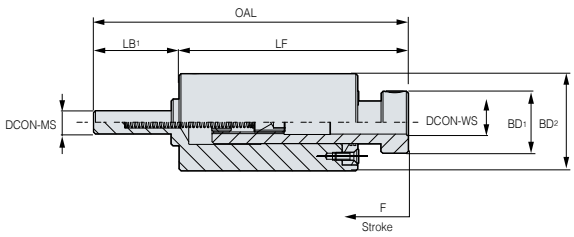
Designation	DCON-WS	LF	BD1	BD2	Sleeve stroke(F)	RPMX
BT30-OFH6-75	6	75	19.7	38	6	15,000

Application Collet **E57, E84**

• Through coolant system is not available

ST-OFH

Floating holder



(mm)

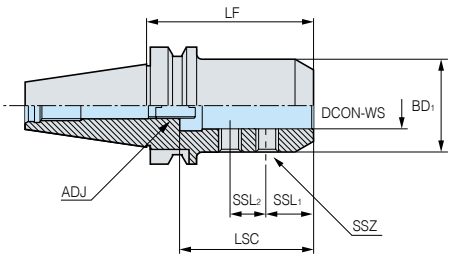
Designation	DCON-WS	OAL	BD1	BD2	DCON–MS	LB1	LF	Sleeve stroke(F)	RPMX
ST06-OFH6-60	6	81	16	25	6	59	22	6	15,000

Application Collet **E57, E84**

• Through coolant system is not available

BT-SLA

Side Lock Arbor



(mm)

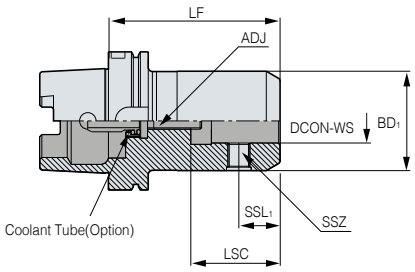
Designation		DCON-WS	LF	BD1	LSC	SSL1	SSL2	SSZ	ADJ	kg
BT30 -	**SLA16-90**	16	90	40	72	25	20	M10	M12	0.9
	SLA20-90	20	90	50	72	25	20	M12	M12	1.2
	SLA25-90	25	90	50	72	25	20	M12	M12	1.1
BT40 -	**SLA16-90**	16	90	40	72	25	20	M10	M12	1.4
	SLA20-90	20	90	50	72	25	20	M12	M12	1.8
	SLA25-90	25	90	50	72	25	20	M12	M12	1.6
	SLA32-90	32	90	60	82	25	25	M14	M12	1.8
	SLA32-105	32	105	60	82	25	25	M14	M12	2.0
	SLA40-105	40	105	80	82	25	25	M16	M12	2.9
BT50 -	**SLA16-90**	16	90	40	72	25	20	M10	M12	4
	SLA20-105	20	105	50	72	25	20	M12	M12	4.4
	SLA25-105	25	105	50	72	25	20	M12	M12	4.3
	SLA25-135	25	135	50	72	25	20	M12	M12	4.6
	SLA25-165	25	165	50	82	25	20	M12	M12	5.2
	SLA32-105	32	105	60	82	25	25	M14	M12	4.5
	SLA32-135	32	135	60	82	25	25	M14	M12	5.1
	SLA32-165	32	165	60	82	25	25	M14	M12	5.7
	SLA40-105	40	105	90	82	25	20	M16	M12	6.1
	SLA40-150	40	150	90	82	25	25	M16	M12	8.1
	SLA42-105	42	105	90	82	25	25	M16	M12	5.9

Application Collet **E57, E84**

• Through coolant system is installed

HSK-SLA

Side Lock Arbor



(mm)

Designation		DCON-WS	LF	BD1	LSC	SSL1	SSZ	ADJ	kg
HSK30A -	SLA20-100	20	100	52	51	25	M8	M12	1.6
	SLA25-105	25	105	65	59	25	M8	M12	2.1
	SLA32-105	32	105	72	63	30	M5	M12	2.3
HSK100A -	SLA20-105	20	105	52	51	25	M16	M12	3.1
	SLA25-110	25	110	65	59	25	M18	M12	3.8
	SLA32-125	32	125	72	63	30	M20	M12	4.4
	SLA40-135	40	135	80	73	32	M20	M12	5.2

Application Collet **E57, E84**

• Through coolant system is installed

Parts

Division	For separate purchase
Internal coolant system	

Classification by shank	
HSK63A	HSK63A-CNS
HSK100A	HSK100A-CNS

SK-SLA

Side Lock Arbor

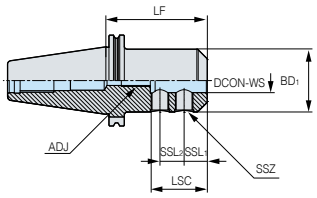


Fig. 1

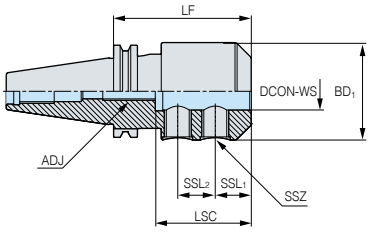


Fig. 2

(mm)

Designation		DCON-WS	LF	BD_1	LSC	SSL_1	SSL_2	SSZ	ADJ	Fig.	kg
SK40 -	**SLA16-75**	16	75	48	49	24	-	M14	M12	1	1.4
	SLA20-75	20	75	52	51	25	-	M16	M12	1	1.5
	SLA25-95	25	95	65	59	24	25	M18	M12	2	2.1
	SLA32-105	32	105	72	63	24	28	M20	M12	2	2.8
SK50 -	**SLA16-90**	16	90	48	49	24	-	M14	M12	1	3.5
	SLA20-90	20	90	52	51	25	-	M16	M12	1	3.6
	SLA25-105	25	105	65	59	24	25	M18	M12	1	4.5
	SLA32-120	32	120	72	63	24	28	M20	M12	1	5.2
	SLA40-120	40	120	80	73	30	32	M20	M12	1	5.6

Application Collet **E57, E84**

• Through coolant system is not available

Parts

Division	Basic			For separate purchase	
	Set screw		Adjust screw	Wrench	
Parts / Designation					
	BT Type	HSK Type		BT Type	HSK Type
SLA16	BTF1010	BTF1414-1.5	M1230C	LW-5	LW-6
SLA20	BTF1212-1.5	BTF1616-1.5		LW-6	LW-8
SLA25	BTF1212-1.5	BTF1818-1.5		LW-6	LW-8
SLA32	BTF1414-1.5	BTF2020-1.5		LW-6	LW-10
SLA40	BTF1624-1.5	BTF2020-1.5		LW-8	LW-10
SLA42	BTF1624-1.5	BTF2020-1.5		LW-8	LW-10

SK-MTA

Morse Taper Arbor

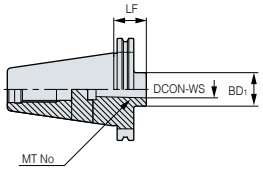


Fig. 1

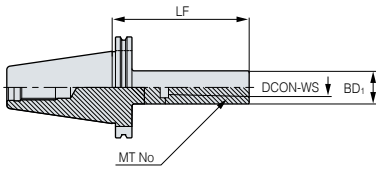


Fig. 2

(mm)

Designation		MT No.	LF	DCON-WS	BD_1	Fig.	kg
SK50 -	**MTA3-45**	3	45	23.825	40	1	2.7
	MTA3-150	3	150	23.825	40	2	3.6
	MTA4-75	4	75	31.267	50	1	2.9

Application Collet **E57, E84**

• Through coolant system is not available

DBT-MD

Modular Arbor

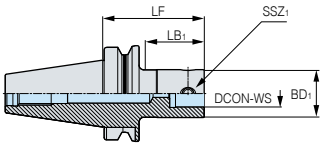


Fig. 1

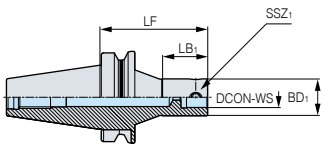


Fig. 2

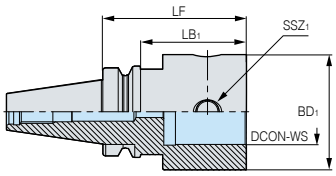


Fig. 3

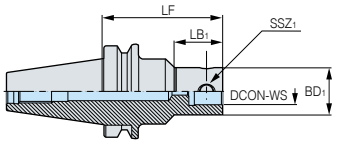


Fig. 4

(mm)

Designation		DCON-WS	LF	BD1	LB1	SSZ1	Fig.	kg
DBT30 -	**MD19F-70R**	11	70	19	27	M5	4	0.5
	MD25F-90R	14	90	25	43	M6	4	0.6
	MD32F-80R	18	80	32	39	M8	4	0.7
	MD40F-45	22	45	40	23	M10	1	0.5
	MD40F-80R	22	80	40	49	M10	4	0.8
	MD50F-70	28	70	50	40	M12	3	0.9
DBT40 -	**MD19F-70**	11	70	19	43	M5	1	1.0
	MD25F-95	14	95	25	68	M6	1	1.1
	MD25F-105R	14	105	25	40	M6	2	1.2
	MD32F-100	18	100	32	73	M8	1	1.2
	MD32F-115R	18	115	32	45	M8	2	1.5
	MD40F-50	22	50	40	23	M10	1	1.2
	MD40F-110R	22	110	40	60	M10	2	1.6
	MD40F-115	22	115	40	88	M10	1	1.6
	MD50F-100R	28	100	50	60	M12	2	1.8
	MD50F-105	28	105	50	78	M12	1	1.9
	MD63F-64	36	64	63	37	M16	3	1.5
	MD63F-90	36	90	63	63	M16	3	2.1
	MD63F-110	36	110	63	83	M16	3	2.5
	MD80F-100	45	100	80	73	M16	3	2.9

Application Collet **E54, E84**

• Through coolant system is installed

DBT-MD

Modular Arbor

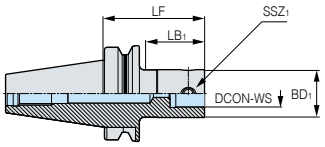


Fig. 1

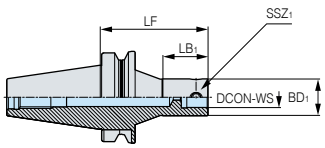


Fig. 2

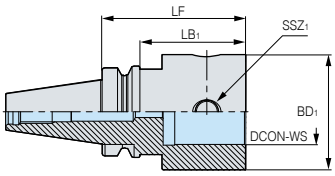


Fig. 3

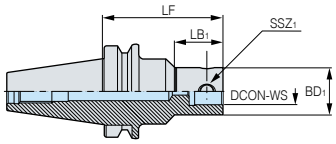


Fig. 4

(mm)

Designation		DCON-WS	LF	BD1	LB1	SSZ1	Fig.	kg
DBT50 -	MD19F-85	11	85	19	45	M5	1	3.7
	MD19F-100	11	100	19	60	M5	1	3.8
	MD25F-105	14	105	25	64	M6	1	3.9
	MD25F-120R	14	120	25	40	M6	2	4.0
	MD32F-110	18	110	32	67	M8	1	4.1
	MD32F-115R	18	115	32	45	M8	2	4.2
	MD32F-235R	18	235	32	115	M8	2	5.5
	MD40F-60	22	60	40	22	M10	1	3.7
	MD40F-125R	22	125	40	59	M10	2	4.3
	MD40F-145	22	145	40	102	M10	1	4.5
	MD40F-195R	22	195	40	83	M10	4	4.8
	MD40F-230R	22	230	40	180	M10	2	5.0
	MD50F-125	28	125	50	82	M12	1	4.6
	MD50F-160R	28	160	50	61	M12	2	5.8
	MD50F-225R	28	225	50	125	M12	4	6.0
	MD50F-250R	28	250	50	81	M12	2	7.0
	MD63F-75	36	75	63	35	M16	1	4.2
	MD63F-130	36	130	63	87	M16	1	5.3
	MD63F-140	36	140	63	97	M16	1	5.5
	MD63F-140R	36	140	63	70	M16	2	5.7
	MD63F-195R	36	195	63	120	M16	4	6.8
	MD63F-230R	36	230	63	149	M16	4	7.5
	MD63F-240R	36	240	63	190	M16	2	7.8
	MD80F-75	45	75	80	36	M16	1	4.4
	MD80F-110	45	110	80	69	M16	1	5.8
	MD80F-160	45	160	80	119	M16	1	8.0
	MD90F-75	45	75	90	37	M16	1	4.8
	MD90F-145	45	145	90	107	M16	1	7.4

Application Collet **E54, E84**

• Through coolant system is installed

BT-MD

Modular Arbor

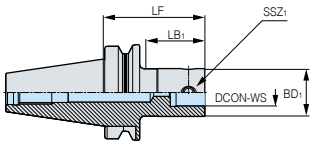


Fig. 1

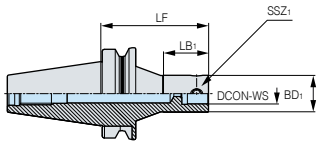


Fig. 2

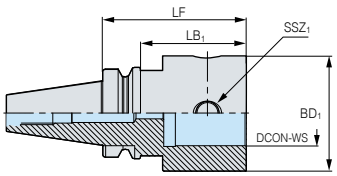


Fig. 3

(mm)

Designation		DCON-WS	LF	BD1	LB1	SSZ1	Fig.	kg
BT30 -	MD19F-70	11	70	19	45	M5	1	0.5
	MD25F-90	14	90	25	63	M6	1	0.6
	MD32F-80	18	80	32	55	M8	1	0.7
	MD40F-45	22	45	40	22	M10	1	0.5
	MD40F-60	22	60	40	36	M10	1	0.7
	MD40F-80	22	80	40	56	M10	1	0.9
	MD50F-70	28	70	50	48	M12	3	0.9
BT40 -	MD19F-70	11	70	19	40	M5	1	1.0
	MD25F-95	14	95	25	63	M6	1	1.1
	MD25F-105R	14	105	25	40	M6	2	1.2
	MD32F-100	18	100	32	70	M8	1	1.2
	MD32F-115R	18	115	32	45	M8	2	1.5
	MD40F-60	22	60	40	31	M10	1	1.1
	MD40F-110R	22	110	40	60	M10	2	1.6
	MD40F-115	22	115	40	83	M10	1	1.6
	MD50F-60	28	60	50	33	M12	1	1.3
	MD50F-100R	28	100	50	50	M12	2	1.8
	MD50F-105	28	105	50	73	M12	1	1.8
	MD63F-64	36	64	63	37	M16	3	1.5
	MD63F-90	36	90	63	63	M16	3	2.0
	MD63F-110	36	110	63	83	M16	3	2.4
	MD63F-135	36	135	63	108	M16	3	3.0
	MD80F-100	45	100	80	73	M16	3	2.9

Application Collet **E57, E84**

• Through coolant system is installed

BT-MD

Modular Arbor

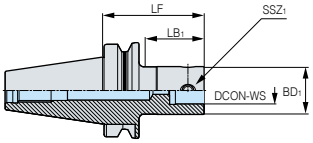


Fig. 1

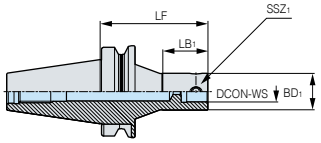


Fig. 2

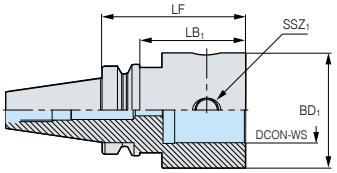


Fig. 3

(mm)

Designation		DCON-WS	LF	BD_1	LB_1	SSZ_1	Fig.	kg
BT50 -	**MD19F-85**	11	85	19	44	M5	1	3.7
	MD19F-100	11	100	19	62	M5	1	3.7
	MD25F-105	14	105	25	62	M6	1	3.8
	MD25F-120R	14	120	25	40	M6	2	3.8
	MD32F-110	18	110	32	67	M8	1	4.0
	MD32F-115R	18	115	32	45	M8	2	4.1
	MD32F-235R	18	235	32	115	M8	2	5.5
	MD40F-60	22	60	40	22	M10	1	3.7
	MD40F-125R	22	125	40	59	M10	2	3.8
	MD40F-145	22	145	40	107	M10	1	4.3
	MD40F-195	22	195	40	152	M10	1	4.8
	MD40F-230R	22	230	40	180	M10	2	5.0
	MD50F-125	28	125	50	82	M12	1	4.6
	MD50F-160R	28	160	50	61	M12	2	5.7
	MD50F-225	28	225	50	182	M12	1	6.0
	MD50F-250R	28	250	50	81	M12	2	7.0
	MD63F-75	36	75	63	35	M16	1	4.2
	MD63F-130	36	130	63	87	M16	1	5.3
	MD63F-140	36	140	63	92	M16	1	5.5
	MD63F-140R	36	140	63	80	M16	2	5.7
	MD63F-195	36	195	63	152	M16	1	6.8
	MD63F-230	36	230	63	187	M16	1	7.5
	MD63F-240R	36	240	63	190	M16	2	7.8
	MD80F-75	45	75	80	36	M16	1	4.3
	MD80F-110	45	110	80	69	M16	1	5.7
	MD80F-175	45	175	80	134	M16	1	8.0
	MD90F-75	45	75	90	36	M16	1	4.8
	MD90F-145	45	145	90	104	M16	1	7.4
	MD90F-195	45	195	90	154	M16	1	9.4

Application Collet **E57, E84**

• Through coolant system is installed

HSK-MD

Modular Arbor

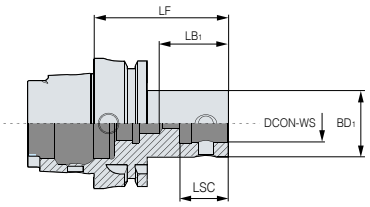


Fig. 1

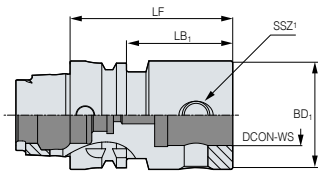


Fig. 2

(mm)

Designation		DCON-WS	LF	BD_1	LB_1	LSC	SSZ_1	Fig.	kg
HSK63A -	MD19F-60	11	60	19	31	15.5	M5	1	0.7
	MD25F-60	14	60	25	31	18.5	M6	1	0.7
	MD32F-65	18	65	32	36	23.5	M8	1	0.8
	MD40F-70	22	70	40	41	29	M10	1	0.9
	MD50F-85	28	85	50	58	36	M12	1	1.3
	MD63F-95	36	95	63	69	46	M16	2	1.7
HSK100A -	MD19F-60	11	60	19	19	15.5	M5	1	2.1
	MD25F-60	14	60	25	20	18.5	M6	1	2.1
	MD32F-65	18	65	32	26	23.5	M8	1	2.1
	MD40F-70	22	70	40	38	29	M10	1	2.3
	MD50F-80	28	80	50	48	36	M12	1	2.6
	MD63F-90	36	90	63	58	46	M16	1	3
	MD80F-105	45	105	80	73	57	M16	1	4.2
	MD90F-105	45	105	90	76	57	M16	1	4.7

Application Collet **E57, E84**

• Through coolant system installed

Parts

For separate purchase		
Division	Clamp bolt	Wrench
Designation \ Parts		
HSK63A	HSK63A-CNS	HSK63-WRENCHI(C)
HSK100A	HSK100A-CNS	HSK100-WRENCHI(C)

SK-MD

Modular Arbor

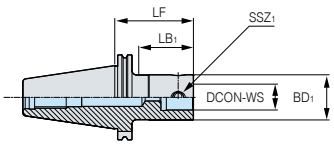


Fig. 1

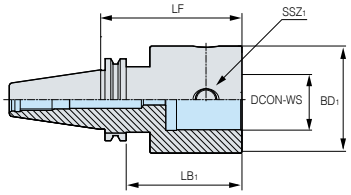


Fig. 2

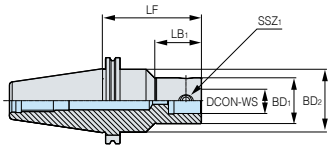


Fig. 3

(mm)

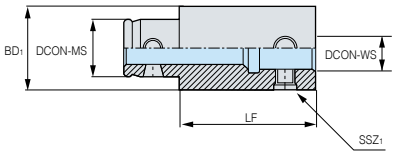
Designation		DCON-WS	LF	BD_1	BD_2	LB_1	SSZ_1	Fig.	kg
SK40 -	**MD19F-80R**	11	80	19	30	12	M5	3	1.0
	MD25F-80R	14	80	25	35	22	M6	3	1.1
	MD32F-115R	18	115	32	42	36	M8	3	1.5
	MD40F-60	22	60	40	-	40	M10	1	1.1
	MD40F-100	22	100	40	-	79	M10	1	1.4
	MD50F-75	28	75	50	-	55	M10	1	1.5
	MD50F-100	28	100	50	-	80	M12	1	1.8
	MD63F-70	36	70	63	-	50	M16	2	1.4
SK50 -	**MD19F-85R**	11	85	19	40	12	M5	3	3.0
	MD25F-80R	14	80	25	44	22	M6	3	3.1
	MD25F-105R	14	105	25	44	22	M6	3	3.3
	MD32F-110	18	110	32	-	87	M8	1	3
	MD32F-110R	18	110	32	50	36	M8	3	3.5
	MD40F-100	22	100	40	-	75	M10	1	3.2
	MD40F-145	22	145	40	-	120	M10	1	3.5
	MD40F-220R	22	220	40	60	83	M10	3	5.6
	MD50F-125R	28	125	50	65	60	M12	3	4.3
	MD50F-240R	28	240	50	65	125	M12	3	6.6
	MD63F-75	36	75	63	-	52	M16	1	3.6
	MD63F-130	36	130	63	-	107	M16	1	4.7
	MD63F-230R	36	230	63	80	149	M16	3	7.9
	MD80F-95	45	95	80	-	75	M16	1	4.8
	MD80F-150	45	150	80	-	130	M16	1	6.8
	MD90F-115	45	115	90	-	95	M16	2	6.3
	MD90F-165	45	165	90	-	145	M16	2	8.1

Application Collet **E57, E84**

• Through coolant system installed

EXT

Extension Bar



(mm)

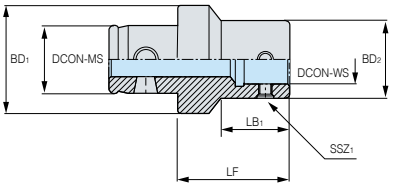
Designation		DCON-MS	LF	BD1	DCON-WS	SSZ1	kg
EXT	1930F	11	30	19	11	M5	0.1
	1950F	11	50	19	11	M5	0.1
	2530F	14	30	25	14	M6	0.1
	2550F	14	50	25	14	M6	0.2
	3235F	18	35	32	18	M8	0.2
	3260F	18	60	32	18	M8	0.4
	4040F	22	40	40	22	M10	0.4
	4090F	22	90	40	22	M10	0.9
	5050F	28	50	50	28	M12	0.7
	50100F	28	100	50	28	M12	1.4
	6360F	36	60	63	36	M16	1.4
	63120F	36	120	63	36	M16	2.9
	8070F	45	70	80	45	M16	2.5
	80120F	45	120	80	45	M16	4.5
	9080F	45	80	90	45	M16	3.8
	90130F	45	130	90	45	M16	6.4

Application Collet **E57, E84**

• Through coolant system is installed

RDC

Reducer Bar



(mm)

Designation		DCON-MS	LF	BD1	DCON-WS	BD2	LB1	SSZ1	kg
RDC	3225F	18	30	32	14	25	17.25	M6	0.1
	4025F	22	30	40	14	25	16.53	M6	0.3
	4032F	22	30	40	18	32	18.55	M8	0.2
	5025F	28	30	50	14	25	16.36	M6	0.3
	5032F	28	40	50	18	32	21.75	M8	0.3
	5040F	28	40	50	22	40	24.75	M10	0.5
	6325F	36	30	63	14	25	15.84	M6	0.6
	6332F	36	40	63	18	32	29.62	M8	0.6
	6340F	36	40	63	22	40	26.85	M10	0.7
	6350F	36	45	63	28	50	33.19	M12	0.9
	8040F	45	40	80	22	40	24.57	M10	1.2
	8050F	45	45	80	28	50	30.91	M12	1.3
	8063F	45	50	80	36	63	34.66	M16	1.6

Application Collet **E57, E84**

• Through coolant system is installed

ANGULAR HEAD

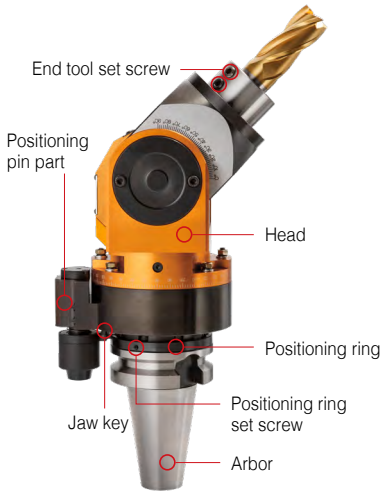
ANGULAR HEAD

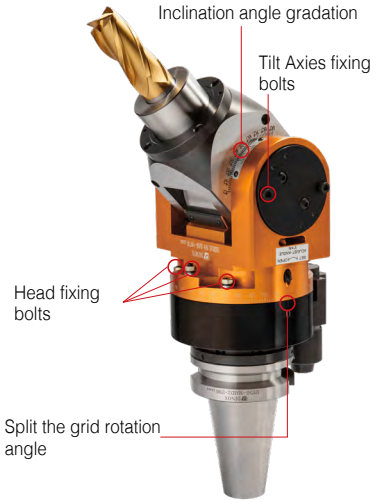
- Doubled effect by one equipment / Available for various angles
- Lighter aluminum body

Code system

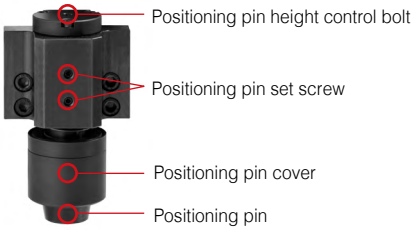
BT50	-	KHU	10	-	195
Spindle		Angular Head	Max. chucking dia.		Length

Name of angular head parts

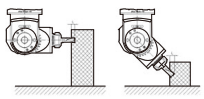
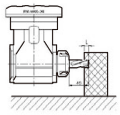
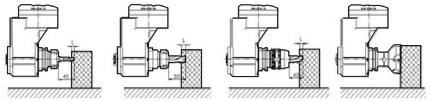




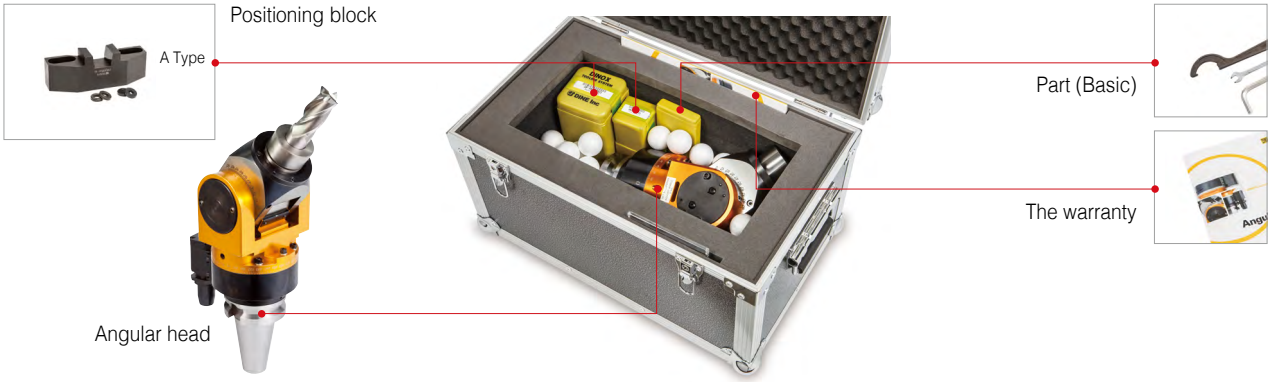
Positioning pin details



Various applications

			
0~90-degree rotating (MAH, KHU)	Fixed 90-degree type (KAH)	Fixed 45-degree type (KAC)	Attachment type (HRAG, KAG)

Components



MAH

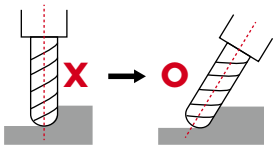
Universal type MAH (Reinforced series)

- Reinforced type Better performance by improving existing universal Angular head
  - Stability on large mold machining
  - Use 32mm Ball Endmill

KHU

Universal type KHU (Free angle)

- Adjustable angle-type angular head that enables flexible machining
  - Wide vertical (0˚~90˚) and horizontal (0˚~360˚) machining angle range
  - To use Tap-exclusive collet, please contact us in advance
  - HSK and SK types are customizable



Be sure to give a slope to the cutting edge of a ball end mill when machining it as the ball end mill edge is worn out and the surface roughness of the workpiece becomes defective

HRAG

Attachment type HRAG (Reinforced type)

- HRAG: The reinforced bracket enhanced durability upto 200%
  - Stablility on face milling machining
  - Enhances compatibility with the machining device due to easy bracket disassembly/ assembly even on the BT50 shank
  - Improves product life cycle

KAG

Attachment type KAG

- Free 360° angle adjusting from side to side
  - Possible to use various tools of BT40 and BT30
  - HSK and SK type are order made
  - Coolant types are to be ordered separately

KAH

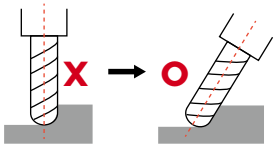
Modular type KAH (90° type)

- Adjustable angle-type angular head that enables flexible machining
  - Adjusting angle up to 360˚
  - To use Tap-exclusive Collet, please contact us in advance
  - HSK and SK type are order made

KAC

Modular type KAC (45° type)

- Fixed angle type angular head that enables flexible machining
  - Adjusting angle up to 360˚
  - To use Tap-exclusive Collet, please contact us in advance
  - 45-degree fixed type angular head
  - For BT40 types, please contact us separately



Be sure to give a slope to the cutting edge of a ball end mill when machining it as the ball end mill edge is worn out and the surface roughness of the workpiece becomes defective

KAH(90° type)_Fixed Angle-type Angular Head

BT-KAH

Features

Adjustable angle-type angular head that enables flexible machining

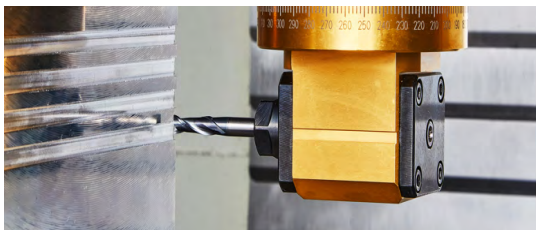
- Adjustable angle up to 360° degree
- HSK and SK types are customizable
- ATC (automatic tool change) available
- Tool rotates in the opposite direction to that of spindle

BT-30 KAH Features

- A small angular head for small equipment (BT30)
- Light weight of 2.6 KG for easy installation
- Available multi-surface processing
- Its processing angle can be freely adjusted by 360° on both sides
- ER11 size collet appllied

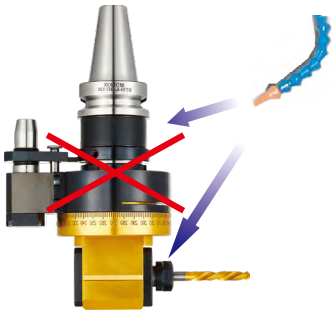
BT-KAH Structure

- Uses spiral bevel gear (with axial angle of 90
- Reduced vibration and noise
- Small backlash
- Thanks to the use of a 1 : 1 gear ratio, can use without complex calculations
- Reverse-rotation direction compared to spindle (CW:CCW)



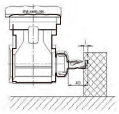
Precautions

- Do not inject cutting oil direct to the Angular Head body.



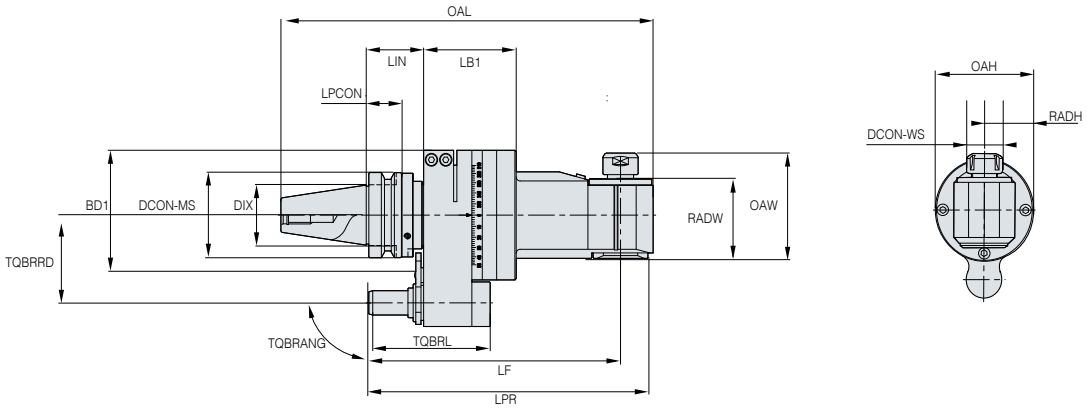
Machining Example

Model : BT50-KAH20-200

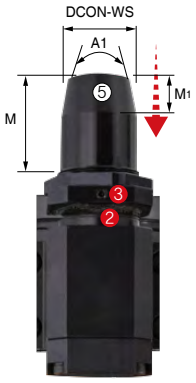
Cutting tool	Workpiece	Depth of cut	RPMX	Feed (mm/min)	Feed (mm/rev)	BT50-KAH20-200
Ø16-2 Flute Endmill(HSS), Over length-40mm	S45C	3	700	98	0.14	
	S45C	4	500	60	0.12	
	Al	7	900	72	0.08	
	Al	4	1800	144	0.08	

Parts

Angular head	Main components		Accessories	Positioning Block
	Nut	Spanner	GERC Collet	
KAH7	R11-AH	S-17	GERC11-ØD	
KHU10	R16-AH(M20)	S-25	GERC16-ØD	
KAH13	RU20-AH	35-38	GERC20-ØD	
KHU20	RU32-AH	48-52	GERC32-ØD	



Positioning Pin



Shank	M	M1	A1	DCON-WS
BT30	Max : 23 Min : 17	8	20°	Ø15
BT40	Max : 32 Min : 26	10	20°	Ø19.6
BT50	Max : 35 Min : 29	15	20°	Ø28

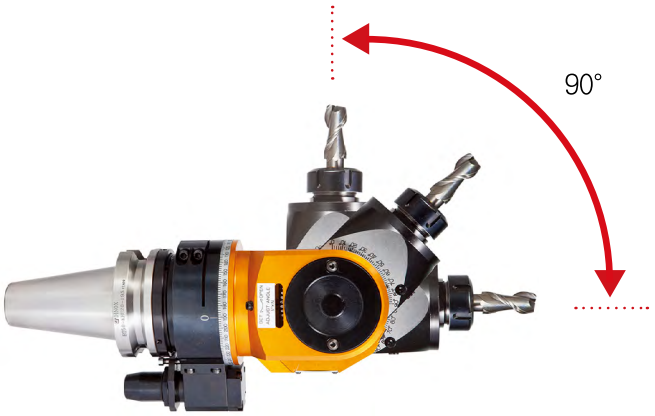
NO	Name
①	Head
②	Rotation Angle Split-gradation (Freely Adjustable for 360 Position
③	Fix Pin Block
④	Jaw Key
⑤	Height Adjusting Wrench Hole

NO	Name	Designation
1	Head angle fix bolt	BX0618
2	Set screw	BT0404
3	Position pin height fix bolt	BX50630

Designation	DCON-MS	DIX	BD1	TQBRRD	OAH	DCON-WS	RADH	LF	LPR	TQBRL	TQBRANG	LPCON	LIN	LB1	OAL	RADW	OAW	Gear ratio	RPMX	Collet	kg
BT30 - KAH7-120	46	42	72	55	40	11	20	120	140	61	90	22	56	39	188.4	24.5	61.5	1:1	5,000	GERC11	2.6
BT40 - KAH7-170	63	50	96	65	40	11	20	170	190	94	90	27	44	71	255.4	24.5	61.5	1:1	5,000	GERC11	5.8
KAH10-195	63	50	96	65	58	16	29	195	220	94	90	27	44	71	285.4	32	78	1:1	5,000	GERC16	6.2
KAH13-165	63	50	96	65	60	20	30	165	193	94	90	27	44	71	258.4	35	88	1:1	5,000	GERC20	6.0
KAH20-180	63	50	96	65	76	32	38	180	218	94	90	27	44	71	283.4	49	120	1:1	3,500	GERC32	7.5
BT50 - KAH07-220	100	87	114	80	40	11	20	220	240	104	90	38	57	54	341.8	24.5	61.5	1:1	3,500	GERC11	10.7
KAH10-215	100	87	114	80	58	16	29	215	240	104	90	38	57	54	341.8	32	78	1:1	3,500	GERC16	11.0
KAH10-260	100	87	114	80	58	16	29	260	285	104	90	38	57	54	386.8	32	78	1:1	3,500	GERC16	11.4
KAH13-260	100	87	114	80	60	20	30	260	288	104	90	38	57	54	389.8	35	88	1:1	3,500	GERC20	12.0
KAH20-200	100	87	114	80	76	32	38	200	238	104	90	38	57	54	339.8	49	120	1:1	3,500	GERC32	11.6
KAH20-240	100	87	114	80	76	32	38	240	278	140	90	38	57	54	379.8	49	120	1:1	3,500	GERC32	13.5

KHU(Free angle)_Collet Type Angular Head (0°-90°)

BT-KHU



Features

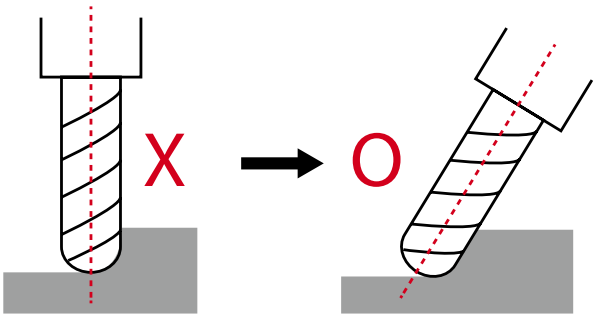
Adjustable angle-type angular head that enables flexible machining

- Wide vertical (0 ° ~90 °) and horizontal (0 ° ~360 °) machining angle range
- HSK and SK types are customizable

Precautions

Do not inject cutting oil direct to the Angular Head body.

Wear of the ball endmill blade and defective surface roughness of the workpiece can occur, so please slope the edge of the ball endmill when machining



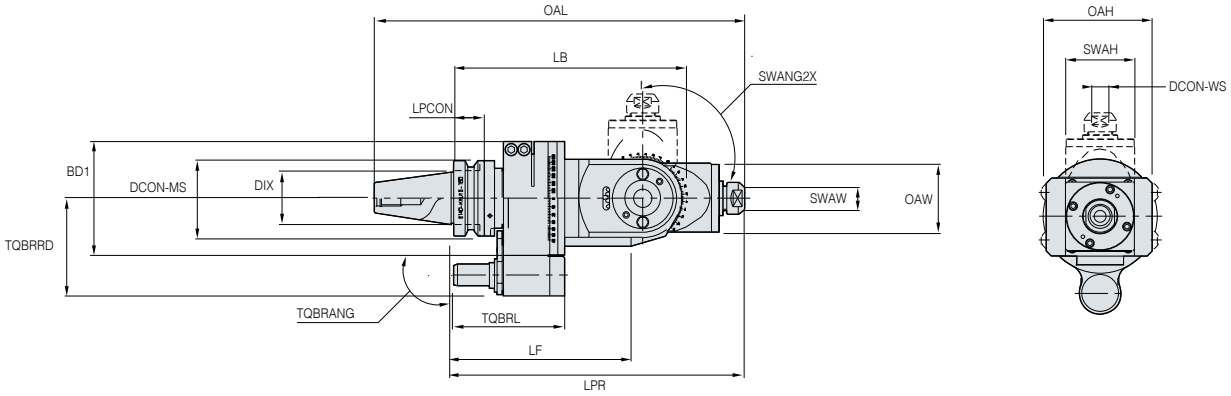
Machining Example

Model : BT50-KHU20-195

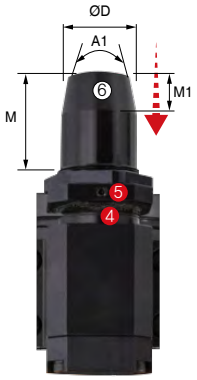
Cutting tool	Workpiece	Depth of cut	RPMX	Feed (mm/min)	Feed (mm/rev)	Cutting angle
Ø16-2 Flute Endmill(HSS), Over length-40mm	S45C	2	600	48	0.08	90˚
	AL	3	1200	168	0.14	90˚
	S45C	3	600	48	0.08	45˚
	AL	5	1200	144	0.12	45˚

Parts

Angular head	Main components		Accessories
	Nut	Spanner	GERC Collet
KHU10	R16-AH	S-25	GERC16-ØD
KHU20	RU32-AH	48-52	GERC32-ØD



Positioning Pin



Shank size	M	M1	A	ØD
BT40	Max: 32 Min: 26	10	20°	Ø19.6

NO	Name
①	Inclination angle gradation (Axial positioning in 0°~90°)
②	Rotating angle graduation (Free radius position in 360°)
③	Head
④	Positioning pin part
⑤	Jaw key
⑥	Height control wrench hole

NO	Part name	Designation
1	Tilt Axies fixing bolt	BH0630
2	Bracket angle fixing bolt	BX0630
3	Position block fixing bolt	BX0512
4	Set screw	BT0404
5	Fixing bolts	BX05630

Designation	ØD	ØD1	L	L1	L2	L3	B	B1	E	F	C	A	G	Q	Q1	Torque rate (IN:OUT)	Direction of rotation (IN:OUT)	Max RPM	Collet	kg
BT40-KHU10-160	1.0~10.0	58	247	160	33	54	22	28	51	98	96	65	90	87	40	1:2	CW:CW	6,000	GER16	8.3
BT50-KHU10-180	1.0~10.0	84	267	180	33	54	22	28	53	103	114	80	90	87	40	1:2	CW:CW	6,000	GER16	11.5
BT50-KHU20-195	1.0~20.0	84	315	195	47	73	29	50	53	132	114	80	124	120	63	1:1	CW:CW	3,000	GER32	17.9

Attachmaent type KAG

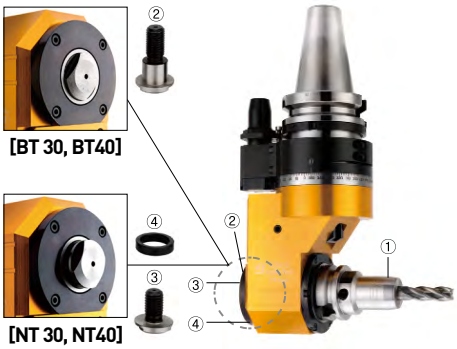
BT-KAG

Features

- Horizontal machining angle range from 0° to 360°
- Compatible with various tools such as BT40 and BT30
- HSK and SK types are customizable
- Coolant types are to be ordered separately

How to Tighten the Tool

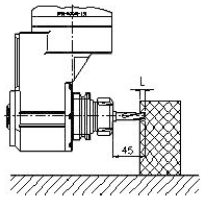
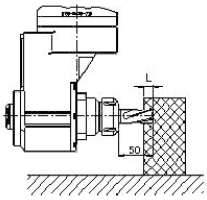
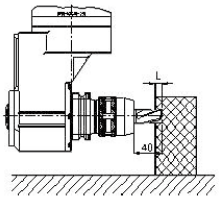
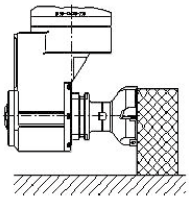
1. Insert the tool ① into the angular head spindle.
2. Tightly secure the tool ① using the fixing bolt ②· (BT type)
3. Tighten the tool ① by putting the ring ④ on the bolt ③. (NT type)

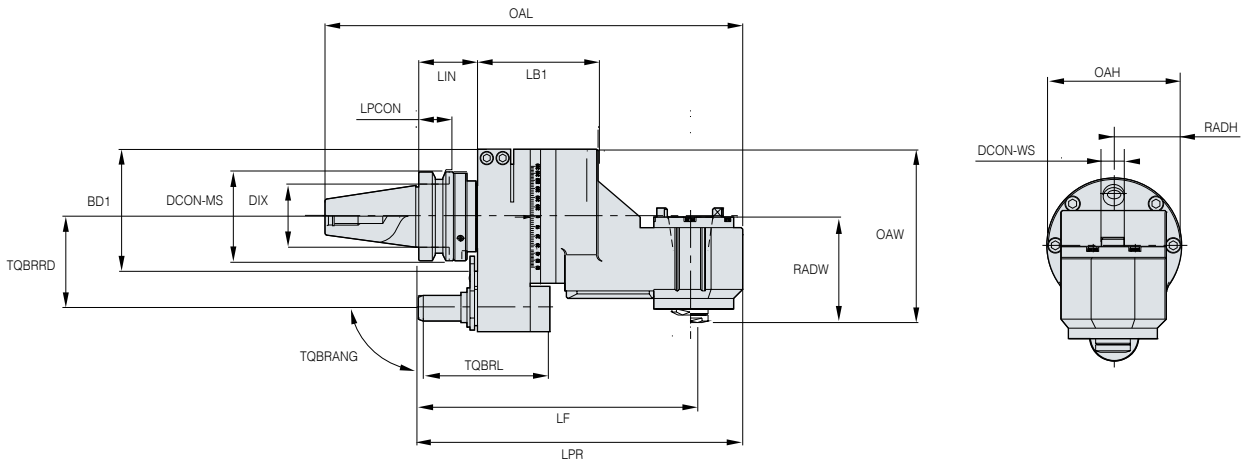


Machining Example

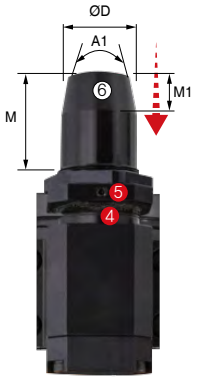
Model : BT50-KAG40-230

Cutting tool	Workpiece	Depth of cut	RPMX	Feed (mm/min)	Feed (mm/rev)
BT40-SDC20-60 Ø12-2 Flute Endmill (HSS)	S45C	3	400	72	0.09
	S45C	3	200	36	0.09
NT40-SDC20-60 Ø20-2 Flute Endmill (HSS)	S45C	4	500	50	0.05
	AL	10	1,000	100	0.05
BT40-NPM20-85 Ø20-2 Flute Endmill (HSS) over hang 40mm	S45C	3	400	72	0.09
	S45C	3	400	36	0.09
	AL	5	400	72	0.09
	AL	5	480	86	0.09
	AL	10	400	72	0.09
	AL	10	320	58	0.09
BT40-FMA25.4-45 Ø80 Shoulder mill (5 Flute-50L)	S45C	2	400	120	-
	S45C	1	200	60	-
	AL	2	600	150	-
	AL	1	600	150	-

BT40-SDC20-60 (Ø12 E/M)	NT40-SDC20-60 (Ø20 E/M)	BT40-NPM20-85 (Ø20 E/M)	BT40-FMA25.4-45 (Ø80 Shoulder Mill)
			



Positioning Pin



Shank size	M	M1	A1	ØD
BT40	Max: 32 Min: 26	10	20°	Ø19.6
BT50	Max: 35 Min: 29	15	20°	Ø28

NO	Name
①	Rotating angle graduation (Free radius position in 360°)
②	Head
③	Positioning pin part
④	Jaw key
⑤	Height control wrench hole

NO	Part name	Designation
1	Set screw	BT0404
2	Fixing bolts	BX50630
3	BT / NT Bolt	

Designation	L	L1	L2	L3	L4	L5	Q	Q1	A	C	G	Torque rate (IN:OUT)	Direction of rotation (IN:OUT)	MAX RPM	Holder shank	kg
BT40-KAG30-195	195	44	86	65	37.5	232.5	66	70	65	96	75	1:1	CW:CW	4,000	BT30/NT30	6.4
BT50-KAG40-230	230	57	88	85	46.5	276.5	89	94	80	114	93	1:1	CW:CW	3,000	BT40/NT40	15.8

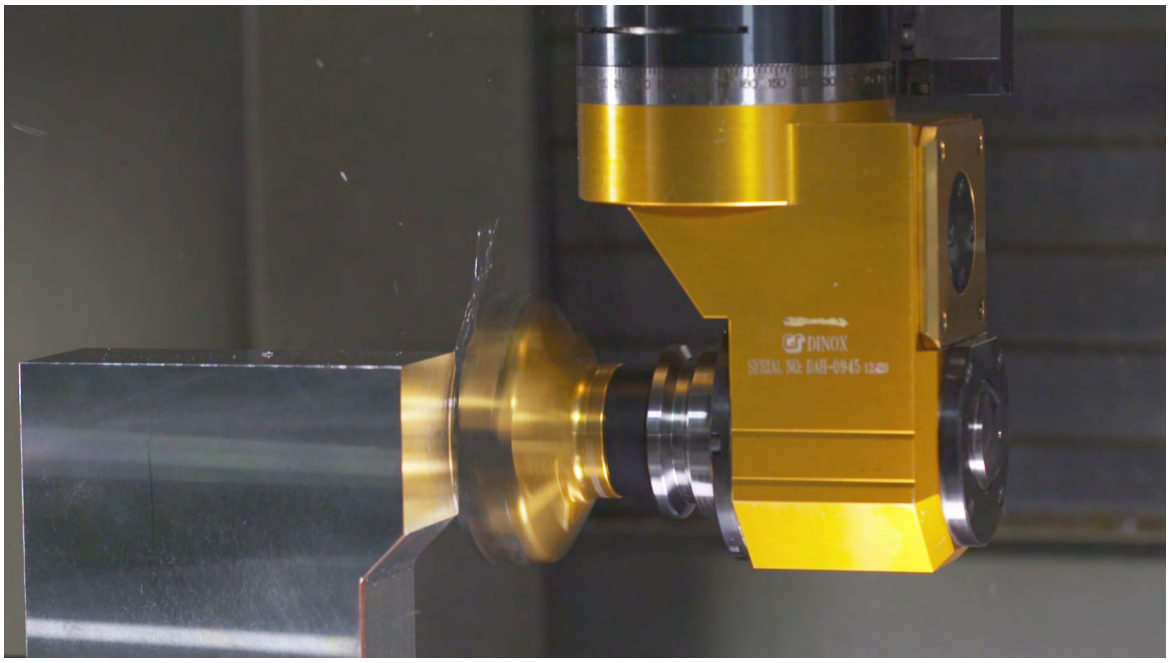
Attachment type HRAG(Reinforced)_Attachment type

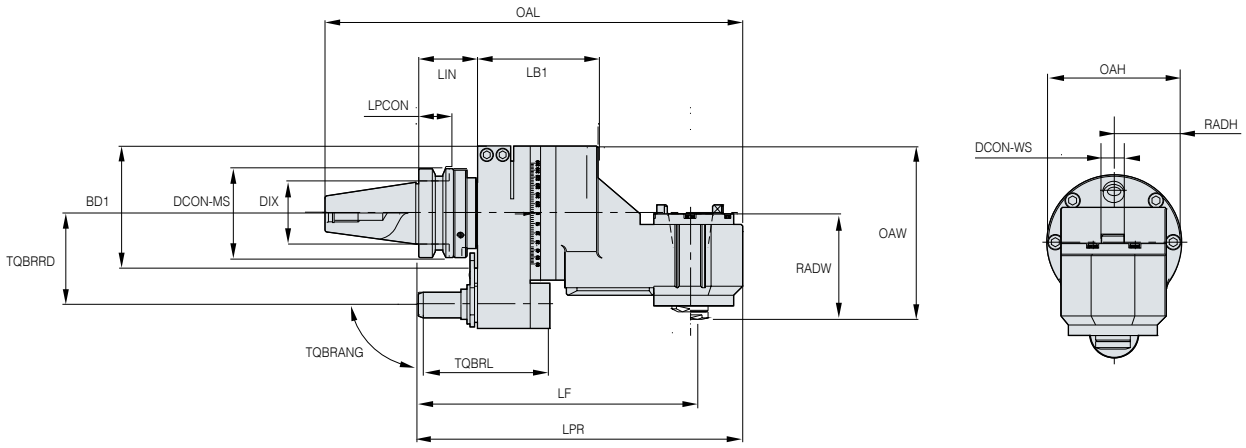
BT-HRAG

Features

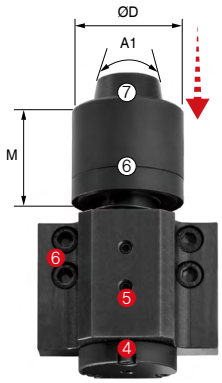
HRAG that improves the rigidity of the attachment-type bracket by 200%

- Provides stable operation of the face mill cutter
- Enhances compatibility with the machining device due to easy bracket disassembly/assembly even on the BT50 shank
- Improves product life cycle





Positioning Pin



Shank size	M	A1	ØD
BT50	56.5	20°	Ø40

NO	Name
①	Rotating angle graduation (Free radius position in 360°)
②	Head
③	Positioning pin part
④	Jaw key
⑤	Positioning ring
⑥	Positioning pin cover
⑦	Positioning pin

NO	Part name	Designation
1	Head fixed bolts	BX0660
2	Positioning ring set screw	MSST5-12
3	Rotating angle graduation screw	BT0648
4	Positioning pin height control bolt	BT0516
5	Positioning pin set screw	BT0512
6	Body position block set screw	BX0516
7	BT/NT Bolt	

Designation	L	L1	L2	L3	L4	Q	Q1	A	G	G1	Max RPM	Tool shank	kg
BT50-HRAG40-230	230	56.5	145	46.5	276.5	89	101	80	93	136	3000	BT/NT40	18.2

Rigidity-reinforced Side Lock type MAH (reinforced series)/Angle Adjustment

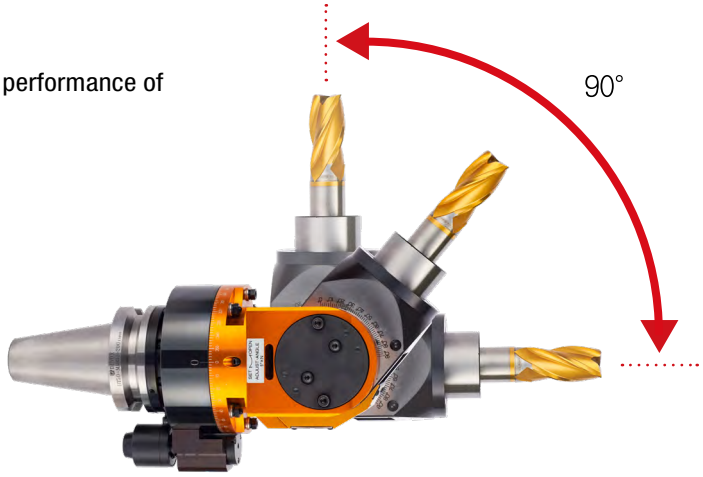
BT-MAH

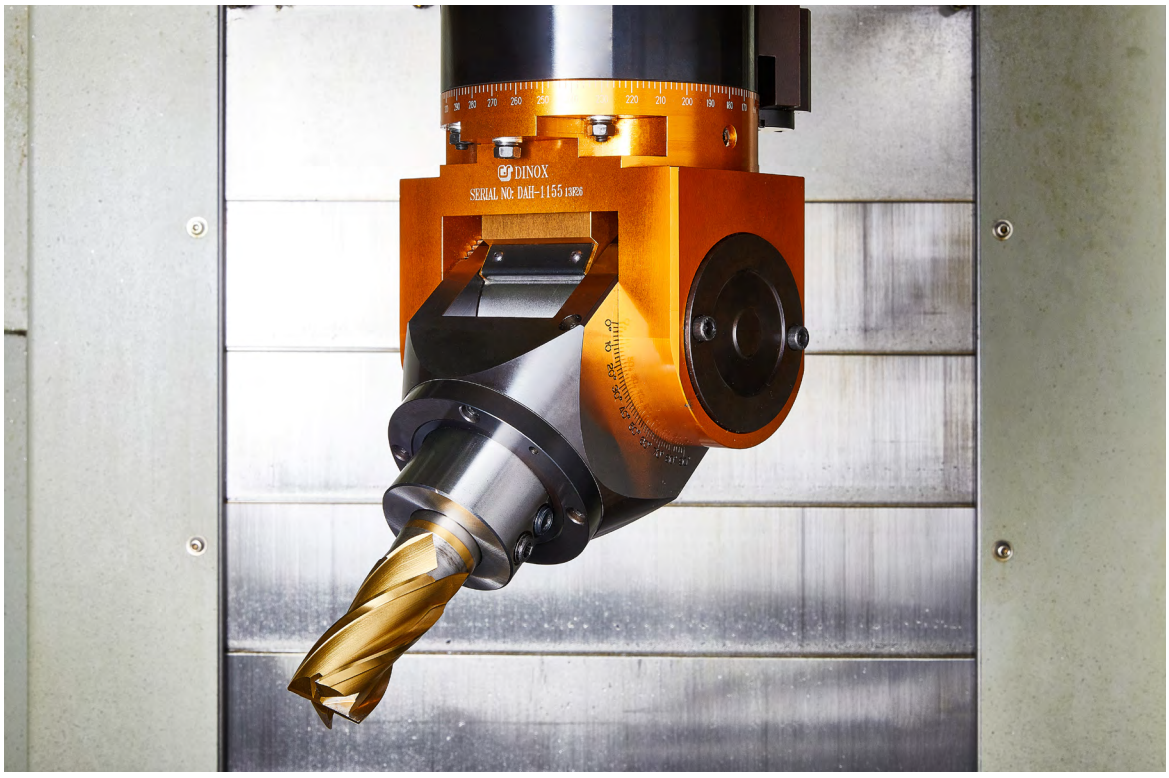
Features

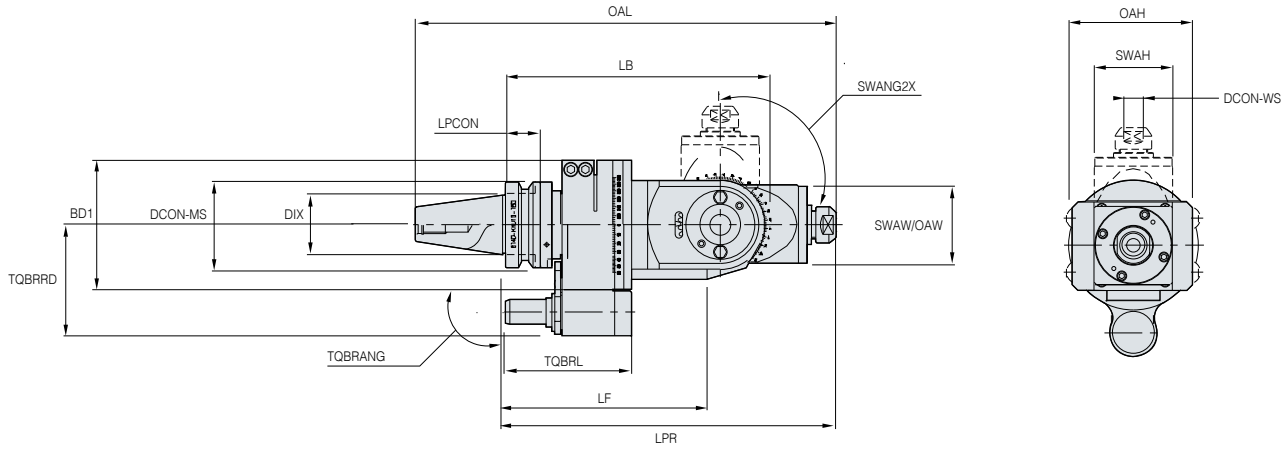
MAH for Mold Machining

MAH ideal for mold machining by improving the performance of conventional universal type products

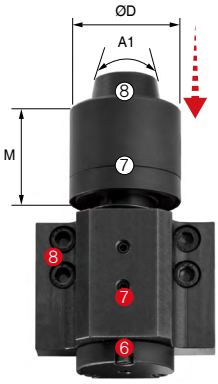
- Stability on large mold machining
- Tool diameter (D) 32mm ball endmill usable







Positioning Pin



Shank	M	A1	ØD
BT50	56.5	20°	Ø40

NO	Name
①	Inclination angle gradation (Axial positioning in 0°~90°)
②	Rotating angle graduation (Free radius position in 360°)
③	Head
④	Positioning pin part
⑤	Jaw key
⑥	Positioning ring
⑦	Positioning pin cover
⑧	Positioning pin

NO	Part name	Designation
1	Inclination angle gradation screw	BT1216
2	Head fixed bolts	BT0645
3	Rotating angle graduation screw	BT0640
4	Positioning ring set screw	MSST5-12
5	Tilt Axies fixing bolt	BH0616
6	Positioning pin height control bolt	BT0516
7	Positioning pin set screw	BT0512
8	Body position block set screw	BX0516

Designation	DCON-MS	DIX	BD1	TQBRRD	LF	LPR	TQBRL	TQBRANG	OAL	LB	LPCON
BT50 - MAH32-200	100	55	136	80	200	325	103	90	426.8	247	38
	SWANG2X		SWAW / OAW		OAH	SWAH	DCON-WS	RPMX	Install tool		kg
	90		95		154	95	32	3,000	SIDE LOCK		19.6

KAC(45° type)_Fixed Angle-type

BT-KAC

Features

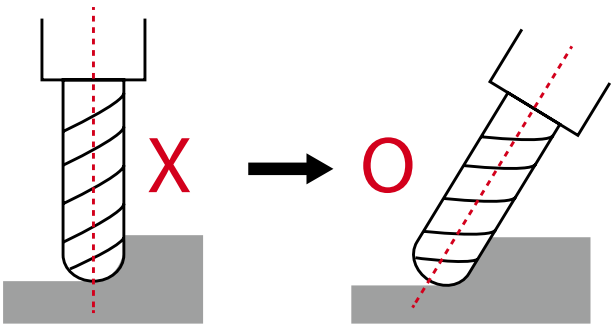
Fixed angle type angular head that enables flexible machining

- Adjustable angle up to 360 degree
- 45-degree fixed type angular head
- For BT40 types, please contact us separately

Precautions

Do not inject cutting oil direct to the Angular Head body.

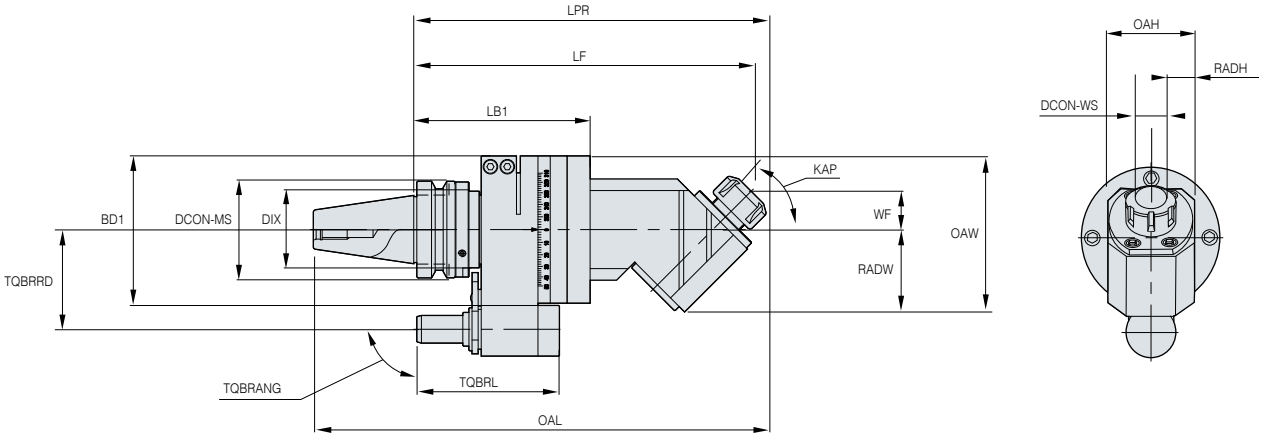
Be sure to give a slope to the cutting edge of a ball end mill when machining it as the ball end mill edge is worn out and the surface roughness of the workpiece becomes defective.



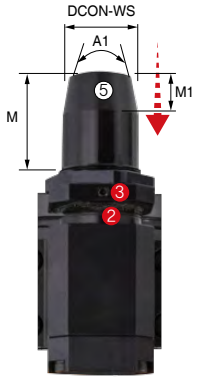
Parts

Angular head	Main components		Accessories
	Nut	Spanner	GERC Collet
KAC10	R16-AH (M20)	S-25	GERC16-ØD
KAC10	RU20-AH	35-38	GERC20-ØD
KAC20	RU32-AH	48-52	GERC32-ØD

※To order nuts, please contact us in advance.



Positioning Pin



Shank	M	M1	A	DCON-WS
BT40	Max : 32 Min : 26	10	20°	Ø19.6
BT50	Max : 35 Min : 29	15	20°	Ø28

NO	Name
①	Head
②	Rotating angle graduation (Free radius position in 360°)
③	Positioning pin part
④	Jaw key
⑤	Height control wrench hole

NO	Part name	Designation
1	Head fixing bolts	BX0618
2	Set screw	BT0404
3	Fixing bolts	BXS0630

Designation		DCON-MS	DIX	BD1	TQBRRD	OAL	TQBRL	TQBRANG	LPR	LF	LB1	OAW	WF	RADW	KAP	OAH	DCON-WS	RADH	RPMXX	Collet	kg
BT50 -	KAC10-240	100	87	114	80	350.8	104	90	249	240	111	102	25	54	45	60	16	30	5,000	GERC16	9.7
	KAC13-240	100	87	114	80	352.8	104	90	251	240	111	102	25	54	45	60	20	30	5,000	GERC20	10.7
	KAC20-250	100	87	114	80	367.8	104	90	266	250	111	108	30	60	45	72	32	36	3,500	GERC32	11.7

Slim Angular Head

BT-SAH

- Angular head for narrow inside boring
  (min. inner diameter of workpiece: Ø40, min. boring width: 32 mm)
- MAX 3,500 RPM, Spindle: applied rotation ratio = 1:1.37
- Boring range: Ø3, Ø4, Ø6

Code system

B50	-	SAH	6	-	277
Spindle		Slim Angular head	Tool Dia.		Length

Machining Features

Min. Ø40 Hole (except tool projection)	Min.32mm gap (except tool projection)

Clamping Force

Division	Measurement	Measured value (N-m)			
Clamp torque	2	2.5	3	3.5	4
Clamping Force	Not measurable	5.5	6.5	7	7

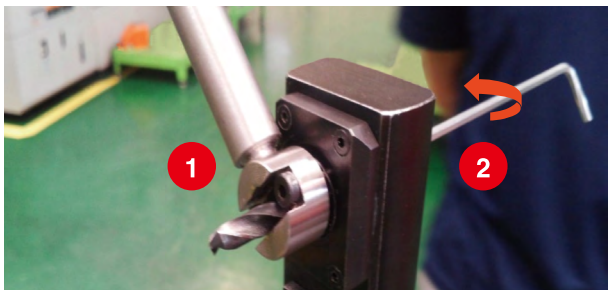
※ The moderate clamp torque of collet is 3.5N-m.

Exclusive collet

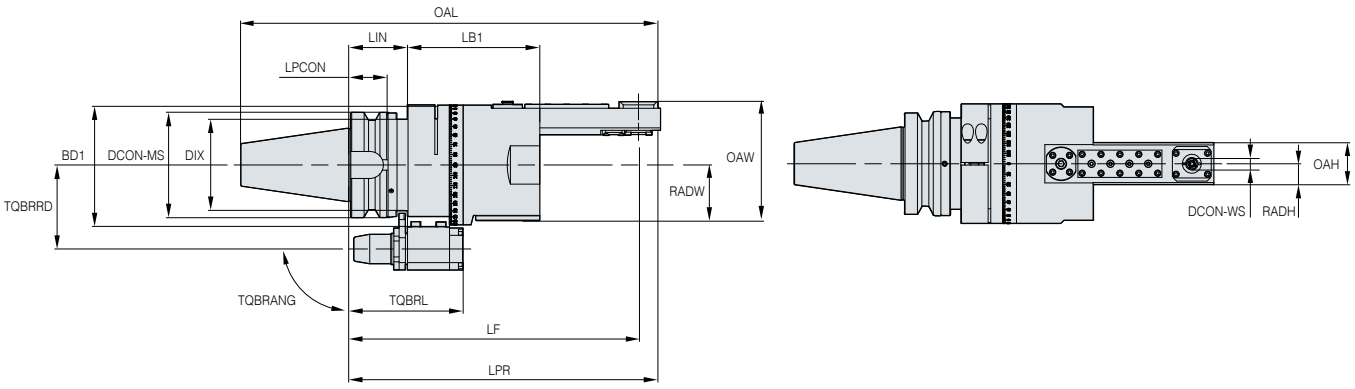
• : Stock item

Designation	Clamping range	Stock
SAH6-C3	3	•
SAH6-C4	4	•
SAH-C6	6	•

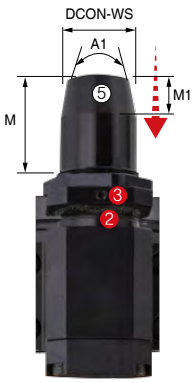
How to clamp



1. Couple the tool with SAH dedicated collet
2. Insert the coupled tool into SAH and fix it with a dedicated tightening jig
3. Turn the bolt using a hexagonal wrench



Positioning Pin



Shank	M	M1	A	DCON-WS
BT50	Max : 35 Min : 29	15	20°	Ø28

NO	Name
①	Head
②	Rotating angle graduation (Free radius position in 360°)
③	Positioning pin part
④	Jaw key
⑤	Height control wrench hole

NO	Part name	Designation
1	Head fixing bolts	BX0618
2	Set screw	BT0404
3	Fixing bolts	BX0630

Designation	DCON-MS	DIX	BD1	TQBRRD	LF	LPR	TQBRL	TQBRANG	OAL	LIN	LB1	LPCON	OAW	RADW	OAH	DCON-WS	RADH	Rotation ratio (IN:OUT)	Rotation direction	RPMXX	kg
BT50 - SAH6-277	100	87	114	80	277	298	104	90	399.8	57	126	38	113	53	40	10	20	1:1.37	CW:CW	3,500	15.2

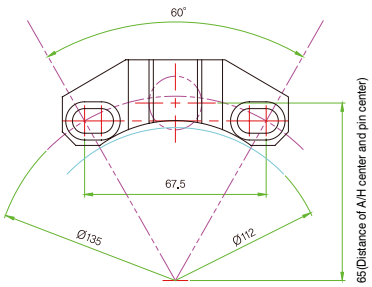
Positioning Block (For BT40)

POSITIONING BLOCK

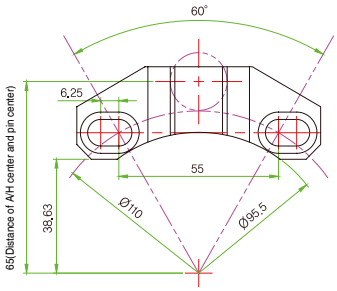
How to install the positioning block on the machine

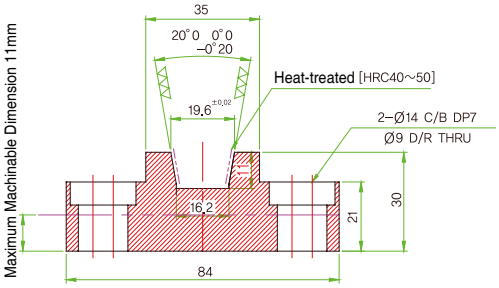
BT40 Customer Standard type - Group A (60° Standard type)

- In case Min. PCD=110mm
- Spindle diameter less than Ø94 available
- Keep the minimum distance 55mm between bolts



- In case Max. PCD=135mm
- Spindle diameter less than Ø112 available
- Keep the minimum distance 67.5mm between bolts

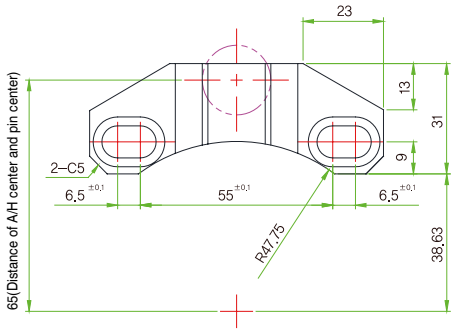


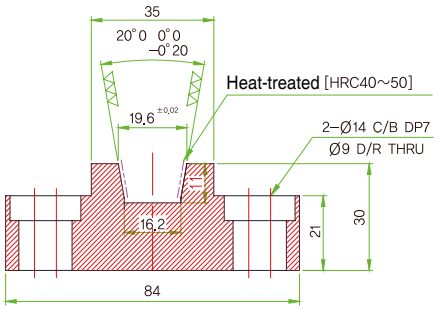


- Semi-finishing : Requires Block Height Machining
- The customer must machine the bottom of the block in person to use for use after determining the block height

※ Minimum block height : 19mm (based on the upper side)

- Only the taper part to be heat-treated
- Based on M8 in the case of less than M8, washer supplide





DINE Inc, provides the positioning block type as default. (Excluding BT30 Angular Head)

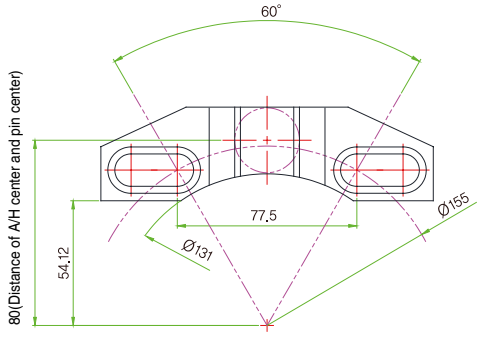
Positioning Block (For BT50)

POSITIONING BLOCK

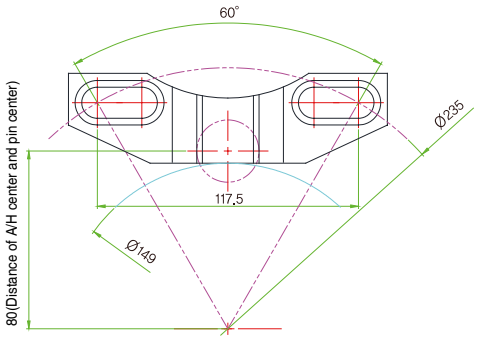
How to install the positioning block on the machine

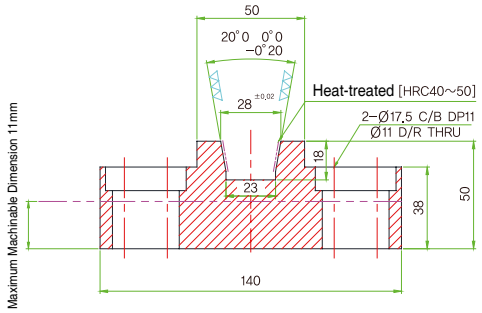
BT50 Customer Standard type - Group A (60° Standard type)

- In case Min. PCD=155mm
- Spindle diameter less than Ø130 available
- Keep the minimum distance 77.5mm between bolts



- In case Max. PCD=235mm
- Spindle diameter less than Ø148 available
- Keep the minimum distance 117.5mm between bolts

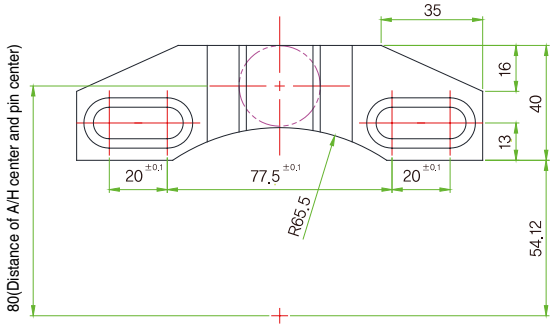


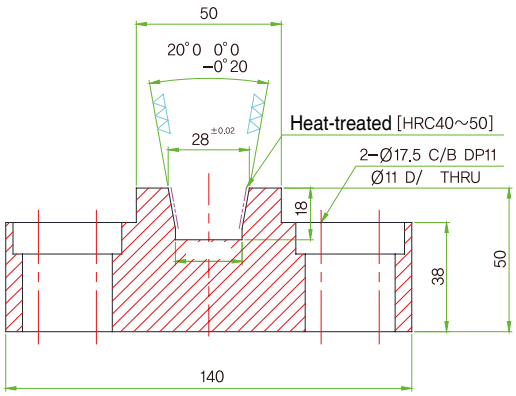


- Semi-finishing : Requires Block Height Machining
- The customer must machine the bottom of the block in person to use for use after determining the block height

※ Minimum block height : 28mm (based on the upper side)

- Only the taper part to be heat-treated
- Based on M8 in the case of less than M8, washer supplide





DINE Inc, provides the positioning block type as default. (Excluding BT30 Angular Head)

Angle Adjustment Air Spindle (Universal type)

ATM

Code system

BT50	-	ATM	6	228	-	(ATC)
Spindle		Air Turbine Machine	Tool Dia.	Length		ATC : Auto Tool Change type NON : General

Features

- High-speed turbine rotation structure using compressed air (max. 50,000rpm)
- The conventional MCT can be compatible just by supplying high-pressure compressed air
- High-speed/precision machining is available regardless of the machine's age
- Continuous machining is possible for a long time due to rapid heat discharge

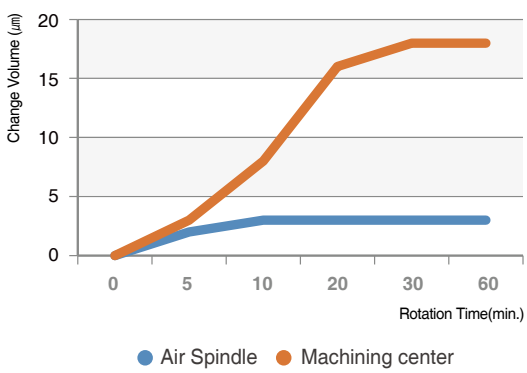
What is ATM?

The air spindle is able to rotate at a high-speed (50,000 RPM) using compressed air, and realize performance the same as that of a high-speed processor even in a standard (conventional) machining center

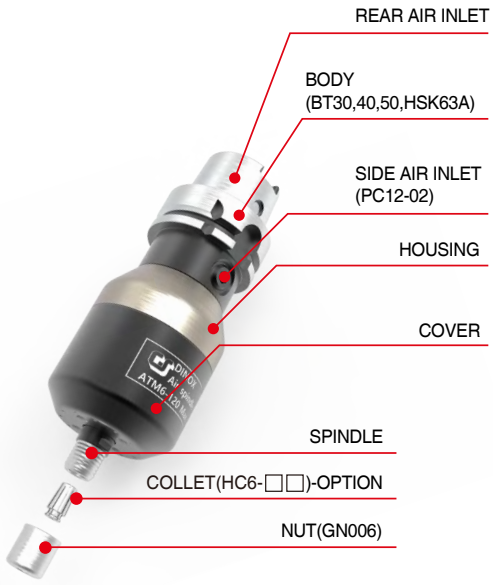
Thermal Deformation Protection

- It prevents an increase in temperature of the spindle using an air blade rotation method
- Prevents the deformation of the Z-axis by thermal deformation of the spindle

Z-axis Change with Rotation Time



Part Name



AIR SPINDLE

General type

How to Use

- Use in an equipment able to spray air on the main axis
- Able to perform ATC as there is no external air hose to be connected

Precautions

- When spraying the air on the main axis, be careful about introduction of foreign

How to Use

- Connect an external air hose
- Connect it directly to the regulator and minimize the introduction of foreign substances

Precautions

- Must separate the hose from the product in case of ATC
- Be careful when the main axis rotates

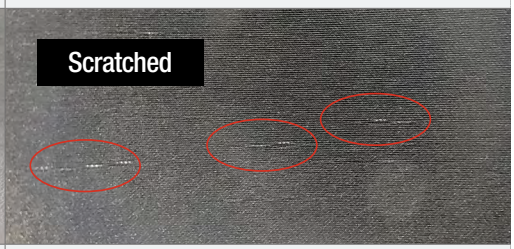
Auto Tool Change type

How to Use

- It is able to perform ATC and equipment rotation even on equipment with no air main
- The air is supplied on the Positioning Block, so ATC and equipment spindle rotation is possible
- The main axis can rotate at a low-speed, and the tool length can be corrected

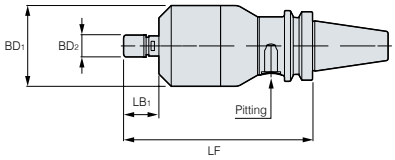
Processing Test

Air spindle has a shank and a body in a prefabricated shape, so the shank (BT30, BT40, BT50, HSK63A) can be easily adapted to different types of equipment

Equipment	Air Spindle <HSK63A-ATM6-170>	Machining center <Hydraulic Chuck>
Materials	SCM440 (H_RC40)	SCM440 (H_RC40)
RPM	50,000	20,000
Cycle Time	146 min.	276 min.
Axial-directional Displacement	5㎛	21㎛
Surface Roughness		
Note	Improved processing speed and surface roughness	Lowered surface roughness and tool life

BT-ATM

Air Spindle General type

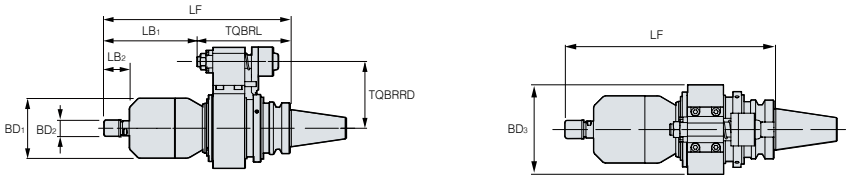


(mm)

Designation		BD1	BD2	LF	LB1	RPM (Based on 2 Bar of Regulator)	Pitting
BT30	ATM6-176	72	19.5	176	31.5	MAX 50,000	PC12-02
BT40	ATM6-171	72	19.5	171	31.5	MAX 50,000	PC12-02
BT50	ATM6-182	72	19.5	182	31.5	MAX 50,000	PC12-02

• This product does not support the internal coolant system

Air Spindle ATC type



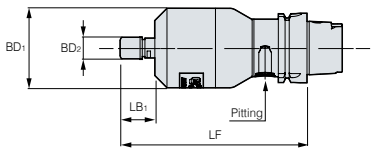
(mm)

Designation		BD1	BD2	BD3	LF	TQBRL	LB1	LB2	TQBRRD	RPM (Based on 2 Bar of Regulator)
BT40	ATM6-227(ATC)	72	19.5	96	227	114	113	32	80	MAX.50,000
BT50	ATM6-228(ATC)	72	19.5	96	228	115	113	32	80	MAX.50,000

• This product does not support the internal coolant system

HSK-ATM

Air Spindle General type

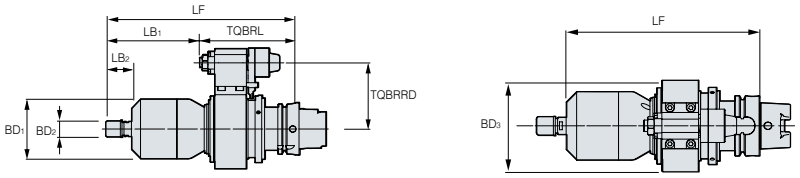


(mm)

Designation		BD1	BD2	LF	LB1	RPM (Based on 2 Bar of Regulator)	Pitting
HSK63A	ATM6-170	72	19.5	170	31.5	MAX 50,000	PC12-02

• This product does not support the internal coolant system

Air Spindle ATC type



(mm)

Designation		BD1	BD2	BD3	LF	TQBRL	LB1	LB2	TQBRRD	RPM (Based on 2 Bar of Regulator)
HSK63A	ATM6-235(ATC)	72	19.5	96	235	122	113	32	80	MAX.50,000

• This product does not support the internal coolant system

Air Spindle Related Parts

ATM(U) SPARE PART

Main components

(ATM)

(ATU)

Parts

Main components					
Images					
Components	Air Spindle	Air Regulator	Fitting	Spanner	Nut
Quantity	1	1	2	1	1

Type	AIR SPINDLE					
Spec	ATM(U)6 (BT30,40,50,HSK63A)				ATM	ATU
ATM components	No	Classification	Name	Designation	Quantity	Quantity
	1	Basic Specifications	ATM(U)6	□□□-ATM(U)6-□□□	1	1
	2		NUT	GN-06	1	1
	3		Regulator	TPC PP3-03BG	1	1
	4		Fitting	PC12-02	1	-
	5			PC12-03	1	2
	6		Spanner	GSK6-SPANNER	1	1
	7			S16 SPANNER	1	1
	8			S17 SPANNER	-	1
	9		Wrench	LW-1.5	-	1
	10			LW-2.5	-	1
	11			LW-3.0	-	1
	12			LW-6.0	-	1

Parts (Accessories)

Designation	Image	ØD1	L	MAX ØD	Distance	Positioning Block
HC6ØD(P)		10.5	25	6	1	

Angle Adjustment Air Spindle_(Universal type)

ATU

Code system

BT50	-	ATU	6	-	155
Spindle		Air Turbine Universal	Tool Dia.		Length

Features

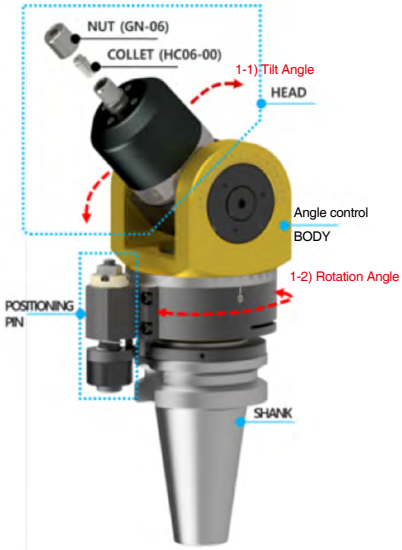
- Air spindle is applicable to multi-axis machining by adjusting the angle
- Air injection method can be selected (positioning pin or equipment main axis)
- ATC device is available

Product Structure and Characteristics

1) Angle Control

1-1) Tilt Angle: -90° ~ +90°

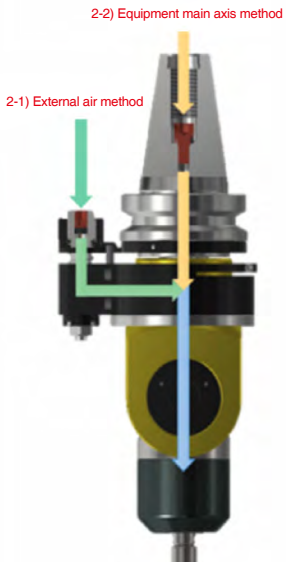
1-2) Rotation Angle: 0° ~ 360°

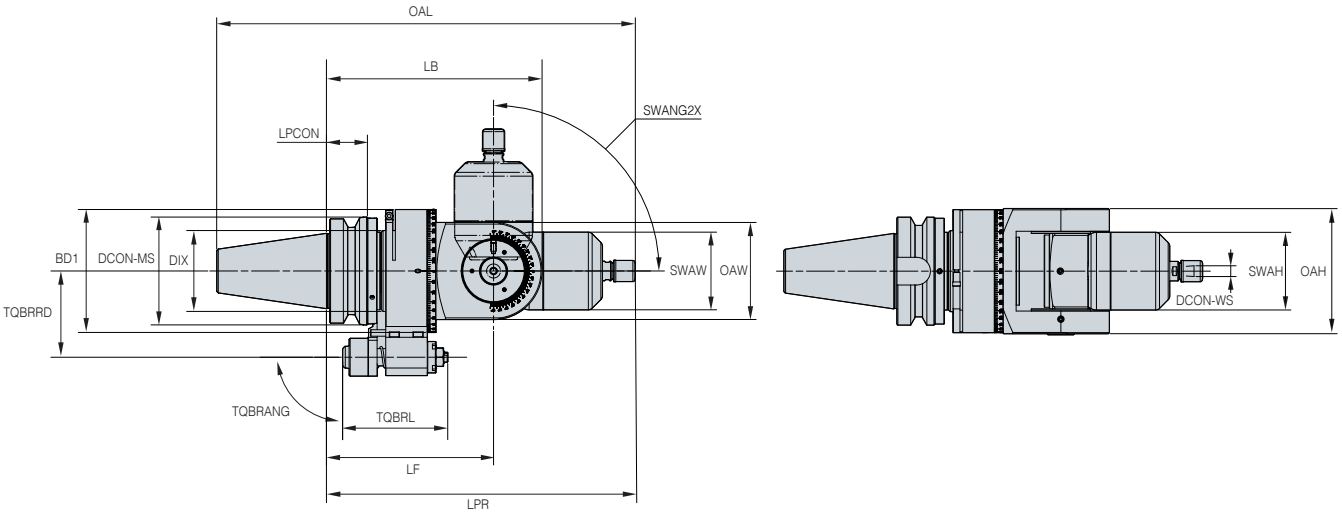


2) Air Injection Method

2-1) External air method

2-2) Equipment main axis method





Designation	DCON-MS	DIX	BD1	TQBBRD	LF	LPR	TQBRL	TQBRANG
BT50 - ATU6-155	100	75	114	80	155	286.5	97.5	90
	LB	OAL	LPCON	SWANG2X	SWAW	OAW	OAH	SWAH	DCON-WS
	200	388.3	38	90	Ø72	90	116	Ø72	10

1. When using it, never rotate the main axis
2. Proper air pressure is based on the Max. RPM and a maximum of 50,000 RPM is available for both external air and main spindle method at approximately 3 bar of pressure
3. ATC is available
4. When using the ATC, a positioning block is required

※ Positioning block is customizable

PART 3

Recommended Cutting Conditions

F2 Super Endmill for HRSA
F3 Super Endmill for Ti/STS
F5 The Mirror Endmill
F6 H-Star Endmill
F64 U-Star Endmill
F91 G-Star Endmill
F99 R+ Endmill
F103 S-Star Endmill
F107 A-Star Endmill
F108 D Endmill
F109 Composite Router Endmill
F111 T Endmill
F111 C-Max
F111 PCD Endmill
F112 MSD Plus
F112 MSD Plus-S
F113 MSD Plus for CFRP
F113 MSFD
F113 MLD Plus
F114 P-Star Drill
F116 W-Star Drill
F116 SSD-N
F117 Burnishing Drill
F117 PCD Drill
F117 Gun Drill
F118 Chucking / Machine Reamer
F118 PCD Reamer
F118 Cermet Reamer
F119 Chamfer Tool
F119 Counter Sink
F121 Tap-Star

Super Endmill for HRSA

SFES4000(Flat), SRES4000(Radius)

Workpiece				Brinell hard-ness (HB)	Specific cutting force (N/mm²)	Tensile strength at high temp. (N/mm²)	ap (mm)	ae (mm)	Machining	Diameter (mm)	3	4	5	6	8	10	12	16	20
ISO	Workpiece materials	KS	ISO (DIN)							Cutting length (mm)	8	10	15	15	20	25	30	42	48
S	Ti/ Ti Alloy	Inconel718 Inconel625	Inconel718 Inconel625	250 ~ 320	690 ~ 965	650	1.5D	0.05D	Shouldering	vc	36	38	38	40	40	39	40	38	40
										fz	0.014	0.020	0.025	0.030	0.035	0.043	0.050	0.069	0.079
										rpm	3,800	3,000	2,450	2,100	1,600	1,250	1,050	765	635
										feed	220	240	245	250	225	215	210	210	200
		Waspaloy	Waspaloy	210 ~ 290	1100 ~ 1400	900	0.3D	1D	Slotting	vc	24	24	24	24	24	24	24	24	24
										fz	0.013	0.018	0.024	0.029	0.041	0.048	0.058	0.058	0.072
		Hastelloy	Hastelloy	170 ~ 240	520 ~ 800	530				rpm	2,500	1,900	1,500	1,250	945	760	630	475	380
										feed	125	135	145	145	155	145	145	110	110

Super Endmill for Ti/STS

SFET4000(Flat), SRET4000(Radius)

Workpiece				Brinell hard-ness (HB)	Specific cutting force (N/mm²)	ap (mm)	ae (mm)	Machining	Diameter (mm)	3	4	5	6	8	10	12	16	20
ISO	Workpiece materials	KS	ISO (DIN)						Cutting length (mm)	8	10	15	15	20	25	30	42	48
P	Carbon steel	SM20C SM40C SM45C	(C22) C40 C45	230	400 ~ 600	1.5D	0.1D	Shouldering	vc	100	108	114	114	114	114	114	114	114
									fz	0.020	0.030	0.040	0.050	0.065	0.070	0.080	0.085	0.100
									rpm	10610	8594	7257	6048	4536	3629	3024	2268	1814
									feed	849	1031	1161	1210	1179	1016	968	771	726
						0.5D	1D	Slotting	vc	64	65	68	70	70	70	70	70	70
									fz	0.016	0.022	0.030	0.038	0.046	0.050	0.056	0.060	0.070
									rpm	6791	5173	4329	3714	2785	2228	1857	1393	1114
									feed	435	455	519	564	512	446	416	334	312
	Alloy steel	SNCM220 SNCM420 SCM430 SCM440	20NiCrMo2 - - 42CrMo4	280	800 ~ 1000	1.5D	0.1D	Shouldering	vc	141	138	151	151	151	151	151	151	151
									fz	0.021	0.032	0.049	0.069	0.067	0.075	0.078	0.095	0.090
									rpm	15000	11000	9600	8000	6000	4800	4000	3000	2400
									feed	1250	1400	1900	2200	1600	1440	1250	1140	860
						0.5D	1D	Slotting	vc	65	70	71	70	70	69	72	70	69
									fz	0.015	0.022	0.035	0.050	0.060	0.060	0.070	0.070	0.080
									rpm	6900	5600	4500	3700	2800	2200	1900	1400	1100
									feed	410	490	630	740	670	530	530	390	350
M	Ferritic/ martensitic series	STS405 STS430 STS416 STS434 STS403 STS410	X6CrAl13 X6Cr17 X12CrS13 X6CrMo17-1 (X6Cr13) X12Cr13	240	450 540 450	1.5D	0.1D	Shouldering	vc	100	108	114	114	114	114	114	114	114
									fz	0.020	0.030	0.040	0.050	0.065	0.070	0.080	0.085	0.100
									rpm	10610	8594	7257	6048	4536	3629	3024	2268	1814
									feed	849	1031	1161	1210	1179	1016	968	771	726
						0.5D	1D	Slotting	vc	64	65	68	70	70	70	70	70	70
									fz	0.016	0.022	0.030	0.038	0.046	0.050	0.056	0.060	0.070
									rpm	6791	5173	4329	3714	2785	2228	1857	1393	1114
									feed	435	455	519	564	512	446	416	334	312
	Austenite series	STS303 STS304 STS316	X10CrNiS18-9 X5CrNi18-9 X5CrNiMo17-12-2	200	520	1.5D	0.1D	Shouldering	vc	72	76	78	80	80	80	80	80	80
									fz	0.020	0.030	0.040	0.050	0.065	0.070	0.080	0.085	0.100
									rpm	7639	6048	4966	4244	3183	2546	2122	1592	1273
									feed	611	726	795	849	828	713	679	541	509
						0.5D	1D	Slotting	vc	45	46	48	50	50	50	50	50	50
									fz	0.016	0.022	0.030	0.038	0.046	0.050	0.056	0.060	0.070
									rpm	4775	3660	3056	2653	1990	1592	1326	955	796
									feed	306	322	367	403	366	318	297	229	223
S	Ti/ Ti Alloy	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	320	600 ~ 1800	1.5D	0.1D	Shouldering	vc	70	74	75	76	78	78	78	78	78
									fz	0.018	0.027	0.035	0.043	0.054	0.064	0.073	0.080	0.092
									rpm	7427	5889	4775	4032	3104	2483	2069	1552	1241
									feed	535	636	668	693	670	636	604	497	457
						0.5D	1D	Slotting	vc	40	41	43	45	45	45	45	45	45
									fz	0.014	0.020	0.027	0.034	0.040	0.045	0.050	0.054	0.063
									rpm	4244	3263	2737	2387	1790	1432	1194	895	716
									feed	238	261	296	327	286	258	239	193	180

Super Endmill for Ti/STS

SBET2000(Ball)

ISO	Workpiece materials	KS	ISO (DIN)	Brinell hardness (HB)	Specific cutting force (N/mm²)	ap (mm)	ae (mm)	Machining	Diameter (mm)	3	4	5	6	8	10	12	16	20
									Cutting length (mm)	8	10	15	15	20	25	30	42	48
P	Carbon steel	SM20C SM40C SM45C	(C22) C40 C45	230	400 ~ 600	≤0.1D	≤0.1D	Copying	vc	130	130	123	200	200	200	200	200	200
									fz	0.039	0.056	0.080	0.044	0.051	0.050	0.059	0.070	0.085
									rpm	41600	20800	13000	16000	12700	10600	8000	6400	5300
	Alloy steel	SNCM220 SNCM420 SCM430 SCM440	20NiCrMo2 - - 42CrMo4	280	800 ~ 1000	≤0.1D	≤0.1D		feed	1625	1170	1040	1400	1300	1050	950	900	900
M	Ferritic/ martensitic series	STS405 STS430 STS416 STS434 STS403 STS410	X6CrAl13 X6Cr17 X12CrS13 X6CrMo17-1 (X6Cr13) X12Cr13	240	450 540 450	≤0.1D	≤0.1D	Copying	vc	120	120	113	180	180	180	180	180	180
									fz	0.039	0.056	0.080	0.035	0.039	0.044	0.058	0.068	0.081
									rpm	38400	19200	12000	14400	11520	9600	7200	5760	4800
						≤0.1D	≤0.1D		feed	3000	2160	1920	1008	897	845	835	783	778
	Austenite series	STS303 STS304 STS316	X10CrNiS18-9 X5CrNi18-9 X5CrNiMo17-12-2	200	520	≤0.1D	≤0.1D	Copying	vc	100	100	94	150	150	150	150	150	150
									fz	0.039	0.056	0.080	0.035	0.039	0.044	0.058	0.068	0.081
									rpm	32000	16000	10000	12000	9600	8000	6000	4800	4000
									feed	2500	1800	1600	850	750	700	700	650	650
S	Ti/ Ti Alloy	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	320	600 ~ 1800	≤0.1D	≤0.1D	Copying	vc	100	100	94	150	150	150	150	150	150
									fz	0.039	0.056	0.080	0.035	0.039	0.044	0.058	0.068	0.081
									rpm	32000	16000	10000	12000	9600	8000	6000	4800	4000
									feed	2500	1800	1600	850	750	700	700	650	650

SBET4000(Ball)

ISO	Workpiece materials	KS	ISO (DIN)	Brinell hardness (HB)	Specific cutting force (N/mm²)	ap (mm)	ae (mm)	Machining	Diameter (mm)	4	5	6	8	10	12
									Cutting length (mm)	8	12	12	16	20	25
P	Carbon steel	SM20C SM40C SM45C	(C22) C40 C45	230	400 ~ 600	≤0.1D	≤0.1D	Copying	vc	200	200	200	200	200	200
									fz	0.044	0.051	0.050	0.059	0.070	0.085
									rpm	16000	12700	10600	8000	6400	5300
	Alloy steel	SNCM220 SNCM420 SCM430 SCM440	20NiCrMo2 - - 42CrMo4	280	800 ~ 1000	≤0.1D	≤0.1D		feed	2800	2600	2100	1900	1800	1800
M	Ferritic/ martensitic series	STS405 STS430 STS416 STS434 STS403 STS410	X6CrAl13 X6Cr17 X12CrS13 X6CrMo17-1 (X6Cr13) X12Cr13	240	450 540 450	≤0.1D	≤0.1D	Copying	vc	180	180	180	180	180	180
									fz	0.035	0.039	0.044	0.058	0.068	0.081
									rpm	14400	11520	9600	7200	5760	4800
						≤0.1D	≤0.1D		feed	2040	1800	1680	1680	1560	1560
	Austenite series	STS303 STS304 STS316	X10CrNiS18-9 X5CrNi18-9 X5CrNiMo17-12-2	200	520	≤0.1D	≤0.1D	Copying	vc	150	150	150	150	150	150
									fz	0.035	0.039	0.044	0.058	0.068	0.081
									rpm	12000	9600	8000	6000	4800	4000
									feed	1700	1500	1400	1400	1300	1300
S	Ti/ Ti Alloy	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	320	600 ~ 1800	≤0.1D	≤0.1D	Copying	vc	150	150	150	150	150	150
									fz	0.035	0.039	0.044	0.058	0.068	0.081
									rpm	12000	9600	8000	6000	4800	4000
									feed	1700	1500	1400	1400	1300	1300

The Mirror Endmill

PCD Endmill

Diameter (DC, Ø)	R	High speed steel, pre-hardened steel and heat treatment steel (~HRC65)			
		n (min^{-1})	vf (mm/min)	ap (mm)	ae (mm)
0.3 ~ 0.4	0.15 ~ 0.2	40,000	200	0.002	0.002
0.6	0.3	40,000	400	0.003	0.003
1.0	0.5	40,000	500	0.005	0.005
1.5 ~ 2.0	0.75 ~ 1	40,000	600	0.005	0.005

cBN Endmill

Diameter (DC, Ø)	Neck length (LU)	HRC~55				HRC55~65				HRC65~68			
		n (min^{-1})	vf (mm/min)	ap (mm)	ae (mm)	n (min^{-1})	vf (mm/min)	ap (mm)	ae (mm)	n (min^{-1})	vf (mm/min)	ap (mm)	ae (mm)
0.4	**0.5**	40,000	1,500	0.005	0.010	40,000	1,200	0.005	0.010	40,000	750	0.005	0.005
0.4	**1**	40,000	1,200	0.005	0.010	40,000	900	0.005	0.010	40,000	600	0.005	0.005
0.5	**1**	40,000	1,500	0.010	0.010	40,000	1,400	0.010	0.010	40,000	900	0.010	0.010
0.6	**1.5**	35,000	2,000	0.020	0.030	35,000	2,000	0.020	0.030	35,000	1,000	0.010	0.020
0.8	**2**	35,000	2,000	0.030	0.040	35,000	2,000	0.020	0.030	35,000	1,500	0.010	0.020
1.0	**2.5**	35,000	3,000	0.040	0.050	35,000	3,000	0.030	0.040	35,000	2,000	0.020	0.030
1.2	**3**	35,000	3,000	0.050	0.050	35,000	2,500	0.035	0.035	35,000	2,000	0.020	0.025
1.5	**4**	30,000	3,000	0.060	0.060	30,000	2,500	0.040	0.040	30,000	2,000	0.020	0.025
2.0	**5**	30,000	3,000	0.080	0.080	30,000	2,500	0.050	0.050	30,000	2,000	0.020	0.050

※ The cutting conditions above are for drilling with external coolant and cutting depth, under 5D.

H-Star Endmill

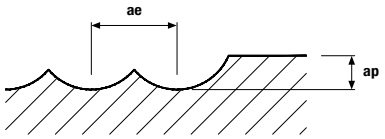
ESB702, ESB712 series

Workpiece / Conditions / Diameter (Ø)	Hardened steel Heat resistant alloy		Hardened steels									
	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
~0.2	50,000	1,200	50,000	1,050	45,000	960	40,000	770	35,000	674	31,500	570
0.3	50,000	1,500	50,000	1,350	45,000	1,200	40,000	765	35,000	840	31,500	700
0.4	50,000	1,900	50,000	1,700	45,000	1,500	40,000	1,200	35,000	1,050	31,500	1,100
0.5	50,000	2,400	50,000	2,100	45,000	1,900	40,000	1,500	35,000	1,300	31,500	1,100
0.6	50,000	2,900	50,000	2,500	45,000	2,200	40,000	1,800	35,000	1,600	31,500	1,400
0.8	50,000	3,900	50,000	3,300	45,000	3,000	40,000	2,400	35,000	1,600	31,500	1,800
1.0	50,000	4,800	50,000	4,200	45,000	3,800	40,000	3,000	35,000	2,600	35,000	2,300
1.5	50,000	5,400	48,000	4,500	43,000	4,000	23,000	3,100	33,000	2,700	29,700	2,300
2.0	49,700	5,700	47,800	4,800	40,000	4,000	35,000	3,150	32,000	2,800	28,500	2,300
3.0	33,100	6,000	31,800	5,300	26,500	4,000	23,500	3,150	21,000	28,00	19,000	2,300
4.0	24,900	6,000	23,900	5,300	20,000	4,000	17,500	3,150	16,000	2,800	14,500	2,300
5.0	18,600	5,800	17,800	4,900	15,000	3,750	13,500	3,050	11,500	2,550	10,500	2,100
6.0	13,900	4,850	13,400	4,100	11,000	3,100	10,000	2,500	8,800	2,150	8,000	1,750
8.0	11,100	4,200	10,700	3,500	9,000	2,700	8,000	2,150	7,000	1,850	6,500	1,550
10.0	9,300	3,700	8,900	3,100	7,500	2,400	6,600	1,900	5,800	1,650	5,300	1,380
12.0	6,950	2,950	6,680	2,500	5,600	1,900	5,000	1,550	4,400	1,250	4,000	1,050

Application tip

*ap : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.25mm
D10 ~ D12 = 0.3mm

*ae : 0.1 × D



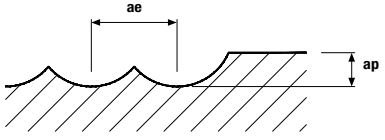
ESB703 series

Workpiece / Conditions / D x R(mm)	Hardened steels											
	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
2.0	57,000	7,100	55,000	6,000	46,000	5,000	40,300	3,900	36,800	3,500	32,800	2,900
2.5	57,000	7,100	55,000	6,000	46,000	5,000	40,300	3,900	36,800	3,500	32,800	2,900
3.0	38,000	7,500	36,600	6,600	30,500	5,000	27,000	3,900	24,200	3,500	21,900	2,900
4.0	28,500	7,500	27,500	6,600	23,000	5,000	20,100	3,900	18,400	3,500	16,700	2,900
5.0	21,500	7,300	20,500	6,100	17,300	4,700	15,500	3,800	13,200	3,200	12,100	2,600
6.0	16,000	6,100	15,400	5,100	12,700	3,900	11,500	3,100	10,100	2,700	9,200	2,200
8.0	12,700	5,300	12,300	4,400	10,400	3,400	9,200	2,700	8,100	2,300	7,500	1,900
10.0	10,700	4,600	10,200	3,900	8,600	3,000	7,600	2,400	6,700	2,100	6,100	1,700
12.0	8,000	3,700	7,700	3,100	6,400	2,400	5,800	1,900	5,100	1,600	4,600	1,300

Application tip

*ap : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.25mm
D10 ~ D12 = 0.3mm

*ae : 0.1 × D



H-Star Endmill

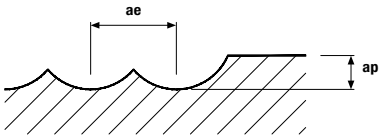
ESB734 series

Workpiece / Conditions / Diameter (Ø)	Hardened steels											
	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
2.0	62,100	8,600	59,800	7,200	50,000	6,000	43,800	4,700	40,000	4,200	35,600	3,500
2.5	62,100	8,600	59,800	7,200	50,000	6,000	43,800	4,700	40,000	4,200	35,600	3,500
3.0	41,400	9,000	39,800	8,000	33,100	6,000	29,400	4,700	26,300	4,200	23,800	3,500
4.0	31,100	9,000	29,900	8,000	25,000	6,000	21,900	4,700	20,000	4,200	18,100	3,500
5.0	23,300	8,700	22,300	7,400	18,800	5,600	16,900	4,600	14,400	3,800	13,100	3,200
6.0	17,400	7,300	16,800	6,200	13,800	4,700	12,500	3,800	11,000	3,200	10,000	2,600
8.0	13,900	6,300	13,400	5,300	11,300	4,100	10,000	3,200	8,800	2,800	8,100	2,300
10.0	11,600	5,600	11,100	4,700	9,400	3,600	8,300	2,900	7,300	2,500	6,600	2,100

Application tip

*ap : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.25mm
D10 ~ D12 = 0.3mm

*ae : 0.1 × D

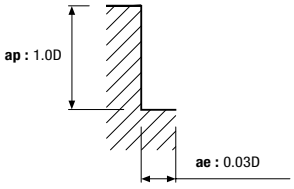


ESE702 series

Side cutting

Workpiece / Conditions / Diameter (Ø)	Hardened steel Heat resistant alloy		Hardened steels									
	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
1.0	48,000	1,050	38,000	820	25,500	510	20,500	310	16,000	190	12,500	125
2.0	33,300	1,200	26,000	970	17,500	600	14,500	370	11,000	230	9,500	165
3.0	21,800	1,200	17,300	970	11,500	600	9,500	370	7,500	230	6,400	165
4.0	16,700	1,250	13,200	1,000	8,800	625	7,200	385	5,600	240	4,750	170
5.0	15,700	1,450	12,500	1,150	8,300	710	6,400	410	5,100	260	4,450	190
6.0	13,100	1,350	10,350	1,100	6,900	690	5,300	400	4,200	255	3,700	185
8.0	9,880	1,320	7,800	1,030	5,200	635	4,000	365	3,200	235	2,800	170
10.0	7,800	1,200	6,150	970	4,100	590	3,200	340	2,550	220	2,200	160
12.0	6,650	1,200	5,250	970	3,500	590	2,650	340	2,100	220	1,860	160
16.0	4,900	1,050	3,900	840	2,600	520	2,000	300	1,600	190	1,400	140
20.0	3,900	950	3,100	750	2,050	475	1,600	275	1,300	175	1,100	125

Application tip



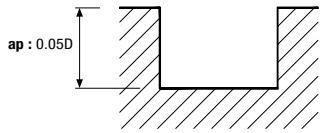
H-Star Endmill

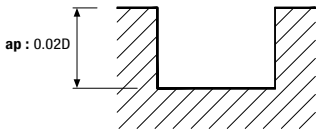
ESE702 series

Slotting

Workpiece / Conditions / Diameter (Ø)	Hardened steel Heat resistant alloy HRC30~40		Hardened steels HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
~0.2	50,000	130	45,000	115	40,000	95	33,000	60	33,000	45	26,400	30
0.3	50,000	190	45,000	140	40,000	115	33,000	70	25,000	50	20,000	35
0.4	50,000	235	45,000	180	40,000	140	33,000	90	25,000	55	20,000	40
0.5	50,000	370	45,000	280	40,000	220	33,000	140	25,000	85	20,000	60
0.6	50,000	470	45,000	360	40,000	285	33,000	160	25,000	105	20,000	75
0.8	50,000	600	40,000	440	30,000	295	25,000	185	19,000	110	15,200	80
0.9	49,000	655	39,000	520	27,800	330	22,700	205	17,500	125	14,000	90
1.0	48,000	750	38,000	570	25,500	360	20,500	215	16,000	135	12,500	85
2.0	33,300	850	26,000	680	17,500	420	14,500	260	11,000	160	9,500	115
3.0	21,800	850	17,300	680	11,500	420	9,500	260	7,500	160	6,400	115
4.0	16,700	880	13,200	700	8,800	440	7,200	270	5,600	170	4,750	118
5.0	15,700	1,000	12,500	805	8,300	500	6,400	285	5,100	180	4,450	132
6.0	13,100	950	10,350	770	6,900	480	5,300	280	4,200	180	3,700	130
8.0	9,880	930	7,800	720	5,200	445	4,000	255	3,200	165	2,800	120
10.0	7,800	850	6,150	680	4,100	415	3,200	240	2,550	155	2,200	122
12.0	6,650	850	5,250	680	3,500	415	2,650	240	2,100	155	1,860	112
16.0	4,900	730	3,900	580	2,600	365	2,000	210	1,600	135	1,400	95
20.0	3,900	660	3,100	525	2,050	335	1,600	195	1,300	125	1,100	85

Application tip



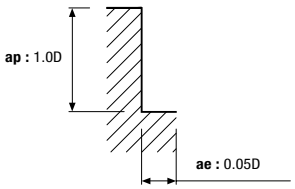


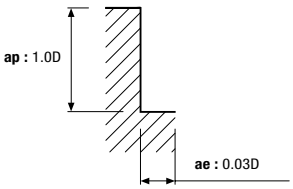
ESE704, ESE714, ESE744 series

Side cutting

Workpiece / Conditions / Diameter (Ø)	Hardened steel Heat resistant alloy HRC30~40		Hardened steels HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
1.0	48,000	1,480	38,000	1,050	25,500	710	20,500	430	16,000	270	12,500	175
2.0	33,300	1,750	26,000	1,250	17,500	840	14,500	520	11,000	320	9,500	230
3.0	21,800	1,750	17,300	1,250	11,500	840	9,500	520	7,500	320	6,400	230
4.0	16,700	1,800	13,200	1,300	8,800	880	7,200	540	5,600	335	4,750	240
5.0	15,700	2,000	12,500	1,500	8,300	1,000	6,400	580	5,100	370	4,450	270
6.0	13,100	1,950	10,350	1,400	6,900	950	5,300	560	4,200	350	3,700	260
8.0	9,880	1,880	7,800	1,350	5,200	900	4,000	520	3,200	330	2,800	240
10.0	7,800	1,750	6,150	1,260	4,100	840	3,200	480	2,550	310	2,200	220
12.0	6,650	1,750	5,250	1,260	3,500	840	2,650	480	2,100	300	1,860	220
16.0	4,900	1,500	3,900	1,100	2,600	730	2,000	420	1,600	270	1,400	200
20.0	3,900	1,300	3,100	970	2,050	650	1,600	380	1,300	250	1,100	180

Application tip





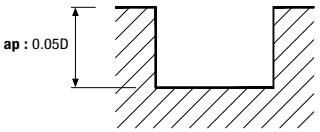
H-Star Endmill

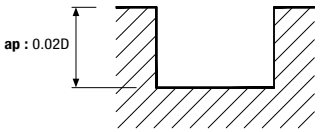
ESE712 series

Slotting

Workpiece / Conditions / Diameter (Ø)	Hardened steel Heat resistant alloy		Hardened steels									
	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
0.2	50,000	130	45,000	115	40,000	95	33,000	60	33,000	45	26,400	30
0.3	50,000	190	45,000	140	40,000	115	33,000	70	25,000	50	20,000	35
0.4	50,000	235	45,000	180	40,000	140	33,000	90	25,000	55	20,000	40
0.5	50,000	370	45,000	280	40,000	220	33,000	140	25,000	85	20,000	60
0.6	50,000	470	45,000	360	40,000	285	30,000	160	25,000	105	20,000	75
0.8	50,000	600	40,000	440	30,000	295	25,000	185	19,000	110	15,200	80
0.9	49,000	655	39,000	520	27,800	330	22,700	205	17,500	125	14,000	90
1.0	48,000	750	38,000	570	25,500	360	20,500	215	16,000	135	12,500	85
2.0	33,300	850	26,000	680	17,500	420	14,500	260	11,000	160	9,500	115
3.0	21,800	850	17,300	680	11,500	420	9,500	260	7,500	160	6,400	115
4.0	16,700	880	13,200	700	8,800	440	7,200	270	5,600	170	4,750	118
5.0	15,700	1,000	12,500	805	8,300	500	6,400	285	5,100	180	4,450	132
6.0	13,100	950	10,350	770	6,900	480	5,300	280	4,200	180	3,700	130
8.0	9,880	930	7,800	720	5,200	445	4,000	255	3,200	165	2,800	120
10.0	7,800	850	6,150	680	4,100	415	3,200	240	2,550	155	2,200	112
12.0	6,650	850	5,250	680	3,500	415	2,650	240	2,100	155	1,860	112
16.0	4,900	730	3,900	580	2,600	365	2,000	210	1,600	135	1,400	95
20.0	3,900	660	3,100	525	2,050	335	1,600	195	1,300	125	1,100	85

Application tip



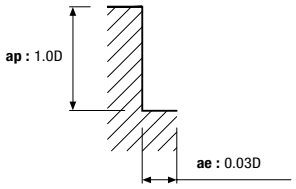


ESE712 series

Side cutting

Workpiece / Conditions / Diameter (Ø)	Hardened steel Heat resistant alloy		Hardened steels									
	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
1.0	48,000	1,050	38,000	820	25,500	510	20,500	310	16,000	190	12,500	125
2.0	33,300	1,200	26,000	970	17,500	600	14,500	370	11,000	230	9,500	165
3.0	21,800	1,200	17,300	970	11,500	600	9,500	370	7,500	230	6,400	165
4.0	16,700	1,250	13,200	1,000	8,800	625	7,200	385	5,600	240	4,750	170
5.0	15,700	1,450	12,500	1,150	8,300	710	6,400	410	5,100	260	4,450	190
6.0	13,100	1,350	10,350	1,100	6,900	690	5,300	400	4,200	255	3,700	185
8.0	9,880	1,320	7,800	1,030	5,200	635	4,000	365	3,200	235	2,800	170
10.0	7,800	1,200	6,150	970	4,100	590	3,200	340	2,550	220	2,200	160
12.0	6,650	1,200	5,250	970	3,500	590	2,650	340	2,100	220	1,860	160
16.0	4,900	1,050	3,900	840	2,600	520	2,000	300	1,600	190	1,400	140
20.0	3,900	950	3,100	750	2,050	475	1,600	275	1,300	175	1,100	125

Application tip



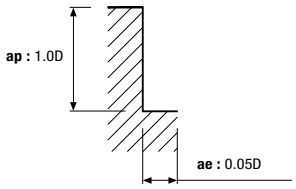
H-Star Endmill

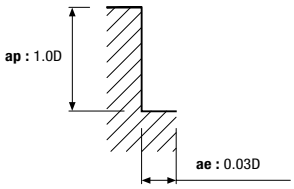
ESE716 series

Side cutting

Workpiece / Conditions / Diameter (Ø)	Hardened steel Heat resistant alloy HRC30~40		Hardened steels HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
6.0	24,800	5,350	23,500	4,900	16,000	4,900	13,500	3,300	10,500	2,100	8,000	1,450
8.0	20,000	5,500	19,000	5,000	12,000	4,600	10,000	3,100	8,000	2,000	6,000	1,400
10.0	16,000	4,900	15,500	4,500	9,500	4,100	8,000	2,900	6,400	1,800	4,800	1,300
12.0	13,000	4,500	12,500	4,100	8,000	3,800	6,600	2,500	5,300	1,600	4,000	1,150
16.0	10,000	4,000	9,700	3,700	6,000	3,400	5,000	2,300	4,000	1,250	3,000	870
20.0	8,000	3,350	7,800	3,400	4,800	3,200	4,000	2,100	3,200	1,020	2,400	690

Application tip



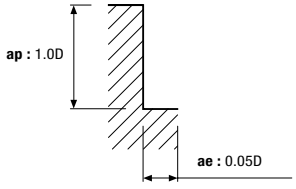


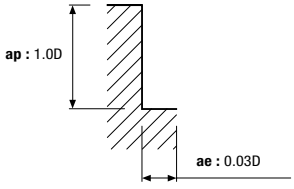
ESE724 series

Side cutting

Workpiece / Conditions / Diameter (Ø)	Hardened steel Heat resistant alloy HRC30~40		Hardened steels HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
1.0	48,000	1,480	38,000	1,050	25,500	710	20,500	430	16,000	270	12,500	175
2.0	33,300	1,750	26,000	1,250	17,500	840	14,500	520	11,000	320	9,500	230
3.0	21,800	1,750	17,300	1,250	11,500	840	9,500	520	7,500	320	6,400	230
4.0	16,700	1,800	13,200	1,300	8,800	880	7,200	540	5,600	335	4,750	240
5.0	15,700	2,000	12,500	1,500	8,300	1,000	6,400	580	5,100	370	4,450	270
6.0	13,100	1,950	10,350	1,400	6,900	950	5,300	560	4,200	350	3,700	260
8.0	9,880	1,880	7,800	1,350	5,200	900	4,000	520	3,200	330	2,800	240
10.0	7,800	1,750	6,150	1,260	4,100	840	3,200	480	2,550	310	2,200	220
12.0	6,650	1,750	5,250	1,260	3,500	840	2,650	480	2,100	300	1,860	220
16.0	4,900	1,500	3,900	1,100	2,600	730	2,000	420	1,600	270	1,400	200
20.0	3,900	1,300	3,100	970	2,050	650	1,600	380	1,300	250	1,100	180

Application tip



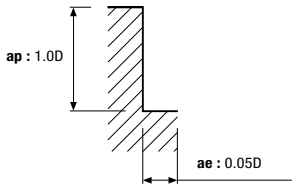


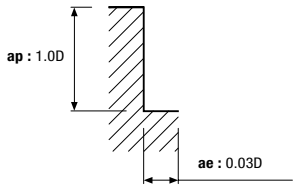
H-Star Endmill

ESE726, ESR736 series

Workpiece / Conditions / Diameter (Ø)	Hardened steel Heat resistant alloy		Hardened steels									
	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
6.0	24,800	5,350	23,500	4,900	16,000	4,900	13,500	3,300	10,500	2,100	8,000	1,450
8.0	20,000	5,500	19,000	5,000	12,000	4,600	10,000	3,100	8,000	2,000	6,000	1,400
10.0	16,000	4,900	15,500	4,500	9,500	4,100	8,000	2,900	6,400	1,800	4,800	1,300
12.0	13,000	4,500	12,500	4,100	8,000	3,800	6,600	2,500	5,300	1,600	4,000	1,150
16.0	10,000	4,000	9,700	3,700	6,000	3,400	5,000	2,300	4,000	1,250	3,000	870
20.0	8,000	3,350	7,800	3,400	4,800	3,200	4,000	2,100	3,200	1,020	2,400	690

Application tip



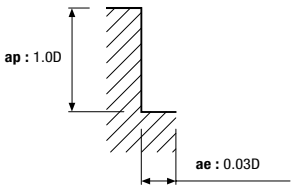


ESR702 series

Side cutting

Workpiece / Conditions / Diameter (Ø)	Hardened steel Heat resistant alloy		Hardened steels									
	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
2.0	33,300	960	26,000	776	17,500	480	14,500	296	11,000	184	9,500	132
3.0	21,800	960	17,300	776	11,500	480	9,500	296	7,500	184	6,400	132
4.0	16,700	1,000	13,200	800	8,800	500	7,200	308	5,600	192	4,750	136
5.0	15,700	1,160	12,500	920	8,300	568	6,400	328	5,100	208	4,450	152
6.0	13,100	1,080	10,350	880	6,900	552	5,300	320	4,200	204	3,700	148
8.0	9,880	1,056	7,800	824	5,200	508	4,000	292	3,200	188	2,800	136
10.0	7,800	960	6,150	776	4,100	472	3,200	272	2,550	176	2,200	128
12.0	6,650	960	5,250	776	3,500	472	2,650	272	2,100	176	1,860	128
16.0	4,900	840	3,900	672	2,600	416	2,000	240	1,600	152	1,400	112
20.0	3,900	760	3,100	600	2,050	380	1,600	220	1,300	140	1,100	100

Application tip



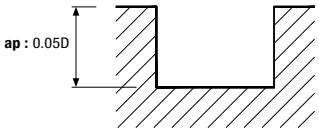
H-Star Endmill

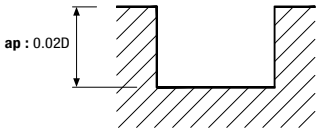
ESR702, ESR732 series

Slotting

Workpiece / Conditions / Diameter (Ø)	Hardened steel Heat resistant alloy HRC30~40		Hardened steels HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
2.0	33,300	680	26,000	544	17,500	336	14,500	208	11,000	128	9,500	92
3.0	21,800	680	17,300	544	11,500	336	9,500	208	7,500	128	6,400	92
4.0	16,700	704	13,200	560	8,800	352	7,200	216	5,600	136	4,750	94
5.0	15,700	800	12,500	644	8,300	400	6,400	228	5,100	144	4,450	106
6.0	13,100	760	10,350	616	6,900	384	5,300	224	4,200	144	3,700	104
8.0	9,880	744	7,800	576	5,200	356	4,000	204	3,200	132	2,800	96
10.0	7,800	680	6,150	544	4,100	332	3,200	192	2,550	124	2,200	90
12.0	6,650	680	5,250	544	3,500	332	2,650	192	2,100	124	1,860	90
16.0	4,900	584	3,900	464	2,600	292	2,000	168	1,600	108	1,400	78
20.0	3,900	528	3,100	420	2,050	268	1,600	168	1,300	100	1,100	70

Application tip



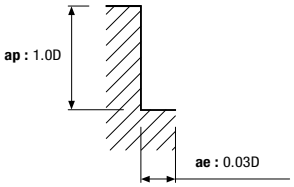


ESR704, ESR714, ESR724, ESR734 series

Side cutting

Workpiece / Conditions / Diameter (Ø)	Hardened steel Heat resistant alloy HRC30~40		Hardened steels HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
3.0	21,800	1,400	17,300	1,000	11,500	672	9,500	416	7,500	256	6,400	184
4.0	16,700	1,440	13,200	1,040	8,800	704	7,200	432	5,600	268	4,750	192
5.0	15,700	1,600	12,500	1,200	8,300	800	6,400	464	5,100	296	4,450	216
6.0	13,100	1,560	10,350	1,120	6,900	760	5,300	448	4,200	280	3,700	208
8.0	9,880	1,504	7,800	1,080	5,200	720	4,000	416	3,200	264	2,800	192
10.0	7,800	1,400	6,150	1,008	4,100	672	3,200	384	2,550	248	2,200	176
12.0	6,650	1,400	5,250	1,008	3,500	672	2,650	384	2,100	240	1,860	176
16.0	4,900	1,200	3,900	880	2,600	584	2,000	336	1,600	216	1,400	160
20.0	3,900	1,040	3,100	776	2,050	520	1,600	304	1,300	200	1,100	144

Application tip

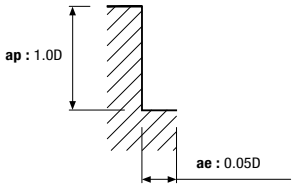


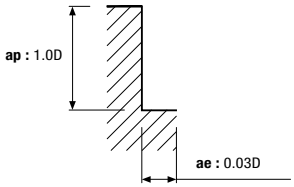
H-Star Endmill

ESR706 series

Workpiece / Conditions / Diameter (Ø)	Hardened steel Heat resistant alloy		Hardened steels									
	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
6.0	24,800	5,350	23,500	4,900	16,000	4,900	13,500	3,300	10,500	2,100	8,000	1,450
8.0	20,000	5,500	19,000	5,000	12,000	4,600	10,000	3,100	8,000	2,000	6,000	1,400
10.0	16,000	4,900	15,500	4,500	9,500	4,100	8,000	2,900	6,400	1,800	4,800	1,300
12.0	13,000	4,500	12,500	4,100	8,000	3,800	6,600	2,500	5,300	1,600	4,000	1,150
16.0	10,000	4,000	9,700	3,700	6,000	3,400	5,000	2,300	4,000	1,250	3,000	870
20.0	8,000	3,350	7,800	3,400	4,800	3,200	4,000	2,100	3,200	1,020	2,400	690

Application tip





H-Star Endmill

ESRB712 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)
0.1	0.3	50,000	240	0.009	50,000	215	0.007	50,000	190	0.005
	0.5	50,000	240	0.006	50,000	215	0.005	50,000	190	0.004
	1	45,000	195	0.002	45,000	175	0.002	45,000	155	0.001
0.2	0.5	50,000	335	0.018	50,000	310	0.014	43,200	260	0.010
	1	50,000	335	0.013	50,000	310	0.010	43,200	260	0.007
	1.5	45,000	270	0.007	45,000	250	0.006	38,880	210	0.004
	2	45,000	270	0.005	45,000	250	0.004	38,880	210	0.003
	3	45,000	270	0.003	45,000	250	0.003	38,880	210	0.002
0.3	1	50,000	475	0.019	50,000	430	0.015	42,800	365	0.011
	1.5	50,000	475	0.019	50,000	430	0.015	42,800	365	0.011
	2	45,000	385	0.011	45,000	350	0.008	38,520	295	0.006
	2.5	45,000	385	0.007	45,000	350	0.005	38,520	295	0.004
	3	45,000	385	0.007	45,000	350	0.005	38,520	295	0.004
	4	40,000	305	0.004	40,000	275	0.003	34,240	235	0.002
	5	30,000	200	0.003	30,000	180	0.002	25,680	155	0.002
0.4	1	41,000	490	0.036	38,800	425	0.028	34,200	340	0.020
	1.5	41,000	490	0.025	38,800	425	0.020	34,200	340	0.014
	2	41,000	490	0.025	38,800	425	0.020	34,200	340	0.014
	2.5	36,900	395	0.014	34,920	345	0.011	30,780	275	0.008
	3	36,900	395	0.014	34,920	345	0.011	30,780	275	0.008
	4	36,900	395	0.009	34,920	345	0.007	30,780	275	0.005
	5	32,800	315	0.009	31,040	270	0.007	27,360	220	0.005
	6	32,800	315	0.005	31,040	270	0.004	27,360	220	0.003
	8	24,600	205	0.004	23,280	180	0.003	20,520	145	0.002
	10	12,300	90	0.004	11,640	75	0.003	10,260	60	0.002
0.5	1	34,200	685	0.045	32,300	580	0.035	28,500	515	0.025
	1.5	34,200	685	0.045	32,300	580	0.035	28,500	515	0.025
	2	34,200	685	0.032	32,300	580	0.025	28,500	515	0.018
	2.5	34,200	685	0.032	32,300	580	0.025	28,500	515	0.018
	3	30,780	555	0.018	29,070	470	0.014	25,650	415	0.010
	4	30,780	555	0.018	29,070	470	0.014	25,650	415	0.010
	5	30,780	555	0.011	29,070	470	0.009	25,650	415	0.006
	6	27,360	440	0.011	25,840	370	0.009	22,800	330	0.006
	8	20,520	290	0.007	19,380	245	0.005	17,100	215	0.004
	10	20,520	290	0.005	19,380	245	0.004	17,100	215	0.003
	12	10,260	125	0.005	9,690	105	0.004	8,550	95	0.003
	14	10,260	125	0.005	9,690	105	0.004	8,550	95	0.003
	16	3,420	35	0.005	3,230	30	0.004	2,850	25	0.003
0.6	1	34,200	1,025	0.038	32,300	840	0.029	28,500	685	0.021
	2	34,200	1,025	0.038	32,300	840	0.029	28,500	685	0.021
	3	34,200	1,025	0.038	32,300	840	0.029	28,500	685	0.021
	4	30,780	830	0.022	29,070	680	0.017	25,650	555	0.012
	5	30,780	830	0.014	29,070	680	0.011	25,650	555	0.008
	6	30,780	830	0.014	29,070	680	0.011	25,650	555	0.008

H-Star Endmill

ESRB712 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
0.6	8	27,360	655	0.008	25,840	540	0.006	22,800	440	0.005
	10	20,520	430	0.005	19,380	355	0.004	17,100	290	0.003
	12	20,520	430	0.005	19,380	355	0.004	17,100	290	0.003
	14	10,260	185	0.005	9,690	150	0.004	8,550	125	0.003
	16	10,260	185	0.005	9,690	150	0.004	8,550	125	0.003
0.7	2	34,200	1,130	0.063	32,300	930	0.049	28,500	765	0.035
	4	30,780	915	0.025	29,070	755	0.020	25,650	620	0.014
	6	30,780	915	0.016	29,070	755	0.012	25,650	620	0.009
	8	27,360	725	0.016	25,840	595	0.012	22,800	490	0.009
	10	27,360	725	0.009	25,840	595	0.007	22,800	490	0.005
	12	20,520	475	0.006	19,380	390	0.005	17,100	320	0.004
0.8	2	34,200	1,230	0.072	32,300	1,035	0.056	28,500	855	0.040
	3	34,200	1,230	0.050	32,300	1,035	0.039	28,500	855	0.028
	4	34,200	1,230	0.050	32,300	1,035	0.039	28,500	855	0.028
	5	30,780	995	0.029	29,070	840	0.022	25,650	695	0.016
	6	30,780	995	0.029	29,070	840	0.022	25,650	695	0.016
	8	30,780	995	0.018	29,070	840	0.014	25,650	695	0.010
	10	27,360	785	0.018	25,840	660	0.014	22,800	545	0.010
	12	27,360	785	0.011	25,840	660	0.008	22,800	545	0.006
	14	20,520	515	0.007	19,380	435	0.006	17,100	360	0.004
	16	20,520	515	0.007	19,380	435	0.006	17,100	360	0.004
	20	10,260	220	0.007	9,690	185	0.006	8,550	155	0.004
0.9	4	29,250	1,120	0.032	27,630	935	0.025	24,390	775	0.018
	6	29,250	1,120	0.032	27,630	935	0.025	24,390	775	0.018
	8	29,250	1,120	0.020	27,630	935	0.016	24,390	775	0.011
	10	26,000	885	0.020	24,560	740	0.016	21,680	610	0.011
1.0	2	30,800	1,540	0.090	29,100	1,310	0.070	25,700	1,075	0.050
	3	30,800	1,540	0.090	29,100	1,310	0.070	25,700	1,075	0.050
	4	30,800	1,540	0.063	29,100	1,310	0.049	25,700	1,075	0.035
	5	30,800	1,540	0.063	29,100	1,310	0.049	25,700	1,075	0.035
	6	27,720	1,245	0.036	26,190	1,060	0.028	23,130	870	0.020
	7	27,720	1,245	0.036	26,190	1,060	0.028	23,130	870	0.020
	8	27,720	1,245	0.036	26,190	1,060	0.028	23,130	870	0.020
	10	27,720	1,245	0.023	26,190	1,060	0.018	23,130	870	0.013
	12	24,640	985	0.023	23,280	840	0.018	20,560	690	0.013
	14	24,640	985	0.014	23,280	840	0.011	20,560	690	0.008
	16	18,480	645	0.014	17,460	550	0.011	15,420	450	0.008
	18	18,480	645	0.009	17,460	550	0.007	15,420	450	0.005
	20	18,480	645	0.009	17,460	550	0.007	15,420	450	0.005
	22	9,240	275	0.009	8,730	235	0.007	7,710	195	0.005
	26	9,240	275	0.009	8,730	235	0.007	7,710	195	0.005
	30	9,240	275	0.009	8,730	235	0.007	7,710	195	0.005
	40	3,080	75	0.009	2,910	65	0.007	2,570	55	0.005
	50	3,080	75	0.006	2,910	65	0.005	2,570	55	0.003

H-Star Endmill

ESRB712 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)
1.2	4	26,300	1,375	0.076	24,800	1,150	0.059	21,900	950	0.042
	6	26,300	1,375	0.076	24,800	1,150	0.059	21,900	950	0.042
	8	23,670	1,115	0.043	22,320	930	0.034	19,710	770	0.024
	10	23,670	1,115	0.027	22,320	930	0.021	19,710	770	0.015
	12	23,670	1,115	0.027	22,320	930	0.021	19,710	770	0.015
	16	21,040	880	0.016	19,840	735	0.013	17,520	610	0.009
	20	15,780	580	0.011	14,880	485	0.008	13,140	400	0.006
	26	7,890	245	0.011	7,440	205	0.008	6,570	170	0.006
1.4	6	21,500	1,295	0.088	20,300	1,100	0.069	18,000	935	0.049
	8	19,350	1,050	0.050	18,270	890	0.039	16,200	755	0.028
	10	19,350	1,050	0.050	18,270	890	0.039	16,200	755	0.028
	16	17,200	830	0.032	16,240	705	0.025	14,400	600	0.018
1.5	4	23,900	1,580	0.135	22,600	1,355	0.105	20,000	1,075	0.075
	5	23,900	1,580	0.095	22,600	1,355	0.074	20,000	1,075	0.053
	6	23,900	1,580	0.095	22,600	1,355	0.074	20,000	1,075	0.053
	7	23,900	1,580	0.095	22,600	1,355	0.074	20,000	1,075	0.053
	8	21,510	1,280	0.054	20,340	1,100	0.042	18,000	870	0.030
	10	21,510	1,280	0.054	20,340	1,100	0.042	18,000	870	0.030
	12	21,510	1,280	0.054	20,340	1,100	0.042	18,000	870	0.030
	14	21,510	1,280	0.034	20,340	1,100	0.026	18,000	870	0.019
	16	19,120	1,010	0.034	18,080	865	0.026	16,000	690	0.019
	18	19,120	1,010	0.034	18,080	865	0.026	16,000	690	0.019
	20	19,120	1,010	0.020	18,080	865	0.016	16,000	690	0.011
	22	19,120	1,010	0.020	18,080	865	0.016	16,000	690	0.011
	26	14,340	665	0.014	13,560	570	0.011	12,000	450	0.008
	30	14,340	665	0.014	13,560	570	0.011	12,000	450	0.008
	35	7,170	285	0.010	6,780	245	0.008	6,000	195	0.005
	40	7,170	285	0.010	6,780	245	0.008	6,000	195	0.005
1.6	4	22,200	1,555	0.101	21,000	1,300	0.078	18,500	1,110	0.056
	6	22,200	1,555	0.101	21,000	1,300	0.078	18,500	1,110	0.056
	8	22,200	1,555	0.101	21,000	1,300	0.078	18,500	1,110	0.056
	10	19,980	1,260	0.058	18,900	1,055	0.045	16,650	900	0.032
	12	19,980	1,260	0.058	18,900	1,055	0.045	16,650	900	0.032
	16	19,980	1,260	0.036	18,900	1,055	0.028	16,650	900	0.020
	20	17,760	995	0.036	16,800	830	0.028	14,800	710	0.020
1.8	4	22,200	1,780	0.113	21,000	1,470	0.088	18,500	1,225	0.063
	6	22,200	1,780	0.113	21,000	1,470	0.088	18,500	1,225	0.063
	8	22,200	1,780	0.113	21,000	1,470	0.088	18,500	1,225	0.063
	10	19,980	1,440	0.065	18,900	1,190	0.050	16,650	990	0.036
	12	19,980	1,440	0.065	18,900	1,190	0.050	16,650	990	0.036
	16	19,980	1,440	0.041	18,900	1,190	0.032	16,650	990	0.023
	20	17,760	1,140	0.041	16,800	940	0.032	14,800	785	0.023
2.0	6	18,000	1,795	0.180	17,000	1,525	0.140	15,000	1,285	0.100
	8	18,000	1,795	0.126	17,000	1,525	0.098	15,000	1,285	0.070

H-Star Endmill

ESRB712 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
2.0	10	18,000	1,795	0.126	17,000	1,525	0.098	15,000	1,285	0.070
	12	16,200	1,455	0.072	15,300	1,235	0.056	13,500	1,040	0.040
	14	16,200	1,455	0.072	15,300	1,235	0.056	13,500	1,040	0.040
	16	16,200	1,455	0.072	15,300	1,235	0.056	13,500	1,040	0.040
	18	16,200	1,455	0.045	15,300	1,235	0.035	13,500	1,040	0.025
	20	16,200	1,455	0.045	15,300	1,235	0.035	13,500	1,040	0.025
	22	14,400	1,150	0.045	13,600	975	0.035	12,000	820	0.025
	26	14,400	1,150	0.045	13,600	975	0.035	12,000	820	0.025
	30	14,400	1,150	0.027	13,600	975	0.021	12,000	820	0.015
	35	10,800	755	0.018	10,200	640	0.014	9,000	540	0.010
	40	10,800	755	0.018	10,200	640	0.014	9,000	540	0.010
	45	5,400	325	0.018	5,100	275	0.014	4,500	230	0.010
	50	5,400	325	0.018	5,100	275	0.014	4,500	230	0.010
	60	5,400	325	0.018	5,100	275	0.014	4,500	230	0.010
2.5	8	15,800	1,925	0.158	14,900	1,605	0.123	13,200	1,305	0.088
	10	15,800	1,925	0.158	14,900	1,605	0.123	13,200	1,305	0.088
	12	15,800	1,925	0.158	14,900	1,605	0.123	13,200	1,305	0.088
	16	14,220	1,560	0.090	13,410	1,300	0.070	11,880	1,055	0.050
	20	14,220	1,560	0.090	13,410	1,300	0.070	11,880	1,055	0.050
	22	14,220	1,560	0.056	13,410	1,300	0.044	11,880	1,055	0.031
	26	12,640	1,230	0.056	11,920	1,025	0.044	10,560	835	0.031
	30	12,640	1,230	0.056	11,920	1,025	0.044	10,560	835	0.031
	35	12,640	1,230	0.034	11,920	1,025	0.026	10,560	835	0.019
	40	9,480	810	0.034	8,940	675	0.026	7,920	550	0.019
	45	9,480	810	0.023	8,940	675	0.018	7,920	550	0.013
	50	9,480	810	0.023	8,940	675	0.018	7,920	550	0.013
3.0	6	13,700	2,050	0.270	12,900	1,730	0.210	11,400	1,435	0.150
	8	13,700	2,050	0.270	12,900	1,730	0.210	11,400	1,435	0.150
	10	13,700	2,050	0.189	12,900	1,730	0.147	11,400	1,435	0.105
	12	13,700	2,050	0.189	12,900	1,730	0.147	11,400	1,435	0.105
	14	13,700	2,050	0.189	12,900	1,730	0.147	11,400	1,435	0.105
	16	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.06
	18	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.06
	20	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.06
	22	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.06
	26	12,330	1,660	0.068	11,610	1,400	0.053	10,260	1,160	0.038
	30	12,330	1,660	0.068	11,610	1,400	0.053	10,260	1,160	0.038
	35	10,960	1,310	0.068	10,320	1,105	0.053	9,120	920	0.038
	40	10,960	1,310	0.041	10,320	1,105	0.032	9,120	920	0.023
	45	10,960	1,310	0.041	10,320	1,105	0.032	9,120	920	0.023
	50	8,220	860	0.027	7,740	725	0.021	6,840	605	0.015
	60	8,220	860	0.027	7,740	725	0.021	6,840	605	0.015
4.0	8	9,800	1,965	0.360	9,300	1,670	0.280	8,200	1,395	0.200
	10	9,800	1,965	0.360	9,300	1,670	0.280	8,200	1,395	0.200

H-Star Endmill

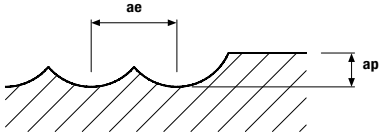
ESRB712 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
4.0	12	9,800	1,965	0.360	9,300	1,670	0.280	8,200	1,395	0.200
	14	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.140
	16	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.140
	18	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.140
	20	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.140
	22	8,820	1,590	0.144	8,370	1,355	0.112	7,380	1,130	0.080
	26	8,820	1,590	0.144	8,370	1,355	0.112	7,380	1,130	0.080
	30	8,820	1,590	0.144	8,370	1,355	0.112	7,380	1,130	0.080
	35	8,820	1,590	0.090	8,370	1,355	0.070	7,380	1,130	0.050
	40	8,820	1,590	0.090	8,370	1,355	0.070	7,380	1,130	0.050
	45	7,840	1,260	0.090	7,440	1,070	0.070	6,560	895	0.050
	50	7,840	1,260	0.090	7,440	1,070	0.070	6,560	895	0.050
	60	7,840	1,260	0.054	7,440	1,070	0.042	6,560	895	0.030
5.0	15	7,700	1,845	0.315	7,300	1,455	0.245	6,400	1,285	0.175
	20	7,700	1,845	0.315	7,300	1,455	0.245	6,400	1,285	0.175
	26	6,930	1,495	0.180	6,570	1,180	0.140	5,760	1,040	0.100
	30	6,930	1,495	0.180	6,570	1,180	0.140	5,760	1,040	0.100
	35	6,930	1,495	0.180	6,570	1,180	0.140	5,760	1,040	0.100
	40	6,930	1,495	0.180	6,570	1,180	0.140	5,760	1,040	0.100
	50	6,930	1,495	0.113	6,570	1,180	0.088	5,760	1,040	0.063
	60	6,160	1,180	0.113	5,840	930	0.088	5,120	820	0.063
6.0	20	6,500	1,900	0.378	6,200	1,600	0.294	5,500	1,330	0.210
	30	6,500	1,900	0.378	6,200	1,600	0.294	5,500	1,330	0.210
8.0	25	4,850	1,800	0.504	4,600	1,500	0.392	4,000	1,280	0.280
	30	4,850	1,800	0.504	4,600	1,500	0.392	4,000	1,280	0.280
10.0	30	3,850	1,650	0.900	3,680	1,400	0.700	3,200	1,200	0.500
	40	3,850	1,650	0.630	3,680	1,400	0.490	3,200	1,200	0.350
12.0	32	3,200	1,520	1.080	3,050	1,300	0.840	2,650	1,100	0.600
	45	3,200	1,520	0.756	3,050	1,300	0.588	2,650	1,100	0.420

Application tip

*ap : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.25mm
D10 ~ D12 = 0.3mm

*ae : 0.1 × D



H-Star Endmill

ESRE712 series

Side cutting

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)
0.1	0.3	50,000	315	0.009	46,200	230	0.007	40,600	170	0.005
	0.5	50,000	315	0.006	46,200	230	0.005	40,600	170	0.004
	1	45,000	255	0.002	41,580	185	0.002	36,540	140	0.001
0.2	0.5	38,500	380	0.018	36,300	270	0.014	32,100	200	0.010
	1	38,500	380	0.013	36,300	270	0.010	32,100	200	0.007
	1.5	34,650	310	0.007	32,670	220	0.006	28,890	160	0.004
	2	34,650	310	0.005	32,670	220	0.004	28,890	160	0.003
0.3	1	34,200	390	0.019	32,300	270	0.015	28,500	230	0.011
	1.5	34,200	390	0.019	32,300	270	0.015	25,800	230	0.011
	2	30,780	315	0.011	29,070	220	0.008	25,650	185	0.006
	2.5	30,780	315	0.007	29,070	220	0.005	25,650	185	0.004
	3	30,780	315	0.007	29,070	220	0.005	25,650	185	0.004
	4	27,360	250	0.004	25,840	175	0.003	22,800	145	0.002
	5	20,520	165	0.003	19,380	115	0.002	17,100	95	0.002
0.4	1	27,400	540	0.036	25,800	380	0.028	22,800	280	0.020
	1.5	27,400	540	0.025	25,800	380	0.020	22,800	280	0.014
	2	27,400	540	0.025	25,800	380	0.020	22,800	280	0.014
	2.5	24,660	435	0.014	23,220	310	0.011	20,520	225	0.008
	3	24,660	435	0.014	23,220	310	0.011	20,520	225	0.008
	4	24,660	435	0.009	23,220	310	0.007	20,520	225	0.005
	5	21,920	345	0.009	20,640	245	0.007	18,240	180	0.005
	6	21,920	345	0.005	20,640	245	0.004	18,240	180	0.003
	8	16,440	225	0.004	15,480	160	0.003	13,680	120	0.002
	10	8,220	95	0.004	7,740	70	0.003	6,840	50	0.002
0.5	1	27,400	540	0.045	25,800	425	0.035	22,800	285	0.025
	1.5	27,400	540	0.045	25,800	425	0.035	22,800	285	0.025
	2	27,400	540	0.032	25,800	425	0.025	22,800	285	0.018
	2.5	27,400	540	0.032	25,800	425	0.025	22,800	285	0.018
	3	24,660	435	0.018	23,220	345	0.014	20,520	230	0.010
	4	24,660	435	0.018	23,220	345	0.014	20,520	230	0.010
	5	24,660	435	0.011	23,220	345	0.009	20,520	230	0.006
	6	21,920	345	0.011	20,640	270	0.009	18,240	180	0.006
	8	16,440	225	0.007	15,480	180	0.005	13,680	120	0.004
	10	16,440	225	0.005	15,480	180	0.004	13,680	120	0.003
	12	8,220	95	0.005	7,740	75	0.004	6,840	50	0.003
	14	8,220	95	0.005	7,740	75	0.004	6,840	50	0.003
	16	2,740	25	0.005	2,580	20	0.004	2,280	15	0.003
0.6	2	27,400	775	0.038	25,800	545	0.029	22,800	405	0.021
	3	27,400	775	0.038	25,800	545	0.029	22,800	405	0.021
	4	24,660	630	0.022	23,220	440	0.017	20,520	330	0.012
	5	24,660	630	0.014	23,220	440	0.011	20,520	330	0.008
	6	24,660	630	0.014	23,220	440	0.011	20,520	330	0.008
	8	21,920	495	0.008	20,640	350	0.006	18,240	260	0.005
	10	16,440	325	0.005	15,480	230	0.004	13,680	170	0.003

H-Star Endmill

ESRE712 series

Side cutting

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)
0.6	12	16,440	325	0.005	15,480	230	0.004	13,680	170	0.003
	14	8,220	140	0.005	7,740	100	0.004	6,840	75	0.003
	16	8,220	140	0.005	7,740	100	0.004	6,840	75	0.003
0.7	2	27,400	775	0.063	25,800	545	0.049	22,800	405	0.035
	4	24,660	630	0.025	23,220	440	0.020	20,520	330	0.014
	6	24,660	630	0.016	23,220	440	0.012	20,520	330	0.009
	8	21,920	495	0.016	20,640	350	0.012	18,240	260	0.009
	10	21,920	495	0.009	20,640	350	0.007	18,240	260	0.005
	12	16,440	325	0.009	15,480	230	0.005	13,680	170	0.004
0.8	2	27,400	775	0.072	25,800	605	0.056	22,800	450	0.040
	3	27,400	775	0.050	25,800	605	0.039	22,800	450	0.028
	4	27,400	775	0.050	25,800	605	0.039	22,800	450	0.028
	5	24,660	630	0.029	23,220	490	0.022	20,520	365	0.016
	6	24,660	630	0.029	23,220	490	0.022	20,520	365	0.016
	8	24,660	630	0.018	23,220	490	0.014	20,520	365	0.010
	10	21,920	495	0.018	20,640	385	0.014	18,240	290	0.010
	12	21,920	495	0.011	20,640	385	0.008	18,240	290	0.006
	14	16,440	325	0.007	15,480	255	0.006	13,680	190	0.004
	16	16,440	325	0.007	15,480	255	0.006	13,680	190	0.004
	20	8,220	140	0.007	7,740	110	0.006	6,840	80	0.004
0.9	6	22,140	575	0.032	20,970	440	0.025	18,450	330	0.018
	8	22,140	575	0.020	20,970	440	0.016	18,450	330	0.011
	10	19,680	455	0.020	18,640	350	0.016	16,400	260	0.011
1.0	2	24,600	1,045	0.090	23,300	890	0.070	20,500	665	0.050
	3	24,600	1,045	0.090	23,300	890	0.070	20,500	665	0.050
	4	24,600	1,045	0.063	23,300	890	0.049	20,500	665	0.035
	5	24,600	1,045	0.063	23,300	890	0.049	20,500	665	0.035
	6	22,140	845	0.036	20,970	720	0.028	18,450	540	0.020
	7	22,140	845	0.036	20,970	720	0.028	18,450	540	0.020
	8	22,140	845	0.036	20,970	720	0.028	18,450	540	0.020
	10	22,140	845	0.023	20,970	720	0.018	18,450	540	0.013
	12	19,680	670	0.023	18,640	570	0.018	16,400	425	0.013
	14	19,680	670	0.014	18,640	570	0.011	16,400	425	0.008
	16	14,760	440	0.014	13,980	375	0.011	12,300	280	0.008
	18	14,760	440	0.009	13,980	375	0.007	12,300	280	0.005
	20	14,760	440	0.009	13,980	375	0.007	12,300	280	0.005
	22	7,380	190	0.009	6,990	160	0.007	6,150	120	0.005
	26	7,380	190	0.009	6,990	160	0.007	6,150	120	0.005
	30	7,380	190	0.009	6,990	160	0.007	6,150	120	0.005
	40	2,460	50	0.009	2,330	45	0.007	2,050	35	0.005
	50	2,460	50	0.006	2,330	45	0.005	2,050	35	0.003
1.2	4	21,900	930	0.076	20,700	720	0.059	18,200	485	0.042
	6	21,900	930	0.076	20,700	720	0.059	18,200	485	0.042
	8	19,710	755	0.043	18,630	585	0.034	16,380	395	0.024

H-Star Endmill

ESRE712 series

Side cutting

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
1.2	10	19,710	755	0.027	18,630	585	0.021	16,380	395	0.015
	12	19,710	755	0.027	18,630	585	0.021	16,380	395	0.015
	14	17,520	595	0.027	16,560	460	0.021	14,560	310	0.015
	16	17,520	595	0.016	16,560	460	0.013	14,560	310	0.009
	20	13,140	390	0.011	12,420	300	0.008	10,920	205	0.006
	26	6,570	165	0.011	6,210	130	0.008	5,460	85	0.006
	30	6,570	165	0.011	6,210	130	0.008	5,460	85	0.006
1.4	6	19,200	815	0.088	18,100	570	0.069	16,000	425	0.049
	8	17,280	660	0.050	16,290	460	0.039	14,400	345	0.028
	10	17,280	660	0.050	16,290	460	0.039	14,400	345	0.028
	14	17,280	660	0.032	16,290	460	0.025	14,400	345	0.018
	16	15,360	520	0.032	14,480	365	0.025	12,800	270	0.018
	20	15,360	520	0.019	14,480	365	0.015	12,800	270	0.011
1.5	4	19,200	905	0.135	18,100	635	0.105	16,000	475	0.075
	5	19,200	905	0.095	18,100	635	0.074	16,000	475	0.053
	6	19,200	905	0.095	18,100	635	0.074	16,000	475	0.053
	7	19,200	905	0.095	18,100	635	0.074	16,000	475	0.053
	8	17,280	735	0.054	16,290	515	0.042	14,400	385	0.030
	10	17,280	735	0.054	16,290	515	0.042	14,400	385	0.030
	12	17,280	735	0.054	16,290	515	0.042	14,400	385	0.030
	14	17,280	735	0.034	16,290	515	0.026	14,400	385	0.019
	16	15,360	580	0.034	14,480	405	0.026	12,800	305	0.019
	18	15,360	580	0.034	14,480	405	0.026	12,800	305	0.019
	20	15,360	580	0.020	14,480	405	0.016	12,800	305	0.011
	22	15,360	580	0.020	14,480	405	0.016	12,800	305	0.011
	26	11,520	380	0.014	10,860	265	0.011	9,600	200	0.008
	30	11,520	380	0.014	10,860	265	0.011	9,600	200	0.008
1.6	8	17,800	840	0.101	16,800	655	0.078	14,800	490	0.056
	10	16,020	680	0.058	15,120	530	0.045	13,320	395	0.032
	12	16,020	680	0.058	15,120	530	0.045	13,320	395	0.032
	16	16,020	680	0.036	15,120	530	0.028	13,320	395	0.020
	20	14,240	540	0.036	13,440	420	0.028	11,840	315	0.020
1.8	8	17,800	840	0.113	16,800	655	0.088	14,800	490	0.063
	10	16,020	680	0.065	15,120	530	0.050	13,320	395	0.036
	12	16,020	680	0.065	15,120	530	0.050	13,320	395	0.036
	16	16,020	680	0.041	15,120	530	0.032	13,320	395	0.023
	20	14,240	540	0.041	13,440	420	0.032	11,840	315	0.023
2.0	6	14,400	820	0.180	13,600	620	0.140	12,000	475	0.100
	8	14,400	820	0.126	13,600	620	0.098	12,000	475	0.070
	10	14,400	820	0.126	13,600	620	0.098	12,000	475	0.070
	12	12,960	665	0.072	12,240	500	0.056	10,800	385	0.040
	14	12,960	665	0.072	12,240	500	0.056	10,800	385	0.040
	16	12,960	665	0.072	12,240	500	0.056	10,800	385	0.040
	18	12,960	665	0.045	12,240	500	0.035	10,800	385	0.025

H-Star Endmill

ESRE712 series

Side cutting

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)
2.0	20	12,960	665	0.045	12,240	500	0.035	10,800	385	0.025
	22	11,520	525	0.045	10,880	395	0.035	9,600	305	0.025
	26	11,520	525	0.045	10,880	395	0.035	9,600	305	0.025
	30	11,520	525	0.027	10,880	395	0.021	9,600	305	0.015
	35	8,640	345	0.018	8,160	260	0.014	7,200	200	0.010
	40	8,640	345	0.018	8,160	260	0.014	7,200	200	0.010
	45	4,320	150	0.018	4,080	110	0.014	3,600	85	0.010
	50	4,320	150	0.018	4,080	110	0.014	3,600	85	0.010
	60	4,320	150	0.018	4,080	110	0.014	3,600	85	0.010
2.5	8	12,300	970	0.158	11,600	680	0.123	10,300	510	0.088
	10	12,300	970	0.158	11,600	680	0.123	10,300	510	0.088
	12	12,300	970	0.158	11,600	680	0.123	10,300	510	0.088
	14	11,070	785	0.090	10,440	550	0.070	9,270	415	0.050
	16	11,070	785	0.090	10,440	550	0.070	9,270	415	0.050
	18	11,070	785	0.090	10,440	550	0.070	9,270	415	0.050
	20	11,070	785	0.090	10,440	550	0.070	9,270	415	0.050
	22	11,070	785	0.056	10,440	550	0.044	9,270	415	0.031
	26	9,840	620	0.056	9,280	435	0.044	8,240	325	0.031
	30	9,840	620	0.056	9,280	435	0.044	8,240	325	0.031
	35	9,840	620	0.034	9,280	435	0.026	8,240	325	0.019
	40	7,380	405	0.034	6,960	285	0.026	6,180	215	0.019
	45	7,380	405	0.023	6,960	285	0.018	6,180	215	0.013
	50	7,380	405	0.023	6,960	285	0.018	6,180	215	0.013
3.0	6	10,900	860	0.270	10,300	605	0.210	6,600	450	0.150
	8	10,900	860	0.270	10,300	605	0.210	6,600	450	0.150
	10	10,900	860	0.189	10,300	605	0.147	6,600	450	0.105
	12	10,900	860	0.189	10,300	605	0.147	6,600	450	0.105
	14	10,900	860	0.189	10,300	605	0.147	6,600	450	0.105
	16	9,810	695	0.108	9,270	490	0.084	5,940	365	0.060
	18	9,810	695	0.108	9,270	490	0.084	5,940	365	0.060
	20	9,810	695	0.108	9,270	490	0.084	5,940	365	0.060
	22	9,810	695	0.108	9,270	490	0.084	5,940	365	0.060
	26	9,810	695	0.068	9,270	490	0.053	5,940	365	0.038
	30	9,810	695	0.068	9,270	490	0.053	5,940	365	0.038
	35	8,720	550	0.068	8,240	385	0.053	5,280	290	0.038
	40	8,720	550	0.041	8,240	385	0.032	5,280	290	0.023
	45	8,720	550	0.041	8,240	385	0.032	5,280	290	0.023
	50	6,540	360	0.027	6,180	255	0.021	3,960	190	0.015
	60	6,540	360	0.027	6,180	255	0.021	3,960	190	0.015
4.0	8	8,000	1,300	0.360	7,600	1,160	0.280	6,700	770	0.200
	10	8,000	1,300	0.360	7,600	1,160	0.280	6,700	770	0.200
	12	8,000	1,300	0.360	7,600	1,160	0.280	6,700	770	0.200
	14	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.140
	16	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.140

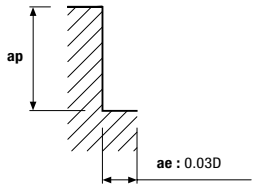
H-Star Endmill

ESRE712 series

Side cutting

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
4.0	18	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.140
	20	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.140
	22	7,200	1,055	0.144	6,840	940	0.112	6,030	625	0.080
	26	7,200	1,055	0.144	6,840	940	0.112	6,030	625	0.080
	30	7,200	1,055	0.144	6,840	940	0.112	6,030	625	0.080
	35	7,200	1,055	0.090	6,840	940	0.070	6,030	625	0.050
	40	7,200	1,055	0.090	6,840	940	0.070	6,030	625	0.050
	45	6,400	830	0.090	6,080	740	0.070	5,360	495	0.050
	50	6,400	830	0.090	6,080	740	0.070	5,360	495	0.050
	60	6,400	830	0.054	6,080	740	0.042	5,360	495	0.030
5.0	16	6,400	1,155	0.315	6,100	900	0.245	5,400	605	0.175
	20	6,400	1,155	0.315	6,100	900	0.245	5,400	605	0.175
	26	5,760	935	0.180	5,490	730	0.140	4,860	490	0.100
	30	5,760	935	0.180	5,490	730	0.140	4,860	490	0.100
	35	5,760	935	0.180	5,490	730	0.140	4,860	490	0.100
	40	5,760	935	0.180	5,490	730	0.140	4,860	490	0.100
	50	5,760	935	0.113	5,490	730	0.088	4,860	490	0.063
	60	5,120	740	0.113	4,880	575	0.088	4,320	385	0.063
6.0	15	5,300	1,055	0.540	5,000	820	0.420	4,400	550	0.300
	20	5,300	1,055	0.378	5,000	820	0.294	4,400	550	0.210
	30	5,300	1,055	0.378	5,000	820	0.294	4,400	550	0.210
	32	4,770	855	0.216	4,500	665	0.168	3,960	445	0.120
8.0	25	4,000	950	0.504	3,800	750	0.392	3,300	500	0.280
	30	4,000	950	0.504	3,800	750	0.392	3,300	500	0.280
	42	3,600	770	0.288	3,400	605	0.224	2,950	405	0.160
10.0	30	3,200	900	0.900	3,050	680	0.700	2,630	400	0.500
	35	3,200	900	0.630	3,050	680	0.490	2,630	400	0.350
	45	3,200	900	0.630	3,050	680	0.490	2,630	400	0.350
12.0	35	2,650	800	1.080	2,520	600	0.840	2,180	350	0.600
	40	2,650	800	0.756	2,520	600	0.588	2,180	350	0.420
	50	2,650	800	0.756	2,520	600	0.588	2,180	350	0.420

Application tip



H-Star Endmill

ESRE714 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)
0.5	1	27,400	756	0.045	25,800	595	0.035	22,800	399	0.025
	2	27,400	756	0.032	25,800	595	0.025	22,800	399	0.018
	3	24,660	609	0.018	23,220	483	0.014	20,520	322	0.01
	4	24,660	609	0.018	23,220	483	0.014	20,520	322	0.01
	5	24,660	609	0.011	23,220	483	0.009	20,520	322	0.006
	6	21,920	483	0.011	20,640	378	0.009	18,240	252	0.006
	8	16,440	315	0.007	15,480	252	0.005	13,680	168	0.004
	10	16,440	315	0.005	15,480	252	0.004	13,680	168	0.003
0.6	1	27,400	1,085	0.038	25,800	763	0.029	22,800	567	0.021
	2	27,400	1,085	0.038	25,800	763	0.029	22,800	567	0.021
	3	27,400	1,085	0.038	25,800	763	0.029	22,800	567	0.021
	4	24,660	882	0.022	23,220	616	0.017	20,520	462	0.012
	5	24,660	882	0.014	23,220	616	0.011	20,520	462	0.008
	6	24,660	882	0.014	23,220	616	0.011	20,520	462	0.008
	8	21,920	693	0.008	20,640	490	0.006	18,240	364	0.005
	10	16,440	455	0.005	15,480	322	0.004	13,680	238	0.003
	12	16,440	455	0.005	15,480	322	0.004	13,680	238	0.003
0.7	2	27,400	1,085	0.063	25,800	763	0.049	22,800	567	0.035
	4	24,660	882	0.025	23,220	616	0.02	20,520	462	0.014
	6	24,660	693	0.016	23,220	616	0.012	20,520	462	0.009
	8	21,920	693	0.016	20,640	490	0.012	18,240	364	0.009
	10	21,920	693	0.009	20,640	490	0.007	18,240	364	0.005
0.8	1	27,400	1,085	0.072	25,800	847	0.056	22,800	630	0.04
	2	27,400	1,085	0.072	25,800	847	0.056	22,800	630	0.04
	3	27,400	1,085	0.05	25,800	847	0.039	22,800	630	0.028
	4	27,400	1,085	0.05	25,800	847	0.039	22,800	630	0.028
	5	24,660	882	0.029	23,220	686	0.022	20,520	511	0.016
	6	24,660	882	0.029	23,220	686	0.022	20,520	511	0.016
	8	24,660	882	0.018	23,220	686	0.014	20,520	511	0.01
	10	21,920	693	0.018	20,640	539	0.014	18,240	406	0.01
	12	21,920	693	0.011	20,640	539	0.008	18,240	406	0.006
	16	16,440	455	0.007	15,480	357	0.006	13,680	266	0.004
1.0	2	24,600	1,463	0.09	23,300	1,246	0.07	20,500	931	0.05
	3	24,600	1,463	0.09	23,300	1,246	0.07	20,500	931	0.05
	4	24,600	1,463	0.063	23,300	1,246	0.049	20,500	931	0.035
	6	22,140	1,183	0.036	20,970	1,008	0.028	18,450	756	0.02
	8	22,140	1,183	0.036	20,970	1,008	0.028	18,450	756	0.02
	10	22,140	1,183	0.023	20,970	1,008	0.018	18,450	756	0.013
	12	19,680	938	0.023	18,640	798	0.018	16,400	595	0.013
	14	19,680	938	0.014	18,640	798	0.011	16,400	595	0.008
	16	14,760	616	0.014	13,980	525	0.011	12,300	392	0.008
	18	14,760	616	0.009	13,980	525	0.007	12,300	392	0.005
	20	14,760	616	0.009	13,980	525	0.007	12,300	392	0.005
1.2	4	21,900	1,302	0.076	20,700	1,008	0.059	18,200	679	0.042
	6	21,900	1,302	0.076	20,700	1,008	0.059	18,200	679	0.042
	8	19,710	1,057	0.043	18,630	819	0.034	16,380	553	0.024
	10	19,710	1,057	0.027	18,630	819	0.021	16,380	553	0.015
	12	19,710	1,057	0.027	18,630	819	0.021	16,380	553	0.015

H-Star Endmill

ESRE714 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
1.2	16	17,520	833	0.016	16,560	644	0.013	14,560	434	0.009
	18	17,520	833	0.016	16,560	644	0.013	14,560	434	0.009
	20	13,140	546	0.011	12,420	420	0.008	10,920	287	0.006
1.4	6	19,200	1,141	0.088	18,100	798	0.069	16,000	595	0.049
	8	17,280	924	0.05	16,290	644	0.039	14,400	483	0.028
	10	17,280	924	0.05	16,290	644	0.039	14,400	483	0.028
	12	17,280	924	0.05	16,290	644	0.039	14,400	483	0.028
	14	17,280	924	0.032	16,290	644	0.025	14,400	483	0.018
	16	15,360	728	0.032	14,480	511	0.025	12,800	378	0.018
1.5	4	19,200	1,267	0.135	18,100	889	0.105	16,000	665	0.075
	6	19,200	1,267	0.095	18,100	889	0.074	16,000	665	0.053
	8	17,280	1,029	0.054	16,290	721	0.042	14,400	539	0.03
	10	17,280	1,029	0.054	16,290	721	0.042	14,400	539	0.03
	12	17,280	1,029	0.054	16,290	721	0.042	14,400	539	0.03
	16	15,360	812	0.034	14,480	567	0.026	12,800	427	0.019
	18	15,360	812	0.034	14,480	567	0.026	12,800	427	0.019
	20	15,360	812	0.02	14,480	567	0.016	12,800	427	0.011
	25	11,520	532	0.014	10,860	371	0.011	9,600	280	0.008
	30	11,520	532	0.014	10,860	371	0.011	9,600	280	0.008
1.6	6	17,800	1,176	0.101	16,800	917	0.078	14,800	686	0.056
	8	17,800	1,176	0.101	16,800	917	0.078	14,800	686	0.056
	10	16,020	952	0.058	15,120	742	0.045	13,320	553	0.032
	12	16,020	952	0.058	15,120	742	0.045	13,320	553	0.032
	14	16,020	952	0.058	15,120	742	0.045	13,320	553	0.032
	16	16,020	952	0.036	15,120	752	0.028	13,320	553	0.02
	18	16,020	952	0.036	15,120	752	0.028	13,320	553	0.02
	20	14,240	756	0.036	13,440	588	0.028	11,840	441	0.02
	25	14,240	756	0.036	13,440	588	0.028	11,840	441	0.02
1.8	6	17,800	1,176	0.113	16,800	917	0.088	14,800	686	0.063
	8	17,800	1,176	0.113	16,800	917	0.088	14,800	686	0.063
	10	16,020	952	0.065	15,120	742	0.05	13,320	553	0.036
	12	16,020	952	0.065	15,120	742	0.05	13,320	553	0.036
	16	16,020	952	0.041	15,120	742	0.032	13,320	553	0.023
	20	14,240	756	0.041	13,440	588	0.032	11,840	441	0.023
	25	14,240	756	0.041	13,440	588	0.032	11,840	441	0.023
2.0	4	14,400	1,148	0.18	13,600	868	0.14	12,000	665	0.1
	6	14,400	1,148	0.18	13,600	868	0.14	12,000	665	0.1
	8	14,400	1,148	0.126	13,600	868	0.098	12,000	665	0.07
	10	14,400	1,148	0.126	13,600	868	0.098	12,000	665	0.07
	12	12,960	931	0.072	12,240	700	0.056	10,800	539	0.04
	14	12,960	931	0.072	12,240	700	0.056	10,800	539	0.04
	16	12,960	931	0.072	12,240	700	0.056	10,800	539	0.04
	18	12,960	931	0.045	12,240	700	0.035	10,800	539	0.025
	20	12,960	931	0.045	12,240	700	0.035	10,800	539	0.025
	22	11,520	735	0.045	10,880	553	0.035	9,600	427	0.025
	25	11,520	735	0.045	10,880	553	0.035	9,600	427	0.025
	30	11,520	735	0.027	10,880	553	0.021	9,600	427	0.015
2.5	10	12,300	1,358	0.158	11,600	952	0.123	10,300	714	0.088

H-Star Endmill

ESRE714 series

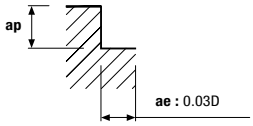
Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)
2.5	12	12,300	1,358	0.158	11,600	952	0.123	10,300	714	0.088
	16	11,070	1,099	0.09	10,440	770	0.07	9,270	581	0.05
	20	11,070	1,099	0.09	10,440	770	0.07	9,270	581	0.05
	25	9,840	868	0.056	9,280	609	0.044	8,240	455	0.031
	30	9,840	868	0.056	9,280	609	0.044	8,240	455	0.031
3.0	6	10,900	1,204	0.27	10,300	847	0.21	6,600	630	0.15
	8	10,900	1,204	0.27	10,300	847	0.21	6,600	630	0.15
	10	10,900	1,204	0.189	10,300	847	0.147	6,600	630	0.105
	12	10,900	1,204	0.189	10,300	847	0.147	6,600	630	0.105
	16	9,810	973	0.108	9,270	686	0.084	5,940	511	0.06
	20	9,810	973	0.108	9,270	686	0.084	5,940	511	0.06
	25	9,810	973	0.068	9,270	686	0.053	5,940	511	0.038
	30	9,810	973	0.068	9,270	686	0.053	5,940	511	0.038
	35	8,720	770	0.068	8,240	539	0.053	5,280	406	0.038
	40	8,720	770	0.041	8,240	539	0.032	5,280	406	0.023
	45	8,720	770	0.041	8,240	539	0.032	5,280	406	0.023
	50	6,540	504	0.027	6,180	357	0.021	3,960	266	0.015
	60	6,540	504	0.027	6,180	357	0.021	3,960	266	0.015
3.5	12	9,310	1,430	0.236	8,800	1,008	0.183	5,640	750	0.131
	16	8,380	1,158	0.135	7,920	816	0.105	5,070	608	0.075
	20	8,380	1,158	0.135	7,920	816	0.105	5,070	608	0.047
	25	8,380	1,158	0.085	7,920	816	0.066	5,070	608	0.047
	30	8,380	1,158	0.085	7,920	816	0.066	5,070	608	0.047
	35	7,450	916	0.085	7,040	641	0.066	4,510	483	0.047
	40	7,450	916	0.051	7,040	641	0.04	4,510	483	0.028
4.0	6	8,000	1,820	0.36	7,600	1,624	0.28	6,700	1,078	0.2
	8	8,000	1,820	0.36	7,600	1,624	0.28	6,700	1,078	0.2
	10	8,000	1,820	0.36	7,600	1,624	0.28	6,700	1,078	0.2
	12	8,000	1,820	0.36	7,600	1,624	0.28	6,700	1,078	0.2
	16	8,000	1,820	0.252	7,600	1,624	0.196	6,700	1,078	0.14
	20	8,000	1,820	0.252	7,600	1,624	0.196	6,700	1,078	0.14
	25	7,200	1,477	0.144	6,840	1,316	0.112	6,030	875	0.08
	30	7,200	1,477	0.144	6,840	1,316	0.112	6,030	875	0.08
	40	7,200	1,477	0.09	6,840	1,316	0.07	6,030	875	0.05
	45	6,400	1,162	0.09	6,080	1,036	0.07	5,360	693	0.05
	50	6,400	1,162	0.09	6,080	1,036	0.07	5,360	693	0.05
	60	6,400	1,162	0.054	6,080	1,036	0.042	5,360	693	0.03
4.5	12	6,830	2,166	0.45	6,490	1,933	0.35	5,720	1,283	0.25
	16	6,830	2,166	0.315	6,490	1,933	0.245	5,720	1,283	0.175
	20	6,830	2,166	0.315	6,490	1,933	0.245	5,720	1,283	0.175
	25	6,150	1,758	0.18	5,840	1,566	0.14	5,150	1,041	0.1
	30	6,150	1,758	0.18	5,840	1,566	0.14	5,150	1,041	0.1

H-Star Endmill

ESRE714 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
4.5	40	6,150	1,758	0.112	5,840	1,566	0.087	5,150	1,041	0.062
5.0	16	6,400	1,617	0.315	6,100	1,260	0.245	5,400	847	0.175
	20	6,400	1,617	0.315	6,100	1,260	0.245	5,400	847	0.175
	25	5,760	1,309	0.18	5,490	1,022	0.14	4,860	686	0.1
	30	5,760	1,309	0.18	5,490	1,022	0.14	4,860	686	0.1
	40	5,760	1,309	0.18	5,490	1,022	0.14	4,860	686	0.1
	50	5,760	1,309	0.113	5,490	1,022	0.088	4,860	686	0.063
	60	5,120	1,036	0.113	4,880	805	0.088	4,320	539	0.063
6.0	20	5,300	1,477	0.378	5,000	1,148	0.294	4,400	770	0.21
	30	5,300	1,477	0.378	5,000	1,148	0.294	4,400	770	0.21
	40	4,770	1,197	0.216	4,500	931	0.168	3,960	623	0.12
	50	4,770	1,197	0.216	4,500	931	0.168	3,960	623	0.12
	60	4,370	958	0.141	4,171	931	0.11	3,690	623	0.078
8.0	25	4,000	1,330	0.504	3,800	1,050	0.392	3,300	700	0.28
	40	3,600	1,078	0.288	3,400	847	0.224	2,950	567	0.16
	50	3,600	1,078	0.288	3,400	847	0.224	2,950	567	0.16
10.0	30	3,200	1,260	0.9	3,050	952	0.7	2,630	560	0.5
	50	3,200	1,260	0.63	3,050	952	0.49	2,630	560	0.35
	60	3,200	1,260	0.63	3,050	952	0.49	2,630	560	0.35
12.0	40	2,650	1,120	0.756	2,520	840	0.588	2,180	490	0.42
	60	2,360	896	0.472	2,250	672	0.367	1,940	392	0.262
	70	2,360	896	0.472	2,250	672	0.367	1,940	392	0.262

Application tip



H-Star Endmill

ESRR712 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
0.2	0.02	0.5	0.016	50,000	258	50,000	205	50,000	180	50,000	160
		1	0.011	50,000	258	50,000	205	50,000	180	50,000	160
		1.5	0.007	42,000	202	36,700	176	36,700	162	36,700	147
	0.05	0.5	0.02	50,000	258	50,000	205	50,000	180	50,000	160
		1	0.014	50,000	258	50,000	205	50,000	180	50,000	160
		1.5	0.008	50,000	240	45,900	202	45,900	170	45,900	153
0.3	0.02	1	0.016	50,000	585	50,000	456	50,000	336	50,000	320
		2	0.011	45,000	530	45,000	420	45,000	300	45,000	290
		3	0.007	35,000	412	35,000	326	30,000	200	30,000	194
	0.05	1	0.021	50,000	585	50,000	456	50,000	336	50,000	320
		2	0.012	45,000	530	45,000	420	45,000	300	45,000	290
		3	0.008	35,000	412	35,000	326	30,000	200	30,000	194
0.4	0.02	1	0.016	50,000	580	50,000	461	40,000	320	36,000	270
		2	0.013	45,000	520	45,000	410	36,000	290	34,000	240
		3	0.01	40,000	410	40,000	330	32,800	240	25,600	200
		4	0.007	30,000	320	30,000	250	21,600	160	19,200	150
	0.05	1	0.025	50,000	580	50,000	461	40,000	320	36,000	270
		2	0.016	45,000	520	45,000	410	36,000	290	34,000	240
		3	0.014	40,000	410	40,000	330	32,800	240	25,600	200
		4	0.008	30,000	320	30,000	250	21,600	160	19,200	150
	0.1	1	0.033	50,000	580	50,000	461	40,000	320	36,000	270
		1.5	0.03	50,000	580	50,000	461	40,000	320	36,000	270
		2	0.028	45,000	520	45,000	410	36,000	290	34,000	240
		3	0.016	40,000	410	40,000	330	32,800	240	25,600	200
		4	0.01	30,000	320	30,000	250	21,600	160	19,200	150
0.5	0.02	1	0.016	50,000	898	40,000	464	30,000	378	28,000	315
		1.5	0.014	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.013	50,000	898	40,000	464	30,000	378	28,000	315
		2.5	0.011	45,000	810	36,000	414	27,000	315	24,500	261
		3	0.01	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.008	40,000	720	32,000	378	24,000	279	20,000	234
		5	0.007	40,000	720	32,000	378	24,000	279	20,000	234
		6	0.006	28,800	480	19,400	260	18,000	250	15,000	200
		8	0.005	28,800	480	19,400	260	18,000	250	15,000	200
		10	0.004	28,800	480	19,400	260	18,000	250	15,000	200
	0.05	1	0.03	50,000	898	40,000	464	30,000	378	28,000	315
		1.5	0.026	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.023	50,000	898	40,000	464	30,000	378	28,000	315
		2.5	0.02	45,000	810	36,000	414	27,000	315	24,500	261
		3	0.017	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.017	40,000	720	32,000	378	24,000	279	20,000	234
		5	0.011	28,800	540	19,400	280	18,000	250	15,000	200
		6	0.008	28,800	480	19,400	260	18,000	250	15,000	200
		8	0.007	28,800	480	19,400	260	18,000	250	15,000	200
		10	0.006	28,800	480	19,400	260	18,000	250	15,000	200

H-Star Endmill

ESRR712 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
0.5	0.1	1	0.035	50,000	898	40,000	464	30,000	378	28,000	315
		1.5	0.032	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.03	50,000	898	40,000	464	30,000	378	28,000	315
		2.5	0.025	45,000	810	36,000	414	27,000	315	24,500	261
		3	0.02	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.02	40,000	720	32,000	378	24,000	279	20,000	234
		5	0.013	28,800	540	19,400	280	18,000	250	15,000	200
		6	0.013	28,800	480	19,400	260	18,000	250	15,000	200
		8	0.01	28,800	480	19,400	260	18,000	250	15,000	200
		10	0.08	28,800	480	19,400	260	18,000	250	15,000	200
0.6	0.02	2	0.016	50,000	1,159	37,830	600	28,200	390	23,000	320
		3	0.014	40,000	830	27,800	440	23,600	280	21,000	230
		4	0.013	40,000	830	27,800	440	23,600	280	21,000	230
		6	0.01	24,000	490	18,000	300	17,800	240	15,000	210
		8	0.008	24,000	466	18,000	285	17,800	228	15,000	200
		10	0.007	24,000	451	18,000	276	17,800	221	15,000	193
		12	0.006	24,000	451	18,000	276	17,800	221	15,000	193
	0.05	2	0.028	50,000	1,159	37,830	600	28,200	390	23,000	320
		3	0.023	40,000	830	27,800	440	23,600	280	21,000	230
		4	0.019	40,000	830	27,800	440	23,600	280	21,000	230
		6	0.012	24,000	490	18,000	300	17,800	240	15,000	210
		8	0.01	24,000	466	18,000	285	17,800	228	15,000	200
		10	0.007	24,000	451	18,000	276	17,800	221	15,000	193
		12	0.006	24,000	451	18,000	276	17,800	221	15,000	193
	0.1	2	0.035	50,000	1,159	37,830	600	28,200	390	23,000	320
		3	0.03	40,000	830	27,800	440	23,600	280	21,000	230
		4	0.024	40,000	830	27,800	440	23,600	280	21,000	230
		6	0.015	24,000	490	18,000	300	17,800	240	15,000	210
		8	0.013	24,000	466	18,000	285	17,800	228	15,000	200
		10	0.009	24,000	451	18,000	276	17,800	221	15,000	193
		12	0.007	24,000	451	18,000	276	17,800	221	15,000	193
0.7	0.1	2	0.042	49,200	1,054	34,190	558	29,030	355	25,830	292
		4	0.029	40,000	830	27,800	440	23,600	280	21,000	230
		6	0.018	24,000	490	18,000	300	17,800	240	15,000	210
		8	0.015	24,000	490	18,000	300	17,800	240	15,000	210
		10	0.012	24,000	490	18,000	300	17,800	240	15,000	210
0.8	0.02	2	0.016	48,000	1,378	28,000	647	20,000	400	20,000	360
		4	0.016	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.013	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.011	29,025	600	20,000	369	16,200	259	16,200	230
		10	0.01	29,025	570	20,000	350	16,200	246	16,200	219
		12	0.09	29,025	570	20,000	350	16,200	246	16,200	219
	0.05	2	0.038	48,000	1,378	28,000	647	20,000	400	20,000	360
		4	0.026	48,000	1,102	28,000	518	20,000	320	20,000	288

H-Star Endmill

ESRR712 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
0.8	0.05	6	0.015	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.012	29,025	600	20,000	369	16,200	259	16,200	230
		10	0.011	29,025	570	20,000	350	16,200	246	16,200	219
		12	0.01	29,025	570	20,000	350	16,200	246	16,200	219
	0.1	2	0.047	48,000	1,378	28,000	647	20,000	400	20,000	360
		4	0.032	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.019	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.015	29,025	600	20,000	369	16,200	259	16,200	230
		10	0.013	29,025	570	20,000	350	16,200	246	16,200	219
		12	0.012	29,025	570	20,000	350	16,200	246	16,200	219
	0.2	2	0.081	48,000	1,378	28,000	647	20,000	400	20,000	360
		4	0.056	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.032	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.018	29,025	600	20,000	369	16,200	259	16,200	230
		10	0.016	29,025	570	20,000	350	16,200	246	16,200	219
		12	0.015	29,025	570	20,000	350	16,200	246	16,200	219
1.0	0.02	4	0.013	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.01	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.008	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.006	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.005	18,144	609	15,422	453	13,608	399	12,701	320
		14	0.004	18,144	533	15,422	420	13,608	342	12,701	266
		16	0.004	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.003	13,608	399	11,567	315	10,206	257	9,526	200
	0.05	4	0.027	32,400	1,359	28,917	1,128	24,300	815	22,680	666
		6	0.017	26,244	990	24,538	928	19,683	660	18,371	539
		8	0.016	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.011	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.01	18,144	609	15,422	453	13,608	399	12,701	320
		14	0.008	18,144	533	15,422	420	13,608	342	12,701	266
		16	0.006	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.004	13,608	399	11,567	315	10,206	257	9,526	200
	0.1	4	0.038	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.024	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.024	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.015	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.015	18,144	609	15,422	453	13,608	399	12,701	320
		14	0.012	18,144	533	15,422	420	13,608	342	12,701	266
		16	0.009	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.006	13,608	399	11,567	315	10,206	257	9,526	200
	0.2	4	0.07	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.04	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.04	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419

H-Star Endmill

ESRR712 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
1.0	0.2	12	0.025	18,144	609	15,422	453	13,608	399	12,701	320
		14	0.02	18,144	533	15,422	420	13,608	342	12,701	266
		16	0.015	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.01	13,608	399	11,567	315	10,206	257	9,526	200
	0.3	4	0.07	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.04	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.04	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.025	18,144	609	15,422	453	13,608	399	12,701	320
		14	0.02	18,144	533	15,422	420	13,608	342	12,701	266
		16	0.015	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.01	13,608	399	11,567	315	10,206	257	9,526	200
1.2	0.02	4	0.013	28,868	1,154	24,538	928	21,651	727	20,208	594
		6	0.01	28,868	1,154	24,538	928	21,651	727	20,208	594
		8	0.008	24,640	962	20,944	791	18,480	620	17,248	506
		10	0.006	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.005	19,278	652	16,386	554	14,458	428	13,494	342
		14	0.004	18,144	533	15,422	453	13,608	342	12,701	266
		16	0.004	18,144	533	15,422	453	13,608	342	12,701	266
		20	0.003	13,608	399	11,567	315	10,206	257	9,526	200
	0.05	4	0.027	28,868	1,154	24,538	928	21,651	727	20,208	594
		6	0.017	28,868	1,154	24,538	928	21,651	727	20,208	594
		8	0.016	24,640	962	20,944	791	18,480	620	17,248	506
		10	0.011	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.01	19,278	652	16,386	554	14,458	428	13,494	342
		14	0.008	18,144	533	15,422	453	13,608	342	12,701	266
		16	0.006	18,144	533	15,422	453	13,608	342	12,701	266
		20	0.004	13,608	399	11,567	315	10,206	257	9,526	200
	0.1	4	0.03	28,868	1,154	24,538	928	21,651	727	20,208	594
		6	0.03	28,868	1,154	24,538	928	21,651	727	20,208	594
		8	0.022	24,640	962	20,944	791	18,480	620	17,248	506
		10	0.015	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.012	19,278	652	16,386	554	14,458	428	13,494	342
		14	0.01	18,144	533	15,422	453	13,608	342	12,701	266
		16	0.01	18,144	533	15,422	453	13,608	342	12,701	266
		20	0.006	13,608	399	11,567	315	10,206	257	9,526	200
	0.2	4	0.05	28,868	1,154	24,538	928	21,651	727	20,208	594
		6	0.05	28,868	1,154	24,538	928	21,651	727	20,208	594
		8	0.037	24,640	962	20,944	791	18,480	620	17,248	506
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.02	19,278	651	16,386	554	14,458	428	13,494	342
		14	0.016	18,144	533	15,422	453	13,608	342	12,701	266
		16	0.016	18,144	533	15,422	453	13,608	342	12,701	266
		20	0.01	13,608	399	11,567	315	10,206	257	9,526	200

H-Star Endmill

ESRR712 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
1.2	0.3	4	0.05	28,868	1,154	24,538	928	21,651	727	20,208	594
		6	0.05	28,868	1,154	24,538	928	21,651	727	20,208	594
		8	0.037	24,640	962	20,944	791	18,480	620	17,248	506
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.02	19,278	651	16,386	554	14,458	428	13,494	342
		14	0.016	18,144	533	15,422	453	13,608	342	12,701	266
		16	0.016	18,144	533	15,422	453	13,608	342	12,701	266
		20	0.01	13,608	399	11,567	315	10,206	257	9,526	200
1.5	0.02	4	0.013	24,930	1,130	20,956	947	18,711	752	17,364	611
		6	0.01	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.008	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.006	20,412	924	17,350	785	15,309	616	14,288	503
		12	0.005	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.004	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.004	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.003	14,112	568	11,995	423	10,584	373	9,878	298
	0.05	4	0.027	24,930	1,130	20,956	947	18,711	752	17,364	611
		6	0.017	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.016	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.011	20,412	924	17,350	785	15,309	616	14,288	503
		12	0.01	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.008	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.006	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.004	14,112	568	11,995	423	10,584	373	9,878	298
	0.1	4	0.042	24,930	1,130	20,956	947	18,711	752	17,364	611
		6	0.04	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.036	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.036	20,412	924	17,350	785	15,309	616	14,288	503
		12	0.036	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.023	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.023	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.018	14,112	568	11,995	423	10,584	373	9,878	298
	0.2	4	0.07	24,930	1,130	20,956	868	18,711	678	17,364	556
		6	0.065	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.06	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.06	20,412	924	17,350	785	15,309	616	14,288	503
		12	0.06	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.03	14,112	568	11,995	423	10,584	373	9,878	298
	0.3	4	0.07	24,930	1,130	20,956	868	18,711	678	17,364	556
		6	0.065	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.06	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.06	20,412	924	17,350	785	15,309	616	14,288	503

H-Star Endmill

ESRR712 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
1.5	0.3	12	0.06	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.03	14,112	568	11,995	423	10,584	373	9,878	298
	0.5	4	0.085	24,930	1,130	20,956	868	18,711	678	17,364	556
		6	0.08	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.07	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.067	20,412	924	17,350	785	15,309	616	14,288	503
		12	0.065	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.045	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.045	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.035	14,112	568	11,995	423	10,584	373	9,878	298
2.0	0.02	6	0.013	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.01	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.008	17,104	1,284	14,539	1,092	1,2828	807	11,973	659
		12	0.006	15,309	1,083	13,013	921	11,482	722	10,716	590
		14	0.005	14,458	1,023	12,290	869	10,844	682	10,121	557
		16	0.004	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.004	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.003	11,907	757	10,121	643	8,930	505	8,335	411
	0.05	6	0.027	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.017	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.016	17104	1,284	14539	1,092	12828	807	11973	659
		12	0.011	15,309	1,083	13,013	921	11,482	722	10,716	590
		14	0.01	14,458	1,023	12,290	869	10,844	682	10,121	557
		16	0.008	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.006	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.004	11,907	757	10,121	643	8,930	505	8,335	411
	0.1	6	0.07	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.055	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.042	17104	1,284	14539	1,092	12828	807	11973	659
		12	0.03	15,309	1,083	13,013	921	11,482	722	10,716	590
		14	0.03	14,458	1,023	12,290	869	10,844	682	10,121	557
		16	0.03	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.025	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.015	11,907	757	10,121	643	8,930	505	8,335	411
		30	0.01	11,312	719	9,615	611	8,484	480	7,918	391
	0.2	6	0.08	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.07	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.055	17,104	1,284	14,539	1,092	12,828	807	11,973	659
		12	0.04	15,309	1,083	13,013	921	11,482	722	10,716	590
		14	0.04	14,458	1,023	12,290	869	10,844	682	10,121	557
		16	0.04	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.035	11,907	843	10,121	716	8,930	562	8,335	459

H-Star Endmill

ESRR712 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
2.0	0.2	25	0.025	11,907	757	10,121	643	8,930	505	8,335	411
		30	0.017	11,312	719	9,615	611	8,484	480	7,918	391
	0.3	6	0.11	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.09	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.075	17,104	1,284	14,539	1,092	12,828	807	11,973	659
		12	0.06	15,309	1,083	13,013	921	11,482	722	10,716	590
		14	0.06	14,458	1,023	12,290	869	10,844	682	10,121	557
		16	0.06	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.037	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.03	11,907	757	10,121	643	8,930	505	8,335	411
		30	0.021	11,312	719	9,615	611	8,484	480	7,918	391
	0.5	6	0.17	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.14	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.11	17,104	1,284	14,539	1143	12,828	807	11,973	659
		12	0.08	15,309	1,083	13,013	1,023	11,482	722	10,716	590
		14	0.08	14,458	1,023	12,290	920	1,084	682	10,121	557
		16	0.08	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.05	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.05	11,907	757	10,121	643	8,930	505	8,335	411
		30	0.03	11,312	719	9,615	611	8,484	480	7,918	391
2.5	0.1	10	0.055	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		16	0.042	16,254	1,224	13,816	1040	12,190	767	11,378	626
		20	0.03	13,608	963	11,567	818	10,206	642	9,526	524
		25	0.022	12,757	860	10,844	730	9,568	573	8,930	467
		30	0.015	11,907	757	10,121	643	8,930	505	8,335	411
	0.2	10	0.07	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		16	0.055	16,254	1,224	1,386	1040	12,190	767	11,378	626
		20	0.04	13,608	963	11,567	818	10,206	642	9,526	524
	0.3	10	0.09	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		16	0.075	16,254	1,224	1,386	1040	12,190	767	11,378	626
		20	0.06	13,608	963	11,567	818	10,206	642	9,526	524
	0.5	10	0.14	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		16	0.11	16,254	1,224	1,386	1040	12,190	767	11,378	626
		20	0.08	13,608	963	11,567	818	10,206	642	9,526	524
3.0	0.1	10	0.06	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.05	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.035	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.035	11,664	1,146	9,914	974	8,748	687	8,165	561
		25	0.031	10,368	973	8,812	827	7,776	583	7,257	477
		30	0.027	9,072	801	7,711	681	6,804	480	6,350	393
		35	0.02	9,072	801	7,711	681	6,804	480	6,350	393
		40	0.015	9,072	801	7,711	681	6,804	480	6,350	393
	0.2	10	0.08	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.07	14,400	1,415	12,240	1,203	10,800	849	10,080	693

H-Star Endmill

ESRR712 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
3.0	0.2	16	0.05	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.05	11,664	1,146	9,914	974	8,748	687	8,165	561
		25	0.045	10,368	973	8,812	827	7,776	583	7,257	477
		30	0.04	9,072	801	7,711	681	6,804	480	6,350	393
		35	0.035	9,072	801	7,711	681	6,804	480	6,350	393
		40	0.03	9,072	801	7,711	681	6,804	480	6,350	393
	0.3	10	0.115	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.1	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.075	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.075	11,664	1,146	9,914	974	8,748	687	8,165	561
		25	0.067	10,368	973	8,812	827	7,776	583	7,257	477
		30	0.06	9,072	801	7,711	681	6,804	480	6,350	393
		35	0.05	9,072	801	7,711	681	6,804	480	6,350	393
		40	0.04	9,072	801	7,711	681	6,804	480	6,350	393
	0.5	10	0.155	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.13	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.1	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.1	11,664	1,146	9,914	974	8,748	687	8,165	561
		25	0.09	10,368	973	8,812	827	7,776	583	7,257	477
		30	0.08	9,072	801	7,711	681	6,804	480	6,350	393
		35	0.065	9,072	801	7,711	681	6,804	480	6,350	393
		40	0.05	9,072	801	7,711	681	6,804	480	6,350	393
	1	10	0.175	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.15	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.12	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.11	11,664	1,146	9,914	974	8,748	687	8,165	561
		25	0.1	10,368	973	8,812	827	7,776	583	7,257	477
		30	0.09	9,072	801	7,711	681	6,804	480	6,350	393
		35	0.075	9,072	801	7,711	681	6,804	480	6,350	393
		40	0.06	9,072	801	7,711	681	6,804	480	6,350	393
4.0	0.1	12	0.065	11,213	1,950	9,531	1,658	8,410	1,170	7,849	956
		16	0.06	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		20	0.055	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		25	0.05	10,255	1,783	7,782	1293	6,545	872	5,904	687
		30	0.045	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		35	0.04	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		40	0.035	10,255	1,783	6,867	1,075	5,491	688	5,124	561
	0.2	12	0.14	11,213	1,950	9,531	1,658	8,410	1,170	7,849	956
		16	0.13	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		20	0.11	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		25	0.105	10,255	1,783	7,782	1293	6,545	872	5,904	687
		30	0.1	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		35	0.08	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		40	0.07	9,247	1,429	6,225	901	5,217	602	4,621	459

H-Star Endmill

ESRR712 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
4.0	0.3	12	0.22	11,213	1,950	9,531	1,658	8,410	1,170	7,849	956
		16	0.2	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		20	0.18	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		25	0.17	10,255	1,783	7,782	1293	6,545	872	5,904	687
		30	0.16	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		35	0.14	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		40	0.13	9,247	1,429	6,225	901	5,217	602	4,621	459
	0.5	12	0.35	11,213	1,950	9,531	1,658	8,410	1,170	7,849	956
		16	0.25	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		20	0.2	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		25	0.175	10,255	1,783	7,782	1,293	6,545	872	5,904	687
		30	0.15	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		35	0.1	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		40	0.075	9,247	1,429	6,225	901	5,217	602	4,621	459
	1	12	0.4	11,213	1,950	9,531	1,658	8,410	1,170	7,849	956
		16	0.29	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		20	0.23	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		25	0.2	10,255	1,783	7,782	1,293	6,545	872	5,904	687
		30	0.17	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		35	0.12	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		40	0.09	9,247	1,429	6,225	901	5,217	602	4,621	459
5.0	0.2	15	0.16	9,154	1,990	7,781	1,692	6,866	1,194	6,408	975
		25	0.152	8,513	1,813	7,236	1,541	6,385	1,088	5,959	888
		30	0.145	7,872	1,637	6,691	1,391	5,904	982	5,510	802
		40	0.13	6,590	1,284	5,602	1,091	4,943	770	4,613	629
	0.5	15	0.35	9,154	1,990	7,781	1,692	6,866	1,194	6,408	975
		25	0.296	8,513	1,813	7,236	1541	6,385	1,088	5,959	888
		30	0.24	7,872	1,637	6,691	1,391	5,904	982	5,510	802
		40	0.135	6,590	1,284	5,602	1,091	4,943	770	4,613	629
	1	15	0.4	9,154	1,990	7,781	1,692	6,866	1,194	6,408	975
		25	0.337	8,513	1,813	7,236	1,541	6,385	1,088	5,959	888
		30	0.275	7,872	1,637	6,691	1,391	5,904	982	5,510	802
		40	0.15	6,590	1,284	5,602	1,091	4,943	770	4,613	629
6.0	0.1	20	0.065	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.05	6,486	1,523	5,513	1,294	4,865	914	4,540	746
	0.2	20	0.14	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.11	6,486	1,523	5,513	1,294	4,865	914	4,540	746
	0.3	20	0.22	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.18	6,486	1,523	5,513	1,294	4,865	914	4,540	746
	0.5	20	0.35	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.24	6,486	1,523	5,513	1,294	4,865	914	4,540	746
	1	20	0.4	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.28	6,486	1,523	5,513	1,294	4,865	914	4,540	746
	1.5	20	0.45	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.3	6,486	1,523	5,513	1,294	4,865	914	4,540	746

H-Star Endmill

ESRR712 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
8.0	0.2	22	0.35	5,730	1,900	4,524	1,483	3,016	914	2,320	584
	0.3	22	0.5	5,730	1,900	4,524	1,483	3,016	914	2,320	584
	0.5	22	0.6	5,730	1,900	4,524	1,483	3,016	914	2,320	584
	1	22	0.7	5,730	1,900	4,524	1,483	3,016	914	2,320	584
	1.5	22	0.8	5,730	1,900	4,524	1,483	3,016	914	2,320	584
10.0	0.2	24	0.4	4,524	1,728	3,567	1,396	2,378	849	1,856	544
	0.3	24	0.5	4,524	1,728	3,567	1,396	2,378	849	1,856	544
	0.5	24	0.6	4,524	1,728	3,567	1,396	2,378	849	1,856	544
	1	24	0.7	4,524	1,728	3,567	1,396	2,378	849	1,856	544
	1.5	24	0.8	4,524	1,728	3,567	1,396	2,378	849	1,856	544
	2	24	0.9	4,524	1,728	3,567	1,396	2,378	849	1,856	544
12.0	0.2	26	0.5	3,857	1,728	3,045	1,396	2,030	849	1,537	544
	0.3	26	0.6	3,857	1,728	3,045	1,396	2,030	849	1,537	544
	0.5	26	0.7	3,857	1,728	3,045	1,396	2,030	849	1,537	544
	1	26	0.8	3,857	1,728	3,045	1,396	2,030	849	1,537	544
	1.5	26	0.9	3,857	1,728	3,045	1,396	2,030	849	1,537	544
	2	26	1	3,857	1,728	3,045	1,396	2,030	849	1,537	544
	3	26	1	3,857	1,728	3,045	1,396	2,030	849	1,537	544
16.0	0.5	35	2	2,842	1,512	2,262	1209	1,508	748	1,160	480
	1	35	2	2,842	453	2,262	362	1,508	224	1,160	480

• Please adjust the cutting depth index according to the cutting depth factors of above table

• In actual machining, the condition should be adjusted according to the machining shape, purpose and machine type

• If RPM of the machine is low, the feed rate should be low in the same ratio as RPM

H-Star Endmill

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
0.5	0.05	2	0.023	50,000	1,257	40,000	649	30,000	529	28,000	441
		4	0.017	40,000	1,008	32,000	529	24,000	390	20,000	327
		6	0.008	28,800	672	19,400	364	18,000	350	15,000	280
		8	0.007	28,800	672	19,400	364	18,000	350	15,000	280
	0.1	2	0.03	50,000	1,257	40,000	649	30,000	529	28,000	441
		4	0.02	40,000	1,008	32,000	529	24,000	390	20,000	327
		6	0.013	28,800	672	19,400	364	18,000	350	15,000	280
		8	0.01	28,800	672	19,400	364	18,000	350	15,000	280
0.6	0.05	2	0.028	50,000	1,622	37,830	840	28,200	546	23,000	448
		4	0.019	40,000	1,162	27,800	616	23,600	392	21,000	322
		6	0.012	24,000	686	18,000	420	17,800	336	15,000	294
		8	0.01	24,000	652	18,000	399	17,800	319	15,000	280
	0.1	2	0.035	50,000	1,622	37,830	840	28,200	546	23,000	448
		4	0.024	40,000	1,162	27,800	616	23,600	392	21,000	322
		6	0.015	24,000	686	18,000	420	17,800	336	15,000	294
		8	0.013	24,000	652	18,000	399	17,800	319	15,000	280
0.7	0.05	2	0.028	49,200	1,475	34,190	781	29,030	497	25,830	408
		4	0.019	40,000	1,162	27,800	616	23,600	392	21,000	322
		6	0.012	24,000	686	18,000	420	17,800	336	15,000	294
		8	0.01	24,000	686	18,000	420	17,800	336	15,000	294
	0.1	2	0.042	49,200	1,475	34,190	781	29,030	497	25,830	408
		4	0.029	40,000	1,162	27,800	616	23,600	392	21,000	322
		6	0.018	24,000	686	18,000	420	17,800	336	15,000	294
		8	0.015	24,000	686	18,000	420	17,800	336	15,000	294
0.8	0.02	2	0.016	48,000	1,929	28,000	905	20,000	560	360	504
		4	0.016	48,000	1,542	28,000	725	20,000	448	288	403
		6	0.013	38,700	1,120	25,000	645	18,000	403	256	358
		8	0.011	29,025	840	20,000	516	16,200	362	230	322
		10	0.01	29,025	798	20,000	490	16,200	344	219	306
		12	0.09	29,025	798	20,000	490	16,200	344	219	306
	0.05	2	0.038	48,000	1,929	28,000	905	20,000	560	360	504
		4	0.026	48,000	1,542	28,000	725	20,000	448	288	403
		6	0.015	38,700	1,120	25,000	645	18,000	403	256	358
		8	0.012	29,025	840	20,000	516	16,200	362	230	322
		10	0.011	29,025	798	20,000	490	16,200	344	219	306
		12	0.01	29,025	798	20,000	490	16,200	344	219	306
	0.1	2	0.047	48,000	1,929	28,000	905	20,000	560	360	504
		4	0.032	48,000	1,542	28,000	725	20,000	448	288	403
		6	0.019	38,700	1,120	25,000	645	18,000	403	256	358
		8	0.015	29,025	840	20,000	516	16,200	362	230	322
		10	0.013	29,025	798	20,000	490	16,200	344	219	306
		12	0.012	29,025	798	20,000	490	16,200	344	219	306
1.0	0.02	4	0.013	32,400	1,902	27,540	1,454	24,300	1,141	22,680	932
		6	0.01	26,244	1,386	22,307	1,178	19,683	924	18,371	754

H-Star Endmill

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
1.0	0.02	8	0.008	23,328	1,232	19,829	1,047	17,496	821	16,330	670
		10	0.006	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.005	18,144	852	15,422	634	13,608	558	12,701	448
		14	0.004	18,144	746	15,422	588	13,608	478	12,701	372
		16	0.004	18,144	746	15,422	588	13,608	478	12,701	372
		20	0.003	13,608	558	11,567	441	10,206	359	9,526	280
	0.05	3	0.027	32,400	1,902	27,540	1,454	24,300	1,141	22,680	932
		4	0.027	32,400	1,902	27,540	1,454	24,300	1,141	22,680	932
		6	0.017	26,244	1,386	22,307	1,178	19,683	924	18,371	754
		8	0.016	23,328	1,232	19,829	1,047	17,496	821	16,330	670
		10	0.011	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.01	18,144	852	15,422	634	13,608	558	12,701	448
		14	0.008	18,144	746	15,422	588	13,608	478	12,701	372
		16	0.006	18,144	746	15,422	588	13,608	478	12,701	372
		20	0.004	13,608	558	11,567	441	10,206	359	9,526	280
	0.1	3	0.038	32,400	1,902	27,540	1,454	24,300	1,141	22,680	932
		4	0.038	32,400	1,902	27,540	1,454	24,300	1,141	22,680	932
		6	0.024	26,244	1,386	22,307	1,178	19,683	924	18,371	754
		8	0.024	23,328	1,232	19,829	1,047	17,496	821	16,330	670
		10	0.015	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.015	18,144	852	15,422	634	13,608	558	12,701	448
		14	0.012	18,144	746	15,422	588	13,608	478	12,701	372
		16	0.009	18,144	746	15,422	588	13,608	478	12,701	372
		20	0.006	13,608	558	11,567	441	10,206	359	9,526	280
	0.2	3	0.07	32,400	1,902	27,540	1,454	24,300	1,141	22,680	932
		4	0.07	32,400	1,902	27,540	1,454	24,300	1,141	22,680	932
		6	0.04	26,244	1,386	22,307	1,178	19,683	924	18,371	754
		8	0.04	23,328	1,232	19,829	1,047	17,496	821	16,330	670
		10	0.025	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.025	18,144	852	15,422	634	13,608	558	12,701	448
		14	0.02	18,144	746	15,422	588	13,608	478	12,701	372
		16	0.015	18,144	746	15,422	588	13,608	478	12,701	372
		20	0.01	13,608	558	11,567	441	10,206	359	9,526	280
	0.3	3	0.07	32,400	1,902	27,540	1,454	24,300	1,141	22,680	932
		4	0.07	32,400	1,902	27,540	1,454	24,300	1,141	22,680	932
		6	0.04	26,244	1,386	22,307	1,178	19,683	924	18,371	754
		8	0.04	23,328	1,232	19,829	1,047	17,496	821	16,330	670
		10	0.025	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.025	18,144	852	15,422	634	13,608	558	12,701	448
		14	0.02	18,144	746	15,422	588	13,608	478	12,701	372
		16	0.015	18,144	746	15,422	588	13,608	478	12,701	372
		20	0.01	13,608	558	11,567	441	10,206	359	9,526	280
1.2	0.02	4	0.013	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		6	0.01	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831

H-Star Endmill

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
1.2	0.02	8	0.008	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.006	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.005	19,278	912	16,386	775	14,458	599	13,494	478
		14	0.004	18,144	746	15,422	634	13,608	478	12,701	372
		16	0.004	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.003	13,608	558	11,567	441	10,206	359	9,526	280
	0.05	3	0.027	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		4	0.027	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		6	0.017	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		8	0.016	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.011	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.01	19,278	912	16,386	775	14,458	599	13,494	478
		14	0.008	18,144	746	15,422	634	13,608	478	12,701	372
		16	0.006	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.004	13,608	558	11,567	441	10,206	359	9,526	280
	0.1	3	0.03	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		4	0.03	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		6	0.03	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		8	0.022	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.015	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.012	19,278	912	16,386	775	14,458	599	13,494	478
		14	0.01	18,144	746	15,422	634	13,608	478	12,701	372
		16	0.01	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.006	13,608	558	11,567	441	10,206	359	9,526	280
	0.2	3	0.05	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		4	0.05	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		6	0.05	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		8	0.037	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.025	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.02	19,278	912	16,386	775	14,458	599	13,494	478
		14	0.016	18,144	746	15,422	634	13,608	478	12,701	372
		16	0.016	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.01	13,608	558	11,567	441	10,206	359	9,526	280
	0.3	3	0.05	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		4	0.05	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		6	0.05	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		8	0.037	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.025	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.02	19,278	912	16,386	775	14,458	599	13,494	478
		16	0.016	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.01	13,608	558	11,567	441	10,206	359	9,526	280
1.5	0.02	6	0.01	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.008	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.006	20,412	1,293	17,350	1,222	15,309	959	14,288	782

H-Star Endmill

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
1.5	0.02	12	0.005	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.004	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.004	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.003	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.003	14,112	795	11,995	592	10,584	522	9,878	417
	0.05	4	0.027	24,930	1,582	20,956	1,325	18,711	1,052	17,364	855
		6	0.017	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.016	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.011	20,412	1,293	17,350	1,222	15,309	959	14,288	782
		12	0.01	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.008	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.006	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.004	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.004	14,112	795	11,995	592	10,584	522	9,878	417
		26	0.003	14,112	795	11,995	592	10,584	522	9,878	417
	0.1	4	0.042	24,930	1,582	20,956	1,325	18,711	1,052	17,364	855
		6	0.04	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.036	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.036	20,412	1,293	17,350	1,222	15,309	959	14,288	782
		12	0.036	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.023	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.023	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.018	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.015	14,112	795	11,995	592	10,584	522	9,878	417
		26	0.01	14,112	795	11,995	592	10,584	522	9,878	417
	0.2	4	0.07	24,930	1,582	20,956	1,325	18,711	1,052	17,364	855
		6	0.065	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.06	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.06	20,412	1,293	17,350	1,222	15,309	959	14,288	782
		12	0.06	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.038	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.038	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.03	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.025	14,112	795	11,995	592	10,584	522	9,878	417
		25	0.02	14,112	795	11,995	592	10,584	522	9,878	417
	0.3	4	0.07	24,930	1,582	20,956	1,325	18,711	1,052	17,364	855
		6	0.065	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.06	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.06	20,412	1,293	17,350	1,222	15,309	959	14,288	782
		12	0.06	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.038	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.038	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.03	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.025	14,112	795	11,995	592	10,584	522	9,878	417
		25	0.02	14,112	795	11,995	592	10,584	522	9,878	417

H-Star Endmill

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
1.5	0.5	4	0.085	24,930	1,582	20,956	1,325	18,711	1,052	17,364	855
		6	0.08	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.07	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.067	20,412	1,293	17,350	1,222	15,309	959	14,288	782
		12	0.065	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.045	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.045	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.035	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.03	14,112	795	11,995	592	10,584	522	9,878	417
		25	0.025	14,112	795	11,995	592	10,584	522	9,878	417
2.0	0.02	6	0.013	20,790	2,289	17,672	1,944	15,593	1,373	14,553	1,121
		8	0.01	18,900	2,080	16,065	1,768	14,175	1,248	13,230	1,019
		10	0.008	17104	1,797	14539	1,528	12828	1,129	11973	922
		12	0.006	15,309	1,516	13,013	1,289	11,482	1,010	10,716	826
		14	0.005	14,458	1,432	12,290	1,216	10,844	954	10,121	779
		16	0.004	13,608	1,348	11,567	1,145	10,206	898	9,526	733
		20	0.004	11,907	1,180	10,121	1,002	8,930	786	8,335	642
		25	0.003	11,907	1,059	10,121	900	8,930	707	8,335	575
		30	0.003	11,312	1,006	9,615	855	8,484	672	7,918	547
	0.05	6	0.027	20,790	2,289	17,672	1,944	15,593	1,373	14,553	1,121
		8	0.017	18,900	2,080	16,065	1,768	14,175	1,248	13,230	1,019
		10	0.016	17104	1,797	14539	1,528	12828	1,129	11973	922
		12	0.011	15,309	1,516	13,013	1,289	11,482	1,010	10,716	826
		14	0.01	14,458	1,432	12,290	1,216	10,844	954	10,121	779
		16	0.008	13,608	1,348	11,567	1,145	10,206	898	9,526	733
		20	0.006	11,907	1,180	10,121	1,002	8,930	786	8,335	642
		25	0.004	11,907	1,059	10,121	900	8,930	707	8,335	575
		30	0.003	11,312	1,006	9,615	855	8,484	672	7,918	547
	0.1	6	0.07	20,790	2,289	17,672	1,944	15,593	1,373	14,553	1,121
		8	0.055	18,900	2,080	16,065	1,768	14,175	1,248	13,230	1,019
		10	0.042	17104	1,797	14539	1,528	12828	1,129	11973	922
		12	0.03	15,309	1,516	13,013	1,289	11,482	1,010	10,716	826
		14	0.03	14,458	1,432	12,290	1,216	10,844	954	10,121	779
		16	0.03	13,608	1,348	11,567	1,145	10,206	898	9,526	733
		20	0.025	11,907	1,180	10,121	1,002	8,930	786	8,335	642
		22	0.02	11,907	1,059	10,121	900	8,930	707	8,335	575
		25	0.015	11,907	1,059	10,121	900	8,930	707	8,335	575
		30	0.01	11,312	1,006	9,615	855	8,484	672	7,918	547
	0.2	6	0.08	20,790	2,289	17,672	1,944	15,593	1,373	14,553	1,121
		8	0.07	18,900	2,080	16,065	1,768	14,175	1,248	13,230	1,019
		10	0.055	17104	1,797	14539	1,528	12828	1,129	11973	922
		12	0.04	15,309	1,516	13,013	1,289	11,482	1,010	10,716	826
		14	0.04	14,458	1,432	12,290	1,216	10,844	954	10,121	779
		16	0.04	13,608	1,348	11,567	1,145	10,206	898	9,526	733

H-Star Endmill

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
2.0	0.2	20	0.035	11,907	1,180	10,121	1,002	8,930	786	8,335	642
		22	0.03	11,907	1,059	10,121	900	8,930	707	8,335	575
		25	0.025	11,907	1,059	10,121	900	8,930	707	8,335	575
		30	0.017	11,312	1,006	9,615	855	8,484	672	7,918	547
	0.3	6	0.11	20,790	2,289	17,672	1,944	15,593	1,373	14,553	1,121
		8	0.09	18,900	2,080	16,065	1,768	14,175	1,248	13,230	1,019
		10	0.075	17104	1,797	14539	1,528	12828	1,129	11973	922
		12	0.06	15,309	1,516	13,013	1,289	11,482	1,010	10,716	826
		14	0.06	14,458	1,432	12,290	1,216	10,844	954	10,121	779
		16	0.06	13,608	1,348	11,567	1,145	10,206	898	9,526	733
		20	0.037	11,907	1,180	10,121	1,002	8,930	786	8,335	642
		22	0.033	11,907	1,059	10,121	900	8,930	707	8,335	575
		25	0.03	11,907	1,059	10,121	900	8,930	707	8,335	575
		30	0.021	11,312	1,006	9,615	855	8,484	672	7,918	547
	0.5	6	0.17	20,790	2,289	17,672	1,944	15,593	1,373	14,553	1,121
		8	0.14	18,900	2,080	16,065	1,768	14,175	1,248	13,230	1,019
		10	0.11	17104	1,797	14539	1,528	12828	1,129	11973	922
		12	0.08	15,309	1,516	13,013	1,289	11,482	1,010	10,716	826
		14	0.08	14,458	1,432	12,290	1,216	10,844	954	10,121	779
		16	0.08	13,608	1,348	11,567	1,145	10,206	898	9,526	733
		20	0.05	11,907	1,180	10,121	1,002	8,930	786	8,335	642
		22	0.05	11,907	1,059	10,121	900	8,930	707	8,335	575
		25	0.05	11,907	1,059	10,121	900	8,930	707	8,335	575
		30	0.03	11,312	1,006	9,615	855	8,484	672	7,918	547
2.5	0.1	8	0.06	18,900	2,080	16,065	1,768	14,175	1,248	13,230	1,019
		10	0.055	18,900	2,080	16,065	1,768	14,175	1,248	13,230	1,019
		12	0.051	18,018	1,958	15,315	1,664	13,513	1,190	12,613	1,019
		14	0.046	17,136	1,835	14,566	1,560	12,852	1,132	11,995	971
		16	0.042	16,254	1,713	13,816	1,456	12,190	1,073	11,378	876
		20	0.03	13,608	1,348	11,567	1,145	10,206	898	9,526	733
		25	0.022	12,757	1,204	10,844	1,022	9,568	802	8,930	653
		30	0.015	11,907	1,059	10,121	900	8,930	707	8,335	575
	0.2	8	0.08	18,900	2,080	16,065	1,768	14,175	1,248	13,230	1,019
		10	0.07	18,900	2,080	16,065	1,768	14,175	1,248	13,230	1,019
		12	0.06	18,018	1,958	15,315	1,664	13,513	1,190	12,613	1,019
		14	0.05	17,136	1,835	14,566	1,560	12,852	1,132	11,995	971
		16	0.055	16,254	1,713	13,816	1,456	12,190	1,073	11,378	876
		20	0.04	13,608	1,348	11,567	1,145	10,206	898	9,526	733
		25	0.03	12,757	1,204	10,844	1,022	9,568	802	8,930	653
		30	0.02	11,907	1,059	10,121	900	8,930	707	8,335	575
	0.3	8	0.1	18,900	2,080	16,065	1,768	14,175	1,248	13,230	1,019
		10	0.09	18,900	2,080	16,065	1,768	14,175	1,248	13,230	1,019
		12	0.085	18,018	1,958	15,315	1,664	13,513	1,190	12,613	1,019
		14	0.08	17,136	1,835	14,566	1,560	12,852	1,132	11,995	971

H-Star Endmill

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
2.5	0.3	16	0.075	16,254	1,713	13,816	1,456	12,190	1,073	11,378	876
		20	0.06	13,608	1,348	11,567	1,145	10,206	898	9,526	733
		25	0.065	12,757	1,204	10,844	1,022	9,568	802	8,930	653
		30	0.06	11,907	1,059	10,121	900	8,930	707	8,335	575
	0.5	8	0.15	18,900	2,080	16,065	1,768	14,175	1,248	13,230	1,019
		10	0.14	18,900	2,080	16,065	1,768	14,175	1,248	13,230	1,019
		12	0.13	18,018	1,958	15,315	1,664	13,513	1,190	12,613	1,019
		14	0.12	17,136	1,835	14,566	1,560	12,852	1,132	11,995	971
		16	0.11	16,254	1,713	13,816	1,456	12,190	1,073	11,378	876
		20	0.08	13,608	1,348	11,567	1,145	10,206	898	9,526	733
		25	0.07	12,757	1,204	10,844	1,022	9,568	802	8,930	653
		30	0.05	11,907	1,059	10,121	900	8,930	707	8,335	575
3.0	0.1	8	0.07	14,400	1,981	12,240	1,684	10,800	1,188	10,080	970
		10	0.06	14400	1,981	12240	1,684	10800	1,188	10080	970
		12	0.05	14,400	1,981	12,240	1,684	10,800	1,188	10,080	970
		14	0.047	14,400	1,981	12,240	1,684	10,800	1,188	10,080	970
		16	0.035	14,400	1,981	12,240	1,684	10,800	1,188	10,080	970
		20	0.035	11,664	1,604	9,914	1,363	8,748	961	8,165	785
		25	0.031	10368	1,362	8812.5	1,158	7776	816	7257.5	667
		30	0.027	9,072	1,121	7,711	953	6,804	672	6,350	550
		35	0.02	9,072	1,121	7,711	953	6,804	672	6,350	550
		40	0.015	8,164	897	6,939	762	6,123	537	5,715	440
		45	0.01	7,258	672	6,169	572	5,443	403	5,080	330
	0.2	8	0.09	14,400	1,981	12,240	1,684	10,800	1,188	10,080	970
		10	0.08	14400	1,981	12240	1,684	10800	1,188	10080	970
		12	0.07	14,400	1,981	12,240	1,684	10,800	1,188	10,080	970
		14	0.06	14,400	1,981	12,240	1,684	10,800	1,188	10,080	970
		16	0.05	14,400	1,981	12,240	1,684	10,800	1,188	10,080	970
		20	0.05	11,664	1,604	9,914	1,363	8,748	961	8,165	785
		25	0.045	10368	1,362	8812.5	1,158	7776	816	7257.5	667
		30	0.04	9,072	1,121	7,711	953	6,804	672	6,350	550
		35	0.035	9,072	1,121	7,711	953	6,804	672	6,350	550
		40	0.03	8,164	897	6,939	762	6,123	537	5,715	440
		45	0.025	7,258	672	6,169	572	5,443	403	5,080	330
	0.3	8	0.13	14,400	1,981	12,240	1,684	10,800	1,188	10,080	970
		10	0.115	14400	1,981	12240	1,684	10800	1,188	10080	970
		12	0.1	14,400	1,981	12,240	1,684	10,800	1,188	10,080	970
		14	0.085	14,400	1,981	12,240	1,684	10,800	1,188	10,080	970
		16	0.075	14,400	1,981	12,240	1,684	10,800	1,188	10,080	970
		20	0.075	11,664	1,604	9,914	1,363	8,748	961	8,165	785
		25	0.0675	10368	1,362	8812.5	1,158	7776	816	7257.5	667
		30	0.06	9,072	1,121	7,711	953	6,804	672	6,350	550
		35	0.05	9,072	1,121	7,711	953	6,804	672	6,350	550
		40	0.04	8,164	897	6,939	762	6,123	537	5,715	440
		45	0.03	7,258	672	6,169	572	5,443	403	5,080	330

H-Star Endmill

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
3.0	0.5	8	0.18	14,400	1,981	12,240	1,684	10,800	1,188	10,080	970
		10	0.155	14400	1,981	12240	1,684	10800	1,188	10080	970
		12	0.13	14,400	1,981	12,240	1,684	10,800	1,188	10,080	970
		14	0.12	14,400	1,981	12,240	1,684	10,800	1,188	10,080	970
		16	0.1	14,400	1,981	12,240	1,684	10,800	1,188	10,080	970
		20	0.1	11,664	1,604	9,914	1,363	8,748	961	8,165	785
		25	0.09	10368	1,362	8812.5	1,158	7776	816	7257.5	667
		30	0.08	9,072	1,121	7,711	953	6,804	672	6,350	550
		35	0.065	9,072	1,121	7,711	953	6,804	672	6,350	550
		40	0.05	8,164	897	6,939	762	6,123	537	5,715	440
		45	0.04	7,258	672	6,169	572	5,443	403	5,080	330
		50	0.03	6,532	538	5,552	457	4,899	322	4,572	264
	1	8	0.2	14,400	1,981	12,240	1,684	10,800	1,188	10,080	970
		10	0.175	14400	1,981	12240	1,684	10800	1,188	10080	970
		12	0.15	14,400	1,981	12,240	1,684	10,800	1,188	10,080	970
		14	0.13	14,400	1,981	12,240	1,684	10,800	1,188	10,080	970
		16	0.12	14,400	1,981	12,240	1,684	10,800	1,188	10,080	970
		20	0.11	11,664	1,604	9,914	1,363	8,748	961	8,165	785
		25	0.1	10368	1,362	8812.5	1,158	7776	816	7257.5	667
		30	0.09	9,072	1,121	7,711	953	6,804	672	6,350	550
		35	0.075	9,072	1,121	7,711	953	6,804	672	6,350	550
		40	0.06	8,164	897	6,939	762	6,123	537	5,715	440
		45	0.045	7,258	672	6,169	572	5,443	403	5,080	330
		50	0.03	6,532	538	5,552	457	4,899	322	4,572	264
4.0	0.1	10	0.072	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1,338
		12	0.065	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1,338
		13	0.062	10,734	2,613	9,114	2,219	8,004	1,558	7,266	1,239
		16	0.06	10,255	2,496	8,697	2116	7,599	1,479	6,684	1,139
		20	0.055	10,255	2496	8,697	2,116	7,599	1,479	6,884	1,139
		25	0.05	10,255	2,496	7,782	1,810	6,545	1,221	5,904	962
		30	0.045	10,255	2,496	6,867	1,505	5,491	963	5,124	785
		35	0.04	10,255	2,496	6,867	1505	5,491	963	5,124	785
		40	0.035	9,247	2,000	6,225	1,262	5,217	842	4,621	643
		45	0.03	8,240	1,505	5,584	1,019	4,944	722	4,119	501
		50	0.02	7,398	1,200	4,980	757	4,174	505	3,697	385
	0.2	10	0.15	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1,338
		12	0.14	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1,338
		13	0.135	10,734	2,613	9,114	2,219	8,004	1,558	7,266	1,239
		16	0.13	10,255	2,496	8,697	2116	7,599	1,479	6,684	1,139
		20	0.11	10,255	2496	8,697	2,116	7,599	1,479	6,884	1,139
		25	0.105	10,255	2,496	7,782	1,810	6,545	1,221	5,904	962
		30	0.1	10,255	2,496	6,867	1,505	5,491	963	5,124	785
		35	0.08	10,255	2,496	6,867	1505	5,491	963	5,124	785
		40	0.07	9,247	2,000	6,225	1,262	5,217	842	4,621	643

H-Star Endmill

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
4.0	0.2	45	0.06	8,240	1,505	5,584	1,019	4,944	722	4,119	501
		50	0.05	7,398	1,200	4,980	757	4,174	505	3,697	385
	0.3	10	0.23	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1,338
		12	0.22	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1,338
		13	0.21	10,734	2,613	9,114	2,219	8,004	1,558	7,266	1,239
		16	0.2	10,255	2,496	8,697	2,116	7,599	1,479	6,684	1,139
		20	0.18	10,255	2496	8,697	2,116	7,599	1,479	6,884	1,139
		25	0.17	10,255	2,496	7,782	1,810	6,545	1,221	5,904	962
		30	0.16	10,255	2,496	6,867	1,505	5,491	963	5,124	785
		35	0.14	10,255	2,496	6,867	1,505	5,491	963	5,124	785
		40	0.13	9,247	2,000	6,225	1,262	5,217	842	4,621	643
		45	0.12	8,240	1,505	5,584	1,019	4,944	722	4,119	501
		50	0.11	7,398	1,200	4,980	757	4,174	505	3,697	385
	0.5	10	0.4	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1,338
		12	0.35	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1,338
		13	0.3	10,734	2,613	9,114	2,219	8,004	1,558	7,266	1,239
		16	0.25	10,255	2,496	8,697	2,116	7,599	1,479	6,684	1,139
		20	0.2	10,255	2496	8,697	2,116	7,599	1,479	6,884	1,139
		25	0.175	10,255	2,496	7,782	1,810	6,545	1,221	5,904	962
		30	0.15	10,255	2,496	6,867	1,505	5,491	963	5,124	785
		35	0.1	10,255	2,496	6,867	1,505	5,491	963	5,124	785
		40	0.075	9,247	2,000	6,225	1,262	5,217	842	4,621	643
		45	0.05	8,240	1,505	5,584	1,019	4,944	722	4,119	501
		50	0.04	7,398	1,200	4,980	757	4,174	505	3,697	385
		55	0.03	6,592	9,903	4,467	611	3,955	433	3,295	300
	1	10	0.5	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1,338
		12	0.4	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1,338
		13	0.35	10,734	2,613	9,114	2,219	8,004	1,558	7,266	1,239
		16	0.29	10,255	2,496	8,697	2,116	7,599	1,479	6,684	1,139
		20	0.23	10,255	2,496	8,697	2,116	7,599	1,479	6,884	1,139
		25	0.2	10,255	2,496	7,782	1,810	6,545	1,221	5,904	962
		30	0.17	10,255	2,496	6,867	1,505	5,491	963	5,124	785
		35	0.12	10,255	2,496	6,867	1,505	5,491	963	5,124	785
		40	0.09	9,247	2,000	6,225	1,262	5,217	842	4,621	643
		45	0.06	8,240	1,505	5,584	1,019	4,944	722	4,119	501
		50	0.05	7,398	1,200	4,980	757	4,174	505	3,697	385
		55	0.04	6,592	9,903	4,467	611	3,955	433	3,295	300
5.0	0.1	16	0.08	9,154	2,786	7,781	2,368	6,866	1,671	6,408	1,365
		30	0.07	7,872	2,291	6,691	1,948	5,904	1,374	5,510	1,122
		40	0.06	6,590	1,797	5,602	1,527	4,943	1,078	4,613	880
	0.2	16	0.16	9,154	2,786	7,781	2,368	6,866	1,671	6,408	1,365
		30	0.145	7,872	2,291	6,691	1,948	5,904	1,374	5,510	1,122
		40	0.13	6,590	1,797	5,602	1,527	4,943	1,078	4,613	880

H-Star Endmill

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
5.0	0.3	16	0.24	9,154	2,786	7,781	23,68	6,866	1,671	6,408	1,365
		30	0.22	7,872	2,291	6,691	1,948	5,904	1,374	5,510	1,122
		40	0.2	6,590	1,797	5,602	1,527	4,943	1,078	4,613	880
	0.5	16	0.35	9,154	2,786	7,781	2,368	6,866	1,671	6,408	1,365
		30	0.296	7,872	2,291	6,691	1,948	5,904	1,374	5,510	1,122
		40	0.135	6,590	1,797	5,602	1,527	4,943	1,078	4,613	880
		50	0.12	5,272	1,078	4,482	916	3,954	646	3,690	528
		60	0.1	4,218	647	3,585	549	3,164	388	2,952	317
	1	16	0.4	9,154	2,786	7,781	2,368	6,866	1,671	6,408	1,365
		30	0.275	7,872	2,291	6,691	1,948	5,904	1,374	5,510	1,122
		40	0.15	6,590	1,797	5,602	1,527	4,943	1,078	4,613	880
		50	0.13	5,272	1,078	4,482	916	3,954	646	3,690	528
		60	0.11	4,218	647	3,585	549	3,164	388	2,952	317
	1.5	15	0.45	9,154	2,786	7,781	2,368	6,866	1,671	6,408	1,365
	2	15	0.5	9,154	2,786	7,781	2,368	6,866	1,671	6,408	1,365
6.0	0.1	20	0.065	7,630	2,787	6,486	2,368	5,722	1,671	5,432	1,365
		40	0.05	6,486	2,132	5,513	1,811	4,865	1,279	4,540	1,044
		50	0.04	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	0.2	20	0.14	7,630	2,787	6,486	2,368	5,722	1,671	5,432	1,365
		40	0.11	6,486	2,132	5,513	1,811	4,865	1,279	4,540	1,044
		50	0.08	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	0.3	20	0.22	7,630	2,787	6,486	2,368	5,722	1,671	5,432	1,365
		30	0.2	7,630	2,787	6,486	2,368	5,722	1,671	5,432	1,365
		40	0.18	6,486	2,132	5,513	1,811	4,865	1,279	4,540	1,044
		50	0.14	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	0.5	20	0.35	7,630	2,787	6,486	2,368	5,722	1,671	5,432	1,365
		30	0.29	7,630	2,787	6,486	2,368	5,722	1,671	5,432	1,365
		40	0.24	6,486	2,132	5,513	1,811	4,865	1,279	4,540	1,044
		50	0.165	5,491	1,470	4,668	1,248	4,118	872	3,844	711
		60	0.1	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	1	20	0.4	7,630	2,787	6,486	2,368	5,722	1,671	5,432	1,365
		30	0.35	7,630	2,787	6,486	2,368	5,722	1,671	5,432	1,365
		40	0.28	6,486	2,132	5,513	1,811	4,865	1,279	4,540	1,044
		50	0.2	5,491	1,470	4,668	1,248	4,118	872	3,844	711
		60	0.15	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	1.5	20	0.45	7,630	2,787	6,486	2,368	5,722	1,671	5,432	1,365
		40	0.4	6,486	2,132	5,513	1,811	4,865	1,279	4,540	1,044
		50	0.3	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	2	20	0.5	7,630	2,787	6,486	2,368	5,722	1,671	5,432	1,365
		30	0.4	7,630	2,787	6,486	2,368	5,722	1,671	5,432	1,365
		40	0.3	6,486	2,132	5,513	1,811	4,865	1,279	4,540	1,044
		50	0.2	5,491	1,470	4,668	1,248	4,118	872	3,844	711

H-Star Endmill

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
8.0	0.1	25	0.35	5,730	2,660	4,524	2,076	3,016	1,279	2,320	817
	0.2	22	0.5	5,730	2,660	4,524	2,076	3,016	1,279	2,320	817
		40	0.25	5,730	2,660	4,524	2,076	3,016	1,279	2,320	817
	0.3	22	0.6	5,730	2,660	4,524	2,076	3,016	1,279	2,320	817
		40	0.3	5,730	2,660	4,524	2,076	3,016	1,279	2,320	817
	0.5	22	0.7	5,730	2,660	4,524	2,076	3,016	1,279	2,320	817
		35	0.5	5,730	2,660	4,524	2,076	3,016	1,279	2,320	817
		40	0.35	5,730	2,660	4,524	2,076	3,016	1,279	2,320	817
		50	0.3	4,584	1,596	3,619	1,245	2,413	767	1,856	490
		60	0.25	4,584	1,596	3,619	1,245	2,413	767	1,856	490
	1	22	0.8	5,730	2,660	4,524	2,076	3,016	1,279	2,320	817
		35	0.6	5,730	2,660	4,524	2,076	3,016	1,279	2,320	817
		40	0.4	5,730	2,660	4,524	2,076	3,016	1,279	2,320	817
		50	0.4	4,584	1,596	3,619	1,245	2,413	767	1,856	490
		60	0.3	4,584	1,596	3,619	1,245	2,413	767	1,856	490
	1.2	22	0.9	5,730	2,660	4,524	2,076	3,016	1,279	2,320	817
		40	0.45	5,730	2,660	4,524	2,076	3,016	1,279	2,320	817
	2	22	1	5,730	2,660	4,524	2,076	3,016	1,279	2,320	817
		40	0.5	5,730	2,660	4,524	2,076	3,016	1,279	2,320	817
		50	0.4	4,584	1,596	3,619	1,245	2,413	767	1,856	490
10.0	0.1	30	0.4	4,524	2,419	3,567	1,954	2,378	1,188	1,856	761
	0.2	24	0.5	4,524	2,419	3,567	1,954	2,378	1,188	1,856	761
		40	0.25	4,524	2,419	3,567	1,954	2,378	1,188	1,856	761
	0.3	24	0.6	4,524	2,419	3,567	1,954	2,378	1,188	1,856	761
		40	0.3	4,524	2,419	3,567	1,954	2,378	1,188	1,856	761
	0.5	24	0.7	4,524	2,419	3,567	1,954	2,378	1,188	1,856	761
		40	0.4	4,524	2,419	3,567	1,954	2,378	1,188	1,856	761
		50	0.3	3,619	1,451	2,854	1,172	1,902	713	1,485	456
		60	0.2	3,619	1,451	2,854	1,172	1,902	713	1,485	456
	1	24	0.8	4,524	2,419	3,567	1,954	2,378	1,188	1,856	761
		40	0.5	4,524	2,419	3,567	1,954	2,378	1,188	1,856	761
		50	0.4	3,619	1,451	2,854	1,172	1,902	713	1,485	456
		60	0.3	3,619	1,451	2,854	1,172	1,902	713	1,485	456
	1.5	24	0.9	4,524	2,419	3,567	1,954	2,378	1,188	1,856	761
		40	0.55	4,524	2,419	3,567	1,954	2,378	1,188	1,856	761
	2	24	1	4,524	2,419	3,567	1,954	2,378	1,188	1,856	761
		40	0.5	3,619	1,451	2,854	1,172	1,902	713	1,485	456
		50	0.4	2,895	870	2,283	703	1,522	427	1,188	274
	2.5	24	1.1	4,524	2,419	3,567	1,954	2,378	1,188	1,856	761
12.0	0.2	32	0.5	3,857	2,419	3,045	1,954	2,030	1,188	1,537	761
	0.3	26	0.6	3,857	2,419	3,045	1,954	2,030	1,188	1,537	761
		45	0.3	3,857	2,419	3,045	1,954	2,030	1,188	1,537	761
	0.5	26	0.7	3,857	2,419	3,045	1,954	2,030	1,188	1,537	761
		40	0.4	3,857	2,419	3,045	1,954	2,030	1,188	1,537	761

H-Star Endmill

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
12.0	0.5	60	0.3	3,086	1,451	2,436	1,172	1,624	713	1,230	456
	1	26	0.8	3,857	2,419	3,045	1,954	2,030	1,188	1,537	761
		40	0.5	3,857	2,419	3,045	1,954	2,030	1,188	1,537	761
		60	0.3	3,086	1,451	2,436	1,172	1,624	713	1,230	456
	1.5	26	0.9	3,857	2,419	3,045	1,954	2,030	1,188	1,537	761
	2	26	1	3,857	2,419	3,045	1,954	2,030	1,188	1,537	761
		40	0.5	3,857	2,419	3,045	1,954	2,030	1,188	1,537	761
	3	26	1	3,857	2,419	3,045	1,954	2,030	1,188	1,537	761
16.0	0.5	35	2	2,842	2,116	2,262	1,692	1,508	1,047	1,160	672
		50	1	2,842	2,116	2,262	1,692	1,508	1,047	1,160	672
	1	35	2	2,842	2,116	2,262	1,692	1,508	1,047	1,160	672
		50	1	2,842	2,116	2,262	1,692	1,508	1,047	1,160	672
20.0	0.5	40	2	2,262	1,915	1,798	1,512	1,189	957	928	616
		55	1	2,262	1,915	1,798	1,512	1,189	957	928	616
	1	40	2	2,262	1,915	1,798	1,512	1,189	957	928	616
		55	1	2,262	1,915	1,798	1,512	1,189	957	928	616

• Please adjust the cutting depth index according to the cutting depth factors of above table
• In actual machining, the condition should be adjusted according to the machining shape, purpose and machine type
• If RPM of the machine is low, the feed rate should be low in the same ratio as RPM

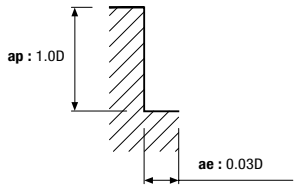
H-Star Endmill

ESXR704, ESXE704, ESXE714 series

Side cutting

Workpiece / Conditions / Diameter (Ø)	Hardened steels Heat resistant alloy HRC40~50		Hardened steels HRC50~55		HRC55~60		HRC60~65		HRC65~70	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
4.0	17,200	1,690	11,440	1,140	9,360	700	7,280	430	6,170	310
6.0	13,450	1,820	8,970	1,230	6,890	720	5,460	450	4,810	330
8.0	9,100	1,750	6,760	1,170	5,200	670	4,160	420	3,640	310
10.0	8,000	1,630	5,330	1,090	4,160	620	3,320	400	2,860	280
12.0	6,830	1,630	4,550	1,010	3,450	580	2,730	370	2,420	260

Application tip



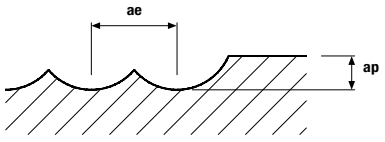
ESLNB20 series

Workpiece / Conditions / Diameter (Ø)	Alloy steels, Heat resistant steels HRC30~45			Hardened steels HRC45~55			Hardened steels HRC55~65			Copper, Copper alloy		
	R.P.M n (min -1)	Feed vf (mm/min)	ae (mm)	R.P.M n (min -1)	Feed vf (mm/min)	ae (mm)	R.P.M n (min -1)	Feed vf (mm/min)	ae (mm)	R.P.M n (min -1)	Feed vf (mm/min)	ae (mm)
0.5	34,100~49,500	600~870	0.007~0.028	31,900~35,200	490~540	0.005~0.023	31,900~35,200	440~480	0.005~0.021	49,000~50,000	1,100~1,400	0.010~0.042
0.6	28,600~40,700	590~850	0.007~0.034	26,400~29,700	480~540	0.006~0.028	26,400~29,700	400~480	0.006~0.025	42,000~50,000	1,100~1,700	0.011~0.050
0.8	22,000~30,800	640~890	0.016~0.064	19,800~22,000	490~550	0.013~0.052	19,800~22,000	440~500	0.012~0.048	31,000~50,000	1,100~2,250	0.024~0.096
1.0	17,600~24,200	600~850	0.008~0.080	15,400~17,600	470~540	0.007~0.065	15,400~17,600	440~500	0.006~0.060	24,000~49,500	1,100~2,200	0.012~0.120
1.2	14,300~18,700	590~780	0.024~0.032	12,000~14,000	480~540	0.020~0.026	12,000~14,000	420~480	0.018~0.024	28,500~38,500	1,480~1,950	0.036~0.048
1.5	11,000~14,300	580~760	0.031~0.048	10,000~11,500	480~540	0.025~0.039	10,000~11,500	420~480	0.023~0.036	17,000~28,500	1,100~1,950	0.046~0.072
2.0	8,500~11,000	590~800	0.024~0.160	7,900~8,800	470~530	0.020~0.130	7,900~8,800	440~480	0.018~0.120	12,600~24,000	1,100~2,150	0.036~0.240
3.0	5,700~8,200	730~1,000	0.064~0.24	5,300~5,800	590~650	0.052~0.195	5,300~5,800	550~620	0.048~0.120	11,900~17,000	1,850~2,700	0.096~0.360
4.0	4,300~6,200	680~990	0.080~0.320	3,950~4,400	550~620	0.065~0.260	3,850~4,400	530~570	0.060~0.240	6,600~12,500	1,260~2,500	0.120~0.480

Application tip

*ap : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.25mm
D10 ~ D12 = 0.3mm

*ae : 0.1 × D



H-Star Endmill

ESTNB20 series

Workpiece					Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut					Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
R (mm)	Diameter (Ø)	Neck length (mm)	Neck Angle (°)	Depth of Cut (mm)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
0.4	0.8	4	0.4	0.062	32,000	2,560	22,400	1,613	20,800	1,331	20,800	1,165
		6	0.4	0.045	32,000	2,560	22,400	1,613	20,800	1,331	20,800	1,165
		8	0.9	0.026	25,600	1,475	17,920	1,032	16,640	852	16,640	745
		12	0.9	0.020	20,800	1,065	14,560	699	13,520	606	13,520	519
		16	0.9	0.018	20,800	932	14,560	612	13,520	530	13,520	454
0.45	0.9	4	0.4	0.063	28,300	2,547	19,810	1,605	18,395	1,324	18,395	1,159
		8	0.4	0.050	28,300	2,547	19,810	1,605	18,395	1,324	18,395	1,159
		12	0.4	0.037	18,400	1,325	12,880	811	11,960	753	11,960	646
		16	0.4	0.024	18,400	1,325	12,880	811	11,960	753	11,960	646
		18	0.4	0.018	18,400	1,325	12,880	811	11,960	753	11,960	646
		20	0.4	0.015	15,850	1,141	11,095	699	10,303	649	10,303	556
		22	0.4	0.012	15,850	1,141	11,095	699	10,303	649	10,303	556
		24	0.4	0.009	14,150	1,019	9,905	624	9,198	579	9,198	497
0.5	1	6	0.4	0.055	25,600	2,560	17,920	1,613	16,640	1,331	16,640	1,165
		8	0.4	0.055	25,600	2,560	17,920	1,613	16,640	1,331	16,640	1,165
		10	0.4	0.032	20,800	1,872	14,560	1,310	13,520	1,082	13,520	946
		10	0.9	0.035	20,800	1,872	14,560	1,310	13,520	1,082	13,520	946
		15	0.9	0.028	16,640	1,331	11,648	874	10,816	757	10,816	649
		20	0.4	0.018	16,640	1,331	11,648	874	10,816	757	10,816	649
		20	0.9	0.020	16,640	1,331	11,648	874	10,816	757	10,816	649
		25	0.9	0.017	14,560	1,165	10,192	764	9,464	662	9,464	568
		30	0.4	0.015	12,480	874	8,736	568	8,112	487	8,112	406
		30	0.9	0.017	12,480	874	8,736	568	8,112	487	8,112	406
		35	0.9	0.010	10,400	728	7,280	473	6,760	406	6,760	338
		40	0.9	0.009	10,000	700	7,000	455	6,500	390	6,500	325
		50	0.9	0.007	9,500	665	6,650	432	6,175	371	6,175	309
		60	0.9	0.005	9,000	630	6,300	410	5,850	351	5,850	293
		70	0.9	0.003	8,500	595	5,950	387	5,525	332	5,525	276
0.75	1.5	8	0.4	0.070	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		10	0.4	0.070	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		12	0.4	0.070	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		15	0.9	0.045	13,568	1,832	9,498	1,282	8,819	1,058	8,819	926
		20	0.9	0.040	11,024	1,323	7,717	810	7,166	752	7,166	645
		30	0.9	0.028	11,024	1,323	7,717	810	7,166	752	7,166	645

H-Star Endmill

ESTNB20 series

Workpiece					Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut					Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
R (mm)	Diameter (Ø)	Neck length (mm)	Neck Angle (°)	Depth of Cut (mm)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
0.9	1.8	4	0.4	0.120	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		8	0.4	0.100	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		12	0.4	0.080	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		16	0.4	0.071	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		20	0.4	0.062	9,230	1,329	6,461	814	6,000	756	6,000	648
		24	0.4	0.053	9,230	1,329	6,461	814	6,000	756	6,000	648
		28	0.4	0.044	9,230	1,329	6,461	814	6,000	756	6,000	648
		32	0.4	0.036	9,230	1,329	6,461	814	6,000	756	6,000	648
		36	0.4	0.028	9,230	1,329	6,461	814	6,000	756	6,000	648
		38	0.4	0.020	8,000	1,152	5,600	706	5,200	655	5,200	562
		40	0.4	0.015	8,000	1,152	5,600	706	5,200	655	5,200	562
1.0	2	8	0.4	0.150	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		12	0.4	0.090	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		16	0.4	0.090	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		20	0.4	0.060	12,160	2,189	8,512	1,532	7,904	1,265	7,904	1,107
		20	0.9	0.070	12,160	2,189	8,512	1,532	7,904	1,265	7,904	1,107
		25	0.9	0.070	9,880	1,581	6,916	968	6,442	899	6,422	771
		30	0.4	0.040	9,880	1,581	6,916	968	6,442	899	6,422	771
		30	0.9	0.045	9,880	1,581	6,916	968	6,442	899	6,422	771
		35	0.9	0.045	9,880	1,581	6,916	968	6,442	899	6,422	771
		40	0.4	0.030	9,880	1,581	6,916	968	6,442	899	6,422	771
		40	0.9	0.035	9,880	1,581	6,916	968	6,442	899	6,422	771
		50	0.9	0.170	8,512	1,192	5,958	775	5,533	664	5,533	553
		60	0.9	0.009	7,235	1,013	5,065	658	4,703	564	4,703	470
		70	0.9	0.005	6,150	861	4,305	560	3,997	480	3,997	400
1.5	3	8	0.4	0.320	12,720	3,816	8,904	2,404	8,268	1,984	8,268	1,736
		16	0.4	0.220	12,720	3,816	8,904	2,404	8,268	1,984	8,268	1,736
		20	0.4	0.150	12,720	3,434	8,904	2,137	8,268	1,736	8,268	1,488
		30	0.4	0.080	10,176	2,748	7,123	1,496	6,614	1,389	6,614	1,191
		30	0.9	0.090	10,176	2,748	7,123	1,496	6,614	1,389	6,614	1,191
		40	0.4	0.060	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		40	0.9	0.070	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		50	0.9	0.050	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		60	0.9	0.030	7,123	1,710	4,986	1,047	4,630	972	4,630	833
		70	0.9	0.020	6,233	1,496	4,363	916	4,051	851	4,051	729
2.0	4	20	1	0.32	11,900	2,860	9,000	2,050	7,800	1,680	7,800	1,590
		30	1	0.23	11,900	2,570	9,000	1,850	7,800	1,520	7,800	1,430
		40	1	0.14	9,500	1,940	7,200	1,400	6,200	1,140	6,200	1,080
		50	1	0.11	7,800	1,590	5,800	1,120	5,000	920	5,000	870
		60	1	0.07	7,800	1,590	5,800	1,120	5,000	920	5,000	870
2.5	5	30	1	0.34	9,500	2,140	7,200	1,540	6,200	1,260	6,200	1,190
		40	1	0.25	9,500	2,140	7,200	1,540	6,200	1,260	6,200	1,190
		60	1	0.15	6,200	1,320	4,700	950	4,000	770	4,000	720

H-Star Endmill

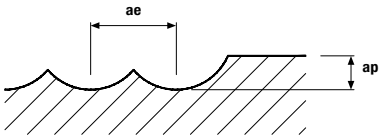
ESTNB20 series

Workpiece					Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut					Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
R (mm)	Diameter (Ø)	Neck length (mm)	Neck Angle (°)	Depth of Cut (mm)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
3.0	6	30	1	0.45	8,000	2,000	6,000	1,430	5,200	1,170	5,200	1,110
		40	1	0.40	8,000	1,800	6,000	1,280	5,200	1,050	5,200	990
		50	1	0.32	8,000	1,800	6,000	1,280	5,200	1,050	5,200	990
		60	1	0.22	6,400	1,360	4,800	970	4,100	780	4,100	740
		70	1	0.18	5,200	1,110	3,900	790	3,400	650	3,400	610
		80	1	0.14	5,200	1,110	3,900	790	3,400	650	3,400	610
4.0	8	50	1	0.50	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		60	1	0.43	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		70	1	0.33	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		80	1	0.25	4,800	1,100	3,600	780	3,100	640	3,100	600
5.0	10	60	1	0.70	4,800	1,300	3,600	920	3,100	750	3,100	710
		75	1	0.50	4,800	1,300	3,600	920	3,100	750	3,100	710

Application tip

*ap : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.25mm
D10 ~ D12 = 0.3mm

*ae : 0.1 × D



- Please adjust the cutting depth index according to the cutting depth factors of above table.
- For Rib or Slotting machining process which are not easy for chip ejection, please reduce the cutting depth by 20~30% from the above cutting condition.

ex) ESTNB2040-20-10, HRC 55, Rib processing

ex) Cutting depth: 0.32(standard cutting depth) × 0.65 × 0.8 = 0.17mm

- In actual machining, the condition should be adjusted according to the machining shape, purpose and the machine type.
- If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

H-Star Endmill

ESTNB30 series

Workpiece					Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut					Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
R (mm)	Diameter (Ø)	Neck length (mm)	Neck Angle (°)	Depth of Cut (mm)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
0.1	0.2	1	0.4	0.017	40,000	800	28,000	504	26,000	416	26,000	364
		1.5	0.4	0.009	40,000	800	28,000	504	26,000	416	26,000	364
		2	0.9	0.007	32,000	461	22,400	323	20,800	266	20,800	233
		2.5	0.9	0.004	26,000	333	18,200	204	16,900	189	16,900	162
0.15	0.3	2	0.4	0.025	40,000	1,200	28,000	756	26,000	624	26,000	546
		3	0.9	0.013	32,000	691	22,400	484	20,800	399	20,800	349
		4	0.9	0.010	26,000	499	18,200	306	16,900	284	16,900	243
0.2	0.4	2	0.4	0.035	40,000	1,600	28,000	1,008	26,000	832	26,000	728
		3	0.4	0.020	40,000	1,600	28,000	1,008	26,000	832	26,000	728
		4	0.4	0.007	32,000	922	22,400	645	20,800	532	20,800	466
		4	0.9	0.009	32,000	922	22,400	645	20,800	532	20,800	466
		5	0.4	0.006	26,000	666	18,200	408	16,900	379	16,900	324
		5	0.9	0.007	26,000	666	18,200	408	16,900	379	16,900	324
0.25	0.5	4	0.4	0.040	40,000	2,000	28,000	1,260	26,000	1,040	26,000	910
		8	0.9	0.010	26,000	728	18,200	446	16,900	414	16,900	355
		12	0.9	0.005	22,400	627	15,680	384	14,560	357	14,560	306
0.27	0.54	2	0.4	0.050	40,000	2,160	28,000	1,361	26,000	1,123	26,000	983
		4	0.4	0.037	40,000	2,160	28,000	1,361	26,000	1,123	26,000	983
		5	0.4	0.031	40,000	1,512	28,000	1,176	26,000	1,040	26,000	832
		6	0.4	0.025	26,000	1,244	18,200	871	16,900	676	16,900	629
		6.5	0.4	0.020	26,000	1,011	18,200	619	16,900	575	16,900	493
		7	0.4	0.015	26,000	899	18,200	585	16,900	543	16,900	465
0.3	0.6	2	0.4	0.055	40,000	2,400	28,000	1,512	26,000	1,248	26,000	1,092
		4	0.4	0.035	40,000	2,400	28,000	1,512	26,000	1,248	26,000	1,092
		6	0.4	0.018	32,000	1,382	22,400	968	20,800	799	20,800	699
		6	0.9	0.020	32,000	1,382	22,400	968	20,800	799	20,800	699
		8	0.9	0.020	26,000	998	18,200	612	16,900	568	16,900	487
		10	0.4	0.013	26,000	874	18,200	535	16,900	497	16,900	426
		10	0.9	0.015	26,000	874	18,200	535	16,900	497	16,900	426
		12	0.9	0.010	26,000	874	18,200	535	16,900	497	16,900	426
		15	0.4	0.005	22,400	753	15,680	461	14,560	367	14,560	367
		15	0.9	0.006	22,400	753	15,680	461	14,560	367	14,560	367
0.4	0.8	4	0.4	0.062	32,000	2,560	22,400	1,613	20,800	1,331	20,800	1,165
		6	0.4	0.045	32,000	2,560	22,400	1,613	20,800	1,331	20,800	1,165
		8	0.9	0.026	25,600	1,475	17,920	1,032	16,640	852	16,640	745
		12	0.9	0.020	20,800	1,065	14,560	699	13,520	606	13,520	519
		16	0.9	0.018	20,800	932	14,560	612	13,520	530	13,520	454
0.45	0.9	4	0.4	0.063	28,300	2,547	19,810	1,605	18,395	1,324	18,395	1,159
		8	0.4	0.050	28,300	2,547	19,810	1,605	18,395	1,324	18,395	1,159
		12	0.4	0.037	18,400	1,325	12,880	811	11,960	753	11,960	646
		16	0.4	0.024	18,400	1,325	12,880	811	11,960	753	11,960	646
		18	0.4	0.018	18,400	1,325	12,880	811	11,960	753	11,960	646
		20	0.4	0.015	15,850	1,141	11,095	699	10,303	649	10,303	556
		22	0.4	0.012	15,850	1,141	11,095	699	10,303	649	10,303	556
		24	0.4	0.009	14,150	1,019	9,905	624	9,198	579	9,198	497

H-Star Endmill

ESTNB30 series

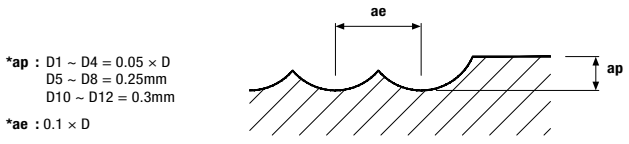
Workpiece					Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut					Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
R (mm)	Diameter (Ø)	Neck length (mm)	Neck Angle (°)	Depth of Cut (mm)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
0.5	1	6	0.4	0.055	25,600	2,560	17,920	1,613	16,640	1,331	16,640	1,165
		8	0.4	0.055	25,600	2,560	17,920	1,613	16,640	1,331	16,640	1,165
		10	0.4	0.032	20,800	1,872	14,560	1,310	13,520	1,082	13,520	946
		10	0.9	0.035	20,800	1,872	14,560	1,310	13,520	1,082	13,520	946
		15	0.9	0.028	16,640	1,331	11,648	874	10,816	757	10,816	649
		20	0.4	0.018	16,640	1,331	11,648	874	10,816	757	10,816	649
		20	0.9	0.020	16,640	1,331	11,648	874	10,816	757	10,816	649
		25	0.9	0.017	14,560	1,165	10,192	764	9,464	662	9,464	568
		30	0.4	0.015	12,480	874	8,736	568	8,112	487	8,112	406
		30	0.9	0.017	12,480	874	8,736	568	8,112	487	8,112	406
		35	0.9	0.010	10,400	728	7,280	473	6,760	406	6,760	338
		40	0.9	0.009	10,000	700	7,000	455	6,500	390	6,500	325
		50	0.9	0.007	9,500	665	6,650	432	6,175	371	6,175	309
		60	0.9	0.005	9,000	630	6,300	410	5,850	351	5,850	293
		70	0.9	0.003	8,500	595	5,950	387	5,525	332	5,525	276
0.75	1.5	8	0.4	0.070	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		10	0.4	0.070	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		12	0.4	0.070	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		15	0.9	0.045	13,568	1,832	9,498	1,282	8,819	1,058	8,819	926
		20	0.9	0.040	11,024	1,323	7,717	810	7,166	752	7,166	645
		30	0.9	0.028	11,024	1,323	7,717	810	7,166	752	7,166	645
0.9	1.8	4	0.4	0.120	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		8	0.4	0.100	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		12	0.4	0.080	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		16	0.4	0.071	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		20	0.4	0.062	9,230	1,329	6,461	814	6,000	756	6,000	648
		24	0.4	0.053	9,230	1,329	6,461	814	6,000	756	6,000	648
		28	0.4	0.044	9,230	1,329	6,461	814	6,000	756	6,000	648
		32	0.4	0.036	9,230	1,329	6,461	814	6,000	756	6,000	648
		36	0.4	0.028	9,230	1,329	6,461	814	6,000	756	6,000	648
		38	0.4	0.020	8,000	1,152	5,600	706	5,200	655	5,200	562
		40	0.4	0.015	8,000	1,152	5,600	706	5,200	655	5,200	562
1.0	2	8	0.4	0.150	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		12	0.4	0.090	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		16	0.4	0.090	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		20	0.4	0.060	12,160	2,189	8,512	1,532	7,904	1,265	7,904	1,107
		20	0.9	0.070	12,160	2,189	8,512	1,532	7,904	1,265	7,904	1,107
		25	0.9	0.070	9,880	1,581	6,916	968	6,442	899	6,422	771
		30	0.4	0.040	9,880	1,581	6,916	968	6,442	899	6,422	771
		30	0.9	0.045	9,880	1,581	6,916	968	6,442	899	6,422	771
		35	0.9	0.045	9,880	1,581	6,916	968	6,442	899	6,422	771
		40	0.4	0.030	9,880	1,581	6,916	968	6,442	899	6,422	771
		40	0.9	0.035	9,880	1,581	6,916	968	6,442	899	6,422	771
		50	0.9	0.170	8,512	1,192	5,958	775	5,533	664	5,533	553
		60	0.9	0.009	7,235	1,013	5,065	658	4,703	564	4,703	470
		70	0.9	0.005	6,150	861	4,305	560	3,997	480	3,997	400

H-Star Endmill

ESTNB30 series

Workpiece					Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut					Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
R (mm)	Diameter (Ø)	Neck length (mm)	Neck Angle (°)	Depth of Cut (mm)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
1.5	3	8	0.4	0.320	12,720	3,816	8,904	2,404	8,268	1,984	8,268	1,736
		16	0.4	0.220	12,720	3,816	8,904	2,404	8,268	1,984	8,268	1,736
		20	0.4	0.150	12,720	3,434	8,904	2,137	8,268	1,736	8,268	1,488
		30	0.4	0.080	10,176	2,748	7,123	1,496	6,614	1,389	6,614	1,191
		30	0.9	0.090	10,176	2,748	7,123	1,496	6,614	1,389	6,614	1,191
		40	0.4	0.060	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		40	0.9	0.070	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		50	0.9	0.050	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		60	0.9	0.030	7,123	1,710	4,986	1,047	4,630	972	4,630	833
		70	0.9	0.020	6,233	1,496	4,363	916	4,051	851	4,051	729
2.0	4	20	1	0.32	11,900	2,860	9,000	2,050	7,800	1,680	7,800	1,590
		30	1	0.23	11,900	2,570	9,000	1,850	7,800	1,520	7,800	1,430
		40	1	0.14	9,500	1,940	7,200	1,400	6,200	1,140	6,200	1,080
		50	1	0.11	7,800	1,590	5,800	1,120	5,000	920	5,000	870
		60	1	0.07	7,800	1,590	5,800	1,120	5,000	920	5,000	870
2.5	5	30	1	0.34	9,500	2,140	7,200	1,540	6,200	1,260	6,200	1,190
		40	1	0.25	9,500	2,140	7,200	1,540	6,200	1,260	6,200	1,190
		60	1	0.15	6,200	1,320	4,700	950	4,000	770	4,000	720
3.0	6	30	1	0.45	8,000	2,000	6,000	1,430	5,200	1,170	5,200	1,110
		40	1	0.40	8,000	1,800	6,000	1,280	5,200	1,050	5,200	990
		50	1	0.32	8,000	1,800	6,000	1,280	5,200	1,050	5,200	990
		60	1	0.22	6,400	1,360	4,800	970	4,100	780	4,100	740
		70	1	0.18	5,200	1,110	3,900	790	3,400	650	3,400	610
		80	1	0.14	5,200	1,110	3,900	790	3,400	650	3,400	610
4.0	8	50	1	0.50	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		60	1	0.43	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		70	1	0.33	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		80	1	0.25	4,800	1,100	3,600	780	3,100	640	3,100	600
5.0	10	60	1	0.70	4,800	1,300	3,600	920	3,100	750	3,100	710
		75	1	0.50	4,800	1,300	3,600	920	3,100	750	3,100	710

Application tip



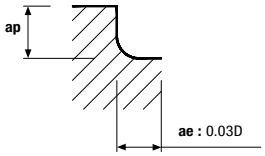
- Please adjust the cutting depth index according to the cutting depth factors of above table
- For Rib or Slotting machining process which are not easy for chip ejection, please reduce the cutting depth by 20~30% from the above cutting condition
  ex) ESTNB2040-20-10, HRC 55, Rib processing
  ex) Cutting depth: 0.32(standard cutting depth) × 0.65 × 0.8 = 0.17mm
- In actual machining, the condition should be adjusted according to the machining shape, purpose and the machine type
- If RPM of the machine is low, the feed rate should be low in the same ratio as RPM

H-Star Endmill

ESLNS20, ESLNS40 series

Workpiece / Conditions / Diameter (Ø)	Alloy steels, Heat resistant steels HRC30~45			Hardened steels HRC45~55			High-hardened steels HRC55~65			Copper, Copper alloy		
	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	ae (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	ae (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	ae (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	ae (mm)
0.4	34,100~50,000	350~590	0.005~0.028	30,500~35,200	295~340	0.003~0.020	18,300~24,600	120~200	0.002~0.012	48,000~50,000	790~920	0.008~0.048
0.5	25,650~33,000	370~470	0.006~0.035	23,750~26,000	285~315	0.004~0.025	14,200~18,000	115~130	0.003~0.015	44,000~50,000	800~1,150	0.010~0.060
0.6	20,900~35,200	330~560	0.007~0.030	19,900~22,000	260~290	0.005~0.021	11,900~15,500	100~120	0.003~0.013	37,500~50,000	770~1,250	0.011~0.051
0.8	16,150~26,400	360~590	0.009~0.040	15,200~16,700	280~310	0.006~0.028	9,000~11,700	110~125	0.004~0.017	28,500~47,000	770~1,300	0.015~0.068
1.0	12,300~18,700	350~540	0.011~0.028	10,500~11,500	250~280	0.008~0.020	6,300~8,050	100~115	0.005~0.012	22,500~34,000	810~1,300	0.018~0.048
1.2	10,450~17,600	350~590	0.025~0.070	9,100~10,000	250~280	0.015~0.042	5,400~7,000	100~115	0.009~0.026	22,500~31,500	950~1,350	0.036~0.101
1.5	9,100~17,600	430~830	0.017~0.077	7,000~8,000	250~280	0.012~0.055	4,300~5,500	100~115	0.007~0.033	14,500~25,000	770~1,320	0.028~0.132
2.0	6,350~10,550	340~570	0.021~0.140	6,100~6,700	270~300	0.015~0.100	3,600~4,700	100~120	0.009~0.060	11,500~18,500	770~1,250	0.036~0.240
3.0	4,300~7,050	550~900	0.056~0.210	3,990~4,600	445~515	0.040~0.150	2,400~3,200	105~310	0.024~0.090	9,000~13,000	1,400~2,110	0.096~0.360
4.0	3,200~5,300	400~675	0.074~0.280	3,000~3,400	335~380	0.053~0.200	1,800~2,400	75~230	0.032~0.120	6,750~9,750	1,050~1,575	0.128~0.480

Application tip



H-Star Endmill

ESLNR20 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
0.2	0.05	0.5	0.020	50,000	258	50,000	205	50,000	180	50,000	160
		1	0.014	50,000	258	50,000	205	50,000	180	50,000	160
		1.5	0.008	50,000	240	45,900	202	45,900	170	45,900	153
		2	0.008	42,000	202	36,700	176	36,700	162	36,700	147
0.3	0.05	1	0.021	50,000	585	50,000	456	50,000	336	50,000	320
		1.5	0.016	50,000	585	45,000	456	45,000	336	45,000	320
		2	0.012	45,000	530	45,000	420	45,000	300	45,000	290
		2.5	0.010	40,000	471	40,000	373	40,000	267	40,000	258
		3	0.008	35,000	412	35,000	326	30,000	200	30,000	194
0.4	0.05	1	0.025	50,000	580	50,000	461	40,000	320	36,000	270
		1.5	0.020	50,000	580	50,000	461	40,000	320	36,000	270
		2	0.016	45,000	520	45,000	410	36,000	290	34,000	240
		2.5	0.015	40,500	480	40,500	370	33,400	270	30,600	220
		3	0.014	40,000	410	40,000	330	32,800	240	25,600	200
		3.5	0.012	36,000	380	36,000	300	29,400	200	22,920	180
		4	0.008	30,000	320	30,000	250	21,600	160	19,200	150
	0.1	2	0.028	45,000	520	45,000	410	36,000	290	34,000	240
		3	0.016	40,000	410	40,000	330	32,800	240	25,600	200
		4	0.010	30,000	320	30,000	250	21,600	160	19,200	150
0.5	0.05	1	0.030	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.023	50,000	898	40,000	464	30,000	378	28,000	315
		3	0.017	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.017	40,000	820	32,000	378	24,000	279	20,000	234
		5	0.011	28,800	540	19,400	280	18,000	250	15,000	200
		6	0.008	28,800	480	19,400	260	18,000	250	15,000	200
	0.1	1	0.035	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.030	50,000	898	40,000	464	30,000	378	28,000	315
		3	0.020	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.020	40,000	720	32,000	378	24,000	279	20,000	234
		5	0.013	28,800	540	19,400	280	18,000	250	15,000	200
		6	0.013	28,800	480	19,400	260	18,000	250	15,000	200
0.6	0.1	2	0.035	50,000	1,159	37,830	600	28,200	390	23,000	320
		4	0.024	40,000	830	27,800	440	23,600	280	21,000	230
		6	0.015	24,000	490	18,000	300	17,800	240	15,000	210
		8	0.013	24,000	466	18,000	285	17,800	228	15,000	200
		10	0.009	24,000	451	18,000	276	17,800	221	15,000	193
0.8	0.1	4	0.032	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.019	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.015	29,025	600	20,000	369	16,200	259	16,200	230
		12	0.012	29,025	570	20,000	350	16,200	246	16,200	219
	0.2	4	0.056	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.032	38,700	800	25,000	461	18,000	288	18,000	256
1.0	0.1	4	0.038	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.024	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.024	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.015	20,412	770	17,350	655	15,309	514	14,288	419

H-Star Endmill

ESLNR20 series

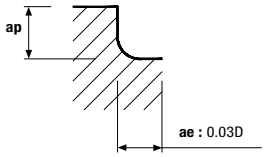
Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
1.0	0.1	12	0.015	18,144	609	15,422	453	13,608	399	12,701	320
		16	0.009	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.006	13,608	399	11,567	315	10,206	257	9,526	200
	0.2	4	0.07	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.040	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.040	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.025	18,144	609	15,422	453	13,608	399	12,701	320
		16	0.015	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.010	13,608	399	11,567	315	10,206	257	9,526	200
	0.3	6	0.040	26,244	990	22,307	842	19,683	660	18,371	539
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		16	0.015	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.010	13,608	399	11,567	315	10,206	257	9,526	200
1.5	0.1	4	0.042	24,930	1,130	20,956	868	18,711	678	17,364	556
		8	0.036	22,680	1,027	19,278	873	17,010	685	15,876	559
		12	0.036	18,144	822	15,422	698	13,608	548	12,701	447
		15	0.023	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.018	14,112	568	11,995	423	10,584	373	9,878	298
	0.2	4	0.070	24,930	1,130	20,956	868	18,711	678	17,364	556
		8	0.060	22,680	1,027	19,278	873	17,010	685	15,876	559
		12	0.060	18,144	822	15,422	698	13,608	548	12,701	447
		15	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.030	14,112	568	11,995	423	10,584	373	9,878	298
	0.3	8	0.060	22,680	1,027	19,278	873	17,010	685	15,876	559
		15	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.030	14,112	568	11,995	423	10,584	373	9,878	298
2.0	0.2	6	0.08	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.07	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		12	0.04	15,309	1,083	13,013	921	11,482	722	10,716	590
		16	0.04	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.035	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.025	11,907	843	10,121	716	8,930	562	8,335	459
		30	0.017	11,312	800	9,615	680	8,484	534	7,918	436
	0.3	8	0.09	18,900	1,651	16,065	1,403	14,175	991	13,230	809
		16	0.06	13,608	1,070	11,567	909	10,206	713	9,526	583
		20	0.037	11,907	936	10,121	796	8,930	624	8,335	510
	0.5	6	0.017	20,709	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.014	18,900	1,651	16,065	1,403	14,175	991	13,230	809
		12	0.08	15,309	1,204	13,013	1,023	11,482	802	10,716	655
		16	0.08	13,608	1,070	11,567	909	10,206	713	9,526	583
		20	0.05	11,907	936	10,121	796	8,930	624	8,335	510
		25	0.05	11,907	936	10,121	796	8,930	624	8,335	510
		30	0.03	11,312	889	9,615	756	8,484	593	7,918	484
		8	0.2	18,900	1,651	16,065	1,403	14,175	991	13,230	809
		16	0.1	13,608	1,070	11,567	909	10,206	713	9,526	583

H-Star Endmill

ESLNR20 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
2.0	0.5	20	0.06	11,907	936	10,121	796	8,930	624	8,335	510
3.0	0.2	8	0.09	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.07	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.05	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.05	11,664	1,146	9,914	974	8,748	764	8,165	624
		30	0.04	9,072	1,146	7,711	974	6,804	764	6,350	624
		35	0.035	9,072	1,146	7,711	974	6,804	764	6,350	624
	0.3	8	0.13	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		16	0.075	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		20	0.075	11,664	1,274	9,914	1,083	8,748	849	8,165	693
		30	0.06	9,072	1,274	7,711	1,083	6,804	849	6,350	693
	0.5	8	0.18	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		12	0.13	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		16	0.1	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		20	0.1	11,664	1,274	9,914	1,083	8,748	849	8,165	693
		30	0.08	9,072	1,274	7,711	1,083	6,804	849	6,350	693
		35	0.065	9,072	1,274	7,711	1,083	6,804	849	6,350	693

Application tip



- Please adjust the cutting depth index according to the cutting depth factors of above table.
- In actual machining, the condition should be adjusted according to the machining shape, purpose and machine type.
- If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

H-Star Endmill

ESTNR20 series

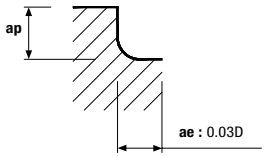
Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
0.2	0.05	2	0.007	39,660	887	33,660	754	29,700	591	27,720	483
0.4	0.05	4	0.009	30,096	899	25,582	764	22,572	599	21,067	489
		5	0.007	26,752	710	22,739	528	20,064	466	18,726	373
	0.1	4	0.009	31,680	946	26,928	804	23,760	631	22,176	515
		5	0.007	28,160	747	23,936	556	21,120	490	19,712	392
0.5	0.1	5	0.013	30,413	1,090	25,851	753	22,810	562	21,289	453
		8	0.008	24,330	678	20,681	468	18,248	350	17,031	282
		10	0.007	18,248	509	15,511	351	13,686	262	12,773	211
0.6	0.1	12	0.01	20,377	791	17,320	546	15,282	408	14,264	329
		15	0.006	16,727	649	14,218	448	12,545	335	11,709	270
0.8	0.2	6	0.045	31,680	1,084	26,928	921	23,760	723	22,176	590
		12	0.02	28,160	943	23,936	695	21,120	613	19,712	490
1.0	0.2	8	0.04	28,512	1,463	24,235	1,244	21,384	976	19,958	797
		10	0.035	28,512	1,596	24,235	1,357	21,384	1,064	19,958	869
		15	0.028	25,344	1,261	21,542	938	19,008	828	17,741	662
		20	0.02	19,008	828	16,157	653	14,256	532	13,306	414
		25	0.017	15,840	690	13,464	544	11,880	443	11,088	345
		30	0.017	15,840	690	13,464	544	11,880	443	11,088	345
		35	0.01	15,840	690	13,464	544	11,880	443	11,088	345
	0.3	8	0.04	28,512	1,463	24,235	1,244	21,384	976	19,958	797
		15	0.028	25,344	1,261	21,542	938	19,008	828	17,741	662
		25	0.017	15,840	690	13,464	544	11,880	443	11,088	345
		30	0.017	15,840	690	13,464	544	11,880	443	11,088	345
1.5	0.2	10	0.05	21,683	1,079	18,431	803	16,262	708	15,178	567
		15	0.045	19,712	981	16,755	730	14,784	644	13,798	515
		20	0.042	17,347	863	14,745	642	13,010	567	12,143	453
		25	0.032	14,784	644	12,566	508	11,088	414	10,349	322
		30	0.028	12,320	536	10,472	423	9,240	345	8,624	268
	0.3	10	0.05	21,683	1,079	18,431	803	16,262	708	15,178	567
		20	0.042	17,347	863	14,745	642	13,010	567	12,143	453
		25	0.032	14,784	644	12,566	508	11,088	414	10,349	322
		30	0.028	12,320	536	10,472	423	9,240	345	8,624	268
2.0	0.2	30	0.045	13,440	1,254	11,424	933	10,080	823	9,408	658
		40	0.035	10,080	823	8,568	650	7,560	529	7,056	412
		50	0.017	8,400	686	7,140	541	6,300	441	5,880	343
	0.3	12	0.088	22,680	1,814	19,278	1,427	17,010	1,191	15,876	1,048
		20	0.054	18,144	1,452	15,422	1,141	13,608	953	12,701	838
		30	0.045	13,440	1,393	11,424	1,036	10,080	914	9,408	732
		40	0.035	10,080	914	8,568	722	7,560	588	7,056	457
		50	0.017	8,400	762	7,140	601	6,300	490	5,880	381

H-Star Endmill

ESTNR20 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
2.0	0.5	8	0.170	22,680	1,814	19,278	1,427	17,010	1,191	15,876	1,048
		12	0.088	22,680	1,814	19,278	1,427	17,010	1,191	15,876	1,048
		16	0.088	19,278	1,542	16,386	1,213	14,459	1,012	13,495	891
		20	0.054	18,114	1,452	15,422	1,141	13,608	953	12,701	838
		25	0.054	15,876	1,270	13,495	999	11,907	833	11,113	733
		30	0.045	13,440	1,393	11,424	1,036	10,080	914	9,408	732
		40	0.035	10,080	914	8,568	722	7,560	588	7,056	457
		50	0.017	8,400	762	7,140	601	6,300	490	5,880	381
3.0	0.2	40	0.070	10,240	956	8,704	711	7,680	627	7,168	502
		50	0.050	7,680	627	6,528	495	5,760	403	5,376	314
		60	0.030	6,400	523	5,440	412	4,800	336	4,480	261
	0.3	40	0.070	10,240	1,062	8,704	790	7,680	697	7,168	557
		50	0.050	7,680	697	6,528	550	5,760	448	5,376	348
		60	0.030	6,400	581	5,440	458	4,800	373	4,480	290
	0.5	40	0.070	10,240	1,062	8,704	790	7,680	697	7,168	557
		50	0.050	7,680	697	6,528	550	5,760	448	5,376	348
		60	0.030	6,400	581	5,440	458	4,800	373	4,480	290

Application tip



- Please adjust the cutting depth index according to the cutting depth factors of above table.
- In actual machining, the condition should be adjusted according to the machining shape, purpose and machine type.
- If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

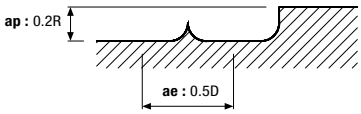
H-Star Endmill

ESPM4 series

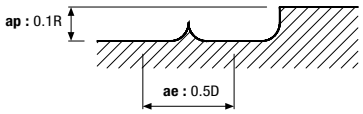
Side cutting

Workpiece	Hardened steels Heat resistant alloy		Hardened steels							
Conditions	~HRC40		HRC40~50		HRC50~55		HRC55~60		HRC60~65	
Diameter (Ø) × R (mm)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
3.0 × R0.5	9,550	6,500	6,900	4,150	4,550	2,750	2,850	1,150	1,900	610
4.0 × R0.5	7,950	7,000	5,750	4,600	4,000	3,200	2,550	1,350	1,750	700
6.0 × R0.5	5,800	7,650	4,100	4,900	2,900	3,500	1,850	1,850	1,350	795
6.0 × R1.0	5,800	7,650	4,100	4,900	2,900	3,500	1,850	1,850	1,350	795
8.0 × R1.0	4,350	7,650	3,050	4,900	2,200	3,500	1,400	1,850	995	795
8.0 × R2.0	4,350	7,650	3,050	4,900	2,200	3,500	1,400	1,850	995	795
10.0 × R1.0	3,500	7,650	2,450	4,900	1,750	3,500	1,100	1,850	795	795
10.0 × R2.0	3,500	7,650	2,450	4,900	1,750	3,500	1,100	1,850	795	795
12.0 × R2.0	2,900	7,650	2,050	4,900	1,450	3,500	925	1,850	665	795
12.0 × R3.0	2,900	7,650	2,050	4,900	1,450	3,500	925	1,850	665	795

Application tip



* ae shouldn't be over max. 0.5D



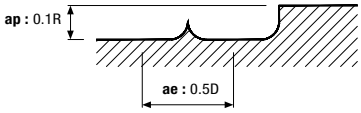
* ae shouldn't be over max. 0.5D

ESPM4 series

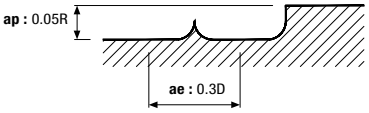
High speed processing

Workpiece	Hardened steels Heat resistant alloy		Hardened steels							
Conditions	~HRC40		HRC40~50		HRC50~55		HRC55~60		HRC60~65	
Diameter (Ø) × R (mm)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
3.0 × R0.5	22,000	16,000	17,000	10,000	12,500	8,000	9,500	4,600	6,900	2,500
4.0 × R0.5	17,000	17,500	13,000	12,000	11,000	9,200	8,000	5,500	5,600	2,900
6.0 × R0.5	13,500	18,500	10,500	13,800	9,000	11,000	6,400	6,400	4,500	3,600
6.0 × R1.0	13,500	18,500	10,500	13,800	9,000	11,000	6,400	6,400	4,500	3,600
8.0 × R1.0	10,000	18,500	8,000	14,000	6,800	11,000	4,800	6,700	3,400	4,100
8.0 × R2.0	10,000	18,500	8,000	14,000	6,800	11,000	4,800	6,700	3,400	4,100
10.0 × R1.0	8,000	18,500	6,400	14,000	5,400	11,000	3,800	6,800	2,700	3,800
10.0 × R2.0	8,000	18,500	6,400	14,000	5,400	11,000	3,800	6,800	2,700	3,800
12.0 × R2.0	6,600	18,500	5,300	14,000	4,500	11,000	3,200	7,000	2,250	3,600
12.0 × R3.0	6,600	18,500	5,300	14,000	4,500	11,000	3,200	7,000	2,250	3,600

Application tip



* ae shouldn't be over max. 0.5D



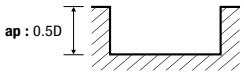
* ae shouldn't be over max. 0.3D

U-Star Endmill

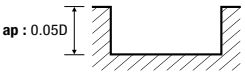
UE502, UXE502 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Stainless steels (SUS)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45				HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		-		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
2.0	11,560	190	7,560	120	6,300	90	5,040	35
3.0	8,920	210	5,560	140	4,620	120	3,360	40
4.0	7,560	300	4,620	180	3,880	150	2,940	40
5.0	6,300	320	3,780	190	3,160	160	2,320	50
6.0	5,560	350	3,360	220	2,840	180	2,000	55
8.0	4,200	380	2,520	200	2,100	180	1,680	75
10.0	3,260	330	2,000	160	1,680	160	1,360	60
12.0	2,740	280	1,680	130	1,360	130	1,160	55
16.0	2,200	220	1,360	110	1,060	110	900	40
20.0	1,680	170	1,060	80	840	80	680	30
25.0	1,360	130	840	70	680	60	540	20

Application tip



(ap : UP to Ø3.0 : 0.2D)



U-Star Endmill

UE512 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~ 1100N/mm²			1100 ~ 1500N/mm²			1500 ~ 2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
0.1	0.3	50,000	315	0.009	46,200	230	0.007	40,600	170	0.005
	0.5	50,000	315	0.006	46,200	230	0.005	40,600	170	0.004
	1	45,000	255	0.002	41,580	185	0.002	36,540	140	0.001
0.2	0.5	38,500	380	0.018	36,300	270	0.014	32,100	200	0.01
	1	38,500	380	0.013	36,300	270	0.010	32,100	200	0.007
	1.5	34,650	310	0.007	32,670	220	0.006	28,890	160	0.004
	2	34,650	310	0.005	32,670	220	0.004	28,890	160	0.003
0.3	1	34,200	390	0.019	32,300	270	0.015	28,500	230	0.011
	1.5	34,200	390	0.019	32,300	270	0.015	25,800	230	0.011
	2	30,780	315	0.011	29,070	220	0.008	25,650	185	0.006
	2.5	30,780	315	0.007	29,070	220	0.005	25,650	185	0.004
	3	30,780	315	0.007	29,070	220	0.005	25,650	185	0.004
	4	27,360	250	0.004	25,840	175	0.003	22,800	145	0.002
	5	20,520	165	0.003	19,380	115	0.002	17,100	95	0.002
0.4	1	27,400	540	0.036	25,800	380	0.028	22,800	280	0.02
	1.5	27,400	540	0.025	25,800	380	0.020	22,800	280	0.014
	2	27,400	540	0.025	25,800	380	0.020	22,800	280	0.014
	2.5	24,660	435	0.014	23,220	310	0.011	20,520	225	0.008
	3	24,660	435	0.014	23,220	310	0.011	20,520	225	0.008
	4	24,660	435	0.009	23,220	310	0.007	20,520	225	0.005
	5	21,920	345	0.009	20,640	245	0.007	18,240	180	0.005
	6	21,920	345	0.005	20,640	245	0.004	18,240	180	0.003
	8	16,440	225	0.004	15,480	160	0.003	13,680	120	0.002
	10	8,220	95	0.004	7,740	70	0.003	6,840	50	0.002
0.5	1	27,400	540	0.045	25,800	425	0.035	22,800	285	0.025
	1.5	27,400	540	0.045	25,800	425	0.035	22,800	285	0.025
	2	27,400	540	0.032	25,800	425	0.025	22,800	285	0.018
	2.5	27,400	540	0.032	25,800	425	0.025	22,800	285	0.018
	3	24,660	435	0.018	23,220	345	0.014	20,520	230	0.01
	4	24,660	435	0.018	23,220	345	0.014	20,520	230	0.01
	5	24,660	435	0.011	23,220	345	0.009	20,520	230	0.006
	6	21,920	345	0.011	20,640	270	0.009	18,240	180	0.006
	8	16,440	225	0.007	15,480	180	0.005	13,680	120	0.004
	10	16,440	225	0.005	15,480	180	0.004	13,680	120	0.003
	12	8,220	95	0.005	7,740	75	0.004	6,840	50	0.003
	14	8,220	95	0.005	7,740	75	0.004	6,840	50	0.003
	16	2,740	25	0.005	2,580	20	0.004	2,280	15	0.003
0.6	2	27,400	775	0.038	25,800	545	0.029	22,800	405	0.021
	3	27,400	775	0.038	25,800	545	0.029	22,800	405	0.021
	4	24,660	630	0.022	23,220	440	0.017	20,520	330	0.012
	5	24,660	630	0.014	23,220	440	0.011	20520	330	0.008
	6	24,660	630	0.014	23,220	440	0.011	20520	330	0.008
	8	21,920	495	0.008	20640	350	0.006	18240	260	0.005

U-Star Endmill

UE512 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~ 1100N/mm²			1100 ~ 1500N/mm²			1500 ~ 2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
0.6	10	16,440	325	0.005	15,480	230	0.004	13,680	170	0.003
	12	16,440	325	0.005	15,480	230	0.004	13,680	170	0.003
	14	8,220	140	0.005	7,740	100	0.004	6,840	75	0.003
	16	8,220	140	0.005	7,740	100	0.004	6,840	75	0.003
0.7	2	27,400	775	0.063	25,800	545	0.049	22,800	405	0.035
	4	24,660	630	0.025	23,220	440	0.020	20,520	330	0.014
	6	24,660	630	0.016	23,220	440	0.012	20,520	330	0.009
	8	21,920	495	0.016	20,640	350	0.012	18,240	260	0.009
	10	21,920	495	0.009	20,640	350	0.007	18,240	260	0.005
	12	16,440	325	0.009	15,480	230	0.005	13,680	170	0.004
0.8	2	27,400	775	0.072	25,800	605	0.056	22,800	450	0.040
	3	27,400	775	0.050	25,800	605	0.039	22,800	450	0.028
	4	27,400	775	0.050	25,800	605	0.039	22,800	450	0.028
	5	24,660	630	0.029	23,220	490	0.022	20,520	365	0.016
	6	24,660	630	0.029	23,220	490	0.022	20,520	365	0.016
	8	24,660	630	0.018	23,220	490	0.014	20,520	365	0.010
	10	21,920	495	0.018	20,640	385	0.014	18,240	290	0.01
	12	21,920	495	0.011	20,640	385	0.008	18,240	290	0.006
	14	16,440	325	0.007	15,480	255	0.006	13,680	190	0.004
	16	16,440	325	0.007	15,480	255	0.006	13,680	190	0.004
	20	8,220	140	0.007	7,740	110	0.006	6,840	80	0.004
0.9	6	22,140	575	0.032	20,970	440	0.025	18,450	330	0.018
	8	22,140	575	0.020	20,970	440	0.016	18,450	330	0.011
	10	19,680	455	0.020	18,640	350	0.016	16,400	260	0.011
1.0	2	24,600	1045	0.090	23,300	890	0.070	20,500	665	0.050
	3	24,600	1045	0.090	23,300	890	0.070	20,500	665	0.050
	4	24,600	1045	0.063	23,300	890	0.049	20,500	665	0.035
	5	24,600	1045	0.063	23,300	890	0.049	20,500	665	0.035
	6	22,140	845	0.036	20,970	720	0.028	18,450	540	0.020
	7	22,140	845	0.036	20,970	720	0.028	18,450	540	0.020
	8	22,140	845	0.036	20,970	720	0.028	18,450	540	0.020
	10	22,140	845	0.023	20,970	720	0.018	18,450	540	0.013
	12	19,680	670	0.023	18,640	570	0.018	16,400	425	0.013
	14	19,680	670	0.014	18,640	570	0.011	16,400	425	0.008
	16	14,760	440	0.014	13,980	375	0.011	12,300	280	0.008
	18	14,760	440	0.009	13,980	375	0.007	12,300	280	0.005
	20	14,760	440	0.009	13,980	375	0.007	12,300	280	0.005
	22	7,380	190	0.009	6,990	160	0.007	6,150	120	0.005
	26	7,380	190	0.009	6,990	160	0.007	6,150	120	0.005
	30	7,380	190	0.009	6,990	160	0.007	6,150	120	0.005
	40	2460	50	0.009	2,330	45	0.007	2,050	35	0.005
	50	2460	50	0.006	2,330	45	0.005	2050	35	0.003
1.2	4	21900	930	0.076	20700	720	0.059	18200	485	0.042

U-Star Endmill

UE512 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~ 1100N/mm²			1100 ~ 1500N/mm²			1500 ~ 2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)
1.2	6	21,900	930	0.076	20,700	720	0.059	18,200	485	0.042
	8	19,710	755	0.043	18,630	585	0.034	16,380	395	0.024
	10	19,710	755	0.027	18,630	585	0.021	16,380	395	0.015
	12	19,710	755	0.027	18,630	585	0.021	16,380	395	0.015
	14	17,520	595	0.027	16,560	460	0.021	14,560	310	0.015
	16	17,520	595	0.016	16,560	460	0.013	14,560	310	0.009
	20	13,140	390	0.011	12,420	300	0.008	10,920	205	0.006
	26	6,570	165	0.011	6,210	130	0.008	5,460	85	0.006
	30	6,570	165	0.011	6,210	130	0.008	5,460	85	0.006
1.4	6	19,200	815	0.088	18,100	570	0.069	16,000	425	0.049
	8	17,280	660	0.050	16,290	460	0.039	14,400	345	0.028
	10	17,280	660	0.050	16,290	460	0.039	14,400	345	0.028
	14	17,280	660	0.032	16,290	460	0.025	14,400	345	0.018
	16	15,360	520	0.032	14,480	365	0.025	12,800	270	0.018
	20	15,360	520	0.019	14,480	365	0.015	12,800	270	0.011
1.5	4	19,200	905	0.135	18,100	635	0.105	16,000	475	0.075
	5	19,200	905	0.095	18,100	635	0.074	16,000	475	0.053
	6	19,200	905	0.095	18,100	635	0.074	16,000	475	0.053
	7	19,200	905	0.095	18,100	635	0.074	16,000	475	0.053
	8	17,280	735	0.054	16,290	515	0.042	14,400	385	0.030
	10	17,280	735	0.054	16,290	515	0.042	14,400	385	0.03
	12	17,280	735	0.054	16,290	515	0.042	14,400	385	0.030
	14	17,280	735	0.034	16,290	515	0.026	14,400	385	0.019
	16	15,360	580	0.034	14,480	405	0.026	12,800	305	0.019
	18	15,360	580	0.034	14,480	405	0.026	12,800	305	0.019
	20	15,360	580	0.020	14,480	405	0.016	12,800	305	0.011
	22	15,360	580	0.020	14,480	405	0.016	12,800	305	0.011
	26	11,520	380	0.014	10,860	265	0.011	9,600	200	0.008
	30	11,520	380	0.014	10,860	265	0.011	9,600	200	0.008
1.6	8	17,800	840	0.101	16,800	655	0.078	14,800	490	0.056
	10	16,020	680	0.058	15,120	530	0.045	13,320	395	0.032
	12	16,020	680	0.058	15,120	530	0.045	13,320	395	0.032
	16	16,020	680	0.036	15,120	530	0.028	13,320	395	0.020
	20	14,240	540	0.036	13,440	420	0.028	11,840	315	0.020
1.8	8	17,800	840	0.113	16,800	655	0.088	14,800	490	0.063
	10	16,020	680	0.065	15,120	530	0.050	13,320	395	0.036
	12	16,020	680	0.065	15,120	530	0.050	13,320	395	0.036
	16	16,020	680	0.041	15,120	530	0.032	13,320	395	0.023
	20	14,240	540	0.041	13,440	420	0.032	11,840	315	0.023
2.0	6	14,400	820	0.180	13,600	620	0.140	12,000	475	0.100
	8	14,400	820	0.126	13,600	620	0.098	12,000	475	0.070
	10	14400	820	0.126	13600	620	0.098	12,000	475	0.070
	12	12960	665	0.072	12240	500	0.056	10,800	385	0.040

U-Star Endmill

UE512 series

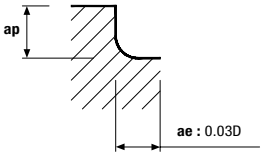
Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~ 1100N/mm²			1100 ~ 1500N/mm²			1500 ~ 2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
2.0	14	12,960	665	0.072	12,240	500	0.056	10,800	385	0.040
	16	12,960	665	0.072	12,240	500	0.056	10,800	385	0.040
	18	12,960	665	0.045	12,240	500	0.035	10,800	385	0.025
	20	12,960	665	0.045	12,240	500	0.035	10,800	385	0.025
	22	11,520	525	0.045	10,880	395	0.035	9,600	305	0.025
	26	11,520	525	0.045	10,880	395	0.035	9,600	305	0.025
	30	11,520	525	0.027	10,880	395	0.021	9,600	305	0.015
	35	8,640	345	0.018	8,160	260	0.014	7,200	200	0.010
	40	8,640	345	0.018	8,160	260	0.014	7,200	200	0.010
	45	4,320	150	0.018	4,080	110	0.014	3,600	85	0.010
	50	4,320	150	0.018	4,080	110	0.014	3,600	85	0.010
	60	4,320	150	0.018	4,080	110	0.014	3,600	85	0.010
2.5	8	12,300	970	0.158	11,600	680	0.123	10,300	510	0.088
	10	12,300	970	0.158	11,600	680	0.123	10,300	510	0.088
	12	12,300	970	0.158	11,600	680	0.123	10,300	510	0.088
	14	11,070	785	0.090	10,440	550	0.070	9,270	415	0.050
	16	11,070	785	0.090	10,440	550	0.070	9,270	415	0.050
	18	11,070	785	0.090	10,440	550	0.070	9,270	415	0.050
	20	11,070	785	0.090	10,440	550	0.070	9,270	415	0.050
	22	11,070	785	0.056	10,440	550	0.044	9,270	415	0.031
	26	9,840	620	0.056	9,280	435	0.044	8,240	325	0.031
	30	9,840	620	0.056	9,280	435	0.044	8,240	325	0.031
	35	9,840	620	0.034	9,280	435	0.026	8,240	325	0.019
	40	7,380	405	0.034	6,960	285	0.026	6,180	215	0.019
	45	7,380	405	0.023	6,960	285	0.018	6,180	215	0.013
	50	7,380	405	0.023	6,960	285	0.018	6,180	215	0.013
3.0	6	10,900	860	0.270	10,300	605	0.210	6,600	450	0.150
	8	10,900	860	0.270	10,300	605	0.210	6,600	450	0.150
	10	10,900	860	0.189	10,300	605	0.147	6,600	450	0.105
	12	10,900	860	0.189	10,300	605	0.147	6,600	450	0.105
	14	10,900	860	0.189	10,300	605	0.147	6,600	450	0.105
	16	9,810	695	0.108	9,270	490	0.084	5,940	365	0.060
	18	9,810	695	0.108	9,270	490	0.084	5,940	365	0.060
	20	9,810	695	0.108	9,270	490	0.084	5,940	365	0.060
	22	9,810	695	0.108	9,270	490	0.084	5,940	365	0.060
	26	9,810	695	0.068	9,270	490	0.053	5,940	365	0.038
	30	9,810	695	0.068	9,270	490	0.053	5,940	365	0.038
	35	8,720	550	0.068	8,240	385	0.053	5,280	290	0.038
	40	8,720	550	0.041	8,240	385	0.032	5,280	290	0.023
	45	8,720	550	0.041	8,240	385	0.032	5,280	290	0.023
	50	6,540	360	0.027	6,180	255	0.021	3,960	190	0.015
	60	6,540	360	0.027	6,180	255	0.021	3,960	190	0.015

U-Star Endmill

UE512 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~ 1100N/mm²			1100 ~ 1500N/mm²			1500 ~ 2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
4.0	8	8,000	1,300	0.360	7,600	1,160	0.280	6,700	770	0.200
	10	8,000	1,300	0.360	7,600	1,160	0.280	6,700	770	0.200
	12	8,000	1,300	0.360	7,600	1,160	0.280	6,700	770	0.200
	14	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.140
	16	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.140
	18	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.140
	20	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.140
	22	7,200	1,055	0.144	6,840	940	0.112	6,030	625	0.080
	26	7,200	1,055	0.144	6,840	940	0.112	6,030	625	0.080
	30	7,200	1,055	0.144	6,840	940	0.112	6,030	625	0.080
	35	7,200	1,055	0.090	6,840	940	0.070	6,030	625	0.050
	40	7,200	1,055	0.090	6,840	940	0.070	6,030	625	0.050
	45	6,400	830	0.090	6,080	740	0.070	5,360	495	0.050
	50	6,400	830	0.090	6,080	740	0.070	5,360	495	0.050
	60	6,400	830	0.054	6,080	740	0.042	5,360	495	0.030
5.0	16	6,400	1,155	0.315	6,100	900	0.245	5,400	605	0.175
	20	6,400	1,155	0.315	6,100	900	0.245	5,400	605	0.175
	26	5,760	935	0.180	5,490	730	0.140	4,860	490	0.100
	30	5,760	935	0.180	5,490	730	0.140	4,860	490	0.100
	35	5,760	935	0.180	5,490	730	0.140	4,860	490	0.100
	40	5,760	935	0.180	5,490	730	0.140	4,860	490	0.100
	50	5,760	935	0.113	5,490	730	0.088	4,860	490	0.063
	60	5,120	740	0.113	4,880	575	0.088	4,320	385	0.063
6.0	15	5,300	1,055	0.540	5,000	820	0.420	4,400	550	0.300
	20	5,300	1,055	0.378	5,000	820	0.294	4,400	550	0.210
	30	5,300	1,055	0.378	5,000	820	0.294	4,400	550	0.210
	32	4,770	855	0.216	4,500	665	0.168	3,960	445	0.120
8.0	25	4,000	950	0.504	3,800	750	0.392	3,300	500	0.280
	30	4,000	950	0.504	3,800	750	0.392	3,300	500	0.280
	42	3,600	770	0.288	3,400	605	0.224	2,950	405	0.160
10.0	30	3,200	900	0.900	3,050	680	0.700	2,630	400	0.500
	35	3,200	900	0.630	3,050	680	0.490	2,630	400	0.350
	45	3,200	900	0.630	3,050	680	0.490	2,630	400	0.350
12.0	35	2,650	800	1.080	2,520	600	0.840	2,180	350	0.600
	40	2,650	800	0.756	2,520	600	0.588	2,180	350	0.420
	50	2,650	800	0.756	2,520	600	0.588	2,180	350	0.420

Application tip

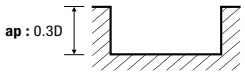


U-Star Endmill

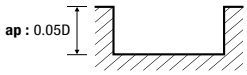
UE522 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
2.0	6,300	60	5,040	50	3,150	25
3.0	4,410	70	3,570	60	2,200	30
4.0	3,570	85	2,840	70	1,790	35
5.0	3,050	105	2,420	85	1,580	40
6.0	2,630	125	2,100	105	1,370	50
8.0	2,000	135	1,580	105	1,050	50
10.0	1,680	135	1,370	105	840	50
12.0	1,370	105	1,160	95	700	40
16.0	1,160	95	890	75	560	35
20.0	840	70	680	50	420	25

Application tip



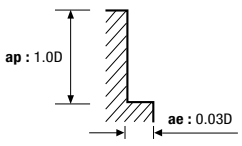
(ap : UP to Ø3.0 : 0.4mm)



UE504H series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
1.0	45,000	750	37,000	560	23,000	300
2.0	23,500	800	18,000	540	12,000	360
3.0	15,750	810	12,600	580	8,280	380
4.0	12,150	830	9,540	600	6,345	400
6.0	9,450	900	7,470	640	4,950	440
8.0	7,110	860	5,625	620	3,780	410
10.0	5,580	800	4,410	570	2,925	380
12.0	4,770	800	3,780	570	2,520	380
16.0	3,600	810	2,900	570	2,000	400
20.0	3,000	810	2,300	570	1,600	400

Application tip

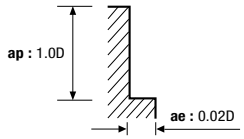


U-Star Endmill

UE514 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Stainless steels (SUS)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45				HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		-		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
1.0	22,000	310	13,500	180	10,750	140	8,500	50
1.5	17,000	320	10,700	190	8,500	150	6,500	50
2.0	13,900	330	9,070	200	7,560	165	6,000	60
2.5	12,000	350	7,600	220	6,000	180	4,500	60
3.0	10,700	380	6,670	240	5,110	200	4,030	70
4.0	9,070	680	5,540	420	4,650	330	3,530	70
5.0	7,560	720	4,530	430	3,800	360	2,780	85
6.0	6,670	790	4,030	490	3,400	390	2,400	95
8.0	5,040	850	3,020	450	2,520	420	2,010	130
10.0	3,910	730	2,400	360	2,010	360	1,630	105
12.0	3,300	620	2,010	300	1,630	280	1,400	95

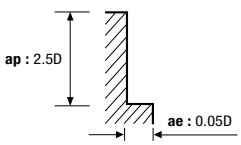
Application tip

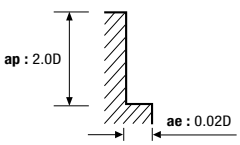


UE524 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
2.0	6,300	100	5,040	80	3,150	45
3.0	4,410	115	3,570	100	2,200	55
4.0	3,570	140	2,840	115	1,790	60
5.0	3,050	180	2,420	140	1,580	70
6.0	2,630	215	2,100	180	1,370	90
8.0	2,000	230	1,580	180	1,050	90
10.0	1,680	230	1,370	180	840	90
12.0	1,370	180	1,160	160	700	70
16.0	1,160	160	890	125	560	60
20.0	840	115	680	90	420	45

Application tip





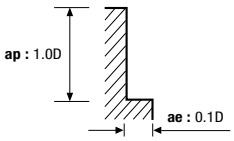
U-Star Endmill

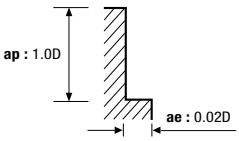
ULE504 series

General processing

Workpiece	Non-ferrous steel Alloy steel, Cast iron		Heat treatment steel				Stainless steel	
Strength	~HRC30		HRC35~45		HRC45~55			
Conditions	~ 1000N/mm²		1000 ~ 1500N/mm²		1500 ~ 2000N/mm²		-	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
2.0	12,100	320	7,900	195	2,700	47	6,600	160
3.0	9,400	370	5,840	230	2,000	58	4,850	195
4.0	7,900	655	4,850	405	1,500	58	4,070	320
5.0	6,600	690	3,970	415	1,300	58	3,320	345
6.0	5,830	760	3,530	470	1,150	58	2,980	380
8.0	4,410	815	2,650	435	880	58	2,200	405
10.0	3,420	700	2,100	345	720	46	1,760	345
12.0	2,880	600	1,760	290	590	46	1,430	275
16.0	2,310	470	1,430	230	460	29	1,150	230
20.0	1,760	370	1,110	185	340	29	880	175
25.0	1,430	290	880	150	270	23	715	140

Application tip

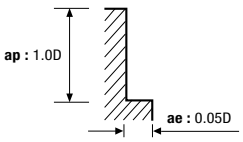




UE504, UXE504 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Stainless steels (SUS)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45				HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		-		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
2.0	11,560	280	7,560	170	6,300	140	6,300	5,040
3.0	8,920	320	5,560	200	4,620	170	4,620	3,360
4.0	7,560	570	4,620	350	3,880	280	3,880	2,940
5.0	6,300	600	3,780	360	3,160	300	3,160	2,320
6.0	5,560	660	3,360	410	2,840	330	2,840	2,000
8.0	4,200	710	2,520	380	2,100	350	2,100	1,680
10.0	3,260	610	2,000	300	1,680	300	1,680	1,360
12.0	2,740	520	1,680	250	1,360	240	1,360	1,160
16.0	2,200	410	1,360	200	1,100	300	1,100	900
20.0	1,680	320	1,060	160	840	150	840	680
25.0	1,360	250	840	130	680	120	680	540

Application tip



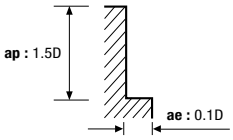
U-Star Endmill

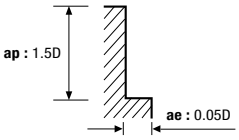
UE506 series

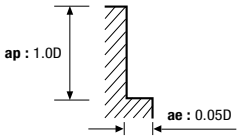
General processing

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
6.0	5,560	2,000	3,880	1,370	1,580	210
8.0	4,200	2,000	2,940	1,370	1,160	210
10.0	3,360	2,000	2,320	1,370	1,000	210
12.0	2,840	1,680	2,000	1,160	840	180
16.0	2,100	1,260	1,480	880	640	130
20.0	1,680	1,010	1,160	690	500	110
25.0	1,500	900	1,100	600	430	90

Application tip





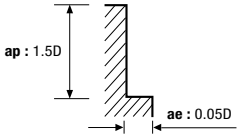


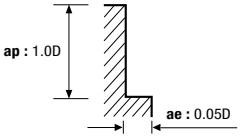
UE506 series

High speed processing

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC45~55	
Conditions	~ 1100N/mm²		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
6.0	16,800	6,090	8,400	3,050
8.0	12,600	6,090	6,300	3,050
10.0	9,980	5,990	5,040	3,050
12.0	8,400	5,040	4,200	2,520
16.0	6,300	3,780	3,160	1,890
20.0	5,040	3,050	2,520	1,470
25.0	4,500	2,700	2,200	1,300

Application tip



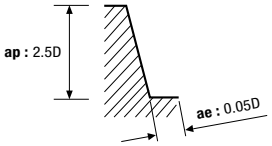


U-Star Endmill

UTE502 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)	
Strength	~HRC35		HRC35~45	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
0.3	45,000	135	35,000	105
0.4	36,000	144	27,900	113
0.6	25,200	144	18,900	113
0.8	18,000	144	13,950	108
1.0	14,850	149	11,250	113
2.0	7,560	153	5,670	113
3.0	3,969	108	3,213	90
4.0	3,213	126	2,556	104
6.0	2,367	189	1,890	153
8.0	1,800	225	1,422	162
10.0	1,440	225	1,170	167

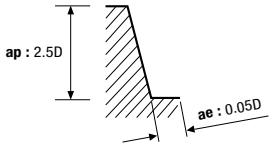
Application tip



UTE504 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)	
Strength	~HRC35		HRC35~45	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
3.0	3,969	216	3,213	180
4.0	3,213	252	2,556	207
6.0	2,367	378	1,890	306
8.0	1,800	450	1,422	324
10.0	1,440	450	1,170	333

Application tip

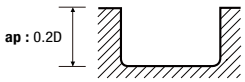


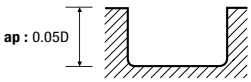
U-Star Endmill

UR502 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
0.2	44,000	145	28,800	60	17,600	40
0.3	41,000	170	27,000	70	16,500	45
0.4	41,000	170	27,000	70	16,500	45
0.5	36,000	190	23,400	80	14,300	50
0.6	30,000	210	19,800	90	12,100	55
0.8	30,000	210	19,800	90	12,100	55
1.0	27,600	240	18,000	100	11,000	60
1.5	22,000	250	13,500	110	8,500	60
2.0	18,000	260	11,560	120	7,200	70
2.5	15,000	270	9,500	130	6,100	70
3.0	13,240	280	8,560	140	5,280	70
4.0	10,720	340	6,820	170	4,300	80
5.0	9,160	420	5,800	200	3,800	100
6.0	7,900	500	5,040	250	3,280	120
8.0	6,000	540	3,800	250	2,520	120
10.0	5,040	540	3,280	250	2,020	120
12.0	4,120	420	2,780	230	1,680	100
16.0	3,100	360	2,100	170	1,280	80
20.0	2,520	280	1,640	120	1,000	60

Application tip



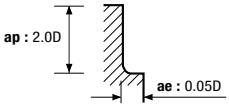


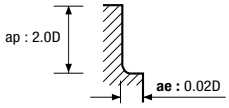
U-Star Endmill

UR504, UR512 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
3.0	4,410	115	3,570	100	2,200	55
4.0	3,570	140	2,840	115	1,790	60
5.0	3,050	180	2,420	140	1,580	70
6.0	2,630	215	2,100	180	1,370	85
8.0	2,000	230	1,580	180	1,050	85
10.0	1,680	230	1,370	180	840	85
12.0	1,370	180	1,160	160	700	70
16.0	1,160	160	890	125	560	60
20.0	840	115	680	90	420	45

Application tip

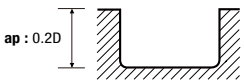


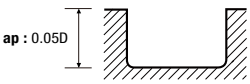


UR542 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
0.2	50,000	170	34,500	75	21,150	45
0.3	50,000	200	32,000	85	20,000	50
0.4	50,000	200	32,000	85	20,000	50
0.5	43,000	220	28,000	95	17,100	60
0.6	36,400	250	24,000	110	14,500	65
0.8	36,400	250	24,000	110	14,500	65
1.0	33,100	280	21,600	120	13,200	70
1.5	26,400	300	16,200	130	10,200	70
2.0	21,600	310	13,800	140	8,640	80
2.5	18,000	320	11,400	150	7,320	80
3.0	15,900	330	10,300	160	6,300	80
4.0	12,800	400	8,200	200	5,150	95
5.0	11,000	500	7,000	240	4,560	120
6.0	9,500	600	6,000	300	3,930	140
8.0	7,200	640	4,550	300	3,020	140
10.0	6,000	640	4,000	300	2,420	140
12.0	5,000	500	3,340	270	2,000	120
16.0	3,720	450	2,520	210	1,540	95
20.0	3,000	330	1,950	140	1,200	70

Application tip



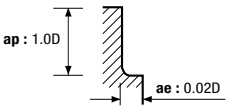


U-Star Endmill

UR544, UXR514 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
1.0	33,100	360	21,600	260	13,200	140
1.5	26,400	370	16,200	270	10,200	140
2.0	21,600	380	13,800	280	8,640	150
2.5	18,000	390	11,400	300	7,320	150
3.0	15,900	400	10,300	310	6,300	150
4.0	12,800	500	8,200	360	5,150	160
5.0	11,000	510	7,000	430	4,560	200
6.0	9,500	510	6,000	430	3,930	200
8.0	7,200	550	4,550	430	3,020	200
10.0	6,000	550	4,000	430	2,420	200
12.0	5,000	430	3,340	380	2,000	160
16.0	3,720	330	2,520	280	1,540	135
20.0	3,000	270	1,950	210	1,200	100

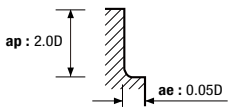
Application tip

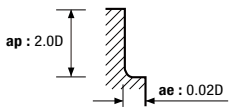


UXR504 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
1.0	27,600	300	18,000	220	11,000	120
1.5	22,000	310	13,500	230	8,500	120
2.0	18,000	320	11,560	240	7,200	130
2.5	15,000	330	9,500	250	6,100	130
3.0	13,240	340	8,560	260	5,280	130
4.0	10,720	420	6,820	300	4,300	140
5.0	9,160	430	5,800	360	3,800	170
6.0	7,900	430	5,040	360	3,280	170
8.0	6,000	460	3,800	360	2,520	170
10.0	5,040	460	3,280	360	2,020	170
12.0	4,120	360	2,780	320	1,680	140
16.0	3,100	280	2,100	230	1,280	115
20.0	2,520	230	1,640	180	1,000	90

Application tip



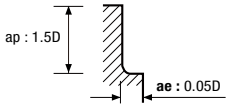


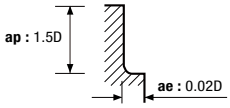
U-Star Endmill

UR506 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
6.0	14,880	3,210	14,100	2,940	9,600	2,940
8.0	12,000	3,300	11,400	3,000	7,200	2,760
10.0	9,600	2,940	9,300	2,700	5,700	2,460
12.0	7,800	2,700	7,500	2,460	4,800	2,280
16.0	6,000	2,400	5,820	2,220	3,600	2,040
20.0	4,800	2,010	4,680	2,040	2,880	1,920

Application tip



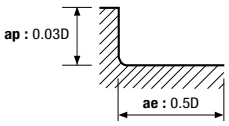


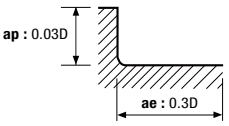
UDR503 series

General processing

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
6.0	5,100	3,500	5,500	3,750	3,850	2,700
8.0	3,800	3,400	4,150	3,700	2,850	2,550
10.0	3,800	3,750	3,600	3,500	2,700	2,700
12.0	3,200	4,200	3,250	4,250	2,250	2,300
16.0	2,400	3,100	2,250	2,900	1,700	1,750
20.0	1,900	2,500	1,800	2,350	1,350	1,400

Application tip





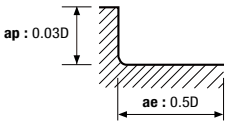
U-Star Endmill

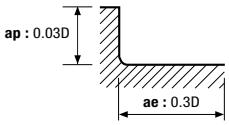
UDR503 series

High speed processing

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
6.0	8,300	5,700	7,650	5,250	6,400	4,550
8.0	6,200	5,550	5,750	5,100	5,250	4,700
10.0	5,750	5,650	5,000	4,900	4,200	4,250
12.0	4,800	6,300	4,150	5,450	3,500	3,650
16.0	3,600	4,700	3,100	4,050	2,650	2,700
20.0	2,900	3,750	2,500	3,250	2,100	2,150

Application tip

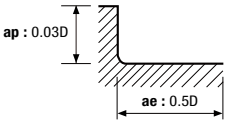


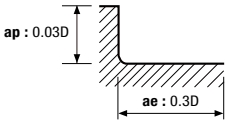


USPM4 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
1.0	49,000	7,650	40,000	6,500	35,000	5,750
1.5	37,000	8,550	30,000	7,200	27,000	6,400
2.0	29,700	9,000	24,300	7,560	21,600	6,750
3.0	19,800	9,900	16,200	8,100	14,400	7,650
4.0	15,300	10,800	12,600	8,550	10,800	7,920
6.0	9,900	11,700	8,100	9,900	7,200	8,640
8.0	7,380	11,700	6,300	9,900	5,400	8,640
10.0	5,850	10,800	4,950	9,000	4,320	8,550
12.0	4,950	10,800	4,140	9,000	3,690	8,100
16.0	3,690	9,000	3,060	7,920	2,700	7,020
20.0	2,970	7,200	2,430	6,300	2,160	5,670

Application tip



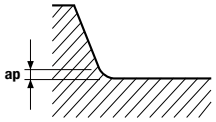


U-Star Endmill

UTR504 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength	~HRC35			HRC35~45			HRC45~55		
Conditions	~ 1100N/mm²			1100 ~ 1500N/mm²			1500 ~ 2000N/mm²		
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	Ap (mm)	R.P.M n (min -1)	Feed vf (mm/min)	Ap (mm)	R.P.M n (min -1)	Feed vf (mm/min)	Ap (mm)
0.4	40,000	630	0.008~0.016	32,000	450	0.008~0.012	22,000	270	0.004~0.008
0.6	30,000	630	0.012~0.024	23,000	450	0.012~0.018	15,000	270	0.006~0.012
0.8	22,500	630	0.016~0.032	17,000	450	0.016~0.024	11,500	270	0.008~0.016
1.0	18,000	630	0.020~0.040	13,500	450	0.020~0.030	9,000	270	0.010~0.020
1.2	14,400	630	0.025~0.050	11,700	450	0.025~0.040	7,200	270	0.012~0.025
1.5	11,700	630	0.030~0.060	9,000	450	0.030~0.050	5,850	270	0.015~0.030
2.0	9,000	630	0.040~0.080	7,200	450	0.040~0.060	4,500	270	0.020~0.040

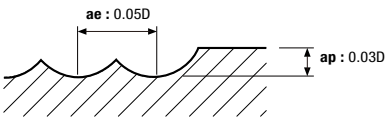
Application tip



UB502, 502---P series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
0.1	40,000	550	40,000	500	33,000	400
0.2	30,000	720	30,000	630	27,000	575
0.3	30,000	900	30,000	810	27,000	720
0.4	30,000	1,140	30,000	1,020	27,000	900
0.5	30,000	1,440	30,000	1,260	27,000	1,140
0.6	30,000	1,740	30,000	1,500	27,000	1,320
0.8	30,000	2,340	30,000	1,980	27,000	1,800
1.0	30,000	2,880	30,000	2,520	27,000	2,280
1.2	30,000	3,060	28,800	2,580	25,800	2,310
1.5	30,000	3,240	28,800	2,700	25,800	2,400
2.0	29,820	3,420	28,680	2,880	24,000	2,400
3.0	19,860	3,600	19,080	3,180	15,900	2,400
4.0	14,940	3,600	14,340	3,180	12,000	2,400
5.0	11,160	3,480	10,680	2,940	9,000	2,250
6.0	8,340	2,910	8,040	2,460	6,600	1,860
8.0	6,660	2,520	6,420	2,100	5,400	1,620
10.0	5,580	2,220	5,340	1,860	4,500	1,440
12.0	4,170	1,770	4,008	1,500	3,360	1,140
16.0	3,340	1,590	3,210	1,320	2,700	1,020
20.0	2,670	1,410	2,580	1,170	2,160	900
25.0	2,130	1,150	2,060	950	1,730	730

Application tip



U-Star Endmill

UB512, UB512...S6 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~ 1100N/mm²			1100 ~ 1500N/mm²			1500 ~ 2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)	R.P.M n (min -1)	Feed vf (mm/min)	ap (mm)
0.1	0.2	50,000	240	0.009	50,000	215	0.007	50,000	190	0.005
	0.3	50,000	240	0.009	50,000	215	0.007	50,000	190	0.005
	0.5	50,000	240	0.006	50,000	215	0.005	50,000	190	0.004
	1	45,000	195	0.002	45,000	175	0.002	45,000	155	0.001
0.2	0.5	50,000	335	0.018	50,000	310	0.014	43,200	260	0.010
	1	50,000	335	0.013	50,000	310	0.010	43,200	260	0.007
	1.5	45,000	270	0.007	45,000	250	0.006	38,880	210	0.004
	2	45,000	270	0.005	45,000	250	0.004	38,880	210	0.003
	3	45,000	270	0.003	45,000	250	0.003	38,880	210	0.002
0.3	1	50,000	475	0.019	50,000	430	0.015	42,800	365	0.011
	1.5	50,000	475	0.019	50,000	430	0.015	42,800	365	0.011
	2	45,000	385	0.011	45,000	350	0.008	38,520	295	0.006
	2.5	45,000	385	0.007	45,000	350	0.005	38,520	295	0.004
	3	45,000	385	0.007	45,000	350	0.005	38,520	295	0.004
	4	40,000	305	0.004	40,000	275	0.003	34,240	235	0.002
	5	30,000	200	0.003	30,000	180	0.002	25,680	155	0.002
0.4	1	41,000	490	0.036	38,800	425	0.028	34,200	340	0.020
	1.5	41,000	490	0.025	38,800	425	0.020	34,200	340	0.014
	2	41,000	490	0.025	38,800	425	0.020	34,200	340	0.014
	2.5	36,900	395	0.014	34,920	345	0.011	30,780	275	0.008
	3	36,900	395	0.014	34,920	345	0.011	30,780	275	0.008
	4	36,900	395	0.009	34,920	345	0.007	30,780	275	0.005
	5	32,800	315	0.009	31,040	270	0.007	27,360	220	0.005
	6	32,800	315	0.005	31,040	270	0.004	27,360	220	0.003
	8	24,600	205	0.004	23,280	180	0.003	20,520	145	0.002
	10	12,300	90	0.004	11,640	75	0.003	10,260	60	0.002
0.5	1	34,200	685	0.045	32,300	580	0.035	28,500	515	0.025
	1.5	34,200	685	0.045	32,300	580	0.035	28,500	515	0.025
	2	34,200	685	0.032	32,300	580	0.025	28,500	515	0.018
	2.5	34,200	685	0.032	32,300	580	0.025	28,500	515	0.018
	3	30,780	555	0.018	29,070	470	0.014	25,650	415	0.010
	4	30,780	555	0.018	29,070	470	0.014	25,650	415	0.010
	5	30,780	555	0.011	29,070	470	0.009	25,650	415	0.006
	6	27,360	440	0.011	25,840	370	0.009	22,800	330	0.006
	8	20,520	290	0.007	19,380	245	0.005	17,100	215	0.004
	10	20,520	290	0.005	19,380	245	0.004	17,100	215	0.003
	12	10,260	125	0.005	9,690	105	0.004	8,550	95	0.003
	14	10,260	125	0.005	9,690	105	0.004	8,550	95	0.003
	16	3,420	35	0.005	3,230	30	0.004	2,850	25	0.003
0.6	1	34,200	1,025	0.038	32,300	840	0.029	28,500	685	0.021
	2	34,200	1,025	0.038	32,300	840	0.029	28,500	685	0.021
	3	34,200	1,025	0.038	32,300	840	0.029	28,500	685	0.021
	4	30,780	830	0.022	29,070	680	0.017	25,650	555	0.012

U-Star Endmill

UB512, UB512...S6 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~ 1100N/mm²			1100 ~ 1500N/mm²			1500 ~ 2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
0.6	5	30,780	830	0.014	29,070	680	0.011	25,650	555	0.008
	6	30,780	830	0.014	29,070	680	0.011	25,650	555	0.008
	8	27,360	655	0.008	25,840	540	0.006	22,800	440	0.005
	10	20,520	430	0.005	19,380	355	0.004	17,100	290	0.003
	12	20,520	430	0.005	19,380	355	0.004	17,100	290	0.003
	14	10,260	185	0.005	9,690	150	0.004	8,550	125	0.003
	16	10,260	185	0.005	9,690	150	0.004	8,550	125	0.003
0.7	2	34,200	1,130	0.063	32,300	930	0.049	28,500	765	0.035
	4	30,780	915	0.025	29,070	755	0.020	25,650	620	0.014
	6	30,780	915	0.016	29,070	755	0.012	25,650	620	0.009
	8	27,360	725	0.016	25,840	595	0.012	22,800	490	0.009
	10	27,360	725	0.009	25,840	595	0.007	22,800	490	0.005
	12	20,520	475	0.006	19,380	390	0.005	17,100	320	0.004
0.8	2	34,200	1,230	0.072	32,300	1,035	0.056	28,500	855	0.040
	3	34,200	1,230	0.050	32,300	1,035	0.039	28,500	855	0.028
	4	34,200	1,230	0.050	32,300	1,035	0.039	28,500	855	0.028
	5	30,780	995	0.029	29,070	840	0.022	25,650	695	0.016
	6	30,780	995	0.029	29,070	840	0.022	25,650	695	0.016
	8	30,780	995	0.018	29,070	840	0.014	25,650	695	0.010
	10	27,360	785	0.018	25,840	660	0.014	22,800	545	0.010
	12	27,360	785	0.011	25,840	660	0.008	22,800	545	0.006
	14	20,520	515	0.007	19,380	435	0.006	17,100	360	0.004
	16	20,520	515	0.007	19,380	435	0.006	17,100	360	0.004
	20	10,260	220	0.007	9,690	185	0.006	8,550	155	0.004
0.9	4	29,250	1,120	0.032	27,630	935	0.025	24,390	775	0.018
	6	29,250	1,120	0.032	27,630	935	0.025	24,390	775	0.018
	8	29,250	1,120	0.020	27,630	935	0.016	24,390	775	0.011
	10	26,000	885	0.020	24,560	740	0.016	21,680	610	0.011
1.0	2	30,800	1,540	0.090	29,100	1,310	0.070	25,700	1,075	0.050
	3	30,800	1,540	0.090	29,100	1,310	0.070	25,700	1,075	0.050
	4	30,800	1,540	0.063	29,100	1,310	0.049	25,700	1,075	0.035
	5	30,800	1,540	0.063	29,100	1,310	0.049	25,700	1,075	0.035
	6	27,720	1,245	0.036	26,190	1,060	0.028	23,130	870	0.020
	7	27,720	1,245	0.036	26,190	1,060	0.028	23,130	870	0.020
	8	27,720	1,245	0.036	26,190	1,060	0.028	23,130	870	0.020
	10	27,720	1,245	0.023	26,190	1,060	0.018	23,130	870	0.013
	12	24,640	985	0.023	23,280	840	0.018	20,560	690	0.013
	14	24,640	985	0.014	23,280	840	0.011	20,560	690	0.008
	16	18,480	645	0.014	17,460	550	0.011	15,420	450	0.008
	18	18,480	645	0.009	17,460	550	0.007	15,420	450	0.005
	20	18,480	645	0.009	17,460	550	0.007	15,420	450	0.005
	22	9,240	275	0.009	8,730	235	0.007	7,710	195	0.005
	26	9,240	275	0.009	8,730	235	0.007	7,710	195	0.005

U-Star Endmill

UB512, UB512...S6 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~ 1100N/mm²			1100 ~ 1500N/mm²			1500 ~ 2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
1.0	30	9,240	275	0.009	8,730	235	0.007	7,710	195	0.005
	40	3,080	75	0.009	2,910	65	0.007	2,570	55	0.005
	50	3,080	75	0.006	2,910	65	0.005	2,570	55	0.003
1.2	4	26,300	1,375	0.076	24,800	1,150	0.059	21,900	950	0.042
	6	26,300	1,375	0.076	24,800	1,150	0.059	21,900	950	0.042
	8	23,670	1,115	0.043	22,320	930	0.034	19,710	770	0.024
	10	23,670	1,115	0.027	22,320	930	0.021	19,710	770	0.015
	12	23,670	1,115	0.027	22,320	930	0.021	19,710	770	0.015
	16	21,040	880	0.016	19,840	735	0.013	17,520	610	0.009
	20	15,780	580	0.011	14,880	485	0.008	13,140	400	0.006
	26	7,890	245	0.011	7,440	205	0.008	6,570	170	0.006
1.4	6	21,500	1,295	0.088	20,300	1,100	0.069	18,000	935	0.049
	8	19,350	1,050	0.050	18,270	890	0.039	16,200	755	0.028
	10	19,350	1,050	0.050	18,270	890	0.039	16,200	755	0.028
	16	17,200	830	0.032	16,240	705	0.025	14,400	600	0.018
1.5	4	23,900	1,580	0.135	22,600	1,355	0.105	20,000	1,075	0.075
	5	23,900	1,580	0.095	22,600	1,355	0.074	20,000	1,075	0.053
	6	23,900	1,580	0.095	22,600	1,355	0.074	20,000	1,075	0.053
	7	23,900	1,580	0.095	22,600	1,355	0.074	20,000	1,075	0.053
	8	21,510	1,280	0.054	20,340	1,100	0.042	18,000	870	0.030
	10	21,510	1,280	0.054	20,340	1,100	0.042	18,000	870	0.03
	12	21,510	1,280	0.054	20,340	1,100	0.042	18,000	870	0.030
	14	21,510	1,280	0.034	20,340	1,100	0.026	18,000	870	0.019
	16	19,120	1,010	0.034	18,080	865	0.026	16,000	690	0.019
	18	19,120	1,010	0.034	18,080	865	0.026	16,000	690	0.019
	20	19,120	1,010	0.020	18,080	865	0.016	16,000	690	0.011
	22	19,120	1,010	0.020	18,080	865	0.016	16,000	690	0.011
	26	14,340	665	0.014	13,560	570	0.011	12,000	450	0.008
	30	14,340	665	0.014	13,560	570	0.011	12,000	450	0.008
	35	7,170	285	0.010	6,780	245	0.008	6,000	195	0.005
	40	7,170	285	0.010	6,780	245	0.008	6,000	195	0.005
1.6	4	22,200	1,555	0.101	21,000	1,300	0.078	18,500	1,110	0.056
	6	22,200	1,555	0.101	21,000	1,300	0.078	18,500	1,110	0.056
	8	22,200	1,555	0.101	21,000	1,300	0.078	18,500	1,110	0.056
	10	19,980	1,260	0.058	18,900	1,055	0.045	16,650	900	0.032
	12	19,980	1,260	0.058	18,900	1,055	0.045	16,650	900	0.032
	16	19,980	1,260	0.036	18,900	1,055	0.028	16,650	900	0.020
	20	17,760	995	0.036	16,800	830	0.028	14,800	710	0.020
1.8	4	22,200	1,780	0.113	21,000	1,470	0.088	18,500	1,225	0.063
	6	22,200	1,780	0.113	21,000	1,470	0.088	18,500	1,225	0.063
	8	22,200	1,780	0.113	21,000	1,470	0.088	18,500	1,225	0.063
	10	19,980	1,440	0.065	18,900	1,190	0.050	16,650	990	0.036
	12	19,980	1,440	0.065	18,900	1,190	0.050	16,650	990	0.036

U-Star Endmill

UB512, UB512...S6 series

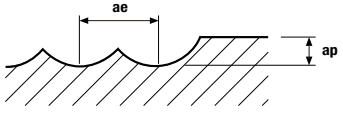
Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~ 1100N/mm²			1100 ~ 1500N/mm²			1500 ~ 2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
1.8	16	19,980	1,440	0.041	18,900	1,190	0.032	16,650	990	0.023
	20	17,760	1,140	0.041	16,800	940	0.032	14,800	785	0.023
2.0	6	18,000	1,795	0.18	17,000	1,525	0.140	15,000	1,285	0.100
	8	18,000	1,795	0.126	17,000	1,525	0.098	15,000	1,285	0.070
	10	18,000	1,795	0.126	17,000	1,525	0.098	15,000	1,285	0.070
	12	16,200	1,455	0.072	15,300	1,235	0.056	13,500	1,040	0.040
	14	16,200	1,455	0.072	15,300	1,235	0.056	13,500	1,040	0.040
	16	16,200	1,455	0.072	15,300	1,235	0.056	13,500	1,040	0.040
	18	16,200	1,455	0.045	15,300	1,235	0.035	13,500	1,040	0.025
	20	16,200	1,455	0.045	15,300	1,235	0.035	13,500	1,040	0.025
	22	14,400	1,150	0.045	13,600	975	0.035	12,000	820	0.025
	26	14,400	1,150	0.045	13,600	975	0.035	12,000	820	0.025
	30	14,400	1,150	0.027	13,600	975	0.021	12,000	820	0.015
	35	10,800	755	0.018	10,200	640	0.014	9,000	540	0.010
	40	10,800	755	0.018	10,200	640	0.014	9,000	540	0.010
	45	5,400	325	0.018	5,100	275	0.014	4,500	230	0.010
	50	5,400	325	0.018	5,100	275	0.014	4,500	230	0.010
	60	5,400	325	0.018	5,100	275	0.014	4,500	230	0.010
2.5	8	15,800	1,925	0.158	14,900	1,605	0.123	13,200	1,305	0.088
	10	15,800	1,925	0.158	14,900	1,605	0.123	13,200	1,305	0.088
	12	15,800	1,925	0.158	14,900	1,605	0.123	13,200	1,305	0.088
	16	14,220	1,560	0.090	13,410	1,300	0.070	11,880	1,055	0.050
	20	14,220	1,560	0.090	13,410	1,300	0.070	11,880	1,055	0.050
	22	14,220	1,560	0.056	13,410	1,300	0.044	11,880	1,055	0.031
	26	12,640	1,230	0.056	11,920	1,025	0.044	10,560	835	0.031
	30	12,640	1,230	0.056	11,920	1,025	0.044	10,560	835	0.031
	35	12,640	1,230	0.034	11,920	1,025	0.026	10,560	835	0.019
	40	9,480	810	0.034	8,940	675	0.026	7,920	550	0.019
	45	9,480	810	0.023	8,940	675	0.018	7,920	550	0.013
	50	9,480	810	0.023	8,940	675	0.018	7,920	550	0.013
3.0	6	13,700	2,050	0.270	12,900	1,730	0.21	11,400	1,435	0.150
	8	13,700	2,050	0.270	12,900	1,730	0.21	11,400	1,435	0.150
	10	13,700	2,050	0.189	12,900	1,730	0.147	11,400	1,435	0.105
	12	13,700	2,050	0.189	12,900	1,730	0.147	11,400	1,435	0.105
	14	13,700	2,050	0.189	12,900	1,730	0.147	11,400	1,435	0.105
	16	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.060
	18	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.060
	20	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.060
	22	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.060
	26	12,330	1,660	0.068	11,610	1,400	0.053	10,260	1,160	0.038
	30	12,330	1,660	0.068	11,610	1,400	0.053	10,260	1,160	0.038
	35	10,960	1,310	0.068	10,320	1,105	0.053	9,120	920	0.038
	40	10,960	1,310	0.041	10,320	1,105	0.032	9,120	920	0.023

U-Star Endmill

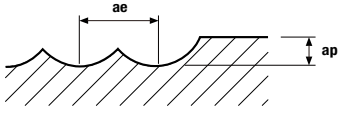
UB512, UB512...S6 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~ 1100N/mm²			1100 ~ 1500N/mm²			1500 ~ 2000N/mm²		
Diameter (Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
3.0	45	10,960	1,310	0.041	10,320	1,105	0.032	9,120	920	0.023
	50	8,220	860	0.027	7,740	725	0.021	6,840	605	0.015
	60	8,220	860	0.027	7,740	725	0.021	6,840	605	0.015
4.0	8	9,800	1,965	0.360	9,300	1,670	0.28	8,200	1,395	0.200
	10	9,800	1,965	0.360	9,300	1,670	0.28	8,200	1,395	0.200
	12	9,800	1,965	0.360	9,300	1,670	0.28	8,200	1,395	0.200
	14	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.140
	16	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.140
	18	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.140
	20	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.140
	22	8,820	1,590	0.144	8,370	1,355	0.112	7,380	1,130	0.080
	26	8,820	1,590	0.144	8,370	1,355	0.112	7,380	1,130	0.080
	30	8,820	1,590	0.144	8,370	1,355	0.112	7,380	1,130	0.080
	35	8,820	1,590	0.090	8,370	1,355	0.07	7,380	1,130	0.050
	40	8,820	1,590	0.090	8,370	1,355	0.07	7,380	1,130	0.050
	45	7,840	1,260	0.090	7,440	1,070	0.07	6,560	895	0.050
	50	7,840	1,260	0.090	7,440	1,070	0.07	6,560	895	0.050
	60	7,840	1,260	0.054	7,440	1,070	0.042	6,560	895	0.030
5.0	15	7,700	1,845	0.315	7,300	1,455	0.245	6,400	1,285	0.175
	20	7,700	1,845	0.315	7,300	1,455	0.245	6,400	1,285	0.175
	26	6,930	1,495	0.180	6,570	1,180	0.14	5,760	1,040	0.100
	30	6,930	1,495	0.180	6,570	1,180	0.14	5,760	1,040	0.100
	35	6,930	1,495	0.180	6,570	1,180	0.14	5,760	1,040	0.100
	40	6,930	1,495	0.180	6,570	1,180	0.14	5,760	1,040	0.100
	50	6,930	1,495	0.113	6,570	1,180	0.088	5,760	1,040	0.063
	60	6,160	1,180	0.113	5,840	930	0.088	5,120	820	0.063
6.0	20	6,500	1,900	0.378	6,200	1,600	0.294	5,500	1,330	0.210
	30	6,500	1,900	0.378	6,200	1,600	0.294	5,500	1,330	0.210
8.0	25	4,850	1,800	0.504	4,600	1,500	0.392	4,000	1,280	0.280
	30	4,850	1,800	0.504	4,600	1,500	0.392	4,000	1,280	0.280
10.0	30	3,850	1,650	0.900	3,680	1,400	0.7	3,200	1,200	0.500
	40	3,850	1,650	0.630	3,680	1,400	0.49	3,200	1,200	0.350
12.0	32	3,200	1,520	1.080	3,050	1,300	0.84	2,650	1,100	0.600
	45	3,200	1,520	0.756	3,050	1,300	0.588	2,650	1,100	0.420

Application tip



ap: D1~D6 = 0.2mm
D8~D12 = 0.3mm
ae: 0.2 × D



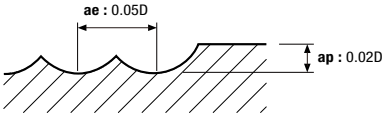
ap: D1~D4 = 0.05 × D
D5~D8 = 0.25mm
D10~D12 = 0.3mm
ae: 0.1 × D

U-Star Endmill

UB532 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
3.0	35,000	2,800	33,000	2,600	12,000	900
4.0	26,000	2,300	25,000	2,200	9,000	800
5.0	21,000	2,100	20,000	2,000	7,000	700
6.0	17,000	1,900	16,000	1,800	6,000	650
8.0	13,000	1,700	12,000	1,600	4,500	550
10.0	10,500	1,450	10,000	1,400	3,500	500
12.0	9,000	1,400	8,000	1,300	3,000	450

Application tip

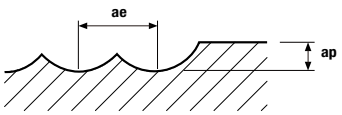


UB542 series

General processing

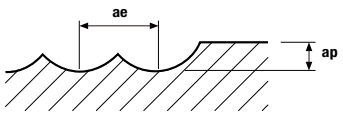
Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
0.1	16,500	80	25,500	185	25,500	160
0.2	16,500	90	25,500	220	25,500	200
0.3	15,300	112	24,000	260	24,000	220
0.4	15,300	112	24,000	260	24,000	220
0.5	13,300	128	20,800	300	20,800	250
0.6	11,200	144	17,600	330	17,600	280
0.8	11,200	144	17,600	330	17,600	280
1.0	10,180	160	16,000	370	16,000	320
1.5	9,500	220	13,000	500	12,800	400
2.0	9,250	260	11,500	640	11,300	590
3.0	8,000	370	10,200	880	9,800	850
4.0	6,720	420	8,500	880	8,200	850
5.0	5,840	460	7,500	880	7,200	850
6.0	5,500	660	6,900	920	6,500	880
8.0	4,600	740	5,600	840	5,300	800
10.0	4,070	820	4,850	800	4,650	770
12.0	3,700	890	4,350	800	4,150	770

Application tip



ap: D1~D6 = 0.2mm
D8~D12 = 0.3mm

ae: 0.2 × D



ap: D1~D4 = 0.05 × D
D5~D8 = 0.25mm
D10~D12 = 0.3mm

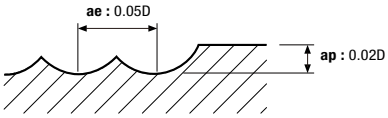
ae: 0.1 × D

U-Star Endmill

USB502 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
3.0	13,500	1,700	13,200	1,620	12,500	860
4.0	10,600	1,700	10,300	1,620	9,800	860
5.0	9,400	1,650	9,050	1,570	8,600	860
6.0	8,600	1,750	8,250	1,670	7,850	865
8.0	7,000	1,550	6,700	1,460	6,350	890
10.0	6,050	1,450	5,800	1,360	5,450	870
12.0	5,450	1,420	5,200	1,330	4,900	785
16.0	4,300	1,200	4,000	1,100	3,700	650
20.0	3,600	1,050	3,200	900	3,000	550

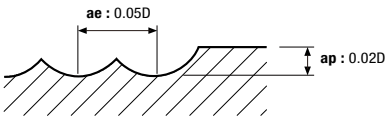
Application tip



UB503 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
1.0	50,000	4,150	44,000	3,000	33,000	2100
1.5	40,000	5,100	35,000	3,660	36,400	2600
2.0	33,000	5,890	29,000	4,150	21,700	3000
3.0	25,000	6,930	22,000	4,880	16,500	3490
4.0	21,670	6,930	18,120	4,880	13,400	3490
5.0	18,000	6,520	15,100	4,880	11,160	3320
6.0	16,200	7,710	13,680	5,590	10,980	4050
8.0	12,150	6,610	10,170	4,720	8,280	3580
10.0	9,720	5,870	8,190	4,130	6,620	3100
12.0	8,150	5,490	4,130	3,830	5,520	2870

Application tip

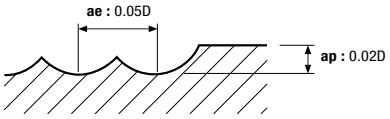


U-Star Endmill

UB504 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
1.0	48,000	3,300	35,000	2,350	32,000	2,200
1.5	38,400	4,100	28,000	2,900	25,600	2,700
2.0	31,680	4,600	23,100	3,300	21,000	3,100
3.0	24,000	5,430	17,500	3,880	16,000	3,650
4.0	20,130	5,430	14,880	3,880	14,220	3,650
5.0	16,780	5,430	12,400	3,690	11,670	3,470
6.0	15,200	6,220	12,200	4,500	11,100	3,830
8.0	11,300	5,250	9,200	3,980	8,320	3,350
10.0	9,100	4,590	7,350	3,450	6,660	2,870
12.0	7,590	4,260	6,130	3,190	5,530	2,400

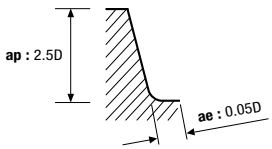
Application tip



UTB502 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)	
Strength	~HRC35		HRC35~45	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
0.4	36,000	144	27,900	113
0.6	25,200	144	18,900	113
0.8	18,000	144	13,950	108
1.0	14,850	149	11,250	113
2.0	7,560	153	5,670	113
3.0	3,969	108	3,213	90
4.0	3,213	126	2,556	104

Application tip

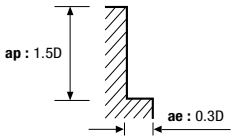


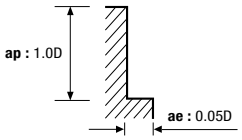
U-Star Endmill

UF50 series

Workpiece	Non ferrous 3teel, Alloy steel, Cast iron		Alloy steel, Heat resisting steel		Stainless Steel		Heat treatment steel			
Strength	~HRC30		HRC30~38		HRC38~45		HRC45~55		HRC55~65	
Conditions	~ 1000N/mm²		1000 ~ 1200N/mm²		1200 ~ 1400N/mm²		1400 ~ 2000N/mm²		2000N/mm² ~	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
6.0	15,600	2,320	12,400	840	8,400	570	3,400	260	2,400	190
8.0	11,600	2,320	9,200	840	6,300	570	2,400	240	1,800	180
10.0	9,200	2,320	7,600	840	5,100	570	2,000	290	1,300	190
12.0	8,000	2,400	6,000	800	4,200	570	1,680	260	1,200	190
14.0	6,800	2,400	5,200	840	3,600	570	1,400	200	900	130
16.0	6,000	2,400	4,800	760	3,300	510	1,200	160	800	110
18.0	5,200	2,320	4,400	720	2,700	420	1,100	150	700	100
20.0	4,800	2,160	3,600	560	2,400	360	1,000	150	660	100
25.0	4,300	2,150	3,200	620	2,160	410	900	160	600	100

Application tip

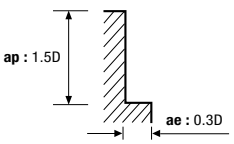


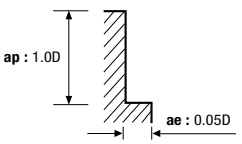


UF51 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
6.0	12,400	840	8,400	570	3,400	260
8.0	9,200	840	6,300	570	2,400	240
10.0	7,600	840	5,100	570	2,000	290
12.0	6,000	800	4,200	570	1,680	260
14.0	5,200	840	3,600	570	1,400	200
16.0	4,800	760	3,300	510	1,200	160
18.0	4,400	720	2,700	420	1,100	150
20.0	3,600	560	2,400	360	1,000	150
25.0	3,200	620	2,160	410	900	160

Application tip



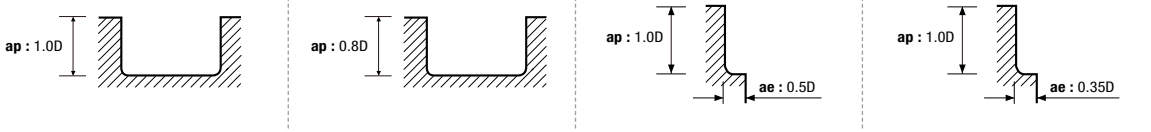


U-Star Endmill

UF51---H series

Workpiece	Alloy steels Carbon steels (SCM, S45C, S50C)		Alloy steels Carbon steels Pre-hardened steels (SCM, SKD, NAK, KP4)		Alloy steels Carbon steels (SCM, S45C, S50C)		Alloy steels Carbon steels Pre-hardened steels (SCM, SKD, NAK, KP4)	
Conditions	~HRC25		HRC25~40		~HRC25		HRC25~40	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
6.0	12,000	1,550	10,600	1,100	15,800	2,570	14,300	1,850
8.0	9,000	1,650	8,100	1,180	11,900	2,700	10,700	1,950
10.0	7,200	1,650	6,400	1,180	9,500	2,700	8,500	1,950
12.0	6,000	1,540	5,400	1,140	8,000	2,570	7,100	1,850
16.0	4,500	1,500	4,100	1,050	6,000	2,450	5,400	1,750
20.0	3,600	1,330	3,200	900	4,800	2,140	4,300	1,500

Application tip



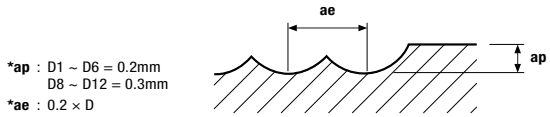
G-Star Endmill

DB312, DB342, DB402, DB502, DB512, DB522, DB54(5)2

General Cutting

Workpiece	Non-alloyed steels alloy steels · Cast iron		Alloy steels, Heat resistant steels		Hardened steels	
Strength	~HRC30		HRC30~40		HRC40~55	
Conditions	~ 1100N/mm²		1000 ~ 1250N/mm²		1500N/mm²	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
1.0	16,500	290	13,300	230	6,100	105
1.5	16,500	405	12,700	310	5,590	140
2.0	15,100	865	11,200	565	4,900	175
2.5	15,100	865	11,200	565	4,900	175
3.0	13,800	780	10,500	530	4,750	175
4.0	11,000	850	8,800	610	4,410	205
5.0	9,600	945	7,600	665	3,860	205
6.0	8,900	1,150	7,200	955	3,340	220
8.0	7,500	1,500	6,050	1,060	2,590	255
10.0	6,700	1,750	5,300	1,170	2,140	260
12.0	6,150	2,000	4,900	1,280	1,840	280
16.0	5,000	1,950	3,900	1,220	1,420	280
20.0	4,350	1,900	3,400	1,200	1,170	290

Application tip



*ap : D1 ~ D6 = 0.2mm
D8 ~ D12 = 0.3mm
*ae : 0.2 × D

*ap : D1 ~ D6 = 0.2mm
D8 ~ D12 = 0.3mm
*ae : 0.1 × D

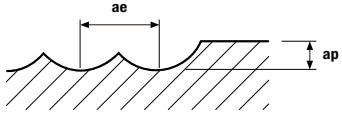
※ Please reduce cutting speed around 20~30% from the above table or DB522 series.

DB312, DB342, DB402, DB502, DB512, DB522, DB54(5)2

High Speed Cutting

Workpiece	Non-alloyed steels alloy steels · Cast iron		Alloy steels, Heat resistant steels	
Strength	~HRC45		HRC30~40	
Conditions	~1500N/mm²		1500~2000N/mm²	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
1.0	26,000	1,500	26,000	920
1.5	24,000	1,600	24,000	990
2.0	22,000	1,700	22,000	1,080
2.5	22,000	2,000	20,000	1,130
3.0	22,000	2,300	17,800	1,200
4.0	22,000	3,350	14,300	1,300
5.0	22,000	4,150	12,600	1,380
6.0	22,000	4,600	11,000	1,440
8.0	17,500	4,600	8,800	1,440
10.0	14,700	4,450	7,350	1,380
12.0	12,800	4,450	6,400	1,330
16.0	10,000	4,000	5,000	1,150
20.0	8,350	3,650	4,150	1,060

Application tip



*ap : D1 ~ D6 = 0.2mm
D8 ~ D12 = 0.3mm
*ae : 0.2 × D

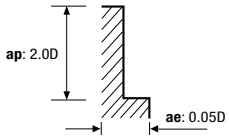
※ Please reduce cutting speed around 20~30% from the above table or DB522 series.

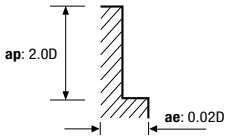
G-Star Endmill

ZR324, ZR504, ZR514, ZR524 series

Workpiece	Non-Alloyed steels Alloy steels · Cast iron		Alloy steels, Heat resistant steels		hardened steels	
Strength	~HRC30		HRC30~45		HRC45~55	
Conditions	~1000N/mm²		1000~1500N/mm²		1500~2000N/mm²	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
3.0	6,950	195	4,500	150	3,300	100
4.0	5,600	240	3,600	170	2,700	105
5.0	4,800	250	3,050	210	2,350	125
6.0	4,150	250	2,650	210	2,050	125
8.0	3,150	265	2,000	210	1,600	125
10.0	2,150	265	1,700	210	1,250	125
12.0	1,800	210	1,500	185	1,050	105
16.0	1,880	185	1,100	140	840	90
20.0	1,300	130	860	105	625	65

Application tip

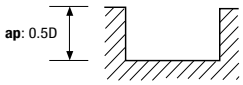


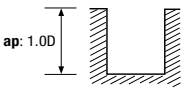


TX202, TX222, TX302 series

Workpiece	Non-Alloy steels, alloy steels, Cast iron		Alloy steels, Heat resistant steels		Stainless steels		Cast iron		Aluminum alloys		Copper, Brass Non-ferrous metals	
Strength	~HRC30		HRC30~45		-		-		-		-	
Conditions	~1000N/mm²		1000~1500N/mm²		-		-		-		-	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
1.0	14,300	105	8,500	65	7,150	50	18,700	205	44,000	330	24,700	200
1.5	9,350	150	5,550	85	5,600	80	12,100	205	27,500	385	20,300	300
2.0	7,850	160	5,150	100	4,300	80	9,350	220	22,000	460	16,500	340
3.0	6,100	180	3,800	120	3,150	100	6,050	220	15,400	460	11,000	340
4.0	5,150	255	3,150	155	2,650	130	4,600	220	11,000	460	8,800	340
5.0	4,300	270	2,550	160	2,150	135	3,650	220	9,150	460	6,800	340
6.0	3,800	300	2,300	190	1,950	155	2,950	255	7,600	485	5,700	375
8.0	2,850	325	1,700	170	1,450	155	2,200	275	5,700	485	4,400	375
10.0	2,200	280	1,350	135	1,150	135	1,850	285	4,600	485	3,400	375
12.0	1,850	240	1,150	110	950	110	1,450	295	3,750	485	2,850	375
14.0	1,700	215	1,050	100	850	100	1,300	310	3,300	485	2,400	375
16.0	1,500	185	950	95	700	95	1,100	320	2,850	485	2,200	375
20.0	1,150	145	700	70	550	70	900	340	2,200	485	1,700	375

Application tip



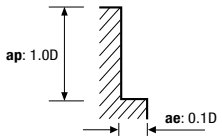


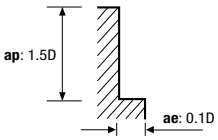
G-Star Endmill

TX204, TX224, TX304 series

Workpiece	Non-Alloy steels, alloy steels, Cast iron		Alloy steels, Heat resistant steels		Stainless steels		Cast iron		Aluminum alloys		Copper, Brass Non-ferrous metals	
Strength	~HRC30		HRC30~45		-		-		-		-	
Conditions	~1000N/mm²		1000~1500N/mm²		-		-		-		-	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
1.0	17,600	150	10,250	85	8,650	75	18,700	620	44,000	1,050	24,700	605
1.5	11,800	215	7,050	115	7,050	120	12,100	620	27500	1,160	20,300	910
2.0	9,850	240	6,450	145	5,350	120	9,350	640	22000	1,320	16,500	1,035
3.0	7,600	270	4,750	170	3,950	145	6,050	640	15400	1,320	11,000	1,035
4.0	6,450	485	3,950	300	3,300	240	4,600	640	11000	1,320	8,800	1,035
5.0	5,350	510	3,200	305	2,700	255	3,650	640	9150	1,320	6,800	1,035
6.0	4,750	560	2,850	350	2,400	280	2,950	770	7600	1,430	5,700	1,100
8.0	3,550	605	2,150	325	1,800	300	2,200	815	5700	1,430	4,400	1,100
10.0	2,750	520	1,700	255	1,450	255	1,850	860	4600	1,430	3,400	1,100
12.0	2,350	440	1,450	215	1,150	205	1,450	900	3750	1,430	2,850	1,100
14.0	2,100	395	1,300	195	1,050	190	1,300	945	3300	1,430	2,400	1,100
16.0	1,850	350	1,150	170	950	170	1,100	970	2850	1,430	2,200	1,100
20.0	1,450	270	900	135	700	130	900	1,035	2200	1,430	1,700	1,100

Application tip





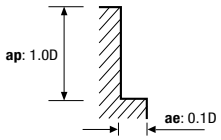
※ The Feed for long & extra long types, should be reduced by around 30~40%.

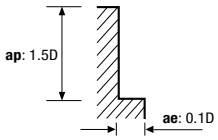
G-Star Endmill

TX304H series

Workpiece	Non-Alloy steels, alloy steels, Cast iron		Alloy steels, Heat resistant steels		Stainless steels		Cast iron		Aluminum alloys		Copper, Brass Non-ferrous metals	
Strength	≤ HRC30		HRC30~45		-		-		-		-	
Conditions	~1000N/mm²		1000~1500N/mm²		-		-		-		-	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
1.0	17,600	150	10,250	85	8,650	75	18,700	620	44,000	1,050	24,700	605
1.5	11,800	215	7,050	115	7,050	120	12,100	620	27,500	1,160	20,300	910
2.0	9,850	240	6,450	145	5,350	120	9,350	640	22,000	1,320	16,500	1,035
3.0	7,600	270	4,750	170	3,950	145	6,050	640	15,400	1,320	11,000	1,035
4.0	6,450	485	3,950	300	3,300	240	4,600	640	11,000	1,320	8,800	1,035
5.0	5,350	510	3,200	305	2,700	255	3,650	640	9,150	1,320	6,800	1,035
6.0	4,750	560	2,850	350	2,400	280	2,950	770	7,600	1,430	5,700	1,100
8.0	3,550	605	2,150	325	1,800	300	2,200	815	5,700	1,430	4,400	1,100
10.0	2,750	520	1,700	255	1,450	255	1,850	860	4,600	1,430	3,400	1,100
12.0	2,350	440	1,450	215	1,150	205	1,450	900	3,750	1,430	2,850	1,100
14.0	2,100	395	1,300	195	1,080	190	1,300	945	3,300	1,430	2,400	1,100
16.0	1,850	350	1,150	170	950	170	1,100	970	2,850	1,430	2,200	1,100
20.0	1,450	270	900	135	700	130	900	1,035	2,200	1,430	1,700	1,100

Application tip



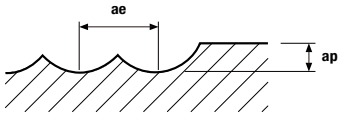


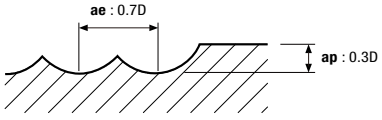
TXB202, TXB222, TXB232, TXB302 series

Workpiece	Carbon steels, Alloy steels, Tool steels				Hardened steels		Cast iron		Aluminum alloys	
Strength	≤ HRC30		HRC30~45		HRC45~50		-		-	
Conditions	~1000N/mm²		1000~1500N/mm²		1500N/mm²		-		-	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
2.0	12,350	640	9,150	415	4,000	125	10,500	220	30,800	395
3.0	11,400	575	8,550	390	3,800	125	7,050	230	20,500	395
4.0	8,950	630	7,150	450	3,600	150	5,150	285	15,400	395
5.0	7,800	700	6,200	490	3,100	150	4,150	330	12,100	470
6.0	7,250	870	5,900	705	2,700	160	3,400	360	10,300	470
8.0	6,100	1,090	4,900	785	2,050	190	2,500	460	7,900	540
10.0	5,450	1,330	4,350	870	1,750	190	2,050	460	6,150	540
12.0	4,990	1,500	3,950	950	1,500	210	1,750	460	5,150	630
14.0	4,530	1,495	3,600	925	1,300	210	1,400	460	4,300	630
16.0	4,085	1,470	3,200	905	1,150	210	1,300	460	3,850	540
18.0	3,800	1,425	3,000	890	1,050	210	1,100	460	3,400	540
20.0	3,550	1,425	2,800	885	950	210	1,050	420	2,950	540

Application tip

*ap : D1 ~ D6 = 0.2mm
D8 ~ D12 = 0.3mm
*ae : 0.2 × D





※ The Feed for long & extra long types, should be reduced by around 30~40%.

G-Star Endmill

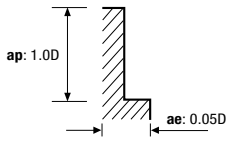
TXB204, TXB304 series

Workpiece	Alloy steels, Tool steels				Hardened steels		Cast iron		Aluminum alloys	
Strength	≤ HRC30		HRC30~45		HRC45~50		-		-	
Conditions	~1000N/mm²		1000~1500N/mm²		1500N/mm²		-		-	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
2.0	15,400	1,000	11,400	600	5,000	200	13,100	300	38,500	600
3.0	14,300	900	10,700	600	4,800	200	8,800	300	25,600	600
4.0	11,200	900	8,900	700	4,500	200	6,400	400	19,300	600
5.0	9,800	1,100	7,800	700	3,900	200	5,200	500	15,100	700
6.0	9,100	1,300	7,400	1,100	3,400	200	4,300	500	12,900	700
8.0	7,600	1,600	6,100	1,200	2,600	300	3,100	700	9,900	800
10.0	6,800	2,000	5,400	1,300	2,200	300	2,600	700	7,700	800
12.0	6,200	2,300	4,900	1,400	1,900	300	2,200	700	6,400	900
14.0	5,700	2,200	4,500	1,400	1,600	300	1,800	700	5,400	900
16.0	5,100	2,200	4,000	1,400	1,400	300	1,600	700	4,800	800
18.0	4,800	2,100	3,800	1,300	1,300	300	1,400	700	4,300	800
20.0	4,400	2,100	3,500	1,300	1,200	300	1,300	600	3,700	800

ZR304H, ZR324H series

Workpiece	Non-Alloyed steels Alloy steels · Cast iron		Alloy steels, Heat resistant steels		hardened steels	
Strength	~HRC30		HRC30~45		HRC30~45	
Conditions	~1000N/mm²		1000~1500N/mm²		1500~2000N/mm²	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
6.0	7,000	910	4,200	560	3,000	140
8.0	5,300	980	3,200	530	2,500	190
10.0	4,100	840	2,500	410	2,050	165
12.0	3,500	730	2,100	340	1,700	140

Application tip



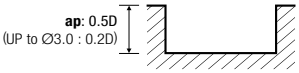
G-Star Endmill

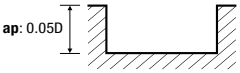
ZE302, ZE322, ZE402, ZE502, ZE522, ZE512 series

General Cutting

Workpiece	Alloy steels, Heat resistant steels		Hardened steels		Stainless steels	
Strength	HRC30~40		HRC40~50		-	
Conditions	1000~1250N/mm²		1250~1750N/mm²		-	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
2.0	9,700	220	6,350	135	5,300	105
3.0	7,500	240	4,670	160	3,880	135
4.0	6,350	345	3,880	205	3,250	175
5.0	5,300	370	3,170	220	2,650	185
6.0	4,670	405	2,830	255	2,380	205
8.0	3,530	435	2,120	230	1,760	205
10.0	2,730	380	1,680	185	1,420	185
12.0	2,310	320	1,420	150	1,140	150
16.0	1,850	255	1,140	125	890	125
20.0	1,420	195	890	90	705	90
25.0	1,150	150	705	80	580	70

Application tip





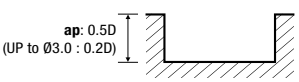
※ Please reduce cutting speed around 20~30% from the above table or ZE522, ZE322 series.

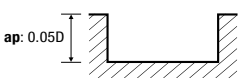
ZE302, ZE322, ZE402, ZE502, ZE522, ZE512 series

High Speed Cutting

Workpiece	Alloy steels, Heat resistant steels		Hardened steels				stainless steels	
Strength	HRC30~40		HRC40~50		HRC40~55		-	
Conditions	1000~1250N/mm²		1250~1750N/mm²		1750~2000N/mm²		-	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
2.0	18,000	665	11,800	415	8,700	175	9,800	345
3.0	11,000	655	6,800	435	5,600	185	6,200	370
4.0	10,300	725	6,300	430	4,300	185	5,300	370
5.0	9,350	715	5,570	420	3,700	185	4,620	355
6.0	8,200	750	4,930	470	3,250	185	4,100	390
8.0	6,300	770	3,780	410	2,470	185	3,120	355
10.0	4,830	750	2,940	360	2,000	160	2,470	310
12.0	4,100	750	2,520	345	1,680	160	2,100	300
16.0	3,260	715	2,000	355	1,890	150	1,940	290
20.0	2,520	665	1,580	310	1,680	150	1,630	275
25.0	2,000	635	1,260	340	1,570	150	1,420	290

Application tip





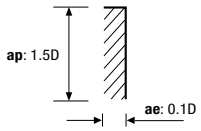
G-Star Endmill

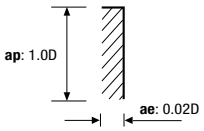
ZE304, ZE324, ZE404, ZE504, ZE524, ZE534, ZE514, ACE4 series

General Cutting

Workpiece	Non-Alloyed steels Alloy steels · Cast iron		Hardened steels				Stainless steels	
Strength	~HRC30		HRC30~45		HRC45~55		-	
Conditions	~1000N/mm²		1000~1500N/mm²		1500~2000N/mm²		-	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
2.0	12,100	320	7,900	195	2,700	47	6,600	160
3.0	9,400	370	5,840	230	2,000	58	4,850	195
4.0	7,900	655	4,850	405	1,500	58	4,070	320
5.0	6,600	690	3,970	415	1,300	58	3,320	345
6.0	5,830	760	3,530	470	1,150	58	2,980	380
8.0	4,410	815	2,650	435	880	58	2,200	405
10.0	3,420	700	2,100	345	720	46	1,760	345
12.0	2,880	600	1,760	290	590	46	1,430	275
16.0	2,310	470	1,430	230	460	29	1,150	230
20.0	1,760	370	1,110	185	340	29	880	175
25.0	1,430	290	880	150	270	23	715	140

Application tip





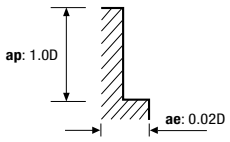
※ Please reduce cutting speed around 20~30% from the above table or ZE524 & ZE324 series.

ZE304, ZE324, ZE404, ZE504, ZE524, ZE534, ZE514, ACE4 series

High Speed Cutting

Workpiece	Non-Alloyed steels Alloy steels · Cast iron		Hardened steels				Stainless steels	
Strength	~HRC30		HRC30~45		HRC45~55		-	
Conditions	~1000N/mm²		1000~1500N/mm²		1500~2000N/mm²		-	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
2.0	31,400	1,230	23,500	520	12,600	275	21,600	465
3.0	19,300	1,210	13,600	735	8,900	390	13,500	660
4.0	18,100	1,330	12,600	865	7,090	465	11,800	775
5.0	16,400	1,310	11,100	1,010	6,040	530	10,300	910
6.0	14,400	1,380	9,900	1,100	5,300	580	9,100	990
8.0	11,000	1,430	7,600	1,090	3,990	575	6,900	980
10.0	8,500	1,380	5,880	1,110	3,150	580	5,420	1,000
12.0	7,200	1,380	5,040	1,090	2,620	575	4,600	985
16.0	5,700	1,320	3,990	1,010	2,000	535	3,590	910
20.0	4,400	1,270	3,150	930	1,580	490	2,840	840
25.0	3,500	1,170	2,520	755	1,260	390	2,270	680

Application tip



※ Please reduce cutting speed around 20~30% from the above table or ZE524 & ZE324 series.

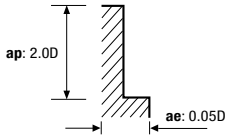
G-Star Endmill

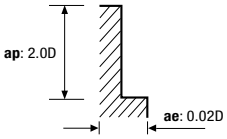
ZR322, ZR502, ZR512, ZR522 series

Side cutting

Workpiece	Non-Alloyed steels Alloy steels · Cast iron		Alloy steels, Heat resistant steels		hardened steels	
Strength	~HRC30		HRC30~45		HRC45~55	
Conditions	~1000N/mm²		1000~1500N/mm²		1500~2000N/mm²	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
3.0	6,950	195	4,500	150	3,300	100
4.0	5,600	240	3,600	170	2,700	105
5.0	4,800	250	3,050	210	2,350	125
6.0	4,150	250	2,650	210	2,050	125
8.0	3,150	265	2,000	210	1,600	125
10.0	2,150	265	1,700	210	1,250	125
12.0	1,800	210	1,500	185	1,050	105
16.0	1,800	185	1,100	140	840	90
20.0	1,300	130	860	105	625	65

Application tip



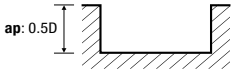


ZR322, ZR502, ZR512, ZR522 series

Slotting

Workpiece	Non-Alloyed steels Alloy steels · Cast iron		Alloy steels, Heat resistant steels		hardened steels	
Strength	~HRC30		HRC30~45		HRC45~55	
Conditions	~1000N/mm²		1000~1500N/mm²		1500~2000N/mm²	
Diameter (Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
3.0	6,950	160	4,500	80	3,300	55
4.0	5,600	195	3,600	100	2,700	60
5.0	4,800	240	3,050	115	2,350	75
6.0	4,150	290	2,650	145	2,050	90
8.0	3,150	210	2,000	145	1,600	90
10.0	2,150	250	1,700	140	1,250	90
12.0	1,800	200	1,500	135	1,050	75
16.0	1,800	215	1,100	100	840	60
20.0	1,300	160	860	70	625	45

Application tip



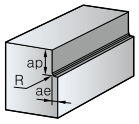
R+ Endmill

RPAE

*For Carbide

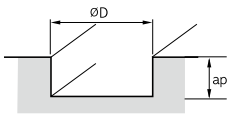
Workpiece / Conditions / Diameter (Ø)	Aluminum, Non-ferrous metal		Aluminum, Non-ferrous metal	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
6.0	13,000	1,125	13,000	1,400
8.0	10,400	1,300	10,400	1,600
10.0	10,400	1,585	10,400	2,000
12.0	10,400	1,950	10,400	1,650
14.0	7,800	1,675	7,800	2,050
16.0	7,800	1,755	7,800	2,250
18.0	5,200	1,300	5,200	1,700
20.0	5,200	1,495	5,200	1,800
25.0	5,000	1,495	5,000	1,800

Application tip



■ Shouldering depth(ap)

•ap : ≤ 1.5D
•ae : ≤ 0.15D



■ Slotting depth(ap)

•ap : ≤ 0.2D

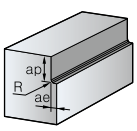
※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

RP(L)E-FP-H

*For Carbide

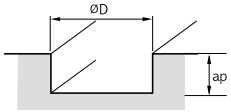
Workpiece / Conditions / Diameter (Ø)	Alloy steels, Carbon steels ≤HRC25		Alloy steels, Carbon steels, Pre-hardened steels HRC25~40		Alloy steels, Carbon steels ≤HRC25		Alloy steels, Carbon steels, Pre-hardened steels HRC25~40	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
6.0	12,000	1,550	10,600	1,100	15,800	2,570	14,300	1,850
8.0	9,000	1,650	8,100	1,180	11,900	2,700	10,700	1,950
10.0	7,200	1,650	6,400	1,180	9,500	2,700	8,500	1,950
12.0	6,000	1,540	5,400	1,140	8,000	2,570	7,100	1,850
14.0	5,200	1,540	4,750	1,095	7,000	2,510	6,250	1,800
16.0	4,500	1,540	4,100	1,050	6,000	2,450	5,400	1,750
18.0	4,400	1,435	3,650	975	5,400	2,295	4,850	1,625
20.0	3,600	1,330	3,200	900	4,800	2,140	4,300	1,500
25.0	3,200	1,200	2,800	850	4,400	2,000	3,800	1,400

Application tip



■ Shouldering depth(ap)

•ap : ≤ 1.0D
•ae : ≤ 0.5D (≤HRC25 Less than)
≤ 0.35D (HRC25~40)



■ Slotting depth(ap)

•ap : ≤ 1.0D (≤HRC25 Less than)
≤ 0.8D (HRC25~40)

※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

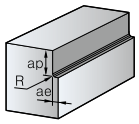
R+ Endmill

RPE-XG

*For Carbide

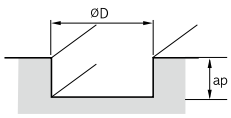
Workpiece / Conditions / Diameter (Ø)	Alloy steels, Carbon steels ≤HRC25		Alloy steels, Carbon steels, Pre-hardened steels HRC25~40		Alloy steels, Carbon steels ≤HRC25		Alloy steels, Carbon steels, Pre-hardened steels HRC25~40	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
6.0	12,000	1,090	10,600	770	15,800	1,800	14,300	1,300
8.0	9,000	1,160	8,100	830	11,900	1,890	10,700	1,370
10.0	7,200	1,160	6,400	830	9,500	1,890	8,500	1,370
12.0	6,000	1,080	5,400	800	8,000	1,800	7,100	1,300
14.0	5,200	1,080	4,750	770	7,000	1,760	6,250	1,260
16.0	4,500	1,080	4,100	740	6,000	1,720	5,400	1,230
18.0	4,400	1,000	3,650	680	5,400	1,610	4,850	1,140
20.0	3,600	930	3,200	630	4,800	1,500	4,300	1,050
25.0	3,200	840	2,800	600	4,400	1,400	3,800	980

Application tip



■ **Shouldering depth(ap)**

- ap : ≤ 1.0D
- ae : ≤ 0.5D (≤HRC25 Less than)
  ≤ 0.35D (HRC25~40)



■ **Slotting depth(ap)**

- ap : ≤ 1.0D (≤HRC25 Less than)
  ≤ 0.8D (HRC25~40)

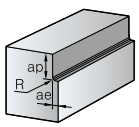
※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

RPE-FP-L

*For Carbide

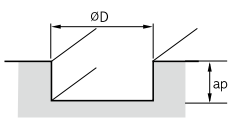
Workpiece / Conditions / Diameter (Ø)	Alloy steel, Carbon steels ≤HRC35		Pre-hardened steels HRC35~45		High hardened steels HRC45~55	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
6.0	12,400	840	8,400	570	3,400	260
8.0	9,200	840	6,300	570	2,400	240
10.0	7,600	840	5,100	570	2,000	290
12.0	6,000	840	4,200	570	1,680	260
14.0	5,200	840	3,600	570	1,400	200
16.0	4,800	760	3,300	510	1,200	160
18.0	4,400	720	2,700	420	1,100	150
20.0	3,600	560	2,400	360	1,000	150
25.0	3,200	620	2,160	410	900	160

Application tip



■ **Shouldering depth(ap)**

- ap : ≤ 1.0D
- ae : ≤ 0.3D (≤HRC45 Less than)
  ≤ 0.05D (HRC45~55)



■ **Slotting depth(ap)**

- ap : ≤ 0.3D (≤HRC45 Less than)
  ≤ 0.05D (HRC45~55)

※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

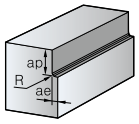
R+ Endmill

RPE-RG

* For Carbide

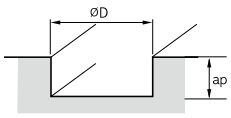
Workpiece / Conditions / Diameter (Ø)	Alloy steels, Carbon steels ≤HRC25		Alloy steels, Carbon steels, Pre-hardened steels HRC25~40		Alloy steels, Carbon steels ≤HRC25		Alloy steels, Carbon steels, Pre-hardened steels HRC25~40	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
6.0	12,000	1,240	10,600	800	15,800	2,060	14,300	1,480
8.0	9,000	1,320	8,100	940	11,900	2,160	10,700	1,560
10.0	7,200	1,320	6,400	940	9,500	2,160	8,500	1,560
12.0	6,000	1,230	5,400	910	8,000	2,060	7,100	1,480
14.0	5,200	1,230	4,750	880	7,000	2,010	6,250	1,440
16.0	4,500	1,230	4,100	840	6,000	1,960	5,400	1,400
18.0	4,400	1,150	3,650	780	5,400	1,840	4,850	1,300
20.0	3,600	1,060	3,200	720	4,800	1,710	4,300	1,200
25.0	3,200	960	2,800	680	4,400	1,600	3,800	1,120

Application tip



■ Shouldering depth(ap)

- ap : ≤ 1.0D
- ae : ≤ 0.5D (≤HRC25 Less than)
  ≤ 0.35D (HRC25~40)



■ Slotting depth(ap)

- ap : ≤ 1.0D (≤HRC25 Less than)
  ≤ 0.8D (HRC25~40)

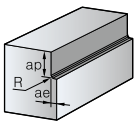
※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

RPE-FF, FP, RG

* For HSS PM

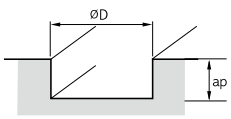
Workpiece / Conditions / Diameter (Ø)	Alloy steels, Carbon steels ≤HRC25		Alloy steels, Carbon steels, Pre-hardened steels HRC25~40		Alloy steels, Carbon steels ≤HRC25		Alloy steels, Carbon steels, Pre-hardened steels HRC25~40	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
6.0	2,700	200	2,100	155	1,500	100	1,250	90
8.0	2,300	250	1,800	200	1,300	140	1,000	110
10.0	1,800	360	1,400	275	1,000	170	850	140
12.0	1,500	360	1,150	290	850	200	700	155
14.0	1,300	360	1,000	290	720	200	600	155
16.0	1,150	360	900	290	625	200	520	155
18.0	1,000	360	850	290	580	200	470	155
20.0	920	370	720	290	500	200	420	155
22.0	850	370	620	290	450	200	380	155
25.0	750	360	570	275	400	190	340	155

Application tip



■ Shouldering depth(ap)

- ap : ≤ 1.5D (All dia.)
- ae : ≤ 0.5D (All dia.)



■ Slotting depth(ap)

- ap : ≤ 0.15D

※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

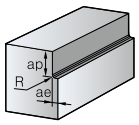
R+ Endmill

RPE-RG

*For HSS PM

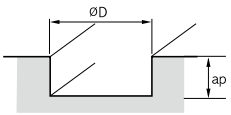
Workpiece / Conditions / Diameter (Ø)	Alloy steels, Carbon steels, Tool steels		Alloy steels, Carbon steels, Tool steels ≤HRC20		Alloy steels, Carbon steels, Tool steels HRC20~30		Alloy steels, Carbon steels, Tool steels HRC30~40	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
6.0	1,800	80	1,600	60	1,200	55	800	30
8.0	1,400	105	1,100	75	900	65	560	45
10.0	1,100	150	900	120	800	110	450	60
12.0	900	180	800	140	630	110	400	70
14.0	800	180	700	140	560	110	350	70
16.0	700	180	560	140	450	110	280	70
18.0	630	180	500	140	400	110	250	70
20.0	560	180	450	140	400	110	220	70
22.0	500	220	450	170	350	140	220	70
25.0	450	220	400	170	310	140	180	85
28.0	400	210	350	160	280	130	160	85
30.0	350	210	310	160	250	130	160	85
32.0	350	210	280	160	220	130	140	85
36.0	310	210	250	160	200	130	120	85
40.0	280	200	220	150	180	120	110	80
50.0	220	200	180	170	160	140	90	80

Application tip



■ Shouldering depth(ap)

- ap : ≤ 1.5D
- ae : ≤ 0.1D



■ Slotting depth(ap)

- ap : ≤ 0.15D

※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

S-Star Endmill

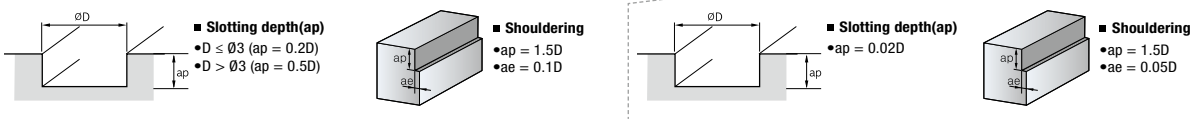
SPFE2000(Flat)

Workpiece / Conditions / Diameter (Ø)	Alloy steel, Cast iron						Stainless steel				Titanium		Inconel	
	~HRC20		~HRC30		HRC30~45		300 Series		400 Series					
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
1.0	31,800	570	30,100	570	28,700	570	22,300	450	31,800	640	22,300	520	9,600	190
1.2	26,500	480	25,100	480	23,900	480	18,600	370	26,500	530	18,600	430	8,000	160
1.5	21,200	380	20,100	380	19,100	380	14,900	300	21,200	420	14,900	340	6,400	130
2.0	15,900	430	15,000	430	14,300	430	11,100	270	15,900	380	11,100	260	4,800	100
2.5	12,700	410	12,000	410	11,500	410	8,900	250	12,700	360	8,900	310	3,800	110
3.0	11,700	420	11,100	420	10,600	420	8,500	340	11,700	470	8,500	290	4,200	130
4.0	8,800	480	8,400	480	8,000	480	6,400	380	8,800	530	6,400	300	3,200	130
5.0	7,000	510	6,700	510	6,400	510	5,100	410	7,000	560	5,100	290	2,500	130
6.0	5,800	520	5,600	530	5,300	530	4,200	420	5,800	580	4,200	290	2,100	130
8.0	4,400	520	4,200	520	4,000	520	3,200	420	4,400	570	3,200	260	1,600	110
10.0	3,500	440	3,300	440	3,200	450	2,500	350	3,500	490	2,500	250	1,300	110
12.0	2,900	420	2,800	430	2,700	430	2,100	340	2,900	460	2,100	240	1,100	110
14.0	2,500	370	2,400	380	2,300	380	1,800	200	2,500	280	1,800	250	900	110
16.0	2,200	340	2,100	340	2,000	340	1,600	270	2,200	370	1,600	260	800	110
18.0	1,900	310	1,900	320	1,800	320	1,400	270	1,900	360	1,400	240	700	110
20.0	1,800	320	1,700	320	1,600	320	1,300	260	1,800	360	1,300	240	600	100

SPFE3000(Flat)

Workpiece / Conditions / Diameter (Ø)	Alloy steel, Cast iron						Stainless steel				Titanium		Inconel	
	~HRC20		~HRC30		HRC30~45		300 Series		400 Series					
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
1.0	35,000	950	33,400	950	31,800	950	22,300	670	31,800	950	22,300	770	9,600	290
1.2	29,200	790	27,900	800	26,500	800	18,600	560	26,500	800	18,600	640	8,000	240
1.5	23,400	630	22,300	640	21,200	640	14,900	450	21,200	640	14,900	520	6,400	190
2.0	17,500	710	16,700	710	15,900	720	11,100	400	15,900	570	11,100	380	4,800	140
2.5	14,000	680	13,400	690	12,700	690	8,900	370	12,700	530	8,900	460	3,800	170
3.0	12,700	690	12,300	700	11,700	700	8,500	510	11,700	700	8,500	440	4,200	190
4.0	9,600	780	9,200	790	8,800	790	6,400	580	8,800	790	6,400	440	3,200	190
5.0	7,600	820	7,400	840	7,000	840	5,100	610	7,000	840	5,100	440	2,500	190
6.0	6,400	870	6,100	870	5,800	870	4,200	630	5,800	870	4,200	440	2,100	190
8.0	4,800	840	4,600	850	4,400	860	3,200	620	4,400	860	3,200	390	1,600	170
10.0	3,800	720	3,700	740	3,500	740	2,500	530	3,500	740	2,500	370	1,300	170
12.0	3,200	690	3,100	710	2,900	700	2,100	500	2,900	700	2,100	360	1,100	170
14.0	2,700	610	2,600	620	2,500	620	1,800	300	2,500	410	1,800	370	900	160
16.0	2,400	550	2,300	560	2,200	560	1,600	410	2,200	560	1,600	390	800	170
18.0	2,100	510	2,000	510	1,900	510	1,400	400	1,900	540	1,400	360	700	160
20.0	1,900	510	1,800	510	1,800	540	1,300	390	1,800	540	1,300	360	600	140

Application tip



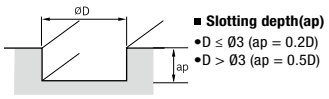
※ The data on the chart above is the shouldering cutting condition. In slotting, set the RPM and feed to 70% of the condition shown above.

S-Star Endmill

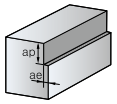
SPFE4000(Flat)/SPRE4000(Radius)

Workpiece / Conditions / Diameter (Ø)	Alloy steel, Cast iron						Stainless steel				Titanium		Inconel	
	~HRC20		~HRC30		HRC30~45		300 Series		400 Series					
	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
1.0	35,000	1,260	33,400	1,270	31,800	1,270	22,300	890	31,800	1,270	22,300	1,030	9,600	380
1.2	29,200	1,050	27,900	1,060	26,500	1,060	18,600	740	26,500	1,060	18,600	860	8,000	320
1.5	23,400	840	22,300	850	21,200	850	14,900	600	21,200	850	14,900	690	6,400	260
2.0	17,500	950	16,700	950	15,900	950	11,100	530	15,900	760	11,100	510	4,800	190
2.5	14,000	910	13,400	920	12,700	910	8,900	500	12,700	710	8,900	620	3,800	230
3.0	12,700	920	12,300	930	11,700	940	8,500	680	11,700	940	8,500	590	4,200	250
4.0	9,600	1,040	9,200	1,050	8,800	1,060	6,400	770	8,800	1,060	6,400	590	3,200	260
5.0	7,600	1,100	7,400	1,120	7,000	1,120	5,100	820	7,000	1,120	5,100	590	2,500	250
6.0	6,400	1,160	6,100	1,160	5,800	1,160	4,200	840	5,800	1,160	4,200	580	2,100	250
8.0	4,800	1,130	4,600	1,140	4,400	1,140	3,200	830	4,400	1,140	3,200	520	1,600	220
10.0	3,800	960	3,700	980	3,500	980	2,500	700	3,500	980	2,500	500	1,300	220
12.0	3,200	920	3,100	940	2,900	930	2,100	670	2,900	930	2,100	490	1,100	220
14.0	2,700	810	2,600	820	2,500	830	1,800	400	2,500	550	1,800	500	900	220
16.0	2,400	740	2,300	740	2,200	750	1,600	540	2,200	750	1,600	520	800	220
18.0	2,100	680	2,000	680	1,900	680	1,400	530	1,900	720	1,400	490	700	210
20.0	1,900	690	1,800	680	1,800	720	1,300	520	1,800	720	1,300	480	600	190

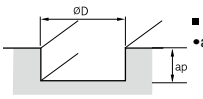
Application tip



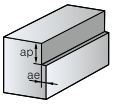
■ Slotting depth(ap)
•D ≤ Ø3 (ap = 0.2D)
•D > Ø3 (ap = 0.5D)



■ Shouldering
•ap = 1.5D
•ae = 0.1D



■ Slotting depth(ap)
•ap = 0.02D



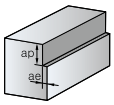
■ Shouldering
•ap = 1.5D
•ae = 0.05D

※ The data on the chart above is the shouldering cutting condition. In slotting, set the RPM and feed to 70% of the condition shown above.

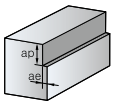
SPFE6000(Flat)

Workpiece / Conditions / Diameter (Ø)	Alloy steel, Cast iron						Stainless steel				Titanium		Inconel	
	~HRC20		~HRC30		HRC30~45		300 Series		400 Series					
	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
6.0	6,400	1,730	6,100	1,740	5,800	1,160	4,200	840	5,800	1,160	4,200	580	2,100	250
8.0	4,800	1,690	4,600	1,700	4,400	1,140	3,200	830	4,400	1,140	3,200	520	1,600	220
10.0	3,800	1,440	3,700	1,480	3,500	980	2,500	700	3,500	980	2,500	500	1,300	220
12.0	3,200	1,390	3,100	1,410	2,900	930	2,100	670	2,900	930	2,100	490	1,100	220
16.0	2,400	1,100	2,300	1,110	2,200	750	1,600	540	2,200	750	1,600	520	800	220
20.0	1,900	1,030	1,800	1,030	1,800	720	1,300	520	1,800	720	1,300	480	600	190

Application tip



■ Shouldering
•ap = 1.5D
•ae = 0.1D



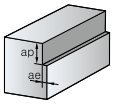
■ Shouldering
•ap = 1.5D
•ae = 0.05D

S-Star Endmill

SPRE5000/SPRE7000(Radius)

Workpiece	Alloy steel, Cast iron						Stainless steel				Titanium		Inconel	
Conditions	~HRC20		~HRC30		HRC30~45		300 Series		400 Series					
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
6.0	6,400	1,370	6,100	1,450	5,800	1,450	4,200	1,050	5,800	1,450	4,200	730	2,100	320
8.0	4,800	1,330	4,600	1,420	4,400	1,430	3,200	1,040	4,400	1,430	3,200	650	1,600	280
10.0	3,800	1,140	3,700	1,230	3,500	1,230	2,500	880	3,500	1,230	2,500	620	1,300	280
12.0	3,200	1,090	3,100	1,180	2,900	1,160	2,100	840	2,900	1,160	2,100	610	1,100	280
16.0	2,400	870	2,300	930	2,200	940	1,600	680	2,200	940	1,600	650	800	280
20.0	1,900	810	1,800	860	1,800	900	1,300	650	1,800	900	1,300	600	600	240

Application tip

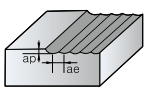


■ Shouldering
•ap = 1.0D
•ae = 0.05D

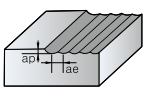
SPBE2000(Ball)

Workpiece	Alloy steel, Cast iron						Stainless steel				Titanium		Inconel	
Conditions	~HRC20		~HRC30		HRC30~45		300 Series		400 Series					
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
2.0	27,100	1,850	25,500	1,940	23,900	1,910	15,900	950	23,900	1,430	20,700	480	9,600	190
4.0	17,500	1,200	16,700	1,270	15,900	1,270	11,900	830	14,300	1,000	11,900	550	6,400	260
6.0	11,700	1,000	11,100	1,050	10,600	1,060	8,000	700	9,600	840	8,000	550	4,200	250
8.0	8,800	900	8,400	960	8,000	960	6,000	700	7,200	840	6,000	490	3,200	220
10.0	7,000	840	6,700	890	6,400	900	4,800	650	5,700	780	4,800	480	2,500	220
12.0	5,800	790	5,600	850	5,300	850	4,000	650	4,800	780	4,000	460	2,100	210

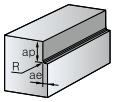
Application tip

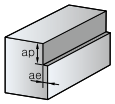


■ Shouldering
•ap = 0.1D
•ae = 0.2D



■ Shouldering
•ap = 0.05D
•ae = 0.1D



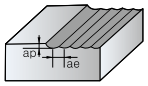


S-Star Endmill

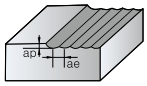
SPBE4000(Ball)

Workpiece / Conditions / Diameter (Ø)	Alloy steel, Cast iron						Stainless steel				Titanium		Inconel	
	~HRC20		~HRC30		HRC30~45		300 Series		400 Series					
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
3.0	21,200	2,900	20,200	3,070	19,100	3,060	15,900	1,910	19,100	2,290	15,900	1,100	8,500	510
4.0	17,500	2,630	16,700	2,790	15,900	2,800	11,900	1,670	14,300	2,000	11,900	1,100	6,400	510
5.0	14,000	2,390	13,400	2,550	12,700	2,540	9,600	1,500	11,500	1,790	9,600	1,110	5,100	510
6.0	11,700	2,000	11,100	2,110	10,600	2,120	8,000	1,410	9,600	1,690	8,000	1,110	4,200	500
8.0	8,800	1,810	8,400	1,920	8,000	1,920	6,000	1,390	7,200	1,670	6,000	970	3,200	450
10.0	7,000	1,680	6,700	1,780	6,400	1,790	4,800	1,310	5,700	1,550	4,800	950	2,500	430
12.0	5,800	1,690	5,600	1,810	5,300	1,800	4,000	1,300	4,800	1,560	4,000	920	2,100	420
16.0	4,400	1,350	4,200	1,440	4,000	1,440	3,000	1,020	3,600	1,220	3,000	970	1,600	450
20.0	3,500	1,140	3,300	1,190	3,200	1,220	2,400	860	2,900	1,040	2,400	890	1,300	420

Application tip



■ Shouldering
•ap = 0.1D
•ae = 0.2D

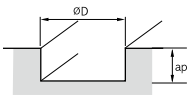


■ Shouldering
•ap = 0.05D
•ae = 0.1D

SPXE3000/4000/5000(Roughing)

Workpiece / Conditions / Diameter (Ø)	Stainless steel			
	300 Series		400 Series	
	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
3.0	5,300	360	6,400	440
4.0	4,800	350	5,700	410
5.0	4,800	360	5,700	430
6.0	4,500	360	5,400	430
7.0	3,900	360	4,600	420
8.0	3,400	340	4,100	410
9.0	3,000	320	3,600	390
10.0	2,700	320	3,200	380
12.0	2,300	290	2,700	330
14.0	1,900	240	2,300	290
16.0	1,700	220	2,000	260
20.0	1,400	190	1,600	220

Application tip



■ Slotting depth(ap)
•D3~D5 = 0.3D
•D6~D10 = 0.25D
•D12~D16 = 0.15D
•D18~D20 = 0.1D

If chattering is occurred even though workpiece is rigidly clamped, lower RPM and feed at the same rate shown in the chart above

※ Notice

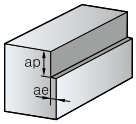
- Please adjust the recommended cutting conditions properly, according to the condition of your machines, the target shapes, and your purpose for machining
- Please set the machine with high rigidity and check the workpiece's clamping status
- Please select proper coolant oil for workpiece materials and check if the pressure and amount of coolant oil is adequate for machining
- In case of chattering, reduce RPM and feed rate by the same ratio

A-Star Endmill

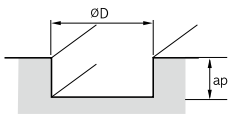
APFE / AFE

Tool	Shouldering depth(ap)				Slotting depth(ap)			
Workpiece / Conditions	Aluminum alloy (A7075)		Aluminum alloy mold (AC4B)		Aluminum alloy (A7075)		Aluminum alloy mold (AC4B)	
Diameter (Ø)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
1.0	40,000	480	40,000	368	40,000	368	40,000	280
2.0	40,000	880	38,000	680	38,000	680	32,000	440
3.0	32,000	1,120	25,000	760	25,000	760	21,000	480
4.0	24,000	1,200	19,000	800	19,000	800	13,000	520
5.0	19,000	1,280	15,000	880	15,000	800	13,000	560
6.0	16,000	1,520	13,000	960	13,000	880	11,000	600
8.0	12,000	1,520	9,500	960	9,500	960	8,000	640
10.0	9,500	1,520	7,600	960	7,600	960	6,400	640
12.0	8,000	1,520	6,400	960	6,400	960	5,300	640
16.0	6,000	1,520	4,800	960	4,800	800	4,000	576
20.0	4,800	1,200	3,800	800	3,800	776	3,200	528

Application tip



■ Shouldering
- ap : ≤ 2.0D
- ae : ≤ 0.2D (D < Ø3)
  ≤ 0.5D (D ≥ Ø3)



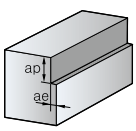
■ Slotting depth(ap)
- ap : ≤ D (Maximum: 12mm)

※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

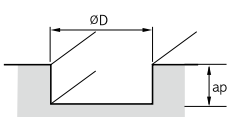
RPAE / APRE

Tool	Shouldering depth(ap)				Slotting depth(ap)			
Workpiece / Conditions	Aluminum alloy (A7075)		Aluminum alloy mold (AC4B)		Aluminum alloy (A7075)		Aluminum alloy mold (AC4B)	
Diameter (Ø)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
4.0	20,000	8,000	16,000	6,400	15,000	5,000	12,000	4,000
5.0	16,000	6,500	12,800	5,200	12,000	4,000	9,600	3,200
6.0	13,500	6,000	10,800	4,800	10,500	3,800	8,400	3,100
8.0	10,500	4,700	8,400	3,800	8,000	3,000	6,400	2,400
10.0	8,500	3,800	6,800	3,100	6,500	2,500	5,200	2,000
12.0	6,800	3,050	5,500	2,500	5,250	2,000	4,200	1,600
14.0	5,800	2,600	4,700	2,100	4,500	1,700	3,600	1,400
16.0	5,200	2,350	4,200	1,900	4,000	1,500	3,200	1,200
18.0	4,700	2,100	3,800	1,700	3,550	1,300	2,900	1,100
20.0	4,200	1,900	3,400	1,600	3,200	1,200	2,600	1,000
25.0	3,400	1,500	2,800	1,200	2,550	1,000	2,100	800

Application tip



■ Shouldering
- ap : ≤ 1.5D
- ae : ≤ 0.5D



■ Slotting depth(ap)
- ap : ≤ 1.5D

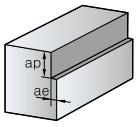
※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

D Endmill

Flat type

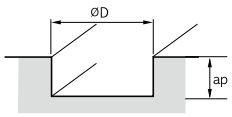
Tool	DFE2000 (Slotting)		DFE2000 (Shouldering)		DFE4000 (Shouldering)	
Workpiece	Graphite					
Conditions / Diameter (Ø)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
1.0	40,000	500	40,000	700	-	-
2.0	25,000	570	25,000	800	25,000	1,600
3.0	20,000	570	20,000	800	20,000	1,600
4.0	18,000	680	18,000	950	18,000	1,900
5.0	14,000	960	14,000	1,200	14,000	2,400
6.0	11,000	1,000	11,000	1,400	11,000	2,800
8.0	8,000	930	8,000	1,300	8,000	2,600
10.0	6,500	860	6,500	1,200	6,500	2,400
12.0	5,500	860	5,500	1,200	5,500	2,400

Application tip



■ Shouldering depth(ap)

•D ≤ Ø2.5, ap = 1.5D, ae = 0.05D
•D > Ø2.5, ap = 1.5D, ae = 0.1D



■ Slotting depth(ap)

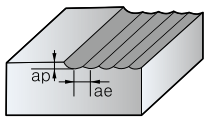
•D ≤ Ø2.5, ap = 0.3D
•D > Ø2.5, ap = 0.5D

※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

Ball type

Tool	DBE2000		DBE4000	
Workpiece	Graphite			
Conditions / Diameter (Ø)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
1.0	16,000	400	-	-
2.0	16,000	800	16,000	1,200
3.0	16,000	1,450	16,000	2,000
4.0	16,000	2,100	16,000	3,100
5.0	15,500	2,550	15,000	3,800
6.0	15,000	2,950	15,000	4,400
8.0	13,000	3,000	13,000	4,500
10.0	11,500	3,000	12,000	4,600
12.0	10,700	3,200	10,000	4,700

Application tip



■ Slotting depth(ap)

• ap = 0.2D
• ae = 0.2D

※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

※ Notice

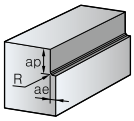
- Cutting conditions are up to the machine's condition and the shape of cutting
- Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio
- When the overhang is longer than 3D, reduce RPM and feed rate

Composite Router Endmill

CCDR

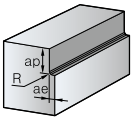
Tool	Rough shouldering				Fine shouldering			
Workpiece	CFRP		GFRP		CFRP		GFRP	
Conditions / Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
6.0	7,960	1,114	3,980	557	10,610	1,910	5,310	743
8.0	5,970	1,075	2,980	536	7,960	1,910	3,980	716
10.0	4,770	1,717	2,390	860	6,370	3,058	3,180	1,145
12.0	3,980	1,672	1,990	836	5,310	3,027	2,650	1,113

Application tip



■ Rough shouldering

•ap : = 1D
•ae : = 0.4D

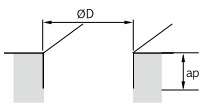


■ Fine shouldering

•ap : = 1D
•ae : = 0.02D

Tool	CCDR (Slotting depth(ap))			
Workpiece	CFRP		GFRP	
Conditions / Diameter (Ø)	R.P.M n (min-1)	Feed vf (mm/min)	R.P.M n (min-1)	Feed vf (mm/min)
6.0	5,310	531	3,710	371
8.0	3,980	478	2,790	335
10.0	3,180	763	2,230	535
12.0	2,650	716	1,860	502

Application tip



■ Slotting depth(ap)

•CFRP, ap : = 1D
•GFRP, ap : = 0.8D

※ Notice

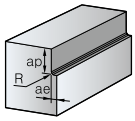
- Please adjust the recommended cutting conditions properly, according to the types of CFRP or GFRP, the workpiece shapes, clamping conditions, and the rigidity of your machines
- In case of machining troubles such as peeling, burrs and flaking, reduce feed rate by the same ratio
- It is highly recommended to use purified water for high-pressure wet machining because cutting heat may cause troubles
- Please provide against dust before machining begins

Composite Router Endmill

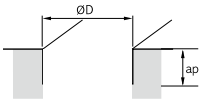
CCR

Tool	Roughing shouldering				Slotting			
Workpiece / Conditions	CFRP		GFRP		CFRP		GFRP	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
4.0	15,920	1,020	7,960	510	7,960	340	3,980	170
5.0	12,730	1,270	6,370	640	6,370	430	3,180	210
6.0	10,610	1,270	5,310	640	5,310	430	2,650	210
8.0	7,960	1,340	3,980	670	3,980	450	1,990	230
10.0	6,370	1,530	3,180	760	3,180	510	1,590	260
12.0	5,310	1,720	2,650	860	2,650	580	1,330	290

Application tip



■ Rough shouldering
- ap : = 2D
- ae : = 0.35D

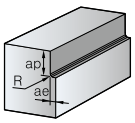


■ Slotting depth(ap)
- CFRP, ap : = 1D
- CFRP, ae : = 1D

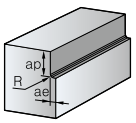
CCLR/CCRR

Tool	Roughing shouldering				Fine shouldering			
Workpiece / Conditions	CFRP		GFRP		CFRP		GFRP	
Diameter (Ø)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)	R.P.M n (min -1)	Feed vf (mm/min)
4.0	15,920	1,530	7,960	510	15,920	1,275	7,960	380
5.0	12,730	1,530	6,370	510	12,730	1,275	6,370	380
6.0	10,610	1,530	5,310	510	10,610	1,275	5,310	380
8.0	7,960	1,530	3,980	510	7,960	1,275	3,980	380
10.0	6,370	1,530	3,180	510	6,370	1,275	3,180	380
12.0	5,310	1,530	2,650	510	5,310	1,275	2,650	380

Application tip



■ Rough shouldering
- CFRP, ap : = 2D, ae : = 0.4
- GFRP, ap : = 2D, ae : = 0.3



■ Fine shouldering
- ap : = 2D
- ae : = 0.1D

※ In case of CCRR, increase feed rate, vf (mm/min) by 30%.

※ Notice

- Please adjust the recommended cutting conditions properly, according to the types of CFRP or GFRP, the workpiece shapes, clamping conditions, and the rigidity of your machines
- In case of machining troubles such as peeling, burrs and flaking, reduce feed rate by the same ratio
- It is highly recommended to use purified water for high-pressure wet machining because cutting heat may cause troubles
- Please provide against dust before machining begins

T Endmill

Titanium / Co-Cr

Diameter (Ø)	Application	ap (mm)	ae (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
3.0	Roughing	0.12	0.7	10,500	1,150
2.5	Medium cutting	0.08	0.53	11,500	850
2.0	Medium cutting	0.08	0.42	14,500	850
1.5	Finishing	0.04	0.32	19,000	850
1.0	Finishing	0.02	0.07	28,500	850
0.6	Finishing	0.02	0.07	28,500	850

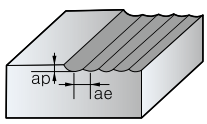
Zirconia

Diameter (Ø)	Application	ap (mm)	ae (mm)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
3.0	Roughing	0.5	1.5	23,500	1,600
2.5	Medium cutting	0.3	1.25	28,000	1,200
2.0	Finishing	0.3	1.0	35,000	1,200
1.0	Finishing	0.1	0.2	38,500	1,050
0.6	Finishing	0.1	0.2	63,500	630

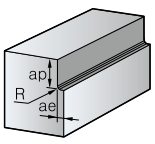
C-Max

Tool	CBE/CBNE		CFE/CFNE		CRE/CRNE	
Workpiece	Copper Alloys					
Conditions / Diameter (Ø)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)	R.P.M n (min $^{-1}$)	Feed vf (mm/min)
0.5	40,000	2,600	40,000	1,800	-	-
1.0	40,000	2,800	40,000	2,000	40,000	2,000
1.5	40,000	3,200	40,000	2,400	30,000	2,400
2.0	40,000	3,600	30,000	1,800	30,000	1,800
3.0	40,000	4,000	23,000	1,380	20,000	1,380
4.0	32,000	3,200	15,000	900	15,000	900
5.0	25,000	2,500	12,000	750	12,000	750
6.0	21,000	2,100	10,000	600	10,000	600
8.0	16,000	1,600	8,000	480	8,000	480
10.0	13,000	1,300	6,400	384	6,400	384
12.0	9,000	900	5,400	324	5,400	324

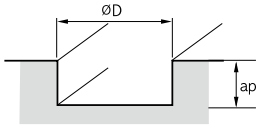
Application tip



■ **Shouldering**
•ap = 0.1D
•ae = 0.2D



■ **Shouldering**
•ap = 1.5D
•ae = 0.1D



■ **Slotting depth(ap)**
•ap ≤ 1.5D

- Please adjust the above cutting conditions according to the state of your machine, the target shape and your purpose
- Workpieces should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

PCD Endmill

Workpiece	vc (m/min)	n (min $^{-1}$)	fz (mm/t)
Aluminum Alloy, Copper	30~300	2,000~12,000	0.02~0.07
Reinforced Plastic	35~300	2,800~16,000	0.04~0.12
Carbon steel, Graphite	10~100	5,300~16,000	0.04~0.2

MSD Plus

Workpiece			HB	Grade	vc (m/min)	Feed rate (mm/rev) per drill dia. (mm) (Depth of cut = 3D~7D)				
ISO	Workpiece material					Ø1.0~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0	Ø12.1~Ø16.0	Ø16.1~Ø20.0
P	Carbon steel	Low carbon steel	80~120	PC325U	90 (80~150)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		High carbon steel	over 250	PC325U	50 (40~80)	0.08~0.20	0.08~0.20	0.10~0.25	0.15~0.25	0.15~0.30
	Alloy steel	Low alloy steel	140~260	PC325U	90 (80~150)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		Hardened low alloy steel	200~400	PC325U	60 (50~100)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		High alloy steel	50~260	PC325U	50 (40~80)	0.08~0.20	0.08~0.20	0.10~0.25	0.15~0.25	0.15~0.30
		Hardened high alloy steel	over 250	PC325U	50 (40~80)	0.08~0.20	0.08~0.20	0.10~0.25	0.15~0.25	0.15~0.30
M	Stainless steel	Austenite series	135~275	PC325U	45 (25~80)	0.05~0.20	0.05~0.20	0.10~0.25	0.10~0.25	0.15~0.30
		Ferrite series Martensite series	135~275	PC325U	50 (30~80)	0.05~0.20	0.05~0.20	0.10~0.25	0.10~0.25	0.15~0.30
K	Cast iron	Gray cast iron	150~230	PC325U	100 (80~150)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		Ductile cast iron	160~260	PC325U	90 (70~140)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
N	Aluminum	Aluminum alloy	30~150	FG2	150 (125~220)	0.24~0.38	0.38~0.53	0.53~0.75	0.61~0.85	0.68~0.98
	Copper alloy	Copper alloy	150~160	FG2	150 (125~220)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40

• Cutting conditions above are for the case of less than 5D depth of cut and through coolant system applied
• In case of external coolant system, reduce the above feed values by 20%

MSD Plus-S

Workpiece			HB	Grade	vc (m/min)	Feed rate (mm/rev) per drill dia. (mm) (Depth of cut = 3D~5D)			
ISO	Workpiece material					Ø2.5~Ø5.0	Ø5.1~Ø8.0	Ø8.1~Ø12.0	Ø12.1~Ø16.0
S	Heat resistant alloy	Fe-base	25~35	PC325T	25~30	0.055~0.07	0.07~0.10	0.08~0.13	0.10~0.15
		Ni or Co base	35~45	PC325T	20~25	0.045~0.06	0.06~0.09	0.07~0.12	0.09~0.14
	Titanium	Pure titanium	10~15	PC325T	40~50	0.07~0.11	0.09~0.14	0.12~0.18	0.16~0.23
		α and β alloys	35~45	PC325T	30~40	0.05~0.09	0.07~0.12	0.10~0.16	0.14~0.21

• Cutting conditions above are for the case of less than 5D depth of cut and through coolant system applied

MSD Plus for CFRP

Workpiece	Grade	vc (m/min)	Feed rate (mm/rev) per drill dia. (mm) (Depth of cut = 5D)		
			Ø2.5~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0
CFRP	ND2100	100 (100~150)	0.03 ~ 0.07	0.03 ~ 0.07	0.03 ~ 0.07

MSFD

Workpiece			Grade	Cutting speed, vc (m/min)	Feed rate (mm/rev) per drill dia. (mm) (Depth of cut = 2D~3D)		
ISO	Workpiece material	HB	Recommended		Ø2.5~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0
P	Carbon steel	Low carbon steel	80~120	PC325U	75 (60~90)	0.03~0.10	0.05~0.15	0.10~0.20
		High carbon steel	180~280	PC325U	75 (60~80)	0.03~0.10	0.05~0.15	0.10~0.20
	Alloy steel	Low alloy steel	140~260	PC325U	65 (50~80)	0.03~0.10	0.05~0.15	0.10~0.20
		High alloy steel	50~260	PC325U	65 (50~80)	0.03~0.10	0.05~0.15	0.10~0.20

MLD Plus

Workpiece			Grade	vc (m/min)	Feed rate (mm/rev) per drill dia. (mm) (Depth of cut = 10D ~ 25D)		
ISO		Workpiece material	HB	Recommended		Ø3.0~Ø5.0	Ø5.1~Ø8.0	Ø8.1~Ø10.0
P	Carbon steel	Low carbon steel	80~120	PC315G	80 (60~90)	0.10~0.15	0.15~0.20	0.20~0.25
		High carbon steel	180~280	PC315G	70 (60~80)	0.10~0.15	0.15~0.20	0.20~0.25
	Alloy steel	Low alloy steel	140~260	PC215G	80 (60~90)	0.10~0.15	0.12~0.17	0.15~0.20
		Low carbon steel	50~260	PC215G	70 (60~80)	0.08~0.15	0.10~0.15	0.15~0.20
K	Cast iron	Gray cast iron	150~230	PC215G	80 (60~100)	0.10~0.20	0.15~0.20	0.15~0.20
		Ductile cast iron	160~260	PC215G	70 (60~80)	0.10~0.20	0.15~0.20	0.15~0.20
N	Aluminum	Aluminum alloy	30~150	FG2	120 (100~150)	0.12~0.17	0.15~0.20	0.20~0.25
	Copper alloy	Copper alloy	150~160	FG2	120 (100~150)	0.12~0.17	0.15~0.20	0.20~0.25

P-Star Drill

HPI503, 505, 508, HP503

Workpiece / Solidity / Conditions / Diameter (Ø)	Non-Alloyed steel		Alloy steels		Gray cast iron		Ductile	
	< 700N/mm²		< 1000N/mm²		< HB240, FC250		< HB300, FCD400	
	R.P.M n (min -1)	Feed fn (mm/rev)	R.P.M n (min -1)	Feed fn (mm/rev)	R.P.M n (min -1)	Feed fn (mm/rev)	R.P.M n (min -1)	Feed fn (mm/rev)
1.0	16,250	0.05	14,800	0.05	26,600	0.05	17,300	0.05
2.0	16,250	0.07	14,800	0.07	26,600	0.07	17,300	0.07
3.0	16,000	0.16	14,500	0.16	26,000	0.16	17,000	0.16
4.0	12,000	0.17	11,000	0.17	20,000	0.17	13,000	0.17
5.0	9,550	0.18	8,600	0.18	16,000	0.18	10,000	0.18
6.0	8,000	0.2	7,200	0.2	13,000	0.2	8,500	0.2
7.0	6,800	0.22	6,100	0.22	11,500	0.22	7,300	0.22
8.0	6,000	0.24	5,400	0.24	9,900	0.24	6,400	0.24
9.0	5,300	0.27	4,800	0.27	8,800	0.27	5,700	0.27
10.0	4,800	0.3	4,300	0.3	8,000	0.3	5,100	0.3
12.0	4,000	0.33	3,600	0.33	6,600	0.33	4,250	0.33
14.0	3,400	0.36	3,050	0.36	5,700	0.36	3,650	0.36
16.0	3,000	0.39	2,700	0.39	5,000	0.39	3,200	0.39
18.0	2,650	0.42	2,400	0.42	4,400	0.42	2,850	0.42
20.0	2,400	0.45	2,150	0.45	4,000	0.45	2,550	0.45

※ Apply to the feed rate for each product as follows.
HPI503(3×D): Feed 100%
HPI505(5×D): Feed 90%
HPI508(8×D): Feed 70~80%

P-Star Drill

PF50, P50, HP50 Series

Workpiece / V / Conditions / Diameter (Ø)	Carbon steels (C<0.3%) Alloy steels/SS400 SCM~710N/mm²		Carbon steels (C≥0.3%) Alloy steels/S50C SCM~1.060N/mm²		SUJ2· SUS440		SKD61 HRC34~43		HRC43~48		SKD11 HRC48~53		Cast iron FC 250~350		Ductile FCD400~500	
	80~125m/min		80~125m/min		63~80m/min		40~63m/min		32~45m/min		25~36m/min		80~125m/min		63~90m/min	
	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)
2.0	12,000	0.06~0.08	12,000	0.06~0.08	11,000	0.06~0.08	8,000	0.06~0.08	6,000	0.05~0.07	4,500	0.03~0.06	15,000	0.06~0.08	11,000	0.06~0.08
3.0	9,600	0.09~0.12	9,600	0.09~0.12	7,500	0.09~0.12	5,300	0.09~0.12	4,000	0.07~0.11	3,200	0.05~0.09	10,000	0.09~0.12	7,600	0.09~0.12
4.0	8,000	0.10~0.15	8,000	0.10~0.15	5,650	0.10~0.15	4,000	0.10~0.15	3,000	0.08~0.13	2,600	0.06~0.10	8,000	0.10~0.15	6,000	0.10~0.15
5.0	6,400	0.12~0.18	6,400	0.12~0.18	4,550	0.12~0.18	3,300	0.12~0.18	2,400	0.10~0.15	2,000	0.8~0.12	6,400	0.12~0.18	4,800	0.12~0.18
6.0	5,300	0.14~0.20	5,300	0.14~0.20	3,800	0.14~0.20	2,750	0.14~0.20	2,000	0.12~0.18	1,700	0.09~0.15	5,300	0.14~0.20	4,000	0.14~0.20
8.0	4,000	0.16~0.24	4,000	0.16~0.24	2,850	0.16~0.24	2,100	0.16~0.24	1,500	0.14~0.22	1,300	0.12~0.20	4,000	0.16~0.24	3,000	0.16~0.24
10.0	3,200	0.18~0.27	3,200	0.18~0.27	2,250	0.18~0.27	1,700	0.18~0.27	1,200	0.15~0.25	1,000	0.13~0.23	3,200	0.18~0.27	2,400	0.18~0.27
12.0	2,650	0.20~0.30	2,650	0.20~0.30	1,900	0.20~0.30	1,400	0.20~0.30	1,000	0.17~0.26	850	0.14~0.24	2,700	0.20~0.30	2,000	0.20~0.30
14.0	2,300	0.22~0.35	2,300	0.22~0.35	1,600	0.22~0.35	1,200	0.22~0.35	860	0.18~0.30	730	0.15~0.26	2,300	0.22~0.35	1,700	0.22~0.35
16.0	2,000	0.25~0.36	2,000	0.25~0.36	1,400	0.25~0.36	1,050	0.25~0.36	760	0.20~0.32	640	0.16~0.26	2,000	0.25~0.36	1,500	0.25~0.36
18.0	1,800	0.28~0.38	1,800	0.28~0.38	1,250	0.28~0.38	920	0.28~0.38	670	0.23~0.33	570	0.18~0.28	1,800	0.28~0.38	1,350	0.28~0.38
20.0	1,600	0.30~0.40	1,600	0.30~0.40	1,150	0.30~0.40	850	0.30~0.40	600	0.25~0.35	500	0.20~0.30	1,600	0.30~0.40	1,200	0.30~0.40

SF503, SF505, SF508, PI503, PI505 Series

Workpiece / V / Conditions / Diameter (Ø)	Carbon steels (C<0.3%) Alloy steels/SS400 SCM~710N/mm²		Carbon steels (C≥0.3%) Alloy steels/S50C SCM~1.060N/mm²		SUJ2· SUS440		SKD61 HRC34~43		HRC43~48		SKD11 HRC48~53		Cast iron FC 250~350		Ductile FCD400~500	
	80~125m/min		80~125m/min		63~80m/min		40~63m/min		32~45m/min		25~36m/min		80~125m/min		63~90m/min	
	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)
3.0	13,000	0.09~0.12	12,000	0.09~0.12	7,600	0.09~0.12	6,400	0.09~0.12	5,300	0.07~0.11	3,800	0.05~0.09	12,000	0.09~0.12	8,500	0.09~0.12
4.0	10,000	0.1~0.15	9,500	0.1~0.15	5,700	0.1~0.15	4,800	0.1~0.15	4,000	0.08~0.13	2,950	0.06~0.1	9,000	0.1~0.15	6,350	0.1~0.15
5.0	8,000	0.12~0.18	7,600	0.12~0.18	4,600	0.12~0.18	3,800	0.12~0.18	3,200	0.1~0.15	2,300	0.08~0.12	7,600	0.12~0.18	5,100	0.12~0.18
6.0	6,600	0.14~0.20	6,400	0.14~0.20	3,800	0.14~0.20	3,200	0.14~0.20	2,650	0.12~0.18	1,900	0.09~0.15	6,400	0.14~0.20	4,250	0.14~0.20
8.0	5,000	0.16~0.24	4,800	0.16~0.24	2,900	0.16~0.24	2,400	0.16~0.24	2,000	0.14~0.22	1,450	0.12~0.2	4,800	0.16~0.24	3,200	0.16~0.24
10.0	4,000	0.18~0.27	3,800	0.18~0.27	2,300	0.18~0.27	1,900	0.18~0.27	1,600	0.15~0.25	1,150	0.13~0.23	3,800	0.18~0.27	2,550	0.18~0.27
12.0	3,300	0.20~0.30	3,200	0.20~0.30	1,900	0.20~0.30	1,600	0.20~0.30	1,300	0.17~0.26	950	0.14~0.24	3,200	0.20~0.30	2,100	0.20~0.30
14.0	2,800	0.22~0.35	2,700	0.22~0.35	1,600	0.22~0.35	1,350	0.22~0.35	1,150	0.18~0.3	800	0.15~0.26	2,700	0.22~0.35	1,800	0.22~0.35
16.0	2,500	0.25~0.36	2,400	0.25~0.36	1,400	0.25~0.36	1,200	0.25~0.36	1,000	0.2~0.32	700	0.16~0.26	2,400	0.25~0.36	1,600	0.25~0.36
18.0	2,200	0.28~0.38	2,100	0.28~0.38	1,300	0.28~0.38	1,100	0.28~0.38	900	0.23~0.33	650	0.18~0.28	2,100	0.28~0.38	1,400	0.28~0.38
20.0	2,000	0.30~0.40	1,900	0.30~0.40	1,150	0.30~0.40	1,000	0.30~0.40	800	0.25~0.35	600	0.2~0.3	1,900	0.30~0.40	1,250	0.30~0.40

- SF503(3×D): fn 100%
- SF505(5×D): fn 90%
- SF508(8×D): fn 70~80%

W-Star Drill

Workpiece				Grade	vc (m/min)	Feed rate (mm/rev) per drill dia. (mm) (Depth of cut = 5D~7D)				
ISO		Workpiece material	HB			Ø2.5~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0	Ø12.1~Ø16.0	Ø16.1~Ø20.0
P	Carbon steel	Low carbon steel	80~120	PC320W	72(64~120)	0.08~0.12	0.13~0.19	0.16~0.24	0.20~0.29	0.24~0.32
		High carbon steel	Over 250	PC320W	40(32~64)	0.06~0.16	0.06~0.16	0.08~0.20	0.12~0.20	0.12~0.24
	Alloy steel	Low alloy steel	140~260	PC320W	72(64~120)	0.08~0.12	0.13~0.19	0.16~0.24	0.20~0.29	0.24~0.32
		Heat-treated low alloy steel	200~400	PC320W	48(40~80)	0.08~0.12	0.13~0.19	0.16~0.24	0.20~0.29	0.24~0.32
		High alloy steel	50~260	PC320W	40(32~64)	0.06~0.16	0.06~0.16	0.08~0.20	0.12~0.20	0.12~0.24
		Heat-treated high alloy steel	Over 250	PC320W	40(32~64)	0.06~0.16	0.06~0.16	0.08~0.20	0.12~0.20	0.12~0.24
M	Stainless steel	Austenite series	135~275	PC320W	36(20~64)	0.04~0.16	0.04~0.16	0.08~0.20	0.08~0.20	0.12~0.24
		Ferrite series Martensite series	135~275	PC320W	40(24~64)	0.04~0.16	0.04~0.16	0.08~0.20	0.08~0.20	0.12~0.24
K	Cast iron	Gray cast iron	150~230	PC320W	80(64~120)	0.08~0.12	0.13~0.19	0.16~0.24	0.20~0.29	0.24~0.32
		Ductile cast iron	160~260	PC320W	72(56~112)	0.08~0.12	0.13~0.19	0.16~0.24	0.20~0.29	0.24~0.32

• Cutting conditions above are for the case of less than 5D depth of cut and through coolant system applied.

SSD-N

SSD-N

Workpiece / Conditions / Diameter (Ø)	Tool steels, Alloy steels		Aluminum, Aluminum alloy		Brass, Bronze		Epoxy, Resin	
	R.P.M n (min $^{-1}$)	Feed fn (mm/rev)	R.P.M n (min $^{-1}$)	Feed fn (mm/rev)	R.P.M n (min $^{-1}$)	Feed fn (mm/rev)	R.P.M n (min $^{-1}$)	Feed fn (mm/rev)
3.0	4,000~7,000	0.02	10,000~12,000	0.03	7,000~10,000	0.02	9,000~12,000	0.08
5.0	2,400~4,200	0.03	6,000~8,000	0.05	4,200~6,000	0.04	5,400~7,200	0.08
8.0	1,500~2,600	0.05	3,700~5,000	0.08	2,600~3,700	0.08	3,400~4,500	0.09
12.0	1,000~1,700	0.06	2,500~3,200	0.12	1,700~2,500	0.12	2,200~3,000	0.11

Workpiece				Grade	vc (m/min)	Feed rate (mm/rev) per drill dia. (mm)			
ISO		Workpiece material	HB			Ø2.5~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0	Ø12.1~Ø15.0
P	Carbon steel	Low carbon steel	80~120	Carbide	35 (20~65)	0.02~0.06	0.04~0.08	0.06~0.12	0.10~0.16
N	Aluminum	Aluminum alloy	30-150		100 (94~120)	0.03~0.06	0.05~0.08	0.08~0.12	0.12~0.18
	Copper alloy	Copper alloy	150-160		80 (65~95)	0.03~0.06	0.05~0.08	0.08~0.12	0.12~0.18

Burnishing Drill

Workpiece	Cutting speed vc (m/min)	Feed rate (mm/rev) per drill dia. (mm)				
		Ø2.0~3.0	Ø3.5~5.0	Ø5.5~8.0	Ø8.5~12.0	Ø12.5~18.0
Aluminum alloy, Copper alloy	30~60	0.02~0.05	0.03~0.10	0.04~0.15	0.05~0.20	0.05~0.30
Aluminum alloy for die castings	50~80	0.02~0.05	0.03~0.10	0.04~0.15	0.05~0.20	0.05~0.30
Cast Iron (FC)	25~60	0.01~0.04	0.02~0.08	0.05~0.12	0.05~0.20	0.05~0.30
Ductile cast Iron	20~50	0.01~0.03	0.02~0.05	0.03~0.08	0.04~0.12	0.05~0.15

PCD Drill

Workpiece	vc (m/min)	fn (mm/rev)
CFRP	50~250	0.075 (0.05~0.25)
Aluminum alloy		0.050 (0.03~0.20)
Counter sink section		0.040 (0.02~0.15)

Gun Drill

Workpiece	Hardness (HB)	Cutting speed vc (m/min)	Feed rate (mm/rev) per drill dia. (mm)					
			~Ø4	~Ø6	~Ø10	~Ø14	~Ø24	Ø25~
Carbon steel Alloy steel	~150	100~150	0.005~0.015	0.010~0.025	0.015~0.035	0.020~0.050	0.030~0.070	0.040~0.080
	150~250	80~120	0.005~0.010	0.010~0.020	0.015~0.030	0.020~0.040	0.030~0.060	0.030~0.060
	250~350	50~100	0.005~0.010	0.005~0.010	0.010~0.020	0.015~0.030	0.020~0.040	0.020~0.040
	350~	~30	-	0.005~0.010	0.005~0.010	0.010~0.020	0.020~0.035	0.020~0.035
Stainless steel	~250	50~80	0.005~0.015	0.010~0.020	0.010~0.020	0.010~0.030	0.020~0.035	0.020~0.040
	250~350	40~50	-	0.005~0.015	0.010~0.015	0.010~0.020	0.010~0.020	0.010~0.020
Cast iron	~220	80~100	0.010~0.0120	0.020~0.040	0.030~0.050	0.040~0.080	0.080~0.120	0.100~0.150
	220~	40~80	0.005~0.010	0.005~0.015	0.010~0.020	0.015~0.030	0.020~0.050	0.025~0.070
Aluminum alloy	-	180~250	0.010~0.020	0.020~0.040	0.030~0.060	0.040~0.080	0.100~0.180	0.150~0.200
Light alloy	-	120~200	0.005~0.010	0.010~0.020	0.020~0.025	0.020~0.030	0.030~0.040	0.040~0.060

Chucking / Machine Reamer

Workpiece	HB	vc (m/min)	Reamer dia.		
			~Ø9	Ø10~25	Ø26~60
Steel	~100kg/mm^2	vc (m/min)	8~12	8~12	8~12
		fn (mm/rev)	0.15~0.25	0.20~0.40	0.30~0.50
	100~140kg/mm^2	vc (m/min)	5~10	5~10	5~10
		fn (mm/rev)	0.10~0.20	0.15~0.25	0.20~0.40
Cast iron	HB ~220	vc (m/min)	6~12	6~12	8~15
		fn (mm/rev)	0.15~0.30	0.30~0.50	0.40~0.80
	HB 220~	vc (m/min)	5~10	5~10	8~12
		fn (mm/rev)	0.10~0.20	0.20~0.35	0.30~0.50
Brass	HB 50~120	vc (m/min)	8~12	10~15	10~15
		fn (mm/rev)	0.10~0.15	0.15~0.25	0.25~0.40
Bronze	HB 60~100	vc (m/min)	8~12	10~15	10~15
		fn (mm/rev)	0.10~0.15	0.15~0.25	0.25~0.40
Aluminum alloy	HB 90~120	vc (m/min)	15~25	15~25	20~30
		fn (mm/rev)	0.15~0.25	0.25~0.40	0.40~0.70
Synthetic resins	-	vc (m/min)	15~30	20~35	30~40
		fn (mm/rev)	0.15~0.25	0.25~0.40	0.40~0.50

PCD Reamer

For high speed and high precision machining

Workpiece	vc (m/min)	fn (mm/rev)
Aluminum alloy	50 ~ 250	0.05~0.20

Cermet Reamer

Workpiece	Hardness	fz (mm/t)	vc (m/min)
Carbon steel	Under HRC30	0.1~0.4	50~80
High carbon steel, Alloy steel	HRC30 ~ 40	0.1~0.4	80~120
	HRC40 ~ 50	0.1~0.4	50~80
Alloy steel	More than HRC50	0.05~0.2	30~60

Chamfer Tool

ISO	Grade	ØD(Ø5 ~Ø20)		ØD(Ø25 ~Ø35)	
		vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)
P	PC3700	160~270	0.05~0.25	160~270	0.05~0.25
	PC5300	190~310		190~310	
	ST30A	60~100		60~100	
M	PC5300	100~160	0.05~0.20	100~160	0.10~0.30
	PC5400	70~120		70~120	
K	PC5300	110~180	0.10~0.30	110~180	0.30~0.50
	G10	50~90		50~90	

Counter Sink

CSPC

Diameter (Ø)	Alloy steels & carbon steels under HRC30		Pre-hardened steels HRC30~45		Stainless steels HRC30~50		Hardened steels HRC45~55		Aluminum alloy	
	R.P.M n (min $^{-1}$)	Feed (mm/min)	R.P.M n (min $^{-1}$)	Feed (mm/min)	R.P.M n (min $^{-1}$)	Feed (mm/min)	R.P.M n (min $^{-1}$)	Feed (mm/min)	R.P.M n (min $^{-1}$)	Feed (mm/min)
6.0	3,030	1,550	1,820	600	1,520	500	1,350	240	7,580	3,870
8.0	2,300	1,520	1,370	580	1,150	480	1,015	270	5,750	3,800
10.0	1,840	1,490	1,100	590	920	500	810	270	4,590	3,720
12.0	1,540	1,480	930	610	780	510	690	270	3,850	3,700
16.0	1,150	1,310	690	520	570	460	505	260	2,890	3,470

CSNC/CSHC

1F(Hole) Type

Diameter (Ø)	Alloy steels & carbon steels under HRC30		Pre-hardened steels HRC30~45		Stainless steels		Aluminum alloy	
	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)
~ 10.0	42~72	121	28~48	120	15~17	50	50~110	350
10.0 ~ 20.0		110		70		25		230
20.0 ~ 30.0		75		50		20		200

CSNC

3F Type

Diameter (Ø)	Alloy steels & carbon steels under HRC30		Pre-hardened steels HRC30~45		Stainless steels		Aluminum alloy	
	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)
~ 10.0	30~60	170	20~40	100	10~12	30	40~100	350
10.0 ~ 20.0		85		60		16		230
20.0 ~ 30.0		60		40		10		200

Counter Sink

CSPH

Diameter (Ø)	Alloy steels & carbon steels under HRC30		Pre-hardened steels HRC30~45		Stainless steels HRC30~50		Hardened steels HRC45~55		Aluminum alloy	
	R.P.M n (min -1)	Feed (mm/min)	R.P.M n (min -1)	Feed (mm/min)	R.P.M n (min -1)	Feed (mm/min)	R.P.M n (min -1)	Feed (mm/min)	R.P.M n (min -1)	Feed (mm/min)
6.3	1,328	230	1,970	350	905	160	807	140	5,760	1,040
8.3	995	230	1,490	360	690	160	610	140	4,370	1,050
10.4	792	230	1,190	360	550	160	487	130	3,485	940
12.4	665	230	1,000	360	460	150	407	130	2,920	960
16.5	500	230	750	360	345	160	307	140	2,200	990
20.5	402	230	600	360	276	160	247	140	1,770	1,010

CSNH/CSHH

1F(Hole) Type

Diameter (Ø)	Alloy steels & carbon steels under HRC30		Pre-hardened steels HRC30~45		Stainless steels		Aluminum alloy	
	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)
~ 10.0	20~30	110	16~20	55	50~60	255	50~100	450
10.0 ~ 20.0		55		35		180		350
20.0 ~ 30.0		35		55		150		300

CSNH

3F Type

Diameter (Ø)	Alloy steels & carbon steels under HRC30		Pre-hardened steels HRC30~45		Stainless steels		Aluminum alloy		Plastic	
	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)
~ 10.0	10~15	60	8~12	35	4~6	30	50~60	255	35~70	400
10.0 ~ 20.0		30		25		16		180		300
20.0 ~ 30.0		20		15		10		150		250

Tap-Star

ISO	Workpiece		Cutting speed, vc (m/min)					Cutting fluid			
			Straight Tap	Spiral Tap	Point Tap	Carbide Tap	Roll Tap	Insoluble	Water soluble (emulsion)	Semi dry	Dry
P	Low carbon steel	≤ C 0.25%	8~13	8~13	15~25	-	8~13	◎	○	△	△
	Medium carbon steel	C 0.25 ~ 0.45%	7~12	7~12	10~15	-	7~10	◎	○	△	△
	High carbon steel	≥ C 0.45%	6~9	6~9	8~13	-	5~8	◎	○	△	△
	Alloy steel	SCM	7~12	7~12	10~15	-	5~8	◎	△	△	△
	Quenched and tempered steel	25~45HRC	3~5	3~5	4~6	-	-	◎	△	–	–
	Tool steel	SKD	6~9	6~9	7~10	-	-	◎	–	–	–
	Cast steel	SCM	6~11	6~11	10~15	-	-	◎	○	–	–
M	Stainless steel	SUS	4~7	5~8	8~13	-	5~10	◎	○	–	–
	Precipitation hardened stainless steel	SUS630 SUS631	3~5	3~5	4~6	-	-	◎	–	–	–
K	Cast iron	FC	10~15	-	-	10~20	-	◎	○	○	○
	Ductile cast iron	FCD	7~12	7~12	10~20	10~20	-	◎	○	○	–
N	Copper	Cu	6~9	6~11	7~12	10~20	7~12	○	○	–	–
	Brass, brass-cast	Bs Bsc	10~15	10~20	15~25	15~25	7~12	○	○	○	○
	Bronze, bronze-cast	PB PBC	6~11	6~11	10~20	10~20	7~12	○	○	–	–
	Rolled aluminum	Al	10~20	10~20	15~25	-	10~20	◎	○	△	–
	Aluminum-cast, alloyed	AC ACD	10~15	10~15	15~20	10~20	10~25	◎	○	△	–
	Magnesium-cast, alloyed	MC	7~12	7~12	10~15	10~20	-	◎	○	○	–
	Zinc-cast, alloyed	ZDC	1~12	7~12	10~15	10~20	7~12	◎	○	△	–
	Thermosetting plastic	Bakelite phenol epoxy	10~20	-	-	15~25	-	–	○	○	○
	Thermoplastic	Nylon vinyl chloride	10~20	10~15	10~20	10~20	-	–	○	○	○

◎ : Recommended ○ : Applicable △ : Usable - : unusable

TECHNICAL INFORMATION

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G8 SI unit Conversion Table
G9 Hardness Calculating Table

Technical Information II

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Workpiece Material Grades

Carbon steel and alloy steel for structural use

Type		Korea	ISO	Japan	U.S.A	Great Britain	Germany	France	Russia
		KS	ISO	JIS	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	GOCT
Carbon steel		SM10C	C10	S10C	1010	040A10 045A10 045M10	C10E C10R	XC10	-
		SM15C	C15E4 C15M2	S15C	1015	055M15	C15E C15R	-	-
		SM20C	-	S20C	1020	070M20 C22, C22E C22R	C22 C22E C22R	C22 C22E C22R	-
		SM25C	C25 C25E4 C25M2	S25C	1025	C25 C25E C25R	C25 C25E C25R	C25 C25E C25R	-
		SM30C	C30 C30E4 C30M2	S30C	1030	080A30 080M30 CC30 C30E C30R	C30 C30E C30R	C30 C30E C30R	30Γ
		SM35C	C35 C35E4 C35M2	S35C	1035	C35 C35E C35R	C35 C35E C35R	C35 C35E C35R	35Γ
		SM40C	C40 C40E4 C40M2	S40C	1039 1040	080M40 C40 C40E C40R	C40 C40E C40R	C40 C40E C40R	40Γ
		SM43C	-	S43C	1042 1043	080A42	-	-	40Γ
		SM45C	C45 C45E4 C45M2	S45C	1045 1046	C45 C45E C45R	C45 C45E C45R	C45 C45E C45R	45Γ
		SM48C	-	S48C	-	080A47	-	-	45Γ
		SM50C	C50 C50E4 C50M2	S50C	1049	080M50 C50 C50E C50R	C50 C50E C50R	C50 C50E C50R	50Γ
		SM53C	-	S53C	1050 1053	-	-	-	50Γ
		SM55C	C55 C55E4 C55M2	S55C	1055	070M55 C55 C55E C55R	C55 C55E C55R	C55 C55E C55R	-
		SM58C	C60 C60E4 C60M2	S58C	1059 1060	C60 C60E C60R	C60 C60E C60R	C60 C60E C60R	60Γ
Alloy steel	Nickel chromium steel	SNC236 SNC415(H) SNC631(H) SNC815(H) SNC836	- - - 15NiCr13 -	SNC236 SNC415(H) SNC631(H) SNC815(H) SNC836	- - - - -	- - - 655M13(655H13) -	- - - 15NiCr13 -	- - - - -	40XH - 30XH3A - -
	Nickel chromium molybdenum steel	SNCM220	20NiCrMo2 20NiCrMoS2	SNCM220	8615 8617(H) 8620(H) 8622(H)	805A20 805M20 805A22 805M22	20NiCrMo2 20NiCrMoS2	20NCD2	-
		SNCM240	41CrNiMo2 41CrNiMoS2	SNCM240	8637 8640	-	-	-	-
		SNCM415 SNCM420(H) SNCM431 SNCM439 SNCM447 SNCM616 SNCM625 SNCM630 SNCM815	- - - - - - - - -	SNCM415 SNCM420(H) SNCM431 SNCM439 SNCM447 SNCM616 SNCM625 SNCM630 SNCM815	- 4320(H) - 4340 - - - - -	- - - - - - - - -	- - - - - - - - -	- - - - - - - - -	- 20XH2M(20XHM) - - - - - - -
	Chromium steel	SCr415(H)	-	SCr415(H)	-	-	17Cr3 17CrS3	-	15X 15XA
		SCr420(H)	20Cr4(H) 20CrS4	SCr420(H)	5120(H)	-	-	-	20X
		SCr430(H)	34Cr4 34CrS4	SCr430(H)	5130(H) 5132(H)	34Cr4 34CrS4	34Cr4 34CrS4	34Cr4 34CrS4	30X
		SCr435(H)	34Cr4 34CrS4 37Cr4 37CrS4	SCr435(H)	5135(H)	37Cr4 37CrS4	37Cr4 37CrS4	37Cr4 37CrS4	35X
		SCr440(H)	37Cr4 37CrS4 41Cr4 41CrS4	SCr440(H)	5140(H)	530M40 41Cr4 41CrS4	41Cr4 41CrS4	41Cr4 41CrS4	40X
		SCr445(H)		SCr445(H)					45X

• The above Alloy steel can supplied by domestic manufacturing

Type		Korea	ISO	Japan	U.S.A	Great Britain	Germany	France	Russia
		KS	ISO	JIS	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	GOCT
Alloy steel	Chromium molybdenum steel	SCM415(H)	-	SCM415(H)	-	-	-	-	-
		SCM418(H)	18CrMo4 18CrMoS4	SCM418(H)	-	-	18CrMo4 18CrMoS4	-	20XM
		SCM420(H)	-	SCM420(H)	-	708M20(708H20)	-	-	20XM
		SCM430	-	SCM430	4130	-	-	-	30XM 30XMA
		SCM432	-	SCM432	-	-	-	-	-
		SCM435(H)	34CrMo4 34CrMoS4	SCM435(H)	(4135H) 4137(H)	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	35XM
		SCM440(H)	42CrMo4 42CrMoS4	SCM440(H)	4140(H) 4142(H)	708M70 709M40 42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	-
		SCM445(H)	-	SCM445(H)	4145(H) 4147(H)	-	-	-	-
	Manganese steel and Manganese chromium steel	SMn420(H)	22Mn6(H)	SMn420(H)	1522(H)	150M19	-	-	-
		SMn433(H)	-	SMn433(H)	1534	150M36	-	-	30Г2 35Г2
		SMn438(H)	36Mn6(H)	SMn438(H)	1541(H)	150M36			35Г2 40Г2
		SMn443(H)	42Mn6(H)	SMn443(H)	1541(H)	-	-	-	40Г2 45Г2
		SMnC420(H)	-	SMnC420(H)	-	-	-	-	-
		SMnC443(H)	-	SMnC443(H)	-	-	-	-	-
	Aluminum chromium molybdenum steel	SACM645	41CrAlMo74	SACM645	-	-	-	-	-

• The above Alloy steel can supplied by domestic manufacturing

Tool steel

Type	Korea	ISO	Japan	U.S.A	Great Britain	Germany	France	Russia
	KS	ISO	JIS	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	GOCT
High speed steel	SKH2	HS18-0-1	SKH2	T1				
	SKH3	-	SKH3	T4				
	SKH4	-	SKH4	T5				
	SKH10	-	SKH10	T15	BM 2	S6/5/2	Z 85 WDCV	
	SKH51	HS6-5-2	SKH51	M2				
	SKH52	HS6-6-2	SKH52	M3-1				
	SKH53	HS6-5-3	SKH53	M3-2				
	SKH54	HS6-5-4	SKH54	M4	BM 35	S6/5/2/5	6-5-2-5	
	SKH55	HS6-5-2-5	SKH55	M 35				
	SKH56	-	SKH56	M36				
	SKH57	HS10-4-3-10	SKH57	-		S2/9/2		
	SKH58	HS2-9-2	SKH58	M7				
	SKH59	HS2-9-1-8	SKH59	M42				
Alloy tool steel	STS11	-	SKS11	F2				
	STS2	-	SKS2	-				
	STS21	-	SKS21	-				
	STS5	-	SKS5	-				
	STS51	-	SKS51	L6				
	STS7	-	SKS7	-				
	STS8	-	SKS8	-				
	STS4	-	SKS4	-				
	STS41	-	SKS41	-				
	STS43	105V	SKS43	W2-9 1/				
	STS44	-	SKS44	W2-8 1-2				
	STS3	-	SKS3	-		105WCr6	105WC13	
	STS31	105WCr1	SKS31	-				
	STS93	-	SKS93	-				
	STS94	-	SKS94	-				
	STS95	-	SKS95	-	BD3	X210Cr12	Z200C12	
	STD1	210Cr12	SKD1	D3				
	STD11	-	SKD11	D2	BA2	X100CrMoV5 1	Z100CDV5	
	STD12	100CrMoV5	SKD12	A2				
	STD4	-	SKD4	-	BH21	X30WCrV9 3	Z30WCV9	
	STD5	X30WCrV9-3	SKD5	H21				
	STD6	X37CrMoV5-1	SKD6	H11	BH13	X40CrMoV5 1	Z40CDV5	
	STD61	X40CrMoV5-1	SKD61	H13				
	STD62	X35CrWMoV5	SKD62	H12				
	STD7	32CrMoV12-28	SKD7	H10				
	STD8	-	SKD8	H19				
	STF3	-	SKT3	-		55NiCrMoV6	55NCDV7	
	STF4	55NiCrMoV7	SKT4	L6				

• The above Alloy steel can supplied by domestic manufacturing

Type	Korea	ISO	Japan	U.S.A	Great Britain	Germany	France	Russia
	KS	ISO	JIS	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	GOCT
Free cutting carbon steel	SUM11	-	SUM11	1110				
	SUM12	-	SUM12	1109				
	SUM21	9S20	SUM21	1212				
	SUM22	11SMn28	SUM22	1213	230M07	9SMn28	S250	
	SUM22L	11SMnPb28	SUM22L	12L13		9SMnPb28	S250Pb	
	SUM23	-	SUM23	1215	240M07	9SMn36	S 300	
	SUM23L	-	SUM23L	-				
	SUM24L	11SMnPb28	SUM24L	12L14		9SMnPb36	S300Pb	
	SUM25	12SMn35	SUM25	-				
	SUM31	-	SUM31	1117				
	SUM31L	-	SUM31L	-				
	SUM32	-	SUM32	-				
	SUM41	-	SUM41	1137				
	SUM42	-	SUM42	1141				
	SUM43	44SMn28	SUM43	1144				
High carbon chromiom	STB1	-	SUJ1	-				
	STB2	B1	SUJ2	52100	534A99	100Cr6	100Cr6	
	STB3	B2	SUJ3	ASTM A 485 Grade 1				
	STB4	-	SUJ4	-				
	STB5	-	SUJ5	-				

• The above Alloy steel can supplied by domestic manufacturing

Stainless steel

Type		Korea	ISO	Japan	U.S.A		Great Britain	Germany	France	Russia
		KS	ISO	JIS	UNS	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	GOCT
Stainless steel	Austenitic	STS201	X12CrMnNiN17-7-5	SUS201	S20100	201	284S16	X12CrNi17-7	Z12CMN17-07Az	12X17•9AH4
		STS202	X12CrMnNiN18-9-5	SUS202	S20200	202	301S21	X2CrNiN18-7		07X16H6
		STS301	X10CrNi18-8	SUS301	S30100	301		X12CrNi17-7	Z11CN17-08	
		STS301L	X2CrNiN18-7	SUS301L						
		STS301J1		SUS301J1			302S25			12X18H9
		STS302		SUS302	S30200	302		X10CrNiS18-9	Z12CN18-09	
		STS302B	X12CrNiSi18-9-3	SUS302B	S30215	302B	303S21			
		STS303	X10CrNiS18-9	SUS303	S30300	303	303S41		Z8CNF18-09	12X18H10E
		STS303Se		SUS303Se	S30323	303Se		X5CrNi18-10		
		STS303Cu		SUS303Cu			304S31			08X18H10
		STS304	X5CrNi18-9 X2CrNi18-9	SUS304	S30400	304	304S11	X2CrNi19-11	Z7CN18-09	03X18H11
		STS304L	X2CrNi19-11	SUS304L	S30403	304L		X2CrNiN18-10	Z3CN19-11	
		STS304N1	X5CrNiN18-8	SUS304N1	S30451	304N			Z6CN19-09Az	
		STS304LN	X2CrNiN18-8	SUS304LN	S30453	304LN		X5CrNi18-12	Z3CN18-10Az	
		STS304J1		SUS304J1			305S19			06X18H11
		STS305	X6CrNi18-12	SUS305	S30500	305			Z8CN18-12	
		STS309S		SUS309S	S30908	309S	310S31	X5CrNiMo27-12-2	Z10CN24-13	10X23H18
		STS310S	X6CrNi25-20	SUS310S	S31008	310S	316S31	X5CrNiMo27-13-3	Z8CN25-20	
		STS316	X5CrNiMo17-12-2 X3CrNiMo17-12-3	SUS316	S31600	316	316S11	X2CrNiMo17-13-2 X2CrNiMo17-14-3	Z7CND17-12-02 Z6CND18-12-03	03X17H14M3
		STS316L	X2CrNiMo17-12-2 X2CrNiMo17-12-3 X2CrNiMo18-14-3	SUS316L	S31603	316L			Z3CND17-12-02 Z3CND17-12-03	
		STS316N		SUS316N	S31651	316N	317S16	X6CrNiTi18-10		
		STS317		SUS317	S31700	317	321S31	X6CrNiNb18-10		08X18H10T
		STS321	X6CrNiTi18-10	SUS321	S32100	321	347S31		Z6CNT18-10	08X18H12
		STS347	X6CrNiNb18-10	SUS347	S34700	347		X6CrAl13	Z6CNNb18-10	
		STS384	X3NiCr18-16	SUS384	S38400	384	405S17		Z6CN18-16	
	Ferritic	STS405	X6CrAl13	SUS405	S40500	405			Z8CA12	
		STS410L		SUS410L				X6Cr17	Z3C14	
		STS429		SUS429	S42900	429	430S17	X7CrS18		12X17
		STS430	X6Cr17	SUS430	S43000	430		X6CrMo17-1	Z8C17	
		STS430F	X7CrS17	SUS430F	S43020	430F	434S17		Z8CF17	
		STS434	X6CrMo17-1	SUS434	S43400	434			Z8CD17-01	
		STS444	X2CrMoTi18-2	SUS444	S44400	444			Z3CDT18-02	
		STSXM27		SUSXM27	S44627			X10Cr13	Z1CD26-01	
	Martensitic	STS403		SUS403	S40300	403	410S21			
		STS410	X12Cr13	SUS410	S41000	410	416S21	X20Cr13	Z13C13	
		STS416	X12CrS13	SUS416	S41600	416	420S29	X20CrNi17-2	Z11CF13	20X13
		STS420J1	X20Cr13	SUS420J1	S42000	420	431S29		Z20C13	20X17H2
		STS431	X19CrNi16-2	SUS431	S43100	431			Z15CN16-02	
		STS440A	X70CrMo15	SUS440A	S44002	440A		X7CrNiAl17-7	Z70C15	
	Precipitation hardening type	STS630	X5CrNiCuNb16-4	SUS630	S17400	S17400			Z6CNU17-04	09X17H7IO
		STS631	X7CrNiAl17-7	SUS631	S17700	S17700			Z9CNA17-07	
		STS631J1		SUS631J1						

• The above Alloy steel can supplied by domestic manufacturing

Casting or forging steel

Type		Korea	ISO	Japan	U.S.A	Great Britain	Germany	France	Russia
		KS	ISO	JIS	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	GOCT
Casting Iron	Grey iron casting	GC100 GC150 GC200 GC250 GC300 GC350	100,150, 200, 250, 300, 350	FC100 FC150 FC200 FC250 FC300 FC350	No 20 B No 25 B No 30 B No 35 B No 45 B No 50 B No 55 B	 Grade 150 Grade 220 Grade 260 Grade 300 Grade 350 Grade 400	GG 10 GG 15 GG 20 GG 25 GG 30 GG 35 GG 40	Ft 10 D Ft 15 D Ft 20 D Ft 25 D Ft 30 D Ft 35 D Ft 40 D	
	Spheroidal graphite iron casting	GCD400-15, GCD400-18 GCD450-10, GCD500-7 GCD600-3 GCD700-2	400-15, 400-18 450-10, 500-7 600-3 700-2	FCD400 FCD500 FCD600 FCD700	60-40-18 65-45-12 80-55-06 100-70-03	SNG 420/12 SNG 370/17 SNG 500/7 SNG 600/3 SNG 700/2	GGG 40 GGG 40.3 GGG 50 GGG 60 GGG 70	FCS 400-12 FGS 370-17 FGS 500-7 FGS 600-3 FGS 700-2	
	Austempered Spheroidal graphite iron casting	FCAD	-	FCAD	-	EN-GJS-	EN-GJS-	EN-GJS-	
	Austenitic iron casting	FCA- FCDA-	L-, S-	FCA- FCDA-	Type 1, 2, Type D-2, D-3A Class 1, 2	F1, F2, S2W, S5S	GGL-, GGG-	L-, S-	

Non-ferrous alloy

Type		Korea	ISO	Japan	U.S.A	Great Britain	Germany	France	Russia
		KS	ISO	JIS	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	GOCT
Aluminum alloy	Aluminum alloy ingots for casting	AC1B	Al-Cu4MgTi	AC1B	204.0	-	-	A-U5GT	
		AC2A	-	AC2A	-	-	-	-	
		AC2B	-	AC2B	319.0	-	-	-	
		AC3A	-	AC3A	-	LM-6	-	-	
		AC4A	-	AC4A	-	-	G(GK)-AlSi9Cu3	-	
		AC4B	-	AC4B	-	-	-	-	
		AC4C	Al-Si7Mg(Fe)	AC4C	356.0	LM-25	G(GK)-AlSi7MG	A-S7G	
		AC4CH	Al-Si7Mg	AC4CH	A356.0	-	-	-	
		AC4D	Al-Si5Cu1Mg	AC4D	355.0	LM-16	-	-	
		AC5A	Al-Cu4Ni2Mg2	AC5A	242.0	-	G(GK)-AlMg5	A-U4NT	
		AC7A	-	AC7A	514.0	LM-5	-	-	
		AC8A	-	AC8A	-	LM-13	-	A-S12UNG	
		AC8B	-	AC8B	-	LM-26	-	A-S10UG	
		AC8C	-	AC8C	-	-	-	A-S10UG	
		AC9A	-	AC9A	-	LM-29	-	-	
		AC9B	-	AC9B	-	-	GD-AlSi12 (Cu)	A-S18UNG	
	Aluminum alloy die casting	ALDC1	Al-Si12CuFe	ADC1	A413.0	LM20	GD-AlSi10Mg	A-S13	
		ALDC2	-	ADC3	A360.0	-	GD-AlMg9	A-S9G	
		ALDC3	-	ADC5	518.0	-	-	A-G6	
		ALDC4	-	ADC6	-	-	GD-AlSi9Cu3	A-G3T	
		ALDC7	Al-Si8Cu3Fe	ADC10	A380.0	-	GD-AlSi9Cu3	-	
		ALDC7Z	Al-Si8Cu3Fe	ADC10Z	A380.0	LM24	-	-	
		ALDC8	-	ADC12	383.0	LM2	-	-	
		ALDC8Z	-	ADC12Z	383.0	LM2	-	-	
		ALDC9	-	ADC14	B390.0	LM30	EN AW-5052	-	
	Aluminum alloy extruded shapes	A5052S	-	A5052S	5052	EN AW-5052	EN AW-5454	EN AW-5052	
		A5454S	-	A5454S	5454	EN AW-5454	EN AW-5083	EN AW-5454	
		A5083S	AlMg4.5Mn0.7	A5083S	5083	EN AW-5083	EN AW-5086	EN AW-5083	
		A5086S	-	A5086S	5086	EN AW-5086	EN AW-6061	EN AW-5086	
		A6061S	AlMg1SiCu	A6061S	6061	EN AW-6061	EN AW-6063	EN AW-6061	
		A6063S	AlMg0.7Si	A6063S	6063	EN AW-6063	EN AW-7003	EN AW-6063	
		A7003S	-	A7003S	-	EN AW-7003	-	EN AW-7003	
		A7N01S	-	A7N01S	-	-	EN AW-7075	-	
		A7075S	AlZn5.5MgCu	A7075S	7075	EN AW-7075		EN AW-7075	

Heat resistant steel

Type		Korea	ISO	Japan	U.S.A		Great Britain	Germany	France	Russia
		KS	ISO	JIS	UNS	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	GOCT
Heat resistant steel	Austenitic	STR31		SUH31			331S42		Z35CNWS14-14	
		STR35		SUH35			349S52	X53CrMnNi21-9	Z52CMN21-09-Az	
		STR36		SUH36			349S54		Z55CMN21-09-Az	
		STR37		SUH37	S63008		381S34			
		STR38		SUH38	S63017					
		STR309		SUH309			309S24	CrNi2520	Z15CN24-13	
		STR310		SUH310	S30900		310S24		Z15CN25-20	
		STR330		SUH330	S31000	309			Z12NCS35-16	
		STR660		SUH660	N08330	310			Z6NCTV25-20	
		STR661		SUH661	S66286	N08330		CrAl1205		
	Ferritic	STR21		SUH21	R30155			X6CrTi12		
		STR409	X6CrTi12	SUH409			409S19		Z6CT12	
		STR409L	X2CrTi12	SUH409L	S40900				Z3CT12	
		STR446		SUH446		409		X45CrSi9-3	Z12C25	
	Martensitic	STR1		SUH1	S44600		401S45		Z45CS9	
		STR3		SUH3	S65007	446			Z40CSD10	
		STR4		SUH4			443S65		Z80CSN20-02	
		STR11		SUH11						
		STR600		SUH600						
		STR616		SUH616	S42200					

• The above Alloy steel can supplied by domestic manufacturing

Steel, Non-Ferrous Metal Symbol List

Comparison of workpiece material standards

Group		Standard term	Code
Structural Steel		Rolled Steel for Welded Structure	SWS
		Rerolled Steel	SBR
		Rolled Steel for General Structure	SB
		Light Gauge Steel for General Structure	SBC
		Hot- rolled Steel Plate, Sheet/ Strip for Automobile Structural Use	SAPH
Steel Plate		Cold-rolled Steel Sheet/Strip	SBC
		Hot-rolled Soft Steel Sheet/Strip	SHP
Steel Pipe		Carbon Steel Pipe for Ordinary Piping	SPP
		Carbon Steel Pipe for Boiler and Heat Exchanger	STH
		Seamless Steel Pipe for High Pressure Gas Cylinder	STHG
		Carbon Steel Pipe for General Structural Use	SPS
		Carbon Steel Pipe for Machine Structural Use	STST
		Alloy Steel Pipe for Structural Use	STA
		Stainless Steel Pipe for Machine and Structural Use	STS-TK
		Carbon Steel Square Pipe for General Structural Use	SPSR
		Alloy Steel Pipe	SPA
		Carbon Steel Pipe for Pressure Service	SPPS
		Carbon Steel Pipe for High Temperature Service	SPSR
		Carbon Steel Pipe for High Pressure Service	SPPH
		Stainless Steel Pipe	STSxT
Iron and Steel		Carbon Steel for Machine Structural Use	SMxxC, SMxxCK
		Aluminum Chromium Molybdenum Steel	SACM
		Chromium Molybdenum Steel	SCM
		Chromium Steel	SCr
		Nickel Chromium Steel	SNC
		Nickel Chromium Molybdenum Steel	SNCM
		Manganese Steel and manganese Chromium Steel for Machine Structural Use	SMn, SMnC
Special steel	Tool steel	Carbon Tool Steel	STC
		Hollow Drill Steel	SKC
		Alloy Tool Steel	STS, STD, STF
		High Speed Tool Steel	SKH
	Stainless steel	Stainless Steel Bar	STS
	Heat resisting steel	Heat Resisting Steel	STR
		Heat Resisting Steel Bar	STR
		Heat Resisting Steel Sheet	STR
	Free cutting carbon steel		SUM
	Special steel		STB
	Spring steel		SPS

Group	Standard term	Code
Forged steel	Carbon Steel Forging	SF
	Chromium Molybdenum Steel Forging	SFCM
	Nickel Chromium Molybdenum Steel Forging	SFNCM
Cast iron	Gray Cast iron	GC
	Spheroidal Graphite Cast iron	GCD
	Blackheart Malleable Cast iron	BMC
	Whiteheat Malleable Cast iron	WMC
	Pearlitic Malleable Cast iron	PMC
Cast steel	Carbon Cast Steel	SC
	High Tensile Strength Carbon Cast Steel & Low Alloy Cast Steel	HSC
	Stainless Cast Steel	SSC
	Heat Resisting Cast Steel	HRSC
	High Manganese Cast Steel	HMnSC
	Cast Steel for High Temperature and High Pressure Service	SCPH
Casting	Brass Casting	BsC
	High Strength Brass Casting	HBsC
	Bronze Casting	BrC
	Phosphoric Bronze Casting	PCB
	Aluminum Bronze Casting	AlBC
	Aluminum Alloy Casting	ACxA
	Magnesium Alloy Casting	MgC
	Zinc Alloy Die Casting	ZnDC
	Aluminum Alloy Die Casting	Aℓ DC
	Magnesium Alloy Die Casting	MgDC
	White Metal	WM
	Aluminum Alloy Casting for Bearing	AM
	Brass Alloy Casting for Bearing	KM

SI Unit Conversion Table

Major SI unit conversion table

Force

N	kgf	dyn
1	1.01972×10^{-1}	1×10^{-5}
9.80665	1	9.80665×10^{5}
1×10^{-5}	1.01972×10^{-6}	1

Stress

Pa or N/m²	MPa or N/mm²	kgf/mm²	kgf/cm²	kgf/m²
1	1×10^{-6}	1.01972×10^{-7}	1.01972×10^{-5}	1.01972×10^{-1}
1×10^{6}	1	1.01972×10^{-1}	1.01972×10	1.01972×10^{5}
9.80665×10^{6}	9.80665	1	1×10^{2}	1×10^{6}
9.80665×10^{4}	9.80665×10^{-2}	1×10^{-2}	1	1×10^{4}
9.80665	9.80665×10^{-6}	1×10^{-6}	1×10^{-4}	1

Pressure

Pa	kPa	MPa	bar	kgf/cm²
1	1×10^{-3}	1×10^{-6}	1×10^{-5}	1.01972×10^{-5}
1×10^{3}	1	1×10^{-3}	1×10^{-2}	1.01972×10^{-2}
1×10^{6}	1×10^{3}	1	1×10	1.01972×10
1×10^{5}	1×10^{2}	1×10^{-1}	1	1.01972
9.80665×10^{4}	9.80665×10	9.80665×10^{-2}	9.80665×10^{-1}	1

Work, Energy, Calorie

J	kW·h	kgf·m	kcal
1	2.77778×10^{-7}	1.01972×10^{-1}	2.38889×10^{-4}
3.60000×10^{6}	1	3.67098×10^{5}	8.60000×10^{2}
9.80665	2.72407×10^{-6}	1	2.34270×10^{-3}
4.18605×10^{3}	1.16279×10^{-3}	4.26858×10^{2}	1

Power

W	kW	kgf·m/s	PS	kcal/h
1	1×10^{-3}	1.01972×10^{-1}	1.35962×10^{-3}	0.860
1×10^{3}	1	1.01972×10^{2}	1.359 62	8.60000×10^{2}
9.81 65	9.80665×10^{-3}	1	1.33333×10^{-2}	8.433 71
7.355×10^{2}	7.355×10^{-1}	7.5×10	1	6.32529×10^{2}
1.16279	1.16279×10^{-3}	1.18572×10^{-1}	1.58095×10^{-3}	1

Specific heat

J/(kg·K)	kcal/(kg·℃) cal/(g·℃)
1	2.38889×10^{-4}
4.18605×10^{3}	1

Thermal conductivity

W/(m·k)	kcal/(h·m·℃)
1	8.6000×10^{-1}
1.16279	1

Revolution per minute

min^{-1}	s^{-1}	r.p.m.
1	0.0167	1
60	1	60

Hardness Calculating Table

Work piece hardness calculating table

Vickers 50kgf HV	Brinell 3000kgf HB		Rockwell				Shore HS	Tensile strength (approximate value) MPa (1)
	Standard ball 10㎜	Cemented carbide ball 10㎜	A scale 60kgf Diamond particle HRA	B scale 100kgf 1/16in ball HRB	C scale 150kgf Diamond particle HRC	D scale 100kgf Diamond particle HRD		
940	-	-	85.6	-	68.0	76.9	97	
920	-	-	85.3	-	67.5	76.5	96	
900	-	-	85.0	-	67.0	76.1	95	
880	-	(767)	84.7	-	66.4	75.7	93	
860	-	(757)	84.4	-	65.9	75.3	92	
840	-	(745)	84.1	-	65.3	74.8	91	
820	-	(733)	83.8	-	64.7	74.3	90	
800	-	(722)	83.4	-	64.0	74.8	88	
780	-	(710)	83.0	-	63.3	73.3	87	
760	-	(698)	82.6	-	62.5	72.6	86	
740	-	(684)	82.2	-	61.8	72.1	84	
720	-	(670)	81.8	-	61.0	71.5	83	
700	-	(656)	81.3	-	60.1	70.8	81	
690	-	(647)	81.1	-	59.7	70.5	-	
680	-	(638)	80.8	-	59.2	70.1	80	
670	-	630	80.6	-	58.8	69.8	-	
660	-	620	80.3	-	58.3	69.4	79	
650	-	611	80.0	-	57.8	69.0	-	
640	-	601	79.8	-	57.3	68.7	77	
630	-	591	79.5	-	56.8	68.3	-	
620	-	582	79.2	-	56.3	67.9	75	
610	-	573	78.9	-	55.7	67.5	-	
600	-	564	78.6	-	55.2	67.0	74	
590	-	554	78.4	-	54.7	66.7	-	2055
580	-	545	78.0	-	54.1	66.2	72	2020
570	-	535	77.8	-	53.6	65.8	-	1985
560	-	525	77.4	-	53.0	65.4	71	1950
550	(505)	517	77.0	-	52.3	64.8	-	1905
540	(496)	507	76.7	-	51.7	64.4	69	1860
530	(488)	497	76.4	-	51.1	63.9	-	1825
520	(480)	488	76.1	-	50.5	63.5	67	1795
510	(473)	479	75.7	-	49.8	62.9	-	1750
500	(465)	471	75.3	-	49.1	62.2	66	1705
490	(456)	460	74.9	-	48.4	61.6	-	1660
480	488	452	74.5	-	47.7	61.3	64	1620
470	441	442	74.1	-	46.9	60.7	-	1570
460	433	433	73.6	-	46.1	60.1	62	1530
450	425	425	73.3	-	45.3	59.4	-	1495
440	415	415	72.8	-	44.5	58.8	59	1460
430	405	405	72.3	-	43.6	58.2	-	1410
420	397	397	71.8	-	42.7	57.5	57	1370
410	388	388	71.4	-	41.8	56.8	-	1330
100	379	379	70.8	-	40.8	56.0	55	1290
390	369	369	70.3	-	39.8	55.2	-	1240
380	360	360	69.8	(100.0)	38.8	54.4	52	1205
370	350	350	69.2	-	39.9	53.6	-	1170
360	341	341	68.7	(109.0)	36.6	52.8	50	1130
350	331	331	68.1	-	35.5	51.9	-	1095
340	322	322	67.6	(108.0)	34.4	51.1	47	1070
330	313	313	67.0	-	33.3	50.2	-	1035

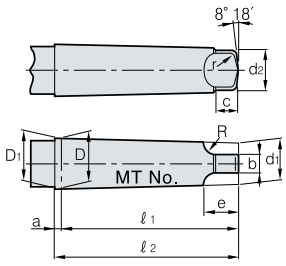
Vickers 50kgf HV	Brinell 3000kgf HB		Rockwell				Shore HS	Tensile strength (approximate value) MPa (1)
	Standard ball 10㎜	Cemented carbide ball 10㎜	A scale 60kgf Diamond particle HRA	B scale 100kgf 1/16in ball HRB	C scale 150kgf Diamond particle HRC	D scale 100kgf Diamond particle HRD		
320	303	303	66.4	(107.0)	32.2	49.4	45	1005
310	294	294	65.8	-	31.0	48.4	-	980
300	284	284	65.2	(105.5)	29.8	47.5	42	950
295	280	280	64.8	-	29.2	47.1	-	935
290	275	275	64.5	(104.5)	28.5	46.5	41	915
285	270	270	64.2	-	27.8	46.0	-	905
280	265	265	63.8	(103.5)	27.1	45.3	40	890
275	261	261	63.5	-	26.4	44.9	-	875
270	256	256	63.1	(102.0)	25.6	44.3	38	855
265	252	252	62.7	-	24.8	43.7	-	840
260	247	247	62.4	(101.0)	24.0	43.1	37	825
255	243	243	62.0	-	23.1	42.2	-	805
250	238	238	61.6	99.5	22.2	41.7	36	795
245	233	233	61.2	-	21.3	41.1	-	780
240	228	228	60.7	98.1	20.3	40.3	34	765
230	219	219	-	96.7	(18.0)	-	33	730
220	209	209	-	95.0	(15.7)	-	32	695
210	200	200	-	93.4	(13.4)	-	30	670
200	190	190	-	91.5	(11.0)	-	29	635
190	181	181	-	89.5	(8.5)	-	28	605
180	171	171	-	87.1	(6.0)	-	26	580
170	162	162	-	85.0	(3.0)	-	25	545
160	152	152	-	81.7	(0.0)	-	24	515
150	143	143	-	78.7	-	-	22	490
140	133	133	-	75.0	-	-	21	455
130	124	124	-	71.2	-	-	20	425
120	114	114	-	66.7	-	-	-	390
110	105	105	-	62.3	-	-	-	-
100	95	95	-	56.2	-	-	-	-
95	90	90	-	52.0	-	-	-	-
90	86	86	-	48.0	-	-	-	-
85	81	81	-	41.0	-	-	-	-

Note) 1. 1MPa = 1N/㎟

2. The number In the blank is not generally used ranges

Technical Information for Tapers

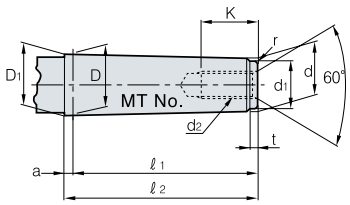
Morse taper (Tang type)



(mm)

MT No.	Taper	Taper angle (α)	D	a	D1	d1	ℓ1	ℓ2	d2	b	c	e	R	r
0	1/19.212	1°29′27″	9.045	3	9.201	6.104	56.5	59.5	6.0	3.9	6.5	10.5	4	1
1	1/20.047	1°25′43″	12.065	3.5	12.240	8.972	62.0	65.5	8.7	5.2	8.5	13.5	5	1.2
2	1/20.020	1°25′50″	17.780	5	18.030	14.034	75.0	80.0	13.5	6.3	10	16	6	1.6
3	1/19.922	1°26′16″	23.825	5	24.076	19.107	94.0	99.0	18.5	7.9	13	20	7	2
4	1/19.254	1°29′15″	31.267	6.5	31.605	25.164	117.5	124.0	24.5	11.9	16	24	8	2.5
5	1/19.002	1°30′26″	44.399	6.5	4.741	36.531	149.5	156.0	35.7	15.9	19	29	10	3
6	1/19.180	1°29′36″	63.348	8	63.765	52.399	210.0	218.0	51.0	19.0	27	40	13	4
7	1/19.231	1°29′22″	83.058	10	83.578	68.186	286.0	296.0	66.8	28.6	35	54	19	5

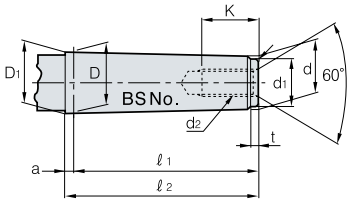
Morse taper (Screw type)



(mm)

MT No.	Taper	Taper angle (α)	D	a	D1	d	ℓ1	ℓ2	d1	d2	k	t	r
0	1/19.212	1°29′27″	9.045	3	9.201	6.442	50	53	6	-		4	0.2
1	1/20.047	1°25′43″	12.065	3.5	12.230	9.396	53.5	57	9	M6	16	5	0.2
2	1/20.020	1°25′50″	17.780	5	18.030	14.583	64	69	14	M10	24	5	0.2
3	1/19.922	1°26′16″	23.825	5	24.076	19.759	81	86	19	M12	28	7	0.6
4	1/19.254	1°29′15″	31.267	6.5	31.605	25.943	102.5	109	25	M16	32	9	1
5	1/19.002	1°30′26″	44.399	6.5	4.741	37.584	129.5	136	35.7	M20	40	9	2.5
6	1/19.180	1°29′36″	63.348	8	63.765	53.859	182	190	51	M24	50	12	4
7	1/19.231	1°29′22″	83.058	10	83.578	70.058	250	260	65	M33	80	18.5	5

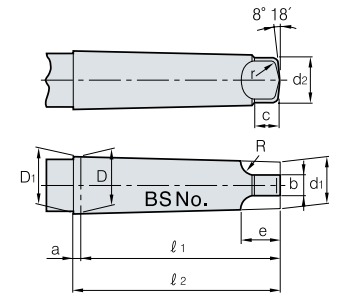
Brown sharp taper (Screw type)



(mm)

B&S No.	D	a	D1	d	d1	ℓ1	ℓ2	t	r	d2	K
4	10.221	2.4	10.321	8.890	8.0	31.0	34.2	2	0.2	-	-
5	13.286	2.4	13.386	11.430	10.0	44.4	46.8	3	0.2	-	-
6	15.229	2.4	15.330	12.700	11.0	60.0	62.7	3	0.2	M 8(1/4)	20
7	18.424	2.4	18.524	15.240	14.0	76.2	78.6	4	0.2	M10(3/8)	24
8	22.828	3.2	22.962	19.090	17.0	90.5	93.7	4	0.6	M12(1/2)	28
9	27.104	3.2	27.238	22.863	21.0	101.6	104.8	4	0.6	M12(1/2)	28
10	32.749	3.2	32.887	26.534	24.0	144.5	147.7	5	1.0	M16(5/8)	32
11	38.905	3.2	39.039	31.749	29.0	171.4	174.6	5	1.0	M16(5/8)	32
12	45.641	3.2	45.774	38.103	35.0	181.0	184.2	6	2.5	M20(3/4)	40
13	52.654	3.2	52.787	44.451	41.0	196.8	200.0	6	3.0	M20(3/4)	40
14	59.533	3.2	59.666	50.800	47.0	209.6	212.8	7	4.0	M24(1)	40
15	66.408	3.2	66.541	57.150	53.0	222.2	225.4	7	4.0	M24(1)	50
16	73.292	3.2	73.425	63.500	59.0	35.0	238.2	8	5.0	M30(11/8)	60

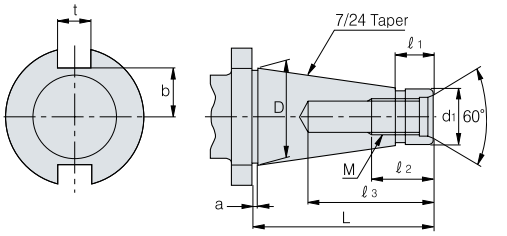
Brown sharp taper (Tang type)



(mm)

B&S No.	D	a	D1	d1	d2	ℓ1	ℓ2	b	c	e	R	r
4	10.221	2.4	10.321	8.458	8.1	42.1	44.5	5.5	8.7	14.4	7.9	1.3
5	13.286	2.4	13.386	10.962	10.7	55.6	58.0	6.3	9.5	16.2	7.9	1.5
6	15.229	2.4	15.330	12.167	11.7	73.0	75.4	7.1	11.1	18.0	7.9	1.5
7	18.424	2.4	18.524	14.675	14.2	89.7	92.1	7.9	11.9	20.3	9.5	1.8
8	22.828	3.2	22.962	18.453.	18.0	104.8	108.0	8.7	12.7	22.0	9.5	2.0
9	28.104	3.2	27.238	22.200	21.8	117.5	120.7	9.5	14.3	25.4	11.1	2.5
10	32.749	3.2	32.887	25.751	25.7	162.7	165.9	11.1	16.7	28.1	11.1	2.8
11	38.905	3.2	39.039	30.985	30.7	189.7	192.9	11.1	16.7	30.0	12.7	3.3
12	45.641	3.2	45.774	37.246	37.1	201.6	204.8	12.7	190	32.5	12.7	3.8
13	52.654	3.2	52.787	43.589	43.4	217.5	220.7	12.7	19.0	35.7	15.9	4.3
14	59.533	3.2	59.666	49.841	49.8	232.6	235.8	14.2	21.4	41.2	19.0	4.8
15	66.408	3.2	66.541	56.186	56.1	245.3	248.5	14.2	21.4	44.4	22.2	5.3
16	73.292	3.2	73.425	62.441	62.2	260.4	263.6	15.8	23.8	50.0	25.4	5.8

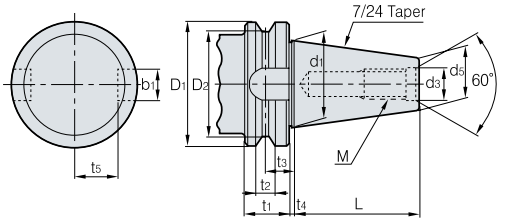
Standard taper of american milling machine



(mm)

NT No.	Dimensions	D	D1	L	ℓ1	M	ℓ2	ℓ3	a	t	b
30	$1\frac{1}{4}$	31.750	$17.40^{-0.29}_{-0.36}$	70	20	UNC $\frac{1''}{2}$	24	50	1.6	15.9	6
40	$1\frac{3}{4}$	44.450	$25.32^{-0.30}_{-0.384}$	95	25	UNC $\frac{5''}{8}$	30	60	1.6	15.9	22.5
50	$2\frac{3}{4}$	69.850	$39.60^{-0.31}_{-0.41}$	130	25	UNC $1''$	45	90	3.2	25.4	35
60	$4\frac{1}{4}$	107.950	$60.20^{-0.34}_{-0.46}$	210	45	UNC $1\frac{1''}{4}$	56	110	3.2	25.4	60

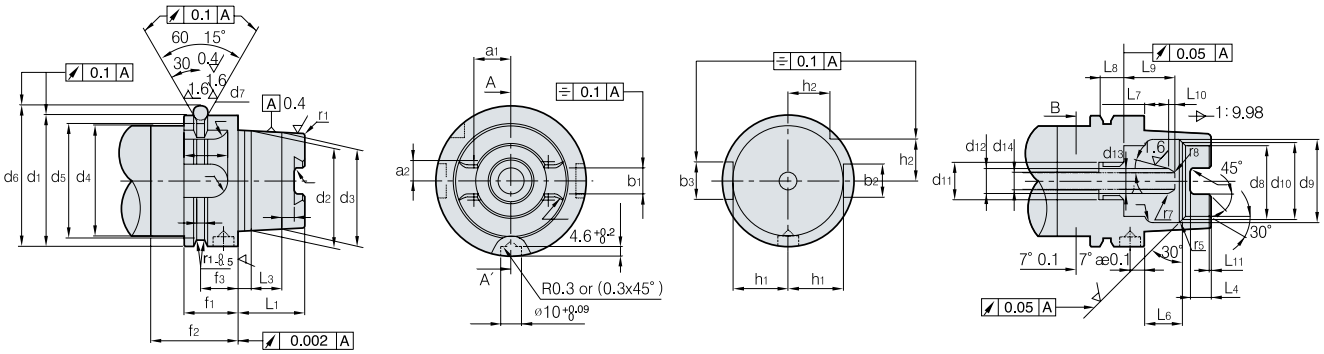
Bottle grip taper



(mm)

BT No.	D1	D2	t1	t2	t3	t4	d1	d3	L	M	b1	t5	d5
35	53	43	22	10	14.6	2	38.1	13	56.5	M12×1.75	16.1	19.6	21.62
40	63	52	25	10	16.6	2	44.45	17	65.4	M16×2	16.1	22.6	25.3
45	85	73	30	12	21.2	3	57.15	21	82.8	M20×25	19.3	29.1	33.1
50	100	85	35	15	23.2	3	69.85	25	101.8	M24×3	25.7	35.4	40.1
60	155	135	45	20	28.2	3	107.95	31	161.8	M30×3.5	25.7	60.1	60.7

HSK shank (DIN 69893)



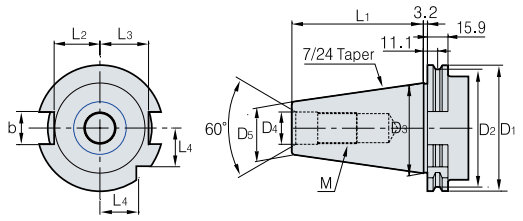
(mm)

HSK No.	b1	b2	b3	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11	d12	d13	d14	a1	a2
50	10.54	12	14	50	38	36.90	42	43	59.3	7	26	32	29	M16X1	10	6.8	6.8	13.997	7.648
63	12.5	16	14	63	48	46.53	53	55	72.3	7	34	40	37	M18X1	12	8	8.4	17.862	9.25
100	20	20	14	100	75	72,80	85	92	109.75	7	53	63	58	M24X1.5	16	12	12	27.329	15.00

(mm)

HSK No.	f1	f2	f3	f4	b1	b2	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	r1	r2	r3	r4	r5	r6	r7	r8
50	26	42	18	3.75	2	15.5	25	5	11	7.5	4.5	14.13	10	10	23	3	1	19	1	1.5	2.38	6	0.5	1	2	6
63	26	42	18	3.75	28.5	20	32	6.3	14.7	10	6	18.13	10	12	24.5	3	1	21	1.2	1.5	3	8	0.6	1.5	3	8
100	29	45	20	3.75	44	31.5	50	10	24	15	10	28.56	12.5	16	28	3	1.5	24	2	2	3	12	1	1.5	3	10

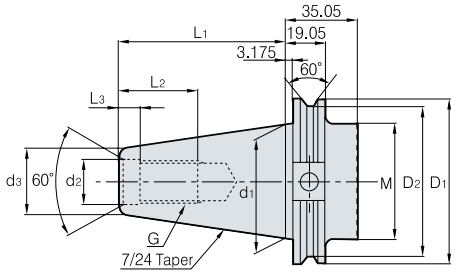
DIN 69871



(mm)

Shank No	D1	D2	D3	D4	D5	L1	L2	L3	L	b	M
30	50.0	44.3	31.75	13	17.8	47.8	16.4	19.0	33.5	16.0	M12×1.75
40	63.5	56.2	44.45	17	24.5	68.4	22.8	25.0	42.5	16.1	M16×2
45	82.5	57.2	57.15	21	33.0	82.7	29.1	31.3	52.5	19.3	M20×2.5
50	97.5	91.2	68.85	25	40.1	101.7	35.5	37.7	61.5	25.7	M24×3

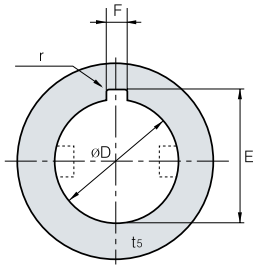
CAT shank



(mm)

Shank No	D1	D2	M	d1	d2	d3	L1	L2	L3	G
CAT40	63.5	56.36	M16×2	44.45	16.28	21.84	68.25	28.45	4.78	5/8-11
CAT45	82.55	75.41	M20×25	57.15	19.46	27.69	82.55	38.1	4.78	3/4-10
CAT50	98.43	91.29	M24×3	69.85	26.19	35.05	101.6	44.45	6.35	1-8

Standard of milling cutter hole (KSB3203)



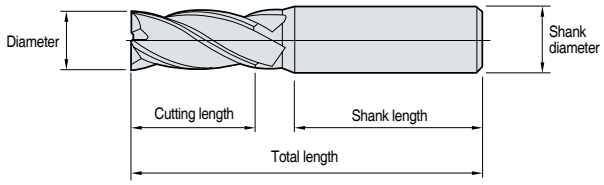
● Type A

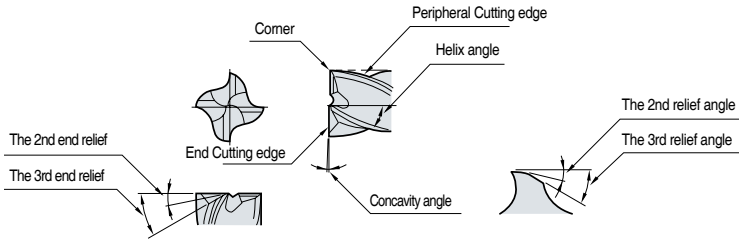
Diameter	øDH7	E	F	r
8	$8^{+0.015}_{0}$	$8.9^{+0.25}_{0}$	$2^{+0.16}_{+0.06}$	0.4
10	$10^{+0.015}_{0}$	$11.5^{+0.25}_{0}$	$3^{+0.16}_{+0.06}$	0.4
13	$13^{+0.018}_{0}$	$14.6^{+0.25}_{0}$	$3^{+0.16}_{+0.06}$	0.6
16	$16^{+0.018}_{0}$	$17.7^{+0.25}_{0}$	$4^{+0.19}_{+0.07}$	0.6
19	$19^{+0.021}_{0}$	$21.1^{+0.25}_{0}$	$5^{+0.19}_{+0.07}$	1
22	$22^{+0.021}_{0}$	$24.1^{+0.25}_{0}$	$6^{+0.19}_{+0.07}$	1
27	$27^{+0.021}_{0}$	$29.8^{+0.25}_{0}$	$7^{+0.23}_{+0.08}$	1.2
32	$32^{+0.025}_{0}$	$34.8^{+0.25}_{0}$	$8^{+0.23}_{+0.08}$	1.2
40	$40^{+0.025}_{0}$	$43.5^{+0.3}_{0}$	$10^{+0.23}_{+0.08}$	1.2
50	$50^{+0.025}_{0}$	$53.5^{+0.3}_{0}$	$12^{+0.23}_{+0.095}$	1.6
60	$60^{+0.030}_{0}$	$64.2^{+0.3}_{0}$	$14^{+0.275}_{+0.095}$	1.6
70	$70^{+0.030}_{0}$	$75.0^{+0.3}_{0}$	$16^{+0.275}_{+0.095}$	2
80	$80^{+0.030}_{0}$	$85.5^{+0.3}_{0}$	$18^{+0.275}_{+0.095}$	2
100	$100^{+0.035}_{0}$	$107.0^{+0.3}_{0}$	$24^{+0.32}_{+0.11}$	2.5

● Type B

Diameter	øDH7	E	F	r
$\frac{1}{2}$	$12.70^{+0.018}_{0}$	$14.17^{+0.25}_{0}$	$2.38^{+0.31}_{+0.13}$	0.5
$\frac{5}{8}$	$15.875^{+0.018}_{0}$	$17.74^{+0.25}_{0}$	$3.18^{+0.31}_{+0.13}$	0.8
$\frac{3}{4}$	$19.050^{+0.021}_{0}$	$20.89^{+0.25}_{0}$	$3.18^{+0.31}_{+0.13}$	0.8
$\frac{7}{8}$	$22.225^{+0.021}_{0}$	$24.07^{+0.25}_{0}$	$3.18^{+0.31}_{+0.13}$	0.8
1	$25.40^{+0.021}_{0}$	$28.04^{+0.25}_{0}$	$6.35^{+0.31}_{+0.13}$	1.2
$1\frac{1}{4}$	$31.750^{+0.025}_{0}$	$35.18^{+0.25}_{0}$	$7.94^{+0.32}_{+0.14}$	1.6
$1\frac{1}{2}$	$38.10^{+0.025}_{0}$	$42.32^{+0.25}_{0}$	$9.53^{+0.89}_{+0.25}$	1.6
$1\frac{3}{4}$	$44.450^{+0.025}_{0}$	$49.48^{+0.25}_{0}$	$11.11^{+0.89}_{+0.25}$	1.6
2	$50.80^{+0.03}_{0}$	$55.83^{+0.25}_{0}$	$12.7^{+0.89}_{+0.25}$	1.6
$2\frac{1}{2}$	$63.50^{+0.03}_{0}$	$69.42^{+0.25}_{0}$	$15.81^{+0.89}_{+0.25}$	1.6
3	$76.20^{+0.03}_{0}$	$82.93^{+0.25}_{0}$	$19.05^{+0.89}_{+0.25}$	2.4
$3\frac{1}{2}$	$88.90^{+0.035}_{0}$	$98.81^{+0.25}_{0}$	$22.23^{+0.89}_{+0.25}$	2.4
4	$101.60^{+0.035}_{0}$	$111.51^{+0.25}_{0}$	$25.4^{+0.89}_{+0.25}$	2.4
$4\frac{1}{2}$	$114.30^{+0.035}_{0}$	$125.81^{+0.25}_{0}$	$25.58^{+0.89}_{+0.25}$	3.2
5	$127.0^{+0.04}_{0}$	$140.08^{+0.25}_{0}$	$31.75^{+0.89}_{+0.25}$	3.2

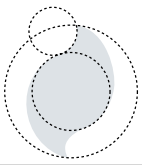
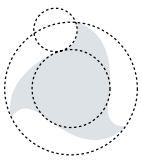
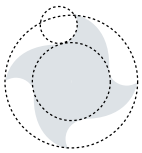
Endmill's shape and names





The comparison according to number of flute

● Features of number of flute

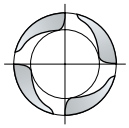
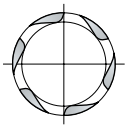
Ø10 mm	2 flutes	3 flutes	4 flutes
Shape			
Cross section	44 mm²	46 mm²	48 mm²
Ratio	56%	58%	61%
Advantages	Good chip flow	Good chip flow	High rigidity
Disadvantages	Weak rigidity	Difficult to measure external diameter	Bad chip flow
Usages	Side facing, Grooving	Side facing, Grooving	Side cutting
	Multi-functional	Medium, finishing	Finishing

● Affection of number of flute

Specification	Major features	2 flutes	4 flutes
Tool rigidity	Torsional rigidity	○	◎
	Bending rigidity	○	◎
Surface finish	Surface roughness	○	◎
	Machining precision	○	◎
Chip control	Chip clogging	◎	○
	Chip evacuation	◎	○
Grooving	Chip evacuation	◎	○
	Grooving	◎	○
Side facing	Surface finish	○	◎
	Vibration	◎	○

◎: Excellent ○: Good

The differences between general endmills and high speed endmills

General endmills		High speed endmills	
Cross section shape	Features	Cross section shape	Features
	- Applied for Low speed, High depth of cut, Low feed - Low hardness workpiece(general steel, cast iron)		- Applied for high speed, low depth of cut, high feed - Useful for hardened workpiece such as die steel

Calculations of cutting condition

● Calculations of Cutting speed

$$vc = \frac{\pi \times D \times n}{1000} \qquad n = \frac{1000 \times vc}{\pi \times D}$$

● Calculations of feed speed

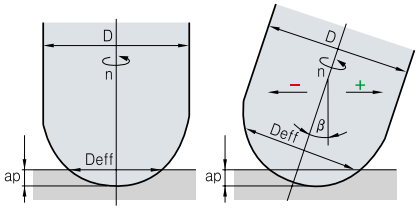
$vf = n \times fn$ or $n \times fz \times z$

$$fn = \frac{vf}{n} \qquad fz = \frac{fn}{z} \text{ or } \frac{vf}{n \times z}$$

vc: Cutting speed (m/min)
π: Circular constant (3.141592)
D: Endmill diameter (mm)
n: Revolution per minute (min^{-1})
vf: Feed speed (m/min)
fn: Feed per revolution (mm/rev)
fz: Feed per flute (mm/t)
z: Number of flute

Ball endmills cutting speed calculation formulas

Revolution per minute	$n = \frac{vc \times 1000}{D \times \pi}$
Cutting speed	$vc = \frac{D \times \pi \times n}{1000}$
Feed per tooth	$fz = \frac{vf}{z \times n}$
Feed per revolution	$fn = fz \times z$
Feed speed	$vf = fz \times z \times n$
Chip removal rate	$Q = ae \times ap \times vf$
Effective diameter of Ball Endmill	$D_{eff} = 2 \times \sqrt{D \times ap - ap^2}$ Calculation Table $D_{eff} = D \times \sin\left[\pm \arccos\left(\frac{D-2ap}{D}\right)\right]$



Technical Information for Endmills

The affection of flute length

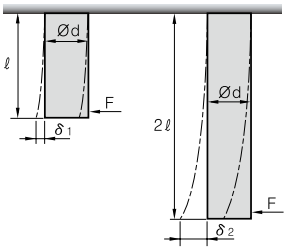
● Expression of aspect ratio

- Aspect ratio
- ℓ/d
- Ex) 3D, 15D, 22D

● Deformation rate according to length

- Deformation rate is reaction force against external force
- Proportional to the cube of length
- Set flute length and overall length as short as possible
- The more flute the better rigidity
- When flute width rate is narrower drill's rigidity is higher

$$\delta = \frac{P\ell^3}{3EI}$$



δ = Deformation volume ℓ = Length of cut

P = Cutting force E = Elasticity coefficient

I = Inertia moment ($I = \frac{\pi d^4}{64}$)

- ℓ: 2ℓ
- δ1: δ1 = 8δ1 = δ2

Spindle revolution conversion table (RPM) - external diameter

vc / External	Cutting speed (vc, m/min)															
	20	30	40	50	60	70	80	90	100	120	140	150	180	200	250	300
0.2	31,831	47,746	63,662	79,577	95,493	111,408	127,324	143,239	159,155	190,986	222,817	238,720	286,479	318,310	397,887	477,465
0.3	21,221	31,831	42,441	53,052	63,662	74,272	84,883	95,493	106,103	127,324	148,545	159,155	190,986	212,207	265,258	318,310
0.4	15,915	23,873	31,831	39,789	47,746	55,704	63,662	71,620	79,577	95,493	111,408	119,366	143,239	159,155	198,944	238,732
0.5	12,732	19,099	25,465	31,831	38,197	44,563	50,930	57,296	63,662	76,394	89,127	95,493	114,592	127,324	159,155	190,986
0.6	10,610	15,915	21,221	26,526	31,831	37,136	42,441	47,746	53,052	63,662	74,272	79,577	95,493	106,103	132,629	159,155
0.7	9,095	13,642	18,189	22,736	27,284	31,831	36,378	40,926	45,473	54,567	63,662	68,209	81,851	90,946	113,682	136,419
0.8	7,958	11,937	15,915	19,894	23,873	27,852	31,831	35,810	39,789	47,746	55,704	59,683	71,620	79,577	99,472	119,366
0.9	7,074	10,610	14,147	17,684	21,221	24,757	28,294	31,831	35,368	42,441	49,515	53,052	63,662	70,736	88,419	106,103
1	6,366	9,549	12,732	15,915	19,009	22,282	25,465	28,648	31,831	38,197	44,563	47,746	57,296	63,662	79,577	95,793
1.5	4,244	6,366	8,488	10,610	12,732	14,854	16,977	19,099	21,221	25,465	29,709	31,831	38,197	42,441	53,052	63,662
2	3,183	4,775	6,366	7,958	9,549	11,141	12,732	14,324	15,915	19,099	22,282	23,873	28,648	31,831	39,789	47,746
2.5	2,546	3,820	5,093	6,366	7,639	8,913	10,186	11,459	12,732	15,279	17,825	19,099	22,918	25,465	31,831	38,197
3	2,122	3,183	4,244	5,305	6,366	7,427	8,488	9,549	10,610	12,732	14,854	15,915	19,099	21,221	26,526	31,831
3.5	1,819	2,728	3,638	4,547	5,457	6,366	7,276	8,185	9,095	10,913	12,732	13,642	16,370	18,189	22,736	27,284
4	1,592	2,387	3,183	3,979	4,775	5,570	6,366	7,162	7,958	9,549	11,141	11,937	14,324	15,915	19,894	23,873
4.5	1,415	2,122	2,829	3,537	4,244	4,951	5,659	6,366	7,074	8,488	9,903	10,610	12,732	14,147	17,684	21,221
5	1,273	1,910	2,546	3,183	3,820	4,456	5,093	5,730	6,366	7,639	8,913	9,549	11,459	12,732	15,915	19,099
5.5	1,157	1,736	2,315	2,894	3,472	4,051	4,630	5,209	5,787	6,945	8,102	8,681	10,417	11,575	14,469	17,362
6	1,061	1,592	2,122	2,653	3,183	3,714	4,244	4,775	5,305	6,366	7,427	7,958	9,549	10,610	13,263	15,915
6.5	979	1,469	1,959	2,449	2,938	3,428	3,918	4,407	4,897	5,876	6,856	7,346	8,815	9,794	12,243	14,691
7	909	1,364	1,819	2,274	2,728	3,183	3,638	4,093	4,547	5,457	6,366	6,821	8,185	9,095	11,368	13,642
7.5	849	1,273	1,698	2,122	2,546	2,971	3,395	3,820	4,244	5,093	5,942	6,366	7,639	8,488	10,610	12,732
8	796	1,194	1,592	1,989	2,387	2,785	3,183	3,581	3,979	4,775	5,570	5,968	7,162	7,958	9,947	11,937
8.5	749	1,123	1,498	1,872	2,247	2,621	2,996	3,370	3,745	4,494	5,243	5,617	6,741	7,490	9,362	11,234
9	707	1,061	1,415	1,768	2,122	2,476	2,829	3,183	3,537	4,244	4,951	5,305	6,366	7,074	8,842	10,610
9.5	670	1,005	1,340	1,675	2,010	2,345	2,681	3,016	3,351	4,021	4,691	5,026	6,031	6,701	9,377	10,052
10	637	955	1,273	1,592	1,910	2,228	2,546	2,865	3,183	3,820	4,456	4,775	5,730	6,366	7,958	9,549
11	579	868	1,157	1,447	1,736	2,026	2,315	2,604	2,894	3,472	4,051	4,341	5,209	5,787	7,234	8,681
12	531	796	1,061	1,326	1,592	1,857	2,122	2,387	2,653	3,183	3,714	3,979	4,775	5,305	6,631	7,958
13	490	735	979	1,224	1,469	1,714	1,959	2,204	2,449	2,938	3,428	3,673	4,407	4,897	6,121	7,346
14	455	682	909	1,137	1,364	1,592	1,819	2,046	2,274	2,728	3,183	3,410	4,093	4,547	5,684	6,821
15	424	637	849	1,061	1,273	1,485	1,698	1,910	2,122	2,546	2,971	3,183	3,820	4,244	5,305	6,366
16	398	597	796	995	1,194	1,393	1,592	1,790	1,989	2,387	2,785	2,984	3,581	3,979	4,974	5,968
17	374	562	749	969	1,123	1,311	1,498	1,685	1,872	2,247	2,621	2,809	3,370	3,745	4,681	5,617
18	354	531	707	884	1,061	1,238	1,415	1,592	1,768	2,122	2,476	2,653	3,183	3,537	4,421	5,305
19	335	503	670	838	1,005	1,173	1,340	1,508	1,675	2,010	2,345	2,513	3,016	3,351	4,188	5,026
20	318	477	637	796	955	1,114	1,273	1,432	1,592	1,910	2,228	2,387	2,865	3,183	3,979	4,775
21	303	455	606	758	909	1,061	1,213	1,364	1,516	1,819	2,122	2,274	2,728	3,032	9,789	4,547
22	289	434	579	723	868	1,013	1,157	1,302	1,447	1,736	2,026	2,170	2,604	2,894	3,617	4,341
23	277	415	554	692	830	969	1,107	1,246	1,384	1,661	1,938	2,076	2,491	2,768	3,460	4,152
24	265	398	531	663	796	928	1,061	1,194	1,326	1,592	1,857	1,989	2,387	2,653	3,316	3,979
25	255	382	509	637	764	891	1,019	1,146	1,273	1,528	1,783	1,910	2,292	2,546	3,183	3,820

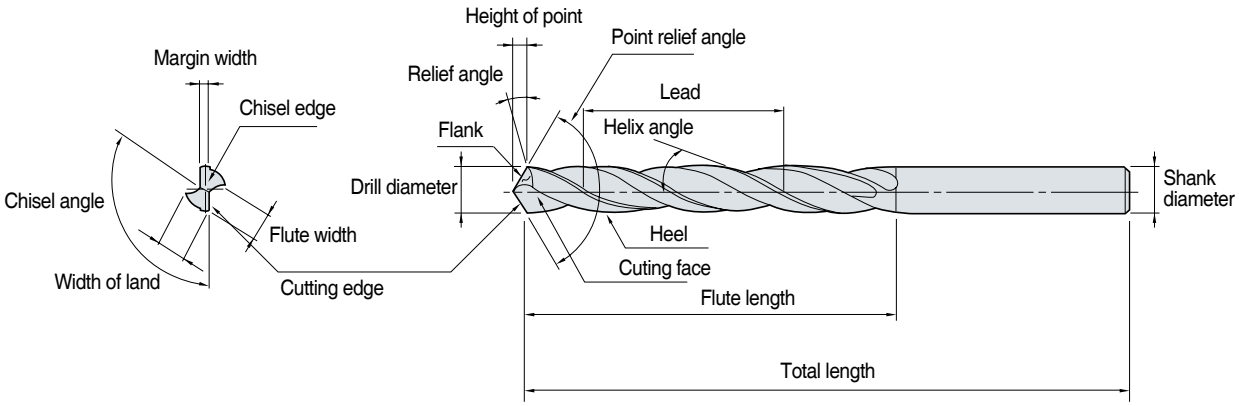
Tool failure and trouble shooting

Trouble		Causes	Solutions																
			Cutting condition					Tool shape						Grade		etc			
			Cutting speed	Feed	Depth of cut	Coolant	Up cut·down cut	Relief angle	Lead angle	Length of flute	Number of flute	Honing	Chip pocket	Toughness	Hardness	Machine rigidity	Machine vibration	Workpiece fixing	Overhang
Damage at cutting edge	Excessive periphery cutting edge	Improper cutting condition	⬇	⬆		◉											⬆		
	Chipping	Improper cutting condition Generating built up edge Weak tool rigidity Improper grade		⬇			⬇	⬇				◉		⬆			⬇	⬆	⬇
	Fracture during operation	Improper cutting conditions Excessive cutting load Excessive overhang		⬇	⬇					⬇			⬆			⬆		⬆	⬇
Poor surface finish		Generating built-up edge	⬆	⬆		◉			⬆			◉							
		Chattering	⬇				⬇			⬇						⬆	⬇	⬆	⬇
		Poor straightness		⬇	⬇		⬆		⬆	⬇									⬇
Poor machining precision (Machined size, perpendicularity)		Improper cutting conditions Improper tool shape	⬆	⬇			⬇			⬇	⬆					⬆	⬇		⬇
Bad chip evacuation		Excessive cutting volume Improper chip pocket Improper cutting conditions		⬇	⬇						⬇		⬆						

⬆: Increase ⬇: Decrease ●: use ◉: Correct use

Technical Information for Drills

The shape of drills and the names



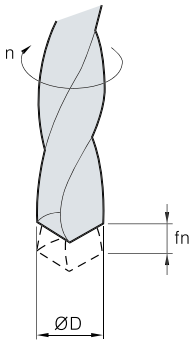
Shape and the feature of cutting

Helix angle	Plays rake angle of cutting edge's role. If helix angle increases Cutting force decreases. On the other hand If helix angle is too big Drill rigidity decreases Poor machinability ◀ low - Helix angle - high ▶ Smooth chip evacuation Hard workpiece (hardened steel) ◀ low - Helix angle - high ▶ Soft material (aluminum etc)
Length of flute	The path of both chip evacuation and cooling lubricant Too big length of flute weakens drill rigidity and too small length of flute worsens chip evacuation to breakage
Point angle	Point angle has big influence on cutting performance. It mainly depends on workpiece. In case of standard drills Point angle is generally 118 thrust resistance decrease ◀ low - Point angle - high ▶ thrust resistance increase Torque increase, Burr on exit increase ◀ low - Point angle - high ▶ Torque decrease, Burr on exit decrease Soft material (aluminum etc) ◀ low - Point angle - high ▶ Hard workpiece (hardened steel)
Margin	While machining Margin is the part of contact between workpiece and drill's external. It prevents bending and plays guide's role It depends on drill size Cutting force decrease ◀ small - Margin - big ▶ Cutting force increase Poor guide ◀ small - Margin - big ▶ Good guide
Web thickness	Web is the part of center of drill and drill's rigidity depends on the web. Drill needs cutting edge, chisel edge, at the tip of drill because drill makes a hole at the beginning of drilling . When web thickness is big Thinning is needed to reduce cutting force Cutting force decrease ◀ small - Web thickness - big ▶ Cutting force increase Rigidity decrease ◀ small - Web thickness - big ▶ Rigidity increase Good chip evacuation ◀ small - Web thickness - big ▶ Bad chip evacuation Soft material (aluminum etc) ◀ small - Web thickness - big ▶ Hard workpiece (hardened steel)
Back taper	Drill diameter size is getting smaller from point to shank in order to avoid the friction between drill periphery and workpiece. The decrease of diameter divided by flute length 100mm generally becomes 0.04~0.1mm. As for high performance drills and drills for hole shrinkage workpiece during operation have big back taper
Thinning	In general drills Thrust effects on chisel over 50%. Chisel edge length depends on web thickness and chisel angle. But if web is thin Drill rigidity weaken. Therefore without web thickness change Thinning makes chisel edge short or gives rake angle. In other words, Thinning makes rake angle at chisel and improves chip evacuation and decrease thrust

Types of	Edge shape	Feature	Korloy's drills
X type		Good centering High central thickness Crank shaft	Mach solid drill (MSD) Vulcan drill (VZD)
S type		For wide use For general Easy regrinding	Solid drill (SSD)

Major cutting formulas

Cutting speed	Feed	Helix angle	Machining time
$vc = \frac{\pi \cdot D \cdot n}{1000}$ (m/min)	$fn = \frac{vf}{n}$ (mm/rev)	$\delta = \tan^{-1}\left(\frac{\pi D}{L}\right)$	$tc = \frac{ld}{n \cdot fn}$ (min)
• vc: Cutting speed (m/min) • D: Drill diameter (mm) • n: Revolution per minute (min^{-1}) • π: Circular constant (3.14)	• fn: Feed per revolution (mm/rev) • vf: Feed per minute (mm/min) • n: Revolution per minute (min^{-1})	• δ : Helix angle • D: Drill diameter (mm) • L: Lead (mm) • π: Circular constant (3.14)	• tc: Machining time (min) • n: Revolution per minute (min^{-1}) • ld: Drilling time (mm) • fn: Feed (mm/rev)



Cutting torque and thrust (calculation formulas)

$Md = KD^2 \times (0.0631 + 1.686 \times fn)$ (kg·cm)

$T = 57.95KDfn^{0.85}$ (kg)

• Md: Cutting torque (kg·cm)
• T: Cutting thrust (kg)
• D: Drill diameter (mm)
• fn: Feed per revolution (mm/rev)
• K: Material coefficient

Workpiece material (SAE/AISI)		Tensile strength (kgf)	Hardness (HB)	Material coefficient K
Cast iron	Cast iron (Gray)	21	177	1.00
	Cast iron	28	198	1.39
	Cast iron (Ductile)	35	224	1.88
General steel	1020(carbon steel C 0.2%)	55	160	2.22
	1112(C 0.12, S 0.2%)	62	183	1.42
	1335(Mn 1.75%)	63	197	1.45
Nickel Chrome steel	3115 (Ni 1.25, Cr 0.6, Mn 0.5)	53	163	1.56
	3120 (Ni 1.25, Cr 0.6, Mn 0.7)	69	174	2.02
	3140	88	241	2.32
Chrome molybdenum steel	4115 (Cr 0.5, Mo 0.11, Mn 0.8)	63	167	1.62
	4130 (Cr 0.95, Mo 0.2, Mn 0.5)	77	229	2.10
	4140 (Cr 0.95, Mo 0.2, Mn 0.85)	94	269	2.41
Nickel molybdenum steel	4615 (Ni 1.8, Mo 0.25, Mn 0.5)	75	212	2.12
	4820 (Ni 3.5, Mo 0.25, Mn 0.6)	140	390	3.44
Chrome steel	5150 (Cr 0.8, Mn 0.8)	95	277	2.46
Chrome vanadium steel	6115 (Cr 0.6, Mn 0.6, V 0.12)	58	174	2.08
	6120 (Cr 0.8, Mn 0.8, V 0.1)	80	255	2.22

Cutting torque and thrust (empirical formula)

$Md = K_1 d^2 \cdot fn^m$

$T = K_2 d \cdot fn^n$

• Md: Cutting torque (kg·cm)
• T: Thrust (kg)
• fn: Feed (mm/rev)
• d: Drill diameter (mm)
• K_1, K_2, m, n: Experimental Data Characteristic value

Workpiece	K_1	m	K_2	n
Soft steel	5.9	1.00	125.0	0.88
Rolled steel	3.5	1.00	55.0	0.88
7-3 brass	2.5	0.94	44.4	0.87
Aluminum	1.5	0.90	33.3	0.78
Zinc	1.4	0.88	27.0	0.74
Gun metal	2.0	0.94	21.6	0.75
Galvanized iron	0.3	0.57	6.4	0.55

Tool failures and solutions

Trouble		Causes	Solutions																	
			Cutting condition					Tool shape						Grade		etc				
			Cutting speed	Feed	Step feed	Initial feed	Coolant	Relief angle	Point angle	Thinning angle	Honing	Flute width rate	Thinning	Toughness	Hardness	Machine rigidity	Machine vibration	Guide bush	Clamping workpiece
Chipping		• Too sharp cutting edge (too big relief angle) (thinning edge is too sharp)						⬇		⬇	⬆			⬆					
		• Excessive cutting speed	⬇				●												
		• Built-up edge					●	⬇		⬇	⬆			⬆					
		• Vibration and chattering	⬇													⬆	⬇		●
Wear		• Excessive cutting speed (Abnormal wear at margin)	⬇				●												
		• Insufficient cutting speed (Abnormal wear at center)	⬆				●												
Chip		• Long chip	⬆	⬆			●				⬇								
		• Over lap	⬆	⬆															
		• Chip burning	⬆				●												
Hole precision burr, poor surface finish		• Tool clamping precision				⬇			⬇		⬇					⬆	⬇		●
		• Excessive feed, sharp point angle		⬇					⬆		⬇								
		• Excessive cutting speed (Considered tool grade)	⬆				●	⬇	◉						⬆				
Fracture	Breakage on contact	• Poor surface finish			●	⬇												●	
		• Insufficient machine rigidity														⬆			●
		• Improper cutting condition	⬆	⬇															
	Breakage at hole bottom	• Crooked hole	⬆						⬆				●				⬇	●	
		• Chip clogging		⬇	●							⬆							

⬆: Increase ⬇: Decrease ●: use ◉: Correct use

Hole size for threading

● Metric coarse screw threads

Specification	Hole diameter
M1 X 0.25	0.75
M1.1 X 0.25	0.85
M1.2 X 0.25	0.95
M1.4 X 0.3	1.1
M1.6 X 0.35	1.25
M1.7 X 0.35	1.35
M1.8 X 0.35	1.45
M2 X 0.4	1.6
M2.2 X 0.45	1.75
M2.3 X 0.4	1.9
M2.5 X 0.45	2.1
M2.6 X 0.45	2.2
M3 X 0.6	2.4
M3 X 0.5	2.5
M3.5 X 0.6	2.9
M4 X 0.75	3.25
M4 X 0.7	3.3
M4.5 X 0.75	3.8
M5 X 0.9	4.1
M5 X 0.8	4.2
M5.5 X 0.9	4.6
M6 X 1	5
M7 X 1	6
M8 X 1.25	6.8
M9 X 1.25	7.8
M10 X 1.5	8.5
M11 X 1.5	9.5
M12 X 1.75	10.3
M14 X 2	12
M16 X 2	14
M18 X 2.5	15.5
M20 X 2.5	17.5
M22 X 2.5	19.5
M24 X 3	21
M27 X 3	24
M30 X 3.5	26.5
M33 X 3.5	29.5
M36 X 4	32
M39 X 4	35
M42 X 4.5	37.5
M45 X 4.5	40.5
M48 X 5	43

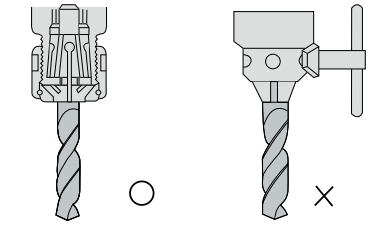
● Metric coarse screw threads

Specification	Hole diameter
M2.5 X 0.35	2.2
M3 X 0.35	2.7
M3.5 X 0.35	3.2
M4 X 0.5	3.5
M4.5 X 0.5	4
M5 X 0.5	4.5
M5.5 X 0.5	5
M6 X 0.75	5.3
M7 X 0.75	6.3
M8 X 1	7
M8 X 0.75	7.3
M9 X 1	8
M9 X 0.75	8.3
M10 X 1.25	8.8
M10 X 1	9
M10 X 0.75	9.3
M11 X 1	10
M11 X 0.75	10.3
M12 X 1.5	10.5
M12 X 1.25	10.8
M12 X 1	11
M14 X 1.5	12.5
M14 X 1	13
M15 X 1.5	13.5
M15 X 1	14
M16 X 1.5	14.5
M16 X 1	15
M17 X 1.5	15.5
M17 X 1	16
M18 X 2	16
M18 X 1.5	16.5
M18 X 1	17
M20 X 2	18
M20 X 1.5	18.5
M20 X 1	19
M22 X 2	20
M22 X 1.5	20.5
M22 X 1	21
M24 X 2	22
M24 X 1.5	22.5
M24 X 1	23
M25 X 2	23
M25 X 1.5	23.5
M25 X 1	24
M26 X 1.5	24.5
M27 X 2	25

Cautions

● Selection of drill chuck

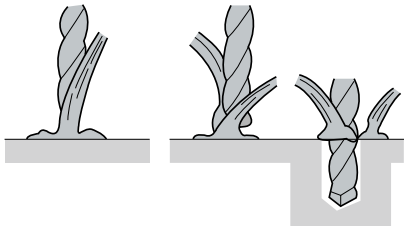
- Collect chuck is favorable Because it has strong grip power (General drill-chuck and Keyless chuck don't have enough grip power.)



• Collect chuck • General drill-chuck

● Coolant supply

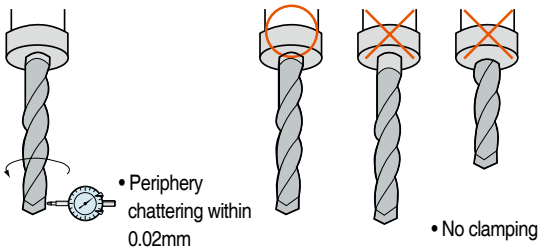
- Supply enough coolant around hole entrance
- Standard cutting oil pressure: 3~5 kg/㎠, Flux: 2~5 ℓ/min



• Supply much coolant at hole entrance

● Mounting drill

- When mounting drill Periphery chattering should be within 0.02mm
- Flute should not be clamped

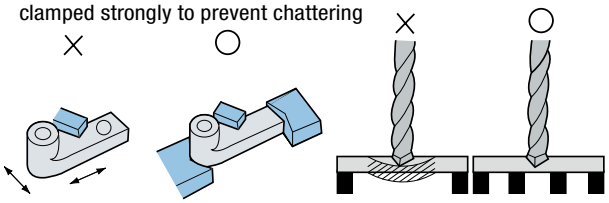


• Periphery chattering within 0.02mm

• No clamping flute

● How to clamp workpiece

- At high performance drilling High thrust, torque and horizontal cutting force work at the same time so that workpiece should be clamped strongly to prevent chattering



• Uniformed and strong clamping is needed (Right and left, up and down)

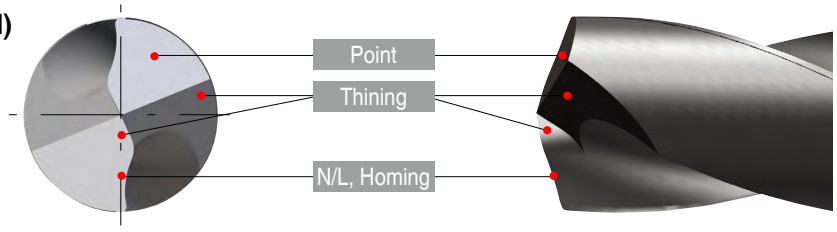
• Strong clamping is needed because bending causes chipping

Notice

1) For better drill's life, small damage and wear are favorable to be regrinding
2) Damage and wear size should be within 1.5mm for regrinding
3) If drill has crack, regrinding is impossible
4) Ordering for regrinding is acceptable or purchase regrinding machine

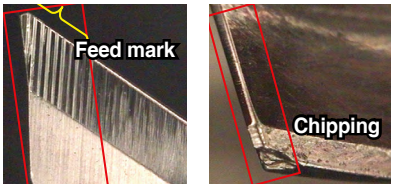
Regrinding procedures

● Regrinding mathod (Mach Drill)



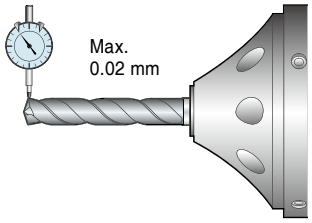
1) Preparation Determination of regrinding areas

- Check the cutting edge for damage and wear If large fracture is found, remove it by rough grinding



2) Grinding operation Drills setting

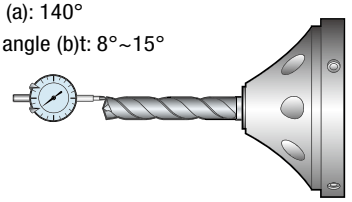
- Drill is clamped to collet chuck Chattering is kept within 0.02mm

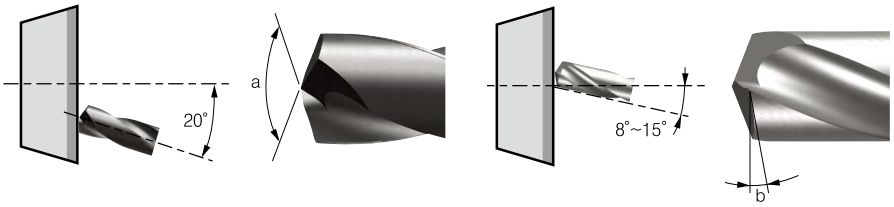


3) Grinding operation-Grinding point

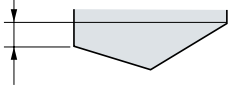
- Check damage and wear at the point and remove it completely
- The difference of the lip height is kept within 0.02 mm

Point angle (a): 140°
Point relief angle (b)t: 8°~15°





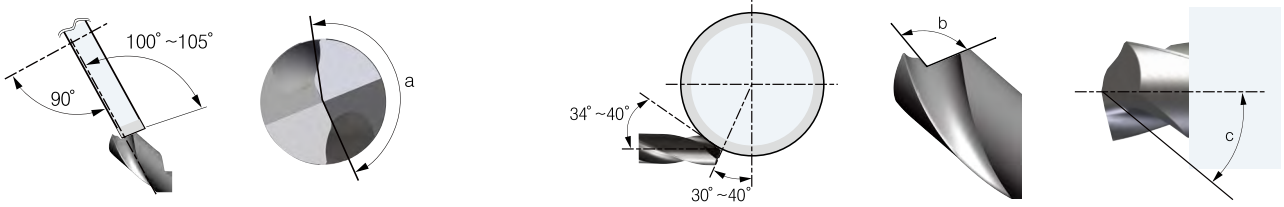
The difference of the lip height Max. 0.02 mm



4) Grinding operation-Thinning grinding

- Considering N/L width Cutting edge length from the center of drill axis should be 0.03~0.08mm for balancing
- Set the wheel to tilt drill axis by 34°~40°.

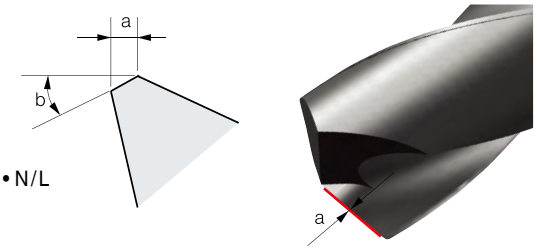
Thinning angle (a)°: 155°~160° Thining open angle (b): 100°~105°
Thinning relief angle (c): 34°~40°



5) Grinding-N/L grinding and honing

- Using diamond chisel Grinds the width flat along point cutting edge
- After negaland operation Finishes with brush or handstone

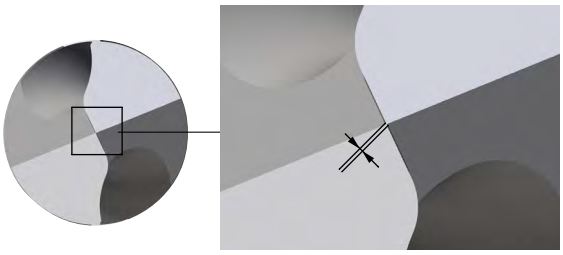
N/L width (a): 0.05mm~0.16mm/N/L angle (b): 24°~26°



● TIP

• Making point
- Without center drill, the point width should be below 0.10 mm

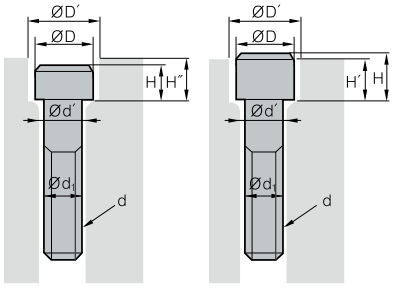
• **Recommended grinding condition**
- Diamond wheel: 240~400 mesh
- Diamond chisel: 400~600 mesh
- Diamond hand stone: 800~1500 mesh



Hexagonal socket bolt (clamping screw) size

● Counter boring and size of bolt hole for hexagonal socket bolt

ISO (d)	M3	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30
Ød₁	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
Ød′	3.4	4.5	5.5	6.5	8.5	11	14	16	18	20	22	24	26	30	33
ØD	5.5	7	8.5	10	13	16	18	21	24	27	30	33	36	40	45
ØD′	5	8	9.5	11	14	17.5	20	23	26	29	32	35	39	43	48
H	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
H′	2.7	3.6	4.6	5.5	7.4	9.2	11.0	12.8	14.5	16.5	18.5	20.5	22.5	25	28
H″	3.3	4.4	5.4	6.5	8.6	10.8	13.0	15.2	17.5	19.5	21.5	23.5	25.5	29	32



KORLOY grades

Cat.		Grade	ISO						Endmill	Solid drill	Coating layer
			P	M	K	S	N	H			
Coating	PVD	PC2510						H05-H15	●		★ New TiAlN film (High hardness/ Oxidation resistance)
Uncoated		H01			K05-K10	S01-S10	N10-N20	H05-H10	●		
cBN	PVD	PC203F						H05-H15	●		★ New TiAlN film (High hardness/ Oxidation resistance)
	PVD	PC210C					N10-N20		●		CrN
	PVD	PC215F	P20-P35						●		★ New TiAlN film (High hardness/ Oxidation resistance)
	PVD	PC215G	P15-P30		K15-K30					●	TiAlN
	PVD	PC221F	P35-P45		K35*K45				●		★ New TiAlN film (High hardness/ Oxidation resistance)
	PVD	PC230F	P05-P15	M05-M15	K05-K15						★ New TiAlN film (High hardness/ Oxidation resistance)
	PVD	PC303S	P05-P15		K05-K15			H05-H15	●		TiMeN / TiAlN
	PVD	PC310U	P10-P20		K10-K20			H10-H20	●		TiMeN / TiAlN
	PVD	PC315E	P20-P35		K20-K35				●		AlCrN
	PVD	PC315G	P15-P30		K15-K30					●	TiAlCrN
	PVD	PC320	P20-P35		K20-K35				●		TiAlN
	PVD	PC320S		M20-M30		S20-S30			●		TiMeN / TiAlN
	PVD	PC320U	P01-P10		K05-K10				●		AlCrN
	PVD	SL				S25-S35			●		TiAlN
	PVD	PC325T				S20-S30				●	TiMeN / TiAlN
	PVD	PC325U	P20-P35	M20-M30	K20-K35					●	TiAlCrN
PCD		H01					N10-N20		●		
		H05S					N10-N20		●		
		FCC			N15-N35				●		
		FG2	P05-P25				N05-N25			●	
		FA1	P05-P25				N05-N25			●	
DIA	CVD	ND2100					N2.5-N7.5		●	●	Dia Coating
	CVD	ND3000					N01-N05		●		Dia Coating
DLC	PVD	PD1005					N05-N10		●		DLC(ta-c)
	PVD	PD1010					N10-N15		●		DLC(ta-c)

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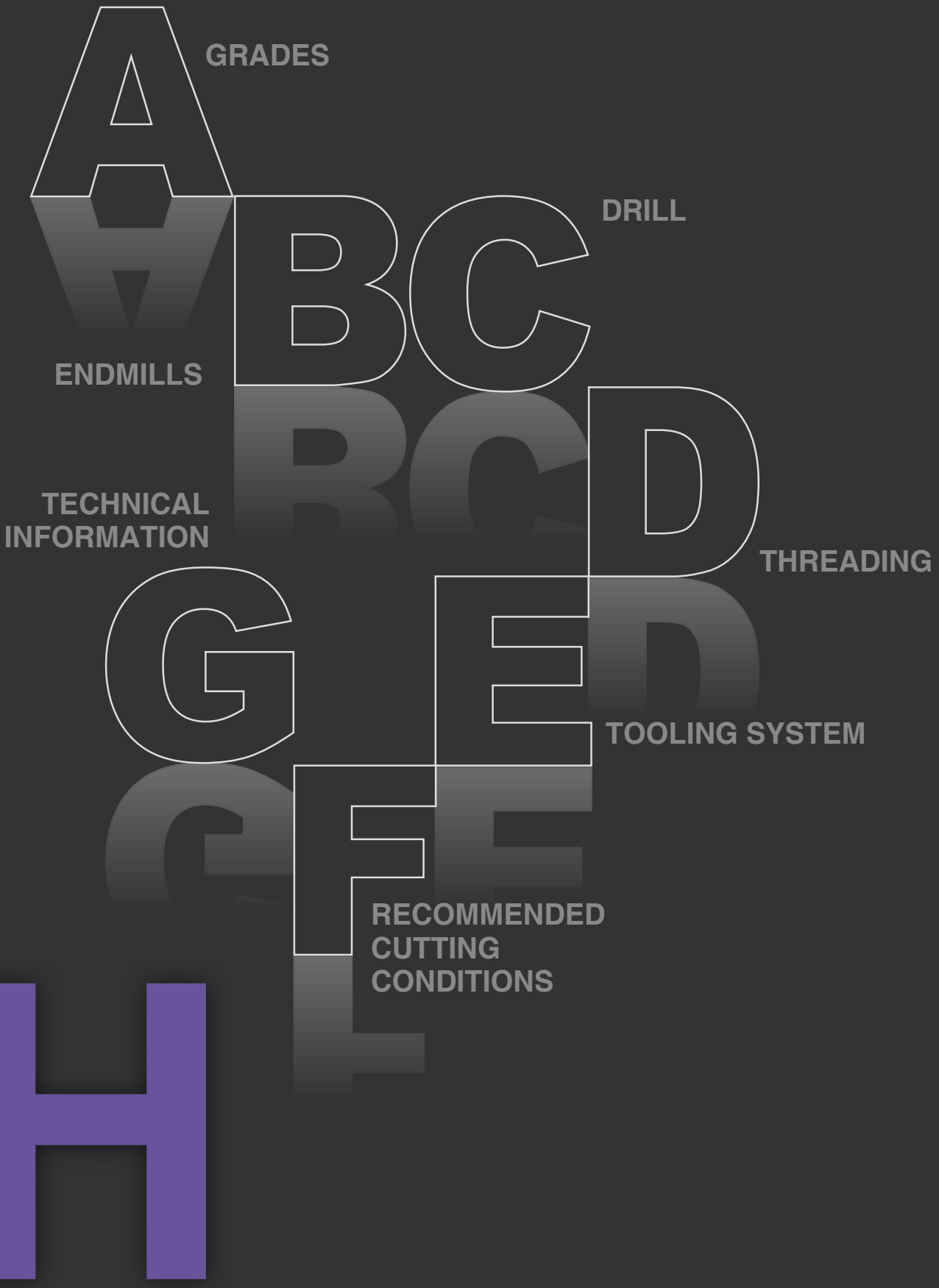
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INFORMATION
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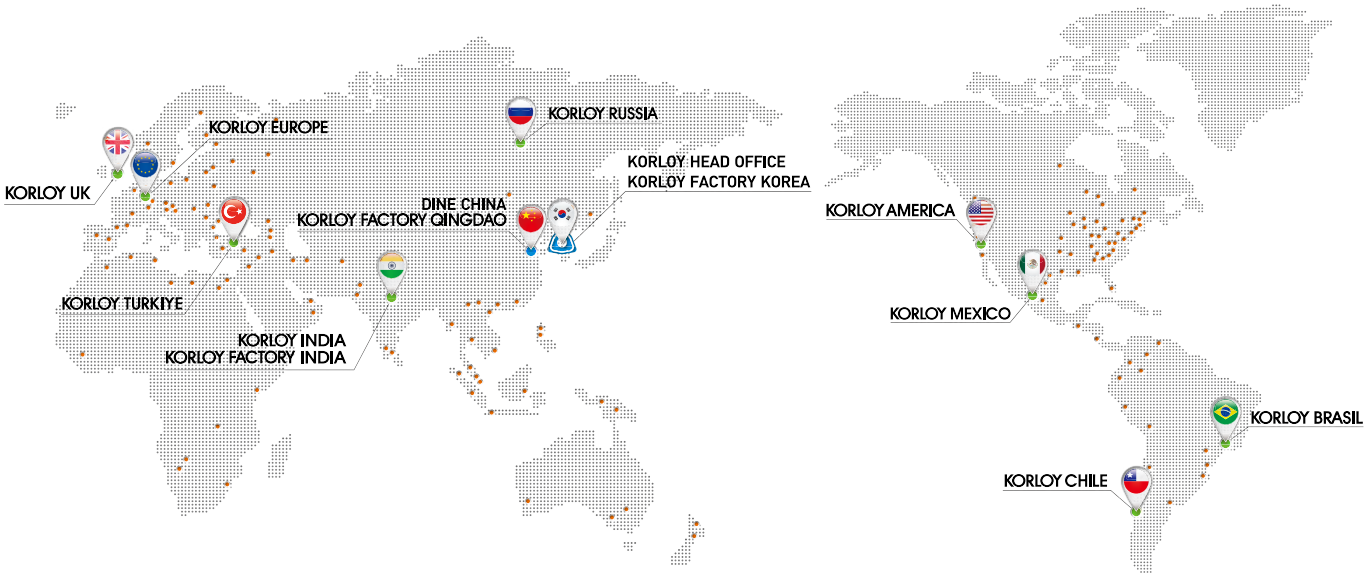
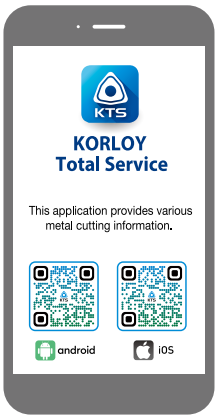
We stand to be the Global Top Manufacturer. Korea's Best. World's Best





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