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

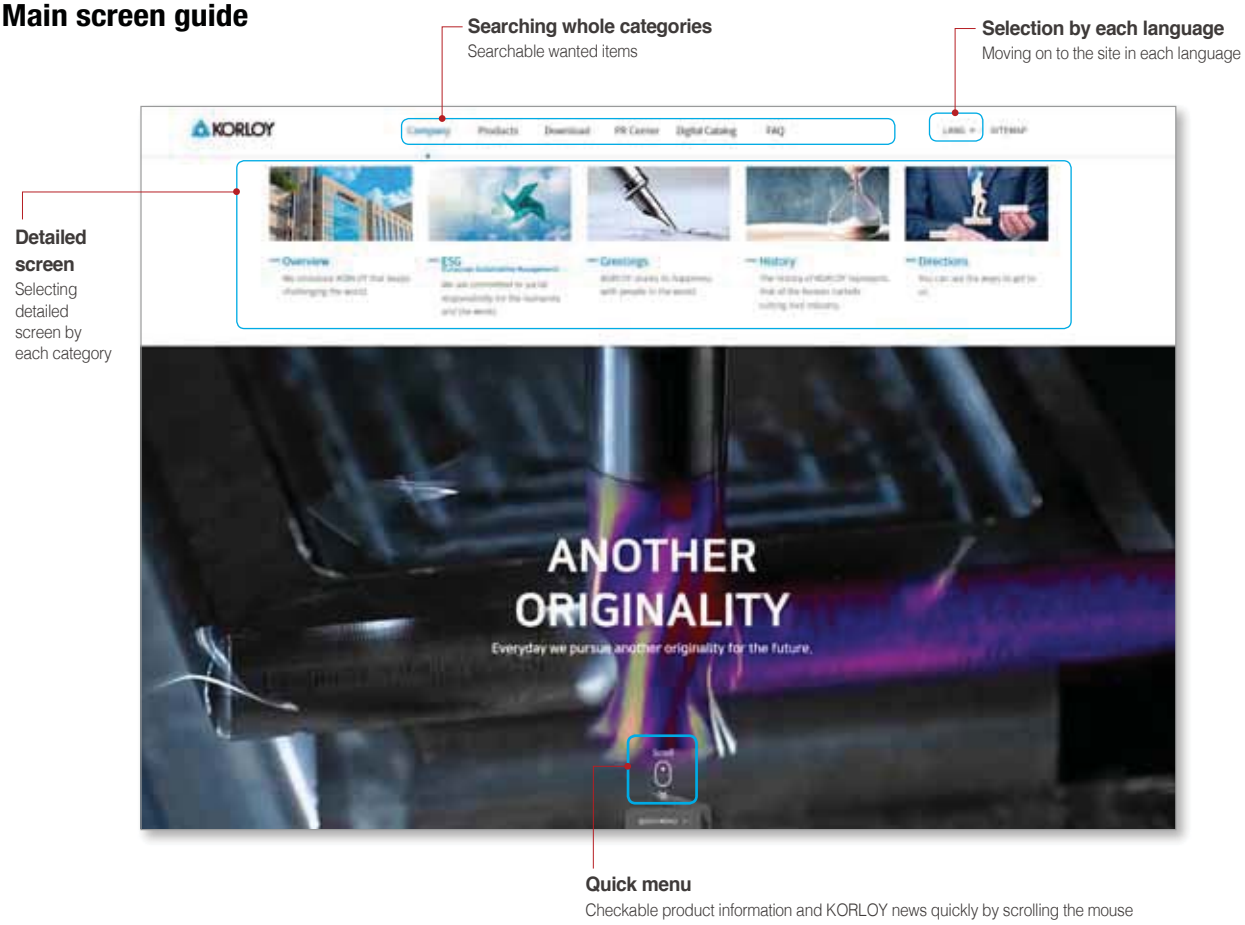
DANGEROUS FACTOR	
Cutting tools	• Sharp cutting edge of cutting tools may cut your bare-hand
	• Inappropriate conditions or usage may cause fragmentation and expel parts of tools which may cause injury
	• Severe load on tool and premature wear of cutting edge may bring excessive cutting force on tool, 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



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



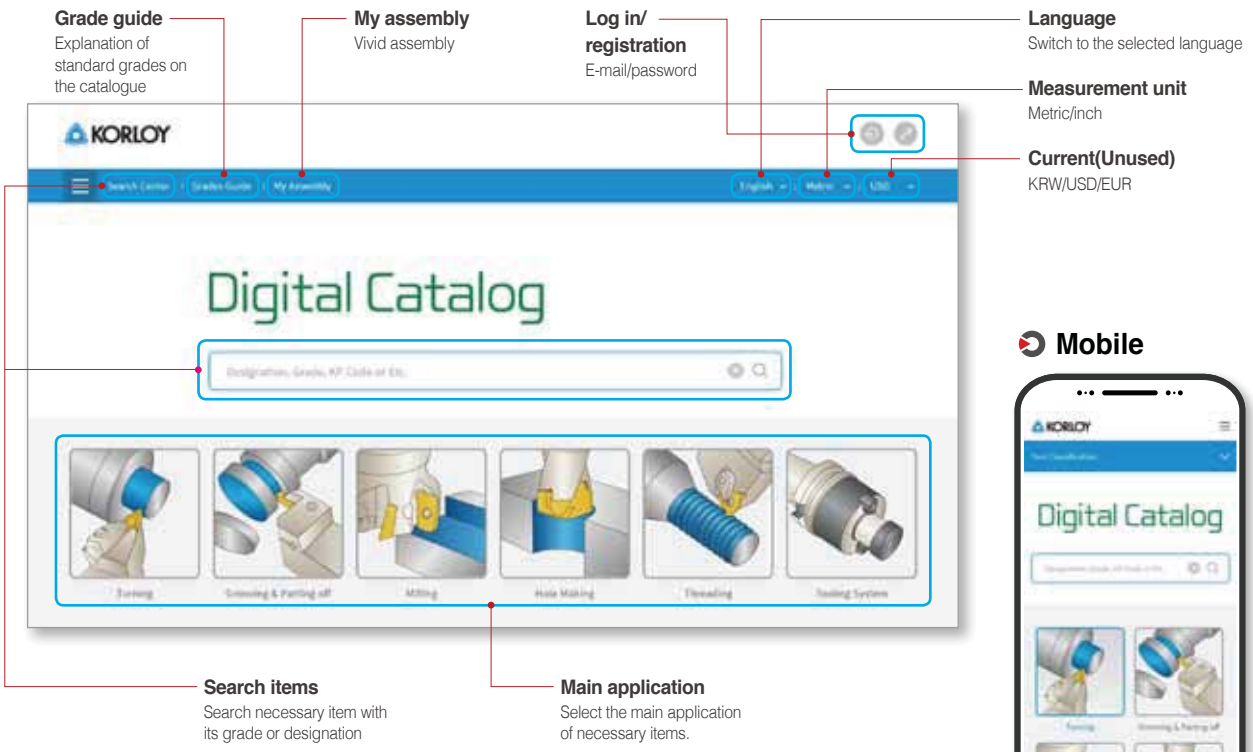
» Shortcut to genuine product certification



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

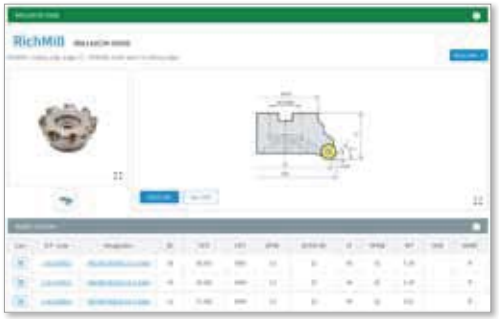
» Sub application



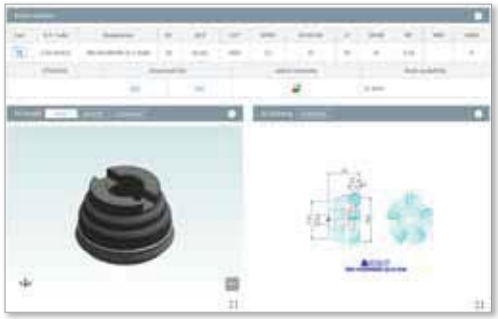
» Item group



» 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 I** Move the wanted hall

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

③ **Side menu I** Searchable wanted sections

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

⑤ **Video I** Item promotion video

⑥ **Tech news I** Checking tech news

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

⑧ **3D modeling I** Checking 3D modeling view

* **Connectable on mobile**

Detailed screen

» **New product hall**



» **Industry hall**



» **Tooling guide**



» **History hall**



» **Smart factory**



» **Poster**



Tool Keeper C/L(COIL/Locker) Type System

The smart tool storage control system which is a 24-hour running unmanned system that can simultaneously store and manage tools and tool holders in real time. It is designed to improve the efficiency and security of tool management in operation sites and other industrial settings.

Efficient and transparent hybrid tool management control system + customer-customized S/W applied

C/L Type



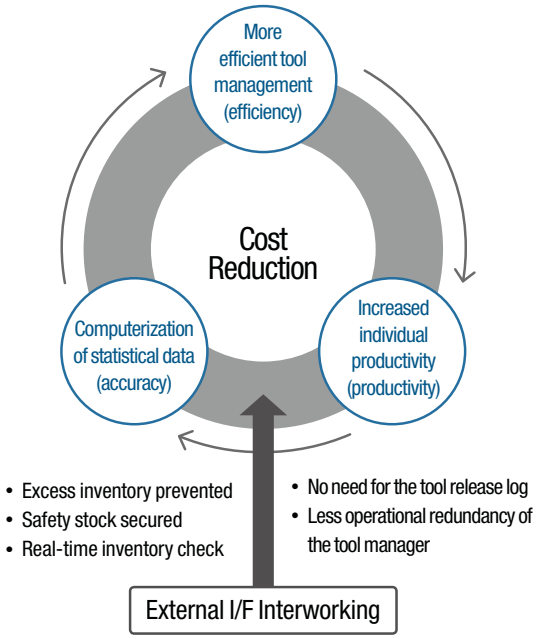
- Storage CAPA: Coils (81 types) + Lockers (21 types)
- Transparent Shipping (Packaging Units)
- Easy Tool Selection/Shipping with Touch Monitor

[Option] L Type



- Storage CAPA: 59 types
- Maximum Length: Up to 14.96 inch
- Can Add Up to: 10 units

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

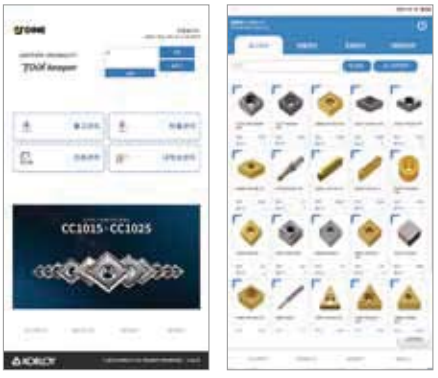


Software Configuration: Administrator Program + User Program

» Administrator Program



» User Program

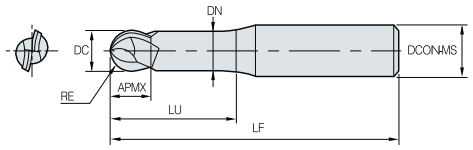


Key features

1. Safety Stock Alert Management (Automatic Email/SMS Notifications)
2. Multilingual Language Settings/Remote Diagnosis/SW
3. Automatic Updates Monthly Tool Usage(Average)/Expenditure/Inbound Quantity Management

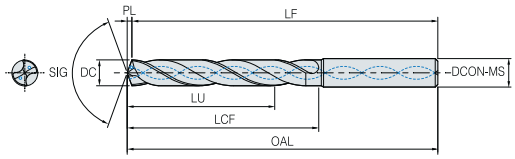
ISO13399 GLOSSARY

Endmill



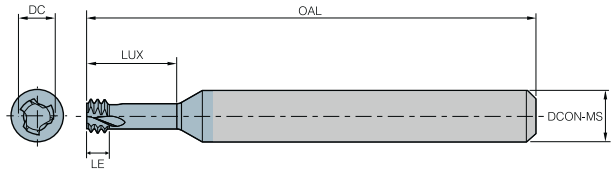
ISO13399 Property Symbols	Property Name
AP	Axial depth
APMX	Depth of cut maximum
BHTA	Body half taper angle
CA	Collision Angle
CHW	Corner chamfer width
DC	Cutting diameter
DCON-MS	Connection diameter machine side
DCX	Cutting diameter maximum
DN	Neck diameter
FHA	Flute helix angle
KCH	Corner chamfer
L	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



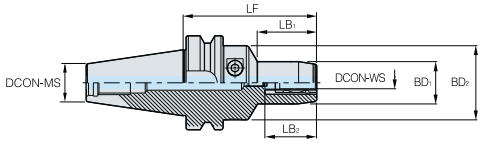
ISO13399 Property Symbols	Property Name
CW	Cutting width
DC	Cutting diameter
DCN	Cutting diameter minimum
DCON-MS	Contact surface diameter machine side
L	Cutting edge length
LCF	Length chip flute
LF	Functional length
LH	Head length
LS	Shank length
LU	Usable length (max. recommended)
NOF	Flute count
OAL	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 : B12

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 : B33



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 : B36

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 : B143

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 : B224



G-Star Endmill

Suitable for low hardness steel (HRC10~30); alloy steel, carbon steel, Pre-hardened, hardened steel etc.

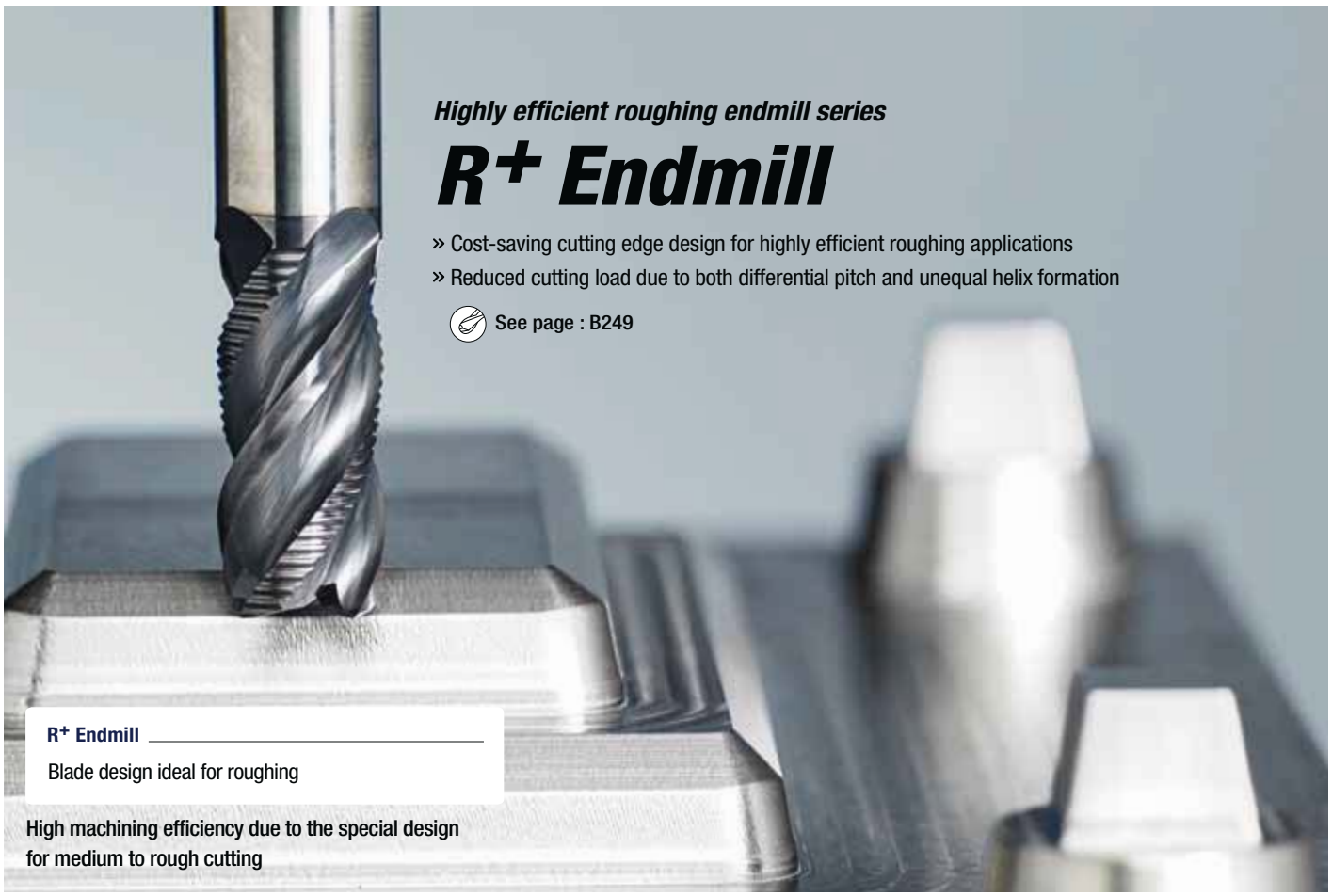
General purpose suitable for rough machining, finishing and curved and sloped surfaces

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 : B249



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

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Endmill for aluminum machining

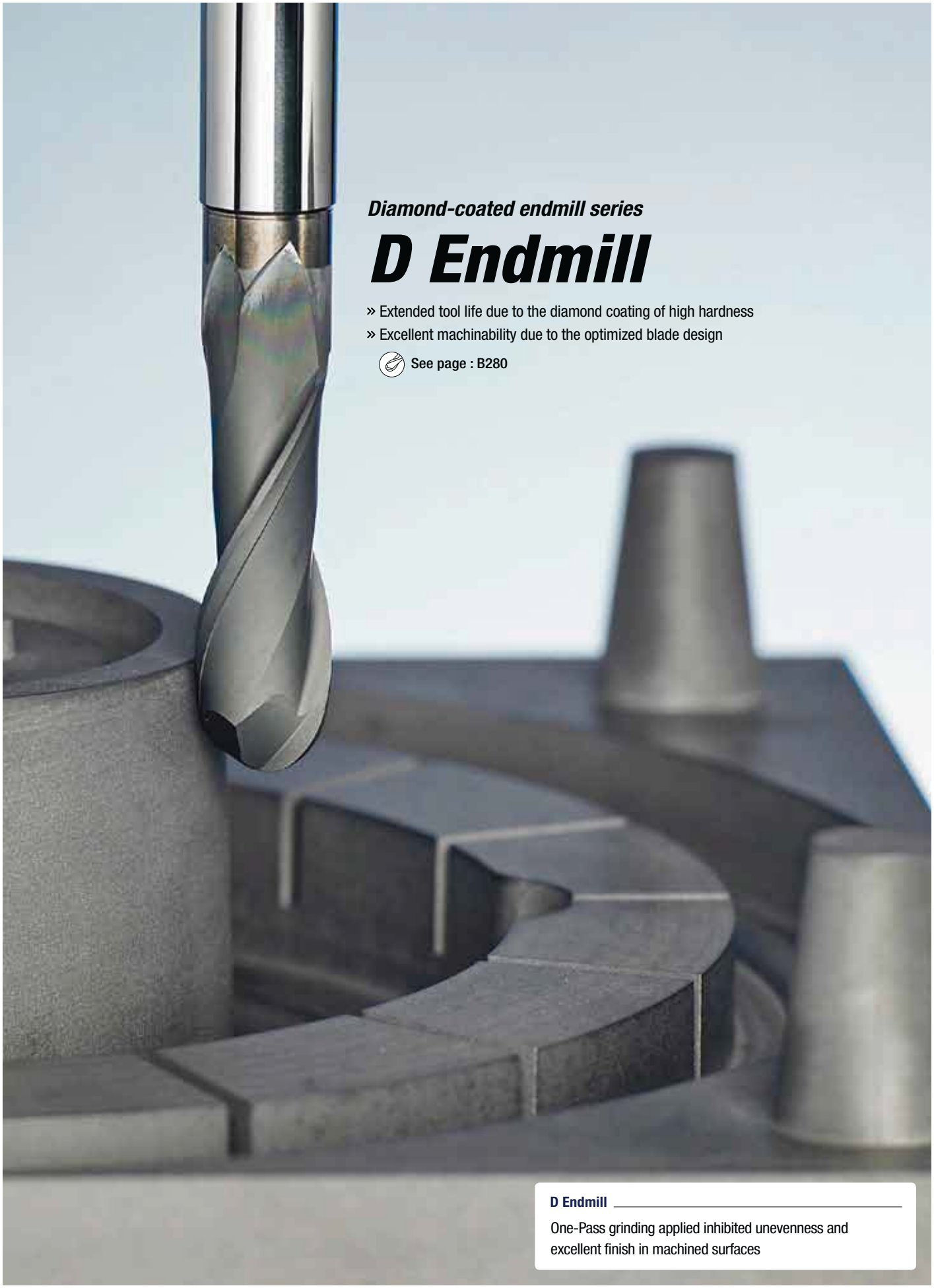
A-Star Endmill

» 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 : B269

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

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D Endmill

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



Router endmill series for machining composite materials

Composite Router Endmill

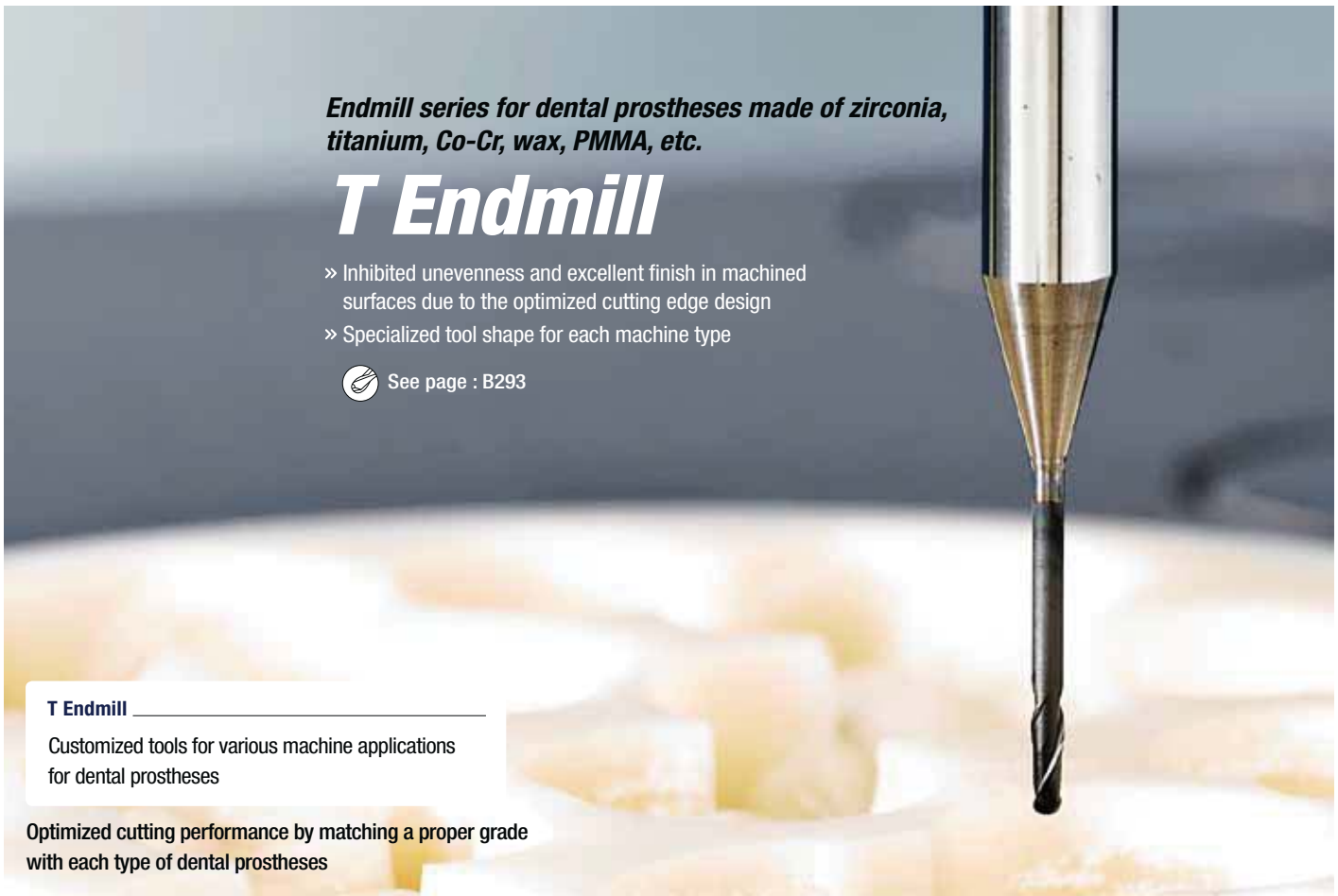
» Blade design to inhibit delamination and burrs
» Boosted productivity due to highly efficient machining

See page : B289

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 : B293

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

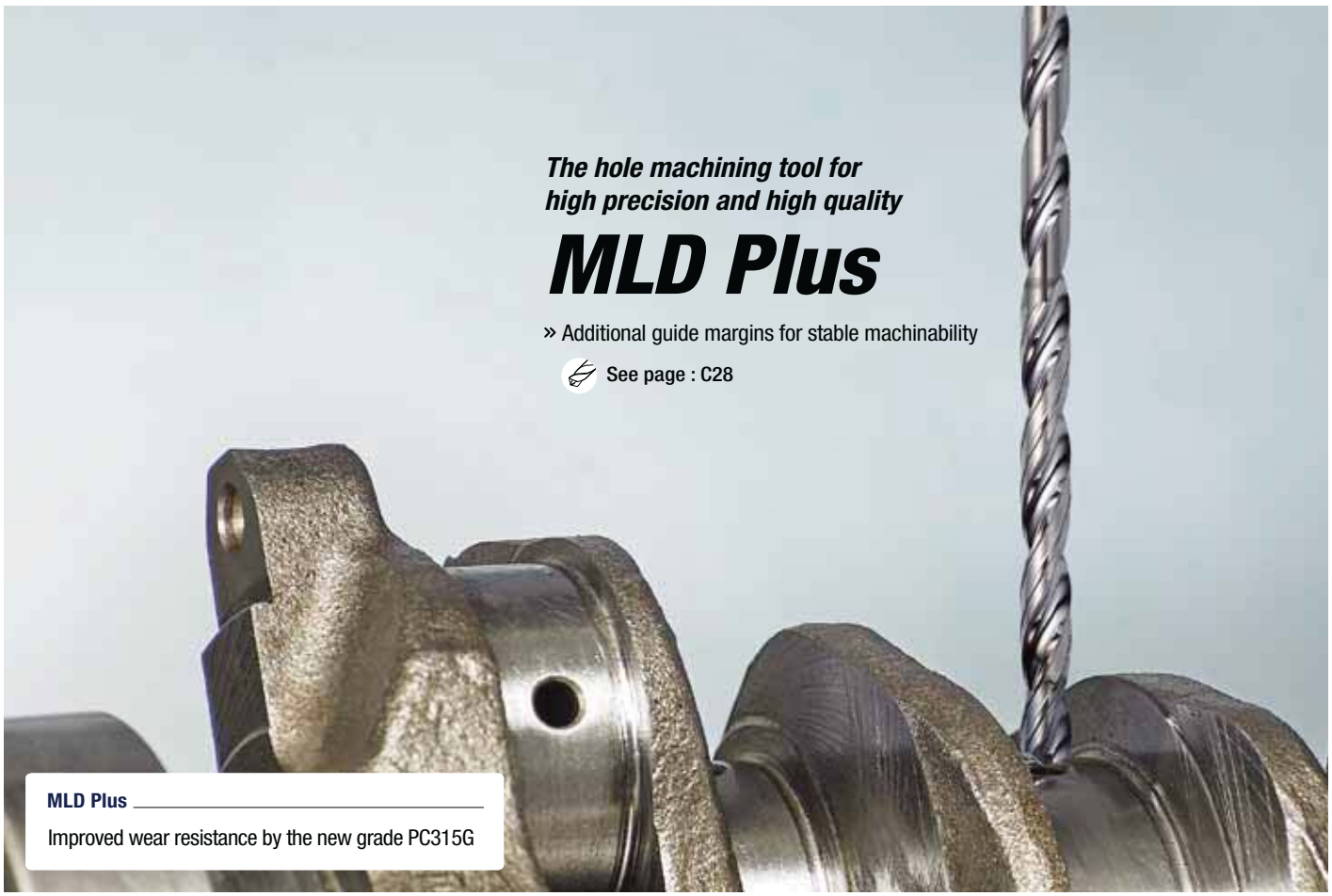
» Highly efficient hole machining for various workpiece types such as automotive components

» Wider chip pockets for smooth chip evacuation

See page : C5

MSD Plus

Improved wear resistance by the new grade PC325U



The hole machining tool for high precision and high quality

MLD Plus

» Additional guide margins for stable machinability

See page : C28

MLD Plus

Improved wear resistance by the new grade PC315G



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 : C10

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 : C19

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 : C21

MSFD

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



Universal drill applied with DIN standard

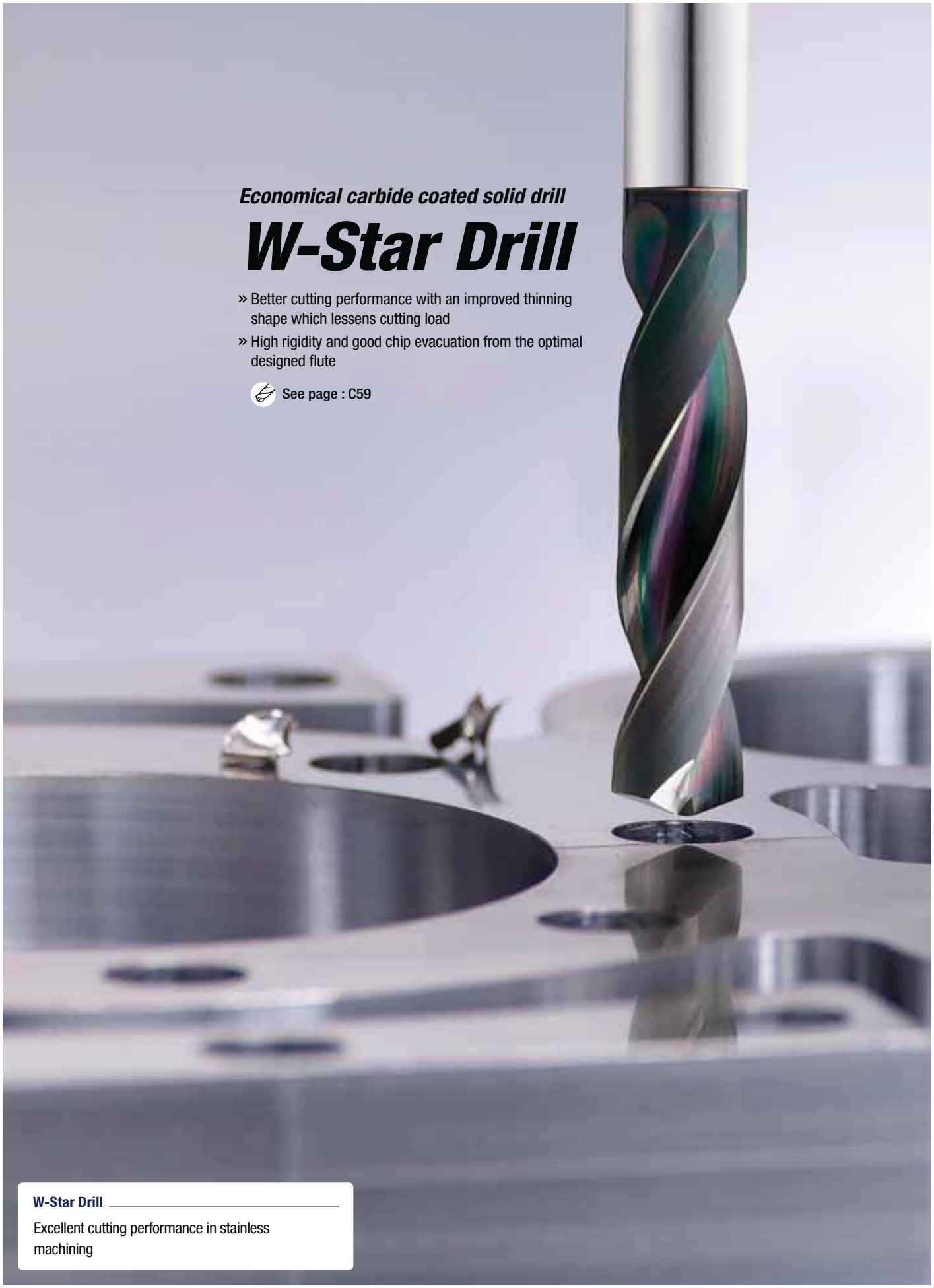
P-Star Drill

» 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 : C32

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 : C59

W-Star Drill

Excellent cutting performance in stainless machining



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

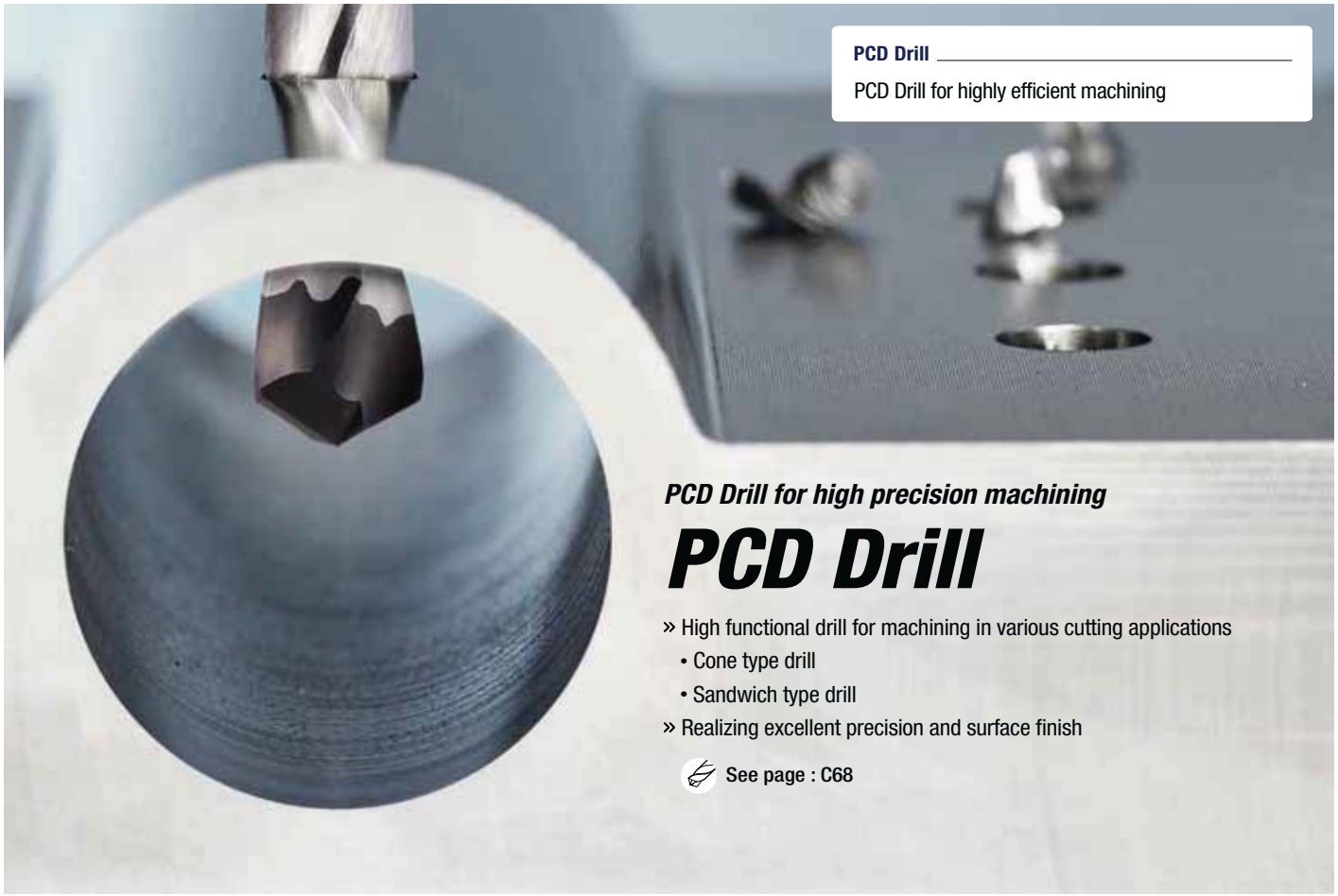
SSD-N

» Stable machining for high productivity

See page : C64

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 : C68

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 : C84

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 temperature 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

Grades

A28 KORLOY Grade Index
A29 Grade System

Solid Endmill 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, PC315W, PC320W, FA1, FG2, H01, H05S, DP150, DP200
		N20	
		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
		P30	PC320
		P40	
M	Stainless steel	M01	
		M10	PC305H, PC303W
		M20	PC315W, PC320, PC325
		M30	
K	Cast iron	K01	
		K10	PC305H, PC303W
		K20	PC315W
		K30	PC320
		K40	
S	HRSA	S01	
		S10	PC2510
		S20	SL, UL, PC325
		S30	
N	Non-ferrous	N01	ND3000, ND2100
		N05	
		N10	
		N20	H01, H05S, PC210C
H	Hardened	H01	
		H10	PC305H
		H20	

Solid Drill Selection system

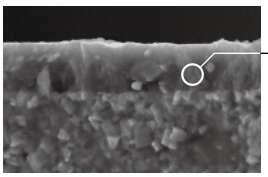
Workpiece		ISO	Application range
P	Steel	P01	
		P10	
		P20	PC215G, PC315G, PC325U, PC320W
		P30	
M	Stainless steel	M01	
		M10	
		M20	PC215G, PC315G, PC320W, PC325U
		M30	
K	Cast iron	K01	
		K10	
		K20	PC215G, PC315G, PC320W, PC325U
		K30	
N	Non-ferrous	N01	ND2100
		N10	FG2, FA1
		N20	
S	HRSA	S10	
		S20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

Solid Endmill Grade Selections

SL

- Applied high lubrication coating and special surface treatment technology

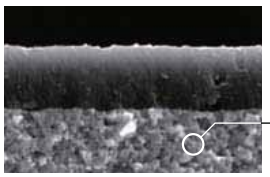
Features



UL

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

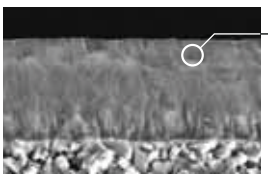
Features



PC305H

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

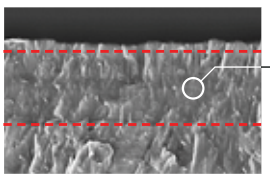
Features



PC303W / PC315W

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

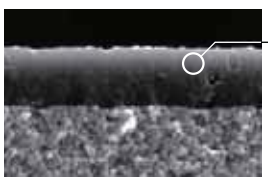
Features



PC325

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

Features

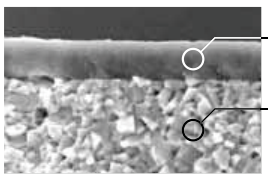


Solid Endmill Grade Selections

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

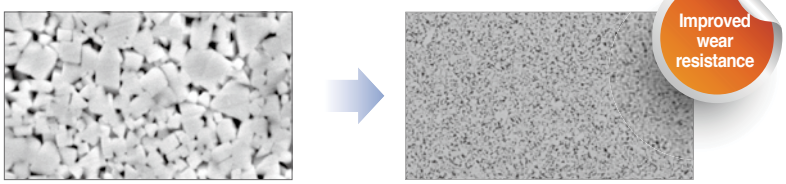


PC2510

- The post-coating 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

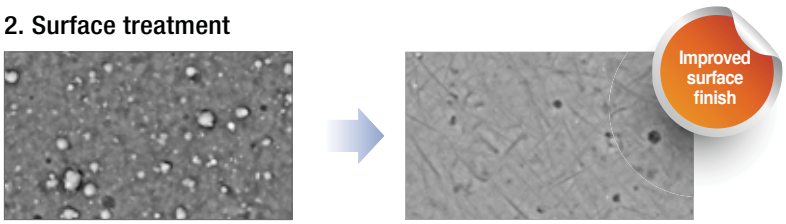
1. Ultra fine substrate with high toughness



[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 • Hlgh 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

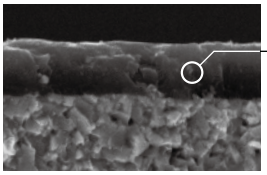
Solid Drill Grade Selections

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



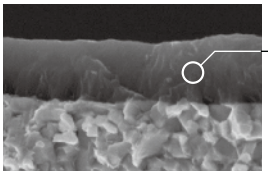
Increased welding resistance in medium to high speed cutting due to highly lubricative coating layers Increased wear resistance in carbon steel machining

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



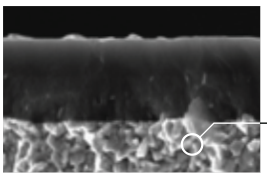
High heat and oxide resistance increase tool life.
Good surface finish coating high quality in machining.

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



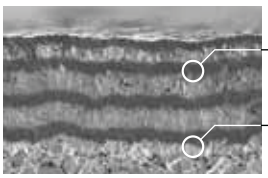
Exceptional wear resistance due to the ultrafine substrate

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

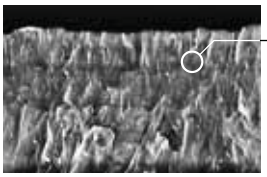
High adherence coating technology

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

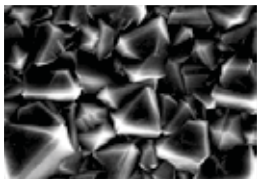
Diamond Coated Grades

Grade for graphite and ceramic

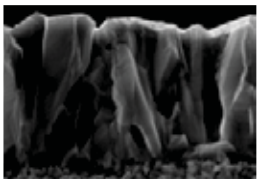
ND3000

- 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



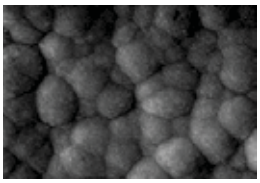
Cross section of ND3000's coated layers

Grade for composite materials

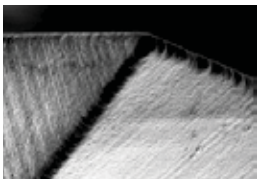
ND2100

- 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

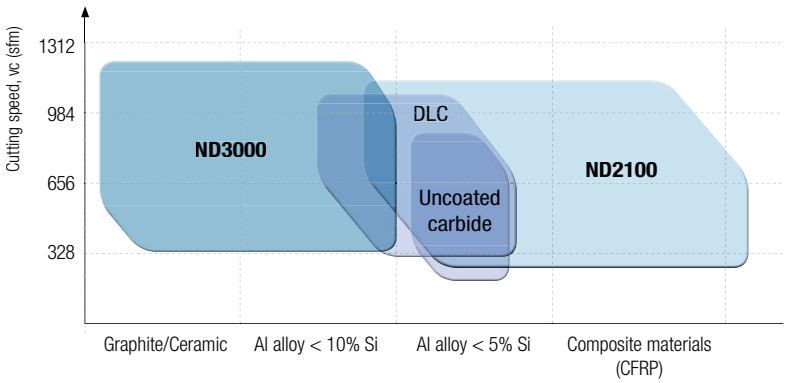


Surface of ND2100



Sharp edges of ND2100

Application range



Selection system

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

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

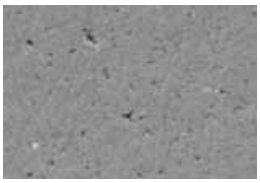
DLC Coated Grades

DLC-Coated Inserts for Non-Ferrous Metals

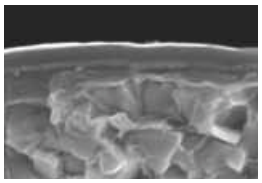
PD1005 / PD1010

- 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



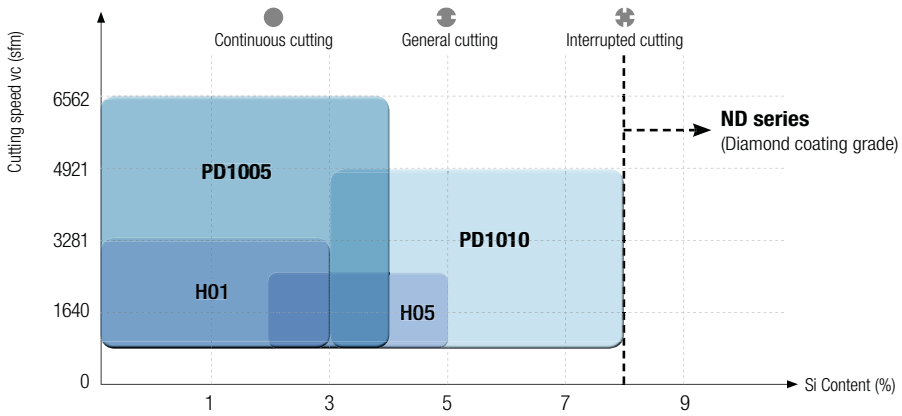
Smooth coating surface



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/mm^2)
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

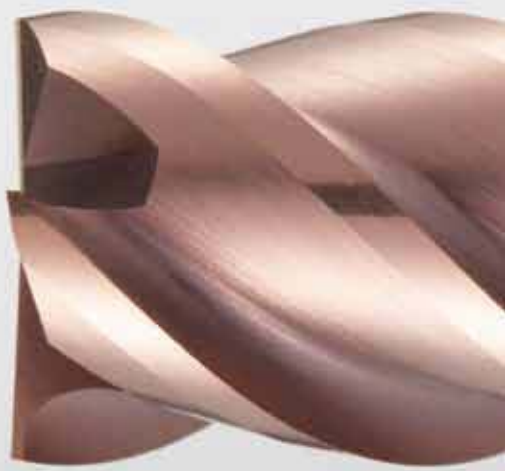
Recommended cutting condition

Workpiece	Cutting speed (sfm)	Feed Turning (ipr), Milling (ipt)	Depth of cut (inch)	Recommended grade	
				1st	2nd
Aluminum alloy (4%~8%Si)	3281 ~ 9843	0.004 ~ 0.024	~ 0.118	DP150	DP200
Aluminum alloy (9%~14%Si)	1969 ~ 8202	0.004 ~ 0.020	~ 0.118	DP150	DP200
Aluminum alloy (15%~18%Si)	984 ~ 2297	0.004 ~ 0.016	~ 0.118	DP150	DP200
Copper, Bronze alloy	~ 3281	0.002 ~ 0.008	~ 0.118	DP150	DP200
Reinforced plastic	~ 3281	0.004 ~ 0.012	~ 0.08	DP150	DP200
Wood	~ 13123	0.004 ~ 0.016	-	DP150	DP200
Cemented carbide	33 ~ 98	~ 0.008	~ 0.02	DP90	DP150

PART B

ENDMILLS

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



Technical information for ENDMILLS

B2	**Code system**
B4	**KORLOY Endmill**
B10	**Endmill selection guide**
B12	**Super Endmill for HRSA** [for difficult-to-cut materials HRSA]
B22	**Super Endmill for Ti** [for difficult-to-cut materials Ti]
B33	**The Mirror Endmill** [for high precision mold manufacture]
B36	**H-Star Endmill** [for high hardness steel(HRC50~63)]
B143	**U-Star Endmill** [for medium hardness steel(HRC30~50)]
B224	**G-Star Endmill** [for low hardness steel(HRC10~30)]
B249	**R+ Endmill** [for high efficient roughing]
B256	**S-Star Endmill** [for stainless steel]
B269	**A-Star Endmill** [for aluminum]
B280	**D Endmill** [for graphite]
B289	**Composite Router Endmill** [for composite materials]
B293	**T Endmill** [for dental prostheses]
B315	**C-Max** [for copper based electrode]
B321	**PCD Endmill** [for non-ferrous metals]
B322	**Special Order Form for Endmills**



C F E A 2 01250 - 2.50 -

1	2	3	4	5	6	7
Series	Type	Endmill	America	No. of flutes	Cutting dia.	Overall length

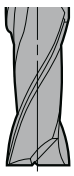
1 Series

C F E A 2 01250 - 2.50 - R T - V N S

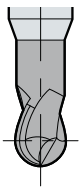
Z, IP, ZP : Endmill for general usage
P : High speed/ hardness Endmill
C : Copper, Copper alloy Endmill
D : Graphite, Non-Ferrous Endmill
V : Variable Endmill
FM : High feed Endmill
SSEA, AP : Aluminum Endmill
SP : Stainless Endmill
CC : Composite Router Endmill
T : Dental Endmill
S : Super Endmill

2 Type

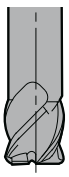
C **F** E A 2 01250 - 2.50 - R T - V N S



Flat type — F



Ball type — B



Radius type — R

3 Endmill

C F **E** A 2 01250 - 2.50 - R T - V N S

4 America

C F E **A** 2 01250 - 2.50 - R T - V N S

5 No. of flutes

C F E A **2** 01250 - 2.50 - R T - V N S



2 Flutes — 2



3 Flutes — 3



4 Flutes — 4

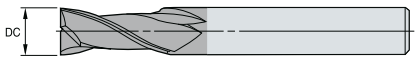


6 Flutes — 6

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

6 Cutting dia.

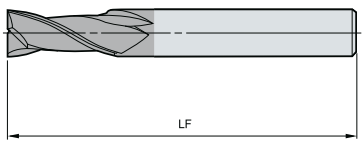
C F E A 2 **01250** - 2.50 - R T - V N S



Cutting dia.	
Notation	**DC** (inch)
01250	Ø0.1250
01562	Ø0.1562
02500	Ø0.2500
05000	Ø0.5000

7 Overall length

C F E A 2 01250 - **2.50** - R T - V N S



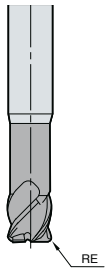
Overall length	
Notation	**LF** (inch)
2.50	2.50
4.00	4.00
6.00	6.00

R.01 T000 - V0.62 N0.65 S1875

8 Corner radius | 9 Taper angle | 10 Flute length | 11 Neck length | 12 Shank diameter

8 Corner radius

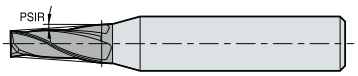
C F E A 2 01250 - 2.50 - **R** T - V N S



Corner radius	
Notation	**RE** (inch)
R.01	r 0.01
R.02	r 0.02
R.04	r 0.04
R.06	r 0.06

9 Taper angle

C F E A 2 01250 - 2.50 - R **T** - V N S

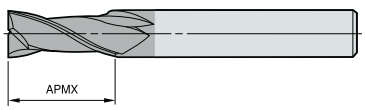


PSIR(BHTA) : Taper angle

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

10 Flute length

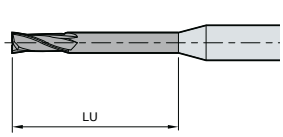
C F E A 2 01250 - 2.50 - R T - **V** N S



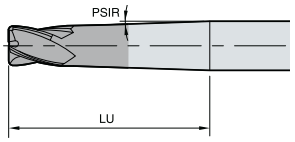
Flute length	
Notation	**APMX** (inch)
V0.62	0.62
V0.75	0.75
V1.00	1.00

11 Neck length

C F E A 2 01250 - 2.50 - R T - V **N** S



Long Neck



Taper Long Neck

LU (inch) : Neck length

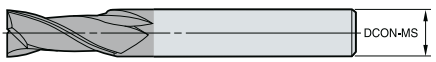
Long	
Notation	**LU** (inch)
N0.65	0.65
N0.80	0.80
N1.25	1.25
N1.30	1.30

PSIR(BHTA) : Taper angle

Taper long neck	
Notation	**LU + PSIR** (inch)
N0.6210	0.62 + 1°
N0.7515	0.75 + 1.5°
N1.0020	1.00 + 2°
N1.2525	1.25 + 2.5°

12 Shank diameter

C F E A 2 01250 - 2.50 - R T - V N **S**



Shank diameter	
Notation	**DCON-MS**
S1250	Ø0.1250
S1875	Ø0.1875
S2500	Ø0.2500
S3750	Ø0.3750
S4375	Ø0.4375

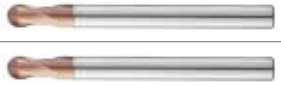
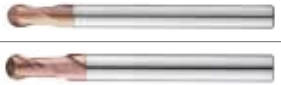
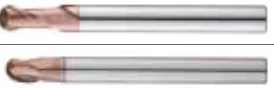
※ This code system is also for special endmills

Line-up

Type	Used	Shape	Designation	Picture	Coated	No. of flute	Unit	Range		Workpiece						Page
										P	M	K	N	S	H	
								Min	Max	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Titanium alloy	Hardened steel	
Super Endmill	HRSA	Flat	SFESA		SL	4	Inch	1/8	3/4					◎		B13
			SFES		SL	4	Metric	3.0	20.0					◎		B14
		Radius	SRESA		SL	4	Inch	1/8	3/4					◎		B15
			SRES		SL	4	Metric	3.0	20.0					◎		B18
	Ti/STS	Flat	SFETA		UL	4	Inch	1/8	3/4					◎		B23
			SFET		UL	4	Metric	3.0	20.0		◎			◎		B24
		Radius	SRETA		UL	4	Inch	1/8	3/4		◎			◎		B25
			SRET		UL	4	Metric	3.0	20.0		◎			◎		B28
		Ball	SBETA		UL	2	Inch	5/32	1/2		◎			◎		B29
			SBET		UL	2	Metric	4.0	12.0		◎			◎		B30
			SBETA		UL	4	Inch	5/32	1/2		◎			◎		B31
			SBET		UL	4	Metric	4.0	12.0		◎			◎		B32
The Mirror Endmill	High precision mold manufacture	Ball	PCD-MBE		-	-	Metric	0.3	2.0	◎					◎	B34
			cBN-MBE		-	2	Metric	0.4	2.0						◎	B34
		Radius	cBN-MRE		-	2	Metric	0.4	2.0						◎	B35
H-Star Endmill	High speed, High hardness	Flat	ESE702A		AlTiN	2	Inch	1/8	5/8	○				○	◎	B39
			ESE702		AlTiN	2	Metric	0.1	20.0	○				○	◎	B40
			ESE712A		AlTiN	2	Inch	1/16	1/2	○				○	◎	B41
			ESE712		AlTiN	2	Metric	1.0	12.0	○				○	◎	B42
			ESE704A		AlTiN	4	Inch	1/4	1/2	○				○	◎	B43
			ESE704		AlTiN	4	Metric	1.0	20.0	○				○	◎	B43
			ESE714A		AlTiN	4	Inch	1/16	1	○				○	◎	B44
			ESE714		AlTiN	4	Metric	1.0	12.0	○				○	◎	B45
			ESE724(6)		AlTiN	4/6	Metric	1.0	12.0	○				○	◎	B46
			ESE744A		AlTiN	4	Inch	1/8	3/4	○				○	◎	B46
			ESE744		AlTiN	4	Metric	1.0	12.0	○				○	◎	B47
			ESE716A		AlTiN	6	Inch	1/4	1	○				○	◎	B48
			ESE716		AlTiN	6	Metric	6.0	20.0	○				○	◎	B48
			ESRE712		AlTiN	2	Metric	0.1	12.0	○				○	◎	B49
			ESRE714		AlTiN	4	Metric	0.5	12.0	○				○	◎	B55
			ESXE704		AlTiN	4	Metric	1.0	12.0	○				○	◎	B59

◎ : Excellent ○ : Good

Line-up

Type	Used	Shape	Designation	Picture	Coated	No. of flute	Unit	Range		Workpiece						Page
										P	M	K	N	S	H	
								Min	Max	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Titanium alloy	Hardened steel	
H-Star Endmill	High speed, High hardness	Flat	ESXE714		AlTiN	4	Metric	2.0	12.0	○				○	◎	B59
			ESLNS20		AlTiN	2	Metric	0.1	5.0	○				○	◎	B60
			ESLNS40		AlTiN	4	Metric	1.0	5.0	○				○	◎	B64
		Radius	ESR702		AlTiN	2	Metric	1.0	12.0	○				○	◎	B66
			ESR732		AlTiN	2	Metric	1.0	12.0	○				○	◎	B71
			ESR704A		AlTiN	4	Inch	1/8	3/4	○				○	◎	B73
			ESR704		AlTiN	4	Metric	1.0	12.0	○				○	◎	B75
			ESR714A		AlTiN	4	Inch	1/8	3/4	○				○	◎	B78
			ESR714		AlTiN	4	Metric	3.0	12.0	○				○	◎	B79
			ESR724		AlTiN	4	Metric	6.0	12.0	○				○	◎	B80
			ESR734		AlTiN	4	Metric	1.0	12.0	○				○	◎	B81
			ESR706A		AlTiN	6	Inch	3/16	1/2	○				○	◎	B83
			ESR706		AlTiN	6	Metric	6.0	12.0	○				○	◎	B84
			ESR716A		AlTiN	6	Inch	1/4	5/8	○				○	◎	B84
			ESR736		AlTiN	6	Metric	6.0	12.0	○				○	◎	B85
			ESR718A		AlTiN	8	Inch	3/4	1	○				○	◎	B85
			ESRR712		AlTiN	2	Metric	0.2	16.0	○				○	◎	B86
			ESRR714		AlTiN	4	Metric	0.5	20.0	○				○	◎	B97
			ESXR704		AlTiN	4	Metric	2.0	12.0	○				○	◎	B110
			ESLNR20		AlTiN	2	Metric	0.2	3.0	○				○	◎	B112
			ESTNR20		AlTiN	2	Metric	0.2	3.0	○				○	◎	B116
		High feed	ESPM4A		AlTiN	4	Inch	1/8	1/2	○				○	◎	B118
			ESPM4		AlTiN	4	Metric	3.0	12.0	○				○	◎	B119
		Ball	ESB702A		AlTiN	2	Inch	1/32	3/4	○				○	◎	B120
			ESB702		AlTiN	2	Metric	0.1	12.0	○				○	◎	B121
			ESB712		AlTiN	2	Metric	1.0	12.0	○				○	◎	B122
			ESB703A		AlTiN	3	Inch	1/16	1/2	○				○	◎	B123
			ESB703		AlTiN	3	Metric	2.0	12.0	○				○	◎	B124
			ESB714A		AlTiN	4	Inch	1/8	1/2	○				○	◎	B125
			ESB734		AlTiN	4	Metric	2.0	10.0	○				○	◎	B125
			ESRB712		AlTiN	2	Metric	0.1	12.0	○				○	◎	B126

◎ : Excellent ○ : Good

Line-up

Type	Used	Shape	Designation	Picture	Coated	No. of flute	Unit	Range		Workpiece						Page
										P	M	K	N	S	H	
								Min	Max	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Titanium alloy	Hardened steel	
H-Star Endmill	High speed, High hardness	Ball	ESLNB20		AlTiN	2	Metric	0.1	5.0	○				○	◎	B134
			ESTNB20		AlTiN	2	Metric	0.2	10.0	○				○	◎	B138
			ESTNB30		AlTiN	3	Metric	2.0	5.0	○				○	◎	B142
U-Star Endmill	General	Flat	UE502		AlCrN	2	Metric	0.1	25.0	◎	○	○			○	B145
			UE512		AlCrN	2	Metric	0.1	12.0	◎	○	○			○	B147
			UE522		AlCrN	2	Metric	1.0	25.0	◎	○	○			○	B150
			UXE502		AlCrN	2	Metric	0.1	20.0	◎	○	○			○	B152
			UE504H		AlCrN	4	Metric	1.0	20.0	◎	○	○			○	B154
			UE514		AlCrN	4	Metric	1.0	12.0	◎	○	○			○	B155
			UE524		AlCrN	4	Metric	1.0	25.0	◎	○	○			○	B157
			ULE504		AlCrN	4	Metric	3.0	16.0	◎	○	○			○	B159
			UE504		AlCrN	4	Metric	0.8	25.0	◎	○	○			○	B160
			UXE504		AlCrN	4	Metric	1.0	20.0	◎	○	○			○	B161
			UE506		AlCrN	6	Metric	6.0	20.0	◎	○	○			○	B162
			UTE502		AlCrN	2	Metric	0.3	10.0	◎	○	○			○	B163
			UTE504		AlCrN	4	Metric	0.8	10.0	◎	○	○			○	B165
		Radius	UR502		AlCrN	2	Metric	0.2	20.0	◎	○	○			○	B168
			UR512		AlCrN	2	Metric	0.2	20.0	◎	○	○			○	B171
			UR542		AlCrN	2	Metric	0.2	4.0	◎	○	○			○	B177
			UR504		AlCrN	4	Metric	3.0	20.0	◎	○	○			○	B182
			UR544		AlCrN	4	Metric	1.0	4.0	◎	○	○			○	B183
			UXR504		AlCrN	4	Metric	1.0	20.0	◎	○	○			○	B187
			UXR514		AlCrN	4	Metric	1.0	20.0	◎	○	○			○	B190
			UR506		AlCrN	6	Metric	6.0	20.0	◎	○	○			○	B195
			UDR503		AlCrN	3	Metric	6.0	20.0	◎	○	○			○	B196
			USPM4		AlCrN	4	Metric	1.0	20.0	◎	○	○			○	B197
			UTR504		AlCrN	4	Metric	0.8	2.5	◎	○	○			○	B198
		Ball	UB502		AlCrN	2	Metric	1.0	25.0	◎	○	○			○	B202
			UB502P		AlCrN	2	Metric	0.1	12.0	◎	○	○			○	B204
			UB512		AlCrN	2	Metric	0.1	12.0	◎	○	○			○	B205
			UB512S6		AlCrN	2	Metric	0.5	2.0	◎	○	○			○	B208

◎ : Excellent ○ : Good

Line-up

Type	Used	Shape	Designation	Picture	Coated	No. of flute	Unit	Range		Workpiece						Page
										P	M	K	N	S	H	
								Min	Max	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Titanium alloy	Hardened steel	
U-Star Endmill	General	Ball	UB532		AlCrN	2	Metric	3.0	12.0	◎	○	○			○	B209
			UB542		AlCrN	2	Metric	0.1	12.0	◎	○	○			○	B210
			USB502		AlCrN	2	Metric	3.0	20.0	◎	○	○			○	B217
			UB503		AlCrN	3	Metric	1.0	12.0	◎	○	○			○	B218
			UB504		AlCrN	4	Metric	1.0	12.0	◎	○	○			○	B218
		Roughing	UTB502		AlCrN	2	Metric	0.3	2.0	◎	○	○			○	B219
			UF50		AlCrN	3~5	Metric	3.0	25.0	◎	○	○			○	B221
			UF51		AlCrN	3~5	Metric	3.0	25.0	◎	○	○			○	B222
			UF51H		AlCrN	3~5	Metric	3.0	25.0	◎	○	○			○	B223
G-Star Endmill	General	Ball	DB312		AlTiN	2	Metric	1.0	20.0	◎	○	◎		○		B226
			DB342		AlTiN	2	Metric	1.0	12.0	◎	○	◎		○		B227
		Flat	TX202		AlTiN	2	Metric	1.0	20.0	◎	○	◎		○		B228
			TX204		AlTiN	4	Metric	1.0	20.0	◎	○	◎		○		B229
			TX222		AlTiN	2	Metric	3.0	20.0	◎	○	◎		○		B230
			TX224		AlTiN	4	Metric	3.0	20.0	◎	○	◎		○		B231
			TX302		AlTiN	2	Metric	1.0	20.0	◎	○	◎		○		B232
			TX304		AlTiN	4	Metric	1.0	20.0	◎	○	◎		○		B233
			TX304H		AlTiN	4	Metric	3.0	20.0	◎	○	◎		○		B234
		Ball	TXB202		AlTiN	2	Metric	1.0	20.0	◎	○	◎		○		B235
			TXB204		AlTiN	4	Metric	2.0	20.0	◎	○	◎		○		B236
			TXB222		AlTiN	2	Metric	3.0	20.0	◎	○	◎		○		B237
			TXB232		AlTiN	2	Metric	3.0	20.0	◎	○	◎		○		B238
			TXB302		AlTiN	2	Metric	1.0	20.0	◎	○	◎		○		B239
			TXB304		AlTiN	4	Metric	1.0	20.0	◎	○	◎		○		B240
		Flat	ZE302P		AlTiN	2	Metric	1.0	20.0	◎	○	◎		○		B241
			ZE304P		AlTiN	4	Metric	1.0	20.0	◎	○	◎		○		B242
			ZE322		AlTiN	2	Metric	3.0	20.0	◎	○	◎		○		B243
			ZE324		AlTiN	4	Metric	3.0	20.0	◎	○	◎		○		B244
		Radius	ZR304H		AlTiN	4	Metric	3.0	12.0	◎	○	◎		○		B245
			ZR322		AlTiN	2	Metric	3.0	12.0	◎	○	◎		○		B246
			ZR324		AlTiN	4	Metric	3.0	12.0	◎	○	◎		○		B247
			ZR324H		AlTiN	4	Metric	6.0	12.0	◎	○	◎		○		B248

◎ : Excellent ○ : Good

Line-up

Type	Used	Shape	Designation	Picture	Coated	No. of flute	Unit	Range		Workpiece						Page
										P	M	K	N	S	H	
								Min	Max	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Titanium alloy	Hardened steel	
R+ Endmill	Aluminum	Roughing	RPAE		Carbide, Non	3	Metric	6.0	25.0				◎			B251
	General		RPE-FP-H		Carbide, TiAlN	4	Metric	5.0	20.0	◎	○	◎		○		B251
			RPLE-FP-H		Carbide, TiAlN	4	Metric	5.0	20.0	◎	○	◎		○		B252
			RPE-XG		Carbide, TiAlN	4	Metric	5.0	20.0	◎	○	◎		○		B252
			RPE-FP-L		Carbide, TiAlN	4	Metric	5.0	20.0	◎	○	◎		○		B253
			RPE-RG		Carbide, TiAlCrN	4	Metric	5.0	20.0	◎	○	◎		○		B253
			RPE-RG		HSS, TiAlN	4	Metric	6.0	20.0	◎	○	◎		○		B254
			RPE-FF		HSS, TiAlN	4	Metric	6.0	20.0	◎	○	◎		○		B254
			RPE-FP		HSS, TiAlN	4	Metric	6.0	20.0	◎	○	◎		○		B255
			RPE-RG		HSS, TiCN HSS, TiN	4	Metric	6.0	50.0	◎	○	◎		○		B255
S-Star Endmill	STS	Flat	SPFE2000		AlCrN	2	Metric	1.0	20.0	○	◎			○		B258
			SPFE3000		AlCrN	3	Metric	1.0	20.0	○	◎			○		B259
			SPFE4000		AlCrN	4	Metric	1.0	20.0	○	◎			○		B260
			SPFE6000		AlCrN	6	Metric	6.0	20.0	○	◎			○		B261
		Radius	SPRE4000		AlCrN	4	Metric	1.0	20.0	○	◎			○		B262
			SPRE5000		AlCrN	5	Metric	6.0	20.0	○	◎			○		B264
			SPRE7000		AlCrN	7	Metric	6.0	20.0	○	◎			○		B265
		Ball	SPBE2000		AlCrN	2	Metric	1.0	12.0	○	◎			○		B266
			SPBE4000		AlCrN	4	Metric	3.0	20.0	○	◎			○		B267
		Roughing	SPXE3000 SPXE4000 SPXE5000		AlCrN	3~5	Metric	3.0	20.0	○	◎			○		B268
A-Star Endmill	Aluminum	Flat	APFE		Non	2	Metric	2.5	20.0	○			◎			B270
					Non	3	Metric	2.5	20.0	○			◎			B270
		Middle Flat	APMFE		Non	2	Metric	3.0	20.0	○			◎			B271
					Non	3	Metric	3.0	20.0	○			◎			B271
		Long Flat	APLFE		Non	2	Metric	3.0	20.0	○			◎			B272
					Non	3	Metric	3.0	20.0	○			◎			B272
		Ball	APBE		Non	2	Metric	1.0	12.0	○			◎			B273
		Short Flat	AFE		Non	3	Metric	1.0	20.0	○			◎			B274
		Flat			Non	3	Metric	1.0	20.0	○			◎			B275
		Long Flat			Non	3	Metric	1.0	20.0	○			◎			B276
		Roughing	APRE		Non	3	Metric	4.0	25.0	○			◎			B228
		Wave Roughing	RPAE		Carbide, Non	3	Metric	6.0	25.0				◎			B279

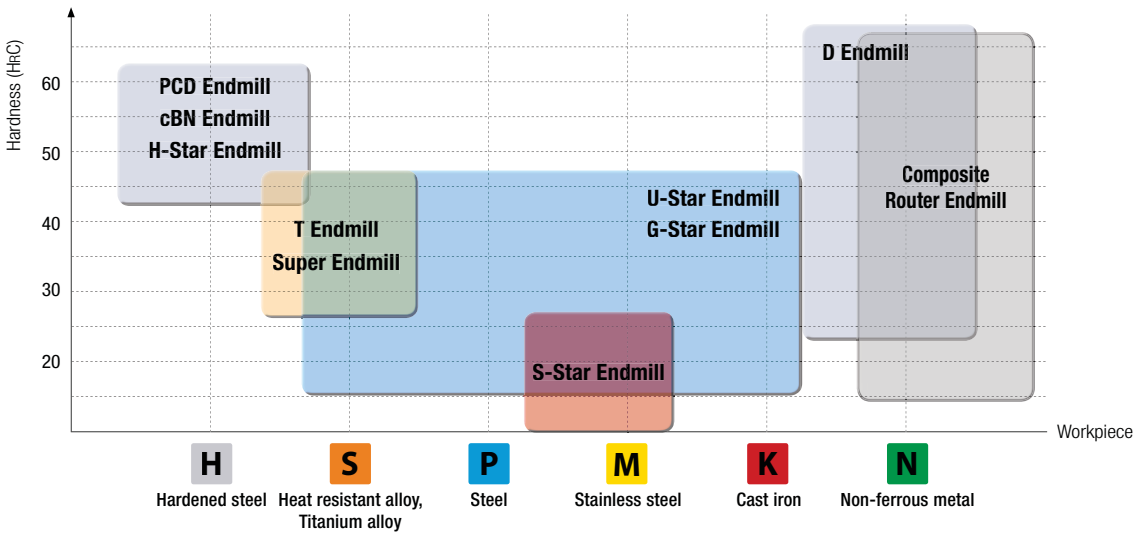
◎ : Excellent ○ : Good

Line-up

Type	Used	Shape	Designation	Picture	Coated	No. of flute	Unit	Range		Workpiece						Page
										P	M	K	N	S	H	
								Min	Max	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Titanium alloy	Hardened steel	
D Endmill	Graphite, Ceramics	Flat	DFE		Diamond	2	Metric	1.0	12.0				◎			B281
					Diamond	4	Metric	2.0	12.0				◎			B282
		Radius	DRE		Diamond	2	Metric	0.5	3.0				◎			B283
					Diamond	4	Metric	2.0	12.0				◎			B284
		Ball	DBE		Diamond	2	Metric	0.6	12.0				◎			B285
					Diamond	4	Metric	2.0	12.0				◎			B288
Composite Router Endmill	Composite CFRP, GFRP	Flat	CCDR		Diamond	4	Metric	6.0	8.0				◎			B290
					Diamond	6	Metric	10.0	12.0				◎			B290
			CCHR		Diamond	4	Metric	6.0	8.0				◎			B290
					Diamond	6	Metric	10.0	12.0				◎			B290
			CCR		Diamond	2	Metric	4.0	12.0				◎			B291
			CCLR		Diamond	4	Metric	4.0	12.0				◎			B291
			CCRR		Diamond	6	Metric	6.0	8.0				◎			B292
					Diamond	8	Metric	10.0	12.0				◎			B292
T Endmill	Dental, Zirconia	Ball	TZBE		Diamond	2	Metric	0.6	3.0				◎			B293
	Dental, Metal		TTBE		Diamond	2	Metric	0.6	3.0					◎		B293
	Dental, Wax		TWBE		-	2	Metric	0.6	3.0				◎			B293
C-Max	Cooper, Cooper alloy	Flat	CFE2000		CrN	2	Metric	1	12	○			◎			B315
			CFNE2000		CrN	2	Metric	0.5	4	○			◎			B316
		Ball	CBE2000		CrN	2	Metric	1	12	○			◎			B317
			CBNE2000		CrN	2	Metric	0.5	4	○			◎			B318
		Radius	CRE2000		CrN	2	Metric	2	12	○			◎			B319
			CRNE2000		CrN	2	Metric	1	4	○			◎			B320
PCD Endmill	Non-ferrous, High speed	Flat	PDE		-	1	Metric	4.6	6.0				◎			B321
					-	2	Metric	6.0	12.0				◎			B321

◎ : 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 workpieces (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 materials 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, Hastelloy, Waspaloy and etc.)

Super Endmill for HRSA

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

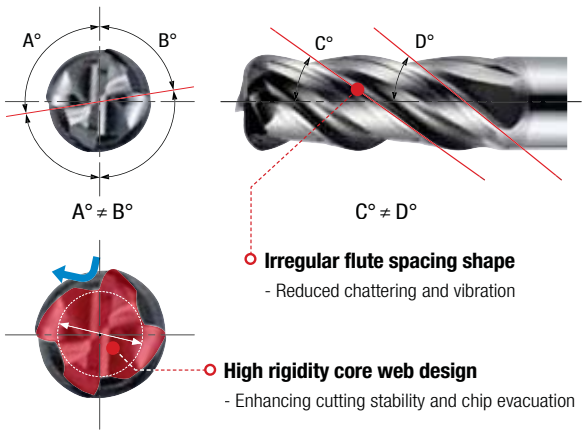
Code system

S	RE	S	A	4	012	-	080	-	001
Super Endmill	**Type** FE: Flat Endmill RE: Radius Endmill BE: Ball Endmill	**Workpiece** S: Super alloy • Inconel718 • Waspaloy • Hastelloy T: Titanium/STS	**Type** A : Inch None : Metric	**No. of flute** 4: 4 flutes	**Tool diameter** 012: Ø1/8 inch		**1.Cutting length** 025: 1/4 inch **2.Overall length** 080: 80 mm		**Corner R** 001: 0.01 inch

Features

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

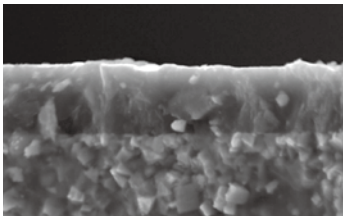
SRES4000 (Radius)



SFES4000 (Flat)



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

SFESA4000

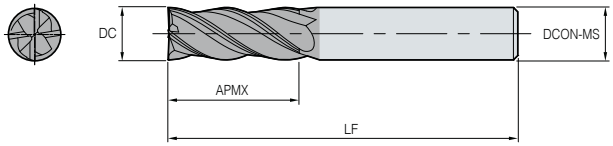
Flat





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

DC	Tolerance
Ø1/8 ~ Ø1/4	0.0000 ~ -0.0006
Ø5/16 ~ Ø3/4	0.0000 ~ -0.0008



(inch)

Designation		DC	APMX	LF	DCON-MS
SFESA	4012-025 SL1	1/8	1/4	1 1/2	1/8
	4012-037 SL1	1/8	3/8	2	1/8
	4012-050 SL1	1/8	1/2	2 1/2	1/8
	4015-018 SL1	5/32	3/16	2	3/16
	4015-031 SL1	5/32	5/16	2	3/16
	4015-043 SL1	5/32	7/16	2 1/2	3/16
	4015-056 SL1	5/32	9/16	2 1/2	3/16
	4018-031 SL1	3/16	5/16	2	3/16
	4018-043 SL1	3/16	7/16	2	3/16
	4018-056 SL1	3/16	9/16	2 1/2	3/16
	4025-050 SL1	1/4	1/2	2 1/2	1/4
	4025-075 SL1	1/4	3/4	2 1/2	1/4
	4025-100 SL1	1/4	1	3	1/4
	4031-075 SL1	5/16	3/4	2 1/2	5/16
	4031-100 SL1	5/16	1	2 1/2	5/16
	4037-050 SL1	3/8	1/2	2 1/2	3/8
	4037-075 SL1	3/8	3/4	2 1/2	3/8
	4037-100 SL1	3/8	1	3	3/8
	4037-125 SL1	3/8	1 1/4	3	3/8
	4050-100 SL1	1/2	1	3	1/2
	4050-125 SL1	1/2	1 1/4	3	1/2
	4050-162 SL1	1/2	1 5/8	4	1/2
	4050-200 SL1	1/2	2	4	1/2
	4062-125 SL1	5/8	1 1/4	3 1/2	5/8
	4062-162 SL1	5/8	1 5/8	3 1/2	5/8
	4062-200 SL1	5/8	2	4	5/8
	4075-162 SL1	3/4	1 5/8	4	3/4
	4075-200 SL1	3/4	2	5	3/4
	4075-225 SL1	3/4	2 1/4	5	3/4
	4075-325 SL1	3/4	3 1/4	6	3/4

SFES4000

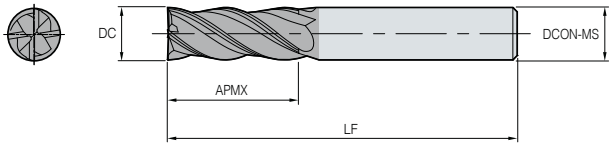
Flat

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

DC	Tolerance
Ø3 ~ Ø6	0.000 ~ -0.015
Ø8 ~ Ø20	0.000 ~ -0.020







(mm)

Designation		DC	APMX	LF	DCON-MS
SFES	4030-050 SL1	3	8	50	6
	4040-050 SL1	4	10	50	6
	4050-060 SL1	5	15	60	6
	4060-060 SL1	6	15	60	6
	4080-070 SL1	8	20	70	8
	4100-075 SL1	10	25	75	10
	4120-080 SL1	12	30	80	12
	4140-090 SL1	14	35	90	14
	4160-100 SL1	16	42	100	16
	4200-100 SL1	20	48	100	20

SRESA4000

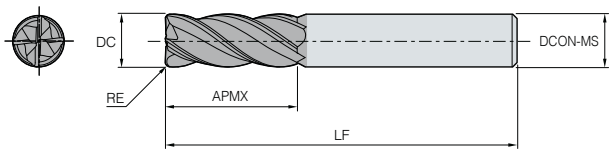
Radius

Inch | 4 | H·A 35°/38° | SL Coated | r tolerance ±0.0005 | h6 shank

DC	Tolerance
Ø1/8 ~ Ø1/4	0.0000 ~ -0.0006
Ø5/16 ~ Ø3/4	0.0000 ~ -0.0008







(inch)

	Designation	DC	APMX	LF	DCON-MS	RE
SRESA	4012-025-001 SL1	1/8	1/4	1 1/2	1/8	0.01
	4012-037-001 SL1	1/8	3/8	2	1/8	0.01
	4012-050-001 SL1	1/8	1/2	2 1/2	1/8	0.01
	4015-018-001 SL1	5/32	3/16	2	3/16	0.01
	4015-031-001 SL1	5/32	5/16	2	3/16	0.01
	4015-043-001 SL1	5/32	7/16	2 1/2	3/16	0.01
	4015-056-001 SL1	5/32	9/16	2 1/2	3/16	0.01
	4018-031-001 SL1	3/16	5/16	2	3/16	0.01
	4018-043-001 SL1	3/16	7/16	2	3/16	0.01
	4018-056-001 SL1	3/16	9/16	2 1/2	3/16	0.01
	4018-031-003 SL1	3/16	5/16	2	3/16	0.03
	4018-043-003 SL1	3/16	7/16	2	3/16	0.03
	4018-056-003 SL1	3/16	9/16	2 1/2	3/16	0.03
	4025-050-002 SL1	1/4	1/2	2 1/2	1/4	0.02
	4025-075-002 SL1	1/4	3/4	2 1/2	1/4	0.02
	4025-100-002 SL1	1/4	1	3	1/4	0.02
	4025-050-003 SL1	1/4	1/2	2 1/2	1/4	0.03
	4025-075-003 SL1	1/4	3/4	2 1/2	1/4	0.03
	4025-100-003 SL1	1/4	1	3	1/4	0.03
	4025-050-006 SL1	1/4	1/2	2 1/2	1/4	0.06
	4025-075-006 SL1	1/4	3/4	2 1/2	1/4	0.06
	4025-100-006 SL1	1/4	1	3	1/4	0.06
	4031-075-001 SL1	5/16	3/4	2 1/2	5/16	0.01
	4031-100-001 SL1	5/16	1	2 1/2	5/16	0.01
	4031-075-002 SL1	5/16	3/4	2 1/2	5/16	0.02
	4031-100-002 SL1	5/16	1	2 1/2	5/16	0.02
	4031-075-003 SL1	5/16	3/4	2 1/2	5/16	0.03
	4031-100-003 SL1	5/16	1	2 1/2	5/16	0.03
	4037-050-002 SL1	3/8	1/2	2 1/2	3/8	0.02
	4037-075-002 SL1	3/8	3/4	2 1/2	3/8	0.02
	4037-100-002 SL1	3/8	1	3	3/8	0.02
	4037-125-002 SL1	3/8	1 1/4	3	3/8	0.02
	4037-050-003 SL1	3/8	1/2	2 1/2	3/8	0.03
	4037-075-003 SL1	3/8	3/4	2 1/2	3/8	0.03
	4037-100-003 SL1	3/8	1	3	3/8	0.03
	4037-125-003 SL1	3/8	1 1/4	3	3/8	0.03
	4037-050-006 SL1	3/8	1/2	2 1/2	3/8	0.06
	4037-075-006 SL1	3/8	3/4	2 1/2	3/8	0.06

SRESA4000

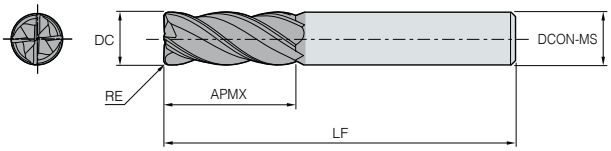
Radius

Inch | 4 | H·A 35°/38° | SL Coated | r tolerance ±0.0005 | h6 shank

DC	Tolerance
Ø1/8 ~ Ø1/4	0.0000 ~ -0.0006
Ø5/16 ~ Ø3/4	0.0000 ~ -0.0008







(inch)

Designation		DC	APMX	LF	DCON-MS	RE
SRESA	4037-100-006 SL1	3/8	1	3	3/8	0.06
	4037-125-006 SL1	3/8	1 1/4	3	3/8	0.06
	4050-100-002 SL1	1/2	1	3	1/2	0.02
	4050-125-002 SL1	1/2	1 1/4	3	1/2	0.02
	4050-162-002 SL1	1/2	1 5/8	4	1/2	0.02
	4050-200-002 SL1	1/2	2	4	1/2	0.02
	4050-100-003 SL1	1/2	1	3	1/2	0.03
	4050-125-003 SL1	1/2	1 1/4	3	1/2	0.03
	4050-162-003 SL1	1/2	1 5/8	4	1/2	0.03
	4050-200-003 SL1	1/2	2	4	1/2	0.03
	4050-100-006 SL1	1/2	1	3	1/2	0.06
	4050-125-006 SL1	1/2	1 1/4	3	1/2	0.06
	4050-162-006 SL1	1/2	1 5/8	4	1/2	0.06
	4050-200-006 SL1	1/2	2	4	1/2	0.06
	4050-100-009 SL1	1/2	1	3	1/2	0.09
	4050-125-009 SL1	1/2	1 1/4	3	1/2	0.09
	4050-162-009 SL1	1/2	1 5/8	4	1/2	0.09
	4050-200-009 SL1	1/2	2	4	1/2	0.09
	4050-100-012 SL1	1/2	1	3	1/2	0.12
	4050-125-012 SL1	1/2	1 1/4	3	1/2	0.12
	4050-162-012 SL1	1/2	1 5/8	4	1/2	0.12
	4050-200-012 SL1	1/2	2	4	1/2	0.12
	4062-125-003 SL1	5/8	1 1/4	3 1/2	5/8	0.03
	4062-162-003 SL1	5/8	1 5/8	3 1/2	5/8	0.03
	4062-200-003 SL1	5/8	2	4	5/8	0.03
	4062-125-006 SL1	5/8	1 1/4	3 1/2	5/8	0.06
	4062-162-006 SL1	5/8	1 5/8	3 1/2	5/8	0.06
	4062-200-006 SL1	5/8	2	4	5/8	0.06
	4062-125-009 SL1	5/8	1 1/4	3 1/2	5/8	0.09
	4062-162-009 SL1	5/8	1 5/8	3 1/2	5/8	0.09
	4062-200-009 SL1	5/8	2	4	5/8	0.09
	4062-125-012 SL1	5/8	1 1/4	3 1/2	5/8	0.12
	4062-162-012 SL1	5/8	1 5/8	3 1/2	5/8	0.12
	4062-200-012 SL1	5/8	2	4	5/8	0.12
	4075-162-003 SL1	3/4	1 5/8	4	3/4	0.03
	4075-200-003 SL1	3/4	2	5	3/4	0.03
	4075-225-003 SL1	3/4	2 1/4	5	3/4	0.03
	4075-325-003 SL1	3/4	3 1/4	6	3/4	0.03

SRESA4000

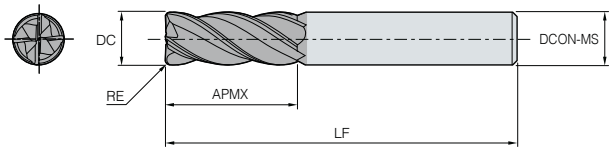
Radius

Inch | 4 | H·A 35°/38° | SL Coated | r tolerance ±0.0005 | h6 shank

DC	Tolerance
Ø1/8 ~ Ø1/4	0.0000 ~ -0.0006
Ø5/16 ~ Ø3/4	0.0000 ~ -0.0008







(inch)

	Designation	DC	APMX	LF	DCON-MS	RE
SRESA	4075-162-006 SL1	3/4	1 5/8	4	3/4	0.06
	4075-200-006 SL1	3/4	2	5	3/4	0.06
	4075-225-006 SL1	3/4	2 1/4	5	3/4	0.06
	4075-325-006 SL1	3/4	3 1/4	6	3/4	0.06
	4075-162-009 SL1	3/4	1 5/8	4	3/4	0.09
	4075-200-009 SL1	3/4	2	5	3/4	0.09
	4075-225-009 SL1	3/4	2 1/4	5	3/4	0.09
	4075-325-009 SL1	3/4	3 1/4	6	3/4	0.09
	4075-162-012 SL1	3/4	1 5/8	4	3/4	0.12
	4075-200-012 SL1	3/4	2	5	3/4	0.12
	4075-225-012 SL1	3/4	2 1/4	5	3/4	0.12
	4075-325-012 SL1	3/4	3 1/4	6	3/4	0.12

SRES4000

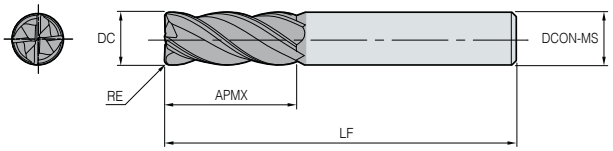
Radius

Metric | 4 | H·A 35°/38° | SL Coated | r tolerance ±0.01 | h6 shank

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.015
Ø8 ~ Ø20	0.000 ~ -0.020







(mm)

Designation		DC	APMX	LF	DCON-MS	RE
SRES	4030-055-R02 SL1	3	8	55	6	0.2
	4030-055-R03 SL1	3	8	55	6	0.3
	4030-055-R05 SL1	3	8	55	6	0.5
	4040-055-R02 SL1	4	10	55	6	0.2
	4040-055-R03 SL1	4	10	55	6	0.3
	4040-055-R05 SL1	4	10	55	6	0.5
	4040-070-R02 SL1	4	10	70	6	0.2
	4040-070-R03 SL1	4	10	70	6	0.3
	4040-070-R05 SL1	4	10	70	6	0.5
	4050-055-R02 SL1	5	15	55	6	0.2
	4050-055-R03 SL1	5	15	55	6	0.3
	4050-055-R05 SL1	5	15	55	6	0.5
	4050-090-R02 SL1	5	15	90	6	0.2
	4050-090-R03 SL1	5	15	90	6	0.3
	4050-090-R05 SL1	5	15	90	6	0.5
	4060-060-R03 SL1	6	15	60	6	0.3
	4060-060-R05 SL1	6	15	60	6	0.5
	4060-060-R08 SL1	6	15	60	6	0.8
	4060-060-R10 SL1	6	15	60	6	1.0
	4060-060-R15 SL1	6	15	60	6	1.5
	4060-060-R20 SL1	6	15	60	6	2.0
	4060-090-R03 SL1	6	15	90	6	0.3
	4060-090-R05 SL1	6	15	90	6	0.5
	4060-090-R08 SL1	6	15	90	6	0.8
	4060-090-R10 SL1	6	15	90	6	1.0
	4060-090-R15 SL1	6	15	90	6	1.5
	4060-090-R20 SL1	6	15	90	6	2.0
	4080-070-R03 SL1	8	20	70	8	0.3
	4080-070-R05 SL1	8	20	70	8	0.5
	4080-070-R08 SL1	8	20	70	8	0.8
	4080-070-R10 SL1	8	20	70	8	1.0
	4080-070-R15 SL1	8	20	70	8	1.5
	4080-070-R20 SL1	8	20	70	8	2.0
	4080-070-R25 SL1	8	20	70	8	2.5
	4080-070-R30 SL1	8	20	70	8	3.0
	4080-100-R03 SL1	8	20	100	8	0.3
	4080-100-R05 SL1	8	20	100	8	0.5

SRES4000

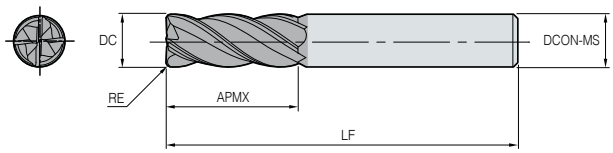
Radius

Metric | 4 | H·A 35°/38° | SL Coated | r tolerance ±0.01 | h6 shank

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.015
Ø8 ~ Ø20	0.000 ~ -0.020







(mm)

	Designation	DC	APMX	LF	DCON-MS	RE
SRES	4080-100-R08 SL1	8	20	100	8	0.8
	4080-100-R10 SL1	8	20	100	8	1.0
	4080-100-R15 SL1	8	20	100	8	1.5
	4080-100-R20 SL1	8	20	100	8	2.0
	4080-100-R25 SL1	8	20	100	8	2.5
	4080-100-R30 SL1	8	20	100	8	3.0
	4100-075-R03 SL1	10	25	75	10	0.3
	4100-075-R05 SL1	10	25	75	10	0.5
	4100-075-R08 SL1	10	25	75	10	0.8
	4100-075-R10 SL1	10	25	75	10	1.0
	4100-075-R15 SL1	10	25	75	10	1.5
	4100-075-R20 SL1	10	25	75	10	2.0
	4100-075-R25 SL1	10	25	75	10	2.5
	4100-075-R30 SL1	10	25	75	10	3.0
	4100-100-R03 SL1	10	25	100	10	0.3
	4100-100-R05 SL1	10	25	100	10	0.5
	4100-100-R08 SL1	10	25	100	10	0.8
	4100-100-R10 SL1	10	25	100	10	1.0
	4100-100-R15 SL1	10	25	100	10	1.5
	4100-100-R20 SL1	10	25	100	10	2.0
	4100-100-R25 SL1	10	25	100	10	2.5
	4100-100-R30 SL1	10	25	100	10	3.0
	4120-080-R05 SL1	12	30	80	12	0.5
	4120-080-R08 SL1	12	30	80	12	0.8
	4120-080-R10 SL1	12	30	80	12	1.0
	4120-080-R15 SL1	12	30	80	12	1.5
	4120-080-R20 SL1	12	30	80	12	2.0
	4120-080-R25 SL1	12	30	80	12	2.5
	4120-080-R30 SL1	12	30	80	12	3.0
	4120-080-R35 SL1	12	30	80	12	3.5
	4120-080-R40 SL1	12	30	80	12	4.0
	4120-110-R05 SL1	12	30	110	12	0.5
	4120-110-R08 SL1	12	30	110	12	0.8
	4120-110-R10 SL1	12	30	110	12	1.0
	4120-110-R15 SL1	12	30	110	12	1.5
	4120-110-R20 SL1	12	30	110	12	2.0
	4120-110-R25 SL1	12	30	110	12	2.5

SRES4000

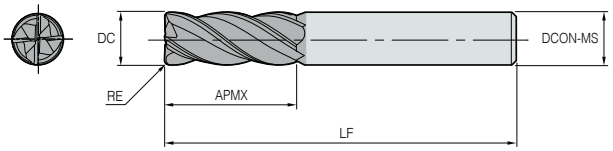
Radius

Metric | 4 | H·A 35°/38° | SL Coated | r tolerance ±0.01 | h6 shank

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.015
Ø8 ~ Ø20	0.000 ~ -0.020







(mm)

	Designation	DC	APMX	LF	DCON-MS	RE
SRES	4120-110-R30 SL1	12	30	110	12	3.0
	4120-110-R35 SL1	12	30	110	12	3.5
	4120-110-R40 SL1	12	30	110	12	4.0
	4140-090-R05 SL1	14	35	90	14	0.5
	4140-090-R08 SL1	14	35	90	14	0.8
	4140-090-R10 SL1	14	35	90	14	1.0
	4140-090-R15 SL1	14	35	90	14	1.5
	4140-090-R20 SL1	14	35	90	14	2.0
	4140-090-R30 SL1	14	35	90	14	3.0
	4140-150-R05 SL1	14	35	150	14	0.5
	4140-150-R08 SL1	14	35	150	14	0.8
	4140-150-R10 SL1	14	35	150	14	1.0
	4140-150-R15 SL1	14	35	150	14	1.5
	4140-150-R20 SL1	14	35	150	14	2.0
	4140-150-R30 SL1	14	35	150	14	3.0
	4160-100-R05 SL1	16	42	100	16	0.5
	4160-100-R08 SL1	16	42	100	16	0.8
	4160-100-R10 SL1	16	42	100	16	1.0
	4160-100-R15 SL1	16	42	100	16	1.5
	4160-100-R20 SL1	16	42	100	16	2.0
	4160-100-R25 SL1	16	42	100	16	2.5
	4160-100-R30 SL1	16	42	100	16	3.0
	4160-100-R35 SL1	16	42	100	16	3.5
	4160-100-R40 SL1	16	42	100	16	4.0
	4160-100-R50 SL1	16	42	100	16	5.0
	4160-100-R60 SL1	16	42	100	16	6.0
	4160-150-R05 SL1	16	42	150	16	0.5
	4160-150-R08 SL1	16	42	150	16	0.8
	4160-150-R10 SL1	16	42	150	16	1.0
	4160-150-R15 SL1	16	42	150	16	1.5
	4160-150-R20 SL1	16	42	150	16	2.0
	4160-150-R25 SL1	16	42	150	16	2.5
	4160-150-R30 SL1	16	42	150	16	3.0
	4160-150-R35 SL1	16	42	150	16	3.5
	4160-150-R40 SL1	16	42	150	16	4.0
	4160-150-R50 SL1	16	42	150	16	5.0
	4160-150-R60 SL1	16	42	150	16	6.0

SRES4000

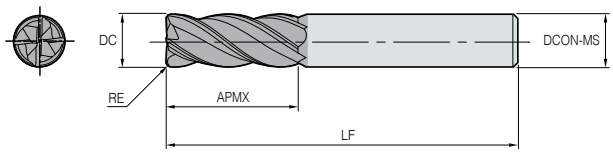
Radius

Metric | 4 | H·A 35°/38° | SL Coated | r tolerance ±0.01 | h6 shank

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.015
Ø8 ~ Ø20	0.000 ~ -0.020







(mm)

Designation		DC	APMX	LF	DCON-MS	RE
SRES	4180-100-R05 SL1	18	45	100	20	0.5
	4180-100-R08 SL1	18	45	100	20	0.8
	4180-100-R10 SL1	18	45	100	20	1.0
	4180-100-R15 SL1	18	45	100	20	1.5
	4180-100-R20 SL1	18	45	100	20	2.0
	4180-100-R30 SL1	18	45	100	20	3.0
	4180-150-R05 SL1	18	45	150	20	0.5
	4180-150-R08 SL1	18	45	150	20	0.8
	4180-150-R10 SL1	18	45	150	20	1.0
	4180-150-R15 SL1	18	45	150	20	1.5
	4180-150-R20 SL1	18	45	150	20	2.0
	4180-150-R30 SL1	18	45	150	20	3.0
	4200-100-R05 SL1	20	48	100	20	0.5
	4200-100-R10 SL1	20	48	100	20	1.0
	4200-100-R15 SL1	20	48	100	20	1.5
	4200-100-R20 SL1	20	48	100	20	2.0
	4200-100-R25 SL1	20	48	100	20	2.5
	4200-100-R30 SL1	20	48	100	20	3.0
	4200-100-R35 SL1	20	48	100	20	3.5
	4200-100-R40 SL1	20	48	100	20	4.0
	4200-100-R50 SL1	20	48	100	20	5.0
	4200-100-R60 SL1	20	48	100	20	6.0
	4200-150-R05 SL1	20	48	150	20	0.5
	4200-150-R10 SL1	20	48	150	20	1.0
	4200-150-R15 SL1	20	48	150	20	1.5
	4200-150-R20 SL1	20	48	150	20	2.0
	4200-150-R25 SL1	20	48	150	20	2.5
	4200-150-R30 SL1	20	48	150	20	3.0
	4200-150-R35 SL1	20	48	150	20	3.5
	4200-150-R40 SL1	20	48	150	20	4.0
	4200-150-R50 SL1	20	48	150	20	5.0
	4200-150-R60 SL1	20	48	150	20	6.0

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 minimize irregular tool fracture and welding ensuring maximized tool life.

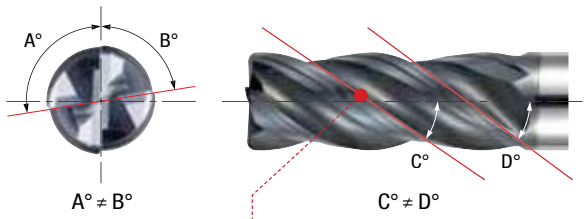
Code system

S	RE	T	A	4	012	-	080	-	001
Super Endmill	**Type** FE: Flat Endmill RE: Radius Endmill BE: Ball Endmill	**Workpiece** T: Titanium/STS S: Super alloy • Inconel718 • Waspaloy • Hastelloy	**Type** A : Inch None : Metric	**No. of flute** 4: 4 flutes	**Tool diameter** 012: Ø1/8 inch		**1.Cutting length** 025: 1/4 inch **2.Overall length** 080: 80 mm		**Corner R** 001: 0.01 inch

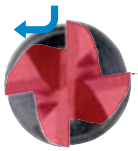
Features

- Endmill for titanium and stainless steel cutting
- **Longer tool life :** high toughness substrate and high lubrication coating layer

SFET (Flat) / SRET (Radius)

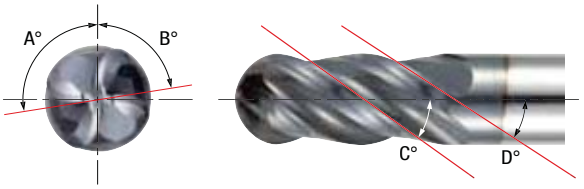


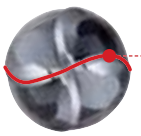
Irregular flute spacing shape
- Reduced chattering and vibration



Large chip pocket and streamlined flute design
- Good chip evacuation

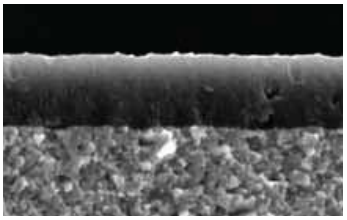
SBET (Ball)





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

SFETA4000

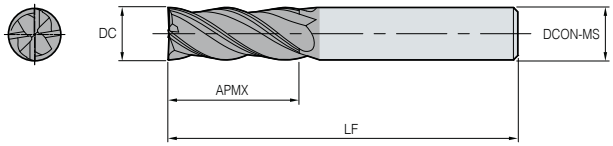
Flat

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

DC	Tolerance
Ø1/8 ~ Ø1/4	0.0000 ~ -0.0006
Ø5/16 ~ Ø3/4	0.0000 ~ -0.0008







(inch)

	Designation	DC	APMX	LF	DCON-MS
SFETA	4012-025 UL1	1/8	1/4	1 1/2	1/8
	4012-037 UL1	1/8	3/8	2	1/8
	4012-050 UL2	1/8	1/2	2 1/2	1/8
	4015-018 UL1	5/32	3/16	2	3/16
	4015-031 UL1	5/32	5/16	2	3/16
	4015-043 UL1	5/32	7/16	2 1/2	3/16
	4015-056 UL2	5/32	9/16	2 1/2	3/16
	4018-031 UL1	3/16	5/16	2	3/16
	4018-043 UL1	3/16	7/16	2	3/16
	4018-056 UL1	3/16	9/16	2 1/2	3/16
	4025-050 UL1	1/4	1/2	2 1/2	1/4
	4025-075 UL1	1/4	3/4	2 1/2	1/4
	4025-100 UL2	1/4	1	3	1/4
	4031-075 UL1	5/16	3/4	2 1/2	5/16
	4031-100 UL2	5/16	1	2 1/2	5/16
	4037-050 UL1	3/8	1/2	2 1/2	3/8
	4037-075 UL1	3/8	3/4	2 1/2	3/8
	4037-100 UL1	3/8	1	3	3/8
	4037-125 UL2	3/8	1 1/4	3	3/8
	4050-100 UL1	1/2	1	3	1/2
	4050-125 UL1	1/2	1 1/4	3	1/2
	4050-162 UL2	1/2	1 5/8	4	1/2
	4050-200 UL2	1/2	2	4	1/2
	4062-125 UL1	5/8	1 1/4	3 1/2	5/8
	4062-162 UL1	5/8	1 5/8	3 1/2	5/8
	4062-200 UL2	5/8	2	4	5/8
	4075-162 UL1	3/4	1 5/8	4	3/4
	4075-200 UL1	3/4	2	5	3/4
	4075-225 UL1	3/4	2 1/4	5	3/4
	4075-325 UL2	3/4	3 1/4	6	3/4

SFET4000

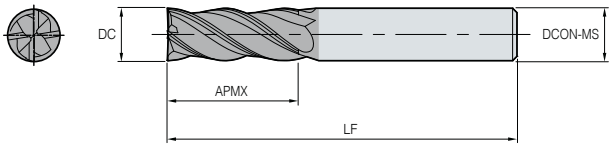
Flat

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

DC	Tolerance
Ø3 ~ Ø6	0.000 ~ -0.015
Ø8 ~ Ø20	0.000 ~ -0.020







(mm)

Designation		DC	APMX	LF	DCON-MS
SFET	4030-050 UL1	3	8	50	6
	4040-050 UL1	4	10	50	6
	4050-060 UL1	5	15	60	6
	4060-060 UL1	6	15	60	6
	4080-070 UL1	8	20	70	8
	4100-075 UL1	10	25	75	10
	4120-080 UL1	12	30	80	12
	4160-100 UL1	16	42	100	16
	4200-100 UL1	20	48	100	20

SRETA4000

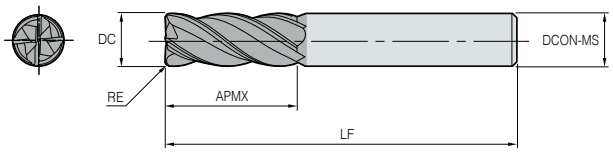
Radius

Inch | 4 | H·A 35°/38° | UL Coated | r tolerance ±0.0005 | h6 shank

DC	Tolerance
Ø1/8 ~ Ø1/4	0.0000 ~ -0.0006
Ø5/16 ~ Ø3/4	0.0000 ~ -0.0008







(inch)

Designation		DC	APMX	LF	DCON-MS	RE
SRETA	4012-025-001 UL1	1/8	1/4	1 1/2	1/8	0.01
	4012-037-001 UL1	1/8	3/8	2	1/8	0.01
	4012-050-001 UL2	1/8	1/2	2 1/2	1/8	0.01
	4015-018-001 UL1	5/32	3/16	2	3/16	0.01
	4015-031-001 UL1	5/32	5/16	2	3/16	0.01
	4015-043-001 UL1	5/32	7/16	2 1/2	3/16	0.01
	4015-056-001 UL2	5/32	9/16	2 1/2	3/16	0.01
	4018-031-001 UL1	3/16	5/16	2	3/16	0.01
	4018-043-001 UL1	3/16	7/16	2	3/16	0.01
	4018-056-001 UL1	3/16	9/16	2 1/2	3/16	0.01
	4018-031-003 UL1	3/16	5/16	2	3/16	0.03
	4018-043-003 UL1	3/16	7/16	2	3/16	0.03
	4018-056-003 UL1	3/16	9/16	2 1/2	3/16	0.03
	4025-050-002 UL1	1/4	1/2	2 1/2	1/4	0.02
	4025-075-002 UL1	1/4	3/4	2 1/2	1/4	0.02
	4025-100-002 UL2	1/4	1	3	1/4	0.02
	4025-050-003 UL1	1/4	1/2	2 1/2	1/4	0.03
	4025-075-003 UL1	1/4	3/4	2 1/2	1/4	0.03
	4025-100-003 UL2	1/4	1	3	1/4	0.03
	4025-050-006 UL1	1/4	1/2	2 1/2	1/4	0.06
	4025-075-006 UL1	1/4	3/4	2 1/2	1/4	0.06
	4025-100-006 UL2	1/4	1	3	1/4	0.06
	4031-075-001 UL1	5/16	3/4	2 1/2	5/16	0.01
	4031-100-001 UL2	5/16	1	2 1/2	5/16	0.01
	4031-075-002 UL1	5/16	3/4	2 1/2	5/16	0.02
	4031-100-002 UL2	5/16	1	2 1/2	5/16	0.02
	4031-075-003 UL1	5/16	3/4	2 1/2	5/16	0.03
	4031-100-003 UL2	5/16	1	2 1/2	5/16	0.03
	4037-050-002 UL1	3/8	1/2	2 1/2	3/8	0.02
	4037-075-002 UL1	3/8	3/4	2 1/2	3/8	0.02
	4037-100-002 UL1	3/8	1	3	3/8	0.02
	4037-125-002 UL2	3/8	1 1/4	3	3/8	0.02
	4037-050-003 UL1	3/8	1/2	2 1/2	3/8	0.03
	4037-075-003 UL1	3/8	3/4	2 1/2	3/8	0.03
	4037-100-003 UL1	3/8	1	3	3/8	0.03
	4037-125-003 UL2	3/8	1 1/4	3	3/8	0.03
	4037-050-006 UL1	3/8	1/2	2 1/2	3/8	0.06
	4037-075-006 UL1	3/8	3/4	2 1/2	3/8	0.06

SRETA4000

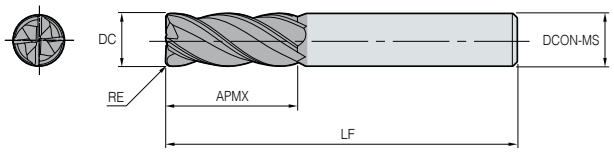
Radius

Inch | 4 | H·A 35°/38° | UL Coated | r tolerance ±0.0005 | h6 shank

DC	Tolerance
Ø1/8 ~ Ø1/4	0.0000 ~ -0.0006
Ø5/16 ~ Ø3/4	0.0000 ~ -0.0008







(inch)

Designation		DC	APMX	LF	DCON-MS	RE
SRETA	4037-100-006 UL1	3/8	1	3	3/8	0.06
	4037-125-006 UL2	3/8	1 1/4	3	3/8	0.06
	4050-100-002 UL1	1/2	1	3	1/2	0.02
	4050-125-002 UL1	1/2	1 1/4	3	1/2	0.02
	4050-162-002 UL2	1/2	1 5/8	4	1/2	0.02
	4050-200-002 UL2	1/2	2	4	1/2	0.02
	4050-100-003 UL1	1/2	1	3	1/2	0.03
	4050-125-003 UL1	1/2	1 1/4	3	1/2	0.03
	4050-162-003 UL2	1/2	1 5/8	4	1/2	0.03
	4050-200-003 UL2	1/2	2	4	1/2	0.03
	4050-100-006 UL1	1/2	1	3	1/2	0.06
	4050-125-006 UL1	1/2	1 1/4	3	1/2	0.06
	4050-162-006 UL2	1/2	1 5/8	4	1/2	0.06
	4050-200-006 UL2	1/2	2	4	1/2	0.06
	4050-100-009 UL1	1/2	1	3	1/2	0.09
	4050-125-009 UL1	1/2	1 1/4	3	1/2	0.09
	4050-162-009 UL2	1/2	1 5/8	4	1/2	0.09
	4050-200-009 UL2	1/2	2	4	1/2	0.09
	4050-100-012 UL1	1/2	1	3	1/2	0.12
	4050-125-012 UL1	1/2	1 1/4	3	1/2	0.12
	4050-162-012 UL2	1/2	1 5/8	4	1/2	0.12
	4050-200-012 UL2	1/2	2	4	1/2	0.12
	4062-125-003 UL1	5/8	1 1/4	3 1/2	5/8	0.03
	4062-162-003 UL1	5/8	1 5/8	3 1/2	5/8	0.03
	4062-200-003 UL2	5/8	2	4	5/8	0.03
	4062-125-006 UL1	5/8	1 1/4	3 1/2	5/8	0.06
	4062-162-006 UL1	5/8	1 5/8	3 1/2	5/8	0.06
	4062-200-006 UL2	5/8	2	4	5/8	0.06
	4062-125-009 UL1	5/8	1 1/4	3 1/2	5/8	0.09
	4062-162-009 UL1	5/8	1 5/8	3 1/2	5/8	0.09
	4062-200-009 UL2	5/8	2	4	5/8	0.09
	4062-125-012 UL1	5/8	1 1/4	3 1/2	5/8	0.12
	4062-162-012 UL1	5/8	1 5/8	3 1/2	5/8	0.12
	4062-200-012 UL2	5/8	2	4	5/8	0.12
	4075-162-003 UL1	3/4	1 5/8	4	3/4	0.03
	4075-200-003 UL1	3/4	2	5	3/4	0.03
	4075-225-003 UL1	3/4	2 1/4	5	3/4	0.03
	4075-325-003 UL2	3/4	3 1/4	6	3/4	0.03

SRETA4000

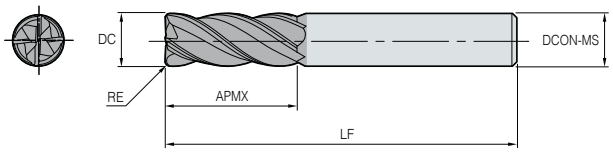
Radius

Inch | 4 | H·A 35°/38° | UL Coated | r tolerance ±0.0005 | h6 shank

DC	Tolerance
Ø1/8 ~ Ø1/4	0.0000 ~ -0.0006
Ø5/16 ~ Ø3/4	0.0000 ~ -0.0008







(inch)

Designation		DC	APMX	LF	DCON-MS	RE
SRETA	4075-162-006 UL1	3/4	1 5/8	4	3/4	0.06
	4075-200-006 UL1	3/4	2	5	3/4	0.06
	4075-225-006 UL1	3/4	2 1/4	5	3/4	0.06
	4075-325-006 UL2	3/4	3 1/4	6	3/4	0.06
	4075-162-009 UL1	3/4	1 5/8	4	3/4	0.09
	4075-200-009 UL1	3/4	2	5	3/4	0.09
	4075-225-009 UL1	3/4	2 1/4	5	3/4	0.09
	4075-325-009 UL2	3/4	3 1/4	6	3/4	0.09
	4075-162-012 UL1	3/4	1 5/8	4	3/4	0.12
	4075-200-012 UL1	3/4	2	5	3/4	0.12
	4075-225-012 UL1	3/4	2 1/4	5	3/4	0.12
	4075-325-012 UL2	3/4	3 1/4	6	3/4	0.12

SRET4000

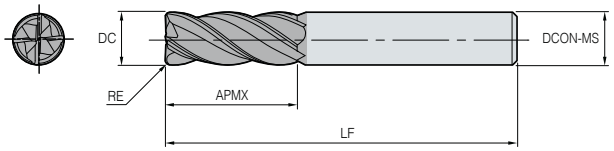
Radius

Metric | 4 | H·A 35°/38° | UL Coated | r tolerance ±0.01 | h6 shank

DC	Tolerance
Ø3 ~ Ø6	0.000 ~ -0.015
Ø8 ~ Ø20	0.000 ~ -0.020







(mm)

Designation		DC	APMX	LF	DCON-MS	RE
SRET	4030-050-R02 UL1	3	8	50	6	0.2
	4030-050-R05 UL1	3	8	50	6	0.5
	4040-050-R02 UL1	4	10	50	6	0.2
	4040-050-R05 UL1	4	10	50	6	0.5
	4050-060-R02 UL1	5	15	60	6	0.2
	4050-060-R05 UL1	5	15	60	6	0.5
	4050-060-R10 UL1	5	15	60	6	1.0
	4060-060-R03 UL1	6	15	60	6	0.3
	4060-060-R05 UL1	6	15	60	6	0.5
	4060-060-R10 UL1	6	15	60	6	1.0
	4080-070-R03 UL1	8	20	70	8	0.3
	4080-070-R05 UL1	8	20	70	8	0.5
	4080-070-R10 UL1	8	20	70	8	1.0
	4100-075-R03 UL1	10	25	75	10	0.3
	4100-075-R05 UL1	10	25	75	10	0.5
	4100-075-R10 UL1	10	25	75	10	1.0
	4100-075-R15 UL1	10	25	75	10	1.5
	4100-075-R20 UL1	10	25	75	10	2.0
	4120-080-R05 UL1	12	30	80	12	0.5
	4120-080-R10 UL1	12	30	80	12	1.0
	4120-080-R15 UL1	12	30	80	12	1.5
	4120-080-R20 UL1	12	30	80	12	2.0
	4120-080-R25 UL1	12	30	80	12	2.5
	4120-080-R30 UL1	12	30	80	12	3.0
	4160-100-R05 UL1	16	42	100	16	0.5
	4160-100-R10 UL1	16	42	100	16	1.0
	4200-100-R05 UL1	20	48	100	20	0.5
	4200-100-R10 UL1	20	48	100	20	1.0

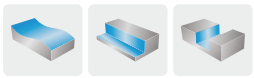
SBETA2000

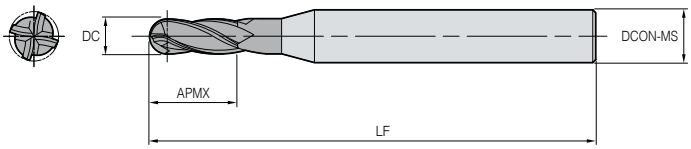
Ball

Inch | 2 | H·A 38°/40° | UL Coated | r tolerance ±0.0005

DC	Tolerance
Ø5/32 ~ Ø1/4	0.0000 ~ -0.0006
Ø5/16 ~ Ø1/2	0.0000 ~ -0.0008







(inch)

Designation		DC	APMX	LF	DCON-MS
SBETA	2015-018 UL1	5/32	3/16	2	3/16
	2015-031 UL1	5/32	5/16	2	3/16
	2015-043 UL1	5/32	7/16	2 1/2	3/16
	2018-031 UL1	3/16	5/16	2	3/16
	2018-043 UL1	3/16	7/16	2	3/16
	2018-056 UL1	3/16	9/16	2 1/2	3/16
	2021-025 UL1	7/32	1/4	2	1/4
	2021-043 UL1	7/32	7/16	2 1/2	1/4
	2021-062 UL1	7/32	5/8	2 1/2	1/4
	2025-037 UL1	1/4	3/8	2	1/4
	2025-050 UL1	1/4	1/2	2 1/2	1/4
	2025-075 UL1	1/4	3/4	2 1/2	1/4
	2031-050 UL1	5/16	1/2	2	5/16
	2031-075 UL1	5/16	3/4	2 1/2	5/16
	2031-100 UL1	5/16	1	2 1/2	5/16
	2037-050 UL1	3/8	1/2	2	3/8
	2037-075 UL1	3/8	3/4	2 1/2	3/8
	2037-100 UL1	3/8	1	3	3/8
	2037-125 UL1	3/8	1 1/4	3	3/8
	2043-062 UL1	7/16	5/8	2 3/4	7/16
	2043-087 UL1	7/16	7/8	2 3/4	7/16
	2043-112 UL1	7/16	1 1/8	2 3/4	7/16
	2050-062 UL1	1/2	5/8	2 1/2	1/2
	2050-100 UL1	1/2	1	3	1/2
	2050-125 UL1	1/2	1 1/4	3	1/2
	2050-162 UL1	1/2	1 5/8	4	1/2

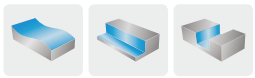
SBET2000

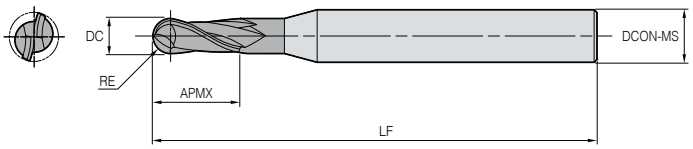
Ball

Metric | 2 | H·A 30° | UL Coated | r tolerance ±0.01 | h5 shank

DC	Tolerance
Ø4 ~ Ø6	0.000 ~ -0.015
Ø6.1 ~ Ø20	0.000 ~ -0.020







(mm)

Designation		DC	APMX	LF	DCON-MS	RE
SBET	2040-050 UL1	4	8	50	6	2.0
	2040-070 UL1	4	8	70	6	2.0
	2050-060 UL1	5	12	60	6	2.5
	2050-080 UL1	5	12	80	6	2.5
	2060-060 UL1	6	12	60	6	3.0
	2060-090 UL1	6	12	90	6	3.0
	2080-070 UL1	8	16	70	8	4.0
	2080-100 UL1	8	16	100	8	4.0
	2100-075 UL1	10	20	75	10	5.0
	2100-100 UL1	10	20	100	10	5.0
	2120-080 UL1	12	25	80	12	6.0
	2120-100 UL1	12	25	100	12	6.0

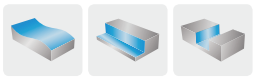
SBETA4000

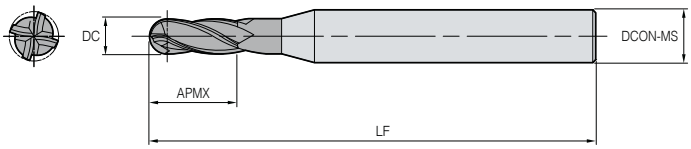
Ball

Inch | 4 | H·A 38°/40° | UL Coated | r tolerance ±0.0005

DC	Tolerance
Ø5/32 ~ Ø1/4	0.0000 ~ -0.0006
Ø5/16 ~ Ø1/2	0.0000 ~ -0.0008







(inch)

Designation		DC	APMX	LF	DCON-MS
SBETA	4015-018 UL1	5/32	3/16	2	3/16
	4015-031 UL1	5/32	5/16	2	3/16
	4015-043 UL1	5/32	7/16	2 1/2	3/16
	4018-031 UL1	3/16	5/16	2	3/16
	4018-043 UL1	3/16	7/16	2	3/16
	4018-056 UL1	3/16	9/16	2 1/2	3/16
	4021-025 UL1	7/32	1/4	2	1/4
	4021-043 UL1	7/32	7/16	2 1/2	1/4
	4021-062 UL1	7/32	5/8	2 1/2	1/4
	4025-037 UL1	1/4	3/8	2	1/4
	4025-050 UL1	1/4	1/2	2 1/2	1/4
	4025-075 UL1	1/4	3/4	2 1/2	1/4
	4031-050 UL1	5/16	1/2	2	5/16
	4031-075 UL1	5/16	3/4	2 1/2	5/16
	4031-100 UL1	5/16	1	2 1/2	5/16
	4037-050 UL1	3/8	1/2	2	3/8
	4037-075 UL1	3/8	3/4	2 1/2	3/8
	4037-100 UL1	3/8	1	3	3/8
	4037-125 UL1	3/8	1 1/4	3	3/8
	4043-062 UL1	7/16	5/8	2 3/4	7/16
	4043-087 UL1	7/16	7/8	2 3/4	7/16
	4043-122 UL1	7/16	1 1/8	2 3/4	7/16
	4050-062 UL1	1/2	5/8	2 1/2	1/2
	4050-100 UL1	1/2	1	3	1/2
	4050-125 UL1	1/2	1 1/4	3	1/2
	4050-162 UL1	1/2	1 5/8	4	1/2

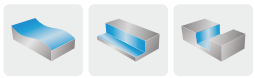
SBET4000

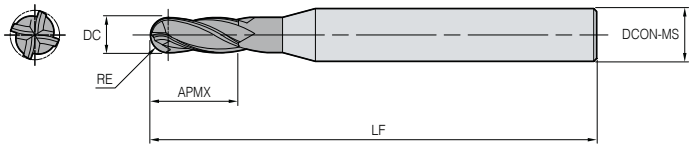
Ball

Metric | 4 | H·A 38°/40° | UL Coated | r tolerance ±0.01

DC	Tolerance
Ø4 ~ Ø6	0.000 ~ -0.015
Ø8 ~ Ø12	0.000 ~ -0.020







(mm)

Designation		DC	APMX	LF	DCON-MS	RE
SBET	4040-050 UL1	4	8	50	6	2.0
	4040-070 UL1	4	8	70	6	2.0
	4050-060 UL1	5	12	60	6	2.5
	4050-080 UL1	5	12	80	6	2.5
	4060-060 UL1	6	12	60	6	3.0
	4060-090 UL1	6	12	90	6	3.0
	4080-070 UL1	8	16	70	8	4.0
	4080-100 UL1	8	16	100	8	4.0
	4100-075 UL1	10	20	75	10	5.0
	4100-100 UL1	10	20	100	10	5.0
	4120-080 UL1	12	25	80	12	6.0
	4120-100 UL1	12	25	100	12	6.0

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

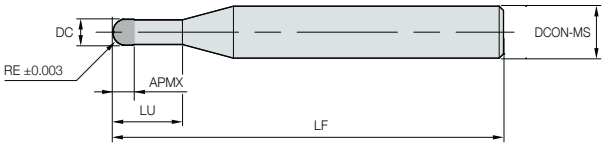
Ball

Metric | 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

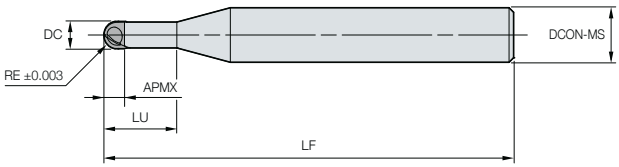
Ball

Metric | 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

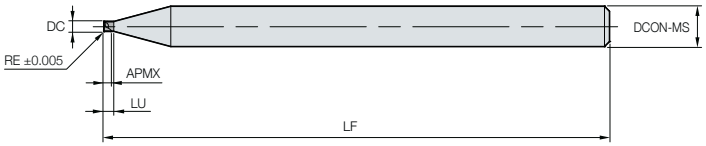
Radius

Metric | 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 0.85 mm with Ø1.5~ 2.0 is necessary, it could be order made by 1.2 mm.

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	A	008001010

H-Star Endmill

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

Type
A : inch
None : Metric

Code No.

Features



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

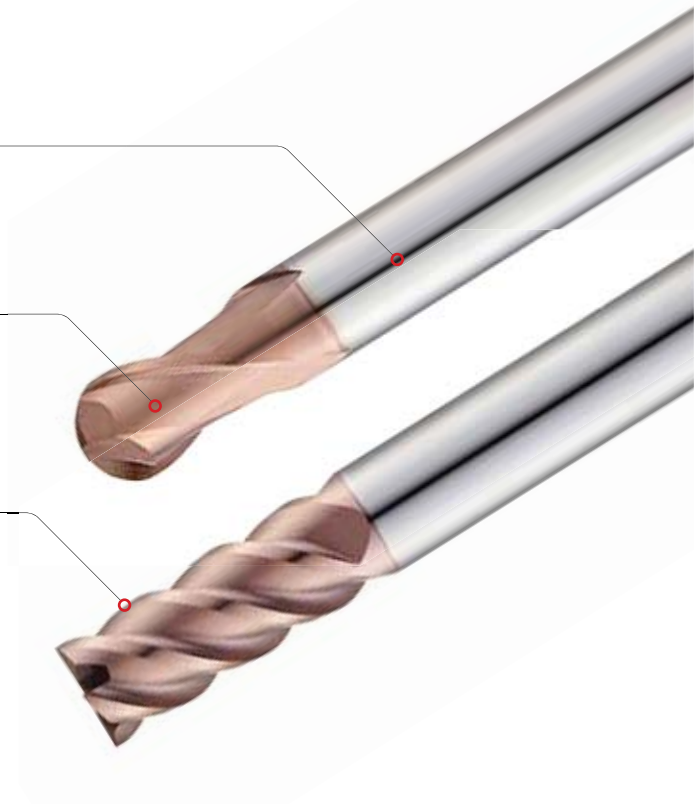


• High hardness coating layer
- High Si content
- Enhanced wear resistance
- Stable cutting through frictional heat resistance increase

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







Line-up

Designation	Picture	Product name	Unit	Range	Irregular flute spacing	Page
ESE702A		2 flutes neck type flat Endmill	Inch	Ø1/8 ~ 5/8		B39
ESE702		2 flutes neck type flat Endmill	Metric	Ø0.1 ~ 20.0		B40
ESE712A		2 flutes flat Endmill	Inch	Ø1/16 ~1/2		B41
ESE712		2 flutes flat Endmill	Metric	Ø1.0 ~ 12.0		B42
ESE704A		4 flutes neck type flat Endmill	Inch	Ø1/4 ~ 1/2		B43
ESE704		4 flutes neck type flat Endmill	Metric	Ø1.0 ~ 20.0		B43
ESE714A		4 flutes high helix flat Endmill	Inch	Ø1/16 ~ 1		B44
ESE714		4 flutes high helix flat Endmill	Metric	Ø1.0 ~ 12.0		B45
ESE724(6)		4&6 flutes neck type flat Endmill	Metric	Ø1.0 ~ 12.0		B46
ESE744A		4 flutes 35° helix flat Endmill	Inch	Ø1/8 ~ 3/4		B46
ESE744		4 flutes high helix flat Endmill	Metric	Ø1.0 ~ 12.0		B47
ESE716A		6 flutes high helix flat Endmill	Inch	Ø1/4 ~ 1		B48
ESE716		6 flutes high helix flat Endmill	Metric	Ø6.0 ~ 20.0		B48
ESRE712		2 flutes rib neck type flat Endmill	Metric	Ø0.1 ~ 12.0		B49~B54
ESRE714		4 flutes rib flat Endmill	Metric	Ø0.5 ~ 12.0		B55~B58
ESXE704		4 flutes neck type flat Endmill	Metric	Ø1.0 ~ 12.0	•	B59
ESXE714		4 flutes flat Endmill	Metric	Ø2.0 ~ 12.0	•	B59
ESLNS20		2 flutes long neck type flat Endmill	Metric	Ø0.1 ~ 5.0		B60~B63
ESLNS40		4 flutes long neck type flat Endmill	Metric	Ø1.0 ~ 5.0		B64~B65
ESR702		2 flutes neck type radius Endmill	Metric	Ø1.0 ~ 12.0		B66~B70
ESR732		2 flutes long shank radius Endmill	Metric	Ø1.0 ~ 12.0		B71~B72
ESR704A		4 flutes neck type radius Endmill	Inch	Ø1/8 ~ 3/4		B73~B74
ESR704		4 flutes neck type radius Endmill	Metric	Ø1.0 ~ 12.0		B75~B77
ESR714A		4 flutes radius Endmill	Inch	Ø1/8 ~ 3/4		B78
ESR714		4 flutes radius Endmill	Metric	Ø3.0 ~ 12.0		B79
ESR724		4 flutes neck type radius Endmill	Metric	Ø6.0 ~ 12.0		B80
ESR734		4 flutes long shank radius Endmill	Metric	Ø1.0 ~ 12.0		B81~B82
ESR706A		6 flutes neck type radius Endmill	Inch	Ø3/16 ~ 1/2		B83
ESR706		6 flutes neck type radius Endmill	Metric	Ø6.0 ~ 12.0		B84
ESR716A		6 flutes type radius Endmill	Inch	Ø1/4 ~ 5/8		B84
ESR736		6 flutes radius Endmill	Metric	Ø6.0 ~ 12.0		B85
ESR718A		8 flutes radius Endmill	Inch	Ø3/4 ~ 1		B85

Line-up

Designation	Picture	Product name	Unit	Range	Irregular flute spacing	Page
ESRR712		2 flutes rib radius Endmill	Metric	Ø0.2 ~ 16.0		B86~B96
ESRR714		4 flutes rib radius Endmill	Metric	Ø0.5 ~ 20.0		B97~B109
ESXR704		4 flutes neck type radius Endmill	Metric	Ø1.0 ~ 12.0	•	B110~B111
ESLNR20		2 flutes long radius Endmill	Metric	Ø0.2 ~ 3.0		B112~B115
ESTNR20		2 flutes tapered neck type radius Endmill	Metric	Ø0.2 ~ 3.0		B116~B117
ESPM4A		4 flutes radius Endmill for high feed	Inch	Ø1/8 ~ 1/2		B118
ESPM4		4 flutes neck type radius Endmill	Metric	Ø3.0 ~ 12.0		B119
ESB702A		2 flutes neck type ball Endmill	Inch	Ø1/32 ~ 1/2		B120
ESB702		2 flutes neck type ball Endmill	Metric	Ø0.1 ~ 12.0		B121
ESB712		2 flutes ball Endmill	Metric	Ø1.0 ~ 12.0		B122
ESB703A		3 flutes ball Endmill	Inch	Ø1/16 ~ 1/2		B123
ESB703		3 flutes neck type ball Endmill	Metric	Ø2.0 ~ 12.0		B124
ESB714A		4 flutes ball Endmill	Inch	Ø1/8 ~ 1/2		B125
ESB734		4 flutes 15° helix ball Endmill	Metric	Ø2.0 ~ 10.0		B125
ESRB712		2 flutes rib ball Endmill	Metric	Ø0.1 ~ 12.0		B126~B133
ESLNB20		2 flutes long neck type ball Endmill	Metric	Ø0.1 ~ 5.0		B134~B137
ESTNB20		2 flutes tapered neck type ball Endmill	Metric	Ø0.2 ~ 10.0		B138~B141
ESTNB30		3 flutes tapered neck type ball Endmill	Metric	Ø2.0 ~ 5.0		B142

ESE702A

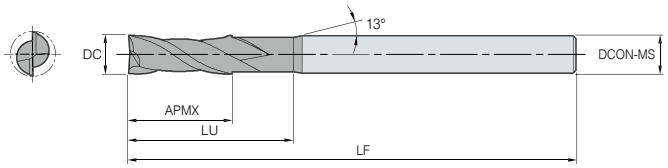
2 flutes neck type flat

Inch | 2 | H·A 30° | h5 shank

DC	Tolerance
Ø1/8 ~ Ø1/4	0.0000 ~ 0.0005
Ø3/8 ~ Ø5/8	0.0000 ~ 0.0006







(inch)

	Designation	DC	DCON-MS	APMX	LU	LF
ESE	702A008016	1/8	1/8	1/4	5/8	3
	702A012024	3/16	3/16	3/8	5/8	3 1/2
	702A016032	1/4	1/4	1/2	3/4	3 1/2
	702A024048	3/8	3/8	3/4	1 1/8	4
	702A032064	1/2	1/2	1	1 3/4	4
	702A040080	5/8	5/8	1 1/4	2	5

ESE702

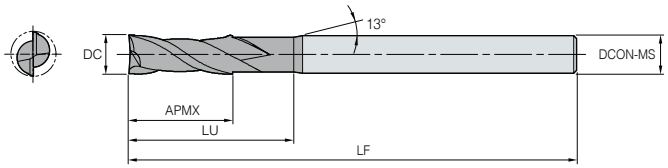
2 flutes neck type flat

Metric | 2 | H·A 30° | 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

ESE712A

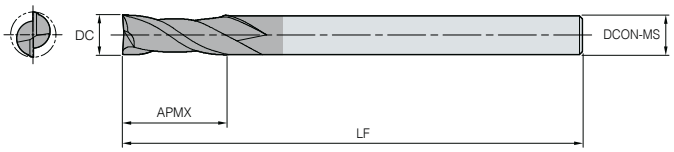
2 flutes flat

Inch | 2 | H·A 35° | h5 shank

DC	Tolerance
Ø1/16 ~ Ø1/4	0.0000 ~ 0.0005
Ø5/16 ~ Ø1/2	0.0000 ~ 0.0006







(inch)

Designation		DC	DCON-MS	APMX	LF
ESE	712A004012	1/16	1/8	3/16	1 1/2
	712A008032	1/8	1/8	1/2	1 1/2
	712A012040	3/16	3/16	5/8	2
	712A016048	1/4	1/4	3/4	2 1/2
	712A020052	5/16	5/16	13/16	2 1/2
	712A024064	3/8	3/8	1	2 1/2
	712A032064	1/2	1/2	1	3

ESE712

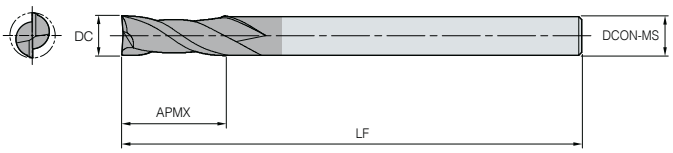
2 flutes flat

Metric | 2 | H·A 35° | h5 shank

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

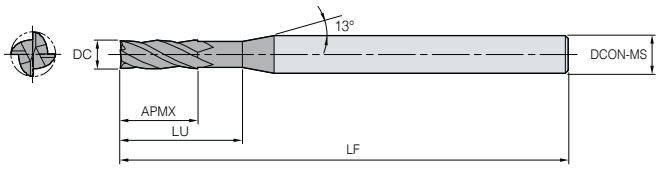
ESE704A

4 flutes neck type flat

Inch | 4 | H·A 30° | h5 shank

DC	Tolerance
Ø1/4 Ø3/8 ~ Ø1/2	0.0000 ~ 0.0005 0.0000 ~ 0.0006







(inch)

	Designation	DC	DCON-MS	APMX	LU	LF
ESE	704A016032	1/4	1/4	1/2	1 1/8	2 1/2
	704A024056	3/8	3/8	7/8	15/16	2 1/2
	704A032080	1/2	1/2	1 1/4	1 7/32	3 1/4

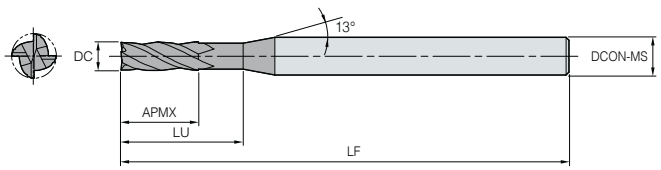
ESE704

4 flutes neck type flat

Metric | 4 | H·A 30° | h5 shank

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

ESE714A

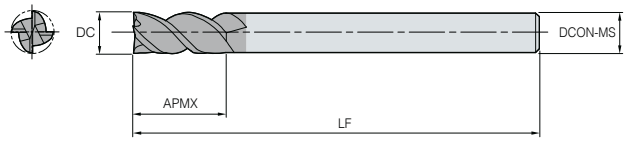
4 flutes high helix flat

Inch | 4 | H·A 45° | h5 shank

DC	Tolerance
Ø1/16 ~ Ø1/4	0.0000 ~ 0.0005
Ø5/16 ~ Ø1	0.0000 ~ 0.0006







(inch)

Designation		DC	DCON-MS	APMX	LF
ESE	714A004012	1/16	1/8	3/16	1 1/2
	714A008024	1/8	1/8	3/8	1 1/2
	714A008032	1/8	1/8	1/2	1 1/2
	714A012028	3/16	3/16	7/16	2
	714A012040	3/16	3/16	5/8	2
	714A012032	3/16	3/16	1/2	1 3/8
	714A012028-2.3	3/16	3/8	7/16	2 5/16
	714A012032-2.37	3/16	3/8	1/2	2 3/8
	714A016048	1/4	1/4	3/4	2 1/2
	714A020052	5/16	5/16	13/16	2 1/2
	714A024064	3/8	3/8	1	2 1/2
	714A024080	3/8	3/8	1 1/4	3
	714A032080	1/2	1/2	1 1/4	3
	714A040096	5/8	5/8	1 1/2	3 1/2
	714A056120	7/8	7/8	1 7/8	4 1/8
	714A064128	1	1	2	4 1/2

ESE714

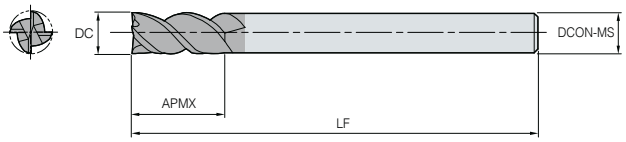
4 flutes high helix flat

Metric | 4 | H·A 45° | 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

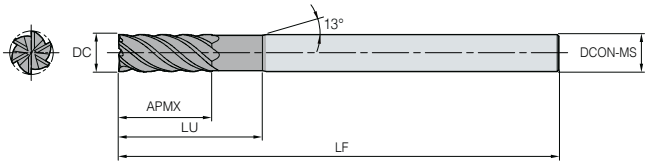
ESE724(6)

4&6 flutes neck type flat

Metric | 4 | 6 | H·A 45° | H·A 60° | 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

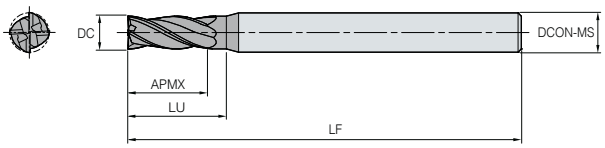
ESE744A

4 flutes high helix flat

Inch | 4 | H·A 35° | h5 shank

DC	Tolerance
Ø1/8 ~ Ø1/4	0.0000 ~ 0.0005
Ø3/8 ~ Ø3/4	0.0000 ~ 0.0006







(inch)

	Designation	DC	DCON-MS	APMX	LU	LF
ESE	744A008024	1/8	1/8	3/8	-	1 1/2
	744A012028	3/16	3/16	7/16	-	2
	744A016032	1/4	1/4	1/2	1 1/8	2 1/2
	744A024056	3/8	3/8	7/8	15/16	2 1/2
	744A032080	1/2	1/2	1 1/4	1 7/32	3 1/4
	744A040080	5/8	5/8	1 1/4	1 31/32	4
	744A048096	3/4	3/4	1 1/2	1 23/32	4

ESE744

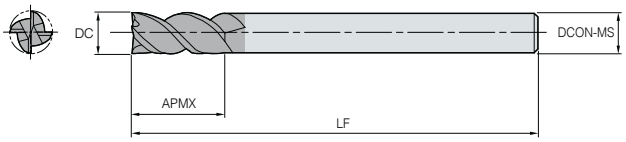
4 flutes flat

Metric | 4 | H·A 35° | 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

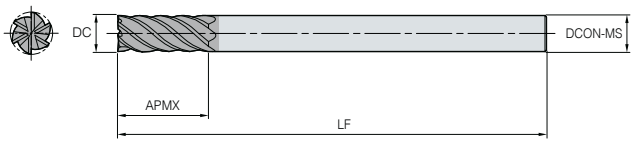
ESE716A

6 flutes high helix flat

Inch | 6 | H·A 50° | h5 shank

DC	Tolerance
Ø1/4 Ø5/16 ~ Ø1	0.0000 ~ 0.0005 0.0000 ~ 0.0006







(inch)

Designation		DC	DCON-MS	APMX	LF
ESE	716A016032	1/4	1/4	1/2	2 1/4
	716A016064	1/4	1/4	1	2 3/4
	716A020048	5/16	5/16	3/4	2 1/2
	716A020096	5/16	5/16	1 1/2	3 5/8
	716A024056	3/8	3/8	7/8	2 7/8
	716A024112	3/8	3/8	1 3/4	4
	716A032064	1/2	1/2	1	3 1/4
	716A032140	1/2	1/2	2 3/16	4 3/8
	716A040080	5/8	5/8	1 1/4	3 5/8
	716A040168	5/8	5/8	2 5/8	5 1/8
	716A048096	3/4	3/4	1 1/2	4 1/8
	716A048144	3/4	3/4	2 1/4	5
	716A048208	3/4	3/4	3 1/4	6
	716A064112	1	1	1 3/4	4 1/4

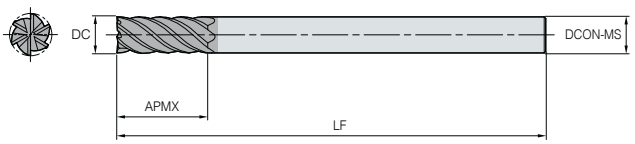
ESE716

6 flutes high helix flat

Metric | 6 | H·A 50° | h5 shank

DC	Tolerance
Ø6 Ø8 ~ Ø20	0.000 ~ -0.012 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

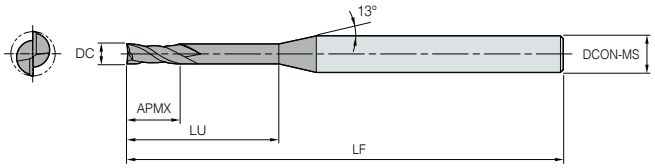
2 flutes rib neck type flat

Metric | 2 | H·A 30° | 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

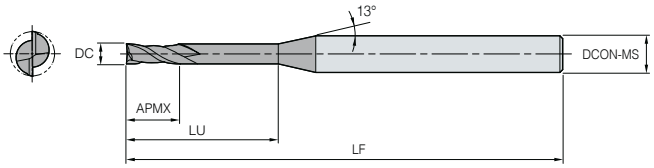
ESRE712

2 flutes rib neck type flat

Metric | 2 | H·A 30° | 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	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

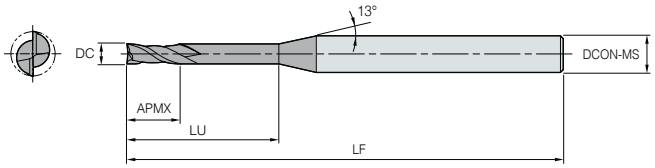
2 flutes rib neck type flat

Metric | 2 | H·A 30° | 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

ESRE712

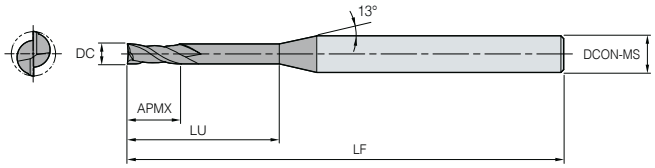
2 flutes rib neck type flat

Metric | 2 | H·A 30° | 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	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

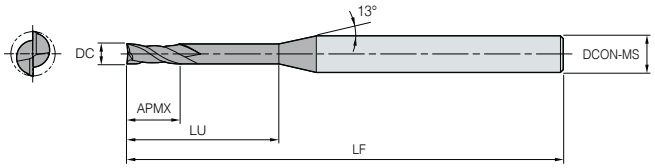
2 flutes rib neck type flat

Metric | 2 | H·A 30° | 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
	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

ESRE712

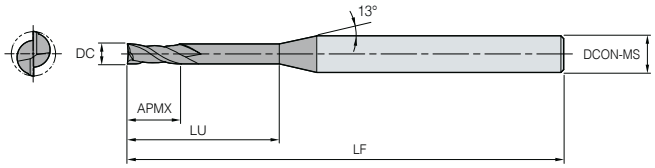
2 flutes rib neck type flat

Metric | 2 | H·A 30° | 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	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

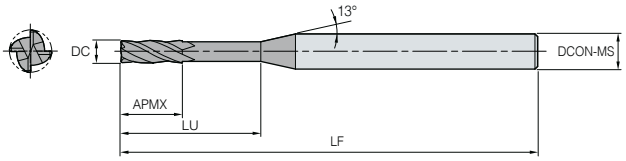
ESRE714

4 flutes rib flat

Metric | 4 | H·A 30° | 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

ESRE714

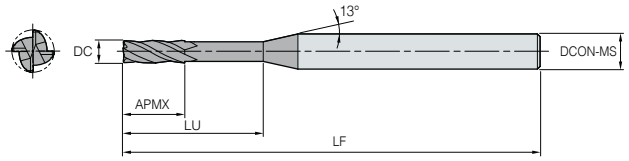
4 flutes rib flat

Metric | 4 | H·A 30° | 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	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

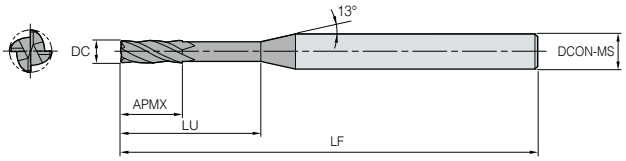
ESRE714

4 flutes rib flat

Metric | 4 | H·A 30° | 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

ESRE714

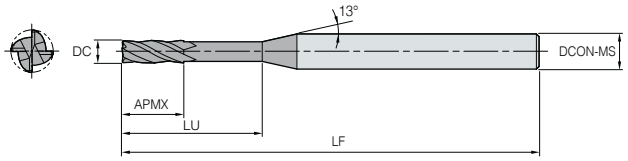
4 flutes rib flat

Metric | 4 | H·A 30° | 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	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

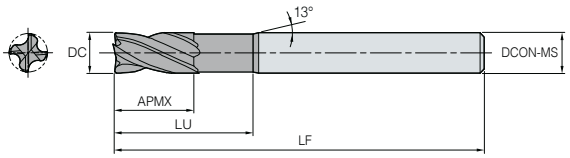
ESXE704

4 flutes neck type flat

Metric | 4 | H·A Multi | 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

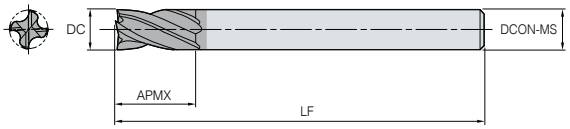
ESXE714

4 flutes flat

Metric | 4 | H·A Multi | h5 shank

DC	Tolerance
ALL	0.000 ~ -0.020







(mm)

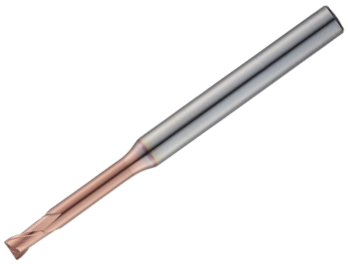
Designation		DC	DCON-MS	APMX	LF
ESXE	714020	2	4	5	45
	714030	3	6	8	45
	714040	4	6	10	45
	714040S4	4	4	10	45
	714060	6	6	16	50
	714080	8	8	20	60
	714100	10	10	25	75
	714120	12	12	35	85

ESLNS20

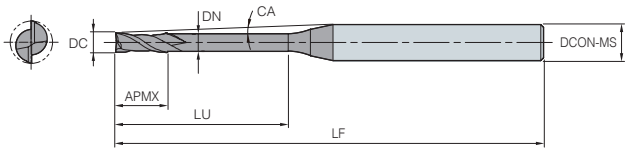
2 flutes long neck type flat

Metric | 2 | H·A 45° | h5 shank

DC	Tolerance
ALL	0.000 ~ -0.012







(mm)

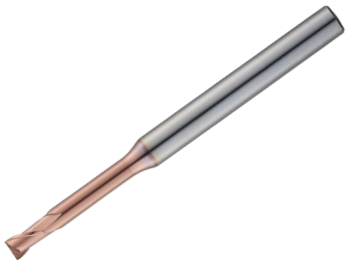
Designation		DC	DCON-MS	APMX	LU	LF	DN	CA	Effective length by inclination angle				
									0.5°	1°	1.5°	2°	3°
ESLNS	2001-0.3	0.1	4	0.15	0.3	45	0.08	11.6	0.4	0.4	0.5	0.5	0.5
	2001-0.5	0.1	4	0.15	0.5	45	0.08	11.4	0.6	0.7	0.7	0.7	0.8
	2001-1	0.1	4	0.15	1	45	0.08	10.9	1.2	1.2	1.2	1.3	1.4
	2002-0.5	0.2	4	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	5	5.4	5.8	6.1	6.6
	2006-6	0.6	4	0.9	6	50	0.57	6.1	7.2	7.7	8.1	8.4	9
	2006-8	0.6	4	0.9	8	50	0.57	5.4	9.3	9.9	10.3	10.7	11.4
	2006-10	0.6	4	0.9	10	50	0.57	9.6	11.5	12.1	12.6	13	13.7
	2007-2	0.7	4	1.05	2	50	0.67	8	2.8	3.1	3.4	3.6	4.1
	2007-4	0.7	4	1.05	4	50	0.67	6.9	5	5.4	5.8	6.1	6.6
	2007-6	0.7	4	1.05	6	50	0.67	6	7.2	7.7	8.1	8.4	9
	2007-8	0.7	4	1.05	8	50	0.67	5.3	9.3	9.9	10.3	10.7	11.4
	2007-10	0.7	4	1.2	10	50	0.77	7.9	11.5	12.1	12.6	13	13.7
	2008-4	0.8	4	1.2	4	50	0.77	6.8	5	5.4	5.8	6.1	6.6

ESLNS20

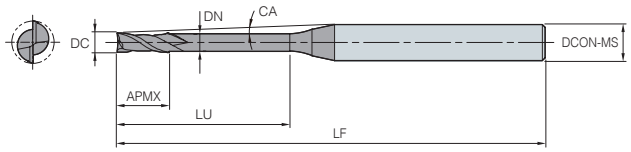
2 flutes long neck type flat

Metric | 2 | H·A 45° | 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	7.2	7.7	8.1	8.4	9
	2008-8	0.8	4	1.2	8	50	0.77	5.2	9.3	9.9	10.3	10.7	11.4
	2008-10	0.8	4	1.2	10	50	0.77	4.7	11.5	12.1	12.6	13	13.7
	2008-12	0.8	4	1.2	12	55	0.77	6.7	13.6	14.2	14.8	15.2	16
	2009-6	0.9	4	1.35	6	50	0.86	5.8	7.2	7.7	8.1	8.4	9.1
	2009-8	0.9	4	1.35	8	50	0.86	5.1	9.4	9.9	10.4	10.7	11.4
	2009-10	0.9	4	1.35	10	55	0.86	4.6	11.5	12.1	12.6	13	13.7
	2009-12	0.9	4	1.35	12	55	0.86	9.4	13.6	14.3	14.8	15.2	16
	2010-2	1	4	1.5	2	50	0.96	7.7	2.9	3.2	3.4	3.7	4.1
	2010-4	1	4	1.5	4	50	0.96	6.6	5.1	5.5	5.8	6.1	6.6
	2010-6	1	4	1.5	6	50	0.96	5.7	7.2	7.7	8.1	8.4	9.1
	2010-8	1	4	1.5	8	50	0.96	5	9.4	9.9	10.4	10.7	11.4
	2010-10	1	4	1.5	10	55	0.96	4.5	11.5	12.1	12.6	13	13.7
	2010-12	1	4	1.5	12	55	0.96	4.1	13.6	14.3	14.8	15.2	16
	2010-14	1	4	1.5	14	60	0.96	3.8	15.7	16.4	17	17.4	18.7
	2010-16	1	4	1.5	16	60	0.96	3.2	17.8	18.6	19.1	19.6	21.3
	2010-20	1	4	1.5	20	60	0.96	6.3	22	22.8	23.5	24	26.6
	2012-6	1.2	4	1.8	6	50	1.15	5.5	7.3	7.7	23.5	8.5	9.1
	2012-8	1.2	4	1.8	8	50	1.15	4.8	9.4	9.9	10.4	10.8	11.4
	2012-10	1.2	4	1.8	10	50	1.15	11.5	11.5	12.1	12.6	13	13.7
	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

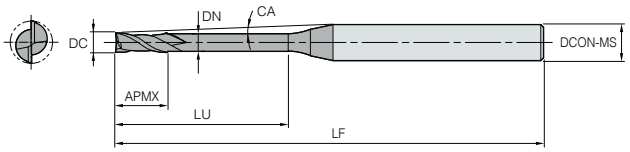
2 flutes long neck type flat

Metric | 2 | H·A 45° | 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

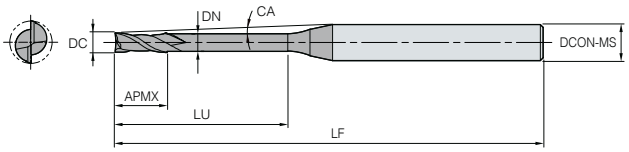
2 flutes long neck type flat

Metric | 2 | H·A 45° | h5 shank

DC	Tolerance
ALL	0.000 ~ -0.012

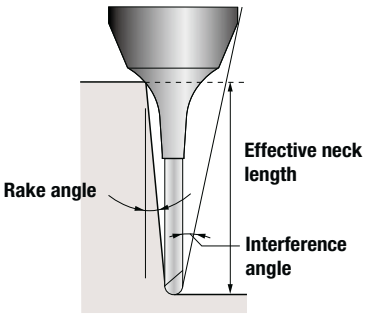


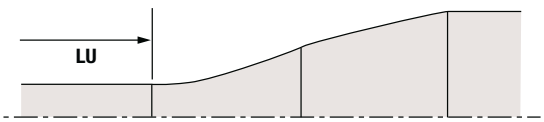




(mm)

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

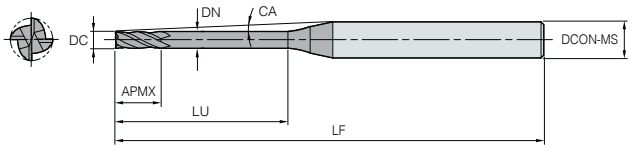
4 flutes long neck type flat

Metric | 4 | H·A 45° | 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
	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

ESLNS40

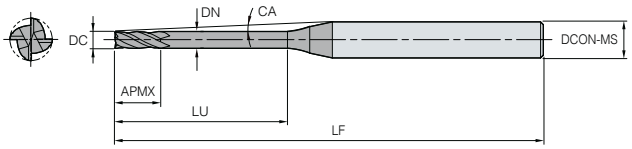
4 flutes long neck type flat

Metric | 4 | H·A 45° | 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	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	-	-	-	-

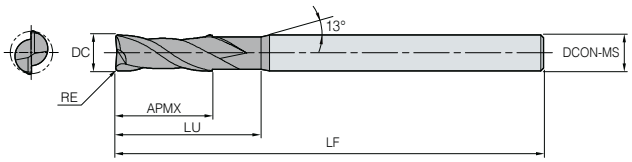
ESR702

2 flutes neck type radius

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

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

ESR702

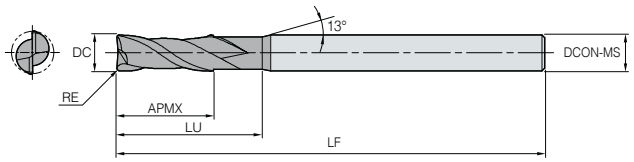
2 flutes neck type radius





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

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



(mm)

	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

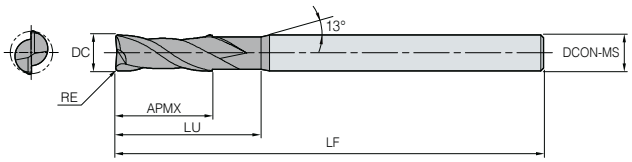
ESR702

2 flutes neck type radius



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

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

ESR702

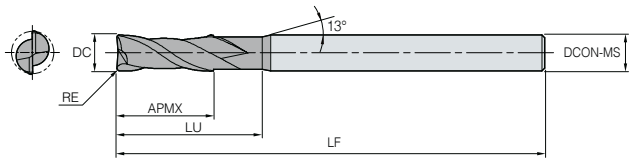
2 flutes neck type radius





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

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



(mm)

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

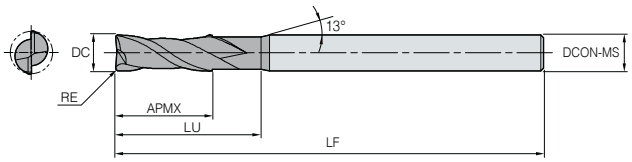
2 flutes neck type radius

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

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
	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

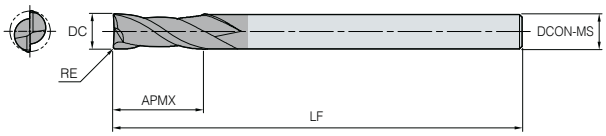
ESR732

2 flutes long shank radius

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

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
	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

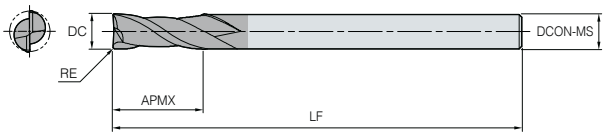
ESR732

2 flutes long shank radius

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

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







(mm)

Designation		DC	DCON-MS	APMX	LF	RE
ESR	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

ESR704A

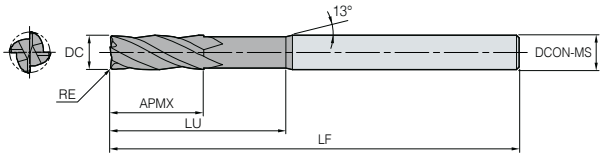
4 flutes neck type radius

Inch | 4 | H·A 30° | RE ±0.0006 | h5 shank

DC	Tolerance
Ø1/8 ~ Ø1/4	0.0000 ~ 0.0005
Ø5/16 ~ Ø3/4	0.0000 ~ 0.0006







(inch)

	Designation	DC	DCON-MS	APMX	LU	LF	RE
ESR	704A008001010	1/8	1/8	5/32	3/4	1 1/2	1/64
	704A012001016	3/16	3/16	1/4	1	2	1/64
	704A016001032	1/4	1/4	1/2	1 1/8	2 1/2	1/64
	704A016002032	1/4	1/4	1/2	1 1/8	2 1/2	2/64
	704A016001020	1/4	1/4	5/16	9/16	2	1/64
	704A016001020-2.5	1/4	1/4	5/16	1	2 1/2	1/64
	704A016004020	1/4	1/4	5/16	1	2 1/2	4/64
	704A016004020-3	1/4	1/4	5/16	1 1/2	3	4/64
	704A020001024	5/16	5/16	3/8	3/4	2 1/2	1/64
	704A020001024-2.5	5/16	5/16	3/8	1	2 1/2	1/64
	704A020004024	5/16	5/16	3/8	1	2 1/2	4/64
	704A024001056	3/8	3/8	7/8	15/16	2 1/2	1/64
	704A024002056	3/8	3/8	7/8	15/16	2 1/2	2/64
	704A024004056	3/8	3/8	7/8	15/16	2 1/2	4/64
	704A024001032	3/8	3/8	1/2	1	3	1/64
	704A024002028	3/8	3/8	7/16	1	2 1/2	2/64
	704A024005028	3/8	3/8	7/16	1	2 1/2	5/64
	704A024005028-3.5	3/8	3/8	7/16	2	3 1/2	5/64

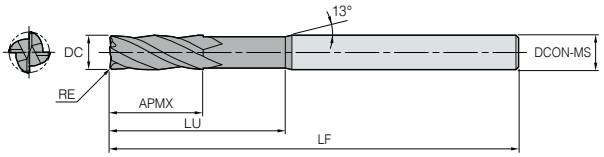
ESR704A

4 flutes neck type radius

Inch | 4 | H·A 30° | RE ±0.0006 | h5 shank

DC	Tolerance
Ø1/8 ~ Ø1/4	0.0000 ~ 0.0005
Ø5/16 ~ Ø3/4	0.0000 ~ 0.0006







(inch)

	Designation	DC	DCON-MS	APMX	LU	LF	RE
ESR	704A028002032	7/16	7/16	1/2	1 1/8	3	2/64
	704A028005032	7/16	7/16	1/2	1 1/8	3	5/64
	704A032001080	1/2	1/2	1 1/4	1 7/32	3 1/4	1/64
	704A032002080	1/2	1/2	1 1/4	1 7/32	3 1/4	2/64
	704A032004080	1/2	1/2	1 1/4	1 7/32	3 1/4	4/64
	704A032001040	1/2	1/2	5/8	1 3/16	3	1/64
	704A032002036	1/2	1/2	9/16	1 1/4	3	2/64
	704A032004036	1/2	1/2	9/16	1 1/4	3	4/64
	704A032006036	1/2	1/2	9/16	1 1/4	3	6/64
	704A032006036-4	1/2	1/2	9/16	1 1/4	4	6/64
	704A040002080	5/8	5/8	1 1/4	1 31/32	4	2/64
	704A040003080	5/8	5/8	1 1/4	1 31/32	4	3/64
	704A040004080	5/8	5/8	1 1/4	1 31/32	4	4/64
	704A040001048	5/8	5/8	3/4	1 1/2	3 1/2	1/64
	704A048002096	3/4	3/4	1 1/2	1 23/32	4	2/64
	704A048003096	3/4	3/4	1 1/2	1 23/32	4	3/64
	704A048004096	3/4	3/4	1 1/2	1 23/32	4	4/64
	704A048001064	3/4	3/4	1	1 3/4	4	1/64

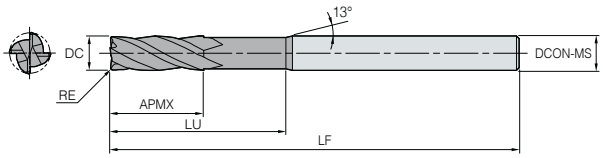
ESR704

4 flutes neck type radius

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

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

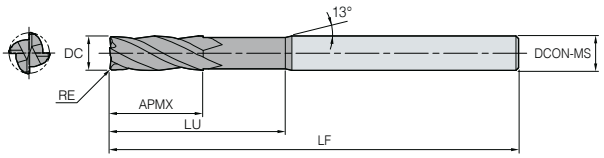
ESR704

4 flutes neck type radius

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

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







(mm)

	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

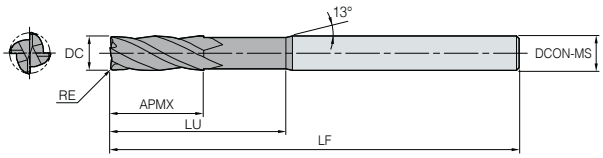
ESR704

4 flutes neck type radius

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

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
	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

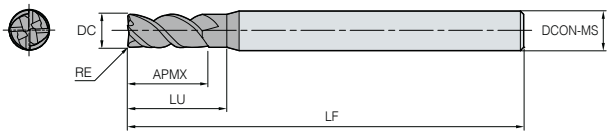
ESR714A

4 flutes radius

Inch | 4 | H·A 45° | RE ±0.0006 | h5 shank

DC	Tolerance
Ø1/8 ~ Ø1/4	0.0000 ~ 0.0005
Ø5/16 ~ Ø3/4	0.0000 ~ 0.0006







(inch)

	Designation	DC	DCON-MS	APMX	LU	LF	RE
ESR	714A008001024	1/8	1/8	1/64	3/8	1 1/2	1/64
	714A008001010	1/8	1/4	1/64	5/32	2 1/2	1/64
	714A012001028	3/16	3/16	1/64	7/16	2	1/64
	714A012002028	3/16	3/16	2/64	7/16	2	2/64
	714A012001014	3/16	1/4	1/64	7/32	2 1/2	1/64
	714A016001018	1/4	1/4	1/64	9/32	2 1/2	1/64
	714A020003026	5/16	5/16	3/64	13/32	2 1/2	3/64
	714A024003030	3/8	3/8	3/64	15/32	2 1/2	3/64
	714A024001080	3/8	3/8	1/64	1 1/4	3	1/64
	714A028003036	7/16	7/16	3/64	9/16	2 1/2	3/64
	714A032003040	1/2	1/2	3/64	5/8	3	3/64
	714A032003040-4.5	1/2	1/2	3/64	5/8	4 1/2	3/64
	714A032001080	1/2	1/2	1/64	1 1/4	3	1/64
	714A040003048	5/8	5/8	3/64	3/4	3 1/2	3/64
	714A040003048-4.5	5/8	5/8	3/64	3/4	4 1/2	3/64
	714A040003048-5.5	5/8	5/8	3/64	3/4	5 1/2	3/64
	714A040002096	5/8	5/8	2/64	1 1/2	3 1/2	2/64
	714A048004060	3/4	3/4	4/64	15/16	4	4/64
	714A048004060-4.5	3/4	3/4	4/64	15/16	4 1/2	4/64
	714A048004060-5.5	3/4	3/4	4/64	15/16	5 1/2	4/64

ESR714

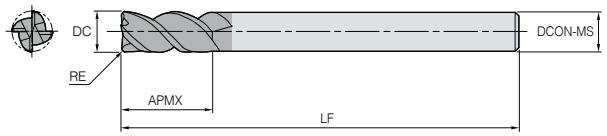
4 flutes radius

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

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
	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

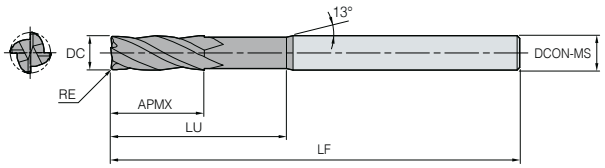
4 flutes neck type radius





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

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
	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

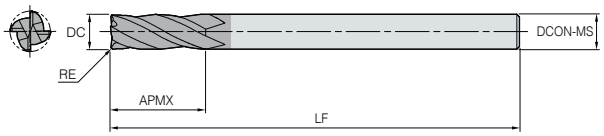
4 flutes long shank radius

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

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
	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

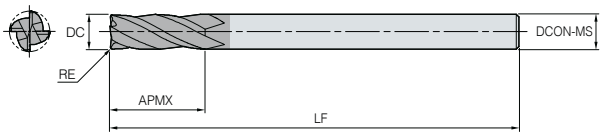
ESR734

4 flutes long shank radius

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

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







(mm)

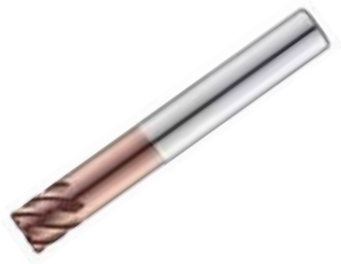
Designation		DC	DCON-MS	APMX	LF	RE
ESR	73408001	8	8	20	100	0.1
	73408002	8	8	20	100	0.2
	73408003	8	8	20	100	0.3
	73408005	8	8	20	100	0.5
	73408010	8	8	20	100	1
	73408020	8	8	20	100	2
	73410002	10	10	25	100	0.2
	73410003	10	10	25	100	0.3
	73410005	10	10	25	100	0.5
	73410010	10	10	25	100	1
	73410020	10	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

ESR706A

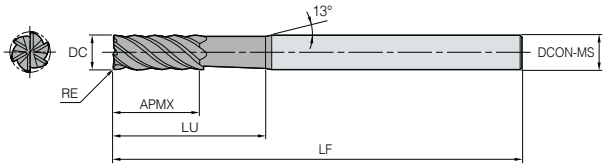
6 flutes neck type radius

Inch | 6 | H·A 45° | RE ±0.0006 | h5 shank

DC	Tolerance
Ø3/16 ~ Ø1/4	0.0000 ~ 0.0005
Ø5/16 ~ Ø1/2	0.0000 ~ 0.0006







(inch)

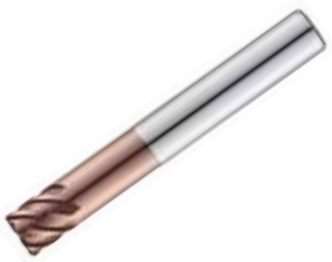
	Designation	DC	DCON-MS	APMX	LU	LF	RE
ESR	706A012001017	3/16	1/4	17/64	13/20	2	1/64
	706A012002017	3/16	1/4	17/64	13/20	2	2/64
	706A012001017-4	3/16	1/4	17/64	1 3/10	4	1/64
	706A012002017-4	3/16	1/4	17/64	1 3/10	4	2/64
	706A016001022	1/4	1/4	11/32	13/16	3	1/64
	706A016002022	1/4	1/4	11/32	13/16	3	2/64
	706A016001022-6	1/4	1/4	11/32	1 5/8	6	1/64
	706A016002022-6	1/4	1/4	11/32	1 5/8	6	2/64
	706A020001026	5/16	5/16	13/32	1 1/8	3	1/64
	706A020002026	5/16	5/16	13/32	1 1/8	3	2/64
	706A020002026-6	5/16	5/16	13/32	13/16	6	2/64
	706A024001030	3/8	3/8	15/32	1 17/64	3	1/64
	706A024002030	3/8	3/8	15/32	1 17/64	3	2/64
	706A024001030-6	3/8	3/8	15/32	2 7/64	6	1/64
	706A024002030-6	3/8	3/8	15/32	2 7/64	6	2/64
	706A024001066	3/8	3/8	1 1/32	1 1/2	3	1/64
	706A032002040	1/2	1/2	5/8	1 25/64	3	2/64

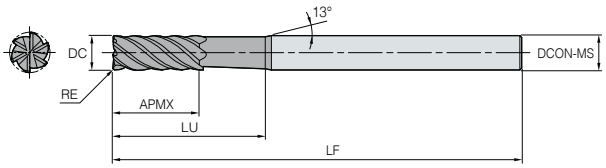
ESR706

6 flutes neck type radius

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

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







(mm)

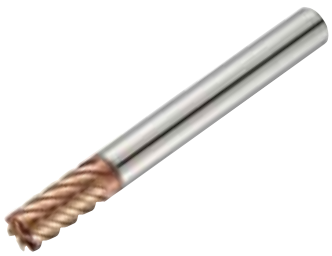
	Designation	DC	DCON-MS	APMX	LU	LF	RE
ESR	7060600314	6	6	6	14	50	0.3
	7060600514	6	6	6	14	50	0.5
	7060800524	8	8	8	24	60	0.5
	7060801024	8	8	8	24	60	1
	7061000530	10	10	10	30	70	0.5
	7061001030	10	10	10	30	70	1
	7061200530	12	12	12	30	75	0.5
	7061201030	12	12	12	30	75	1

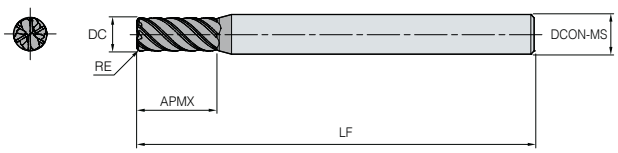
ESR716A

6 flutes type radius

Inch | 6 | H·A 45° | RE ±0.0006 | h5 shank

DC	Tolerance
Ø1/4	0.0000 ~ 0.0005
Ø5/16 ~ Ø5/8	0.0000 ~ 0.0006







(inch)

	Designation	DC	DCON-MS	APMX	LF	RE
ESR	716A016001032	1/4	1/4	1/2	2 1/4	1/64
	716A020001048	5/16	5/16	3/4	2 1/2	1/64
	716A024002056	3/8	3/8	7/8	2 7/8	2/64
	716A032002064	1/2	1/2	1	3 1/4	2/64
	716A040002096	5/8	5/8	1 1/2	3 5/8	2/64
	716A040004096	5/8	5/8	1 1/2	3 5/8	4/64

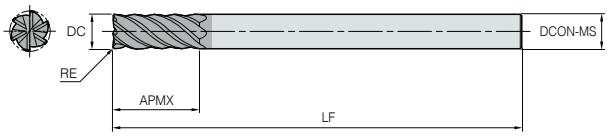
ESR736

6 flutes type radius

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

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

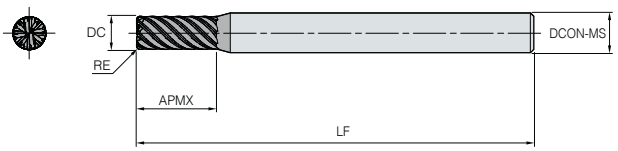
ESR718A

8 flutes type radius

Inch | 8 | H·A 45° | RE ±0.0006 | h5 shank

DC	Tolerance
ALL	0.0000 ~ 0.0006







(inch)

	Designation	DC	DCON-MS	APMX	LF	RE
ESR	718A048002096	3/4	3/4	1 1/2	4 1/8	2/64
	718A048004096	3/4	3/4	1 1/2	4 1/8	4/64
	718A064002096	1	1	1 1/2	4 1/4	2/64
	718A064004096	1	1	1 1/2	4 1/4	4/64
	718A064002288	1	1	4 1/2	7	2/64
	718A064004288	1	1	4 1/2	7	4/64

ESRR712

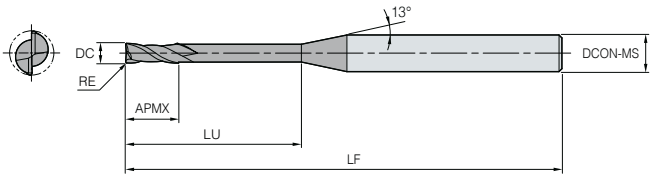
2 flutes rib ball





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

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

ESRR712

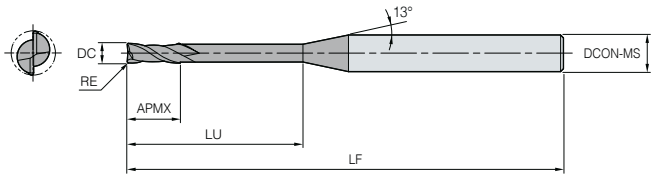
2 flutes rib ball

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

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	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

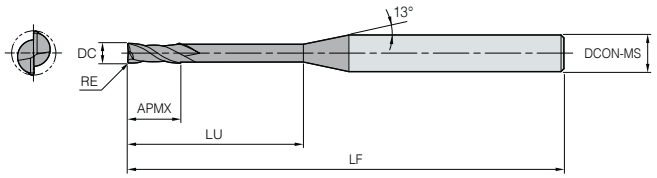
2 flutes rib ball

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

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

ESRR712

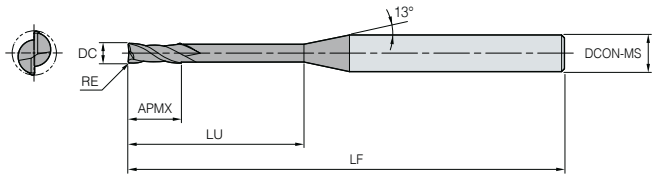
2 flutes rib ball

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

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	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

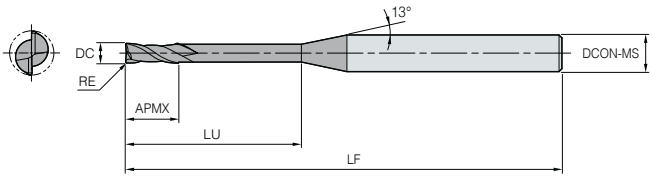
2 flutes rib ball





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

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

ESRR712

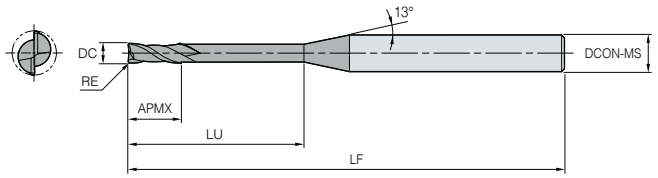
2 flutes rib ball

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

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	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

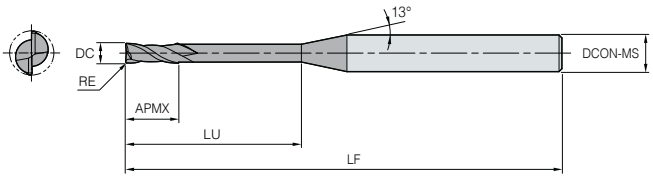
2 flutes rib ball





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

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

ESRR712

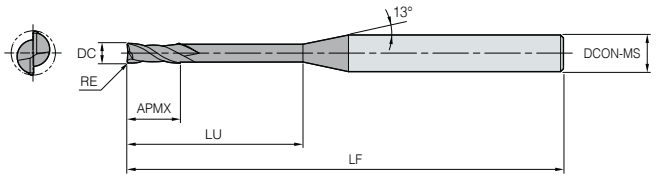
2 flutes rib ball

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

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	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

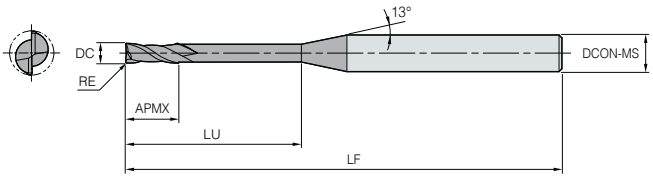
2 flutes rib ball





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

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

ESRR712

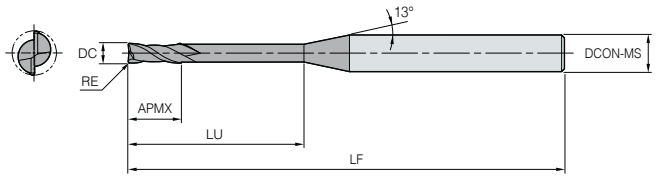
2 flutes rib ball

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

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	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

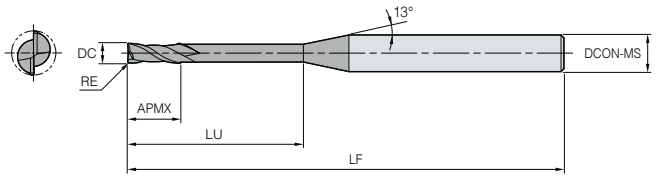
2 flutes rib ball

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

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
	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

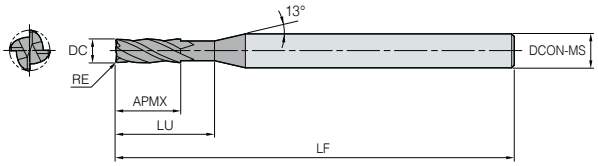
4 flutes rib ball

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

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







(mm)

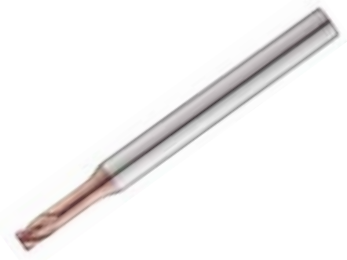
	Designation	DC	DCON-MS	APMX	LU	LF	RE
ESRR	71400500502	0.5	4	0.5	2	45	0.05
	71400500504	0.5	4	0.5	4	45	0.05
	71400500506	0.5	4	0.5	6	45	0.05
	71400500508	0.5	4	0.5	8	45	0.05
	71400501002	0.5	4	0.5	2	45	0.1
	71400501004	0.5	4	0.5	4	45	0.1
	71400501006	0.5	4	0.5	6	45	0.1
	71400501008	0.5	4	0.5	8	45	0.1
	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

ESRR714

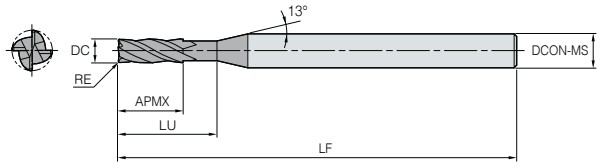
4 flutes rib ball

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

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	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

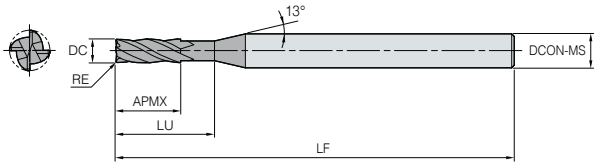
4 flutes rib ball

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

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





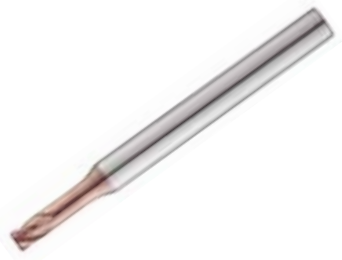


(mm)

	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

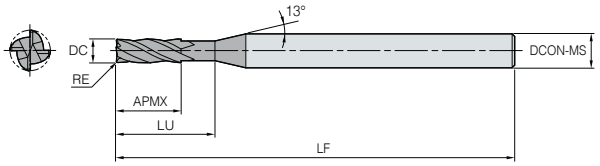
ESRR714

4 flutes rib ball



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

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	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

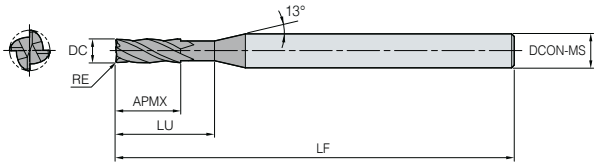
4 flutes rib ball

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

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







(mm)

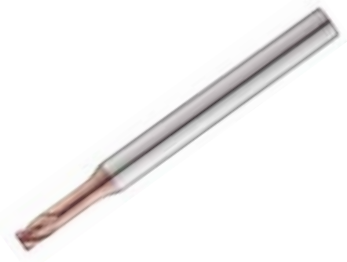
	Designation	DC	DCON-MS	APMX	LU	LF	RE
ESRR	71401501026	1.5	4	1.5	26	60	0.1
	71401502004	1.5	4	1.5	4	45	0.2
	71401502006	1.5	4	1.5	6	45	0.2
	71401502008	1.5	4	1.5	8	45	0.2
	71401502010	1.5	4	1.5	10	50	0.2
	71401502012	1.5	4	1.5	12	50	0.2
	71401502014	1.5	4	1.5	14	50	0.2
	71401502016	1.5	4	1.5	16	50	0.2
	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

ESRR714

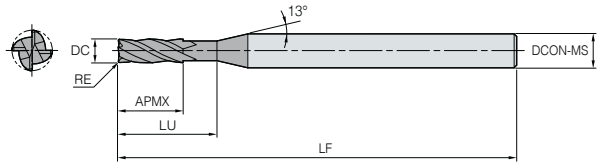
4 flutes rib ball

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

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	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

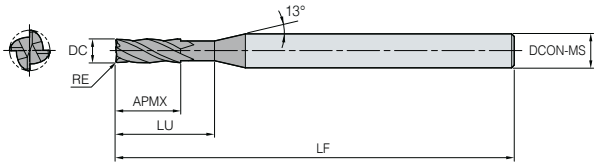
4 flutes rib ball

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

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







(mm)

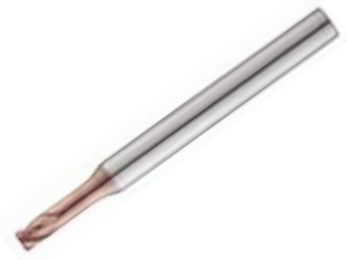
	Designation	DC	DCON-MS	APMX	LU	LF	RE
ESRR	71402003030	2	4	2	30	70	0.3
	71402005006	2	4	3	6	45	0.5
	71402005008	2	4	2	8	45	0.5
	71402005010	2	4	2	10	50	0.5
	71402005012	2	4	2	12	50	0.5
	71402005014	2	4	2	14	50	0.5
	71402005016	2	4	2	16	50	0.5
	71402005020	2	4	2	20	50	0.5
	71402005022	2	4	2	22	60	0.5
	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

ESRR714

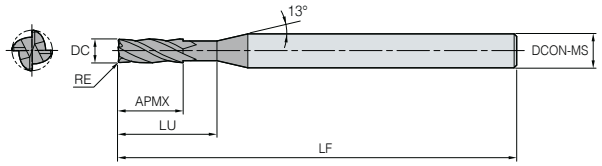
4 flutes rib ball

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

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	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

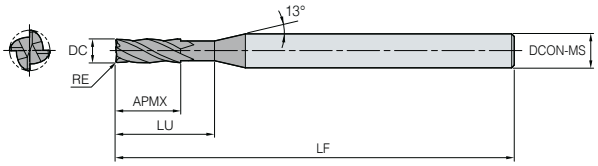
4 flutes rib ball

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

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





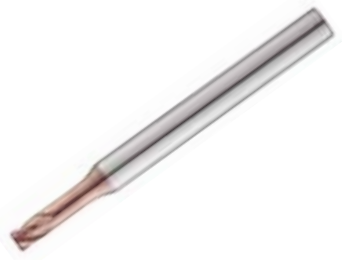


(mm)

	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

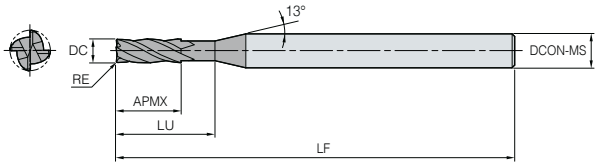
ESRR714

4 flutes rib ball



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

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	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

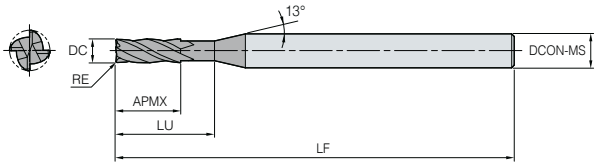
4 flutes rib ball

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

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







(mm)

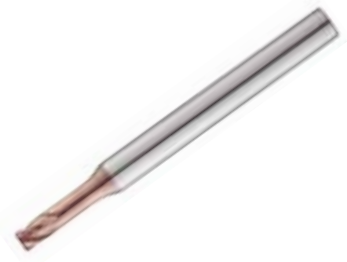
	Designation	DC	DCON-MS	APMX	LU	LF	RE
ESRR	71404010055	4	6	4	55	100	1
	71405001016	5	6	5	16	60	0.1
	71405001030	5	6	5	30	70	0.1
	71405001040	5	6	5	40	80	0.1
	71405002016	5	6	5	16	60	0.2
	71405002030	5	6	5	30	70	0.2
	71405002040	5	6	5	40	80	0.2
	71405003016	5	6	5	16	60	0.3
	71405003030	5	6	5	30	70	0.3
	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

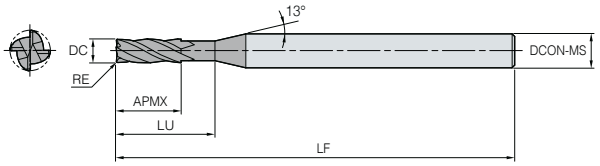
ESRR714

4 flutes rib ball

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

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





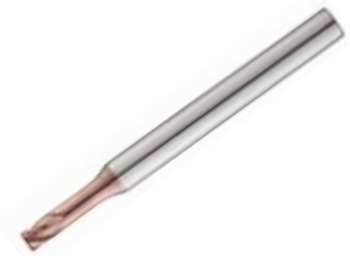


(mm)

	Designation	DC	DCON-MS	APMX	LU	LF	RE
ESRR	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

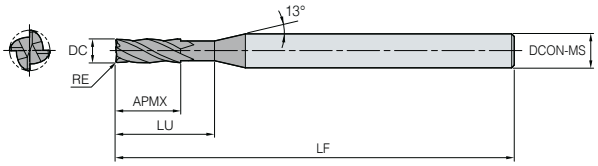
4 flutes rib ball





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

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
	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

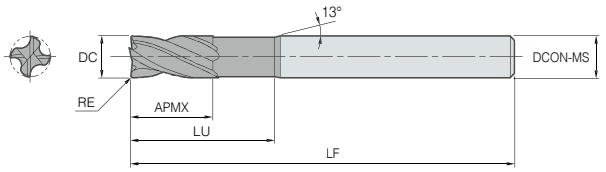
4 flutes neck type radius

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

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
	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

ESXR704

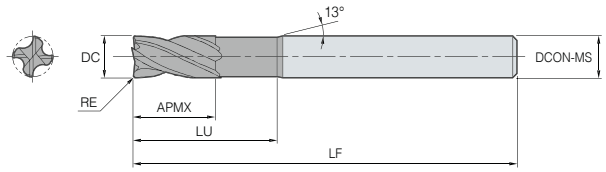
4 flutes neck type radius

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

DC	Tolerance
ALL	0.000 ~ -0.020







(mm)

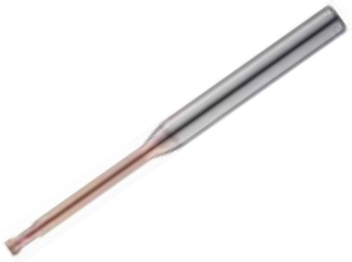
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESXR	7040801525	8	8	9	25	60	1.5
	7040802025	8	8	9	25	60	2
	7041000225	10	10	12	25	75	0.2
	7041000232	10	10	11	32	75	0.2
	7041000332	10	10	11	32	75	0.3
	7041000532	10	10	11	32	75	0.5
	7041001032	10	10	11	32	75	1
	7041001532	10	10	11	32	75	1.5
	7041002032	10	10	11	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

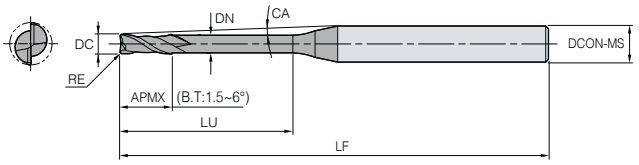
2 flutes long neck type radius

Metric | 2 | H·A 30° | RE ±0.01 | h5 shank

DC	Tolerance
ALL	0.000 ~ -0.012







(mm)

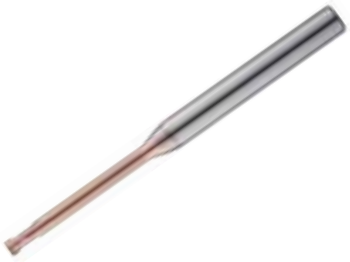
	Designation	DC	DCON-MS	APMX	LU	LF	DN	CA	RE	Effective length by inclination angle				
										0.5°	1°	1.5°	2°	3°
ESLNR	2002-0.5-005	0.2	4	0.15	0.5	50	0.17	11.4	0.05	0.9	1	1	1.1	12
	2002-1-005	0.2	4	0.15	1	50	0.17	10.9	0.05	1.6	1.7	1.9	2	2.3
	2002-1.5-005	0.2	4	0.15	1.5	50	0.17	10.3	0.05	2.1	2.3	2.5	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

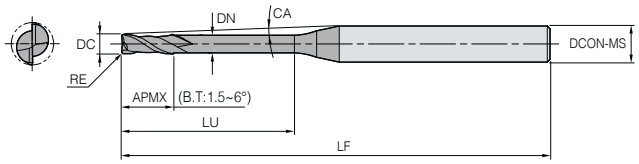
2 flutes long neck type radius

Metric | 2 | H·A 30° | RE ±0.01 | h5 shank

DC	Tolerance
ALL	0.000 ~ -0.012







(mm)

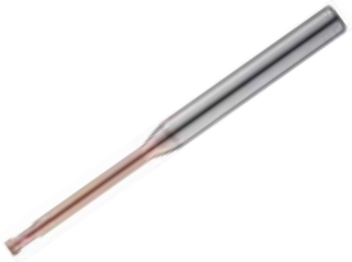
	Designation	DC	DCON-MS	APMX	LU	LF	DN	CA	RE	Effective length by inclination angle				
										0.5°	1°	1.5°	2°	3°
ESLNR	2006-8-01	0.6	4	0.4	8	50	0.57	6.1	0.1	9.3	9.9	10.3	10.7	11
	2006-10-01	0.6	4	0.4	10	50	0.57	5.5	0.1	11.5	12.1	12.5	13	13.7
	2008-4-01	0.8	4	0.5	4	50	4	8	0.1	4.8	5.2	5.4	5.7	6.1
	2008-6-01	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

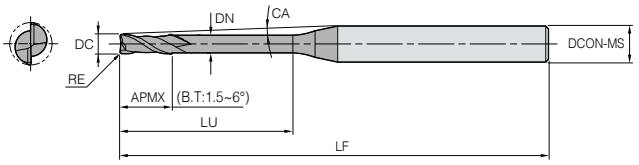
2 flutes long neck type radius

Metric | 2 | H·A 30° | RE ±0.01 | h5 shank

DC	Tolerance
ALL	0.000 ~ -0.012







(mm)

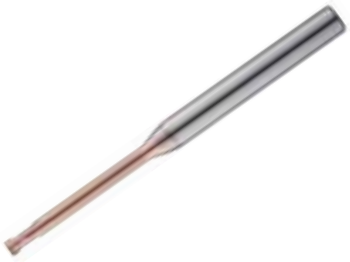
	Designation	DC	DCON-MS	APMX	LU	LF	DN	CA	RE	Effective length by inclination angle				
										0.5°	1°	1.5°	2°	3°
ESLNR	2015-15-02	1.5	4	1.35	15	55	1.42	3.5	0.2	16.9	17.5	18.1	18.6	20
	2015-20-02	1.5	4	1.35	20	60	1.42	2.8	0.2	22.1	22.9	23.5	24.1	-
	2015-8-03	1.5	4	1.35	8	50	1.42	5.2	0.3	9.2	9.6	10	10.3	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

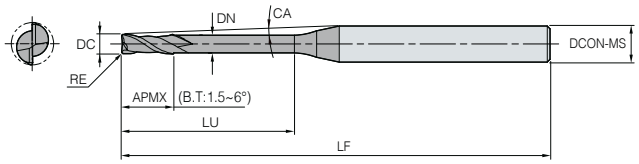
2 flutes long neck type radius

Metric | 2 | H·A 30° | RE ±0.01 | h5 shank

DC	Tolerance
ALL	0.000 ~ -0.012

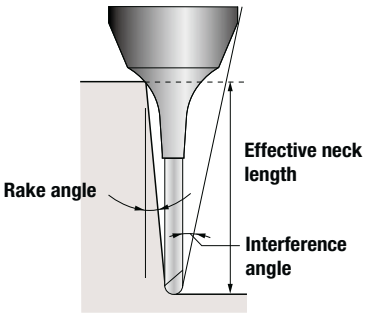


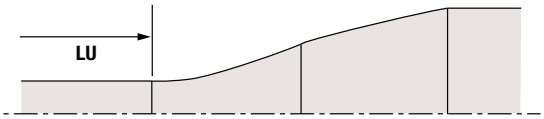




(mm)

	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	-





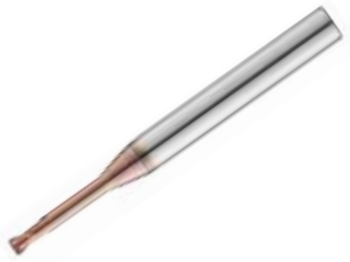
※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required.

ESTNR20

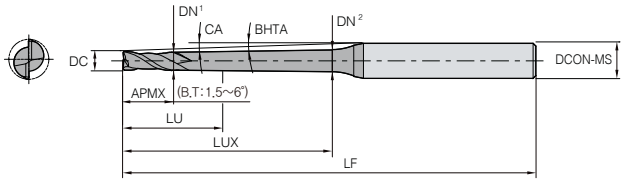
2 flutes tapered neck type radius

Metric | 2 | H·A 30° | RE ±0.01 | h5 shank

DC	Tolerance
ALL	0.000 ~ -0.012







(mm)

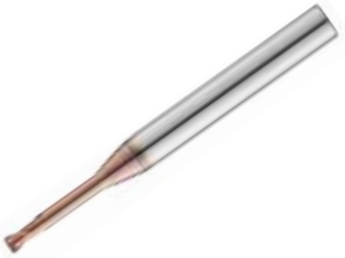
	Designation	DC	DCON-MS	APMX	LU	LUX	CA	BHTA (°)	DN1	DN2	LF	RE	Effective length by inclination angle				
													0.5°	1°	1.5°	2°	3°
ESTNR	2002-2-09005	0.2	4	0.15	1.1	2	0.9	10	0.17	0.23	50	0.05	-	2.8	3.1	3.4	3.9
	2004-4-09005	0.4	4	0.3	1.25	4	0.9	8.4	0.37	0.49	50	0.05	-	4.9	5.3	5.7	6.3
	2004-5-09005	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

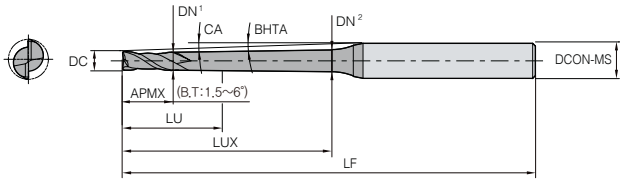
2 flutes tapered neck type radius

Metric | 2 | H·A 30° | RE ±0.01 | h5 shank

DC	Tolerance
ALL	0.000 ~ -0.012

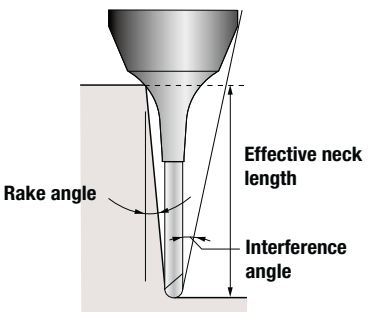


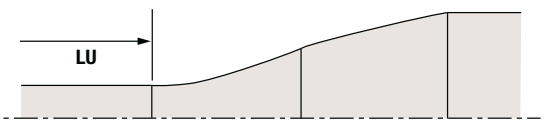




(mm)

	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.

ESPM4A

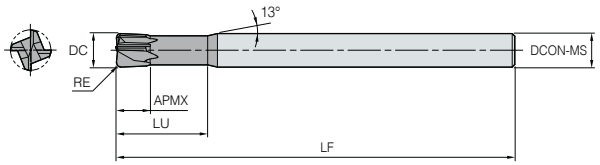
4 flutes radius for high speed machining

Inch | 4 | H·A 0° | RE ±0.0006 | h5 shank

DC	Tolerance
Ø1/8 ~ Ø1/4	0.000 ~ -0.012
Ø5/16 ~ Ø1/2	0.000 ~ -0.015







(inch)

	Designation	DC	DCON-MS	APMX	LU	LF	RE
ESPM	4A008002003	1/8	1/4	1/20	3/8	2 1/4	2/64
	4A008002004	1/8	1/4	1/16	3/8	2 1/4	2/64
	4A012004005	3/16	1/4	3/40	3/8	2 1/4	4/64
	4A012004006	3/16	1/4	3/32	9/16	2 1/4	4/64
	4A016004006	1/4	1/4	1/10	1/2	2 1/2	4/64
	4A016004006-3	1/4	1/4	1/10	1	3	4/64
	4A020006008-3	5/16	5/16	3/23	1 1/4	3	6/64
	4A024006010-3	3/8	3/8	3/20	3/4	3	6/64
	4A024006010-4	3/8	3/8	3/20	1 1/2	4	6/64
	4A032006013	1/2	1/2	1/5	1	3 1/4	6/64
	4A032008013-5	1/2	1/2	1/5	2	5	8/64

ESPM4

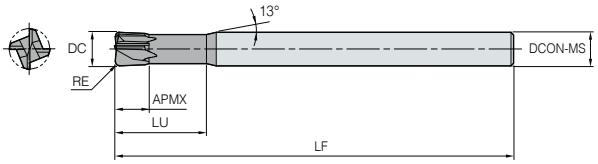
4 flutes neck type radius

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

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

ESB702A

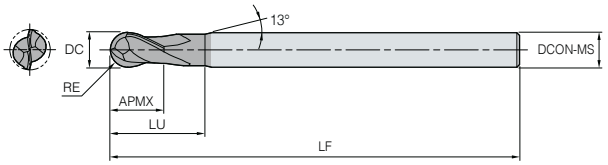
2 flutes neck type ball

Inch | 2 | H·A 30° | RE ±0.0003 | h5 shank

DC	Tolerance
Ø1/32 ~ Ø1/4	0.0000 ~ 0.0005
Ø5/16 ~ Ø1/2	0.0000 ~ 0.0006







(inch)

	Designation	DC	DCON-MS	APMX	LU	LF
ESB	702A002002	1/32	1/4	1/32	1/16	2
	702A002002-3	1/32	1/4	1/32	1/16	3
	702A004004	1/16	1/4	1/16	1/8	2
	702A004004-3	1/16	1/4	1/16	1/8	3
	702A006006	3/32	1/4	3/32	3/16	2
	702A006006-3	3/32	1/4	3/32	3/16	3
	702A008008	1/8	1/4	1/8	1/4	3
	702A008016	1/8	1/8	1/4	5/8	3
	702A012012	3/16	1/4	3/16	3/8	3
	702A012017	3/16	1/4	17/64	21/32	2
	702A012017-4	3/16	3/16	17/64	1 5/16	4
	702A012024	3/16	3/16	3/8	5/8	3 1/2
	702A016016	1/4	1/4	1/4	1/2	3 1/2
	702A016022	1/4	1/4	11/32	1 5/16	3
	702A016022-6	1/4	1/4	11/32	1 39/64	6
	702A016032	1/4	1/4	1/2	3/4	3 1/2
	702A020020	5/16	5/16	5/16	5/8	4
	702A024024	3/8	3/8	3/8	3/4	4
	702A024030	3/8	3/8	15/32	1 17/64	3
	702A024030-6	3/8	3/8	15/32	2 1/8	6
	702A024048	3/8	3/8	3/4	1 1/8	4
	702A032032	1/2	1/2	1/2	1	4 1/2
	702A032040	1/2	1/2	5/8	1 25/64	4
	702A032040-6	1/2	1/2	5/8	2 5/16	6
	702A032064	1/2	1/2	1	1 3/4	4
	702A040040	5/8	5/8	5/8	1 1/4	5 1/2
	702A040048	5/8	5/8	3/4	1 21/32	4
	702A040048-6	5/8	5/8	3/4	2 5/8	6
	702A040080	5/8	5/8	1 1/4	2	5
	702A048048	3/4	3/4	3/4	1 1/2	6 1/2

ESB702

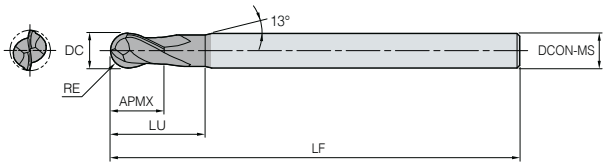
2 flutes neck type ball

Metric | 2 | H·A 30° | RE ±0.005 (DC6 or below) | RE ±0.0008 (Above DC6) | h5 shank

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





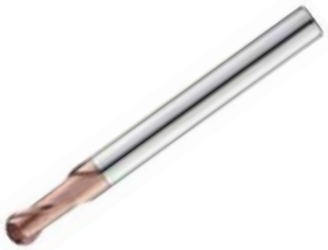


(mm)

	Designation	DC	DCON-MS	APMX	LU	LF	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

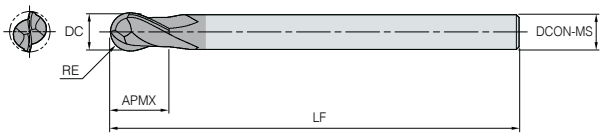
2 flutes ball





Metric | 2 | H·A 30° | RE ±0.005 (DC6 or below) | RE ±0008 (Above DC6) | h5 shank

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



(mm)

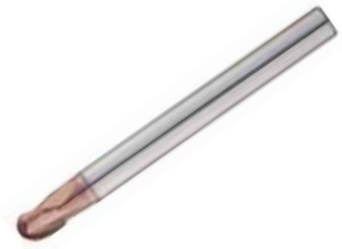
Designation		DC	DCON-MS	APMX	LF	RE
ESB	712010	1	6	2.5	50	0.5
	712010S	1	6	1.5	40	0.5
	712010S4	1	4	2.5	50	0.5
	712012	1.2	6	3	50	0.6
	712015	1.5	6	4	50	0.75
	712015S	1.5	6	2.5	40	0.75
	712015S4	1.5	4	4	50	0.75
	712020	2	6	5	50	1
	712020S	2	6	3	40	1
	712020S4	2	4	5	50	1
	712025	2.5	6	7	60	1.25
	712030	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

ESB703A

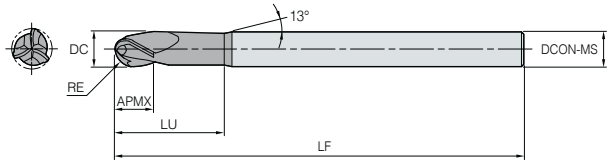
3 flutes neck type radius

Inch | 3 | H·A 30° | RE ±0.0003 | h5 shank

DC	Tolerance
Ø1/16 ~ Ø1/4	0.0000 ~ 0.0005
Ø5/16 ~ Ø1/2	0.0000 ~ 0.0006







(inch)

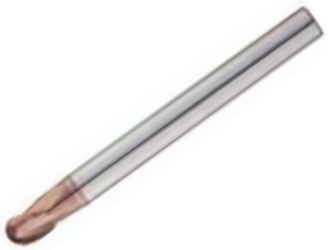
	Designation	DC	DCON-MS	APMX	LU	LF
ESB	703A004004	1/16	1/4	1/16	1/8	2
	703A006006	3/32	1/4	3/32	3/16	2
	703A008008	1/8	1/4	1/8	1/4	2
	703A012012	3/16	1/4	3/16	3/8	2
	703A016016	1/4	1/4	1/4	1/2	2 1/4
	703A020020	5/16	5/16	5/16	5/8	2 1/2
	703A024024	3/8	3/8	3/8	3/4	3
	703A032032	1/2	1/2	1/2	1	3

ESB703

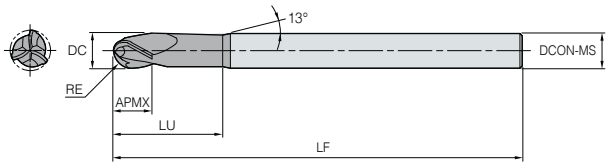
3 flutes neck type ball

Metric | 3 | H·A 30° | RE ±0.005 (DC6 or below) | RE ±0008 (Above DC6) | h5 shank

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







(mm)

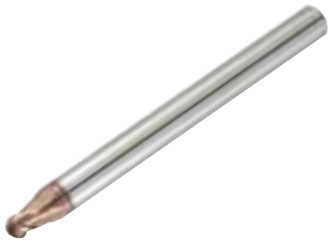
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESB	703020	2	6	2.5	5	50	1
	703025	2.5	6	3	7	50	1.25
	703030	3	6	4	10	60	1.5
	703030S	3	6	4	10	50	1.5
	703031	3	6	4	10	70	1.5
	703040	4	6	5	10	60	2
	703040S	4	6	5	10	50	2
	703041	4	6	5	10	70	2
	703050	5	6	6	12	60	2.5
	703060	6	6	7	12	60	3
	703061	6	6	7	12	90	3
	703080	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

ESB714A

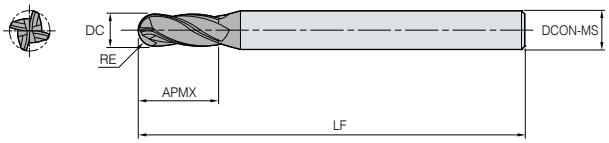
4 flutes type ball

Inch | 4 | H·A 30° | RE ±0.0003 | h5 shank

DC	Tolerance
Ø1/8 ~ Ø1/4	0.0000 ~ 0.0005
Ø5/16 ~ Ø1/2	0.0000 ~ 0.0006







(inch)

	Designation	DC	DCON-MS	APMX	LU	LF
ESB	714A008008	1/8	1/4	1/8	-	3
	714A010010	5/32	1/4	5/32	-	3
	714A012012	3/16	1/4	3/16	-	3
	714A016016	1/4	3/8	1/4	-	4
	714A020020	5/16	3/8	5/16	-	4
	714A024024	3/8	1/2	3/8	-	5
	714A032032	1/2	1/2	1/2	-	5

ESB734

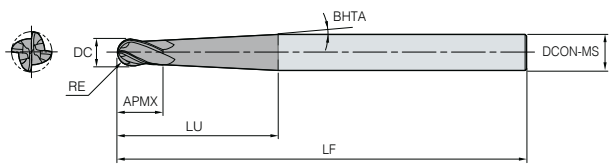
4 flutes 15° helix ball

Metric | 4 | H·A 15° | RE ±0.005 (DC6 or below) | RE ±0008 (Above DC6) | h5 shank

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







(mm)

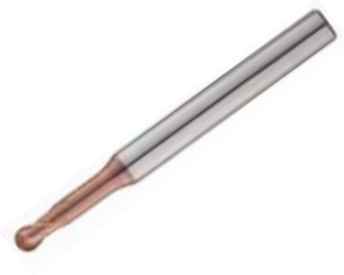
	Designation	DC	DCON-MS	APMX	LU	LF	RE	BHTA(°)
ESB	734020-2.5	2	4	2	25	60	1	2.5
	734020-3.5	2	4	2	18	60	1	3.5
	734025-2.5	2.5	4	3	20	60	1.25	2.5
	734025-3.0	2.5	4	3	17	60	1.25	3
	734030-2.0	3	6	3	46	70	1.5	2
	734030-2.5	3	6	3	37	70	1.5	2.5
	734040-2.0	4	6	4	33	70	2	2
	734040-2.5	4	6	4	27	70	2	2.5
	734050-2.5	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

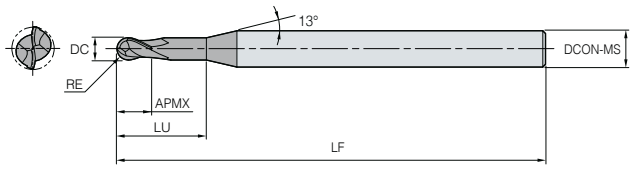
2 flutes rib ball

Metric | 2 | H·A 30° | RE ±0.005 (DC6 or below) | RE ±0008 (Above DC6) | h5 shank

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







(mm)

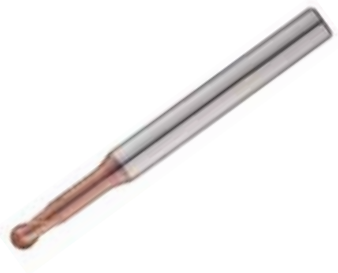
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRB	712001002	0.1	4	0.1	0.2	40	0.05
	712001003	0.1	4	0.1	0.3	40	0.05
	712001005	0.1	4	0.1	0.5	40	0.05
	71200101	0.1	4	0.1	1	40	0.05
	712002005	0.2	4	0.2	0.5	40	0.1
	712002015	0.2	4	0.2	1.5	40	0.1
	71200201	0.2	4	0.2	1	40	0.1
	71200202	0.2	4	0.2	2	40	0.1
	71200203	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

ESRB712

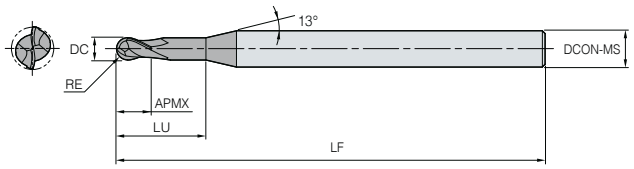
2 flutes rib ball

Metric | 2 | H·A 30° | RE ±0.005 (DC6 or below) | RE ±0008 (Above DC6) | h5 shank

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







(mm)

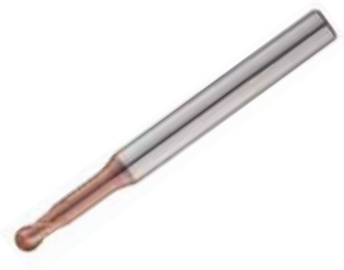
	Designation	DC	DCON-MS	APMX	LU	LF	RE
ESRB	71200512	0.5	4	0.5	12	45	0.25
	71200514	0.5	4	0.5	14	45	0.25
	71200516	0.5	4	0.5	16	45	0.25
	71200601	0.6	4	0.6	1	45	0.3
	71200601S6	0.6	6	0.6	1	45	0.3
	71200602	0.6	4	0.6	2	45	0.3
	71200602S6	0.6	6	0.6	2	45	0.3
	71200603	0.6	4	0.6	3	45	0.3
	71200603S6	0.6	6	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

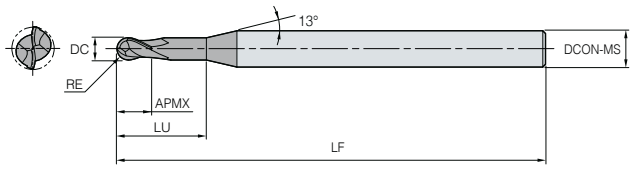
2 flutes rib ball

Metric | 2 | H·A 30° | RE ±0.005 (DC6 or below) | RE ±0008 (Above DC6) | h5 shank

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







(mm)

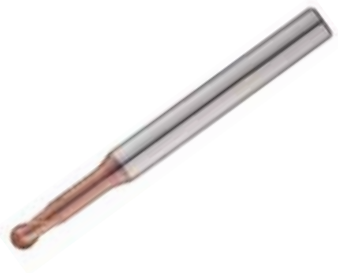
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRB	71200805	0.8	4	0.8	5	45	0.4
	71200805S6	0.8	6	0.8	5	45	0.4
	71200806	0.8	4	0.8	6	45	0.4
	71200806S6	0.8	6	0.8	6	45	0.4
	71200808	0.8	4	0.8	8	45	0.4
	71200808S6	0.8	6	0.8	8	45	0.4
	71200810	0.8	4	0.8	10	45	0.4
	71200810S6	0.8	6	0.8	10	45	0.4
	71200812	0.8	4	0.8	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

ESRB712

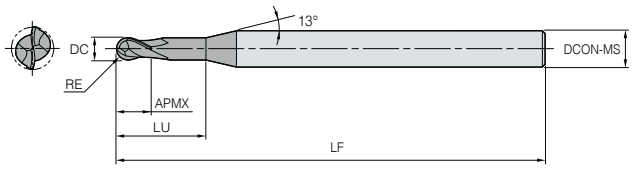
2 flutes rib ball

Metric | 2 | H·A 30° | RE ±0.005 (DC6 or below) | RE ±0008 (Above DC6) | h5 shank

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







(mm)

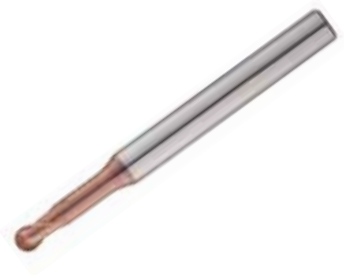
	Designation	DC	DCON-MS	APMX	LU	LF	RE
ESRB	71201012S6	1	6	1	12	50	0.5
	71201014	1	4	1	14	50	0.5
	71201014S6	1	6	1	14	50	0.5
	71201016	1	4	1	16	50	0.5
	71201016S6	1	6	1	16	50	0.5
	71201018	1	4	1	18	50	0.5
	71201018S6	1	6	1	18	50	0.5
	71201020	1	4	1	20	55	0.5
	71201020S6	1	6	1	20	55	0.5
	71201022	1	4	1	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

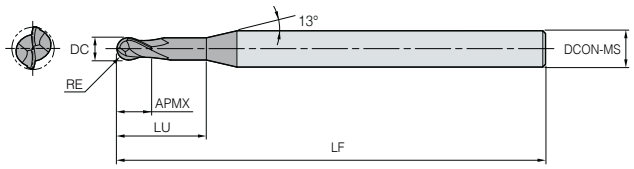
2 flutes rib ball

Metric | 2 | H·A 30° | RE ±0.005 (DC6 or below) | RE ±0008 (Above DC6) | h5 shank

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





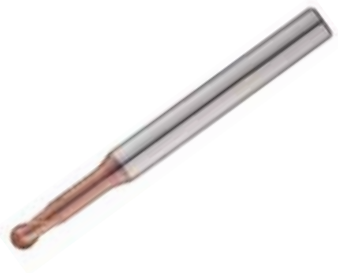


(mm)

	Designation	DC	DCON-MS	APMX	LU	LF	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

ESRB712

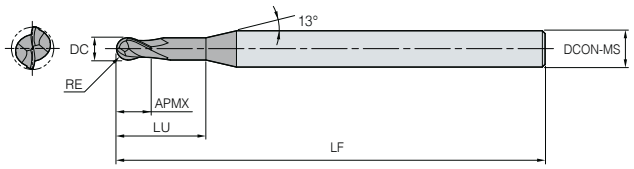
2 flutes rib ball





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

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

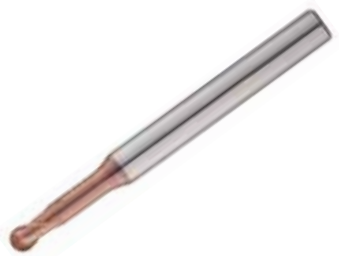


(mm)

	Designation	DC	DCON-MS	APMX	LU	LF	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

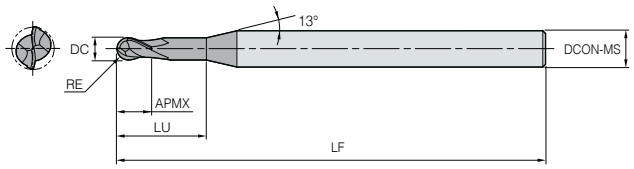
2 flutes rib ball





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

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



(mm)

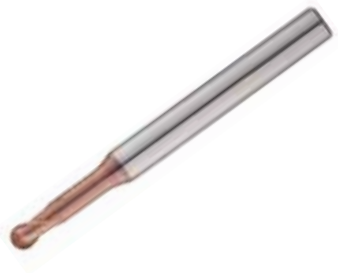
Designation		DC	DCON-MS	APMX	LU	LF	RE
ESRB	71202535	2.5	4	2.5	35	70	1.25
	71202540	2.5	4	2.5	40	80	1.25
	71202545	2.5	4	2.5	45	90	1.25
	71202550	2.5	4	2.5	50	100	1.25
	71203006	3	6	3	6	50	1.5
	71203008	3	6	3	8	50	1.5
	71203010	3	6	3	10	50	1.5
	71203012	3	6	3	12	50	1.5
	71203014	3	6	3	14	60	1.5
	71203016	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
	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

ESRB712

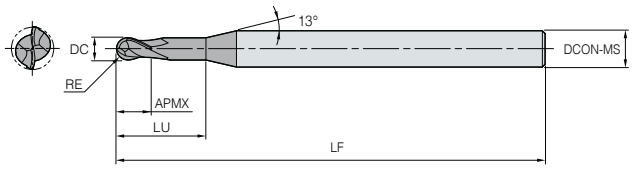
2 flutes rib ball

Metric | 2 | H·A 30° | RE ±0.005 (DC6 or below) | RE ±0008 (Above DC6) | 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	RE
ESRB	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

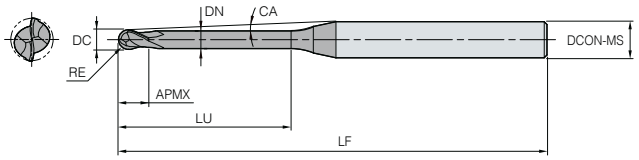
2 flutes long neck type ball

Metric | 2 | H·A 30° | RE ±0.005 (DC6 or below) | RE ±0008 (Above DC6) | h5 shank

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

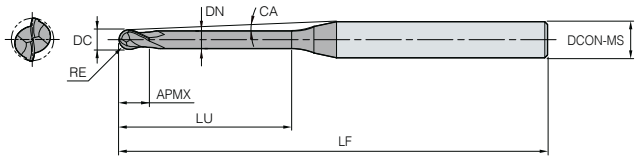
2 flutes long neck type ball





Metric | 2 | H·A 30° | RE ±0.005 (DC6 or below) | RE ±0.0008 (Above DC6) | h5 shank

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

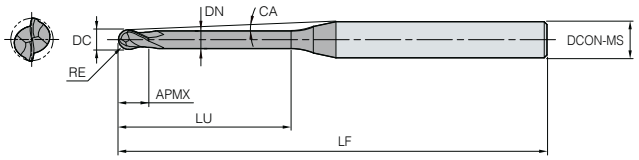
2 flutes long neck type ball

Metric | 2 | H·A 30° | RE ±0.005 (DC6 or below) | RE ±0008 (Above DC6) | h5 shank

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

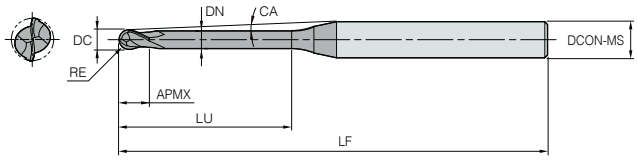
2 flutes long neck type ball

Metric | 2 | H·A 30° | RE ±0.005 (DC6 or below) | RE ±0.0008 (Above DC6) | h5 shank

DC	Tolerance
ALL	0.000 ~ -0.012

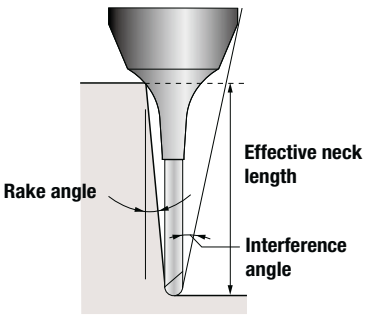


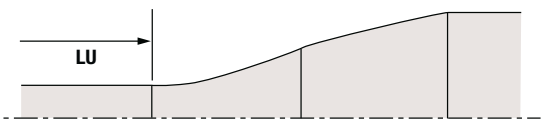




(mm)

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

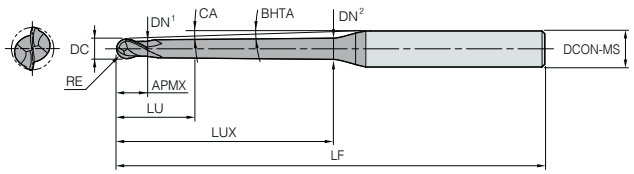
2 flutes long neck type ball





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

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



(mm)

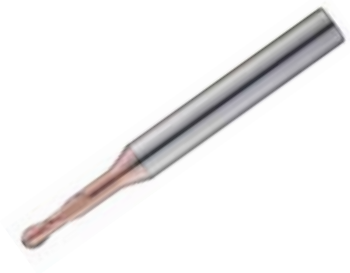
Designation		DC	DCON-MS	APMX	LU	LUX	LF	DN1	DN2	RE	BHTA (°)	CA	Effective length by inclination angle				
													0.5°	1°	1.5°	2°	3°
ESTNB	2002-1-04	0.2	4	0.15	1.35	1	50	0.17	0.18	0.1	0.4	10.9	1.5	1.7	1.8	2	2.3
	2002-1.5-04	0.2	4	0.15	1.77	1.5	50	0.17	0.19	0.1	0.4	10.4	2	2.2	2.4	2.6	2.9
	2002-2-09	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

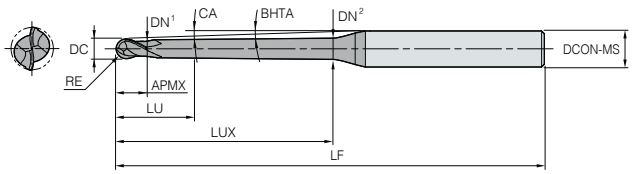
2 flutes long neck type ball

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

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

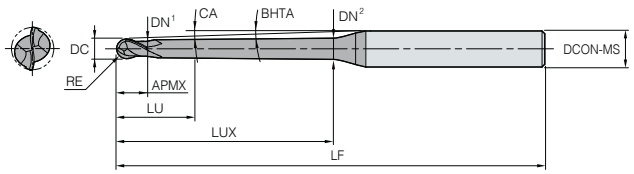
2 flutes long neck type ball





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

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



(mm)

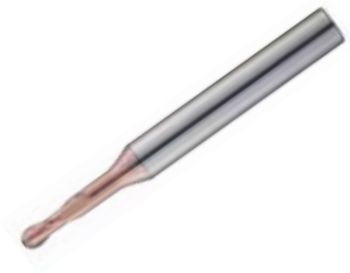
Designation		DC	DCON-MS	APMX	LU	LUX	LF	DN1	DN2	RE	BHTA (°)	CA	Effective length by inclination angle				
													0.5°	1°	1.5°	2°	3°
ESTNB	2018-28-04	1.8	6	1.6	6.61	28	70	1.73	2.1	0.9	0.4	3.4	29.4	30.6	31.5	32.4	35.9
	2018-32-04	1.8	6	1.6	6.61	32	70	1.73	2.15	0.9	0.4	3	33.4	34.8	35.7	37.1	-
	2018-36-04	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

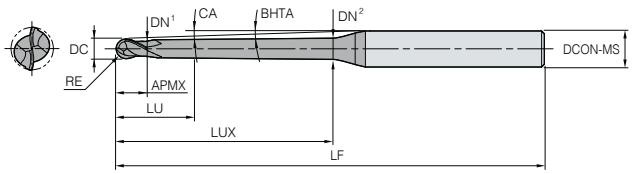
2 flutes long neck type ball

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

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

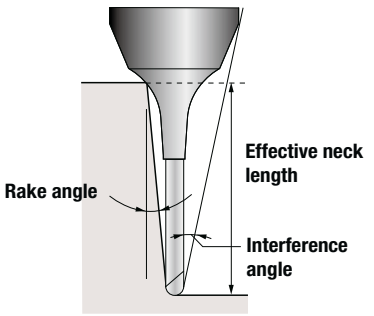


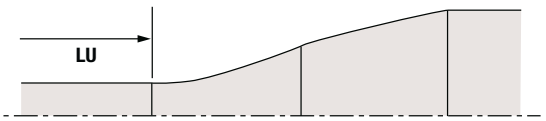




(mm)

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	-	-	-	-





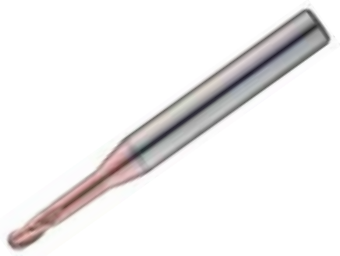
※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required.

ESTNB30

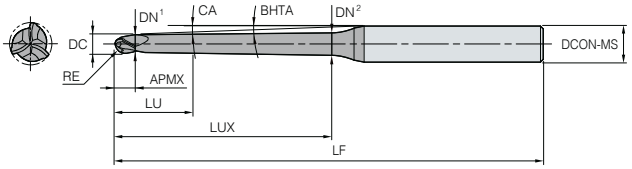
3 flutes tapered neck type ball

Metric | 3 | H·A 30° | RE ±0.005 | h5 shank

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 dia.
010 : Ø1.0 mm
060 : Ø6.0 mm
250 : Ø25.0 mm

Corner R
5 : 0.05 mm
10 : 0.10 mm
20 : 0.20 mm

Effective length
005 : 0.05 mm
10 : 10 mm
50 : 50 mm

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

Shank dia.
S3 : Ø3 mm
S6 : Ø6 mm
S20 : Ø20 mm

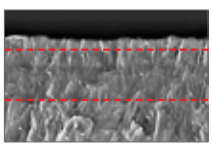
Features

• Edge treatment



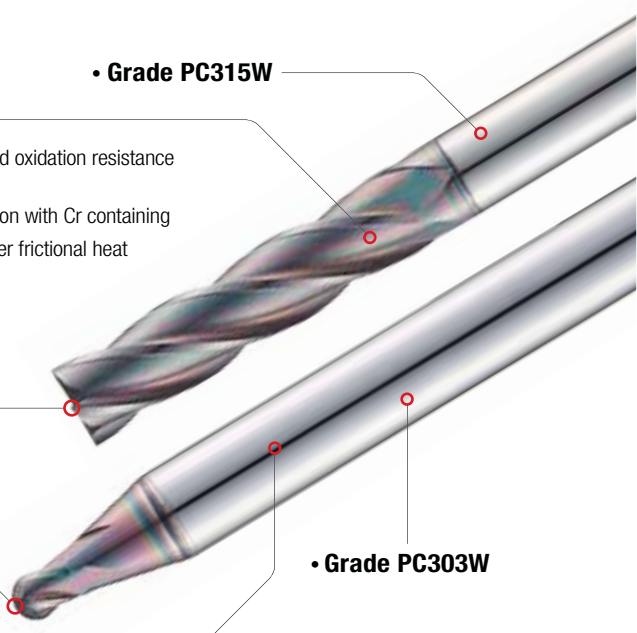
- Enhanced chipping resistance in the beginning of cutting
- Guiding stable cutting for managing the properties of mold machining

• AlCrN base new coating

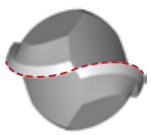


- Increased wear and oxidation resistance due to multi layer
- Enhanced lubrication with Cr containing
- Stable cutting under frictional heat

• Grade PC315W



• 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

• Grade PC303W

Line-up

Designation	Picture	Product name	Unit	Range	Irregular flute spacing	Page
UE502		2 flutes flat Endmill	Metric	∅0.1 ~ 25.0		B145~B146
UE512		2 flutes long neck flat Endmill	Metric	∅0.1 ~ 12.0		B147~B149
UE522		2 flutes flat Endmill	Metric	∅1.0 ~ 25.0		B150~B151
UXE502		2 flutes flat for heavy cuts	Metric	∅0.1 ~ 20.0		B152~B153
UE504H		4 flutes 45° helix flat Endmill	Metric	∅1.0 ~ 20.0		B154
UE514		4 flutes long neck flat Endmill	Metric	∅1.0 ~ 12.0		B155~B156
UE524		4 flutes flat Endmill	Metric	∅1.0 ~ 25.0		B157~B158
ULE504		4 flutes automatic cnc flat Endmill	Metric	∅3.0 ~ 16.0		B159
UE504		4 flutes flat Endmill	Metric	∅0.8 ~ 25.0	●	B160
UXE504		4 flutes flat for heavy cuts	Metric	∅1.0 ~ 20.0	●	B161
UE506		6 flutes flat Endmill	Metric	∅6.0 ~ 20.0		B162
UTE502		2 flutes tapered flat Endmill	Metric	∅0.3 ~ 10.0		B163~B164
UTE504		4 flutes tapered flat Endmill	Metric	∅0.8 ~ 10.0		B165~B167
UR502		2 flutes radius Endmill	Metric	∅0.2 ~ 20.0		B168~B170
UR512		2 flutes neck type radius Endmill	Metric	∅0.2 ~ 20.0		B171~B176
UR542		2 flutes tapered neck radius Endmill	Metric	∅0.2 ~ 4.0		B177~B181
UR504		4 flutes radius Endmill	Metric	∅3.0 ~ 20.0	●	B182
UR544		4 flutes tapered neck radius Endmill	Metric	∅1.0 ~ 4.0		B183~B186
UXR504		4 flutes multi helix radius Endmill	Metric	∅1.0 ~ 20.0	●	B187~B189
UXR514		4 flutes multi helix neck radius Endmill	Metric	∅1.0 ~ 20.0	●	B190~B194
UR506		6 flutes radius Endmill	Metric	∅6.0 ~ 20.0		B195
UDR503		3 flutes double radius Endmill	Metric	∅6.0 ~ 20.0		B196
USPM4		4 flutes radius for high speed machining	Metric	∅1.0 ~ 20.0		B197
UTR504		4 flutes tapered radius Endmill	Metric	∅0.8 ~ 2.5		B198~B201
UB502		2 flutes ball Endmill	Metric	∅1.0 ~ 25.0		B202~B203
UB502P		2 flutes high precision ball Endmill	Metric	∅0.1 ~ 12.0		B204
UB512		2 flutes long neck ball Endmill	Metric	∅0.1 ~ 12.0		B205~B207
UB512S6		2 flutes long neck ball Endmill (shank 6)	Metric	∅0.5 ~ 2.0		B208
UB532		2 flutes lollipop style ball Endmill	Metric	∅3.0 ~ 12.0		B209
UB542		2 flutes tapered neck ball Endmill	Metric	∅0.1 ~ 12.0		B210~B216
USB502		2 flutes straight ball Endmill	Metric	∅3.0 ~ 20.0		B217
UB503		3 flutes ball Endmill	Metric	∅1.0 ~ 12.0		B218
UB504		4 flutes ball Endmill	Metric	∅1.0 ~ 12.0		B218
UTB502		2 flutes tapered ball Endmill	Metric	∅0.3 ~ 2.0		B219~B220
UF50		3~5 flutes chamfer pitch roughing Endmill	Metric	∅3.0 ~ 25.0		B221
UF51		3~5 flutes fine pitch roughing Endmill	Metric	∅3.0 ~ 25.0		B222
UF51H		3~5 flutes 45° helix fine pitch roughing Endmill	Metric	∅3.0 ~ 25.0		B223

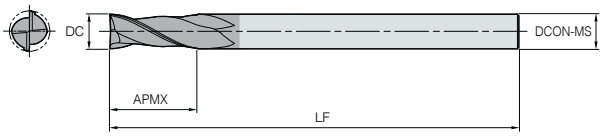
UE502

2 flutes flat

Metric | 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

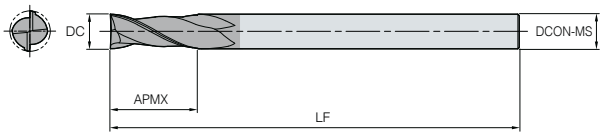
UE502

2 flutes flat



Metric | 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

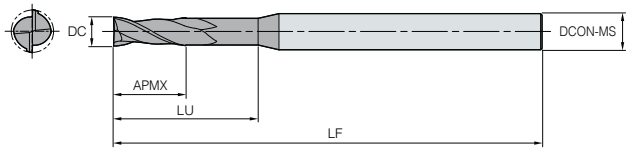
2 flutes long neck flat

Metric | 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

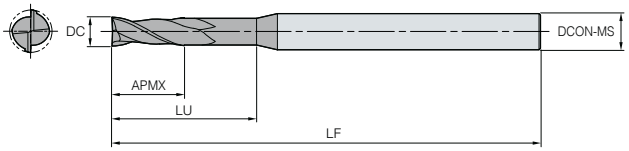
2 flutes long neck flat

Metric | 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

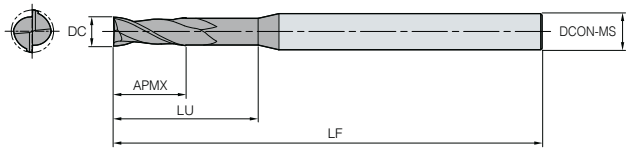
2 flutes long neck flat

Metric | 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

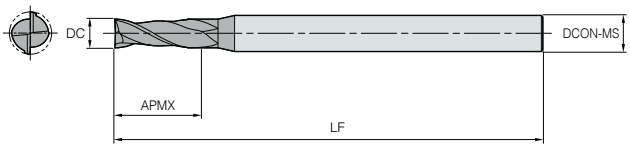
2 flutes flat

Metric | 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

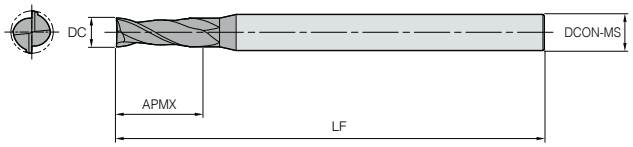
2 flutes flat

Metric | 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

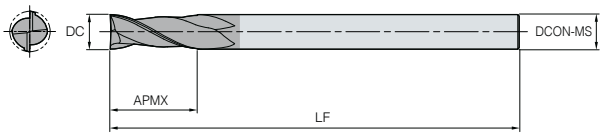
UXE502

2 flutes flat for heavy cuts

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

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

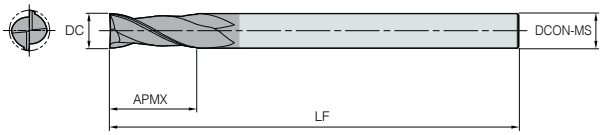
UXE502

2 flutes flat for heavy cuts

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

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

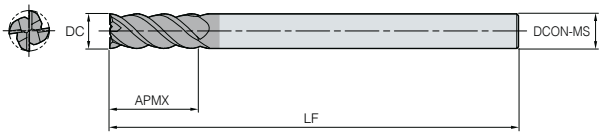
UE504H

4 flutes 45° helix flat

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

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







(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

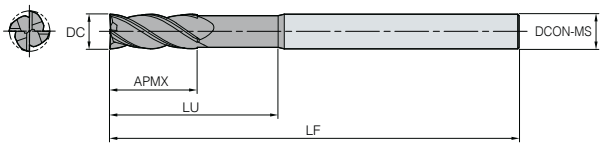
4 flutes long neck flat

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

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







(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

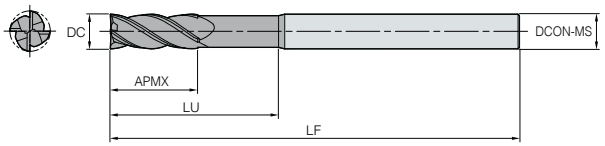
4 flutes long neck flat

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

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







(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

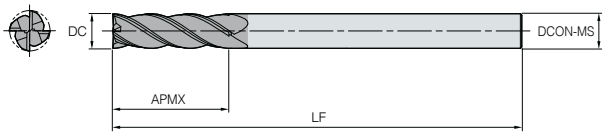
UE524

4 flutes flat

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

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.012
Ø7 ~ Ø25	0.000 ~ -0.015







(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

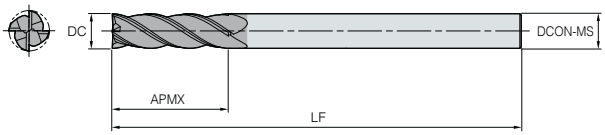
UE524

4 flutes flat



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

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.012
Ø7 ~ Ø25	0.000 ~ -0.015





(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

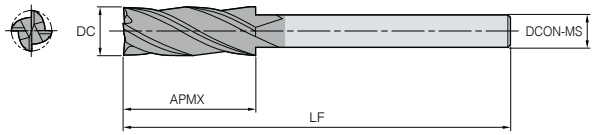
4 flutes automatic CNC flat

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

DC	Tolerance
Ø3 ~ Ø6	0.000 ~ -0.012
Ø7 ~ Ø16	0.000 ~ -0.015







(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

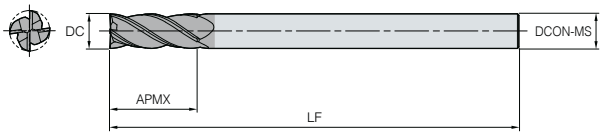
UE504

4 flutes flat

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

DC	Tolerance
Ø0.8 ~ Ø6	0.000 ~ -0.012
Ø6.5 ~ Ø25	0.000 ~ -0.015







(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

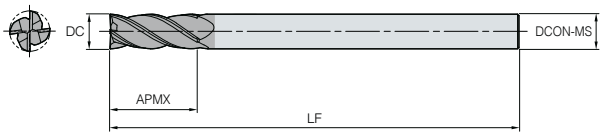
UXE504

4 flutes flat Endmill for heavy cuts



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

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





(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

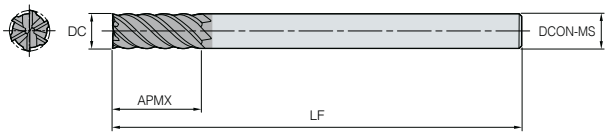
UE506

6 flutes flat

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

DC	Tolerance
Ø6	0.000 ~ -0.012
Ø7 ~ Ø25	0.000 ~ -0.015







(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

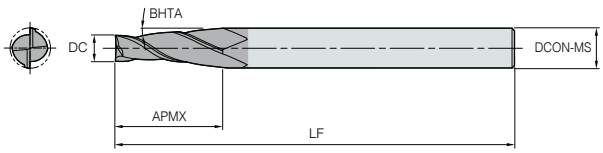
UTE502

2 flutes tapered flat

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

DC	Tolerance
Ø0.3 ~ Ø6	0.000 ~ -0.012
Ø7 ~ Ø10	0.000 ~ -0.015







(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

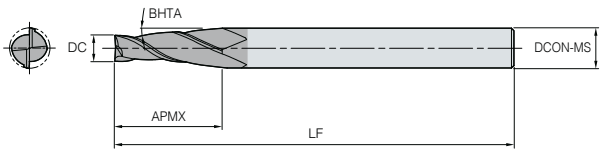
UTE502

2 flutes tapered flat

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

DC	Tolerance
Ø0.3 ~ Ø6	0.000 ~ -0.012
Ø7 ~ Ø10	0.000 ~ -0.015







(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

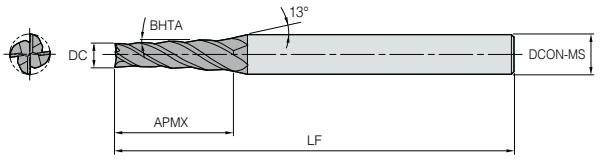
UTE504

4 flutes tapered flat

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

DC	Tolerance
Ø0.8 ~ Ø6	0.000 ~ -0.012
Ø7 ~ Ø10	0.000 ~ -0.015







(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

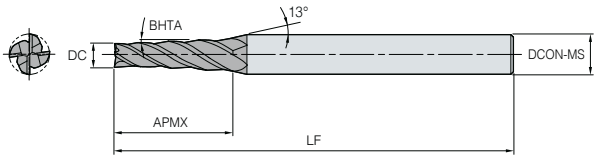
UTE504

4 flutes tapered flat

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

DC	Tolerance
Ø0.8 ~ Ø6	0.000 ~ -0.012
Ø7 ~ Ø10	0.000 ~ -0.015







(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

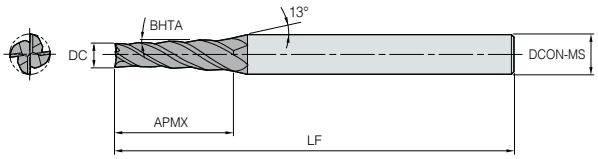
UTE504

4 flutes tapered flat

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

DC	Tolerance
Ø0.8 ~ Ø6	0.000 ~ -0.012
Ø7 ~ Ø10	0.000 ~ -0.015







(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

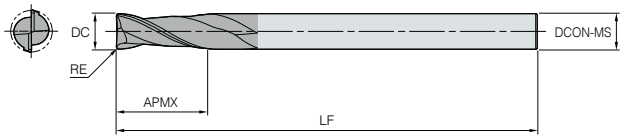
UR502

2 flutes radius

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

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

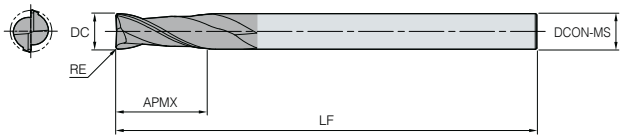
UR502

2 flutes radius

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

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

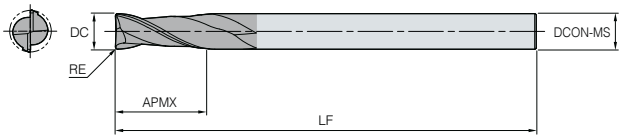
UR502

2 flutes radius

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

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

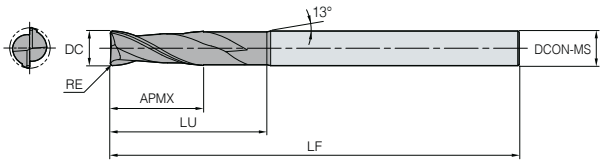
2 flutes neck type radius

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

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

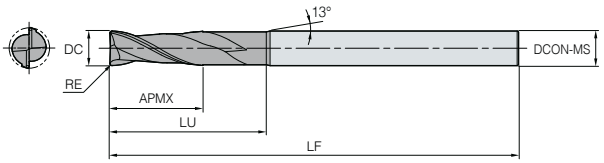
UR512

2 flutes neck type radius

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

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

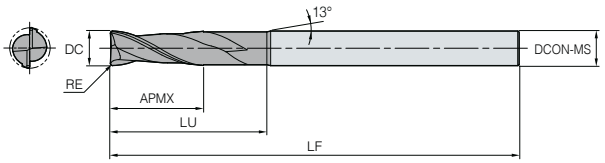
2 flutes neck type radius

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

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

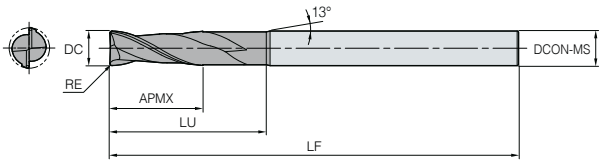
UR512

2 flutes neck type radius

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

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

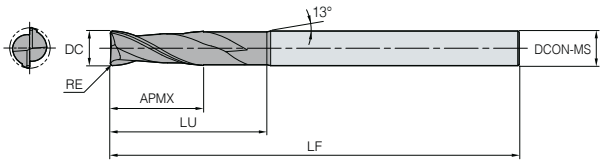
UR512

2 flutes neck type radius

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

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

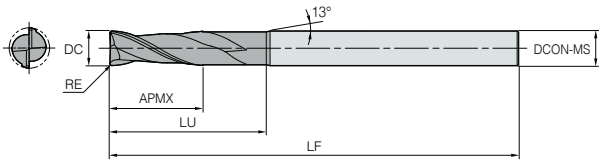
UR512

2 flutes neck type radius

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

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

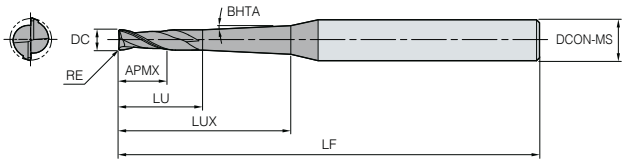
2 flutes tapered neck

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

DC	Tolerance
ALL	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
	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

Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA (°)	RE
UR	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
	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

UR542

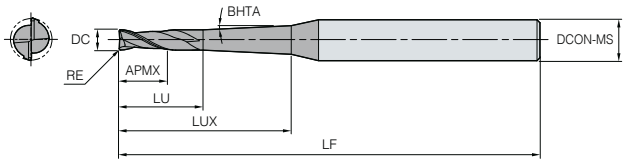
2 flutes tapered neck

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

DC	Tolerance
ALL	0.000 ~ -0.012







(mm)

Designation	DC	DCON-MS	APMX	LU	LUX	LF	BHTA (°)	RE
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
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

Designation	DC	DCON-MS	APMX	LU	LUX	LF	BHTA (°)	RE
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
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

UR542

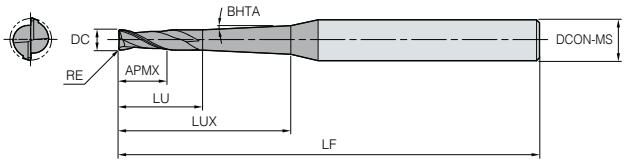
2 flutes tapered neck

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

DC	Tolerance
ALL	0.000 ~ -0.012







(mm)

Designation	DC	DCON-MS	APMX	LU	LUX	LF	BHTA (°)	RE
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
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

Designation	DC	DCON-MS	APMX	LU	LUX	LF	BHTA (°)	RE
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
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

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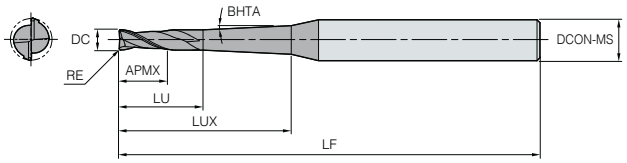
2 flutes tapered neck

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

DC	Tolerance
ALL	0.000 ~ -0.012







(mm)

Designation	DC	DCON-MS	APMX	LU	LUX	LF	BHTA (°)	RE
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
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
542020030216	2	4	2	5	16	50	2	0.3
542020030220	2	4	2	5	20	50	2	0.3

Designation	DC	DCON-MS	APMX	LU	LUX	LF	BHTA (°)	RE
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
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

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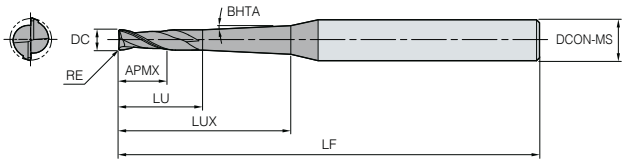
2 flutes tapered neck

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

DC	Tolerance
ALL	0.000 ~ -0.012







(mm)

Designation	DC	DCON-MS	APMX	LU	LUX	LF	BHTA (°)	RE
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

Designation	DC	DCON-MS	APMX	LU	LUX	LF	BHTA (°)	RE
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
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

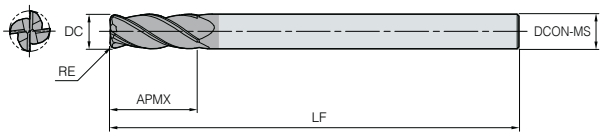
UR504

4 flutes radius

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

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







(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

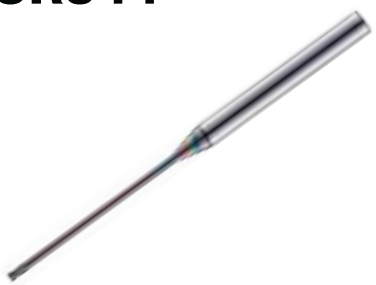
	Designation	DC	DCON-MS	APMX	LF	RE
UR	50410003075	10	10	25	75	0.3
	50410005	10	10	25	100	0.5
	50410005075	10	10	25	75	0.5
	50410010	10	10	25	100	1
	50410010075	10	10	25	75	1
	50410015	10	10	25	100	1.5
	50410020	10	10	25	100	2
	50410025	10	10	25	100	2.5
	50412003	12	12	30	110	0.3
	50412003080	12	12	30	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

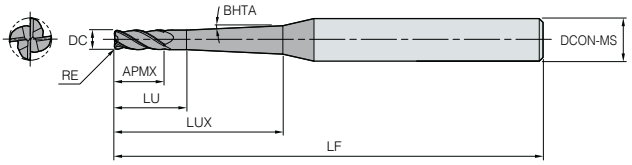
4 flutes tapered neck radius

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

DC	Tolerance
ALL	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

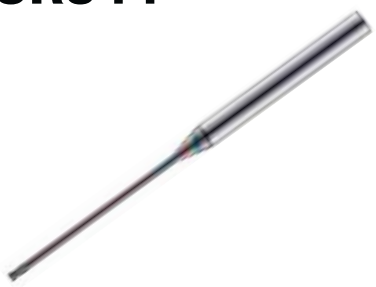
Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA (°)	RE
UR	544010020225	1	4	1.5	2.5	25	60	2	0.2
	544010020230	1	4	1.5	2.5	30	70	2	0.2
	544010020240	1	4	1.5	2.5	40	80	2	0.2
	544010020250	1	6	1.5	2.5	50	90	2	0.2
	544012010108	1.2	4	1.8	3	8	50	2	0.1
	544012010112	1.2	4	1.8	3	12	50	1	0.1
	544012010116	1.2	4	1.8	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

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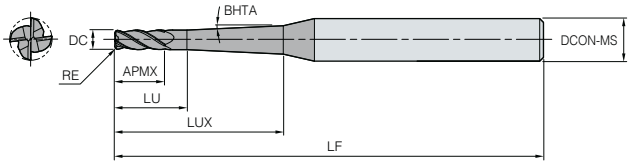
4 flutes tapered neck radius

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

DC	Tolerance
ALL	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

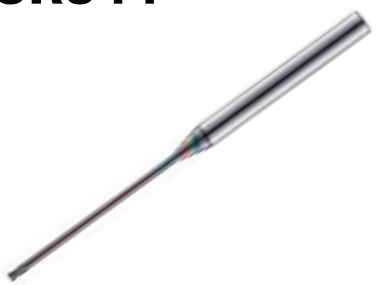
Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA (°)	RE
UR	544015030150	1.5	4	2.3	3	50	90	1	0.3
	544015030208	1.5	4	2.3	3	8	50	1	0.3
	544015030210	1.5	4	2.3	3	10	50	2	0.3
	544015030212	1.5	4	2.3	3	12	50	2	0.3
	544015030216	1.5	4	2.3	3	16	50	2	0.3
	544015030220	1.5	4	2.3	3	20	50	2	0.3
	544015030225	1.5	4	2.3	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

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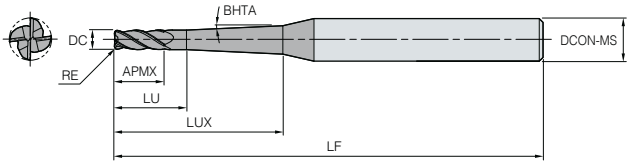
4 flutes tapered neck radius

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

DC	Tolerance
ALL	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

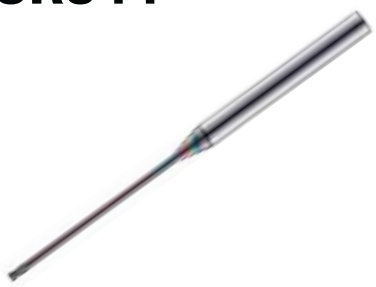
Designation		DC	DCON-MS	APMX	LU	LUX	LF	BHTA (°)	RE
UR	544020050116	2	4	2	5	16	50	1	0.5
	544020050120	2	4	2	5	20	50	1	0.5
	544020050125	2	4	2	5	25	60	1	0.5
	544020050130	2	4	2	5	30	70	1	0.5
	544020050140	2	6	2	5	40	80	1	0.5
	544020050150	2	6	2	5	50	100	1	0.5
	544020050160	2	6	2	5	60	100	1	0.5
	544020050180	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

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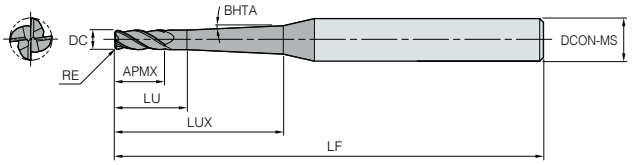
4 flutes tapered neck radius

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

DC	Tolerance
ALL	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

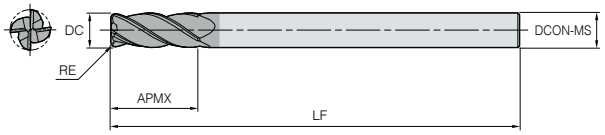
UXR504

4 flutes multi helix radius

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

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.012
Ø7 ~ Ø20	0.000 ~ -0.015







(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

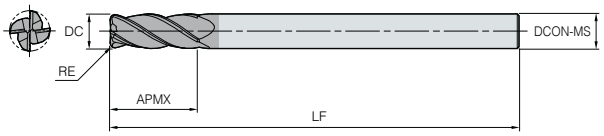
UXR504

4 flutes multi helix radius

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

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.012
Ø7 ~ Ø20	0.000 ~ -0.015







(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

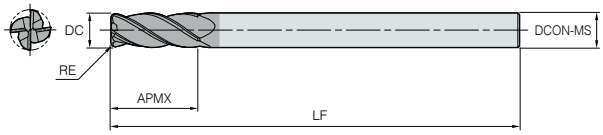
UXR504

4 flutes multi helix radius

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

DC	Tolerance
Ø1 ~ Ø6	0.000 ~ -0.012
Ø7 ~ Ø20	0.000 ~ -0.015







(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

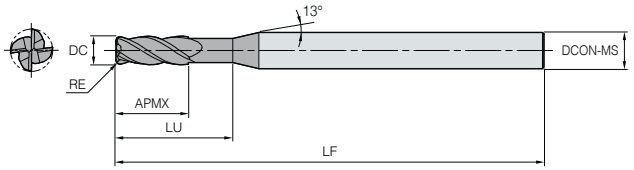
4 flutes multi helix neck radius

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

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







(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

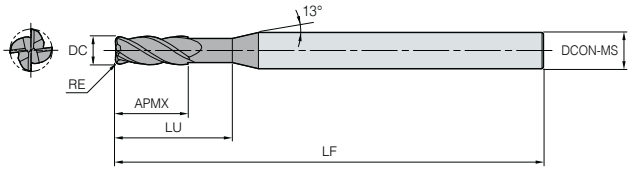
UXR514

4 flutes multi helix neck radius



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

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





(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

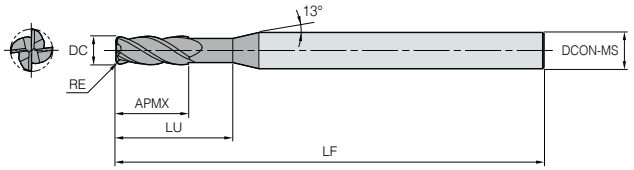
4 flutes multi helix neck radius

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

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







(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

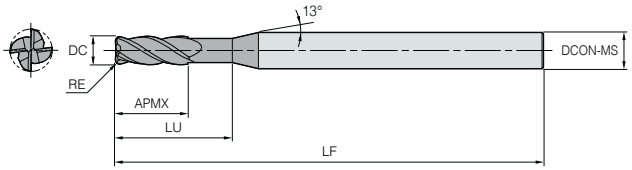
UXR514

4 flutes multi helix neck radius

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

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







(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

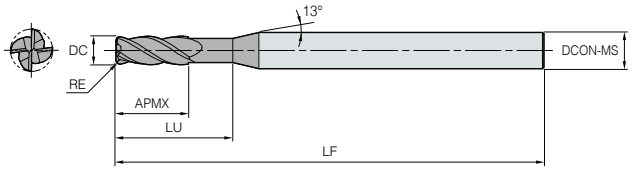
4 flutes multi helix neck radius

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

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







(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

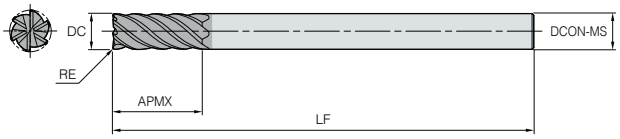
UR506

6 flutes radius

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

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







(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

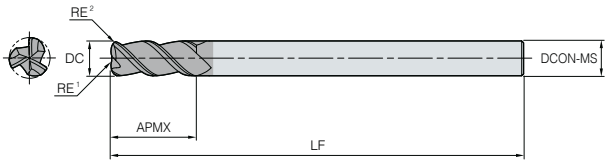
UDR503

3 flutes double radius



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

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





(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

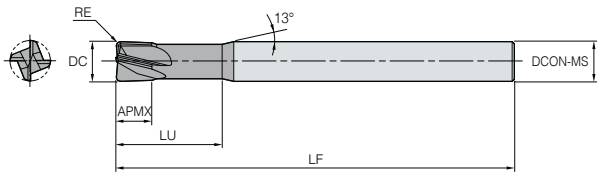
4 flutes radius Endmill for high speed machining

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

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







(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

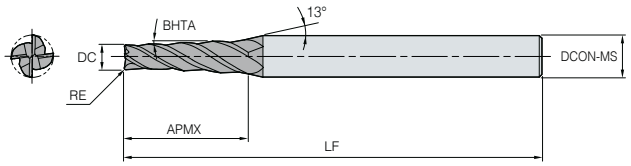
UTR504

4 flutes tapered radius

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

DC	Tolerance
ALL	0.000 ~ -0.012







(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

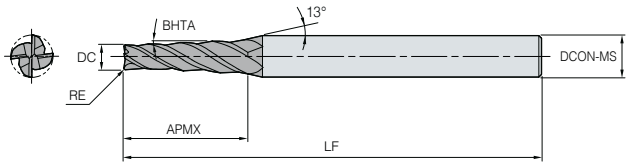
UTR504

4 flutes tapered radius

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

DC	Tolerance
ALL	0.000 ~ -0.012







(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

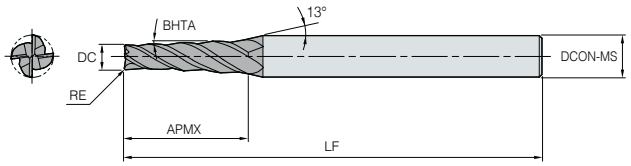
UTR504

4 flutes tapered radius

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

DC	Tolerance
ALL	0.000 ~ -0.012







(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

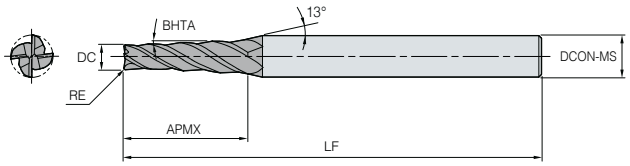
UTR504

4 flutes tapered radius

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

DC	Tolerance
ALL	0.000 ~ -0.012







(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

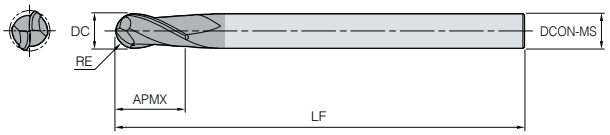
UB502

2 flutes ball



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

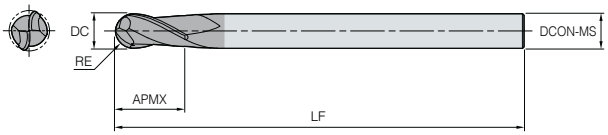
UB502

2 flutes ball

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

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







	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

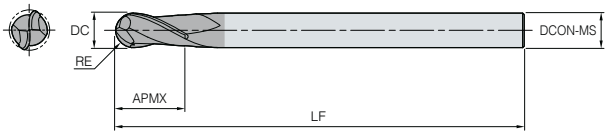
UB502P

2 flutes high precision ball



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

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

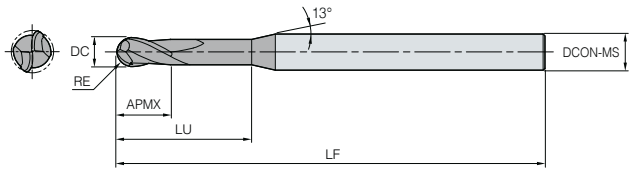
2 flutes long neck ball

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

Designation		DC	DCON-MS	APMX	LU	LF	RE
UB	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
	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

UB512

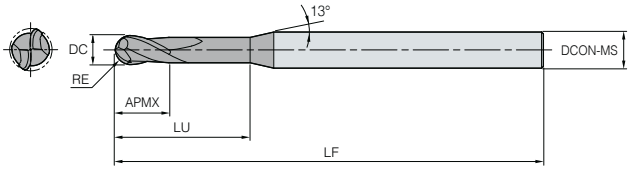
2 flutes long neck ball

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

Designation		DC	DCON-MS	APMX	LU	LF	RE
UB	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
	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

UB512

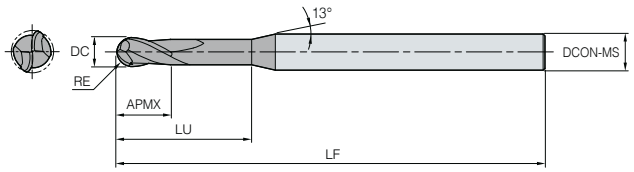
2 flutes long neck ball

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

Designation		DC	DCON-MS	APMX	LU	LF	RE
UB	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
	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
	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

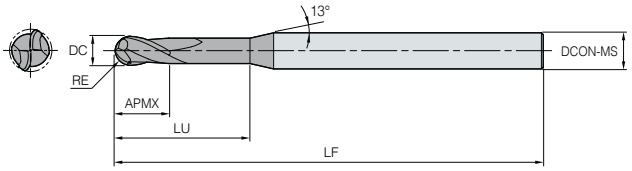
2 flutes long neck ball

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

DC	Tolerance
ALL	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

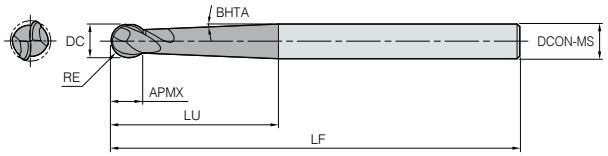
2 flutes lollipop style





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

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



(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

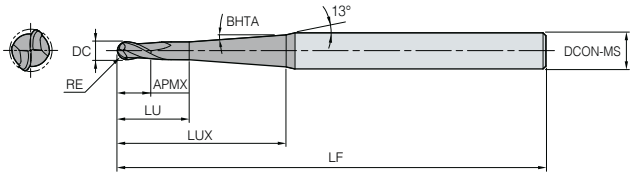
UB542

2 flutes tapered neck ball



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

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

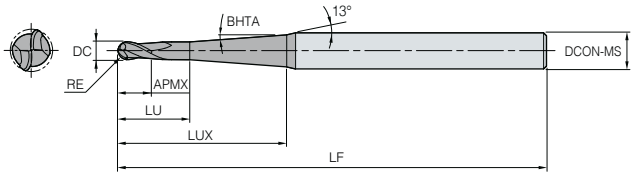
UB542

2 flutes tapered neck ball



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

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

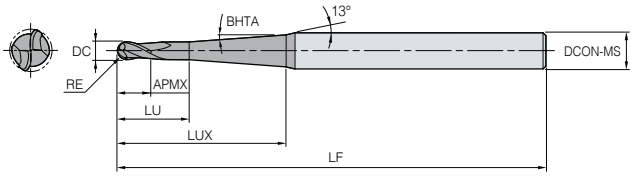
2 flutes tapered neck ball

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

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

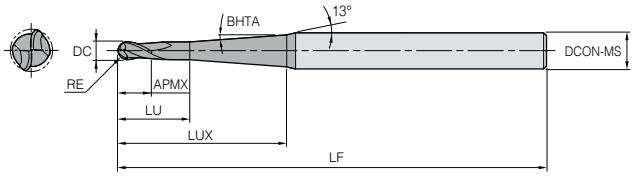
UB542

2 flutes tapered neck ball



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

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

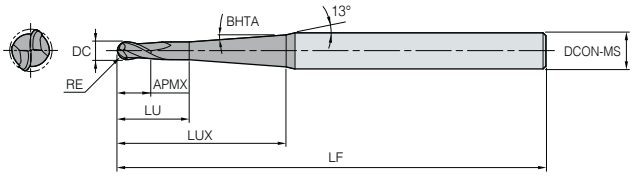
UB542

2 flutes tapered neck ball



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

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

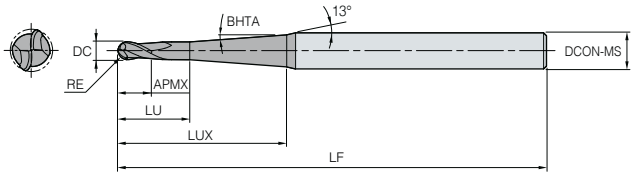
UB542

2 flutes tapered neck ball



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

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

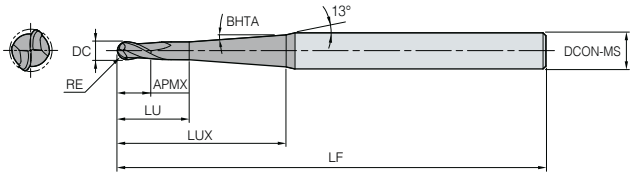
UB542

2 flutes tapered neck ball



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

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

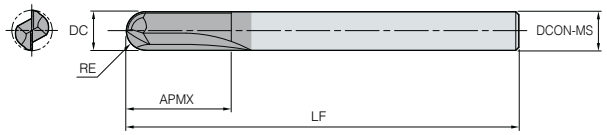
2 flutes straight ball

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

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

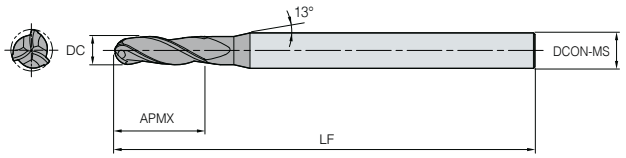
3 flutes ball

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

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







(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

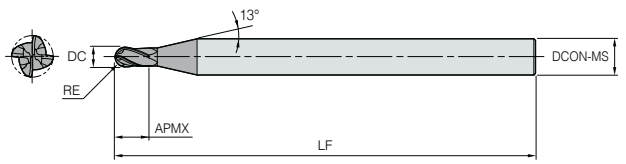
4 flutes ball

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

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







(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

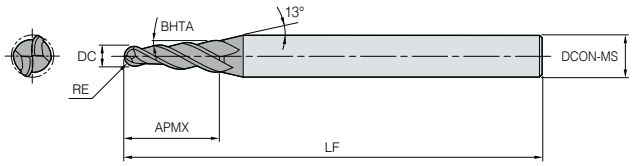
2 flutes tapered ball

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

DC	Tolerance
ALL	0.000 ~ -0.012







(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

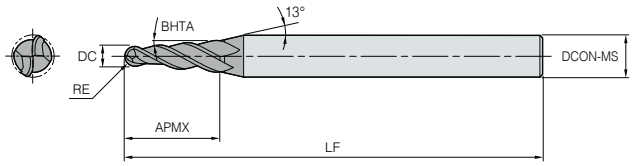
2 flutes tapered ball

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

DC	Tolerance
ALL	0.000 ~ -0.012







(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

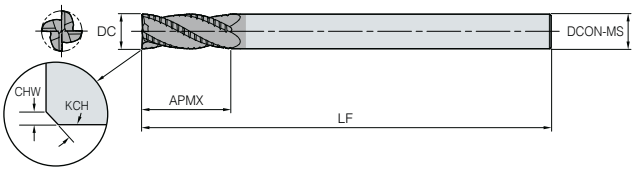
3~5 flutes chamfer pitch roughing





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

DC	Tolerance
Ø3 ~ Ø6	0.000 ~ -0.012
Ø7 ~ Ø25	0.000 ~ -0.015



(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

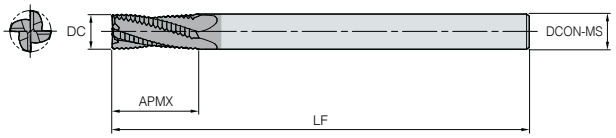
UF51

3~5 flutes fine pitch roughing

Metric | CARBIDE | 3 4 5 | H·A 30° | 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

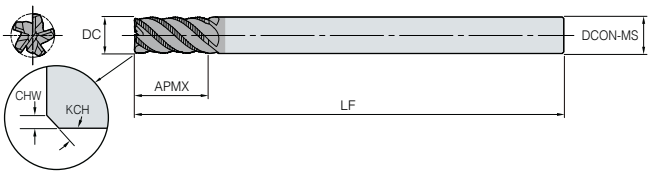
3~5 flutes chamfer pitch roughing

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

DC	Tolerance
Ø3 ~ Ø6	0.000 ~ -0.012
Ø7 ~ Ø25	0.000 ~ -0.015







(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
D : Dynamic
Z : Zamus
T : Thunder

Type
B : Ball
E : Flat
R : Radius
X : Flat
S : Flat
XB : Ball

Length, Shank type
30 : Straight
31 : Standard
32 : Long Cutting Length
33 : Long Shank
34 : Tapered Neck

No. of flute
2 : 2 flutes
4 : 4 flutes
4H : 4 flutes
(Helix 45°)

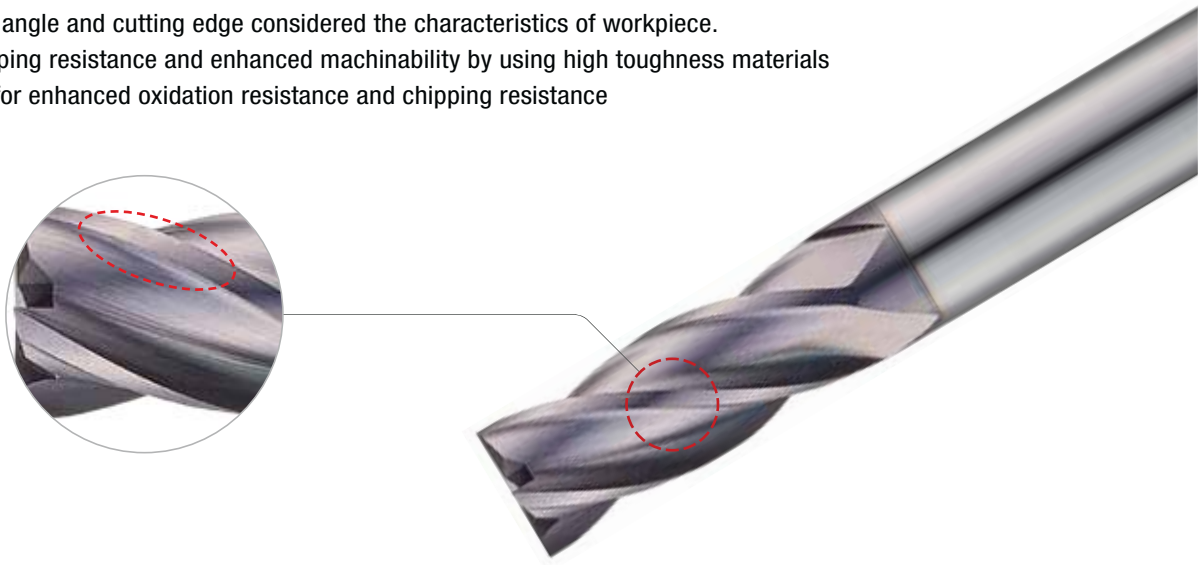
Cutting dia.
1 ~ 20 mm

Corner R
0.2 ~ 3 mm

Shank dia.
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



Line-up

Designation	Picture	Product name	Unit	Range	Page
DB312		2 flutes ball Endmill	Metric	Ø1.0 ~ 20.0	B226
DB342		2 flutes tapered neck type ball Endmill	Metric	Ø1.0 ~ 12.0	B227
TX202		2 flutes short shank flat Endmill	Metric	Ø1.0 ~ 20.0	B228
TX204		4 flutes short shank flat Endmill	Metric	Ø1.0 ~ 20.0	B229
TX222		2 flutes long flat Endmill	Metric	Ø3.0 ~ 20.0	B230
TX224		4 flutes long flat Endmill	Metric	Ø3.0 ~ 20.0	B231
TX302		2 flutes flat Endmill	Metric	Ø1.0 ~ 20.0	B232
TX304		4 flutes flat Endmill	Metric	Ø1.0 ~ 20.0	B233
TX304H		4 flutes 45° helix flat Endmill	Metric	Ø3.0 ~ 20.0	B234
TXB202		2 flutes short shank ball Endmill	Metric	Ø1.0 ~ 20.0	B235
TXB204		4 flutes short shank ball Endmill	Metric	Ø2.0 ~ 20.0	B236
TXB222		2 flutes long ball Endmill	Metric	Ø3.0 ~ 20.0	B237
TXB232		2 flutes long shank ball Endmill	Metric	Ø3.0 ~ 20.0	B238
TXB302		2 flutes ball Endmill	Metric	Ø1.0 ~ 20.0	B239
TXB304		4 flutes ball Endmill	Metric	Ø1.0 ~ 20.0	B240
ZE302P		2 flutes flat Endmill	Metric	Ø1.0 ~ 20.0	B241
ZE304P		4 flutes flat Endmill	Metric	Ø1.0 ~ 20.0	B242
ZE322		2 flutes extra long flat Endmill	Metric	Ø3.0 ~ 20.0	B243
ZE324		4 flutes extra long flat Endmill	Metric	Ø3.0 ~ 20.0	B244
ZR304H		4 flutes 45° helix radius Endmill	Metric	Ø3.0 ~ 12.0	B245
ZR322		2 flutes long shank radius Endmill	Metric	Ø3.0 ~ 12.0	B246
ZR324		4 flutes long shank radius Endmill	Metric	Ø3.0 ~ 12.0	B247
ZR324H		4 flutes 45° helix radius Endmill	Metric	Ø6.0 ~ 12.0	B248

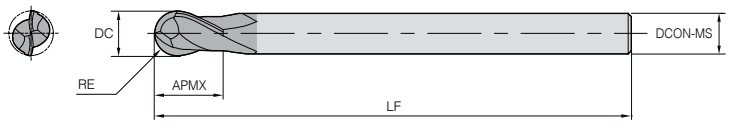
DB312

2 flutes ball



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

DC	Tolerance
ALL	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

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

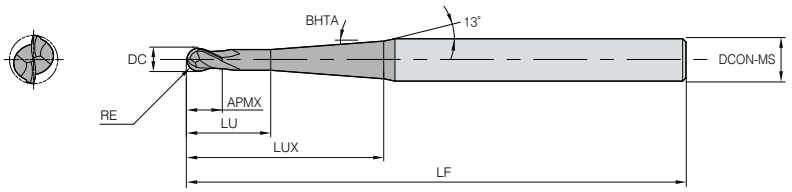
DB342

2 flutes tapered neck type ball



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

DC	Tolerance
ALL	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

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

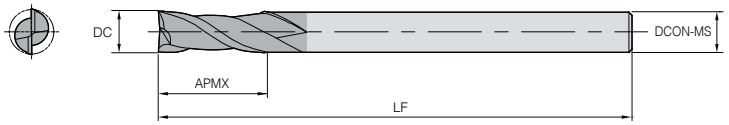
TX202

2 flutes short shank flat



Metric | 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

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

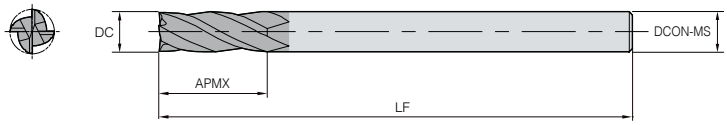
TX204

4 flutes short shank flat



Metric | FINE GRAIN | 4 | 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	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

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

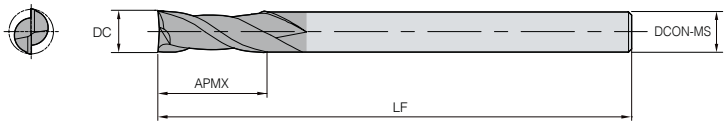
TX222

2 flutes long flat



Metric | FINE GRAIN | 2 | 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	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

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

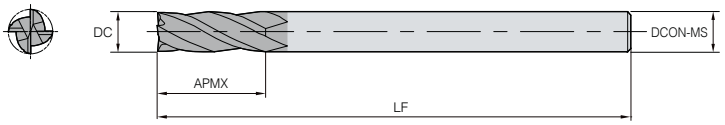
TX224

4 flutes long flat



Metric | FINE GRAIN | 4 | 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	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

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

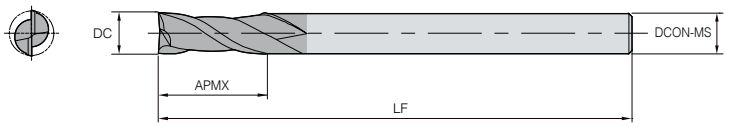
TX302

2 flutes flat



Metric | 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

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

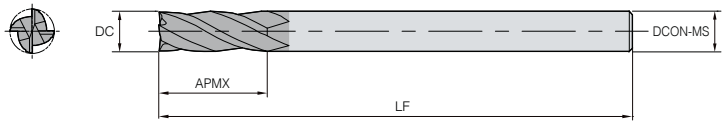
TX304

4 flutes flat



Metric | FINE GRAIN | 4 | 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	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

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

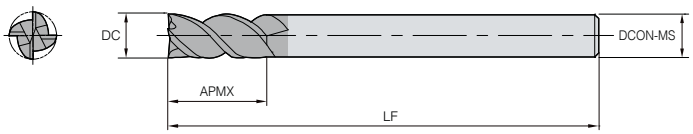
TX304H

4 flutes 45° helix flat



Metric | FINE GRAIN | 4 | H·A 45° | 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	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

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

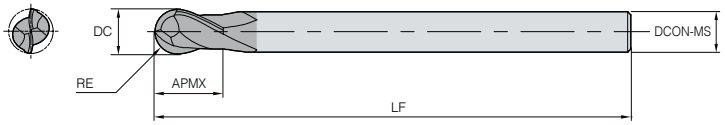
TXB202

2 flutes short shank ball



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

DC	Tolerance
ALL	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

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

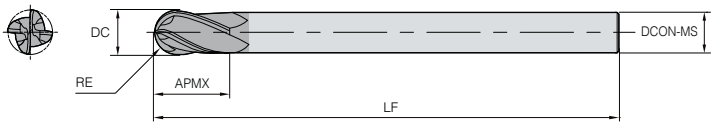
TXB204

4 flutes short shank ball

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

DC	Tolerance
ALL	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

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

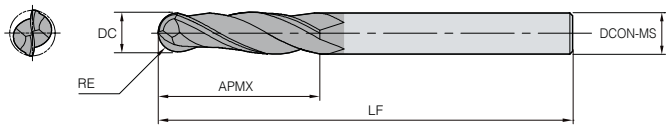
TXB222

2 flutes long ball



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

DC	Tolerance
ALL	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

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

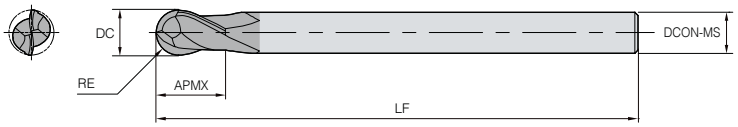
TXB232

2 flutes long shank ball



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

DC	Tolerance
ALL	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

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

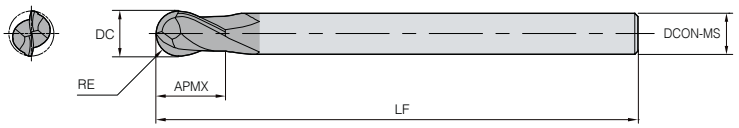
TXB302

2 flutes ball



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

DC	Tolerance
ALL	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

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

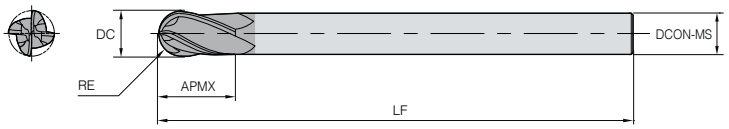
TXB304

4 flutes ball



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

DC	Tolerance
ALL	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.

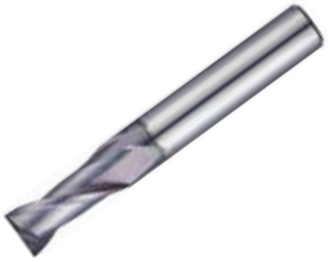
• Applicable Workpiece

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

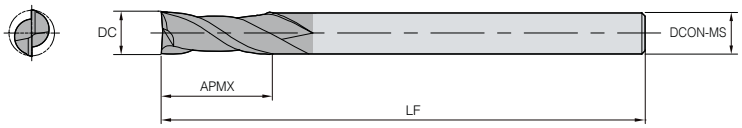
ZE302P

2 flutes flat



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

DC	Tolerance
ALL	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

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

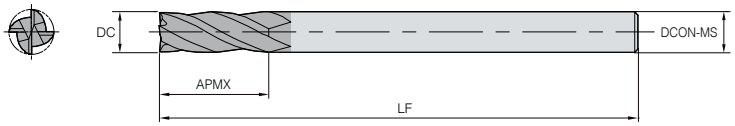
ZE304P

4 flutes flat

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

DC	Tolerance
ALL	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

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

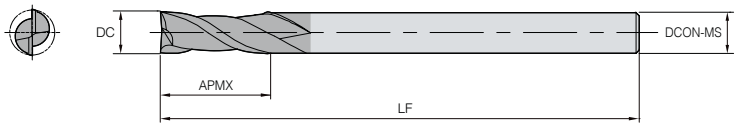
ZE322

2 flutes extra long flat

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

DC	Tolerance
ALL	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

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

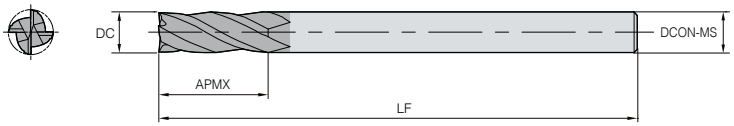
ZE324

4 flutes extra long flat



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

DC	Tolerance
ALL	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

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

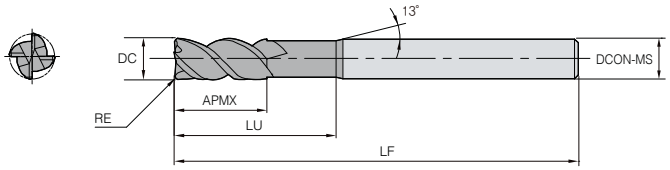
ZR304H

4 flutes 45° helix radius



Metric | FINE GRAIN | 4 | H·A 45° | Grade AiTIN | RE ±0.02 | h6 shank

DC	Tolerance
ALL	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

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

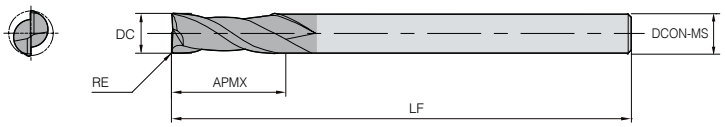
ZR322

2 flutes long shank radius



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

DC	Tolerance
ALL	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

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

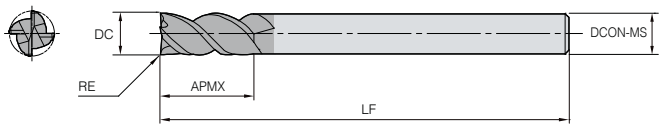
ZR324

4 flutes long shank radius



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

DC	Tolerance
ALL	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

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

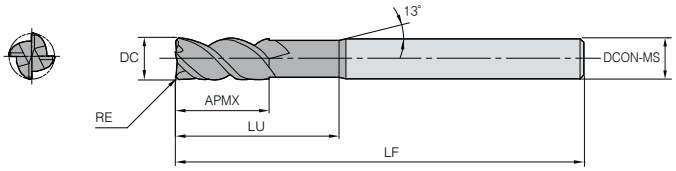
ZR324H

4 flutes 45° helix radius



Metric | FINE GRAIN | 4 | H·A 45° | Grade AiTIN | RE ±0.02 | h6 shank

DC	Tolerance
ALL	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

◎: Excellent ○: Good

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 ~)					
◎	◎	○							

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

No. of flute
4: 4 flutes

Cutting dia.
080: Ø8

Overall length
075: 75mm

Flute information

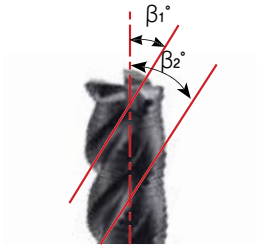
<Cutting-edge>
F: Fine Pitch
M: Medium Pitch
R: Roughing Pitch
X: 2-tooth finishing, 2-tooth roughing

<Flute>
P: Irregular Flutes/Leads
F: Irregular Flutes
L: Irregular Leads
G: General

Helix angle
H: High Helix
L: Low Helix

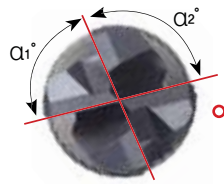
Features

- **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	Picture	Product name	Unit	Range	Page
RPAE		Wave roughing Endmill for Al	Metric	∅6.0 ~ 25.0	B251
RPE-FP-H		Fine pitch standard type roughing Endmill	Metric	∅5.0 ~ 20.0	B251
RPLE-FP-H		Fine pitch long type roughing Endmill	Metric	∅5.0 ~ 20.0	B252
RPE-XG		Endmill for finishing and roughing	Metric	∅5.0 ~ 20.0	B252
RPE-FP-L		Roughing Endmill for fine pitches	Metric	∅5.0 ~ 20.0	B253
RPE-RG		Standard roughing Endmill	Metric	∅5.0 ~ 20.0	B253
RPE-RG		4 flutes roughing Endmill	Metric	∅6.0 ~ 20.0	B254
RPE-FF		Roughing Endmill for fine pitches	Metric	∅6.0 ~ 20.0	B254
RPE-FP		Roughing Endmill for fine pitches	Metric	∅6.0 ~ 20.0	B255
RPE-RG		Standard roughing Endmill	Metric	∅6.0 ~ 50.0	B255

RPAE

(Carbide)

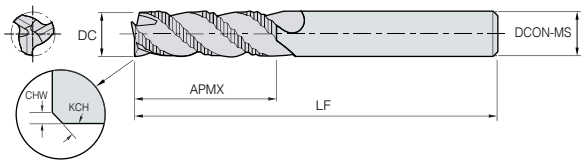
Wave roughing Endmill for Al

Metric | 3 | H·A 45° | Grade PC30T | h6 shank

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)

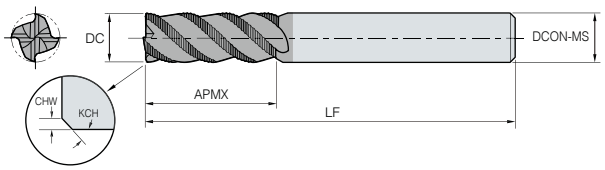
Fine pitch standard type roughing

Metric | 4 | H·A 40°/42° | Grade PC30T | h6 shank

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)

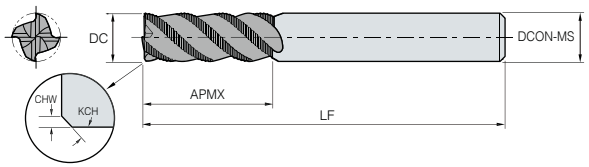
Fine pitch long type roughing

Metric | 4 | H·A 40°/42° | Grade PC30T | h6 shank

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)

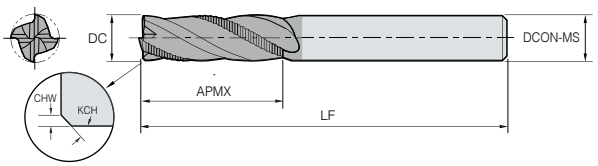
Endmill for finishing and roughing

Metric | 4 | H·A 30° | Grade PC30T | h6 shank

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)

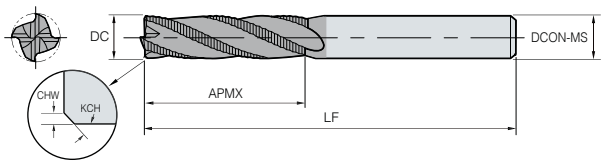
Fine pitch long type roughing

Metric | 4 | H·A 18°/23° | Grade PC30T | h6 shank

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)

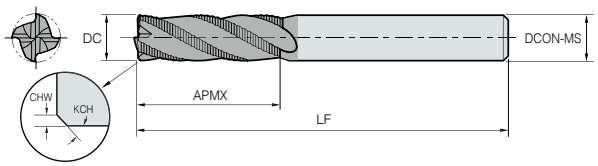
Endmill for finishing and roughing

Metric | 4 | H·A 30° | Grade PC40T | h6 shank

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)

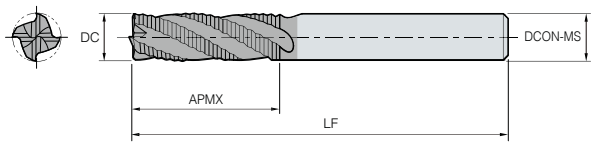
4 flutes roughing

Metric | 4 | H·A 30° | HSS PM | Grade HN30T HC30T | h6 shank

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)

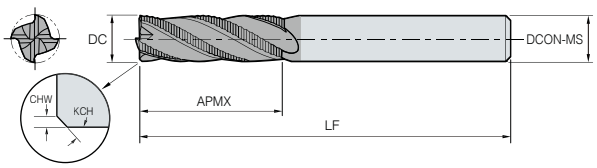
Roughing Endmill for fine pitches

Metric | 4 | H·A 25°/30° | HSS PM | Grade PC30T | h6 shank

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)

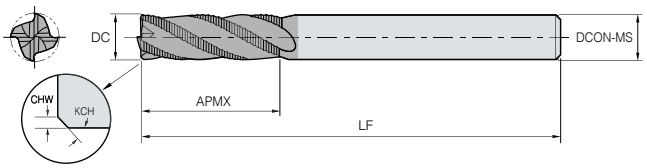
Roughing Endmill for fine pitches

Metric | 4 | H·A 25°/30° | HSS PM | Grade PC30T | h6 shank

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)

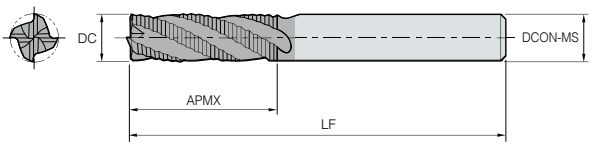
Roughing

Metric | 4 | H·A 30° | HSS Co 8% | Grade HN20T HC20T HC10T | h6 shank

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 minimal vibration, unequal index and optimal rake angle
- High machinability and low vibration with the application of an unegual 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 evacuation 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)

- **SP** — **S-Star Endmill**
- **FE** — **Type**
  - FE: Flat Endmill
  - RE: Radius Endmill
  - BE: Ball Endmill
  - XE: Roughing Endmill
- **4** — **No. of flute**
  - 4 : 4flutes
- **120** — **Tool dia**
  - 120 : Ø12.0 mm
- **075** — **Overall length**
  - 075 : 75 mm
- **(-V00N00)** — **Flute length**
  - V10 : 10 mm
  - **Neck length**
  - N20 : 20 mm
- **R10** — **Corner radius**
  - R10 : 1.0 mm
  - C05 : 0.5 mm
- **(-N)**
  - 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

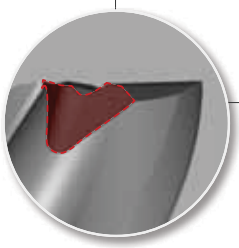
- Improved chipping resistance in the beginning of cutting
- Better wear resistance and stable cutting
- High quality of product from cutting edge treatment stabilization





• 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

Line-up

Designation	Picture	Product name	Unit	Range	Page
SPFE2000		2 flutes flat Endmill	Metric	∅1.0 ~ 20.0	B258
SPFE3000		3 flutes flat Endmill	Metric	∅1.0 ~ 12.0	B259
SPFE4000		4 flutes flat Endmill	Metric	∅1.0 ~ 20.0	B260
SPFE6000		6 flutes flat Endmill	Metric	∅6.0 ~ 20.0	B261
SPRE4000		4 flutes radius Endmill	Metric	∅1.0 ~ 20.0	B262~B263
SPRE5000		5 flutes neck type radius Endmill	Metric	∅6.0 ~ 20.0	B264
SPRE7000		7 flutes neck type radius Endmill	Metric	∅6.0 ~ 20.0	B265
SPBE2000		2 flutes ball Endmill	Metric	∅1.0 ~ 12.0	B266
SPBE4000		4 flutes ball Endmill	Metric	∅3.0 ~ 20.0	B267
SPXE3000 **SPXE4000** **SPXE5000**		3~5 flutes roughing Endmill	Metric	∅3.0 ~ 20.0	B268

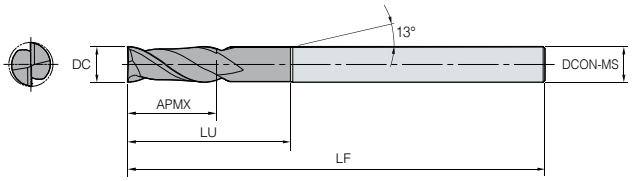
SPFE2000

2 flutes flat

Metric | 2 | H·A 36° | Grade PC325 | h5 shank

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

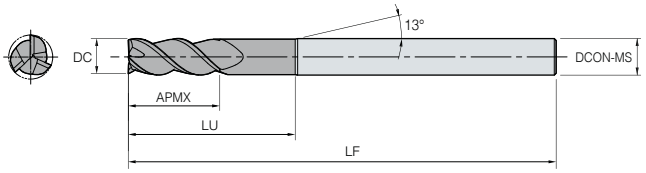
3 flutes flat

Metric | 3 | H·A 42°/45° | Grade PC325 | h5 shank

DC	Tolerance
Ø1 ~ Ø5.5	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 ~)					
○	○	○					◎	○	○

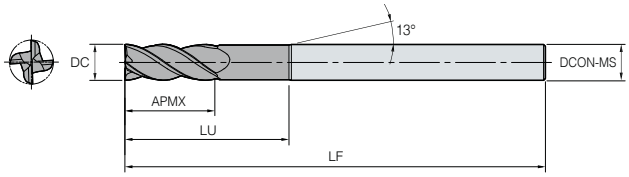
SPFE4000

4 flutes flat

Metric | 4 | H·A 35°/37° | Grade PC325 | h5 shank

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

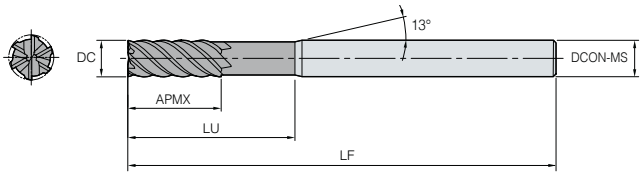
6 flutes flat





Metric | 6 | H·A 45° | Grade PC325 | h5 shank

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 ~)					
○	○	○					◎	○	○

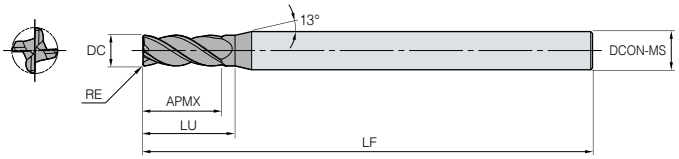
SPRE4000

4 flutes radius

Metric | 4 | H·A 35°/37° | Grade PC325 | h5 shank

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	35	80	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

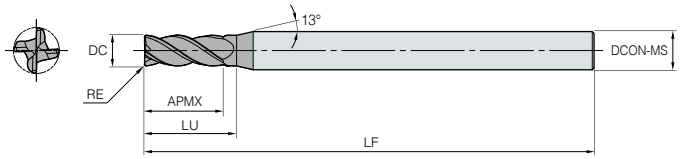
4 flutes radius

Metric | 4 | H·A 35°/37° | Grade PC325 | h5 shank

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

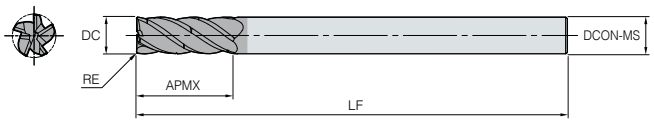
5 flutes neck type radius

Metric | 5 | H·A 35°/38° | Grade PC325 | h5 shank

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 ~)					
○	○	○					◎	○	○

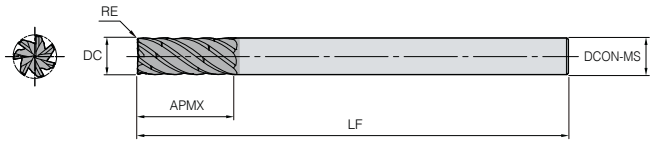
SPRE7000

7 flutes neck type radius

Metric | 7 | H·A 35°/38° | Grade PC325 | h5 shank

DC	Tolerance
Ø6	0.000 ~ -0.020
Ø8 ~ Ø20	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

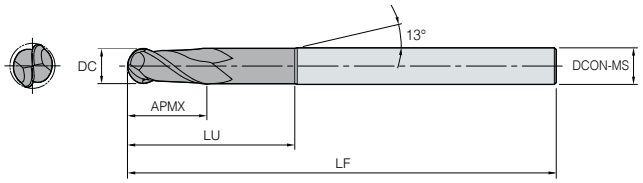
2 flutes ball

Metric | 2 | H·A 38° | Grade PC325 | h5 shank

DC	Tolerance
Ø1 ~ Ø5	0.000 ~ -0.015
Ø6	0.000 ~ -0.020
Ø8 ~ Ø12	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 ~)					
○	○	○					◎	○	○

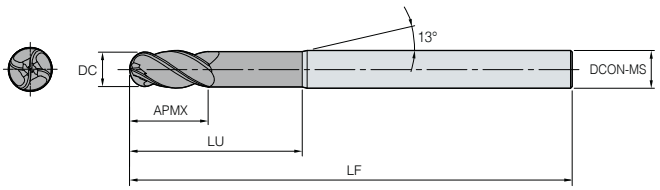
SPBE4000

4 flutes ball

Metric | 4 | H·A 35°/37° | Grade PC325 | h5 shank

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

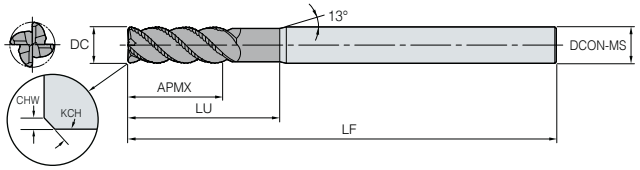
3~5 flutes roughing

Metric | 3 | 4 | 5 | H·A 45° | Grade PC325 | h5 shank

DC	Tolerance
Ø3 ~ Ø20	0.000 ~ -0.050







(mm)

Designation		DC	DCON-MS	APMX	LU	LF	CHW	KCH	NOF
SPXE	3030-050-C02	3	6	8	13	50	0.2	45°	3
	3040-050-C02	4	6	10	15	50	0.2	45°	3
	4050-050-C03	5	6	13	18	50	0.3	45°	4
	4060-060-C03	6	6	13	22	60	0.3	45°	4
	4060-060-V10N20S6-C03	6	6	10	20	60	0.3	45°	4
	4070-070-C04	7	8	18	32	70	0.4	45°	4
	4080-070-C04	8	8	19	32	70	0.4	45°	4
	4080-070-V12N25S8-C04	8	8	12	25	70	0.4	45°	4
	4090-070-C04	9	10	20	28	70	0.4	45°	4
	4100-075-C04	10	10	22	33	75	0.4	45°	4
	4100-075-V15N30S10-C04	10	10	15	30	75	0.4	45°	4
	4110-080-C05	11	12	25	33	80	0.5	45°	4
	4120-080-C05	12	12	26	35	80	0.5	45°	4
	4120-080-V20N35S12-C05	12	12	20	35	80	0.5	45°	4
	5060-060-C05	6	6	13	22	60	0.5	45°	5
	5080-065-C05	8	8	19	27	65	0.5	45°	5
	5100-070-C05	10	10	22	30	70	0.5	45°	5
	5120-080-C05	12	12	26	35	80	0.5	45°	5
	5140-090-C05	14	16	28	40	90	0.5	45°	5
	5160-100-C05	16	16	32	50	100	0.5	45°	5
	5160-100-V42-C05	16	16	42	52	100	0.5	45°	5
	5200-100-C05	20	20	38	48	100	0.5	45°	5
	5200-100-V45-C05	20	20	45	50	100	0.5	45°	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 ~)					
○	○	○					◎	○	○

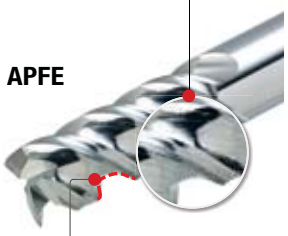
Endmill series for aluminum machining

A-Star Endmill

- Endmill series for Aluminum machining
- Optimized Solutions for each application - A wide selection of tools is available for various machining processes
- Higher Machining Efficiency - Advanced flute design and cutting edge technology are applied

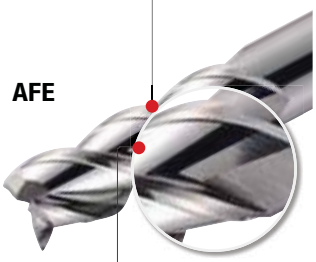
Features

APFE



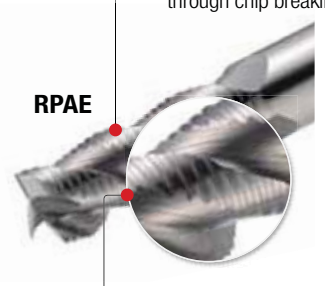
- **Sharp cutting edges and double relief angles**
  - Reduced cutting force
  - Prevention of tool breakage due to reinforced cutting edges
- **U-shaped flutes with mirror-like finishing**
  - Efficient chip evacuation through wide chip pockets
  - BUE is inhibited because of the mirror-like finishing

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	Picture	Product name	Unit	Range	Page
APFE		2~3 flutes flat Endmill	M Metric	Ø2.0 ~ 20.0	B270
APMFE		2~3 flutes middle flat Endmill	M Metric	Ø3.0 ~ 20.0	B271
APLFE		2~3 flutes long flat Endmill	M Metric	Ø3.0 ~ 20.0	B272
APBE		2 flutes ball Endmill	M Metric	Ø1.0 ~ 12.0	B273
AFE		3 flutes short flat Endmill	M Metric	Ø1.0 ~ 20.0	B274
AFE		3 flutes flat Endmill	M Metric	Ø1.0 ~ 20.0	B275
AFE		3 flutes long flat Endmill	M Metric	Ø1.0 ~ 20.0	B276~B277
APRE		3 flutes roughing Endmill	M Metric	Ø4.0 ~ 25.0	B228
RPAE		3 flutes wave roughing Endmill	M Metric	Ø6.0 ~ 25.0	B279

APFE2000/3000

2~3 flutes flat

Metric | 2 | 3 | H·A 50° | Grade H05S | h6 shank

DC	Tolerance
Ø1 ~ Ø5	0.000 ~ -0.020
Ø6 ~ Ø8	0.000 ~ -0.025
Ø10 ~ Ø20	0.000 ~ -0.030



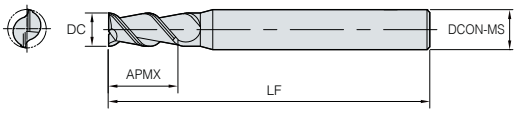


Fig. 1

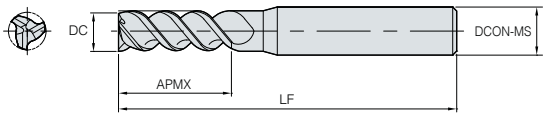


Fig. 2



(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



Metric | 2 | 3 | H·A 50° | Grade H05S | h6 shank

DC	Tolerance
Ø1 ~ Ø5	0.000 ~ -0.020
Ø6 ~ Ø8	0.000 ~ -0.025
Ø10 ~ Ø20	0.000 ~ -0.030

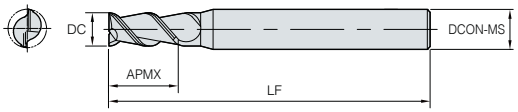


Fig. 1

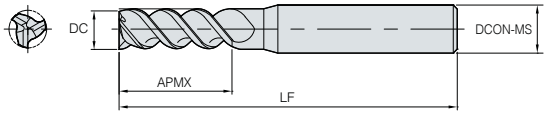


Fig. 2



(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

Metric | 2 | 3 | H·A 45° | Grade H05S | h6 shank

DC	Tolerance
Ø1 ~ Ø5	0.000 ~ -0.020
Ø6 ~ Ø8	0.000 ~ -0.025
Ø10 ~ Ø20	0.000 ~ -0.030



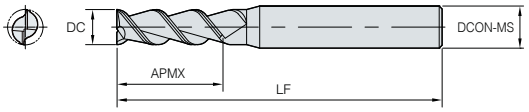


Fig. 1

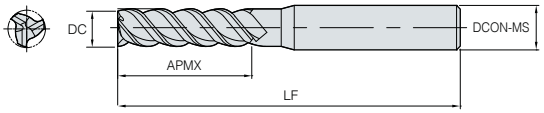


Fig. 2



(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

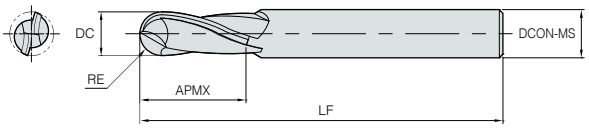
APBE2000

2 flutes ball



Metric | 2 | H·A 25° | Grade H05S | h6 shank

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

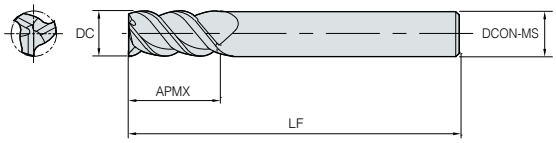
3 flutes short flat

Metric | 3 | H·A 45° | Grade H05S | h6 shank

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

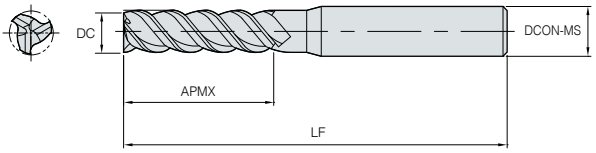
3 flutes flat





Metric | 3 | H·A 45° | Grade H05S | h6 shank

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

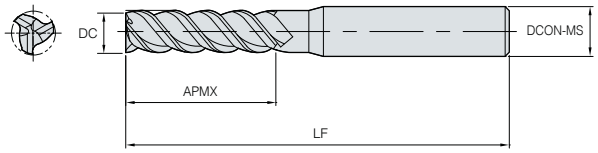
3 flutes long flat

Metric | 3 | H·A 45° | Grade H05S | h6 shank

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

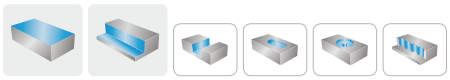
AFE3000

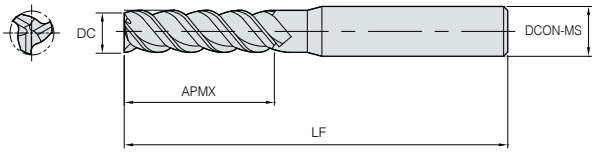
3 flutes long flat

Metric | 3 | H·A 45° | Grade H05S | h6 shank

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

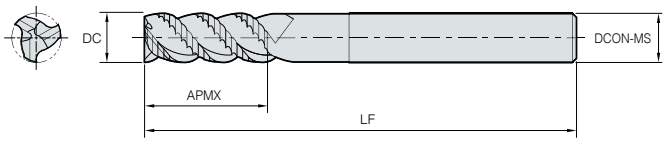
3 flutes roughing

Metric | 3 | H·A 45° | Grade H05S | h6 shank

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

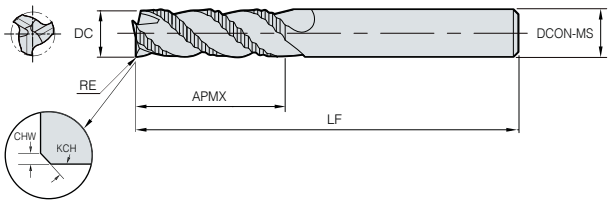
3 flutes wave roughing

Metric | 3 | H·A 45° | Grade FN30T | h6 shank

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** FE : Flat Endmill RE : Radius Endmill BE : Ball Endmill	**No. of flute** 2 : 2 flutes	**Cutting diameter** 030 : 3 mm		**Overall length** 080 : 80 mm		**Neck length** N200 : 20 mm	**Shank diameter** S04 : 4 mm

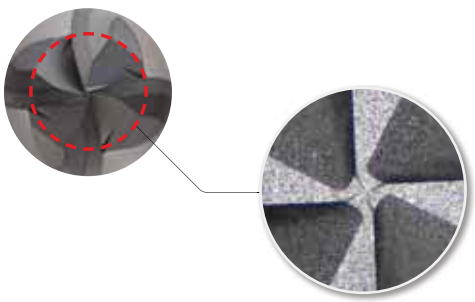
Features

- **Tangential cutting-edge geometry**
  - 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

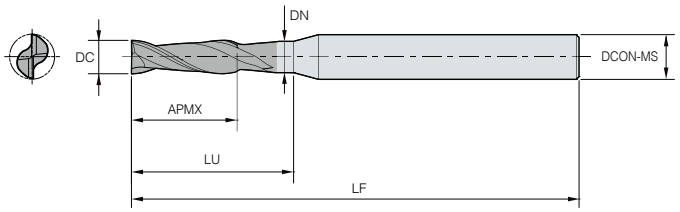
Flat





Metric | 2 | H·A 30° | Grade ND3000 | h6 shank

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

(mm)

	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

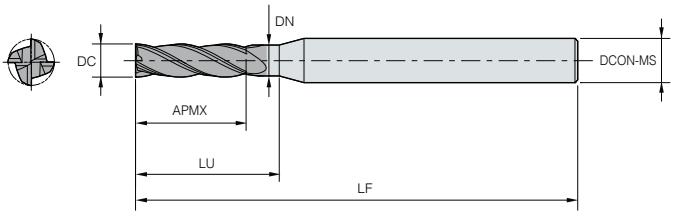
Flat





Metric | 4 | H·A 30° | Grade ND3000 | h6 shank

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

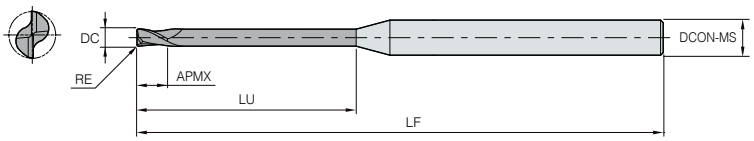
DRE2000

Radius



Metric | 2 | H·A 30° | Grade ND3000 | h6 shank

DC	Tolerance
ALL	0.000 ~ -0.020





(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
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

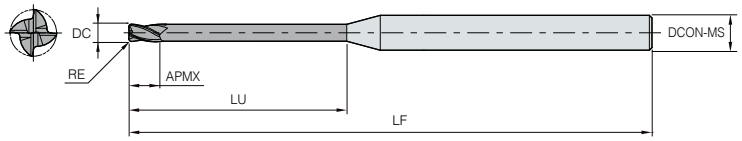
DRE4000

Radius

Metric | 4 | H·A 30° | Grade ND3000 | h6 shank

DC	Tolerance
Ø0.2 ~ Ø4	0.000 ~ -0.020
Ø6 ~ Ø12	0.000 ~ -0.030







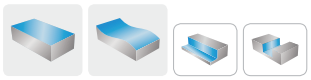
(mm)

Designation		DC	DCON-MS	APMX	LU	LF	RE
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

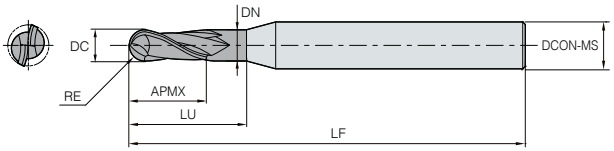
Ball





Metric | 2 | H·A 30° | Grade ND3000 | h6 shank

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

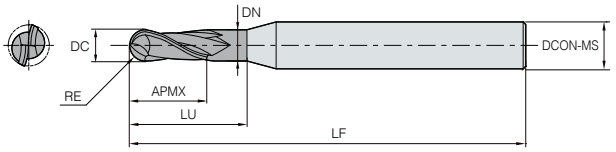
DBE2000

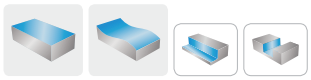
Ball

Metric | 2 | H·A 30° | Grade ND3000 | h6 shank

DC	Tolerance
Ø0.3 ~ Ø5	0.000 ~ -0.020
Ø6 ~ Ø12	0.000 ~ -0.030







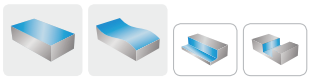
(mm)

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

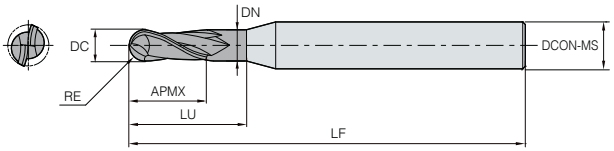
Ball





Metric | 2 | H·A 30° | Grade ND3000 | h6 shank

DC	Tolerance
Ø0.3 ~ Ø5	0.000 ~ -0.020
Ø6 ~ Ø12	0.000 ~ -0.030



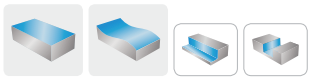
(mm)

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

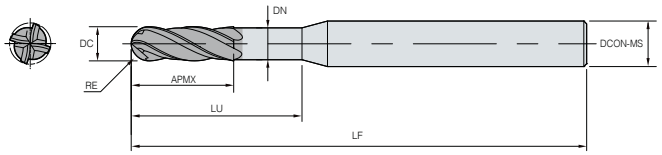
Ball





Metric | 4 | H·A 30° | Grade ND3000 | h6 shank

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	-

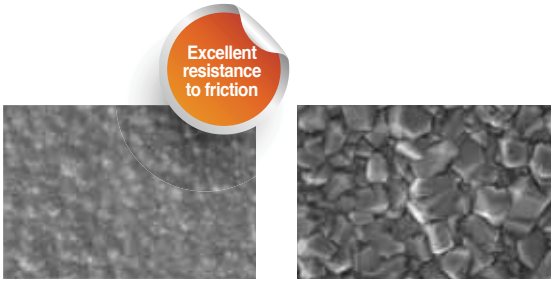
Router Endmill for machining composite materials

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 delamination resistance with substrate specificallt designed for diamond coating



[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



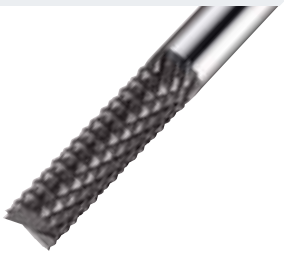
CCHR (High-performance Router Endmill)

- 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



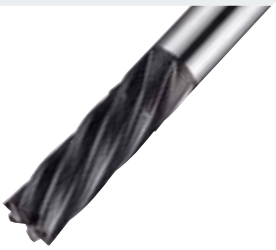
CCLR (Low Helix Router Endmill)

- 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

Metric | 4 | 6 | H·A 30°/-30° | Grade ND2100 | h5 shank

DC	Tolerance
Ø6 ~ Ø12	0.000 ~ -0.030



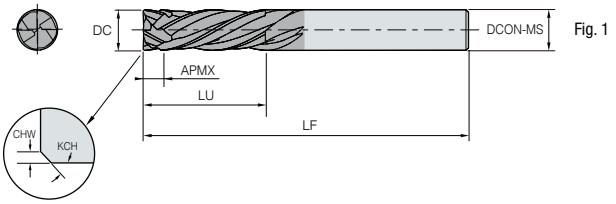


Fig. 1

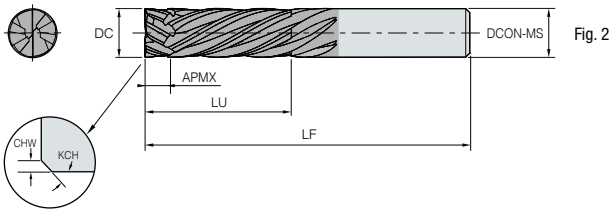


Fig. 2



(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

Metric | 4 | 6 | H·A 15° | Grade ND2100 | h5 shank

DC	Tolerance
Ø6 ~ Ø12	0.000 ~ -0.050



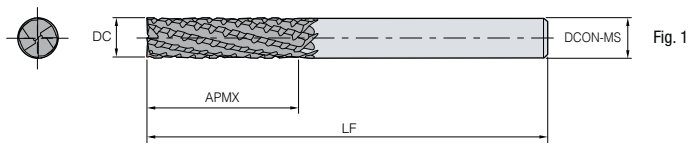


Fig. 1

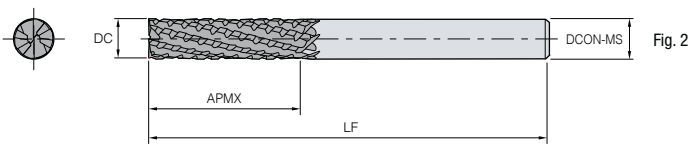


Fig. 2



(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

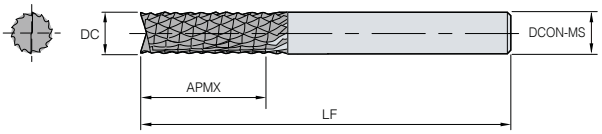
CCR2000

Flat

Metric | 2 | H·A -27° | Grade ND2100 | h5 shank

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

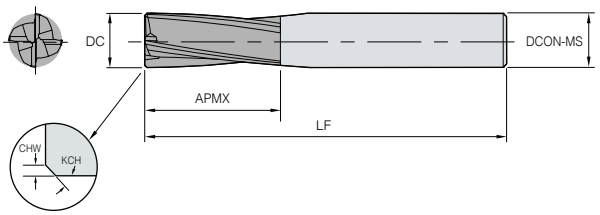
CCLR4000

Flat

Metric | 4 | H·A 15° | Grade ND2100 | h5 shank

DC	Tolerance
Ø4 ~ Ø12	-0.020 ~ -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

Metric | 6 | 8 | H·A -25° | Grade ND2100 | h5 shank

DC	Tolerance
Ø6 ~ Ø12	0.000 ~ -0.030



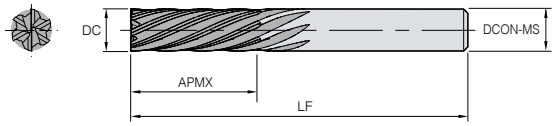


Fig. 1

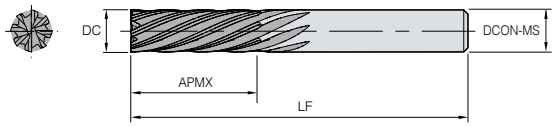


Fig. 2



(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 2 025 - 053 - N201 S06 (450i)

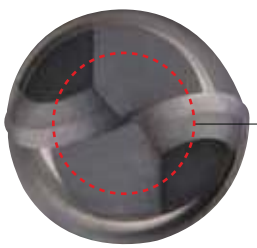
- **T Endmill Dental**
- **Workpiece**
  - Z: Zirconia
  - T: Titanium, Co-Cr
  - W: Wax, PMMA
- **Type**
  - BE: Ball Endmill
  - FE: Flat Endmill
  - RE: Radius Endmill
- **No. of flute**
  - 2: 2 flutes
  - 3: 3 flutes
  - 4: 4 flutes
- **Cutting Diameter**
  - 025: 2.5 mm
- **Overall length**
  - 053: 53 mm
- **Usable length**
  - N201: 20.1 mm
- **Shank Diameter**
  - S03: 3 mm
  - S04: 4 mm
  - S06: 6 mm
- **Machine maker/ model**

ET RE 006 041 - S 4 M200 - T7

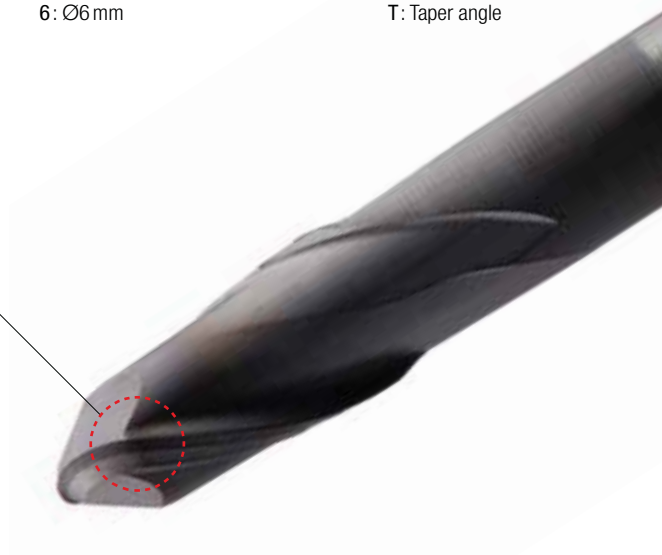
- **Electroplating Tool**
- **Shape**
  - RE: Round end cylinder
  - ND: Needle
- **Cutting Diameter**
  - 006: 0.6 mm
  - 105: 10.5 mm
- **Tool length**
  - 041: 41 mm
  - 031: 31 mm
  - 100: 100 mm
- **Shank Material**
  - S: SCM440
  - T: Stainless steel
  - C: Carbide
  - H: HSS
- **Shank Diameter**
  - 4: Ø4 mm
  - 6: Ø6 mm
- **Grit size**
  - M: Mesh
  - S: ISO(FEPA)
- **Tool lead angle**
  - No code: None
  - T: Taper angle

Features

- **Tangential cutting-edge shape**
  - One-Pass Grinding applied.
  - Inhibited unevenness and achieved excellent finish in machined surfaces.



- **Center-Matched ball shape**
  - Optimized center shape ensures relief angle at the ball point.
  - Cutting edges of the ball point shape provide excellent wear resistance and cutting performance.



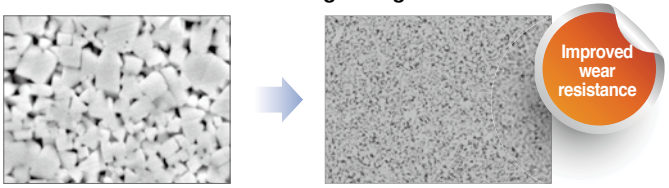
Grade for Titanium



- High hardness coating layer - Ensures stable cutting conditions from high Si contents and enhances wear resistance and frictional heat resistance through the application of AlTiSiN series coating layer.
- A grade optimized for interrupted machining of high hardness steels and wet cutting conditions with high thermal shock. The ultrafine substrate provides high toughness, ensuring stable performance.

PC2010 (Coated grade for high hardened steel)

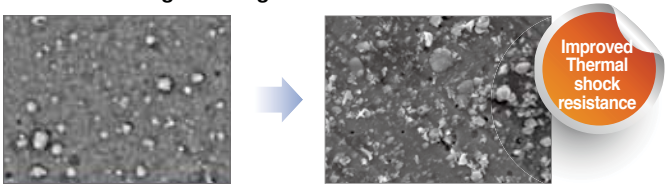
1. Ultra fine substrate with high toughness



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

» Its tough and wear-resistant substrate is optimized for absorbing thermal shock which is concentrated on cutting edges when machining Titanium.

2. TiSiN coating with high thermal resistance



[Conventional coating] **[TiSiN coating]**

» Its high hardness TiSiN coating is optimized for machining Titanium that causes thermal shock due to its low thermal conductivity.

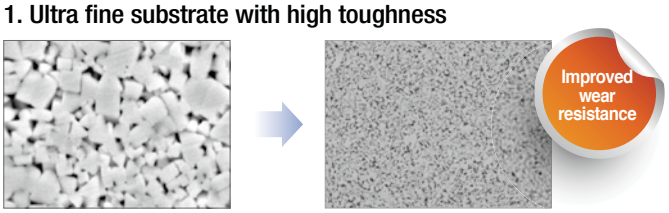
Grade for Co-Cr



- Post-coating treatment has been applied to improve surface finish.
- A grade optimized for interrupted machining of high hardness steels and wet cutting condition accompanying high thermal shock. The ultrafine substrate offers high toughness, ensuring stable performance.

PC2510 (Coated grade for high hardened steel)

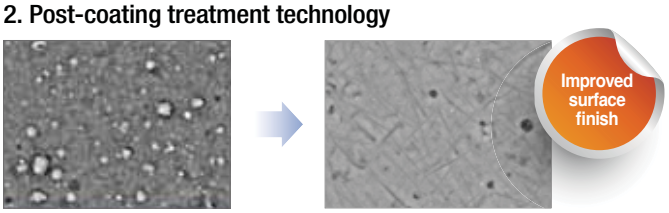
1. Ultra fine substrate with high toughness



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

» Its tough and wear-resistant substrate is optimized for absorbing thermal shock which is concentrated on cutting edges when machining Co-Cr.

2. Post-coating treatment technology



[Conventional coating] **[Post-coating treatment]**

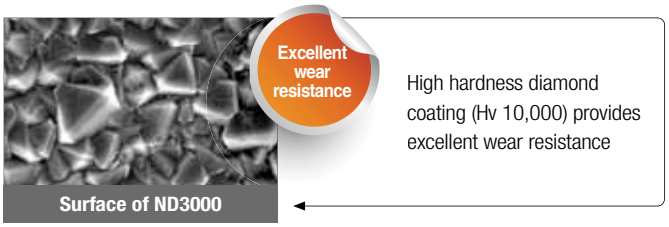
» With the post-coating treatment, the cutting edge retains its sharpness and smoothness that result in longer tool life.

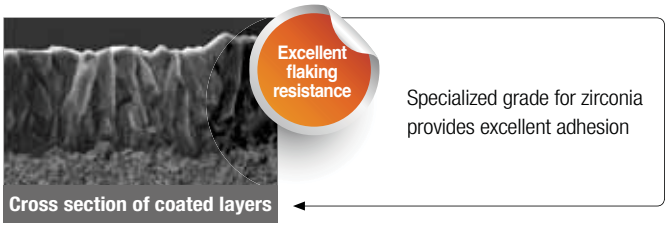
Grade for Zirconia



- High hardness diamond coating that is excellent in machining zirconia.
- Optimized for high speed and medium duty cutting due to its excellent grip to coated layers.

ND3000 (Diamond-coated grade)





» Inhibiting excessive flank wear caused by friction between zirconia material and clearance surface of the tool.

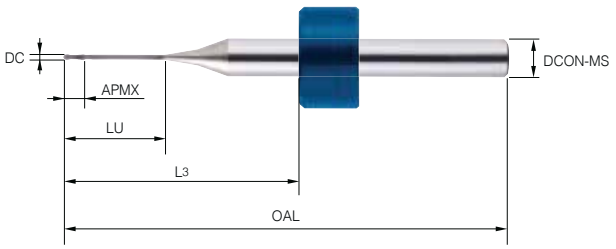
» Under Ø1 tool diameter, we also use PC2510 for better accuracy.(ND3000 is possible on request)

Special T Endmill order form

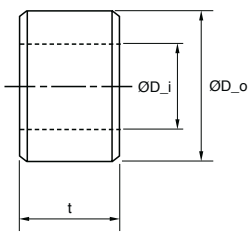
• Stop rings and other tool resources can be made to order

[Data Sheet]

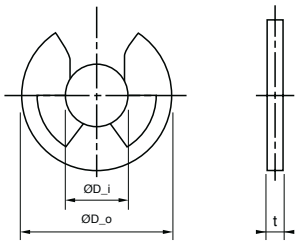
Type of machine	
Workpiece	
Dental material	
Cutting diameter (DC)	
Shank diameter (DCON-MS)	
Cutting length (APMX)	
Neck length (LU)	
Stop ring position (L_3)	
Overall length (OAL)	
Stop ring shape	



[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

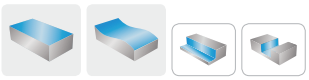
ROLAND Type

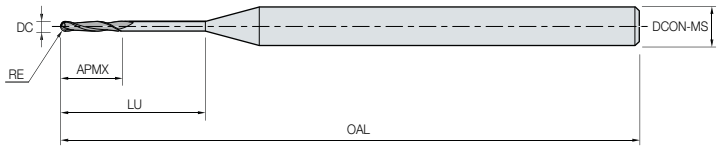
(DWX-30, DWX-50, DWX-51D, DWX-52D)

Metric | 2 | H·A 30° | Grade PC2010 PC2510 (PVD) | Grade ND3000 (DIA) | h5 shank

DC	Tolerance
Ø0.3 ~ Ø2	0 ~ -0.02 0 ~ -0.015







(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.3 mm ROLAND	TZBE2003-050-N226(ROLAND)	-	0.3	0.15	1.5	22.6	50	4
	0.6 mm ROLAND	TZBE2006-050-N12(ROLAND)	PC2510	0.6	0.3	1.5	12	50	4
	1 mm ROLAND	TZBE2010-050-N16(ROLAND)	ND3000	1	0.5	2	16	50	4
	2 mm ROLAND	TZBE2020-050-N20(ROLAND)	ND3000	2	1	3	20	50	4
PMMA	1 mm ROLAND PMMA	TWBE2010-050-N16(ROLAND)	-	1	0.5	2	16	50	4
	2 mm ROLAND PMMA	TWBE2020-050-N20(ROLAND)	-	2	1	3	20	50	4
HYBRID	0.6 mm ROLAND ULTIMATE	ETRE006050-S4M325-R(ROLAND)	Electronic Deposition DIA	0.6	0.3	10	10	50	4
	1 mm ROLAND ULTIMATE	ETRE010050-S4M170-R(ROLAND)		1	0.5	12	12	50	4
	2 mm ROLAND ULTIMATE	ETRE020050-S4M120-R(ROLAND)		2	1	17	17	50	4

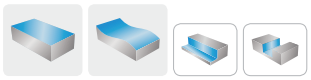
IMES-ICORE Type

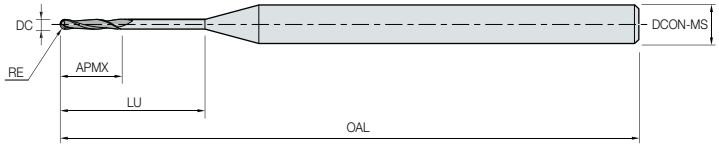
(250i, 340i, 450i)

Metric | 2 | H·A 30° | Grade PC2010 PC2510 (PVD) | Grade ND3000 (DIA) | h5 shank

DC	Tolerance
Ø0.3 ~ Ø2.5	0 ~ -0.02 0 ~ -0.015







(mm)

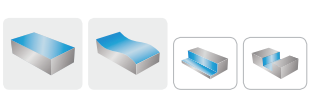
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.3mm 250i 340i 450i	TZBE2003-048-N223S03(450I)	PC2510	0.3	0.15	1.8	22.3	48	3
	0.6 mm 250i 340i 450i	TZBE2006-048-N080S03(450I)	PC2510	0.6	0.3	1.5	8	48	3
	1 mm 250i 340i 450i	TZBE2010-048-N14(450I)	ND3000	1	0.5	4.5	14	48	3
	2.5 mm 250i 340i 450i	TZBE2025-048-N20(450I)	ND3000	2.5	1.25	6	20	48	3
	0.6 mm 250i 340i 450i-S6	TZBE2006-053-N090S06(450IS6)	PC2510	0.6	0.3	3	9	53	6
	1 mm 250i 340i 450i-S6	TZBE2010-053-N142S06(450IS6)	ND3000	1	0.5	4.5	14.2	53	6
	2.5 mm 250i 340i 450i-S6	TZBE2025-053-N201S06(450IS6)	ND3000	2.5	1.25	7.5	20.1	53	6
PMMA	1 mm 250i 340i 450i PMMA	TWBE2010-048-N140S03(250I340I450I)	-	1	0.5	4.5	14	48	3
	2.5 mm 250i 340i 450i PMMA	TWBE2025-048-N200S03(250I340I450I)	-	2.5	1.25	6	20	48	3
Titanium/ Co-Cr	1 mm 250i 340i 450i TiTAN	TTBE2010-040-N090S03(450i)	PC2010/ PC2510	1	0.5	2	9	40	3
	2 mm 250i 340i 450i TiTAN	TTBE2020-040-N120S03(450i)		2	1	4	12	40	3
	3 mm 250i 340i 450i TiTAN	TTBE2030-0385-N120S03(450i)		3	1.5	4	12	38.5	3
HYBRID	0.6 mm 250i 340i 450i ULTIMATE	ETND006039-S3M325-T5(450i)	Electronic Deposition DIA	0.6	0.3	10.3	10.3	39.8	3
	1 mm 250i 340i 450i ULTIMATE	ETRE010039-S3M230(450i)		1	0.5	10.2	10.2	39.8	3
	2.5 mm 250i 340i 450i ULTIMATE	ETRE025039-S3M120(450i)		2.5	1.25	13	13	39.8	3

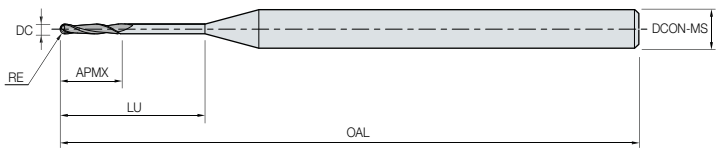
WIELAND SELECT Type

Metric | 2 | H·A 30° | Grade PC2010 PC2510 (PVD) | Grade ND3000 (DIA) | h5 shank

DC	Tolerance
Ø0.7 ~ Ø2.5	0 ~ -0.02 0 ~ -0.015







(mm)

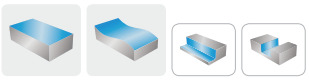
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.7mm WIELAND SELECT	TZBE2007-040-N145S03(WIELAND)	PC2510	0.7	0.35	2.5	14.5	40	3
	1mm WIELAND SELECT	TZBE2010-040-N145S03(WIELAND)	ND3000	1	0.5	4.5	14.5	40	3
	2.5mm WIELAND SELECT	TZBE2025-040-N200S03(WIELAND)	ND3000	2.5	1.25	7.5	20	40	3
PMMA	1mm WIELAND SELECT PMMA	TWBE2010-040-N145S03(WIELAND)	-	1	0.5	4.5	14.5	40	3
	2.5mm WIELAND SELECT PMMA	TWBE2025-040-N200S03(WIELAND)		2.5	1.25	7.5	20	40	3

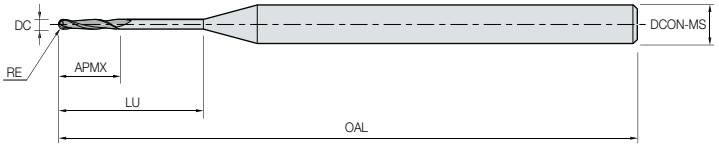
WIELAND MINI Type

Metric | 2 | H·A 30° | h5 shank

DC	Tolerance
Ø1 ~ Ø2.5	0 ~ -0.02 0 ~ -0.015







(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	1 mm WIELAND MINI	TZBE2010-035-N140S03(WIELAND MINI)	-	1	0.5	4.5	14	35	3
	2.5 mm WIELAND MINI	TZBE2025-035-N200S03(WIELAND MINI)	-	2.5	1.25	6	20	35	3

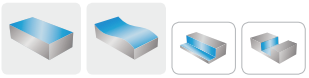
AMANN GIRRBACH Type

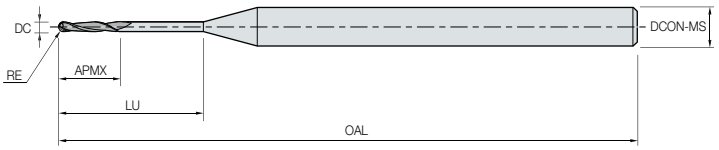
(Cera-Mill)

Metric | 2 | H·A 30° | Grade PC2010 PC2510 (PVD) | Grade ND3000 (DIA) | h5 shank

DC	Tolerance
Ø0.6 ~ Ø2.5	0 ~ -0.02 0 ~ -0.015







(mm)

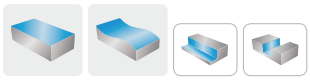
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.6 mm CERA-MILL	TZBE2006-047-N135S03(CERAMILL)	PC2510	0.6	0.3	2.4	13.5	47	3
	1 mm CERA-MILL	TZBE2010-047-N165S03(CERAMILL)	ND3000	1	0.5	2	16.5	47	3
	2.5 mm CERA-MILL	TZBE2025-047-N180S03(CERAMILL)	ND3000	2.5	1.25	4.5	18	47	3
PMMA	1mm CERA-MILL PMMA	TWBE2010-047-N165S03(CERAMILL)	-	1	0.5	2	16.5	47	3
	2.5mm CERA-MILL PMMA	TWBE2025-047-N180S03(CERAMILL)	-	2.5	1.25	4.5	18	47	3

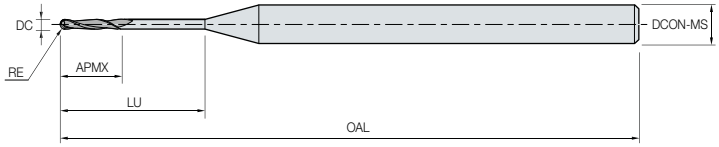
VHF-S1 Type

Metric | 2 | H·A 30° | Grade PC2010 PC2510 (PVD) | Grade ND3000 (DIA) | h5 shank

DC	Tolerance
Ø0.6 ~ Ø2	0 ~ -0.02 0 ~ -0.015







(mm)

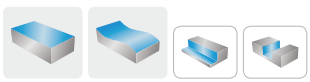
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.6 mm VHF-S1	TZBE2006-035-N120S03(VHFS1)	PC2510	0.6	0.3	1.5	12	35	3
	1 mm VHF-S1	TZBE2010-040-N145S03(VHFS1)	ND3000	1	0.5	5	14.5	40	3
	2 mm VHF-S1	TZBE2020-040-N160S03(VHFS1)	ND3000	2	1	4	16	40	3
PMMA	1 mm VHF-S1 PMMA	TWBE2010-040-N145S03(VHFS1)	-	1	0.5	5	14.5	40	3
	2 mm VHF-S1 PMMA	TWBE2020-040-N160S03(VHFS1)	-	2	1	4	16	40	3

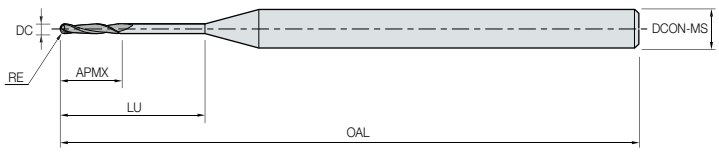
VHF-K4/CM Type

Metric | 2 | 3 | H·A 30° | h5 shank

DC	Tolerance
Ø0.6 ~ Ø2	0 ~ -0.02 0 ~ -0.015







(mm)

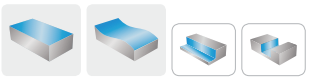
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
PMMA	0.6 mm VHF-K4	TWBE2006-035-N030S03(VHFK4)	-	0.6	0.3	1	3	35	3
	1 mm VHF-K4	TWBE2010-035-N160S03(VHFK4)	-	1	0.5	2	16	35	3
	2 mm VHF-K4	TWBE3020-035-N160S03(VHFK4)	-	2	1	4	16	35	3

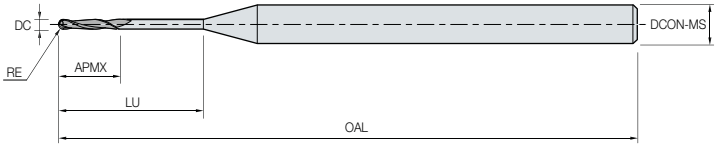
CHARLY Type

Metric | 2 | H·A 30° | Grade PC2010 PC2510 (PVD) | Grade ND3000 (DIA) | h5 shank

DC	Tolerance
Ø1 ~ Ø2.5	0 ~ -0.02 0 ~ -0.015







(mm)

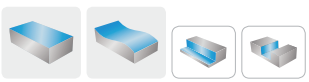
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.5 mm CHARLY	TZBE2005-0385-N100S03(CHARLY)	PC2510	0.5	0.25	1.5	10	38.5	3
	1 mm CHARLY	TZBE2010-0385-N120S03(CHARLY)	ND3000	1	0.5	2	12	38.5	3
	1.5 mm CHARLY	TZBE2015-0385-N120S03(CHARLY)	ND3000	1.5	0.75	3	12	38.5	3
	3 mm CHARLY	TZFE2030-0385-N060S03(CHARLY)	ND3000	3	1.5	6	-	38.5	3
PMMA	1 mm CHARLY PMMA	TWBE2010-0385-N120S03(CHARLY)	-	1	0.5	2	12	38.5	3
	1.5 mm CHARLY PMMA	TWBE2015-0385-N120S03(CHARLY)	-	1.5	0.75	3	12	38.5	3
	3 mm CHARLY PMMA	TWBE2030-0385-N060S03(CHARLY)	-	3	1.5	6	-	38.5	3

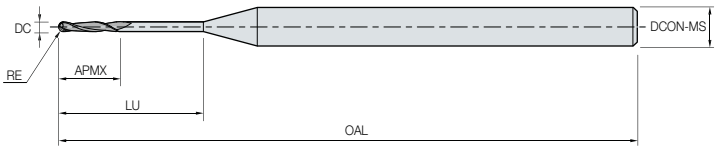
ZIRKONZAHN M5 Type

Metric | 2 | H·A 30° | Grade ND3000 (DIA) | h5 shank

DC	Tolerance
Ø0.3 ~ Ø2	0 ~ -0.02 0 ~ -0.015







(mm)

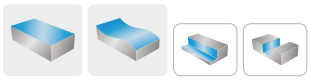
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	1mm ZIRKONZHAN M5	TZBE2010-057-N120S03(ZIRKON)-DYD	ND3000	1	0.5	6	12	57	3
	2mm ZIRKONZHAN M5	TZBE2020-057-N180S03(ZIRKON)-DYD	ND3000	2	1	10	18	57	3
	0.3mm ZIRKONZHAN M5-N	TZBE2003-057-N060S03(ZIRKONZAHN)-DY	-	0.3	0.15	3	6	57	3
	0.5mm ZIRKONZHAN M5-N	TZBE2005-057-N100S03(ZIRKONZHAN)-DY	-	0.5	0.25	3	10	57	3
	1mm ZIRKONZHAN M5-N	TZBE2010-057-N120S03(ZIRKONZHAN)-DY	-	1	0.5	6	12	57	3
	2mm ZIRKONZHAN M5-N	TZBE2020-057-N180S03(ZIRKONZHAN)-DY	-	2	1	10	18	57	3

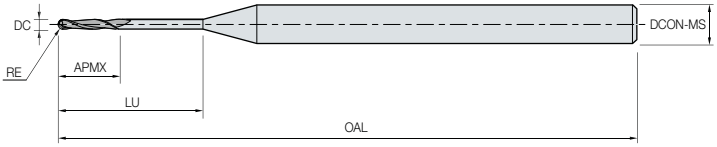
ZIRKONZAHN M1/M4 Type

Metric | 2 | H·A 30° | Grade PC2010 PC2510 (PVD) | Grade ND3000 (DIA) | h5 shank

DC	Tolerance
Ø0.5 ~ Ø3	0 ~ -0.02 0 ~ -0.015







(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.5 mm ZIRKONZHAN M1/M4	TZBE2005-050-N108S06(ZIRKONM1)	PC2510	0.5	0.25	3.5	10.8	50	6
	1 mm ZIRKONZHAN M1/M4	TZBE2010-050-N120S06(ZIRKONM1)	ND3000	1	0.5	6	12	50	6
	2 mm ZIRKONZHAN M1/M4	TZBE2020-050-N180S06(ZIRKONM1)	ND3000	2	1	10	18	50	6
	0.5 mm ZIRKONZHAN M1/M4-N	TZBE2005-050-N095S06(ZIRKON M1)	-	0.5	0.25	3	9.5	50	6
	1 mm ZIRKONZHAN M1/M4-N	TZBE2010-050-N120S06(ZIRKONM1)-N	-	1	0.5	6	12	50	6
	2 mm ZIRKONZHAN M1/M4-N	TZBE2020-050-N180S06(ZIRKONM1)-N	-	2	1	10	18	50	6
Titanium/ Co-Cr	1 mm ZIRKONZHAN M1/M4 TiTAN	TTBE2010-050-N120S06(ZIRKON M1)	PC2010/ PC2510	1	0.5	1	12	50	6
	2 mm ZIRKONZHAN M1/M4 TiTAN	TTBE2020-050-N120S06(ZIRKON M1)		2	1	3	12	50	6
	3 mm ZIRKONZHAN M1/M4 TiTAN	TTBE2030-050-N180S06(ZIRKON M1)		3	1.5	4	18	50	6

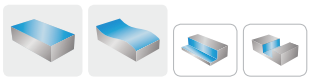
SIRONA Type

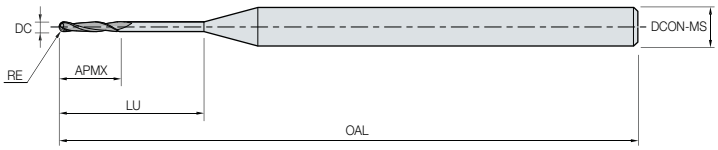
(MC-X5)

Metric | 2 | 4 | H·A 30° | Grade PC2010 PC2510 (PVD) | Grade ND3000 (DIA) | h5 shank

DC	Tolerance
Ø0.5 ~ Ø2.5	0 ~ -0.02 0 ~ -0.015







(mm)

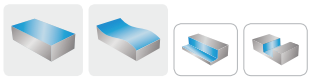
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.5 mm MC-X5	TZBE2005-042-N060S03(MC-X5)	PC2510	0.5	0.25	1	6	42	3
	1 mm MC-X5	TZBE2010-043-N170S03(MC-X5)	ND3000	1	0.5	3	17	43	3
	2.5 mm MC-X 5	TZBE4025-044-N240S03(MC-X5)	ND3000	2.5	1.25	5	24	44	3
PMMA	1 mm MC-X5 PMMA	TWBE2010-043-N170S03(MC-X5)	-	1	0.5	3	17	43	3
	2.5 mm MC-X5 PMMA	TWBE2025-044-N240S3(MC-X5)	-	2.5	1.25	5	24	44	3

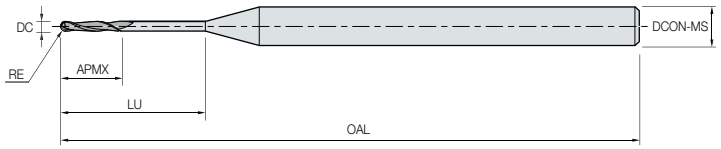
YENA Type

Metric | 2 | H·A 30° | Grade PC2010 PC2510 (PVD) | Grade ND3000 (DIA) | h5 shank

DC	Tolerance
Ø1 ~ Ø3	0 ~ -0.02 0 ~ -0.015







(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	1 mm YENA	TZBE2010-045-N160S04(YENA)-DY	ND3000	1	0.5	3	16	45	4
	2 mm YENA	TZBE2020-045-N160S04(YENA)-DY	ND3000	2	1	3	16	45	4
PMMA	1 mm YENA PMMA	TWBE2010-045-N160S04(YENA)-DY	-	1	0.5	3	16	45	4
	2 mm YENA PMMA	TWBE2020-045-N160S04(YENA)-DY	-	2	1	3	16	45	4
Titanium/ Co-Cr	2 mm YENA TiTAN	TTBE2020-045-N122S04(YENA)	PC2010/ PC2510	2	1	3.6	12.2	45	4
	3 mm YENA TiTAN	TTBE2030-045-N125S04(YENA)		3	1.5	5.5	12.5	45	4

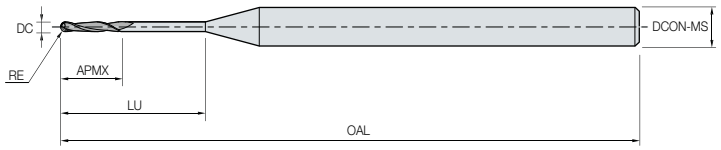
LEZIRTH Type

Metric | 2 | H·A 30° | Grade PC2010 PC2510 (PVD) | h5 shank

DC	Tolerance
Ø1 ~ Ø3	0 ~ -0.02 0 ~ -0.015







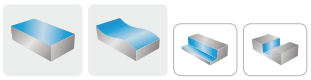
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
Co-Cr	1 mm LEZIRTH(Co-Cr)	TTBE2010-050-V1.2N8S6	PC2510	1	0.5	1.2	8	50	6
	1.5 mm LEZIRTH(Co-Cr)	TTBE2015-045-V1.7N8.5S6	PC2510	1.5	0.75	1.7	8.5	45	6
	2 mm LEZIRTH(Co-Cr)	TTBE2020-050-V2.2N12S6	PC2510	2	1	2.2	12	50	6
	3 mm LEZIRTH(Co-Cr)	TTBE2030-060-V3.5N16S6	PC2510	3	1.5	3.5	16	60	6

ARUM Type

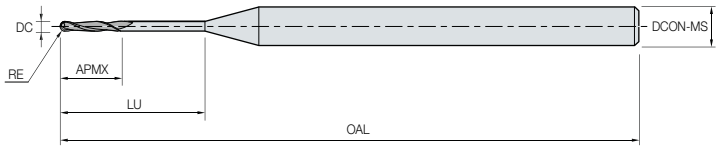
(4X/5X-100)





Metric | 2 | H·A 30° | Grade PC2010 PC2510 PVD | Grade ND3000 DIA | h5 shank

DC	Tolerance
Ø0.6 ~ Ø2	0 ~ -0.02 0 ~ -0.015



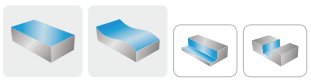
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.6 mm 4X-100	TZBE2006-063-N120S06(4X-100)	PC2510	0.6	0.3	1.5	12	63	6
	1 mm 4X-100	TZBE2010-063-N160S06(4X-100)	ND3000	1	0.5	2.5	16	63	6
	2 mm 4X-100	TZBE2020-063-N200S06(4X-100)	ND3000	2	1	6	20	63	6
PMMA	1 mm 4X-100 PMMA	TWBE2010-063-N160S06(4X-100)	-	1	0.5	2.5	16	63	6
	2 mm 4X-100 PMMA	TWBE2020-063-N200S06(4X-100)	-	2	1	6	20	63	6

ARUM Type

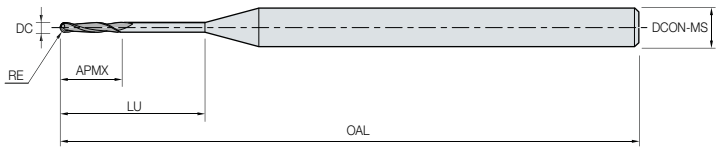
(5X-150)





Metric | 2 | H·A 30° | Grade PC2010 PC2510 PVD | Grade ND3000 DIA | h5 shank

DC	Tolerance
Ø0.5 ~ Ø2.5	0 ~ -0.02 0 ~ -0.015



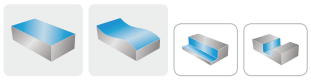
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.6 mm 5X-150	TZBE2006-045-N100S04(5X-150)	PC2510	0.6	0.3	1.5	10	45	4
	1 mm 5X-150	TZBE2010-050-N161S04(5X-150)-K	ND3000	1	0.5	2.5	16.1	50	4
	2 mm 5X-150	TZBE2020-050-N181S04(5X-150)	ND3000	2	1	6.5	18.1	50	4
PMMA	1 mm 5X-150 PMMA	TWBE2010-050-N161S04(5X-150)	-	1	0.5	2.5	16.1	50	4
	2 mm 5X-150 PMMA	TWBE2020-050-N181S04(5X-150)	-	2	1	6.5	18.1	50	4
HYBRID	0.6 mm 5X-150 ULTIMATE	ETND006041-C4M325-T7(5X-150)	Electronic Deposition DIA	0.6	0.3	8	8	41	4
	1 mm 5X-150 ULTIMATE	ETND010044-C4M170(5X-150)		1	0.5	10	10	44.5	4
	1.5 mm 5X-150 ULTIMATE	ETND015044-C4M140(5X-150)		1.5	0.75	10	10	44.5	4
	2.5 mm 5X-150 ULTIMATE	ETND025044-C4M120(5X-150)		2.5	1.25	12	12	44.5	4

ARUM Type

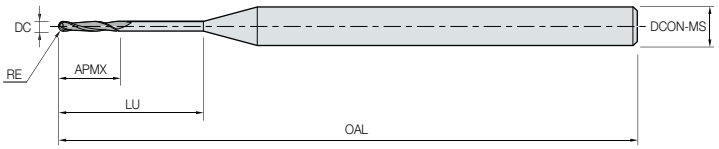
(5X-200)





Metric | 2 | H·A 30° | Grade PC2010 PC2510 PVD | Grade ND3000 DIA | h5 shank

DC	Tolerance
Ø0.6 ~ Ø2.5	0 ~ -0.02 0 ~ -0.015



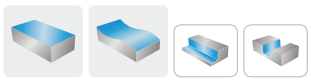
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.6 mm 5X-200	TZBE2006-050-N080S06(5X-200)	PC2510	0.6	0.3	1.6	8	50	6
	1 mm 5X-200	TZBE2010-053-N140S06(5X-200)	ND3000	1	0.5	2	14	53	6
	2 mm 5X-200	TZBE2020-055-N200S06(5X-200)	ND3000	2	1	6	20	55	6
PMMA	1 mm 5X-200 PMMA	TWBE2010-053-N140S06(5X-200)	-	1	0.5	2	14	53	6
	2 mm 5X-200 PMMA	TWBE2020-055-N200S06(5X-200)	-	2	1	6	20	55	6
HYBRID	0.6 mm 5X-200 ULTIMATE	ETND006050-H6M270-T7(5X-200)	Electronic Deposition DIA	0.6	0.3	8	8	50	6
	1 mm 5X-200 ULTIMATE	ETRE010050-H6M200(5X-200)		1	0.5	10	10	50	6
	1.5 mm 5X-200 ULTIMATE	ETRE015050-H6M170(5X-200)		1.5	0.75	10	10	50	6
	2.5 mm 5X-200 ULTIMATE	ETRE025050-H6M140(5X-200)		2.5	1.25	12	12	50	6

ARUM Type

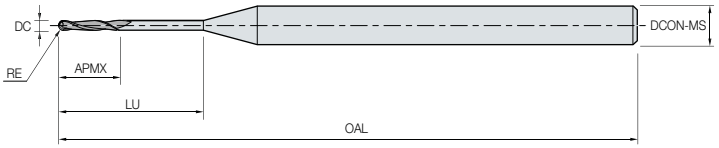
(5X-300)





Metric | 2 | H·A 30° | Grade PC2010 PC2510 PVD | Grade ND3000 DIA | h5 shank

DC	Tolerance
Ø1 ~ Ø3	0 ~ -0.02 0 ~ -0.015



(mm)

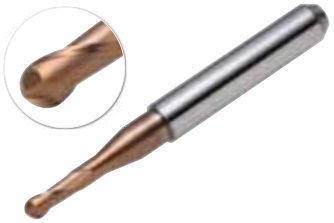
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.3 mm 5X-300	TZBE2003-045-N120S04(5X-300)	PC2510	0.3	0.15	0.6	12	45	4
	0.6 mm 5X-300	TZBE2006-045-N100S04(5X-300)	PC2510	0.6	0.3	1.2	10	45	4
	1 mm 5X-300	TZBE2010-050-N160S04(5X-300)	ND3000	1	0.5	2	16	50	4
	2 mm 5X-300	TZBE2020-050-N180S04(5X-300)	ND3000	2	1	6	18	50	4
PMMA	1 mm 5X-300 PMMA	TWBE2010-050-N160S04(5X-300)	-	1	0.5	2	16	50	4
	2 mm 5X-300 PMMA	TWBE2020-050-N180S04(5X-300)	-	2	1	6	18	50	4

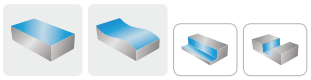
ARUM Type

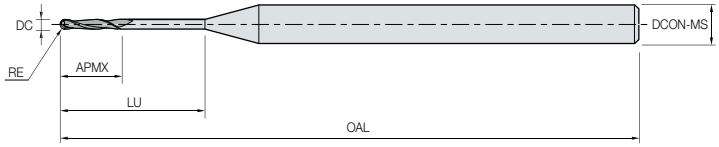
(Metal tool)

Metric | 2 | H·A 30° | Grade PC2010 PC2510 PVD | h5 shank

DC	Tolerance
Ø0.6 ~ Ø2	0 ~ -0.02 0 ~ -0.015







(mm)

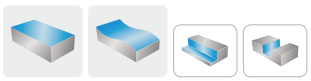
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
Titanium/ Co-Cr	1 mm ARUM TiTAN	TTBE2010-050-N100S06(ARUM)-DY	PC2010/ PC2510	1	0.5	2.5	10	50	6
	1.5 mm ARUM TiTAN	TTBE2015-050-N100S06(ARUM)-DY		1.5	0.75	3	10	50	6
	2 mm ARUM TiTAN	TTBE2020-050-N120S06(ARUM)-DY		2	1	4	12	50	6
	2.5 mm ARUM TiTAN	TTBE2025-050-N140S06(ARUM)C1		2.5	1.25	8	14	50	6
	3 mm ARUM TiTAN	TTBE2030-050-N120S06(ARUM)-DY		3	1.5	6	12	50	6

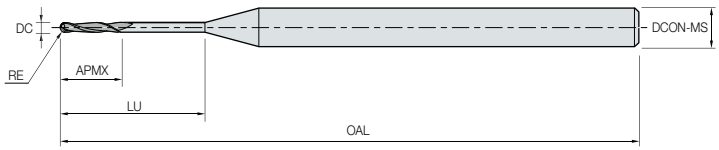
Z-MATCH/CAMELEON Type

Metric | 2 | H·A 30° | Grade PC2010 PC2510 PVD | Grade ND3000 DIA | h5 shank

DC	Tolerance
Ø0.6 ~ Ø2.5	0 ~ -0.02 0 ~ -0.015







(mm)

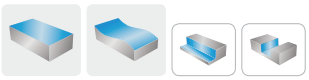
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.5 mm Z-MATCH	TZBE2005-055-N8(Z-MATCH)	PC2510	0.5	0.25	1.5	8	55	6
	1 mm Z-MATCH	TZBE2010-055-N16(Z-MATCH)	ND3000	1	0.5	3	16	55	6
	2 mm Z-MATCH	TZBE2020-055-N20(Z-MATCH)	ND3000	2	1	6	20	55	6
PMMA	1 mm Z-MATCH PMMA	TWBE2010-055-N160S06(Z-MATCH)	-	1	0.5	3	16	55	6
	2 mm Z-MATCH PMMA	TWBE2020-055-N200S06(Z-MATCH)	-	2	1	6	20	55	6

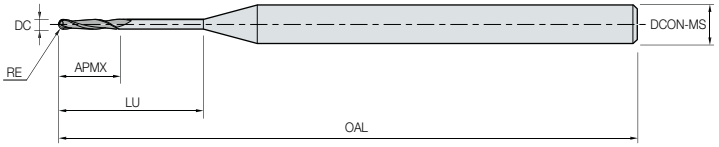
CAMELEON CS Type

Metric | 2 | H·A 30° | Grade PC2010 PC2510 (PVD) | Grade ND3000 (DIA) | h5 shank

DC	Tolerance
Ø0.5 ~ Ø2	0 ~ -0.02 0 ~ -0.015







(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.5 mm CAMELEON CS	TZBE2005-040-N080S03(CAMELEON CS)	PC2510	0.5	0.25	1	8	40	3
	1 mm CAMELEON CS	TZBE2010-040-N160S03(CAMELEON CS)	ND3000	1	0.5	2	16	40	3
	2 mm CAMELEON CS	TZBE2020-040-N200S03(CAMELEON CS)	ND3000	2	1	4	20	40	3
PMMA	1 mm CAMELEON CS PMMA	TWBE2010-040-N160S03(CAMELEON CS)	-	1	0.5	2	16	40	3
	2 mm CAMELEON CS PMMA	TWBE2020-040-N200S03(CAMELEON CS)	-	2	1	4	20	40	3

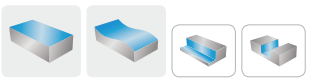
CAMELEON Type

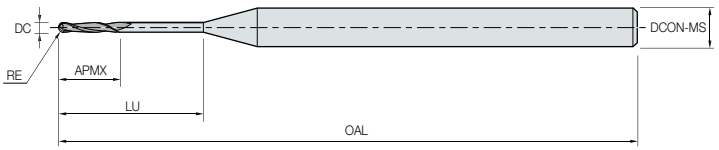
(Metal tool)

Metric | 2 | H·A 30° | Grade PC2010 PC2510 (PVD) | h5 shank

DC	Tolerance
Ø1.5 ~ Ø3	0 ~ -0.02 0 ~ -0.015







(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
Titanium/ Co-Cr	1.5 mm CAMELEON TiTAN	TTBE2015-045-N7(Z-MATCH-M)	PC2010/ PC2510	1.5	0.75	3	7	45	6
	2 mm CAMELEON TiTAN	TTBE2020-045-N7(Z-MATCH-M)		2	1	3	7	45	6
	3 mm CAMELEON TiTAN	TTBE2030-045-N10(Z-MATCH-M)		3	1.5	4	10	45	6
	1.5 mm CAMELEON TiTAN-long	TTBE2015-055-N8(CAMELEON-M)		1.5	0.75	1.5	8	55	6
	2 mm CAMELEON TiTAN-long	TTBE2020-055-N8(CAMELEON-M)		2	1	2	8	55	6
	3 mm CAMELEON TiTAN-long	TTBE2030-055-N10(CAMELEON-M)		3	1.5	3	10	55	6

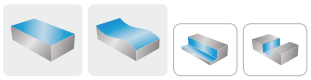
RND Type

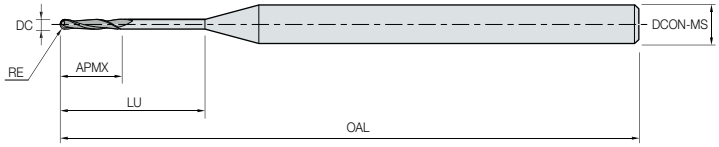
(DS200-5Z, DM-100, DS-4WA)

Metric | 2 | H·A 30° | Grade PC2010 PC2510 (PVD) | Grade ND3000 (DIA) | h5 shank

DC	Tolerance
Ø0.6 ~ Ø2	0 ~ -0.02 0 ~ -0.015







(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.6 mm DS200-5Z	TZBE2006-045-N120S03(DS200-5Z)	PC2510	0.6	0.3	1.2	12	45	3
	1 mm DS200-5Z	TZBE2010-045-N180S03(DS200-5Z)	ND3000	1	0.5	3	18	45	3
	2 mm DS200-5Z	TZBE2020-045-N200S03(DS200-5Z)	ND3000	2	1	4	20	45	3
PMMA	1 mm DS200-5Z PMMA	TWBE2010-045-N180S03(DS200-5Z)	-	1	0.5	3	18	45	3
	2 mm DS200-5Z PMMA	TWBE2020-045-N200S03(DS200-5Z)	-	2	1	4	20	45	3
Titanium/ Co-Cr	1.5 mm RND DM-100	TTBE2015-050-N100S06(RND)-DY	PC2010/ PC2510	1.5	0.75	3	10	50	6
	2 mm RND DM-100	TTBE2020-050-N130S06(RND)-DY		2	1	4	13	50	6
	3 mm RND DM-100	TTBE2030-050-N120S06(RND)-DY		3	1.5	6	12	50	6

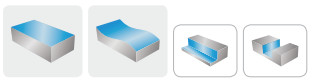
MANIX Type

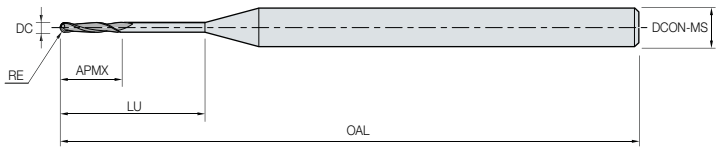
(ZX-5SD, MA-4)

Metric | 2 | H·A 30° | Grade PC2010 PC2510 (PVD) | Grade ND3000 (DIA) | h5 shank

DC	Tolerance
Ø0.6 ~ Ø3	0 ~ -0.02 0 ~ -0.015







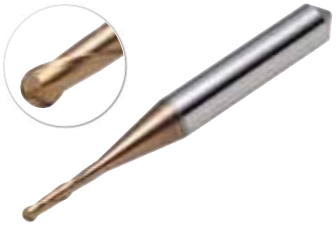
(mm)

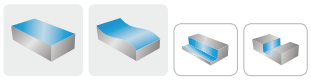
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.6 mm ZX-5SD	TZBE2006-045-N145S04(ZX-5SD)	PC2510	0.6	0.3	1	14.5	45	4
	1 mm ZX-5SD	TZBE2010-050-N160S04(ZX-5SD)	ND3000	1	0.5	3	16	50	4
	2 mm ZX-5SD	TZBE2020-050-N200S04(ZX-5SD)	ND3000	2	1	6	20	50	4
PMMA	1 mm MANIX ZX-5SD PMMA	TWBE2010-050-N165S04(MANIX)	-	1	0.5	2.8	16.5	50	4
	2 mm MANIX ZX-5SD PMMA	TWBE2020-050-N200S04(MANIX)	-	2	1	5	20	50	4
Titanium/ Co-Cr	1.5 mm MANIX TiTAN	TTBE2015-045-N105S06(MANIX)	PC2010/ PC2510	1.5	0.75	2	10.5	45	6
	2 mm MANIX TiTAN	TTBE2020-045-N125S06(MANIX)		2	1	4.8	12.5	45	6
	2.5 mm MANIX TiTAN	TTBE2025-045-N120S06(MANIX)		2.5	1.25	3	12	45	6
	3 mm MANIX TiTAN	TTBE2030-045-N125S06(MANIX)		3	1.5	4	12.5	45	6

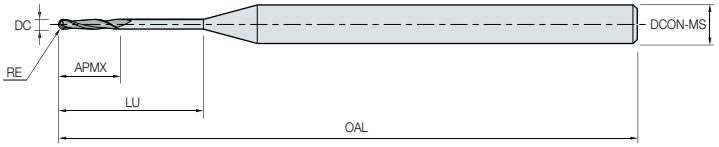
SEUNGWON DI Type

Metric | 2 | H·A 30° | Grade PC2010 PC2510 (PVD) | h5 shank

DC	Tolerance
Ø1.5 ~ Ø2	0 ~ -0.02 0 ~ -0.015







(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
Titanium/ Co-Cr	1.5 mm SW DI TiTAN	TTBE2015-050-N100S06(SW DI-M)	PC2010/ PC2510	1.5	0.75	8	10	50	6
	2 mm SW DI TiTAN	TTBE2020-050-N120S06(SW DI-M)		2	1	8	12	50	6

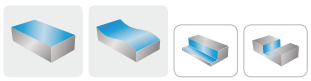
PROTECH INNOTION Type

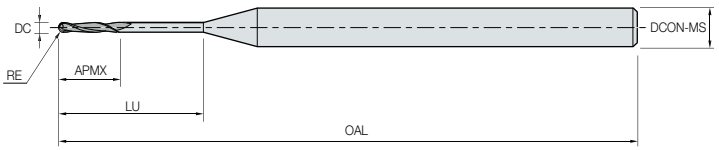
(Proden, Prodia, Nexus)

Metric | 2 | H·A 30° | Grade PC2010 PC2510 (PVD) | Grade ND3000 (DIA) | h5 shank

DC	Tolerance
Ø0.6 ~ Ø2	0 ~ -0.02 0 ~ -0.015







(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.6 mm PRODEN	TZBE2006-060-N115S06(PRODEN)	PC2510	0.6	0.3	2.2	11.5	60	6
	1 mm PRODEN	TZBE2010-060-N180S06(PRODEN)	ND3000	1	0.5	3	18	60	6
	2 mm PRODEN	TZBE2020-060-N200S06(PRODEN)	ND3000	2	1	5	20	60	6
PMMA	1 mm PRODEN PMMA	TWBE2010-060-N180S06(PRODEN)	-	1	0.5	3	18	60	6
	2 mm PRODEN PMMA	TWBE2020-060-N200S06(PRODEN)	-	2	1	5	20	60	6

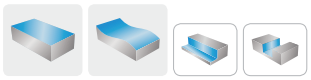
PROTECH INNOTION Type

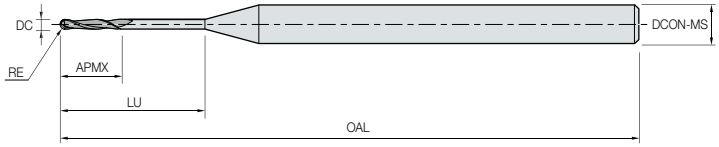
(Metal tool-Monster, Nexus, Protech)

Metric | 2 | H·A 30° | Grade PC2010 PC2510 PVD | h5 shank

DC	Tolerance
Ø1 ~ Ø3	0 ~ -0.02 0 ~ -0.015







(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
Co-Cr	1 mm NEXUS Co-Cr	TTBE2010-051-N100S06(NEXUS)	PC2510	1	0.5	2	10	51	6
	1.5 mm NEXUS Co-Cr	TTBE2015-051-N100S06(NEXUS)	PC2510	1.5	0.75	2	10	51	6
	2 mm NEXUS Co-Cr	TTBE2020-051-N120S06(NEXUS)	PC2510	2	1	3	12	51	6
	3 mm NEXUS Co-Cr	TTBE2030-051-N120S06(NEXUS)	PC2510	3	1.5	4.5	12	51	6

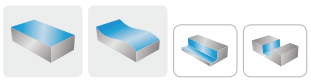
CERACUBE/TRION-Z Type

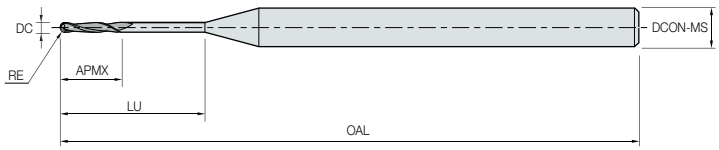
(ZX-5SD, MA-4)

Metric | 2 | H·A 30° | Grade PC2010 PC2510 PVD | Grade ND3000 DIA | h5 shank

DC	Tolerance
Ø0.5 ~ Ø2	0 ~ -0.02 0 ~ -0.015







(mm)

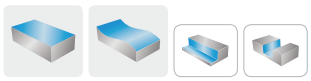
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.5 mm CERACUBE/TRION-Z	TZBE2005-050-N22(TRION-Z)	PC2510	0.5	0.25	2	22	50	4
	1 mm CERACUBE/TRION-Z	TZBE2010-050-N18(TRION-Z)	ND3000	1	0.5	3	18	50	4
	2 mm CERACUBE/TRION-Z	TZBE2020-050-N20(TRION-Z)	ND3000	2	1	7	20	50	4
PMMA	1 mm CERACUBE/TRION-Z PMMA	TWBE2010-050-N180S04(TRION-Z)	-	1	0.5	3	18	50	4
	2 mm CERACUBE/TRION-Z PMMA	TWBE2020-050-N200S04(TRION-Z)	-	2	1	7	20	50	4

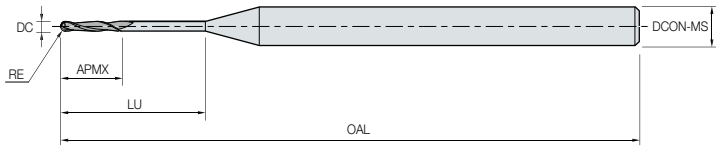
DENTIUM Type

Metric | 2 | H·A 30° | Grade PC2010 PC2510 (PVD) | Grade ND3000 (DIA) | h5 shank

DC	Tolerance
Ø0.5 ~ Ø2.5	0 ~ -0.02 0 ~ -0.015







(mm)

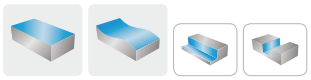
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.5mm RAINBOW	TZBE2005-050-N080S06(DENTIUM)	ND3000	0.5	0.25	2	8	50	6
	1mm RAINBOW	TZBE2010-050-N160S06(DENTIUM)	ND3000	1	0.5	3	16	50	6
	2mm RAINBOW	TZBE2020-050-N180S06(DENTIUM)	ND3000	2	1	6	18	50	6
	0.5mm RAINBOW-MILL	TZBE2005-043-N080S03(DENTIUM)	ND3000	0.5	0.25	2	8	43	3
	1mm RAINBOW-MILL	TZBE2010-050-N160S03(DENTIUM)	ND3000	1	0.5	3	16	50	3
	2mm RAINBOW-MILL	TZBE2020-050-N180S03(DENTIUM)	ND3000	2	1	6	18	50	3
	0.5mm RAINBOW-MILL Zr 2ND	TZBE2005-045-N080S04(DENTIUM)	ND3000	0.5	0.25	2	8	45	4
	1mm RAINBOW-MILL Zr 2ND	TZBE2010-045-N160S04(DENTIUM)	ND3000	1	0.5	3	16	45	4
	2.5mm RAINBOW-MILL Zr 2ND	TZBE2025-045-N180S04(DENTIUM)	ND3000	2.5	1.25	6	18	45	4
PMMA	0.5mm RAINBOW PMMA	TWBE2005-050-N080S06(DENTIUM)	-	0.5	0.25	2	8	50	6
	1mm RAINBOW PMMA	TWBE2010-050-N160S06(DENTIUM)	-	1	0.5	3	16	50	6
	2mm RAINBOW PMMA	TWBE2020-050-N180S06(DENTIUM)	-	2	1	6	18	50	6
	1mm RAINBOW-MILL PMMA	TWBE2010-050-N160S03(DENTIUM)	-	1	0.5	3	16	50	3
	2mm RAINBOW-MILL PMMA	TWBE2020-050-N180S03(DENTIUM)	-	2	1	6	18	50	3
	1mm RAINBOW-MILL Zr 2ND PMMA	TWBE2010-045-N160S04(DENTIUM)	-	1	0.5	3	16	45	4
	2.5mm RAINBOW-MILL Zr 2ND PMMA	TWBE2025-045-N180S04(DENTIUM)	-	2.5	1.25	6	18	45	4
Titanium/ Co-Cr	1mm RAINBOW TITAN	TTBE2010-050-N100S06(DENTIUM)	PC2010/ PC2510	1	0.5	2	10	50	6
	1.5mm RAINBOW TITAN	TTBE2015-050-N100S06(DENTIUM)		1.5	0.75	3	10	50	6
	2mm RAINBOW TITAN	TTBE2020-050-N120S06(DENTIUM)		2	1	4	12	50	6
	3mm RAINBOW TITAN	TTBE2030-050-N120S06(DENTIUM)		3	1.5	6	12	50	6
HYBRID	0.6mm RAINBOW ULTIMATE	ETRE006050-H6M325-D	Electronic Deposition DIA	0.6	0.3	6	6	50	6
	1mm RAINBOW ULTIMATE	ETRE010050-H6M170-D		1	0.5	10	10	50	6
	2mm RAINBOW ULTIMATE	ETRE020050-H6M120-D		2	1	12	12	50	6
	0.6mm RAINBOW-MILL ULTIMATE	ETRE006040-H3M325-D		0.6	0.3	6	6	40	3
	1mm RAINBOW-MILL ULTIMATE	ETRE010045-H3M170-D		1	0.5	10	10	45	3
	2mm RAINBOW-MILL ULTIMATE	ETRE020045-H3M120-D		2	1	12	12	45	3
	0.6mm RAINBOW-MILL Zr 2ND ULTIMATE	ETRE006045-H4M325-D		0.6	0.3	6	6	45	4
	1mm RAINBOW-MILL Zr 2ND ULTIMATE	ETRE010045-H4M170-D		1	0.5	10	10	45	4
	2mm RAINBOW-MILL Zr 2ND ULTIMATE	ETRE020045-H4M120-D		2	1	12	12	45	4

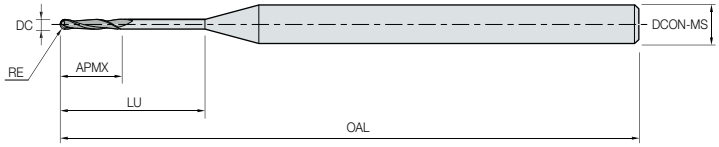
DOF Type

Metric | 2 | H·A 30° | Grade ND3000 DIA | h5 shank

DC	Tolerance
Ø1 ~ Ø2	0 ~ -0.02 0 ~ -0.015







(mm)

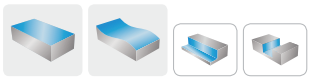
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	1 mm DOF	TZBE2010-044-N19(DOF)	ND3000	1	0.5	6	19	44	3
	2 mm DOF	TZBE2020-044-N20(DOF)	ND3000	2	1	8	20	44	3
PMMA	1 mm DOF PMMA	TWBE2010-044-N19(DOF)	-	1	0.5	6	19	44	3
	2 mm DOF PMMA	TWBE2020-044-N20(DOF)	-	2	1	8	20	44	3

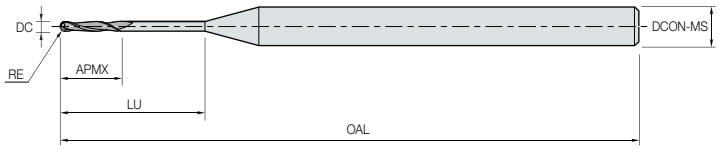
ELBEN Type

Metric | 2 | H·A 30° | Grade PC2010 PC2510 PVD | Grade ND3000 DIA | h5 shank

DC	Tolerance
Ø0.6 ~ Ø3	0 ~ -0.02 0 ~ -0.015







(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.6 mm ELBEN	TZBE2006-043-N080S06(ELBEN)	PC2510	0.6	0.3	1.2	8	43	6
	1 mm ELBEN	TZBE2010-050-N160S06(ELBEN)	ND3000	1	0.5	3	16	50	6
	2 mm ELBEN	TZBE2020-050-N200S06(ELBEN)	ND3000	2	1	6	20	50	6
PMMA	1 mm ELBEN PMMA	TWBE2010-050-N160S06(ELBEN)	-	1	0.5	3	16	50	6
	2 mm ELBEN PMMA	TWBE2020-050-N200S06(ELBEN)	-	2	1	6	20	50	6
Titanium/ Co-Cr	1 mm ELBEN TiTAN	TTBE2010-045-N050S06(ELBEN)	PC2010/ PC2510	1	0.5	2	5	45	6
	2 mm ELBEN TiTAN	TTBE2020-045-N120S06(ELBEN)		2	1	4	12	45	6
	3 mm ELBEN TiTAN	TTBE2030-045-N150S06(ELBEN)		3	1.5	6	15	45	6

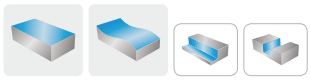
CEREC Type

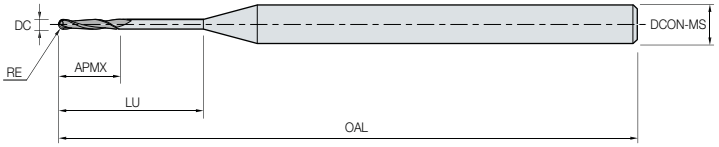
(MC-XL)

Metric | 2 | H·A 30° | Grade ND3000 DIA | h5 shank

DC	Tolerance
Ø0.9 ~ Ø1.73	0 ~ -0.02 0 ~ -0.015







(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
HYBRID	MC-XL12	ETRE018038-T35M230-12	Electronic Deposition DIA	1.73	0.865	8	12	38.1	3.5
	MC-XL12S	ETRE009038-T35M230-12S		0.9	0.45	4	12	38.1	3.5

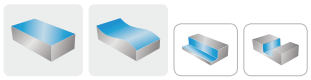
UGINT Type

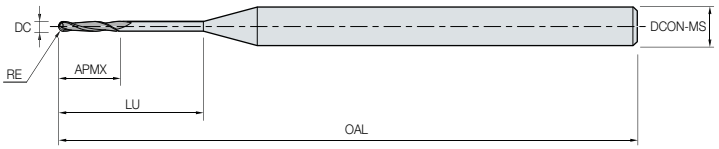
(D-100, D-200)

Metric | 2 | H·A 30° | Grade PC2010 PC2510 PVD | Grade ND3000 DIA | h5 shank

DC	Tolerance
Ø0.7 ~ Ø2	0 ~ -0.02 0 ~ -0.015







(mm)

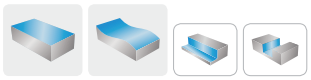
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.7mm D-100	TZBE2007-040-N145S03(D-100)	PC2510	0.7	0.35	2.5	14.5	40	3
	1mm D-100	TZBE2010-040-N145S03(D-100)	ND3000	1	0.5	5	14.5	40	3
	2mm D-100	TZBE2020-040-N160S03(D-100)	ND3000	2	1	4	16	40	3
	0.6mm D-200	TZBE2006-043-N080S06(D-200)	PC2510	0.6	0.3	1.2	8	43	6
	1mm D-200	TZBE2010-050-N160S06(D-200)	ND3000	1	0.5	3	16	50	6
	2mm D-200	TZBE2020-050-N200S06(D-200)	ND3000	2	1	6	20	50	6
PMMA	1mm D-100 PMMA	TWBE2010-040-N145S03(D-100)	-	1	0.5	5	14.5	40	3
	2mm D-100 PMMA	TWBE2020-040-N160S03(D-100)	-	2	1	4	16	40	3
	1mm D-200 PMMA	TWBE2010-050-N160S06(D-200)	-	1	0.5	3	16	50	6
	2mm D-200 PMMA	TWBE2020-050-N200S06(D-200)	-	2	1	6	20	50	6
Titanium/ Co-Cr	1.5mm D-200 TiTAN	TTBE2015-050-N100S06(D-200)	PC2010/ PC2510	1.5	0.75	7.4	10	50	6
	2mm D-200 TiTAN	TTBE2020-050-N120S06(D-200)		2	1	7.6	12	50	6

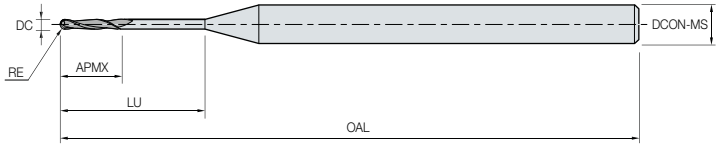
PISTIS Type

Metric | 2 | H·A 30° | Grade PC2010 PC2510 PVD | h5 shank

DC	Tolerance
Ø1 ~ Ø3	0 ~ -0.02 0 ~ -0.015







(mm)

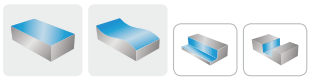
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
Co-Cr	1mm PISTIS TiTAN	TTBE2010-049-N082S06(PISTIS)	PC2510	1	0.5	3	8.2	49	6
	1.5mm PISTIS TiTAN	TTBE2015-050-N102S06(PISTIS)	PC2510	1.5	0.75	3.5	10.2	50	6
	2mm PISTIS TiTAN	TTBE2020-050-N120S06(PISTIS)	PC2510	2	1	4	12	50	6
	3mm PISTIS TiTAN	TTBE2030-051-N120S06(PISTIS)	PC2510	3	1.5	5.5	12	51	6

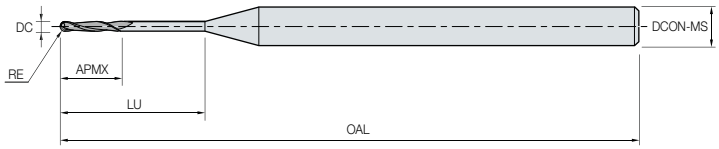
DMG Type

Metric | 2 | H·A 30° | Grade PC2010 PC2510 PVD | h5 shank

DC	Tolerance
Ø1 ~ Ø3	0 ~ -0.02 0 ~ -0.015







(mm)

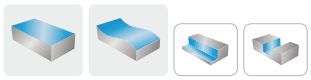
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
Titanium/ Co-Cr	1mm DMG TiTAN	TTBE2010-050-N080S06(DMG)	PC2010/ PC2510	1	0.5	1.2	8	50	6
	1.5mm DMG TiTAN	TTBE2015-050-N080S06(DMG)		1.5	0.75	4	8	50	6
	2mm DMG TiTAN	TTBE2020-050-N120S06(DMG)		2	1	5	12	50	6
	3mm DMG TiTAN	TTBE2030-050-N140S06(DMG)		3	1.5	8	14	50	6

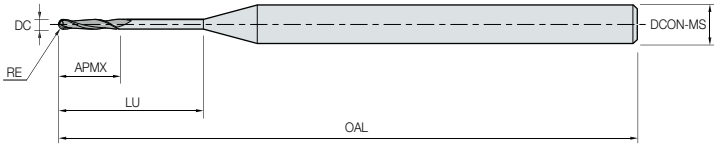
MY CAM Type

Metric | 2 | H·A 30° | Grade PC2010 PC2510 PVD | h5 shank

DC	Tolerance
Ø1 ~ Ø3	0 ~ -0.02 0 ~ -0.015







(mm)

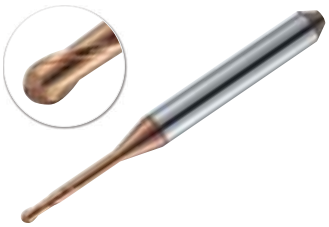
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
Titanium/ Co-Cr	1mm MYCAM TiTAN	TTBE2010-045-N040S06(MYCAM)	PC2010/ PC2510	1	0.5	2	4	45	6
	3mm MYCAM TiTAN	TTBE2030-050-N160S06(MYCAM)		3	1.5	4	16	50	6

Dental Plus Type

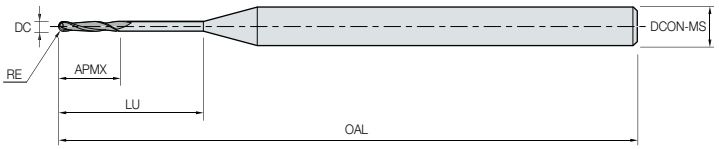
(BX-4)

Metric | 2 | 3 | H·A 30° | Grade PC2010 PC2510 PVD | h5 shank

DC	Tolerance
Ø1.5 ~ Ø3	0 ~ -0.02 0 ~ -0.015







(mm)

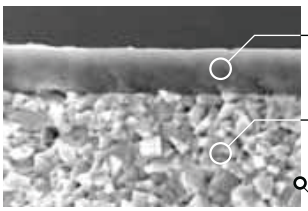
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
Titanium/ Co-Cr	1.5mm BX-4 TiTAN	TTBE2015-040-N120S04(BX-4)	PC2010/ PC2510	1.5	0.75	4	12	40	4
	2mm BX-4 TiTAN	TTBE2020-040-N120S04(BX-4)		2	1	5	12	40	4
	3mm BX-4 TiTAN	TTBE3030-040-N120S04(BX-4)		3	1.5	6	12	40	4

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

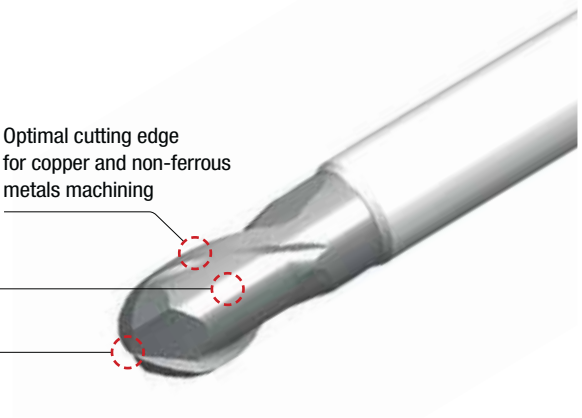
Features



PC210C

Coating layer (K-Silver)
: Enhancing wear resistance and lubrication

Substrate
: Optimal for wear and chipping resistance



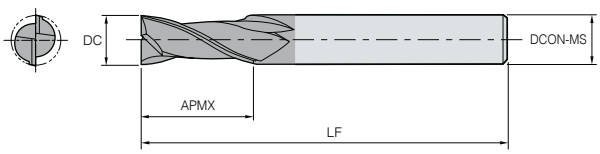
CFE2000

Flat

Metric | 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

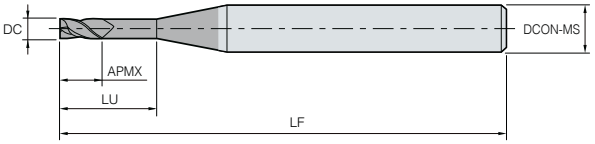
CFNE2000

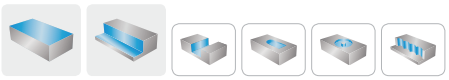
Flat



Metric | 2 | H·A 30° | Grade PC210C

DC	Tolerance
Ø0.5 ~ Ø6	0.00 ~ 0.01
Ø8 ~ Ø12	0.00 ~ 0.02





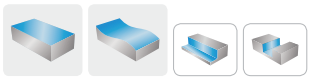
(mm)

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

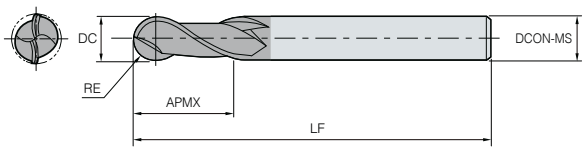
Ball





Metric | 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

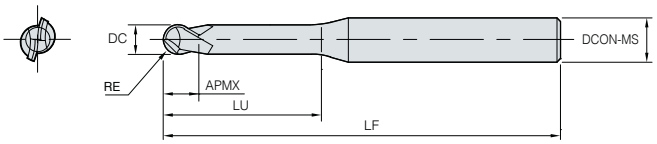
Long neck type ball

Metric | 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

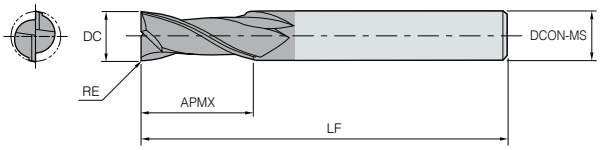
Radius





Metric | 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

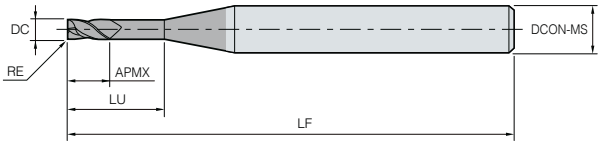
CRNE2000

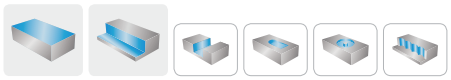
Long neck type radius

Metric | 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

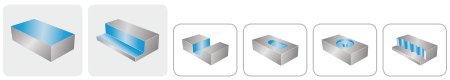
PCD Endmill

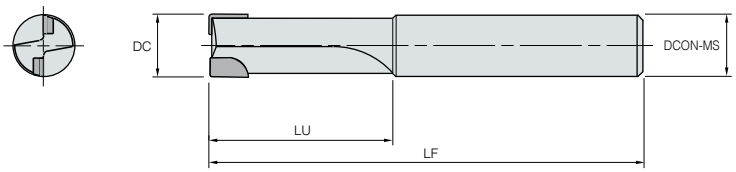
- Longer tool life and good surface roughness
- Reducing burrs at non-ferrous metals machining
- 1000 type: Ultra finishing for non-ferrous metals
- 2000 type: Optimal for aluminum alloy, carbon steel, graphite and reinforced Plastic machining

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



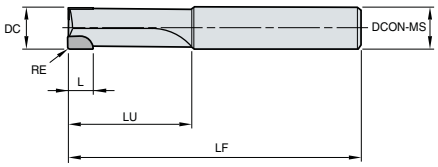


Fig. 1

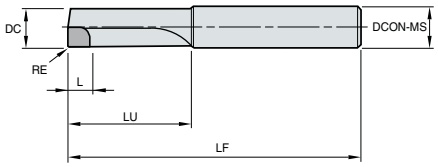
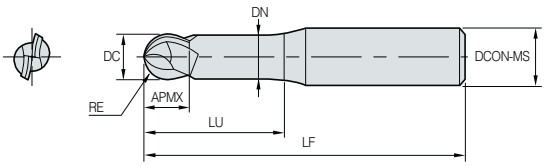


Fig. 2

Designation	Fig	NOF	mm					
			DC	DCON-MS	RE	L	LU	LF
PDES								

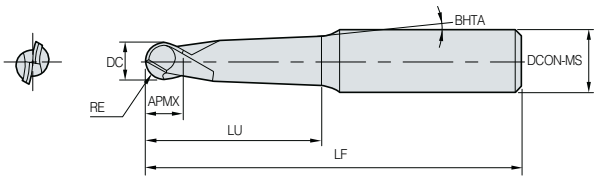
※ Depending on customer requests, we can make special Endmill





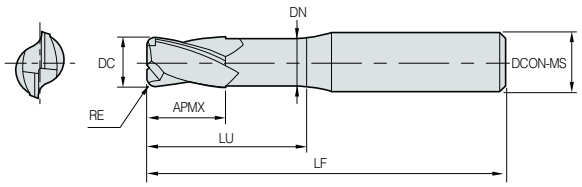
Designation	NOF	RE	DC	DCON-MS	DN	APMX	LU	LF





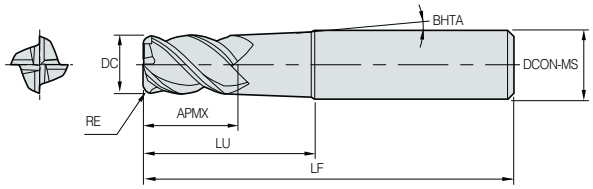
Designation	NOF	RE	DC	DCON-MS	DN	APMX	LU	LF





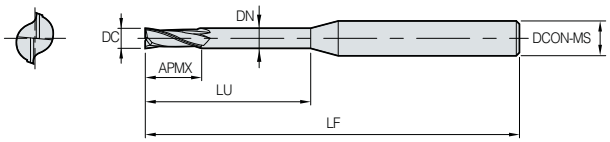
Designation	NOF	DC	DCON-MS	DN	RE	APMX	LU	LF



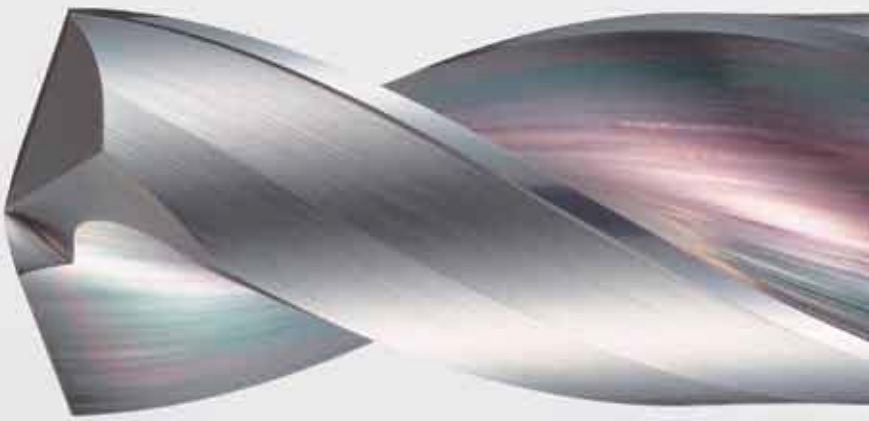


Designation	NOF	RE	DC	DCON-MS	APMX	LU	LF	BHTA(°)





Designation	NOF	DC	DCON-MS	DN	APMX	LU	LF



C PART

DRILL

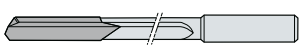
Korloy drills provide a total solution for hole making,
based on tooling know-how as well as extensive research and
development for our tools.



Technical information for DRILLS

C2	KORLOY Drill	C67	Burninshing Drill
C5	MSD Plus	C68	PCD Drill
C10	MSD Plus-S	C71	Gun Drill
C19	MSD Plus for CFRP	C77	Chucking / Machine Reamer
C21	MSFD	C79	PCD Reamer
C28	MLD Plus	C80	Cermet Reamer
C32	P-Star Drill	C80	Broach Reamer
C59	W-Star Drill	C81	Chamfer Tool
C64	SSD-N	C84	Counter Sink

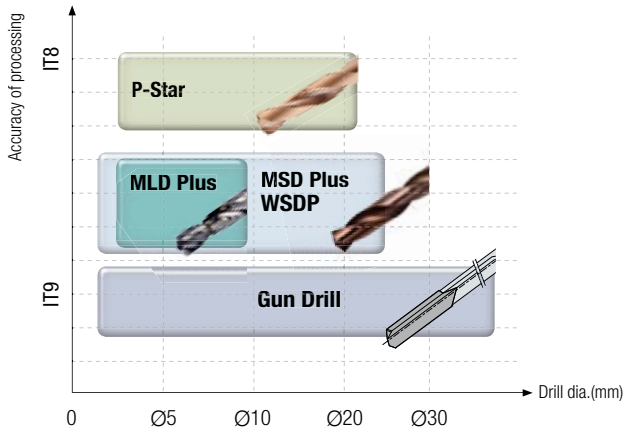
Solid Drill

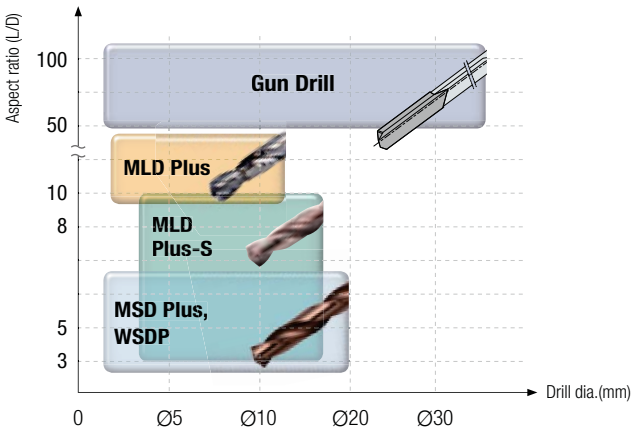
Type	Designation		Picture	Unit	Range	Aspect ratio	Page
Carbide coated solid drill	MSD Plus	MSDPH		Metric	Ø2.5 ~ Ø20.0	3D ~ 7D	C6
	MSD Plus-S	MSDPH-S		Metric	Ø3.0 ~ Ø16.0	3D ~ 10D	C11
	MSD Plus for CFRP	MSDP-C		Inch	3/16 ~ 1/2	5D	C20
				Metric	Ø3.0 ~ Ø12.7		
	MSFD	MSFD		Metric	Ø2.5 ~ Ø16.0	2D	C22
		MSFDH		Metric	Ø2.5 ~ Ø16.0	3D	C25
	MLD Plus	MLD		Metric	Ø3.0 ~ Ø10.0	10D ~ 25D	C29
	P-Star Drill	HP503		Inch	Ø0.1181 ~ Ø0.6299	3D	C34
				Metric	Ø3.0 ~ Ø16.0		
		HPI503		Inch	Ø0.1181 ~ Ø0.7874	3D	C37
				Metric	Ø3.0 ~ Ø20.0		
		HPI505		Inch	Ø0.1181 ~ Ø0.7874	5D	C41
				Metric	Ø3.0 ~ Ø20.0		
		HPI508-N		Inch	Ø0.1181 ~ Ø0.7874	8D	C46
				Metric	Ø3.0 ~ Ø20.0		
		P503A(F)		Metric	Ø3.0 ~ Ø20.0	3D	C50
		PI503A(F)		Metric	Ø3.0 ~ Ø20.0	3D	C53
		PI505A(F)		Metric	Ø4.0 ~ Ø20.0	5D	C56
	W-Star Drill	WSDP		Metric	Ø1.0 ~ Ø20.0	5D, 7D	C60
	SSD-N	SSD-N		Metric	Ø1.0 ~ Ø13.0	-	C65
	Burnishing Drill	BDS		Metric	Ø4.0 ~ Ø16.0	5D ~ 7D	C67
		BDT		Metric	Ø4.2 ~ Ø10.3	2D ~ 4D	C67
	PCD Drill	PDD		Metric	Ø5.0 ~ Ø12.0	5D	C68
		CPD		Metric	Ø2.0 ~ Ø8.0	3D ~ 5D	C69
		CPDL		Metric	Ø2.0 ~ Ø8.0	12D ~ 45D	C69
		SPD		Metric	Ø4.0 ~ Ø16.0	4D ~ 5D	C70
	Gun Drill	KGDS		Metric	Ø3.0 ~ Ø33.0	50D ~ 100D	C75
		KGDT		Metric	Ø6.0 ~ Ø26.5	50D ~ 100D	C76

Reamer / Chamfer

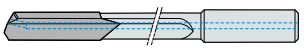
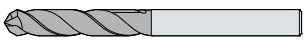
Type	Designation		Picture	Unit	Range	Aspect ratio	Page
Reamer	Chucking, Machine Reamer	SCRS		Metric	Ø5.0 ~ Ø20.0	2D ~ 3D	C77
		SCRH		Metric	Ø5.0 ~ Ø20.0	2D ~ 3D	C77
		TCRS		Metric	Ø7.0 ~ Ø30.0	2D ~ 3D	C78
		TMRS		Metric	Ø7.0 ~ Ø30.0	3D ~ 5D	C78
	PCD Reamer	PDR		Metric	Ø5.0 ~ Ø20.0	3D ~ 5D	C79
	Cermet Reamer	KCR		Metric	Ø6.0 ~ Ø30.0	3D ~ 7D	C80
	Broach Reamer	HBRE		Metric	Ø3.0 ~ Ø25.0	3D ~ 7D	C80
Chamfer	Chamfer Tool	CET		Metric	Ø3.0 ~ Ø16.0	-	C81
		CCT		Metric	Ø3.0 ~ Ø12.0	-	C82
	Counter Sink	CSPC		Metric	Ø6.0 ~ Ø20.0	-	C84
		CSNC		Metric	Ø10.0 ~ Ø30.0	-	C84
		CSNC		Metric	Ø10.0 ~ Ø30.0	-	C85
		CSHC		Metric	Ø10.0 ~ Ø30.0	-	C85
		CSPH		Metric	Ø6.3 ~ Ø25.0	-	C86
		CSNH		Metric	Ø10.0 ~ Ø50.0	-	C86
		CSNH		Metric	Ø10.0 ~ Ø50.0	-	C87
		CSHH		Metric	Ø10.0 ~ Ø50.0	-	C87

Application range





Solid drill Line-up and features

Workpiece	Use	Product name	Coolant	Range	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
	General	MSD Plus	Central/ peripheral	Ø2.5~20.0 (h7)	3D~7D		• High efficiency machining for various workpiece machining such as automobile components
		MLD Plus (Long drill)	Central	Ø3.0~10.0 (h7)	10D~25D		• For deep drilling with high efficiency and high quality
		W-Star Drill (WSDP)	Peripheral	Ø1.0~20.0 (h7)	5D, 7D		• High efficient and economic drill
		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.
		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
	Non-ferrous metal, Aluminum	SSD-N	Peripheral	Ø1.0~13.0 (h7)	-		• Non-coated drill for non-ferrous steel and mild steel
		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

MSDP
MSDPH(Oil hole)

Drill dia.
040 : Ø4.0 mm
(One decimal point 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

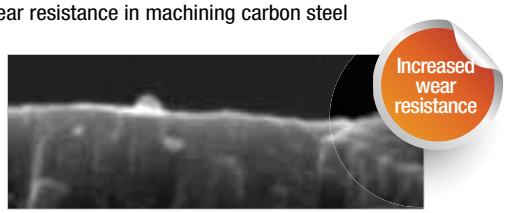
Overall length
100L : 100 mm

Shank dia.
5S : Ø5 mm

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

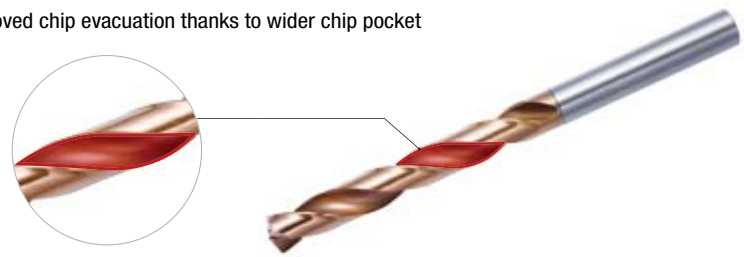
- Increased welding resistance and lower cutting load
- Reduced frictional resistance at cutting edges and on the flute



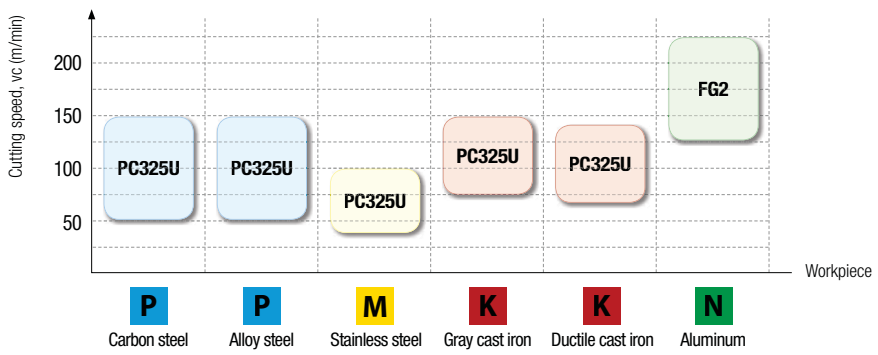
PC325U Competitor

Flute shape

- Improved chip evacuation thanks to wider chip pocket

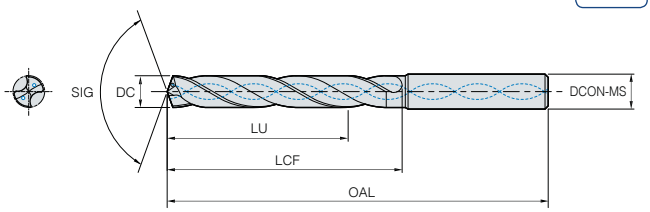


Application range



MSDPH-□(P/M/K/N)





Metric

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

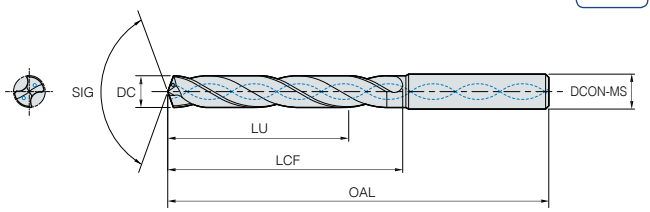
MSDPH-□(P/M/K/N)

Metric

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



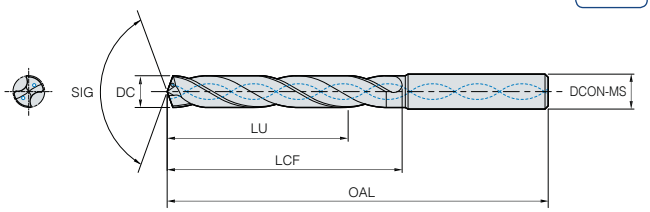


(mm)

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)





Metric

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			

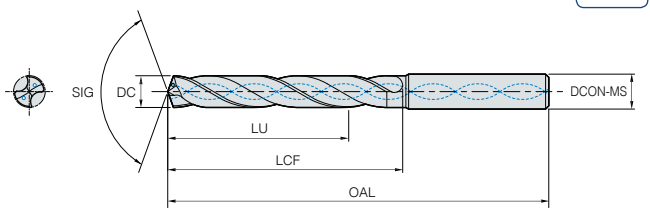
P Steel M Stainless steel K Cast iron N Non-ferrous metal

(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)





Metric

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

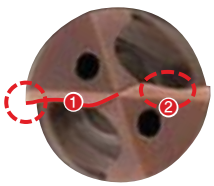
Code system

Special type

MSDP(H)	060	-	5	S	-	100L	-	5S
MSDP **MSDPH**(Oil hole)	**Drill dia.** 060 : Ø6.0 mm		**Standard type** Aspect ratio (L/D) 3D, 5D **Special type** Flute length 50 : 50 mm	**Machining area** S : HRSA		**Overall length** 100L : 100 mm		**Shank dia.** 5S : Ø5 mm

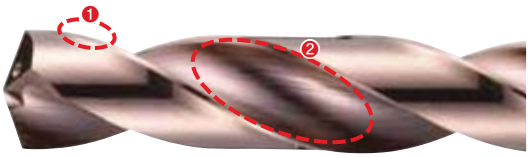
Features

- Notch-controlled blade design and specially treated cutting edges prevent chipping and breakage



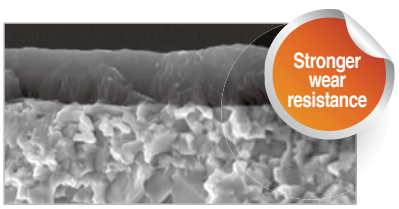
① Cutting edges designed for low cutting resistance
② Tip relief angle and shape optimized for heat evacuation

- Optimized margin and back-tapered design

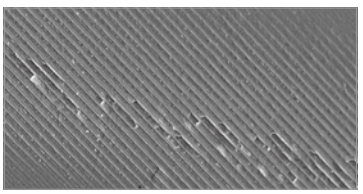


① Reduced friction resistance and cutting temperature
② Wider chip pockets improve chip evacuation

- 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

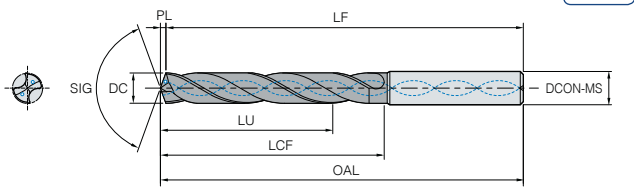


Smooth coating surface



MSDPH-S(3D, 5D)





Metric

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

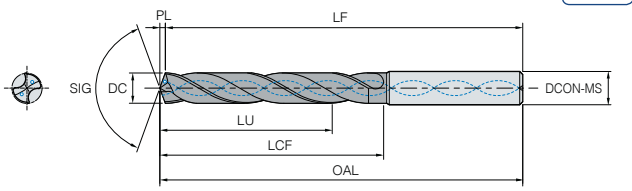
S Heat resistant alloy, Titanium alloy

(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)





Metric

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

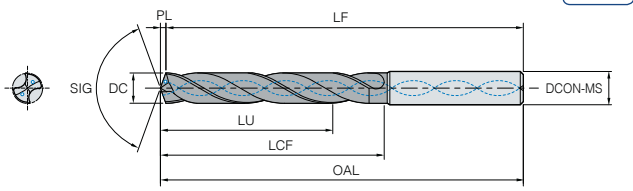
S Heat resistant alloy, Titanium alloy

(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)





Metric

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

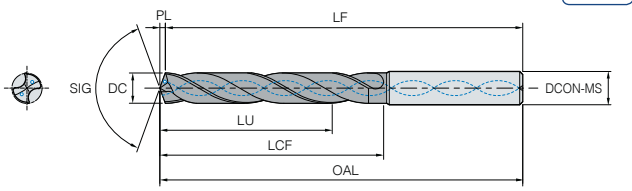
S Heat resistant alloy, Titanium alloy

(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-□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)





Metric

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

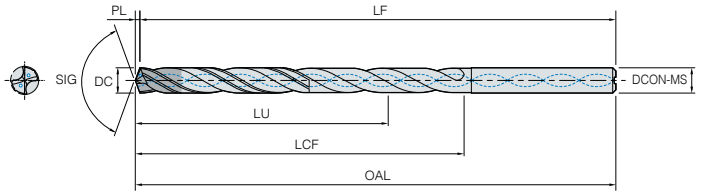
S Heat resistant alloy, Titanium alloy

(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)





Metric

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

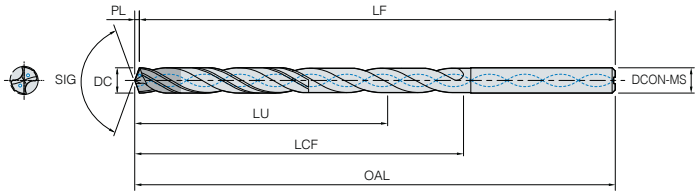
S Heat resistant alloy, Titanium alloy

(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)





Metric

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

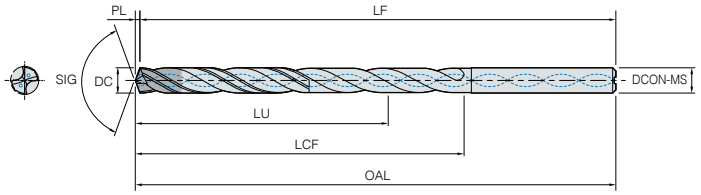
S Heat resistant alloy, Titanium alloy

(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)





Metric

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

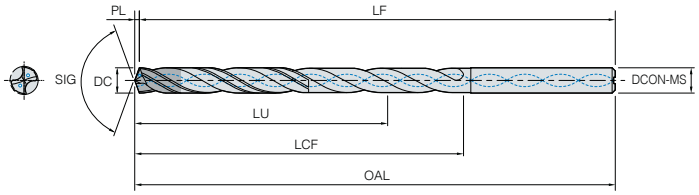
S Heat resistant alloy, Titanium alloy

(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)





Metric

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

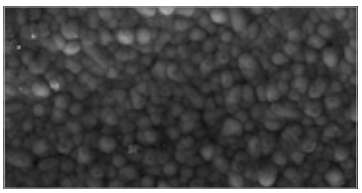
Code system

Special type

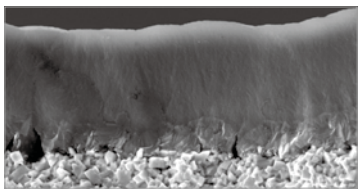
MSDP	060	-	5	C	-	100L	-	6S
Mach Solid Drill Plus	**Drill dia.** 060 : Ø6.0 mm (One decimal point marked)		**Standard type** Aspect ratio (L/D) **Special type** Flute length 100 : 100 mm	**Machining area** C : CFRP		**Overall length** 100L : 100 mm		**Shank dia.** 6S : Ø6 mm

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

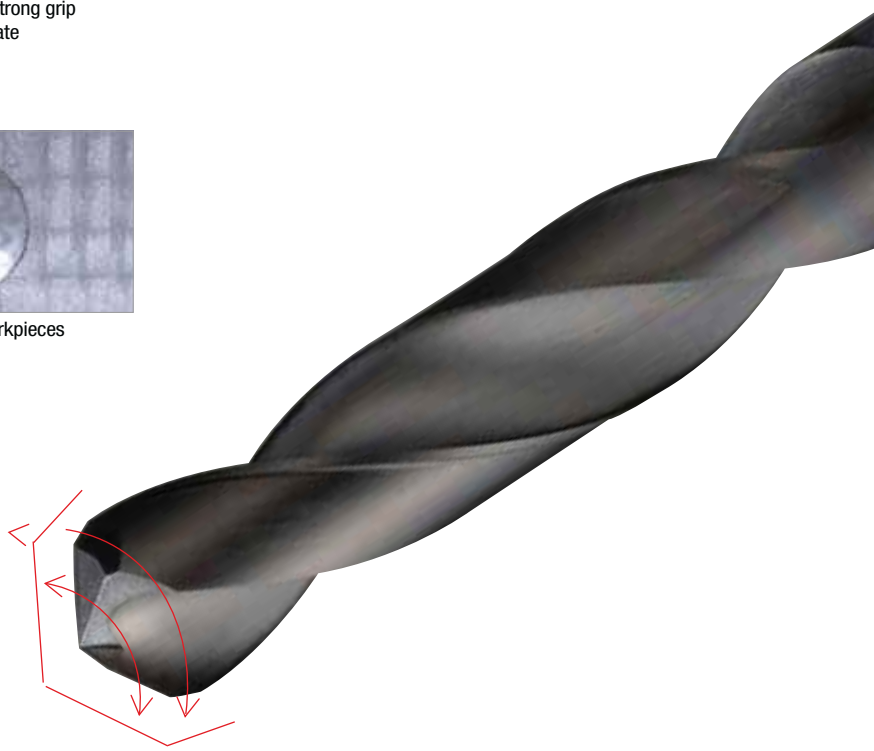


Fewer burrs on workpieces

- 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

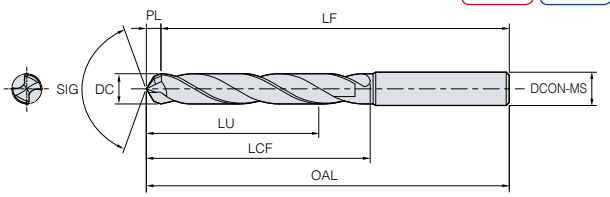


ND2100



MSDP-5C





Inch Metric

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		
		inch	mm		LU	LCF	OAL
MSDP	030	-	3	6	15	28.7	66
	040	-	4	6	20	37.2	74
	0476	3/16	4.76	6	23.8	45.5	82
	050	-	5	6	25	45.6	82
	060	-	6	6	30	46	82
	0635	1/4	6.35	8	31.75	55.2	91
	070	-	7	8	35	55.4	91
	0794	5/16	7.94	8	39.7	55.8	91
	080	-	8	8	40	55.9	91
	090	-	9	10	45	64.3	103
	0952	3/8	9.52	10	47.6	64.5	103
	100	-	10	10	50	64.7	103
	110	-	11	12	55	75.1	118
	1111	7/16	11.11	12	55.55	75.2	118
	120	-	12	12	60	75.5	118
	127	1/2	12.7	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

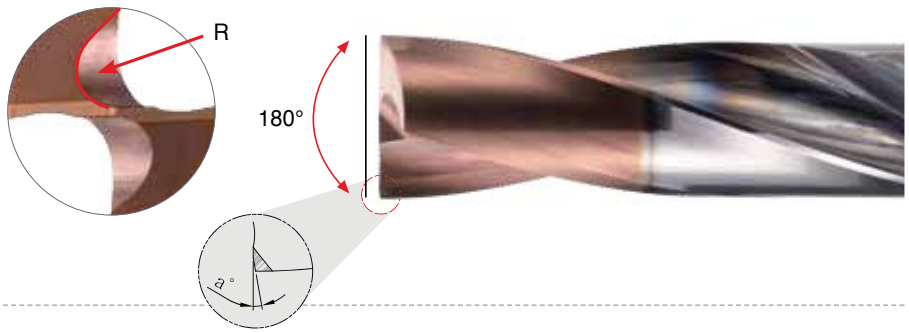
Code system

Special type

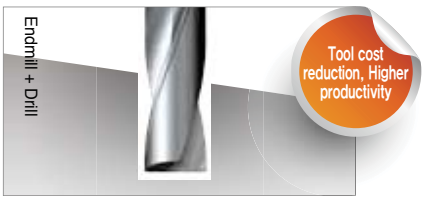
MSFD(H)	060	-	2	P	-	100L	-	6S
MSFD **MSFDH**(Oil hole)	**Drill dia.** 060 : Ø6.0 mm (One decimal point marked)		**Standard type** Aspect ratio (L/D) 2D, 3D **Special type** Flute length 100 : 100 mm	**Machining area** P : General - Carbon steel, alloy steel		**Overall length** 100L : 100 mm		**Shank dia.** 6S : Ø6 mm

Features

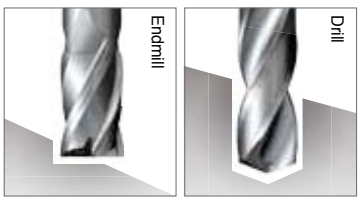
- Excellent straightness with its 180° - point angle when drilling on ramped surface
- Stronger resistance to chipping through corner chamfering
- Widened chip pockets by the use of 'R' shape on the thinning part



- Multi-functional capability - end milling and drilling using a single MSFD



MSFD



Conventional tools application example

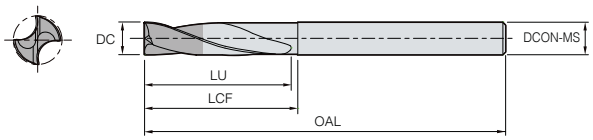
MSFD-2P

Metric

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



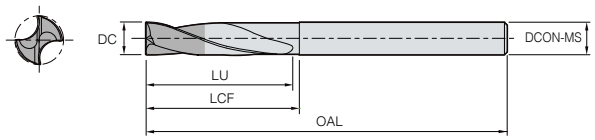


(mm)

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





Metric

Terminology	P
Grade	PC325U
Tolerance(drill Dia.)	H7
Tolerance(shank Dia.)	h6
Point angle(SIG)	180°
Twist angle	20°
Thinning	R type
Coolant	External

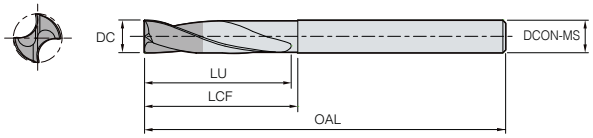
P Steel

(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





Metric

Terminology	P
Grade	PC325U
Tolerance(drill Dia.)	H7
Tolerance(shank Dia.)	h6
Point angle(SIG)	180°
Twist angle	20°
Thinning	R type
Coolant	External

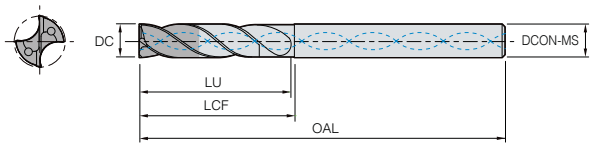
P Steel

(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





Metric

Terminology	P
Grade	PC325U
Tolerance(drill Dia.)	H7
Tolerance(shank Dia.)	h6
Point angle(SIG)	180°
Twist angle	30°
Thinning	R type
Coolant	Through

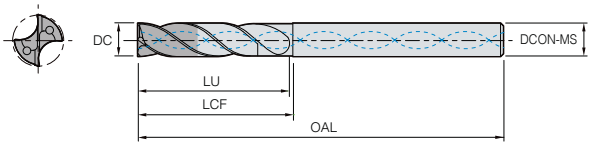
P Steel

(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





Metric

Terminology	P
Grade	PC325U
Tolerance(drill Dia.)	H7
Tolerance(shank Dia.)	h6
Point angle(SIG)	180°
Twist angle	30°
Thinning	R type
Coolant	Through

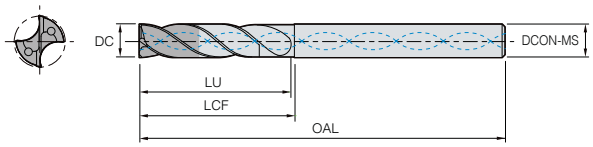
P Steel

(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





Metric

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.
0600 : Ø6.00 mm (Two decimal points marked)

Standard type
Aspect ratio (L/D)
10D, 15D, 20D, 25D

Special type
Flute length
100 : 100 mm

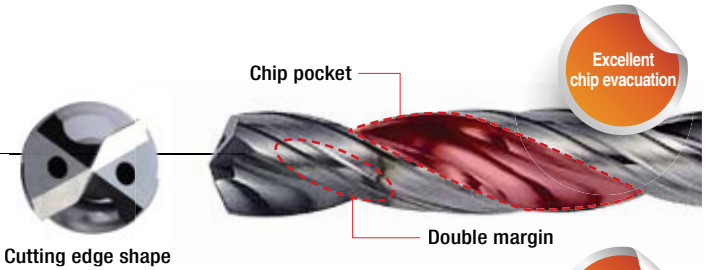
Machining area
P: Carbon steel, alloy steel
K: Cast iron
N: Aluminum, copper alloy

Overall length
100L : 100 mm

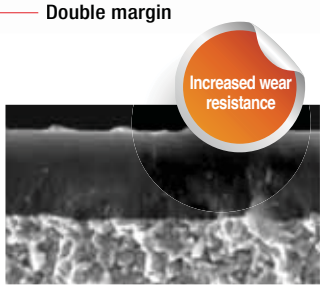
Shank dia.
10S : Ø10 mm

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



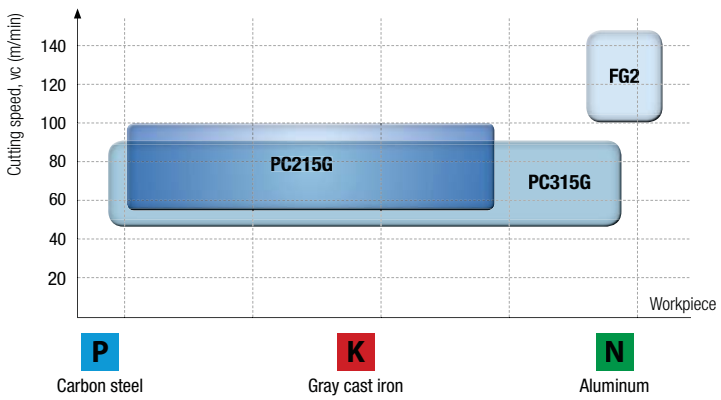
- New grade (PC315G)
  - Ultra-fine substrate and new coating applied
  - Lubricative coating layer improves chip evacuation with lower frictional resistance
  - Longer tool life due to higher wear resistance



PC315G

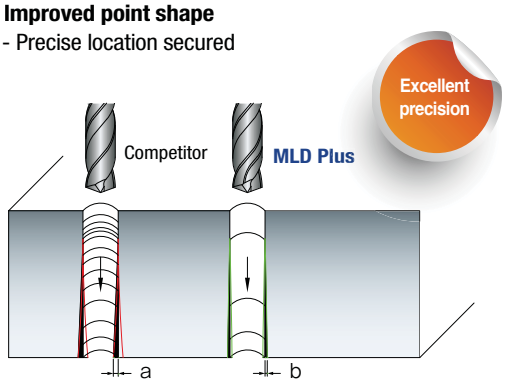
Application range

- **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]

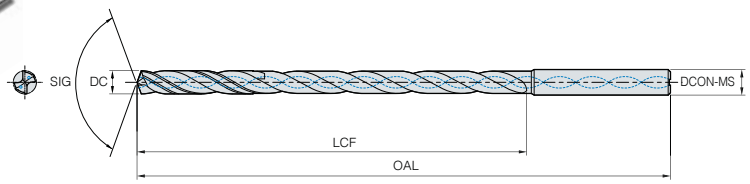
- **Improved machining precision**
  - Bent holes reduced, Inside hole surface roughness improved
  - Hole size uniformity increased
- **Improved point shape**
  - Precise location secured



Reduced bent holes compared to competitors (a > b)

MLD-□□(P/K/N)





Metric

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		

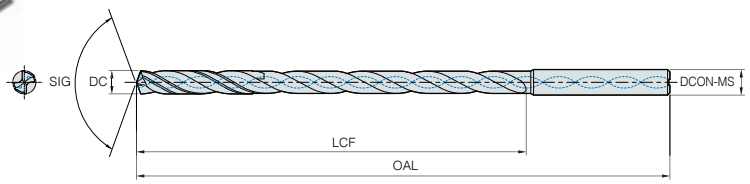
P Steel K Cast iron N Non-ferrous metal

(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)





Metric

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

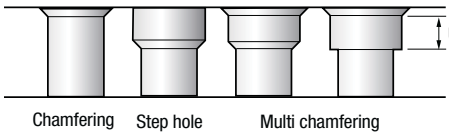
(mm)

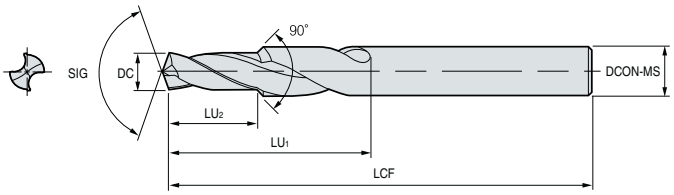
Designation		DC	DCON-MS	10P, K, N		15P, K, N		20P, K, N		25P, K, N	
				LCF	OAL	LCF	OAL	LCF	OAL	LCF	OAL
MLD	0700N - □□P,K,N	7	7	90	140	125	175	160	210	200	250
	0710N - □□P,K,N	7.1	8	100	155	135	195	170	230	-	-
	0720N - □□P,K,N	7.2	8	100	155	135	195	170	230	-	-
	0730N - □□P,K,N	7.3	8	100	155	135	195	170	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

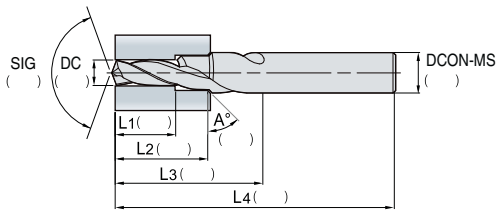
MSDP(H)S Drill dia. Effective flute length - Flute length Overall length - Shank dia.

Oil hole type : MSDPHS	DC	LU_1	LU_2	LCF	DCON-MS

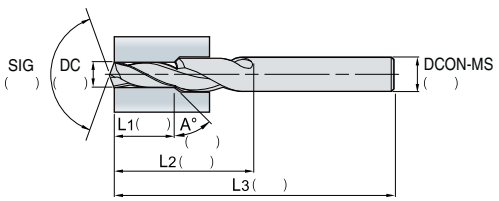




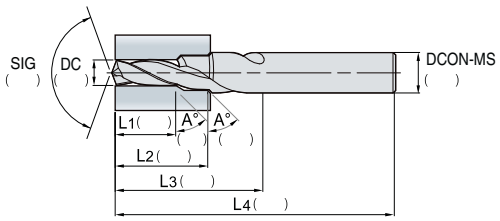
☐ **Multi chamfering** (Coolant : Internal☐/ External☐)



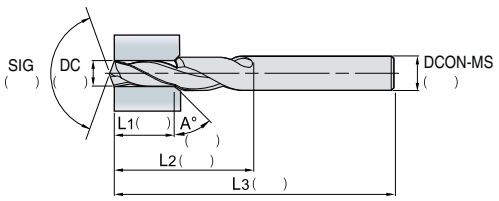
☐ **Step hole** (Coolant : Internal☐/ External☐)



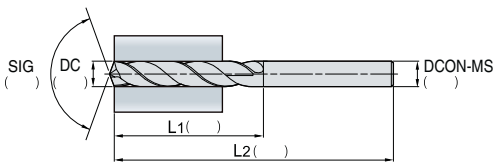
☐ **Multi chamfering** (Coolant : Internal☐/ External☐)



☐ **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	030
P-Star Drill P: Power max. (General) S: Spiral Coolant HP: High Precision	**Appearance** F: Facet Point I: Internal Coolant	**Drilling depth** 503: 3×D 505: 5×D 508: 8×D 510: 10×D 520: 20×D	**Shank type** A: Plane F: DIN 6535 HE	**Cutting dia.** 030: 3 mm 200: 20 mm

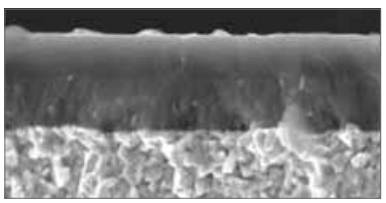
Features

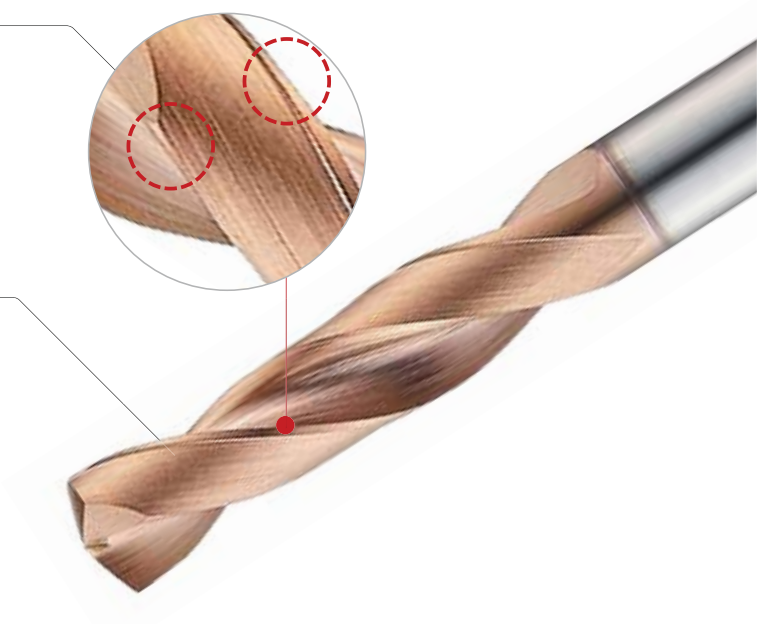
[Features of drill]

- High chipping resistance with high feed by using the high toughness material
- Toughening the surface hardness with heat resistance by applying to TiAlN coating
- Improvement of process-ability by decreasing friction by using the internal coolant series

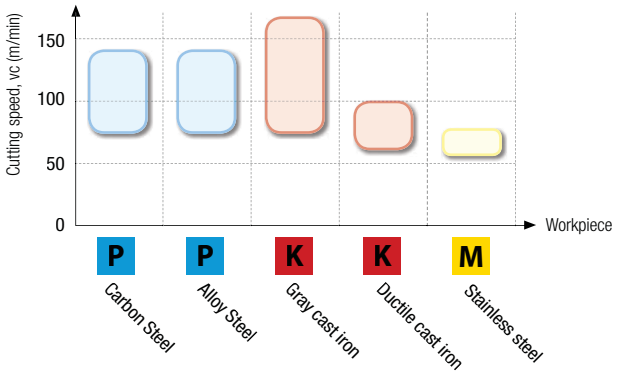
[Features of substrate/grade]

- Toughening the straightness and hole surface roughness by applying double margin
- Toughening the chip emission by applying wide chip pocket
- Improvement of processing with versatility which the customer can choose between the external and internal coolant depending on the drilling depth





Application range



EDP. NO. INCH : ◆ METRIC : ◇	Flute	Feature		Length					Internal Coolant	Margin Type	Tolerance D	Diameter range(∅)	
		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

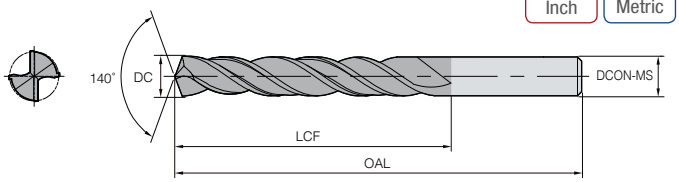
Line-up

Designation	Picture	Product name	Unit	Range	page
HP503		DIN 6537K Double margin drill - 3×D	Inch	∅0.1181 ~ ∅0.6299	C34~C36
			Metric	∅3.0 ~ ∅16.0	
HPI503		DIN 6537K Double margin internal coolant drill - 3×D	Inch	∅0.1181 ~ ∅0.7874	C37~C40
			Metric	∅3.0 ~ ∅20.0	
HPI505		DIN 6537L Double margin internal coolant drill - 5×D	Inch	∅0.1181 ~ ∅0.7874	C41~C45
			Metric	∅3.0 ~ ∅20.0	
HPI508-N		Double margin internal coolant drill - 8×D	Inch	∅0.1181 ~ ∅0.7874	C46~C49
			Metric	∅3.0 ~ ∅20.0	
P503A(F)		DIN 6537K type drill	Metric	∅3.0 ~ ∅20.0	C50~C52
PI503A(F)		DIN 6537K type internal coolant drill	Metric	∅3.0 ~ ∅20.0	C53~C55
PI505A(F)		DIN 6537L type internal coolant drill	Metric	∅4.0 ~ ∅20.0	C56~C58

HP503

DIN 6537K Double margin drill - 3×D





Inch Metric

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

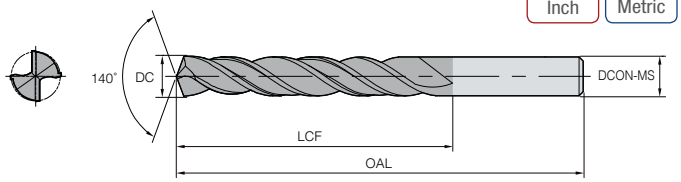
(mm)

Designation		DC		DCON-MS	LCF	OAL
		inch	mm			
HP	503 030	0.1181	3	6	20	62
	503 031	0.122	3.1	6	20	62
	503 032	0.126	3.2	6	20	62
	503 033	0.1299	3.3	6	20	62
	503 034	0.1339	3.4	6	20	62
	503 035	0.1378	3.5	6	20	62
	503 036	0.1417	3.6	6	20	62
	503 037	0.1457	3.7	6	20	62
	503 038	0.1496	3.8	6	24	66
	503 039	0.1535	3.9	6	24	66
	503 040	0.1575	4	6	24	66
	503 041	0.1614	4.1	6	24	66
	503 042	0.1654	4.2	6	24	66
	503 043	0.1693	4.3	6	24	66
	503 044	0.1732	4.4	6	24	66
	503 045	0.1772	4.5	6	24	66
	503 046	0.1811	4.6	6	24	66
	503 047	0.185	4.7	6	24	66
	503 048	0.189	4.8	6	28	66
	503 049	0.1929	4.9	6	28	66
	503 050	0.1969	5	6	28	66
	503 051	0.2008	5.1	6	28	66
	503 052	0.2047	5.2	6	28	66
	503 053	0.2087	5.3	6	28	66
	503 054	0.2126	5.4	6	28	66
	503 055	0.2165	5.5	6	28	66
	503 056	0.2205	5.6	6	28	66
	503 057	0.2244	5.7	6	28	66
	503 058	0.2283	5.8	6	28	66
	503 059	0.2322	5.9	6	28	66
	503 060	0.2362	6	6	28	66
	503 061	0.2402	6.1	8	34	79
	503 062	0.2441	6.2	8	34	79
	503 063	0.248	6.3	8	34	79
	503 064	0.252	6.4	8	34	79
	503 065	0.2559	6.5	8	34	79
	503 066	0.2598	6.6	8	34	79
	503 067	0.2638	6.7	8	34	79
	503 068	0.2677	6.8	8	34	79
	503 069	0.2717	6.9	8	34	79
	503 070	0.2756	7	8	34	79
	503 071	0.2795	7.1	8	41	79
	503 072	0.2835	7.2	8	41	79
	503 073	0.2874	7.3	8	41	79

HP503

DIN 6537K Double margin drill - 3×D





Inch Metric

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

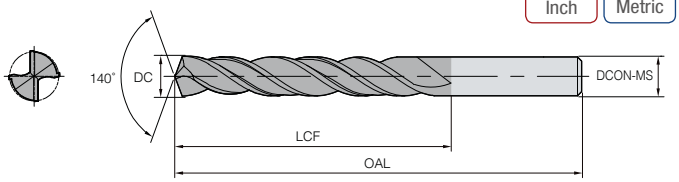
(mm)

Designation		DC		DCON-MS	LCF	OAL
		inch	mm			
HP	503 074	0.2913	7.4	8	41	79
	503 075	0.2953	7.5	8	41	79
	503 076	0.2992	7.6	8	41	79
	503 077	0.3031	7.7	8	41	79
	503 078	0.3071	7.8	8	41	79
	503 079	0.311	7.9	8	41	79
	503 080	0.315	8	8	41	79
	503 081	0.3189	8.1	10	47	89
	503 082	0.3228	8.2	10	47	89
	503 083	0.3268	8.3	10	47	89
	503 084	0.3307	8.4	10	47	89
	503 085	0.3346	8.5	10	47	89
	503 086	0.3386	8.6	10	47	89
	503 087	0.3425	8.7	10	47	89
	503 088	0.3465	8.8	10	47	89
	503 089	0.3504	8.9	10	47	89
	503 090	0.3543	9	10	47	89
	503 091	0.3583	9.1	10	47	89
	503 092	0.3622	9.2	10	47	89
	503 093	0.3661	9.3	10	47	89
	503 094	0.3701	9.4	10	47	89
	503 095	0.374	9.5	10	47	89
	503 096	0.378	9.6	10	47	89
	503 097	0.3819	9.7	10	47	89
	503 098	0.3858	9.8	10	47	89
	503 099	0.3898	9.9	10	47	89
	503 100	0.3937	10	10	47	89
	503 101	0.3976	10.1	12	55	102
	503 102	0.4016	10.2	12	55	102
	503 103	0.4055	10.3	12	55	102
	503 104	0.4094	10.4	12	55	102
	503 105	0.4134	10.5	12	55	102
	503 106	0.4173	10.6	12	55	102
	503 107	0.4213	10.7	12	55	102
	503 108	0.4252	10.8	12	55	102
	503 109	0.4291	10.9	12	55	102
	503 110	0.4331	11	12	55	102
	503 111	0.437	11.1	12	55	102
	503 112	0.4409	11.2	12	55	102
	503 113	0.4449	11.3	12	55	102
	503 114	0.4488	11.4	12	55	102
	503 115	0.4528	11.5	12	55	102
	503 116	0.4567	11.6	12	55	102
	503 117	0.4606	11.7	12	55	102

HP503

DIN 6537K Double margin drill - 3×D





Inch Metric

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
		inch	mm			
HP	503 118	0.4646	11.8	12	55	102
	503 119	0.4685	11.9	12	55	102
	503 120	0.4724	12	12	55	102
	503 121	0.4764	12.1	14	60	107
	503 122	0.4803	12.2	14	60	107
	503 123	0.4843	12.3	14	60	107
	503 124	0.4882	12.4	14	60	107
	503 125	0.4921	12.5	14	60	107
	503 126	0.4961	12.6	14	60	107
	503 127	0.5	12.7	14	60	107
	503 128	0.5039	12.8	14	60	107
	503 129	0.5079	12.9	14	60	107
	503 130	0.5118	13	14	60	107
	503 131	0.5157	13.1	14	60	107
	503 132	0.5157	13.2	14	60	107
	503 133	0.5236	13.3	14	60	107
	503 135	0.5315	13.5	14	60	107
	503 137	0.5394	13.7	14	60	107
	503 140	0.5512	14	14	60	107
	503 142	0.5591	14.2	16	65	115
	503 143	0.563	14.3	16	65	115
	503 145	0.5709	14.5	16	65	115
	503 146	0.5787	14.6	16	65	115
	503 148	0.5827	14.8	16	65	115
	503 150	0.5906	15	16	65	115
	503 155	0.6102	15.5	16	65	115
	503 157	0.6181	15.7	16	65	115
	503 160	0.6299	16	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~					
○	◎	◎	○	○			◎		○

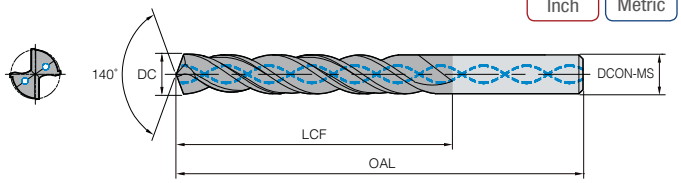
◎: Excellent ○: Good

HPI503

DIN 6537K type Double margin internal coolant drill - 3×D

Inch Metric





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

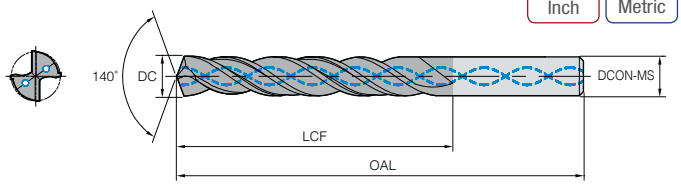
(mm)

Designation		DC			DCON-MS	LCF	OAL
		inch	fraction	mm			
HPI	503 030	0.1181	-	3	6	20	62
	503 031	0.112	-	3.1	6	20	62
	503 03175	0.125	1/8	3.175	6	20	62
	503 032	0.126	-	3.2	6	20	62
	503 03264	0.1285	-	3.264	6	20	62
	503 033	0.1299	-	3.3	6	20	62
	503 034	0.1339	-	3.4	6	20	62
	503 035	0.1378	-	3.5	6	20	62
	503 03572	0.1406	9/64	3.572	6	20	62
	503 036	0.1417	-	3.6	6	20	62
	503 037	0.1457	-	3.7	6	20	62
	503 038	0.1496	-	3.8	6	24	66
	503 039	0.1535	-	3.9	6	24	66
	503 0397	0.1563	5/32	3.97	6	24	66
	503 040	0.1575	-	4	6	24	66
	503 04039	0.159	-	4.039	6	24	66
	503 041	0.1614	-	4.1	6	24	66
	503 042	0.1654	-	4.2	6	24	66
	503 043	0.1693	-	4.3	6	24	66
	503 04366	0.1719	-	4.366	6	24	66
	503 044	0.1732	-	4.4	6	24	66
	503 045	0.1772	-	4.5	6	24	66
	503 046	0.1811	-	4.6	6	24	66
	503 047	0.185	-	4.7	6	24	66
	503 04763	0.1875	3/16	4.763	6	28	66
	503 048	0.189	-	4.8	6	28	66
	503 049	0.1929	-	4.9	6	28	66
	503 050	0.1969	-	5	6	28	66
	503 051	0.2008	-	5.1	6	28	66
	503 05159	0.2031	13/64	5.159	6	28	66
	503 052	0.2047	-	5.2	6	28	66
	503 053	0.2087	-	5.3	6	28	66
	503 054	0.2126	-	5.4	6	28	66
	503 055	0.2165	-	5.5	6	28	66
	503 05558	0.2188	7/32	5.558	6	28	66
	503 056	0.2205	-	5.6	6	28	66
	503 057	0.2244	-	5.7	6	28	66
	503 058	0.2283	-	5.8	6	28	66
	503 059	0.2323	-	5.9	6	28	66
	503 05953	0.2344	15/64	5.953	6	28	66
	503 060	0.2362	-	6	6	28	66
	503 061	0.2402	-	6.1	8	34	79
	503 062	0.2441	-	6.2	8	34	79
	503 063	0.248	-	6.3	8	34	79

HPI503

DIN 6537K type Double margin internal coolant drill - 3×D





Inch Metric

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)

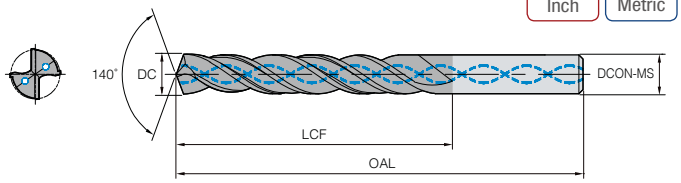
Designation		DC			DCON-MS	LCF	OAL
		inch	fraction	mm			
HPI	503 0635	0.25	1/4	6.35	8	34	79
	503 064	0.252	-	6.4	8	34	79
	503 065	0.2559	-	6.5	8	34	79
	503 066	0.2598	-	6.6	8	34	79
	503 067	0.2638	-	6.7	8	34	79
	503 06747	0.2656	17/64	6.747	8	34	79
	503 068	0.2677	-	6.8	8	34	79
	503 069	0.2717	-	6.9	8	34	79
	503 070	0.2756	-	7	8	34	79
	503 071	0.2795	-	7.1	8	41	79
	503 07145	0.2813	9/32	7.145	8	41	79
	503 072	0.2835	-	7.2	8	41	79
	503 073	0.2874	-	7.3	8	41	79
	503 074	0.2913	-	7.4	8	41	79
	503 075	0.2953	-	7.5	8	41	79
	503 07541	0.2969	19/64	7.541	8	41	79
	503 076	0.2992	-	7.6	8	41	79
	503 077	0.3031	-	7.7	8	41	79
	503 078	0.0371	-	7.8	8	41	79
	503 079	0.311	-	7.9	8	41	79
	503 07938	0.3125	5/16	7.938	8	41	79
	503 080	0.315	-	8	8	41	79
	503 081	0.3189	-	8.1	10	47	89
	503 082	0.3228	-	8.2	10	47	89
	503 083	0.3268	-	8.3	10	47	89
	503 08334	0.3281	21/64	8.334	10	47	89
	503 0834	0.3283	-	8.34	10	47	89
	503 084	0.3307	-	8.4	10	47	89
	503 085	0.3346	-	8.5	10	47	89
	503 086	0.3386	-	8.6	10	47	89
	503 087	0.3425	-	8.7	10	47	89
	503 08733	0.3438	11/32	8.733	10	47	89
	503 088	0.3465	-	8.8	10	47	89
	503 089	0.6504	-	8.9	10	47	89
	503 090	0.3543	-	9	10	47	89
	503 091	0.3583	-	9.1	10	47	89
	503 09129	0.3594	23/64	9.129	10	47	89
	503 092	0.3622	-	9.2	10	47	89
	503 093	0.3661	-	9.3	10	47	89
	503 094	0.368	-	9.4	10	47	89
	503 095	0.374	-	9.5	10	47	89
	503 09525	0.375	3/8	9.525	10	47	89
	503 096	0.378	-	9.6	10	47	89
	503 097	0.3819	-	9.7	10	47	89

HPI503

DIN 6537K type Double margin internal coolant drill - 3×D

Inch Metric





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

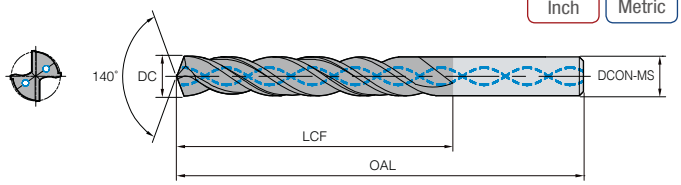
(mm)

Designation		DC			DCON-MS	LCF	OAL
		inch	fraction	mm			
HPI	503 098	0.3858	-	9.8	10	47	89
	503 099	0.3898	-	9.9	10	47	89
	503 09921	0.3906	25/64	9.9921	10	47	89
	503 100	0.3937	-	10	10	47	89
	503 101	0.3976	-	10.1	12	55	105
	503 102	0.4016	-	10.2	12	55	105
	503 103	0.4055	-	10.3	12	55	105
	503 1032	0.4063	13/32	10.32	12	55	105
	503 104	0.4094	-	10.4	12	55	105
	503 105	0.4134	-	10.5	12	55	105
	503 106	0.4173	-	10.6	12	55	105
	503 107	0.4213	-	10.7	12	55	105
	503 10716	0.4219	27/64	10.716	12	55	105
	503 108	0.4252	-	10.8	12	55	105
	503 109	0.4291	-	10.9	12	55	105
	503 110	0.4331	-	11	12	55	105
	503 111	0.437	-	11.1	12	55	105
	503 11113	0.4375	7/16	11.113	12	55	105
	503 112	0.4409	-	11.2	12	55	105
	503 113	0.4449	-	11.3	12	55	105
	503 114	0.4488	-	11.4	12	55	105
	503 115	0.4528	-	11.5	12	55	105
	503 11509	0.4531	29/64	11.509	12	55	105
	503 116	0.4567	-	11.6	12	55	105
	503 117	0.4606	-	11.7	12	55	105
	503 118	0.4646	-	11.8	12	55	105
	503 119	0.4685	-	11.9	12	55	105
	503 11908	0.4688	15/32	11.908	12	55	105
	503 120	0.4724	-	12	12	55	105
	503 121	0.4764	-	12.1	14	60	107
	503 122	0.4803	-	12.2	14	60	107
	503 123	0.4843	-	12.3	14	60	107
	503 12304	0.4844	31/64	12.304	14	60	107
	503 124	0.4882	-	12.4	14	60	107
	503 125	0.4921	-	12.5	14	60	107
	503 126	0.4961	-	12.6	14	60	107
	503 127	0.5	1/2	12.7	14	60	107
	503 128	0.5039	-	12.8	14	60	107
	503 129	0.5079	-	12.9	14	60	107
	503 130	0.5118	-	13	14	60	107
	503 132	0.5197	-	13.2	14	60	107
	503 133	0.5236	-	13.3	14	60	107
	503 13494	0.5313	17/32	13.494	14	60	107
	503 135	0.5315	-	13.5	14	60	107

HPI503

DIN 6537K type Double margin internal coolant drill - 3×D





Inch Metric

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
		inch	fraction	mm			
HPI	503 137	0.5394	-	13.7	14	60	107
	503 13891	0.5469	35/64	13.891	14	60	107
	503 140	0.5512	-	14	14	60	107
	503 141	0.5551	-	14.1	16	65	115
	503 142	0.5591	-	14.2	16	65	115
	503 14288	0.5625	9/16	14.288	16	65	115
	503 145	0.5709	-	14.5	16	65	115
	503 146	0.5746	-	14.6	16	65	115
	503 147	0.5787	-	14.7	16	65	115
	503 150	0.5906	-	15	16	65	115
	503 15081	0.5937	19/32	15.081	16	65	115
	503 155	0.6102	-	15.5	16	65	115
	503 157	0.6181	-	15.7	16	65	115
	503 158	0.622	-	15.8	16	65	115
	503 15875	0.625	5/8	15.875	16	65	115
	503 160	0.6299	-	16	16	65	115
	503 162	0.6378	-	16.2	18	73	123
	503 163	0.6417	-	16.3	18	73	123
	503 165	0.6496	-	16.5	18	73	123
	503 167	0.6575	-	16.7	18	73	123
	503 168	0.6614	-	16.8	18	73	123
	503 170	0.6693	-	17	18	73	123
	503 171	0.6732	-	17.1	18	73	123
	503 17463	0.6875	11/16	17.463	18	73	123
	503 175	0.689	-	17.5	18	73	123
	503 180	0.7087	-	18	18	73	123
	503 185	0.7883	-	18.5	20	79	131
	503 190	0.748	-	19	20	79	131
	503 1905	0.75	3/4	19.05	20	79	131
	503 197	0.7756	-	19.7	20	79	131
	503 200	0.7874	-	20	20	79	131

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

• Applicable Workpiece

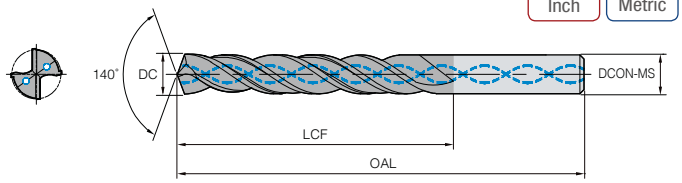
Carbon steel ~ HB225	Alloy Steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○	○			◎		○

◎: Excellent ○: Good

HPI505

DIN 6537L type Double margin internal coolant drill - 5×D





Inch Metric

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

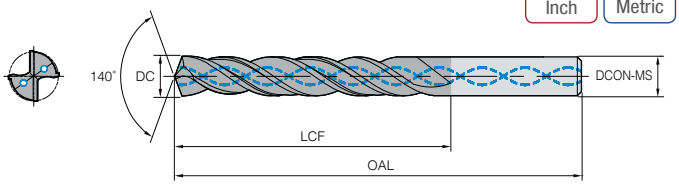
(mm)

Designation		DC			DCON-MS	LCF	OAL
		inch	fraction	mm			
HPI	505 030	0.1181	-	3	6	30	66
	505 031	0.112	-	3.1	6	30	66
	505 03175	0.125	-	3.175	6	30	66
	505 032	0.126	-	3.2	6	30	66
	505 03264	0.1285	1/8	3.264	6	30	66
	505 033	0.1299	-	3.3	6	30	66
	505 034	0.1339	-	3.4	6	30	66
	505 035	0.1378	-	3.5	6	30	66
	505 03572	0.1406	9/64	3.572	6	30	66
	505 036	0.1417	-	3.6	6	30	66
	505 037	0.1457	-	3.7	6	30	66
	505 038	0.1496	-	3.8	6	36	74
	505 039	0.1535	-	3.9	6	36	74
	505 0397	0.1563	5/32	3.97	6	36	74
	505 040	0.1575	-	4	6	36	74
	505 04039	0.159	-	4.039	6	36	74
	505 041	0.1614	-	4.1	6	36	74
	505 042	0.1654	-	4.2	6	36	74
	505 043	0.1693	-	4.3	6	36	74
	505 04366	0.1719	-	4.366	6	36	74
	505 044	0.1732	-	4.4	6	36	74
	505 045	0.1772	-	4.5	6	36	74
	505 0458	0.1803	-	4.58	6	36	74
	505 046	0.1811	-	4.6	6	36	74
	505 04623	0.182	-	4.623	6	36	74
	505 047	0.185	-	4.7	6	36	74
	505 04763	0.1875	3/16	4.763	6	44	82
	505 048	0.189	-	4.8	6	44	82
	505 049	0.1929	-	4.9	6	44	82
	505 050	0.1969	-	5	6	44	82
	505 051	0.2008	-	5.1	6	44	82
	505 05159	0.2031	13/64	5.159	6	44	82
	505 052	0.2047	-	5.2	6	44	82
	505 053	0.2087	-	5.3	6	44	82
	505 054	0.2126	-	5.4	6	44	82
	505 0541	0.213	-	5.41	6	44	82
	505 055	0.2165	-	5.5	6	44	82
	505 05558	0.2188	7/32	5.558	6	44	82
	505 056	0.2205	-	5.6	6	44	82
	505 057	0.2244	-	5.7	6	44	82
	505 058	0.2283	-	5.8	6	44	82
	505 059	0.2323	-	5.9	6	44	82
	505 05953	0.2344	15/64	5.953	6	44	82
	505 060	0.2362	-	6	6	44	82

HPI505

DIN 6537L type Double margin internal coolant drill - 5×D





Inch Metric

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

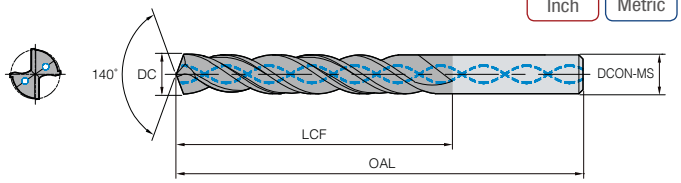
(mm)

Designation		DC			DCON-MS	LCF	OAL
		inch	fraction	mm			
HPI	505 061	0.2402	-	6.1	8	53	91
	505 062	0.2441	-	6.2	8	53	91
	505 063	0.248	-	6.3	8	53	91
	505 0635	0.25	1/4	6.35	8	53	91
	505 064	0.252	-	6.4	8	53	91
	505 065	0.2559	-	6.5	8	53	91
	505 06528	0.257	-	6.528	8	53	91
	505 066	0.2598	-	6.6	8	53	91
	505 067	0.2638	-	6.7	8	53	91
	505 06747	0.2656	17/64	6.747	8	53	91
	505 068	0.2677	-	6.8	8	53	91
	505 069	0.2717	-	6.9	8	53	91
	505 06909	0.272	-	6.909	8	53	91
	505 070	0.2756	-	7	8	53	91
	505 071	0.2795	-	7.1	8	53	91
	505 07145	0.2813	9/32	7.145	8	53	91
	505 072	0.2835	-	7.2	8	53	91
	505 073	0.2874	-	7.3	8	53	91
	505 074	0.2913	-	7.4	8	53	91
	505 075	0.2953	-	7.5	8	53	91
	505 07541	0.2969	19/64	7.541	8	53	91
	505 076	0.2992	-	7.6	8	53	91
	505 077	0.3031	-	7.7	8	53	91
	505 078	0.3071	-	7.8	8	53	91
	505 079	0.311	-	7.9	8	53	91
	505 07938	0.3125	5/16	7.938	8	53	91
	505 080	0.315	-	8	8	53	91
	505 081	0.3189	-	8.1	10	61	103
	505 082	0.3228	-	8.2	10	61	103
	505 083	0.3268	-	8.3	10	61	103
	505 08334	0.3281	21/64	8.334	10	61	103
	505 084	0.3307	-	8.4	10	61	103
	505 08433	0.332	-	8.433	10	61	103
	505 085	0.3346	-	8.5	10	61	103
	505 086	0.3386	-	8.6	10	61	103
	505 087	0.3425	-	8.7	10	61	103
	505 08733	0.3438	11/32	8.733	10	61	103
	505 088	0.3465	-	8.8	10	61	103
	505 089	0.3504	-	8.9	10	61	103
	505 090	0.3543	-	9	10	61	103
	505 091	0.3583	-	9.1	10	61	103
	505 09129	0.3594	23/64	9.129	10	61	103
	505 092	0.3622	-	9.2	10	61	103
	505 093	0.3661	-	9.3	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

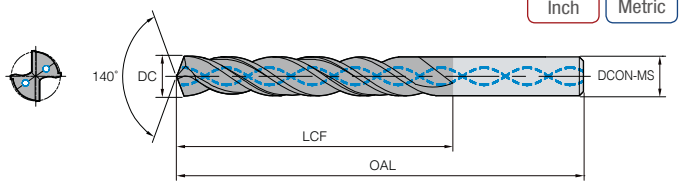
(mm)

Designation		DC			DCON-MS	LCF	OAL
		inch	fraction	mm			
HPI	505 09347	0.368	-	9.347	10	61	103
	505 094	0.3701	-	9.4	10	61	103
	505 095	0.374	-	9.5	10	61	103
	505 09525	0.375	3/8	9.525	10	61	103
	505 096	0.378	-	9.6	10	61	103
	505 097	0.3819	-	9.7	10	61	103
	505 09703	0.382	-	9.703	10	61	103
	505 09746	0.3837	-	9.746	10	61	103
	505 098	0.3858	-	9.8	10	61	103
	505 099	0.3898	-	9.9	10	61	103
	505 09921	0.3906	25/64	9.921	10	61	103
	505 100	0.3937	-	10	10	61	103
	505 101	0.3976	-	10.1	12	71	118
	505 102	0.4016	-	10.2	12	71	118
	505 103	0.4055	-	10.3	12	71	118
	505 1032	0.4063	13/32	10.32	12	71	118
	505 104	0.4074	-	10.4	12	71	118
	505 105	0.4134	-	10.5	12	71	118
	505 106	0.4173	-	10.6	12	71	118
	505 107	0.4213	-	10.7	12	71	118
	505 10716	0.4219	27/64	10.716	12	71	118
	505 108	0.4252	-	10.8	12	71	118
	505 109	0.4291	-	10.9	12	71	118
	505 110	0.4331	-	11	12	71	118
	505 111	0.437	-	11.1	12	71	118
	505 11113	0.4375	7/16	11.113	12	71	118
	505 112	0.4409	-	11.2	12	71	118
	505 113	0.4449	-	11.3	12	71	118
	505 114	0.4488	-	11.4	12	71	118
	505 115	0.4528	-	11.5	12	71	118
	505 11509	0.4531	29/64	11.509	12	71	118
	505 116	0.4567	-	11.6	12	71	118
	505 117	0.4606	-	11.7	12	71	118
	505 118	0.4646	-	11.8	12	71	118
	505 119	0.4685	-	11.9	12	71	118
	505 11908	0.4688	15/32	11.908	12	71	118
	505 120	0.4724	-	12	12	71	118
	505 121	0.4764	-	12.1	14	77	124
	505 122	0.4803	-	12.2	14	77	124
	505 123	0.4843	-	12.3	14	77	124
	505 12304	0.4844	31/64	12.304	14	77	124
	505 124	0.4882	-	12.4	14	77	124
	505 125	0.4921	-	12.5	14	77	124
	505 126	0.4961	-	12.6	14	77	124

HPI505

DIN 6537L type Double margin internal coolant drill - 5×D





Inch Metric

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

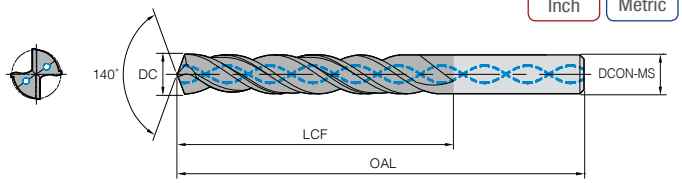
(mm)

Designation		DC			DCON-MS	LCF	OAL
		inch	fraction	mm			
HPI	505 127	0.5	1/2	12.7	14	77	124
	505 128	0.5039	-	12.8	14	77	124
	505 129	0.5079	-	12.9	14	77	124
	505 12903	0.508	-	12.903	14	77	124
	505 130	0.5118	-	13	14	77	124
	505 13096	0.5156	33/64	13.096	14	77	124
	505 131	0.5157	-	13.1	14	77	124
	505 132	0.5197	-	13.2	14	77	124
	505 133	0.5236	-	13.3	14	77	124
	505 134	0.5276	-	13.4	14	77	124
	505 13494	0.5313	17/32	13.494	14	77	124
	505 135	0.5315	-	13.5	14	77	124
	505 137	0.5394	-	13.7	14	77	124
	505 138	0.5433	-	13.8	14	77	124
	505 13891	0.5504	35/64	13.981	14	77	124
	505 140	0.5512	-	14	14	77	124
	505 141	0.5551	-	14.1	16	83	133
	505 142	0.5591	-	14.2	16	83	133
	505 14288	0.5625	9/16	14.288	16	83	133
	505 145	0.5709	-	14.5	16	83	133
	505 146	0.5748	-	14.6	16	83	133
	505 147	0.5787	-	14.7	16	83	133
	505 148	0.5827	-	14.8	16	83	133
	505 149	0.5866	-	14.9	16	83	133
	505 150	0.5906	-	15	16	83	133
	505 15081	0.5937	19/32	15.081	16	83	133
	505 151	0.5945	-	15.1	16	83	133
	505 152	0.5984	-	15.2	16	83	133
	505 155	0.6102	-	15.5	16	83	133
	505 156	0.6142	-	15.6	16	83	133
	505 157	0.6181	-	15.7	16	83	133
	505 158	0.622	-	15.8	16	83	133
	505 15875	0.625	5/8	15.875	16	83	133
	505 159	0.626	-	15.9	16	83	133
	505 160	0.6299	-	16	16	83	133
	505 16078	0.633	-	16.078	18	93	143
	505 162	0.6378	-	16.2	18	93	143
	505 164	0.6457	-	16.4	18	93	143
	505 165	0.6496	-	16.5	18	93	143
	505 166	0.6535	-	16.6	18	93	143
	505 16667	0.6562	21/32	16.667	18	93	143
	505 167	0.6575	-	16.7	18	93	143
	505 170	0.6693	-	17	18	93	143
	505 171	0.6732	-	17.1	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
		inch	fraction	mm			
HPI	505 172	0.6772	-	17.2	18	93	143
	505 173	0.6811	-	17.3	18	93	143
	505 17463	0.6875	11/16	17.463	18	93	143
	505 175	0.689	-	17.5	18	93	143
	505 176	0.6929	-	17.6	18	93	143
	505 177	0.6969	-	17.7	18	93	143
	505 178	0.7008	-	17.8	18	93	143
	505 179	0.7047	-	17.9	18	93	143
	505 180	0.7087	-	18	18	93	143
	505 184	0.7244	-	18.4	20	101	153
	505 185	0.7283	-	18.5	20	101	153
	505 186	0.7323	-	18.6	20	101	153
	505 188	0.7402	-	18.8	20	101	153
	505 189	0.7441	-	18.9	20	101	153
	505 190	0.748	-	19	20	101	153
	505 1905	0.75	3/4	19.05	20	101	153
	505 192	0.7559	-	19.2	20	101	153
	505 19253	0.758	-	19.253	20	101	153
	505 19446	0.7656	49/64	19.446	20	101	153
	505 195	0.7677	-	19.5	20	101	153
	505 197	0.7756	-	19.7	20	101	153
	505 19844	0.7813	25/32	19.844	20	101	153
	505 200	0.7874	-	20	20	101	153

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

• Applicable Workpiece

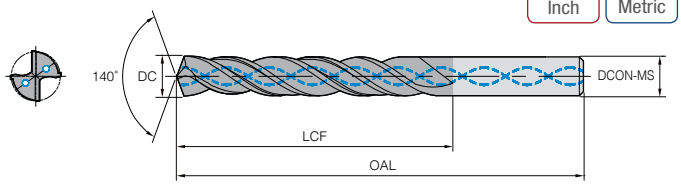
Carbon steel ~ HB225	Alloy Steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○	○			◎		○

◎: Excellent ○: Good

HPI508-N

Double margin internal coolant drill - 8×D





Inch Metric

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

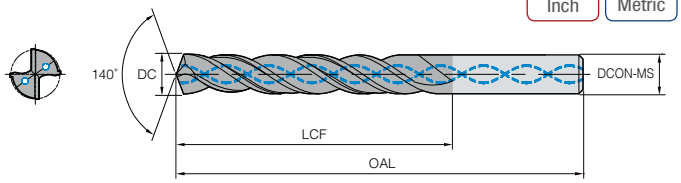
(mm)

Designation		DC			DCON-MS	LCF	OAL
		inch	fraction	mm			
HPI	508 030N	0.1181	-	3	6	43	80
	508 031N	0.122	-	3.1	6	43	80
	508 03175N	0.125	1/8	3.175	6	43	80
	508 032N	0.126	-	3.2	6	43	80
	508 03264N	0.1285	-	3.264	6	43	80
	508 033N	0.1299	-	3.3	6	43	80
	508 034N	0.1339	-	3.4	6	43	80
	508 035N	0.1378	-	3.5	6	43	80
	508 03572N	0.1406	9/64	3.572	6	43	80
	508 036N	0.1417	-	3.6	6	43	80
	508 037N	0.1457	-	3.7	6	43	80
	508 038N	0.1496	-	3.8	6	49	87
	508 039N	0.1535	-	3.9	6	49	87
	508 0397N	0.1563	5/32	3.97	6	49	87
	508 040N	0.1575	-	4	6	49	87
	508 04039N	0.159	-	4.039	6	49	87
	508 041N	0.1614	-	4.1	6	49	87
	508 042N	0.1654	-	4.2	6	49	87
	508 043N	0.1693	-	4.3	6	49	87
	508 04366N	0.1719	-	4.366	6	49	87
	508 044N	0.1732	-	4.4	6	49	87
	508 045N	0.1772	-	4.5	6	49	87
	508 046N	0.1811	-	4.6	6	49	87
	508 047N	0.185	-	4.7	6	49	87
	508 04763N	0.1875	3/16	4.763	6	56	94
	508 048N	0.189	-	4.8	6	56	94
	508 049N	0.1929	-	4.9	6	56	94
	508 050N	0.1969	-	5	6	56	94
	508 051N	0.2008	-	5.1	6	56	94
	508 05159N	0.2031	13/64	5.159	6	56	94
	508 052N	0.2047	-	5.2	6	56	94
	508 053N	0.2087	-	5.3	6	56	94
	508 054N	0.2126	-	5.4	6	56	94
	508 055N	0.2165	-	5.5	6	56	94
	508 05558N	0.2188	7/32	5.558	6	56	94
	508 056N	0.2205	-	5.6	6	56	94
	508 057N	0.2244	-	5.7	6	56	94
	508 058N	0.2283	-	5.8	6	56	94
	508 059N	0.2323	-	5.9	6	56	94
	508 05953N	0.2344	15/64	5.953	6	56	94
	508 060N	0.2362	-	6	6	65	94
	508 061N	0.2402	-	6.1	8	67	105
	508 062N	0.2441	-	6.2	8	67	105
	508 063N	0.248	-	6.3	8	67	105

HPI508-N

Double margin internal coolant drill - 8×D





Inch Metric

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

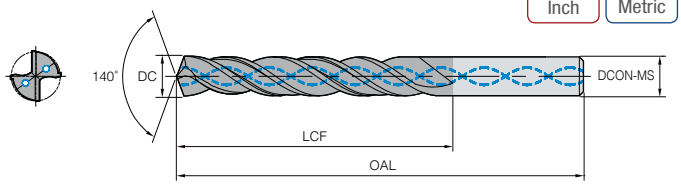
(mm)

Designation		DC			DCON-MS	LCF	OAL
		inch	fraction	mm			
HPI	508 0635N	0.25	1/4	6.35	8	67	105
	508 064N	0.252	-	6.4	8	67	105
	508 065N	0.2559	-	6.5	8	67	105
	508 066N	0.2598	-	6.6	8	67	105
	508 067N	0.2638	-	6.7	8	67	105
	508 06747N	0.2656	17/64	6.747	8	67	105
	508 068N	0.2677	-	6.8	8	67	105
	508 069N	0.2717	-	6.9	8	67	105
	508 070N	0.2756	-	7	8	76	116
	508 071N	0.2795	-	7.1	8	76	116
	508 07145N	0.2813	9/32	7.145	8	76	116
	508 072N	0.2835	-	7.2	8	76	116
	508 073N	0.2874	-	7.3	8	76	116
	508 074N	0.2913	-	7.4	8	76	116
	508 075N	0.2953	-	7.5	8	76	116
	508 07541N	0.2969	19/64	7.541	8	76	116
	508 076N	0.2992	-	7.6	8	76	116
	508 077N	0.3031	-	7.7	8	76	116
	508 078N	0.3071	-	7.8	8	76	116
	508 079N	0.311	-	7.9	8	76	116
	508 07938N	0.3125	5/16	7.938	8	76	116
	508 080N	0.315	-	8	8	76	116
	508 081N	0.3189	-	8.1	10	87	131
	508 082N	0.3228	-	8.2	10	87	131
	508 083N	0.3268	-	8.3	10	87	131
	508 08334N	0.3281	21/64	8.334	10	87	131
	508 084N	0.3307	-	8.4	10	87	131
	508 085N	0.3346	-	8.5	10	87	131
	508 086N	0.3386	-	8.6	10	87	131
	508 087N	0.3425	-	8.7	10	87	131
	508 08733N	0.3438	11/32	8.733	10	87	131
	508 088N	0.3465	-	8.8	10	87	131
	508 089N	0.3504	-	8.9	10	87	131
	508 090N	0.3543	-	9	10	87	131
	508 091N	0.3583	-	9.1	10	95	139
	508 09129N	0.3594	23/64	9.129	10	95	139
	508 092N	0.3622	-	9.2	10	95	139
	508 093N	0.3661	-	9.3	10	95	139
	508 094N	0.3701	-	9.4	10	95	139
	508 095N	0.374	-	9.5	10	95	139
	508 09525N	0.375	3/8	9.525	10	95	139
	508 096N	0.378	-	9.6	10	95	139
	508 097N	0.3819	-	9.7	10	95	139
	508 098N	0.3858	-	9.8	10	95	139

HPI508-N

Double margin internal coolant drill - 8×D





Inch Metric

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

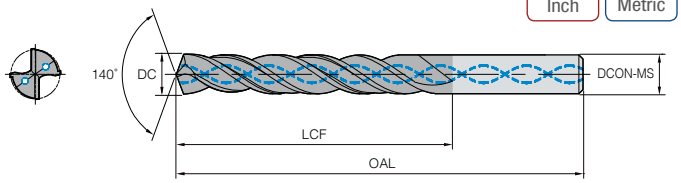
(mm)

Designation		DC			DCON-MS	LCF	OAL
		inch	fraction	mm			
HPI	508 099N	0.3898	-	9.9	10	95	139
	508 09921N	0.3906	25/64	9.921	10	95	139
	508 100N	0.3937	-	10	10	95	139
	508 101N	0.3976	-	10.1	12	106	155
	508 102N	0.4016	-	10.2	12	106	155
	508 103N	0.4055	-	10.3	12	106	155
	508 1032N	0.4063	13/32	10.32	12	106	155
	508 104N	0.4094	-	10.4	12	106	155
	508 105N	0.4134	-	10.5	12	106	155
	508 107N	0.4213	-	10.7	12	106	155
	508 10716N	0.4219	27/64	10.716	12	106	155
	508 108N	0.4252	-	10.8	12	106	155
	508 109N	0.4291	-	10.9	12	106	155
	508 110N	0.4331	-	11	12	106	155
	508 111N	0.437	-	11.1	12	114	163
	508 11113N	0.4375	7/16	11.113	12	114	163
	508 112N	0.4409	-	11.2	12	114	163
	508 113N	0.4449	-	11.3	12	114	163
	508 114N	0.4488	-	11.4	12	114	163
	508 115N	0.4528	-	11.5	12	114	163
	508 11509N	0.4531	29/64	11.509	12	114	163
	508 116N	0.4567	-	11.6	12	114	163
	508 117N	0.4606	-	11.7	12	114	163
	508 118N	0.4646	-	11.8	12	114	163
	508 119N	0.4685	-	11.9	12	114	163
	508 11908N	0.4688	15/32	11.908	12	114	163
	508 120N	0.4724	-	12	12	114	163
	508 12304N	0.4844	31/64	12.304	14	133	182
	508 125N	0.4921	-	12.5	14	133	182
	508 127N	0.5	1/2	12.7	14	133	182
	508 128N	0.5039	-	12.8	14	133	182
	508 130N	0.5118	-	13	14	133	182
	508 13494N	0.5313	-	13.494	14	133	182
	508 135N	0.5315	-	13.5	14	133	182
	508 140N	0.5512	-	14	14	133	182
	508 14288N	0.5625	9/16	14.288	16	152	204
	508 145N	0.5709	-	14.5	16	152	204
	508 150N	0.5906	-	15	16	152	204
	508 151N	0.5945	-	15.1	16	152	204
	508 152N	0.5984	-	15.2	16	152	204
	508 153N	0.6024	-	15.3	16	152	204
	508 155N	0.6102	-	15.5	16	152	204
	508 158N	0.622	-	15.8	16	152	204
	508 15875N	0.625	5/8	15.875	16	152	204

HPI508-N

Double margin internal coolant drill - 8×D





Inch Metric

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
		inch	fraction	mm			
HPI	508 160N	0.6299	-	16	16	152	204
	508 16078N	0.633	-	16.078	18	171	223
	508 162N	0.6378	-	16.2	18	171	223
	508 165N	0.6496	-	16.5	18	171	223
	508 170N	0.6693	-	17	18	171	223
	508 17463N	0.6875	11/16	17.463	18	171	223
	508 175N	0.689	-	17.5	18	171	223
	508 180N	0.7087	-	18	18	171	223
	508 185N	0.7283	-	18.5	20	191	244
	508 190N	0.748	-	19	20	191	244
	508 1905N	0.75	3/4	19.05	20	191	244
	508 19253N	0.758	-	19.253	20	191	244
	508 198N	0.7795	-	19.8	20	191	244
	508 200N	0.7874	-	20	20	191	244

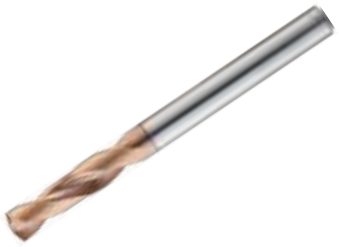
• Applicable Workpiece

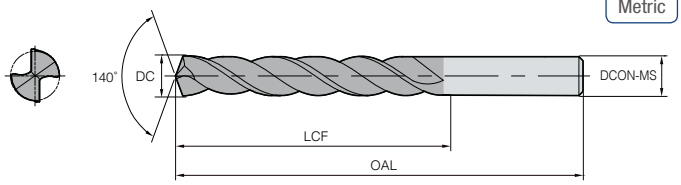
Carbon steel ~ HB225	Alloy Steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○	○			◎		○

◎: Excellent ○: Good

P503A(F)

DIN 6537k type drill





Metric

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

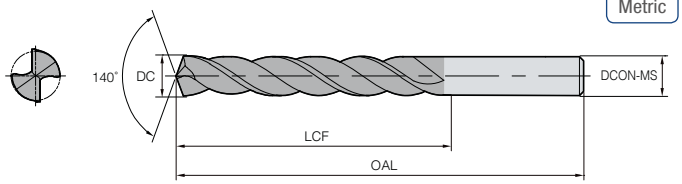
(mm)

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





Metric

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		

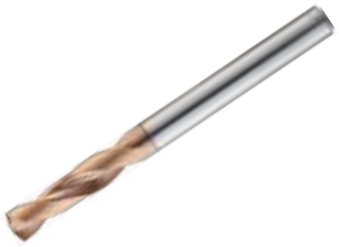
P Steel M Stainless steel K Cast iron

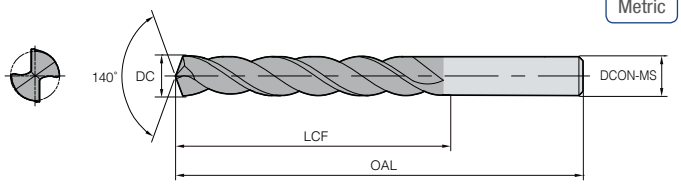
(mm)

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





Metric

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

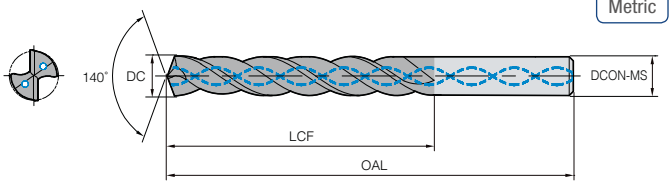
Carbon steel ~ HB225	Alloy Steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○	○			◎		○

◎: 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

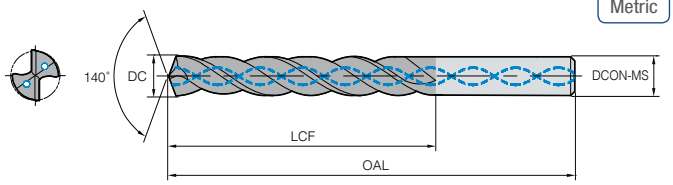
(mm)

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





Metric

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

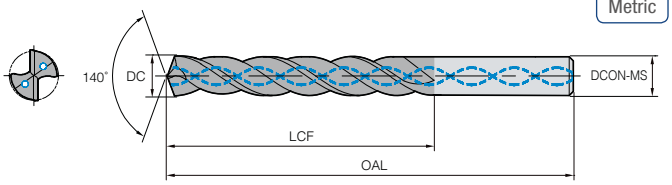
(mm)

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





Metric

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

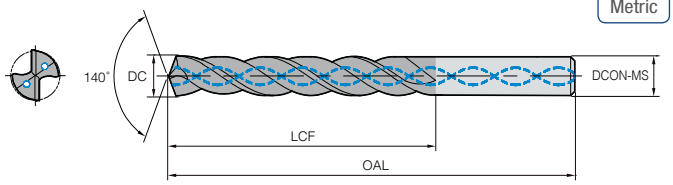
Carbon steel ~ HB225	Alloy Steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○	○			◎		○

◎: Excellent ○: Good

PI505A(F)

DIN 6537L type internal coolant drill





Metric

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

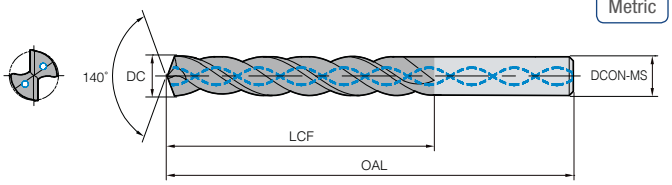
(mm)

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





Metric

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

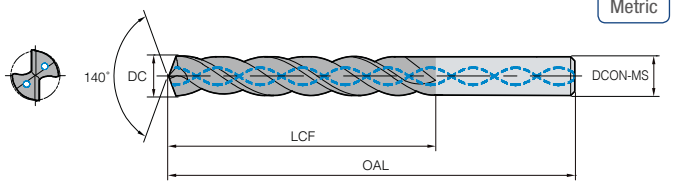
(mm)

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





Metric

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

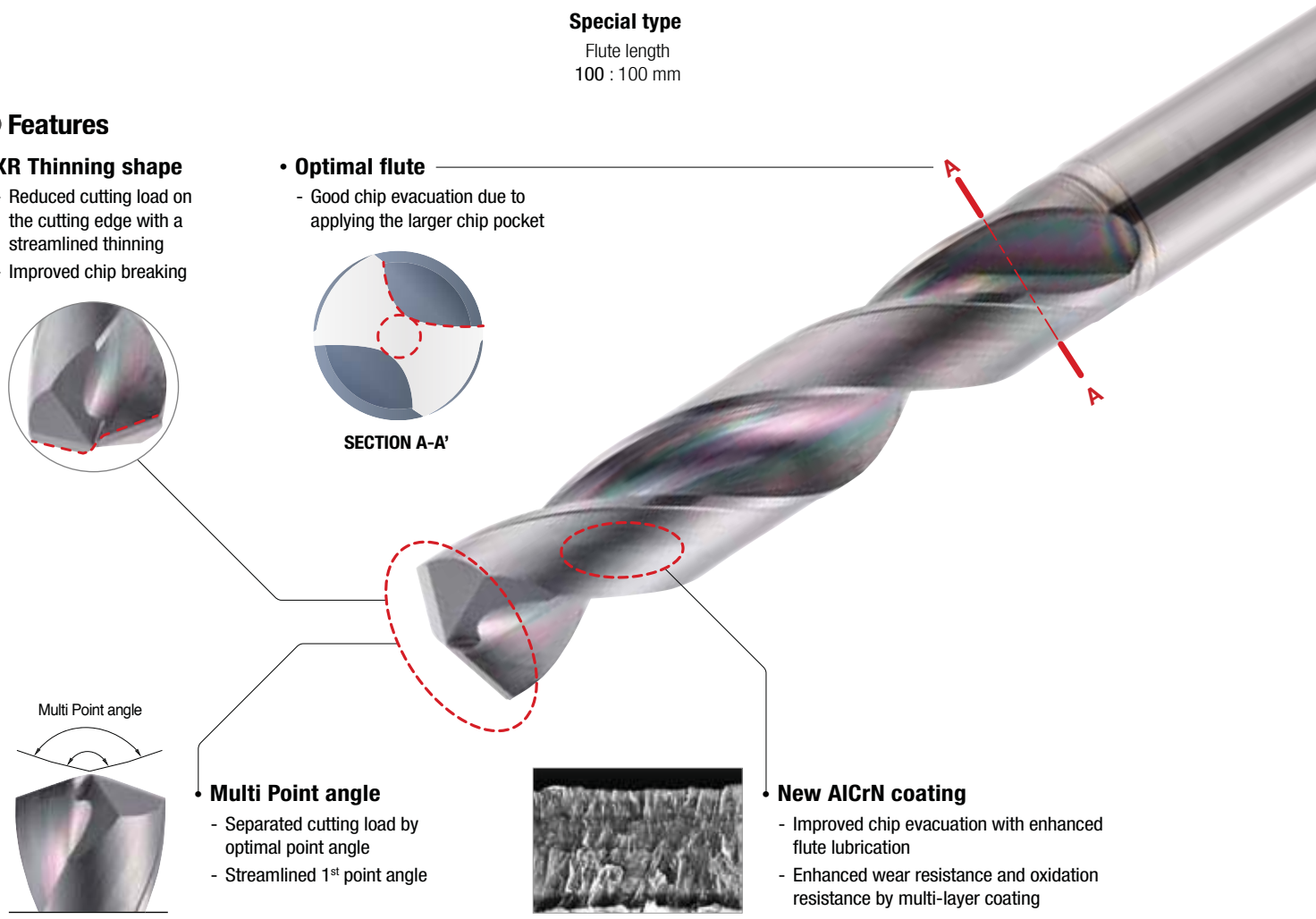
Code system

Special type

WSDP	040	-	5D	-	100L	-	5S
W-Star Drill Plus	Drill dia. 040 : Ø4.0mm		Aspect ratio (L/D) 5D, 7D		Overall length 100L : 100 mm		Shank dia. 5S : Ø5 mm

Special type
Flute length
100 : 100 mm

Features



- **XR Thinning shape**
  - Reduced cutting load on the cutting edge with a streamlined thinning
  - Improved chip breaking
- **Optimal flute**
  - Good chip evacuation due to applying the larger chip pocket

SECTION A-A'

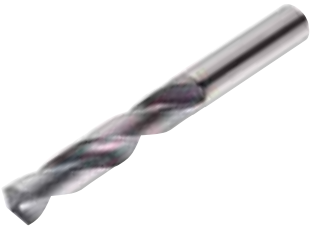
- **Multi Point angle**
  - Separated cutting load by optimal point angle
  - Streamlined 1st point angle
- **New AlCrN coating**
  - Improved chip evacuation with enhanced flute lubrication
  - Enhanced wear resistance and oxidation resistance by multi-layer coating

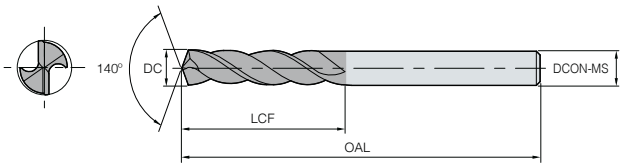
Application range

◎: 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





Metric

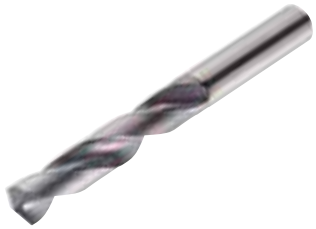
Terminology	P	M	K
Grade	PC320W		
Tolerance(drill Dia.)	h7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	streamlined		
Thinning	X type		
Coolant	External		

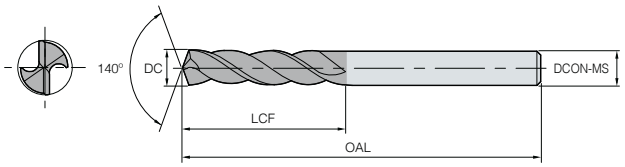
P Steel M Stainless steel K Cast iron

(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





Metric

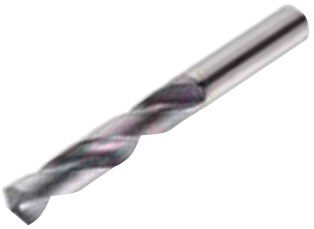
Terminology	P	M	K
Grade	PC320W		
Tolerance(drill Dia.)	h7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	streamlined		
Thinning	X type		
Coolant	External		

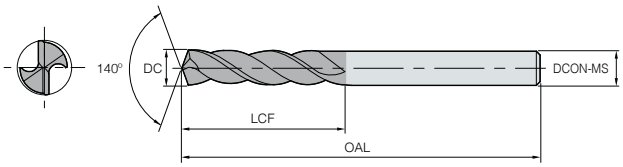
P Steel M Stainless steel K Cast iron

(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





Metric

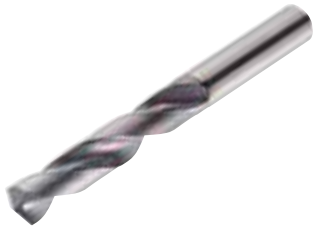
Terminology	P	M	K
Grade	PC320W		
Tolerance(drill Dia.)	h7		
Tolerance(shank Dia.)	h6		
Point angle(SIG)	140°		
Twist angle	streamlined		
Thinning	X type		
Coolant	External		

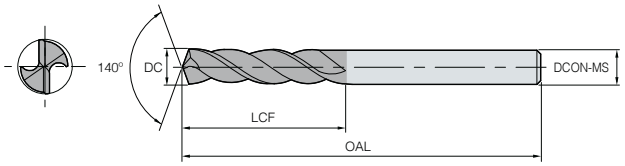
P Steel M Stainless steel K Cast iron

(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





Metric

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

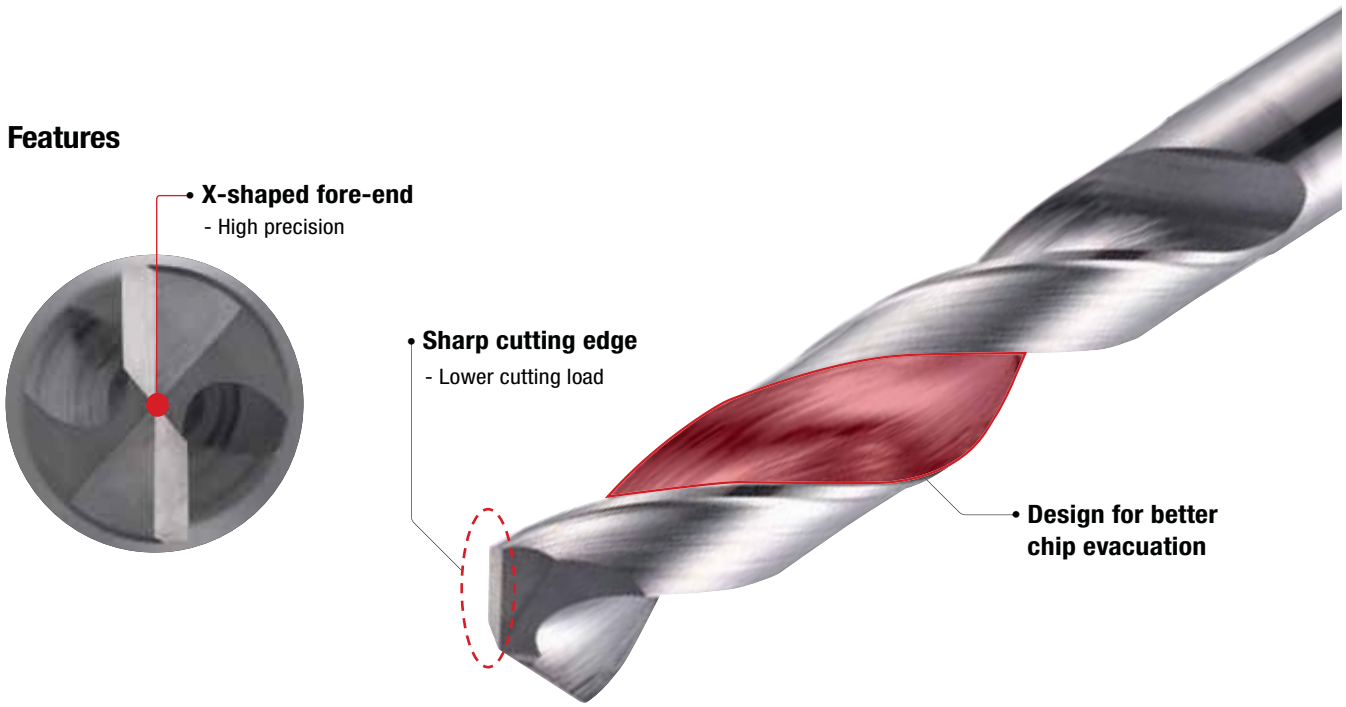
- Stable drilling for high productivity
- Available for various workpieces such as mild steel and non-ferrous metals

Code system

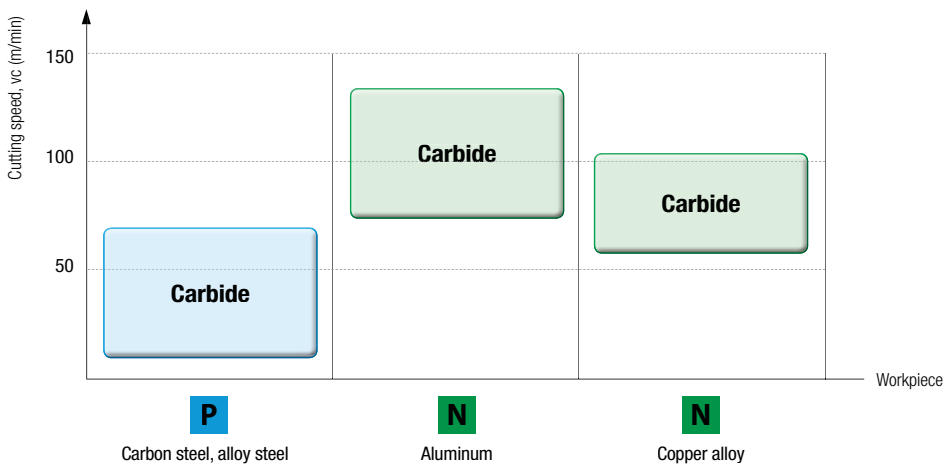
Special type

SSD	010	-	N	10	-	60L	-	6S
Solid Spiral Drill	Drill dia. 010: Ø1.0 mm		Non-ferrous	Flute length 10: 10 mm		Overall length 60L: 60 mm		Shank dia. 6S: Ø6 mm

Features

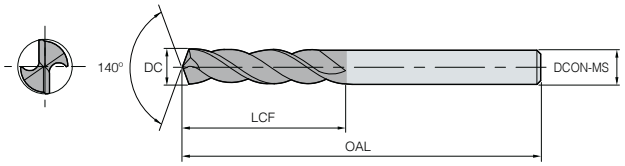


Application range



SSD-N





Metric

Coating	×
Tolerance(drill Dia.)	h8
Tolerance(shank Dia.)	h7
Point angle(SIG)	118°
Twist angle	30°
Thinning	X type
Coolant	External

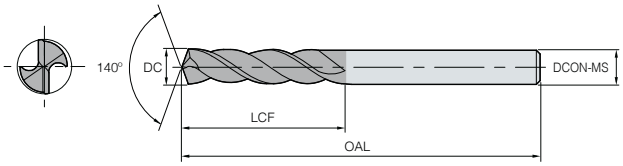
(mm)

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





Metric

Coating	×
Tolerance(drill Dia.)	h8
Tolerance(shank Dia.)	h7
Point angle(SIG)	118°
Twist angle	30°
Thinning	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



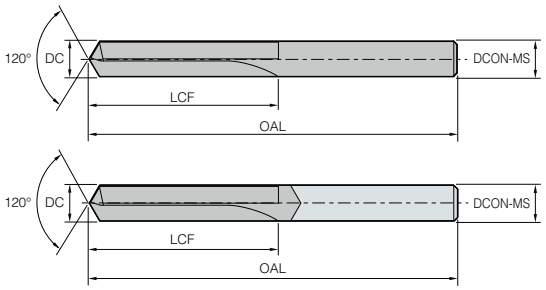


Fig. 1

Fig. 2

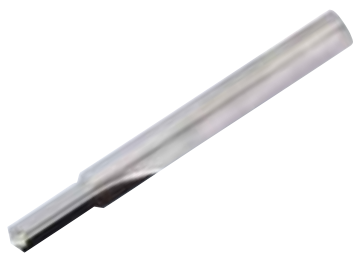
Metric

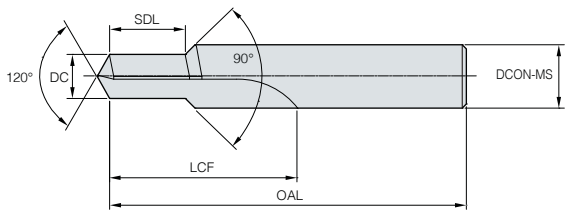
(mm)

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





Metric

(mm)

Designation		DC	DCON-MS	SDL	LCF	OAL	Tap
BDT	M05080 - Q1	4.2	6	35	9~15	90	M5 × P0.8
	M06100 - Q1	5.0	7	40	11~18	95	M6 × P1.0
	M08125 - Q1	6.8	10	50	15~24	105	M8 × P1.25
	M10125 - Q1	8.8	12	55	17~30	110	M10 × P1.25
	M10150 - Q1	8.5	12	55	17~30	110	M10 × P1.5
	M12125 - Q1	10.8	14	60	19~36	120	M12 × P1.25
	M12150 - Q1	10.5	14	60	19~36	120	M12 × P1.5
	M12175 - Q1	10.3	14	60	19~36	120	M12 × P1.75

High accuracy hole machining for Aluminum alloy

PCD Drill

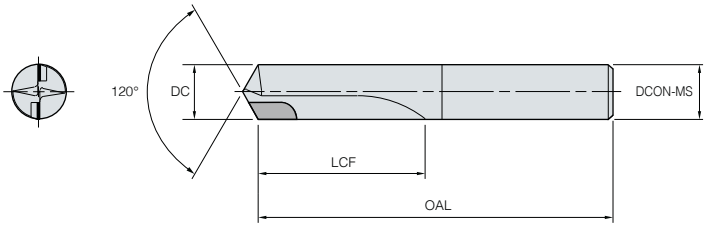
- High accuracy hole machining for aluminum alloy
- Drilling tolerance : IT7~8 class
- Recommended for high accuracy and high spindle machine

PDD

Brazing type

Metric





(mm)

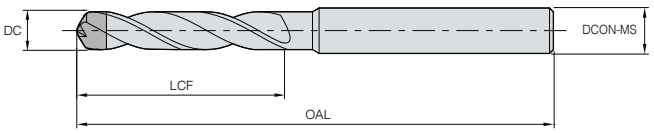
Designation		DC	DCON-MS	LCF	OAL
PDD	0500	5.0	5.0	30	80
	0550	5.5	5.5	30	80
	0600	6.0	6.0	30	80
	0650	6.5	6.5	40	95
	0700	7.0	7.0	40	95
	0750	7.5	7.5	45	100
	0800	8.0	8.0	45	100
	0850	8.5	8.5	50	110
	0900	9.0	9.0	50	110
	0950	9.5	9.5	55	115
	1000	10.0	10.0	55	115
	1050	10.5	10.5	60	120
	1100	11.0	11.0	60	120
	1150	11.5	11.5	65	125
	1200	12.0	12.0	65	125

CPD

Standard Cone type

Metric





(mm)

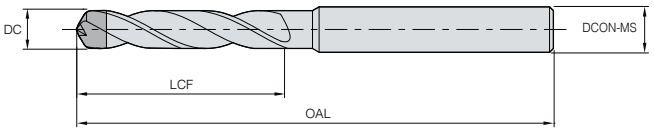
Designation		DC	DCON-MS	LCF	OAL
CPD	020~030	2.0~3.0	4	10	43
	031~035	3.1~3.5	4	15	43
	036~040	3.6~4.0	4	15	43
	041~050	4.1~5.0	6	20	53
	051~060	5.1~6.0	6	25	63
	061~070	6.1~7.0	8	30	79
	071~080	7.1~8.0	8	35	79

CPDL

Long Cone type

Metric





(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

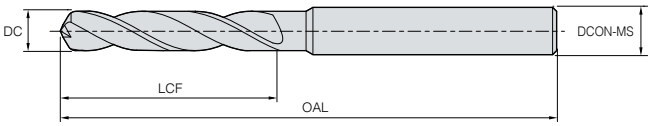
- High functional drill for machining in various cutting range : Cone type drill(CPD)
- Realizing excellent accuracy and surface finish
- High precision premium PCD drill

SPD

Standard Sandwich type

Metric





(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

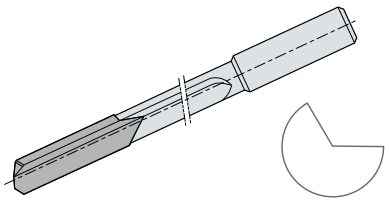
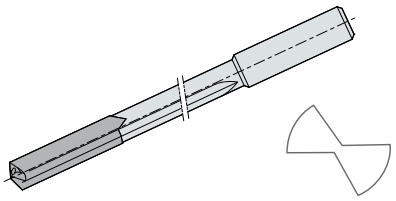
Gun Drill

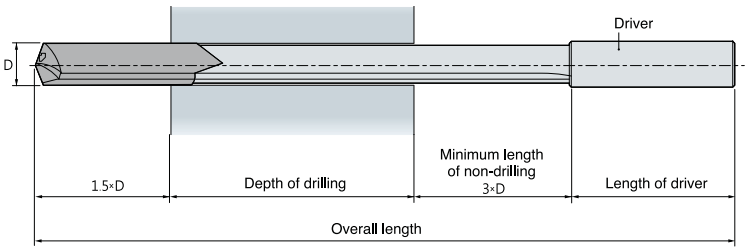
- High efficiency in deep hole machining
- High accuracy (Hole tolerance: IT9, surface finish: Ra0.1~3.0S)
- Stable Quality due to unique cutting edge and guide pad available regrinding
- Used drill can be recycled by exchanging the carbide part
- Depending on request, the drills can change geometry 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.** Ø12.05 mm		**Overall length** 1500 mm		**Drive no.** D30

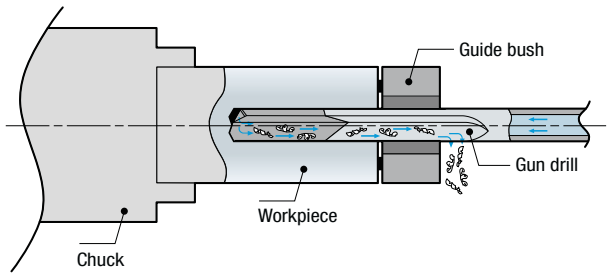
Features

	Single Lip type	Twin Lip type
Shape		
Drill Dia.	Ø3.0~Ø30.0	Ø8.0~Ø24.0
Depth of drilling	≥ 2,000 mm	≥ 1,000 mm
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

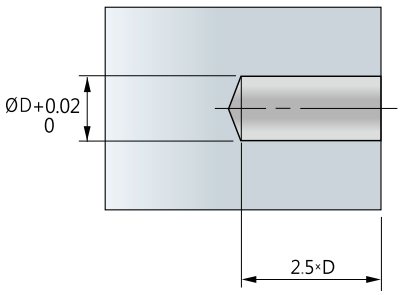
Application of Gun Drill on exclusive machine



- The guide bush is necessary for centering before gun-drilling

Application of Gun Drill on machining center

1 Machining of a pilot hole

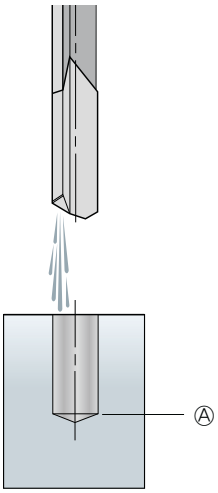


1. A pilot hole is necessary in machining on a machining center instead of a guide bush
2. The diameter of the pilot hole should be 0.01~0.02 (H7) larger bigger than one of the Gun Drill diameter and the depth of drilling should be about 2.5×D
3. Use Mach Drill (MSD) for machining of a pilot hole



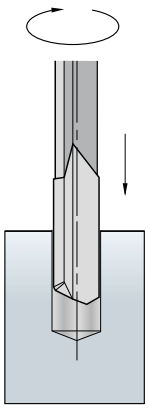
[MSD]

2 Moving the Gun Drill to the pilot hole



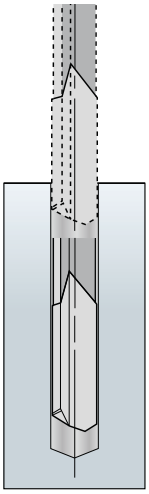
1. The Gun Drill should not drill before entering the pilot hole
2. Coolant is necessary for gun drilling

3 Start Gun Drilling



1. Rotate the spindle
2. Machine with drilling to vertical axis

4 After Gun Drilling



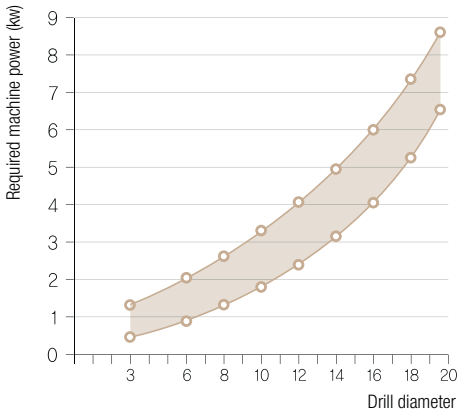
1. Return the drill
2. Stop drilling and supplying coolant
3. Remove the Gun Drill

Technical information

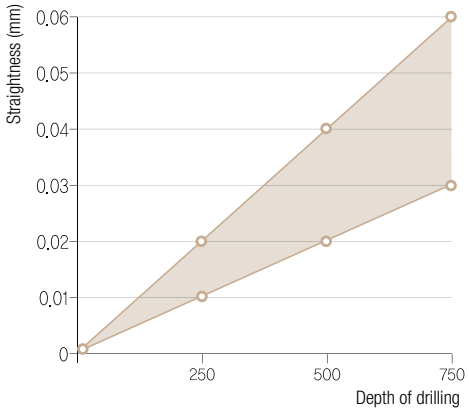
The factors below determine the straightness of hole

- Drill diameter and depth of drilling
- Workpiece material and machine type
- Cutting conditions and machining application
- Drill bush

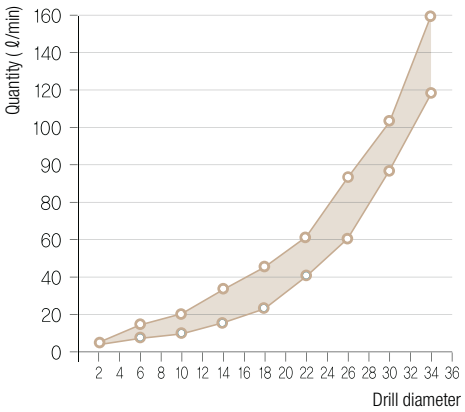
Required machine power



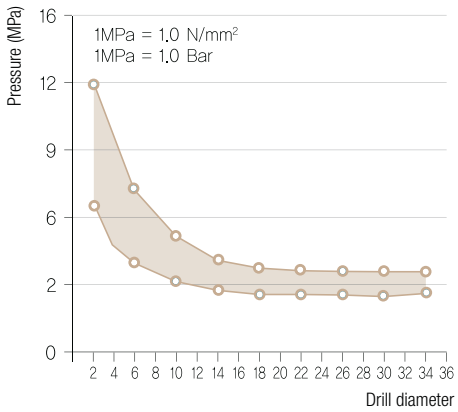
Straightness



Quantity of coolant



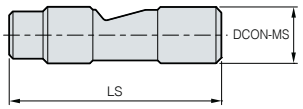
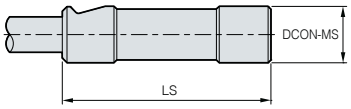
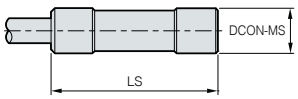
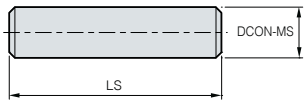
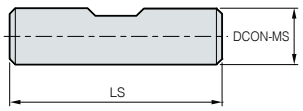
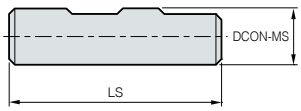
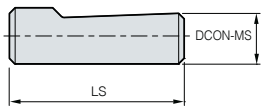
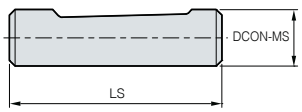
Pressure of coolant



※ 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	Geometries	No.	DCON-MS × LS		Carbide type	
			DCON-MS × LS	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		●	●

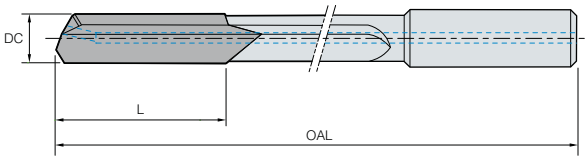
※ Special types are available for quotation with shape and size information

KGDS

Single lip type

Metric

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

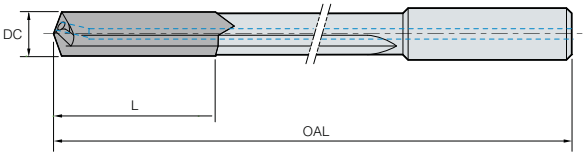
※ When ordering, please mark the overall length(L) and driver number(or drawing)

Available overall length

Designation	Drill dia.	Overall length				
		250 mm	500 mm	1000 mm	1500 mm	2000 mm
KGDS	3.00~3.49	○	○	○		
	3.50~32.99	○	○	○	○	○

KGDT

Twin Lip type



Metric

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)

Available overall length

Designation	Drill dia.	Overall length				
		250 mm	500 mm	1000 mm	1500 mm	2000 mm
KGDT	8.00~23.99	○	○	○		

Chucking/Machine Reamer

SCRS

Metric



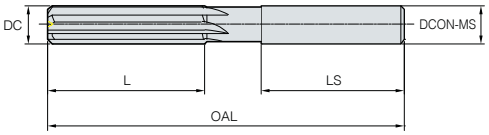


Fig. 1

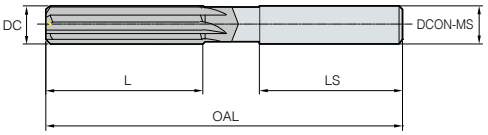


Fig. 2

(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

Metric



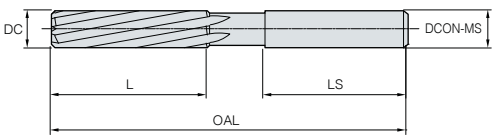


Fig. 1

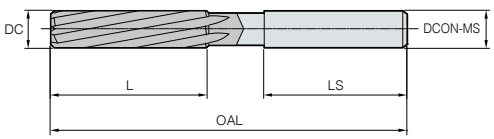


Fig. 2

(mm)

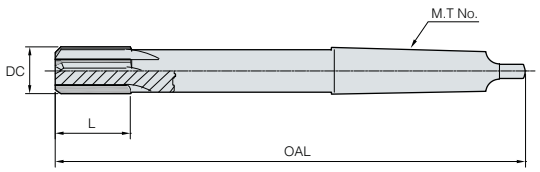
	Designation	NOF	DC	DCON-MS	L	LS	OAL	Fig.
SCRH	050S	4	5	6	20	40	100	1
	060S	4	6	6	20	40	115	1
	070S	4	7	8	20	40	125	1
	080S	4	8	8	20	40	135	1
	090S	4	9	10	20	45	140	1
	100B	4	10	10	25	50	145	2
	110B	4	11	12	25	50	150	2
	120B	4	12	12	25	50	160	2
	130B	4	13	16	25	50	165	2
	140B	6	14	16	25	50	170	2
	150B	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

Metric





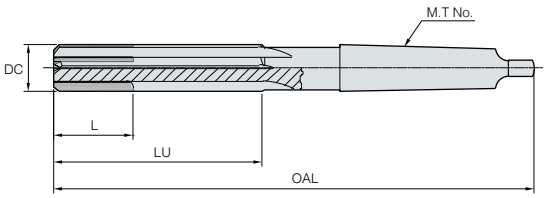
(mm)

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

Metric





(mm)

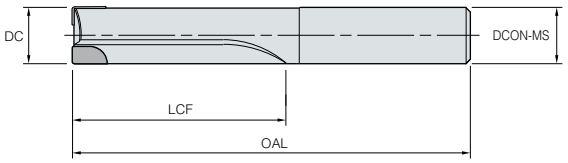
Designation		NOF	DC	L	LU	OAL	M.T No.
TMRS	070	4	7	60	60	150	1
	080	4	8	70	70	150	1
	090	4	9	70	70	160	1
	100	4	10	75	75	170	1
	110	4	11	75	75	170	1
	120	4	12	80	40	180	1
	130	4	13	85	40	190	1
	140	6	14	90	45	210	1
	150	6	15	90	45	215	2
	160	6	16	100	50	220	2
	180	6	18	105	50	225	2
	200	6	20	120	50	240	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

Metric





(mm)

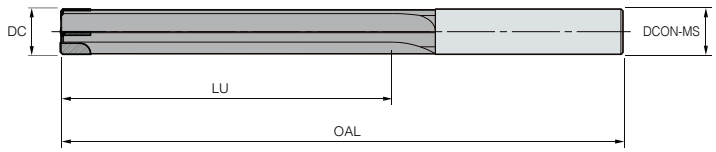
Designation		NOF	DC	DCON-MS	LCF	OAL
PDR	2050	2	5	6	30	65
	2060	2	6	6	40	75
	2070	2	7	8	40	75
	2080	2	8	8	40	75
	2090	2	9	10	40	85
	2100	2	10	10	40	85
	2120	2	12	12	50	95
	2140	2	14	16	50	95
	2150	2	15	16	50	100
	4160	4	16	16	50	100
	4180	4	18	20	60	110
	4200	4	20	20	60	110

Cermet Reamer

KCR

Metric





(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

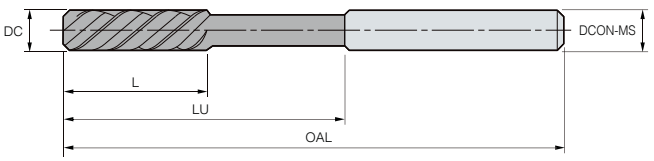
※ Customizing tools are available (Maximum overhang length should be less than 150mm.)

Broach Reamer

HBRE

Metric



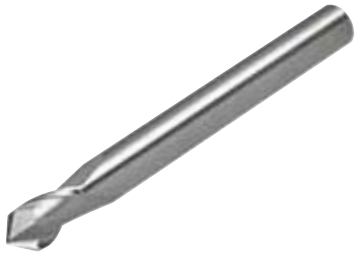


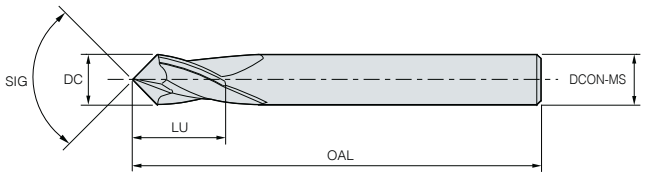
(mm)

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



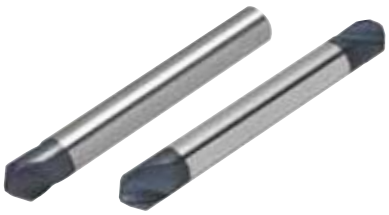


Metric

(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



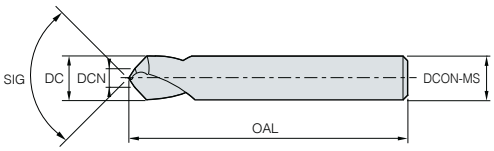


Fig. 1

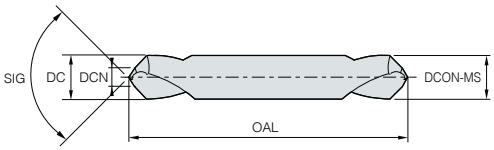
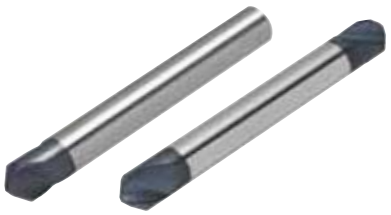


Fig. 2

(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



Metric

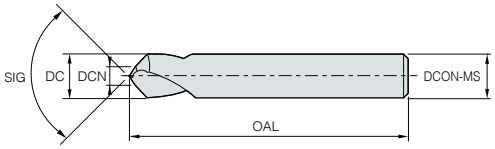


Fig. 1

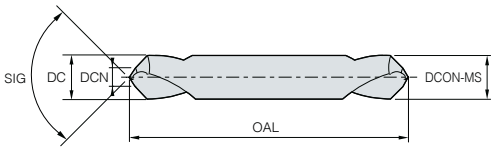


Fig. 2

(mm)

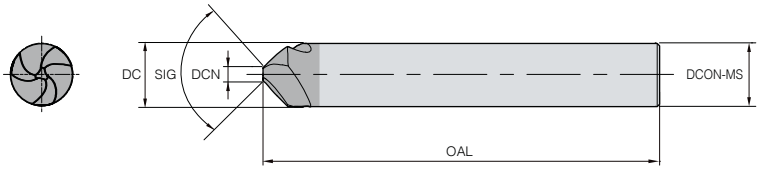
Designation		DC = DCON-MS	DCN	OAL	SIG	Fig.
CCT	120-030	3	1	40	120°	1
	120-040	4	1.5	40	120°	1
	120-060	6	2	50	120°	1
	120-080	8	2.5	60	120°	1
	120-100	10	3	70	120°	1
	120-120	12	4	80	120°	1
	120-160	16	5	100	120°	1
	120T-030	3	1	40	120°	2
	120T-040	4	1.5	40	120°	2
	120T-060	6	2	50	120°	2
	120T-080	8	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

Metric | 3 | Unequal Division /Lead | h6 shank | Grade PC40T | DC ±0.5mm





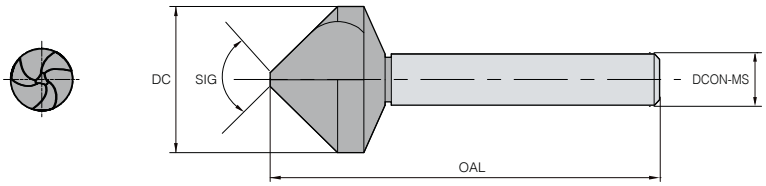
(mm)

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

Metric | 3 | Straight Type | h9 shank | Grade PC20T | DC ±1.0mm





(mm)

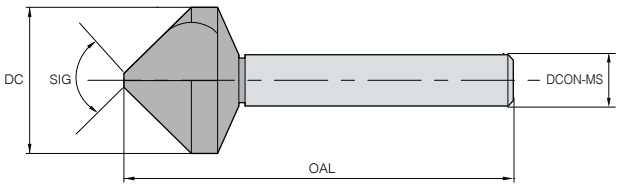
Designation		DC	DCON-MS	Range	OAL	SIG
CSNC	3100-047	10	6	2.0~9.0	47	90°
	3150-053	15	8	3.0~14.0	53	90°
	3200-057	20	10	4.0~19.0	57	90°
	3250-067	25	12	5.0~24.0	67	90°
	3300-075	30	12	6.0~29.0	75	90°

※ Order made available

CSNC1000

Metric | 1 | Straight Type | h9 shank | Grade PC20T | DC ±1.0mm





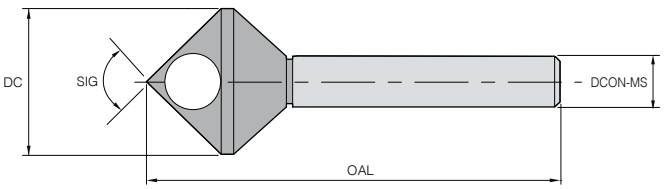
(mm)

Designation		DC	DCON-MS	Range	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

Metric | 1 | Hole Type | h9 shank | Grade PC20T | DC ±1.0mm





(mm)

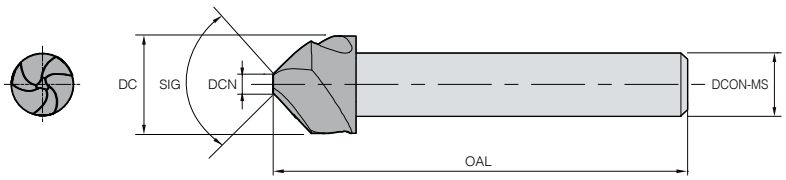
Designation		DC	DCON-MS	Range	OAL	SIG
CSHC	1100-045	10.0	6	4.0~8.0	45	90°
	1150-055	15.0	8	5.0~12.0	55	90°
	1200-070	20.0	10	8.0~15.0	70	90°
	1250-075	25.0	12	10.0~20.0	75	90°
	1300-085	30.0	12	12.0~25.0	85	90°

※ Order made available

CSPH3000

Metric | 3 | Unequal Division /Lead | h8 shank | Grade PC40T | DC ±0.5mm





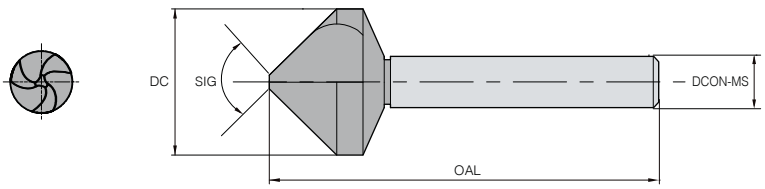
(mm)

Designation		DC	DCON-MS	Range	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°

CSNC3000

Metric | 3 | Straight Type | h9 shank | Grade HC10T HC20T | DC ±1.0mm ±1°





(mm)

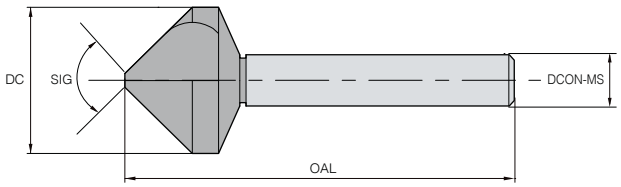
Designation		DC	DCON-MS	Range	OAL	SIG
CSNH	3100-050	10	6	3~9	50	90°
	3150-055	15	8	3~14	55	90°
	3200-060	20	10	4~19	60	90°
	3250-070	25	12	5~24	70	90°
	3300-075	30	12	6~29	75	90°
	3350-080	35	12	7~34	80	90°
	3400-085	40	12	8~39	85	90°
	3450-087	45	12	9~44	87	90°
	3500-090	50	12	12~49	90	90°

※ Order made available

CSNH1000

Metric | 1 | Straight Type | h9 shank | Grade HC10T HC20T | DC ±1.0mm





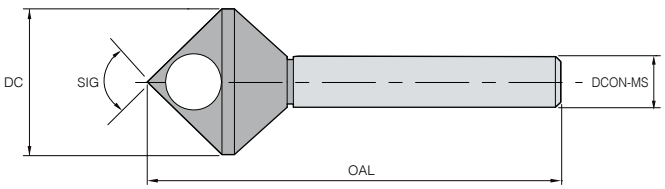
(mm)

Designation		DC	DCON-MS	Range	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

Metric | 1 | Hole Type | h9 shank | Grade HC10T HC20T | DC ±1.0mm





(mm)

Designation		DC	DCON-MS	Range	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 D

THREADING

Korloy threading tools are available for machining various shapes of thread at various pitches while ensuring high quality performances



Technical information for THREADING

D2 Solid threading endmills code system

Helical flutes with thru-hole coolant

D3 ISO Metric
D5 American UN (UNC,UNF,UNEF)
D7 Whitworth (BSW,BSF)
D9 National Pipe Thread (NPT)
D10 National Pipe Thread (NPTF)
D11 British Standard Pipe Thread (BSP)
D12 British Standard Pipe Thread (BSPT)
D13 UNJ (Unified Constant Thread)

Helical flutes with radial coolant

D14 American UN (UNC,UNF,UNEF)
D14 ISO Metric

Helical flutes with External coolant

D15 ISO Metric
D16 American UN (UNC,UNF,UNEF)
D17 National Pipe Thread (NPT)
D17 National Pipe Thread (NPTF)
D18 British Standard Pipe Thread (BSP)
D18 British Standard Pipe Thread (BSPT)

Straight flutes with External coolant

D19 ISO Metric
D20 National Pipe Thread (NPT)
D20 National Pipe Thread (NPTF)
D21 British Standard Pipe Thread (BSP)
D21 British Standard Pipe Thread (BSPT)

Helical flutes with thru-hole coolant-Thru & Chamfer

D22 American UN (UNC,UNF,UNEF)
D22 ISO Metric

Drill, Chamfer & Thread with thru-hole coolant

D23 ISO Metric

Deep thread - Long Tools

D24 ISO Metric
D25 TP60

Miniature thread mill

D26 ISO Metric
D28 American UN
D29 American UN (UNC,UNF,UNEF)
D30 UNJ (Unified Constant Thread)
D30 MJ

Miniature thread mill for Dental Implants

D31 ISO Metric
D31 American UN (UNC,UNF,UNEF)

Miniature thread mill for hard materials (~HRC62)

D32 ISO Metric
D34 American UN
D35 American UN (UNC,UNF)

Tap-Star

D36 Technical Information for Tap-Star
D39 Tap-Star

STM D 25 189 L03 - I 1.00 ISO

1	2	3	4	5	6	7	8
Type	Flute style	Shank dia.	Cutting dia.	Cutting edge length	Type of tool	Pitch	Type

1 Type

STM D 25 189 L03 - I 1.00 ISO

Solid Threading Endmill

2 Flute style

STM D 25 189 L03 - I 1.00 ISO

HC : Helical flutes with thru-hole coolant
HCR : Helical flute with radial coolant
HCC : Helical flutes with thru-coolant-Thru&Chamfer
HCD : Drill, Chamfer & Thread with thru-hole coolant
D : Deep thread

3 Shank dia.

STM D 25 189 L03 - I 1.00 ISO

25: 0.25

4 Cutting dia.

STM D 25 189 L03 - I 1.00 ISO

189: 0.189

5 Cutting edge length

STM D 25 189 L03 - I 1.00 ISO

L03: 0.300

6 Type of tool

STM D 25 189 L03 - I 1.00 ISO

I: Internal E: External

7 Pitch

STM D 25 189 L03 - I 1.00 ISO

mm: 0.35~3.0 tpi: 72~12

8 Type

STM D 25 189 L03 - I 1.00 ISO

ISO Metric
American UN
Cutting edge Length UNJ
Whit Worth (BSW, BSF, BSP, BSB)
National Pipe Thread (NPT)
National Pipe Thread (NPTF)
British Standard Pipe Thread (BSPT)

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.

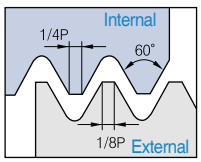
http://www.korloy.com

ISO Metric

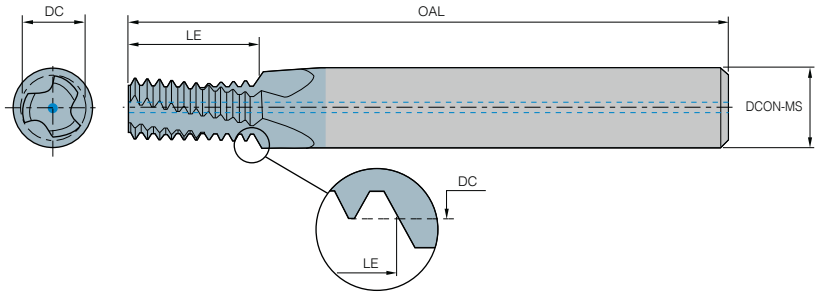
Helical flutes with thru-hole coolant

Inch

Internal



Defined by : R262(DIN 13)
TCTR : 6H



(LE ≤ 1.5 × Thread diameter)

Thread		Pitch (TP)	Designation		PC9070M	Dimensions (inch)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine		Internal			DC	DCON-MS	LE	OAL	NOF	NT	PHD
M3×0.5	M3.5~M16×0.5	0.5	STMHC	19094L01-I0.50ISO		0.094	3/16	0.187	1.772	3	9	0.098
M4×0.7		0.7		19124L02-I0.70ISO		0.124	3/16	0.262	1.772	3	9	0.129
M5×0.8		0.8		19159L02-I0.80ISO		0.159	3/16	0.299	2.244	3	9	0.165
M6×1.0	M8~M40×1.0	1.0		25189L03-I1.00ISO		0.189	1/4	0.374	2.244	3	9	0.197
M8×1.25		1.25		31256L05-I1.25ISO		0.256	5/16	0.524	2.402	3	10	0.268
M10×1.5	M12~M48×1.5	1.5		37323L06-I1.50ISO		0.323	3/8	0.62	2.874	3	10	0.335
M12×1.75		1.75		37370L07-I1.75ISO		0.37	3/8	0.724	2.874	4	10	0.405
M14×2.0	M17~M80×2.0	2.0		50457L08-I2.00ISO		0.457	1/2	0.827	2.874	4	10	0.472
M16×2.0	M17~M80×2.0	2.0		63535L09-I2.00ISO		0.535	5/8	0.984	3.622	4	12	0.551

● : Korea Stock ● : US Stock

(LE ≤ 2 × Thread diameter)

Thread		Pitch (TP)	Designation		PC9070M	Dimensions (inch)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine		Internal			DC	DCON-MS	LE	OAL	NOF	NT	PHD
M3×0.5	M3.5~M16×0.5	0.5	STMHC	19094L02-I0.50ISO		0.094	3/16	0.246	1.772	3	12	0.098
	M4×0.5	0.5		19126L03-I0.50ISO		0.126	3/16	0.325	1.772	3	16	0.138
	M5×0.5	0.5		25165L04-I0.50ISO		0.165	1/4	0.404	2.244	3	20	0.177
M4×0.7		0.7		19124L03-I0.70ISO		0.124	3/16	0.344	1.722	3	12	0.129
	M6×0.75	0.75		25197L04-I0.75ISO		0.197	1/4	0.487	2.244	3	16	0.209
M5×0.8		0.8		19159L04-I0.80ISO		0.159	3/16	0.425	2.244	3	13	0.165
M6×1.0	M8~M40×1.0	1.0		25189L04-I1.00ISO	●	0.189	1/4	0.492	2.244	3	12	0.197
	M8×1.0	1.0		31264L06-I1.00ISO		0.264	5/16	0.650	2.402	3	16	0.276
	M10×1.0	1.0		37343L08-I1.00ISO		0.343	3/8	0.807	2.874	3	20	0.354
	M12×1.0	1.0		50421L09-I1.00ISO	●	0.421	1/2	0.965	2.874	4	24	0.433
M8×1.25		1.25		31256L06-I1.25ISO	●	0.256	5/16	0.664	2.402	3	13	0.268
	M10×1.25	1.25		37335L08-I1.25ISO	●	0.335	3/8	0.812	2.874	3	16	0.346
M10×1.5	M12~M48×1.5	1.5		37323L07-I1.50ISO	●	0.323	3/8	0.797	2.874	3	13	0.335
	M12×1.5	1.5		37370L09-I1.50-ISO	●	0.370	3/8	0.974	2.874	4	16	0.413
	M14×1.5	1.5		50469L11-I1.50ISO		0.469	1/2	1.152	3.150	4	19	0.492
	M16×1.5	1.5		63547L12-I1.50ISO		0.547	5/8	1.270	3.150	4	21	0.571
M12×1.75		1.75		37370L09-I1.75ISO		0.370	3/8	0.999	2.874	4	14	0.405
M14×2.0	M17~M80×2.0	2.0		50457L11-I2.00ISO		0.457	1/2	1.142	3.150	4	14	0.472
M16×2.0	M17~M80×2.0	2.0		63535L12-I2.00ISO		0.535	5/8	1.299	3.622	4	16	0.551
M18×2.5		2.5		63583L14-I2.50ISO		0.583	5/8	1.427	3.622	4	14	0.598
M 20×2.5		2.5		75673L16-I2.50ISO		0.673	3/4	1.624	4.016	4	16	0.687
M 24×3.0		3.0		75746L19-I3.00ISO		0.746	3/4	1.949	4.016	4	16	0.827

※ Bore Diameter applies to smallest thread Dia

Maximum thread length = LE − $\frac{\text{Pitch}}{4}$

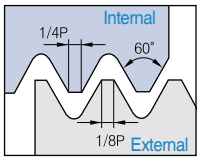
● : Korea Stock ● : US Stock

ISO Metric

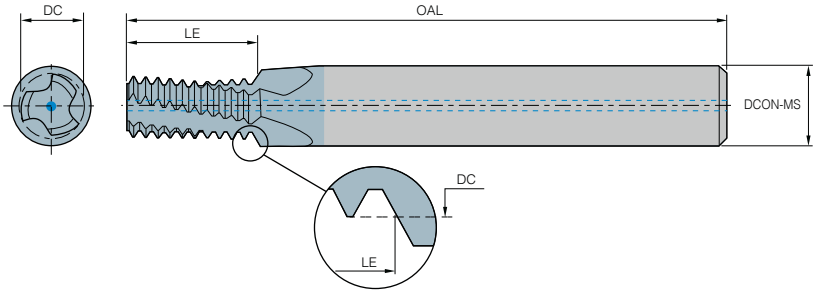
Helical flutes with thru-hole coolant

Metric

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

●: Korea Stock ●: US Stock

(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 − $\frac{\text{Pitch}}{4}$

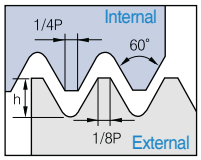
●: Korea Stock ●: US Stock

American UN(UNC,UNF,UNEF)

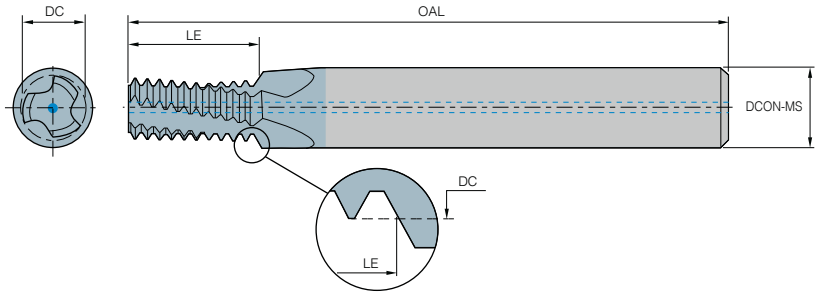
Helical flutes with thru-hole coolant

Inch

Internal



Defined by : ANSI B1.1.74
TCTR : 2B



(LE ≤ 1.5 × Thread diameter)

Thread			Pitch (tpi)	Designation		PC9070M	Dimensions (inch)				No.of flute	Tooth	*Bore dia.
UNC	UNF	UNEF		Internal			DC	DCON-MS	LE	OAL	NOF	NT	PHD
No.10~24	5/16″ ,3/8″×24	9/16″~11/16″×24	24	STMHC	19141L03-I24UNC		0.141	3/16	0.312	1.722	3	7	0.150
No.10~24	5/16″ ,3/8″×24	9/16″~11/16″×24	24		25163L03-I24UNC		0.163	1/4	0.354	2.244	3	8	0.177
1/4″×20	7/16″ ,1/2″×20	3/4″~1″×20	20		25192L03-I20UNC		0.162	1/4	0.375	2.244	3	7	0.201
5/16″×18	9/16″ ,5/8″×18	11/16″~1 11/16″×18	18		31242L04-I18UNC		0.242	5/16	0.472	2.402	3	8	0.260
3/8″×16	3/4″×16		16		31301L05-I16UNC		0.301	5/16	0.594	2.402	3	9	0.315
7/16″×14	7/8″×14		14		37354L06-I14UNC		0.354	3/8	0.678	2.874	3	9	0.370
1/2″×13			13		50407L08-I13UNC		0.407	1/2	0.808	3.150	4	10	0.429
9/16″×12	1″~1 1/2″×12		12		50465L08-I12UNC		0.465	1/2	0.875	3.150	4	10	0.484

●: Korea Stock ●: US Stock

(LE ≤ 2 × Thread diameter)

Thread			Pitch (tpi)	Designation		PC9070M	Dimensions (inch)				No.of flute	Tooth	*Bore dia.
UNC	UNF	UNEF		Internal			DC	DCON-MS	LE	OAL	NOF	NT	PHD
	No.10~32	No. 12~3/8″×32	32	STMHC	19150L03-I32UNF		0.150	3/16	0.391	1.772	3	12	0.157
		No. 12~3/8″×32	32		25173L04-I32UNEF		0.173	1/4	0.453	2.244	3	14	0.185
	No.12, 1/4″×28	7/16″; 1/2″×28	28		25169L04-I28UNF		0.169	1/4	0.446	2.244	3	12	0.181
	1/4″×28	7/16″; 1/2″×28	28		25203L05-I28UNF		0.203	1/4	0.518	2.244	3	14	0.216
		7/16″; 1/2″×28	28		37371L08-I28UNEF		0.371	3/8	0.875	2.874	3	24	0.401
No.10~24	5/16″, 3/8″×24	9/16″~11/16″×24	24		19141L04-I24UNC		0.141	3/16	0.396	1.772	3	9	0.150
No.12~24	5/16″, 3/8″×24	9/16″~11/16″×24	24		25163L04-I24UNC		0.163	1/4	0.437	2.244	3	10	0.177
	5/16″, 3/8″×24	9/16″~11/16″×24	24		31263L06-I24UNF		0.263	5/16	0.646	2.402	3	15	0.272
	3/8″×24	9/16″~11/16″×24	24		37323L07-I24UNF		0.323	3/8	0.771	2.874	3	18	0.355
		9/16″~11/16″×24	24		50496L11-I24UNEF		0.496	1/2	1.145	3.150	4	27	0.520
1/4″×20	7/16″, 1/2″×20	3/4″~1″×20	20		25192L05-I20UNC		0.192	1/4	0.525	2.244	3	10	0.201
	7/16″, 1/2″×20	3/4″~1″×20	20		37362L08-I20UNF		0.362	3/8	0.875	2.874	3	17	0.390
	1/2″×20	3/4″~1″×20	20		50437L10-I20UNF		0.437	1/2	1.025	3.150	3	20	0.453
		3/4″~1″×20	20		75685L15-I20UNEF		0.685	3/4	1.525	4.016	4	30	0.701
5/16″×18	9/16″, 5/8″×18	11/16″~1 11/16″×18	18		31242L16-I18UNC		0.242	5/16	0.639	2.402	3	11	0.260
	9/16″, 5/8″×18	11/16″~1 11/16″×18	18		50492L11-I18UNF		0.492	1/2	1.139	3.150	4	20	0.512
	5/8″×18	11/16″~1 11/16″×18	18		63555L12-I18UNF		0.555	5/8	1.250	3.622	4	22	0.575
3/8″×16	3/4″×16		16		31301L07-I16UNC		0.301	5/16	0.781	2.402	3	12	0.315
	3/4″×16		16		75669L15-I16UNF		0.669	3/4	1.528	4.016	4	24	0.689
7/16″×14	7/8″×14		14		37354L08-I14UNC		0.354	3/8	0.893	2.874	3	12	0.370
	7/8″×14		14		75746L17-I14UNF		0.746	3/4	1.750	4.016	4	24	0.807
1/2″×13			13		50407L10-I13UNC		0.407	1/2	1.039	3.150	4	13	0.430
9/16″×12	1″~1 1/2″×12		12		50465L11-I12UNC		0.462	1/2	1.125	3.150	4	13	0.484
	1″~1 1/2″×12		12		75746L20-I12UNF		0.746	3/4	2.042	4.016	4	24	0.925
5/8″×11			11		63516L13-I11UNC		0.516	5/8	1.318	3.622	4	14	0.539
3/4″×10			10		63622L15-I10UNC		0.622	5/8	1.550	3.622	4	15	0.657
7/8″×9			9		75746L18-I9UNC		0.746	3/4	1.833	4.016	4	16	0.768
1″×8			8		75746L20-I8UNC		0.746	3/4	2.063	4.016	4	16	0.866

※ Bore Diameter applies to smallest thread Dia

Maximum thread length = LE − $\frac{\text{Pitch}}{4}$

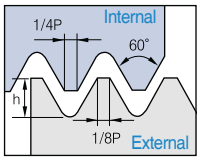
●: Korea Stock ●: US Stock

American UN(UNC,UNF,UNEF)

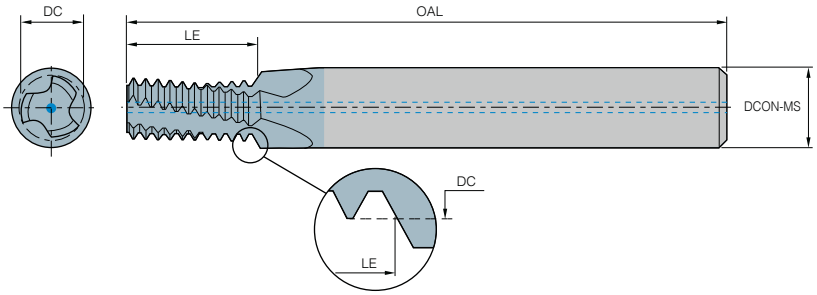
Helical flutes with thru-hole coolant

Metric

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″×24	9/16″~11/16″×24	24	STMHC	04035L07-I24UNC		3.58	4	7.9	45	3	7	3.8
No.10~24	5/16″ ,3/8″×24	9/16″~11/16″×24	24		06041L08-I24UNC		4.15	6	9.0	57	3	8	4.5
1/4″×20	7/16″ ,1/2″×20	3/4″~1″×20	20		06048L09-I20UNC		4.88	6	9.5	57	3	7	5.2
5/16″×18	9/16″ ,5/8″×18	11/16″~1 11/16″×18	18		08061L11-I18UNC		6.15	8	12.0	61	3	8	6.5
3/8″×16	3/4″×16		16		08076L15-I16UNC		7.65	8	15.1	61	3	9	8.0
7/16″×14	7/8″×14		14		10090L17-I14UNC		9.00	10	17.2	73	3	9	9.3
1/2″×13			13		12104L20-I13UNC		10.35	12	20.5	73	4	10	10.8
9/16″×12	1″~1 1/2″×12		12		12118L22-I12UNC		11.80	12	22.2	73	4	10	12.3

●: Korea Stock ●: US Stock

(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″×32	32	STMHC	04038L09-I32UNF		3.80	4	9.9	45	3	12	4.0
		No. 12~3/8″×32	32		06044L11-I32UNEF		4.40	6	11.5	57	3	14	4.7
	No.12, 1/4″×28	7/16″; 1/2″×28	28		06043L11-I28UNF		4.30	6	11.3	57	3	12	4.6
	1/4″×28	7/16″; 1/2″×28	28		06052L13-I28UNF		5.15	6	13.1	57	3	14	5.5
		7/16″; 1/2″×28	28		10099L22-I28UNEF		9.90	10	22.2	73	3	24	10.2
No.10~24	5/16″, 3/8″×24	9/16″~11/16″×24	24		04035L10-I24UNC		3.58	4	10.0	45	3	9	3.8
No.12~24	5/16″, 3/8″×24	9/16″~11/16″×24	24		06041L11-I24UNC		4.15	6	11.1	57	3	10	4.5
	5/16″, 3/8″×24	9/16″~11/16″×24	24		08066L16-I24UNF		6.68	8	16.4	61	3	15	6.8
	3/8″×24	9/16″~11/16″×24	24		10082L19-I24UNF		8.20	10	19.6	73	3	18	8.5
		9/16″~11/16″×24	24		14129L29-I24UNEF		12.90	14	29.1	92	4	27	13.2
1/4″×20	7/16″, 1/2″×20	3/4″~1″×20	20		06048L13-I20UNC		4.88	6	13.3	57	3	10	5.2
	7/16″, 1/2″×20	3/4″~1″×20	20		10096L22-I20UNF		9.60	10	22.2	73	3	17	9.8
	1/2″×20	3/4″~1″×20	20		12111L26-I20UNF		11.10	12	26.0	80	3	20	11.5
		3/4″~1″×20	20		18174L38-I20UNEF		17.40	18	38.7	102	4	30	17.8
5/16″×18	9/16″, 5/8″×18	11/16″~1 11/16″×18	18		08061L16-I18UNC		6.15	8	16.2	61	3	11	6.5
	9/16″, 5/8″×18	11/16″~1 11/16″×18	18		14125L28-I18UNF		12.50	14	28.9	92	4	20	12.8
	5/8″×18	11/16″~1 11/16″×18	18		16141L31-I18UNF		14.10	16	31.7	92	4	22	14.5
3/8″×16	3/4″×16		16		08076L19-I16UNC		7.65	8	19.8	61	3	12	8.0
	3/4″×16		16		18170L38-I16UNF		17.00	18	38.8	102	4	24	17.5
7/16″×14	7/8″×14		14		10090L22-I14UNC		9.00	10	22.7	73	3	12	9.3
	7/8″×14		14		20199L44-I14UNF		19.90	20	44.4	102	4	24	20.5
1/2″×13			13		12104L26-I13UNC		10.35	12	26.4	80	4	13	10.8
9/16″×12	1″~1 1/2″×12		12		12118L28-I12UNC		11.80	12	28.6	80	4	13	12.3
	1″~1 1/2″×12		12		20199L51-I12UNF		19.90	20	51.9	102	4	24	23.5
5/8″×11			11		14131L33-I11UNC		13.10	14	33.5	92	4	14	13.5
3/4″×10			10		16159L39-I10UNC		15.90	16	39.4	92	4	15	16.5
7/8″×9			9		20190L46-I9UNC		19.00	20	46.6	102	4	16	19.5
1″×8			8		20199L52-I8UNC		19.90	20	52.4	102	4	16	22.0

※ Bore Diameter applies to smallest thread Dia

Maximum thread length = LE − $\frac{\text{Pitch}}{4}$

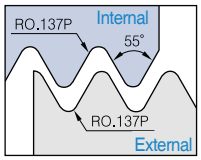
●: Korea Stock ●: US Stock

Whitworth(BSW,BSF)

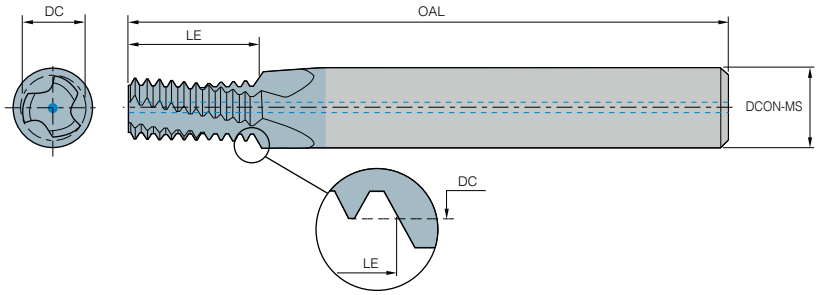
Helical flutes with thru-hole coolant

Inch

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 (inch)				No.of flute	Tooth	*Bore dia.
BSW	BSF		External/Internal			DC	DCON-MS	LE	OAL	NOF	NT	PHD
	1/4″×26	26	STMHC	25197L05-EI26BSF		0.197	1/4	0.519	2.244	3	13	0.209
	5/16″×22	22		31250L06-EI22BSF		0.250	5/16	0.659	2.402	3	14	0.264
1/4″×20	3/8″×20	20		25175L05-EI20BSW		0.175	1/4	0.525	2.244	3	10	0.197
	3/8″×20	20		31301L07-EI20BSF		0.301	5/16	0.775	2.402	3	15	0.323
5/16″×18	7/16″×18	18		25230L06-EI18BSW		0.230	1/4	0.639	2.244	3	11	0.256
	7/16″×18	18		37362L09-EI18BSF		0.362	3/8	0.917	2.874	3	16	0.382
3/8″×16	1/2″, 9/16″×16	16		31283L07-EI16BSW		0.283	5/16	0.781	2.402	3	12	0.311
	1/2″, 9/16″×16	16		50413L10-EI16BSF		0.413	1/2	1.031	2.840	4	16	0.437
	9/16″×16	16		50478L11-EI16BSF		0.478	1/2	1.156	3.150	4	18	0.496
7/16″×14	5/8″, 11/16″×14	14		37335L08-EI14BSW		0.335	3/8	0.893	2.874	3	12	0.362
	5/8″, 11/16″×14	14		63528L12-EI14BSF		0.528	5/8	1.250	3.150	4	17	0.551
	11/16″×14	14		63591L13-EI14BSF		0.591	5/8	1.393	3.622	4	19	0.614
1/2″×12	3/4″×12	12		37362L10-EI12BSW		0.362	3/8	1.042	2.874	3	12	0.413
9/16″×12	3/4″×12	12		50444L11-EI12BSW		0.444	1/2	1.125	3.150	4	13	0.476
	3/4″×12	12		63622L15-EI12BSF		0.622	5/8	1.542	3.622	4	18	0.661
5/8″×11	7/8″×11	11		50496L13-EI11BSW		0.496	1/2	1.318	3.150	4	14	0.528
11/16″×11		11		63559L14-EI11BSW		0.559	5/8	1.409	3.622	4	15	0.591

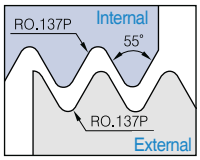
●: Korea Stock ●: US Stock

Whitworth(BSW,BSF)

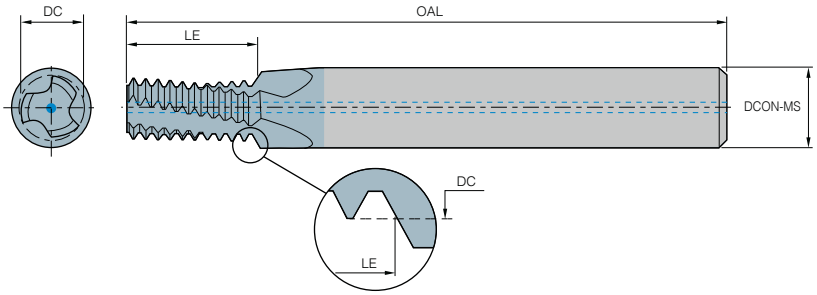
Helical flutes with thru-hole coolant

Metric

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 = $LE - \frac{Pitch}{4}$

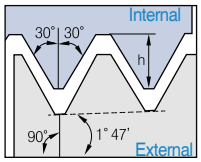
●: Korea Stock ●: US Stock

National Pipe Thread(NPT)

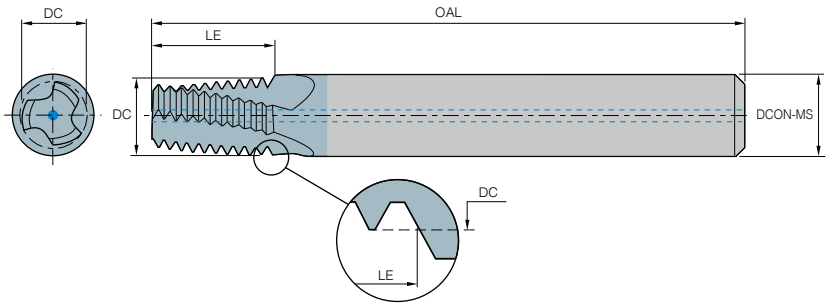
Helical flutes with thru-hole coolant

Inch

External/Internal



Defined by : USAS B2.1:1968
TCTR : Standard NPT



Thread	Pitch (tpi)	Designation		PC9070M	Dimensions (inch)				No.of flute	Tooth	*Bore dia.
Standard		Internal			DC	DCON-MS	LE	OAL	NOF	NT	PHD
1/16″×27	27	STMHC	25232L03-EI27NPT		0.232	1/4	0.389	2.244	3	10	0.244
1/8″×27	27		31301L03-EI27NPT		0.301	5/16	0.389	2.402	3	10	0.330
1/4″×18	18		37370L05-EI18NPT	●	0.370	3/8	0.583	2.874	3	10	0.437
3/8″×18	18		50439L05-EI18NPT		0.439	1/2	0.583	2.874	4	10	0.562
1/2″, 3/4″×14	14		63561L07-EI14NPT		0.561	5/8	0.750	3.150	4	10	0.407, 0.905
1″, 1 1/14, 1 1/2″, 2″×11.5	11.5		75746L09-EI11.5NPT		0.746	3/4	0.913	4.016	4	10	1.411, 1.484, 1.732, 2.204
2 1/2″×8 ; 3″×8	8		75746L13-EI8NPT		0.746	3/4	1.313	4.016	4	10	2.625, 3.232

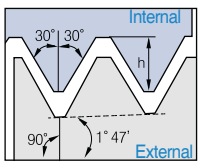
●: Korea Stock ●: US Stock

National Pipe Thread(NPT)

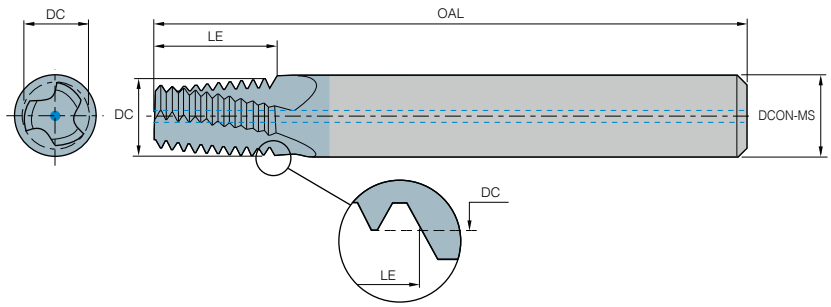
Helical flutes with thru-hole coolant

Metric

External/Internal



Defined by : USAS B2.1:1968
TCTR : Standard NPT



Thread	Pitch (tpi)	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
Standard					DC	DCON-MS	LE	OAL	NOF	NT	PHD
1/16″×27	27.0	STMHC	06059L09-EI27NPT		5.90	6	9.9	57	3	10	6.3
1/8″×27	27.0		08076L09-EI27NPT		7.65	8	9.9	61	3	10	8.5
1/4″×18	18.0		10099L14-EI18NPT	●	9.90	10	14.8	73	3	10	11.1
3/8″×18	18.0		12111L14-EI18NPT		11.15	12	14.8	73	4	10	14.5
1/2″, 3/4″×14	14.0		16142L19-EI14NPT		14.25	16	19.0	92	4	10	17.7, 23.0
1″, 1 1/14, 1 1/2″, 2″×11.5	11.5		20196L23-EI11.5NPT		19.60	20	23.2	102	4	10	29.0, 37.7, 44.0, 56.0
2 1/2″×8 ; 3″×8	8.0		20196L33-EI8NPT		19.60	20	33.3	102	4	10	66.5, 82.1

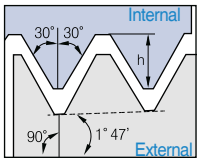
●: Korea Stock ●: US Stock

National Pipe Thread(NPTF)

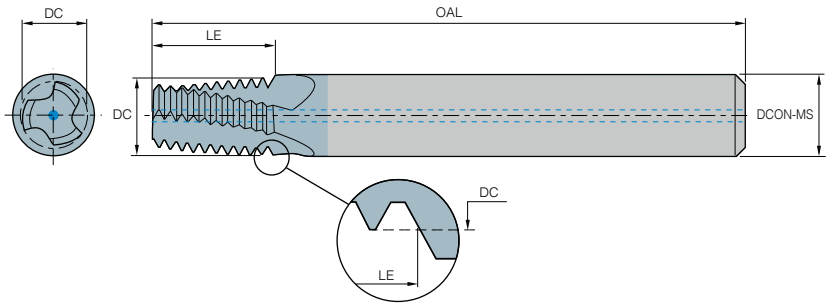
Helical flutes with thru-hole coolant

Inch

External/Internal



Defined by : ANSI 1.20.3-1976
TCTR : Standard NPTF



Thread Standard	Pitch (tpi)	Designation Internal		PC9070M	Dimensions (inch) DC	DCON-MS	LE	OAL	No.of flute NOF	Tooth NT	*Bore dia. PHD
1/16″×27	27	STMHC	25232L03-EI27NPTF	●	0.232	1/4	0.389	2.244	3	10	0.240
1/8″×27	27		31301L03-EI27NPTF		0.301	5/16	0.389	2.402	3	10	0.330
1/4″×18	18		37370L05-EI18NPTF		0.370	3/8	0.583	2.874	3	10	0.437
3/8″×18	18		50439L05-EI18NPTF		0.439	1/2	0.583	2.874	4	10	0.562
1/2″, 3/4″×14	14		63561L07-EI14NPTF		0.561	5/8	0.750	3.150	4	10	0.704, 0.095
1″, 1 1/14, 1 1/2″, 2″×11.5	11.5		75746L09-EI11.5NPTF		0.746	3/4	0.913	4.016	4	10	1.411, 1.484, 1.720, 2.188
2 1/2″×8 ; 3″×8	8		75746L13-EI8NPTF		0.746	3/4	1.313	4.016	4	10	2.610, 3.232

※ Bore Diameter applies to smallest thread Dia

Maximum thread length = LE – $\frac{\text{Pitch}}{4}$

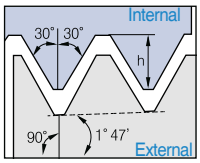
●: Korea Stock ●: US Stock

National Pipe Thread(NPTF)

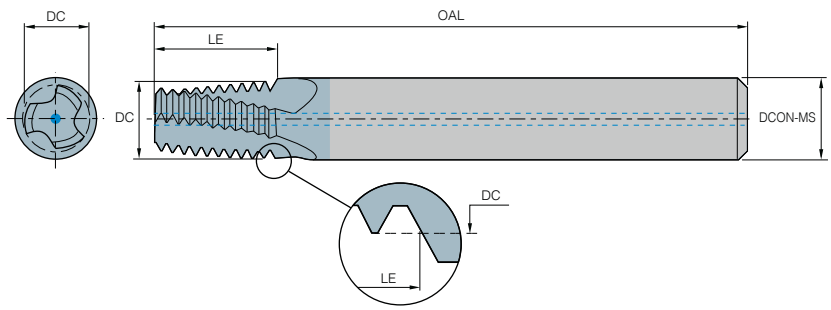
Helical flutes with thru-hole coolant

Metric

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″×27	27.0	STMHC	06059L09-EI27NPTF	●	5.90	6	9.9	57	3	10	6.3
1/8″×27	27.0		08076L09-EI27NPTF		7.65	8	9.9	61	3	10	8.5
1/4″×18	18.0		10099L14-EI18NPTF		9.90	10	14.8	73	3	10	11.1
3/8″×18	18.0		12111L14-EI18NPTF		11.15	12	14.8	73	4	10	14.5
1/2″, 3/4″×14	14.0		16142L19-EI14NPTF		14.25	16	19.0	92	4	10	17.7, 23.4
1″, 1 1/14, 1 1/2″, 2″×11.5	11.5		20196L23-EI11.5NPTF		19.60	20	23.2	102	4	10	29.0, 37.7, 43.7, 55.6
2 1/2″×8 ; 3″×8	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 – $\frac{\text{Pitch}}{4}$

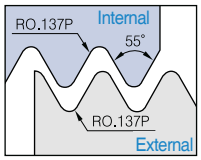
●: Korea Stock ●: US Stock

British Standard Pipe Thread(BSP)

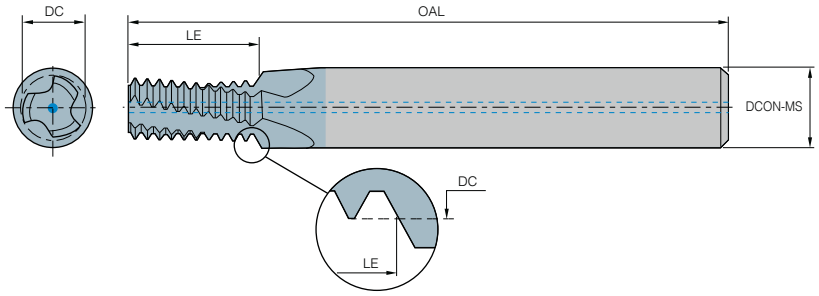
Helical flutes with thru-hole coolant

Metric

Internal



Defined by : B.S.2779:1956
TCTR : Medium class



(LE ≤ 1.5 × Thread diameter)

Thread Standard	Pitch (tpi)	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
					DC	DCON-MS	LE	OAL	NOF	NT	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

● : Korea Stock ● : US Stock

(LE ≤ 2 × Thread diameter)

Thread Standard	Pitch (tpi)	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
					DC	DCON-MS	LE	OAL	NOF	NT	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 = $LE - \frac{Pitch}{4}$

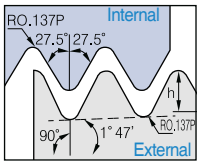
● : Korea Stock ● : US Stock

British Standard Pipe Thread(BSPT)

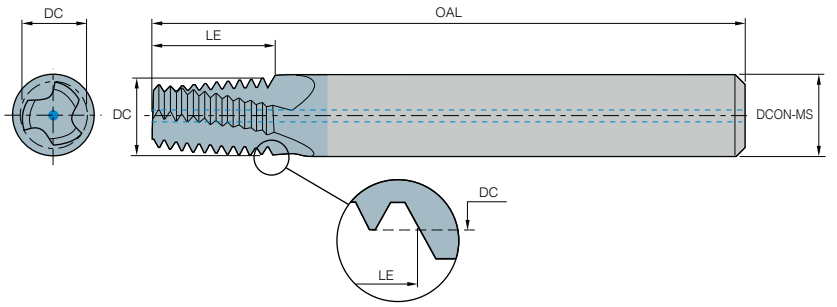
Helical flutes with thru-hole coolant

Inch

External/Internal



Defined by : B.S.21:1985
TCTR : Standard BSPT



Thread	PITCH (tpi)	Designation		PC9070M	Dimensions (inch)				No.of flute	Tooth	*Bore dia.
Standard		Internal			DC	DCON-MS	LE	OAL	NOF	NT	PHD
1/16″×28	28	STMHC	25232L03-EI28BSPT		0.232	1/4	0.401	2.402	3	11	0.264
1/8″×28	28		31301L03-EI28BSPT		0.301	5/16	0.401	2.402	3	11	0.342
1/4″×19	19		50400L05-EI19BSPT		0.400	1/2	0.605	2.874	3	11	0.464
3/8″×19	19		50439L05-EI19BSPT		0.439	1/2	0.605	2.874	4	11	0.598
1/2″, 3/4″×14	14		63561L08-EI14BSPT		0.561	5/8	0.893	3.150	4	12	0.748
1″, 1 1/2″, 2″, 2 1/2″×11	11		75746L10-EI11BSPT		0.746	3/4	1.136	4.016	4	12	1.209

※ Bore Diameter applies to smallest thread Dia

Maximum thread length = $LE - \frac{Pitch}{4}$

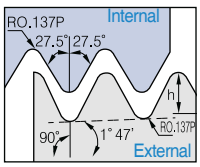
●: Korea Stock ●: US Stock

British Standard Pipe Thread(BSPT)

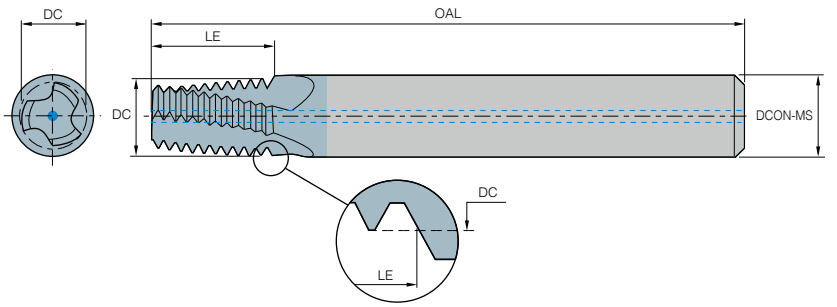
Helical flutes with thru-hole coolant

Metric

External/Internal



Defined by : B.S.21:1985
TCTR : Standard BSPT



Thread	Pitch (tpi)	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
Standard					DC	DCON-MS	LE	OAL	NOF	NT	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

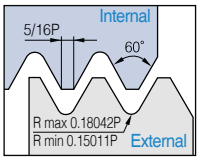
●: Korea Stock ●: US Stock

UNJ(Unified Constant Thread)

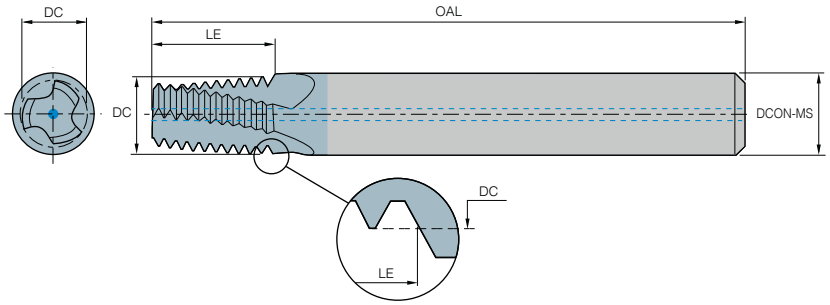
Helical flutes with thru-hole coolant

Metric

External/Internal



Defined by : MIL-S-8879C
TCTR : 3B



Thread			Pitch (tpi)	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
UNJC	UNJF	UNFEF/UNJ					DC	DCON-MS	LE	OAL	NOF	NT	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 = $LE - \frac{Pitch}{4}$

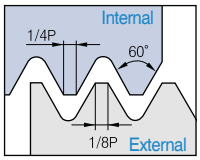
● : Korea Stock ● : US Stock

American UN(UNC,UNF,UNEF)

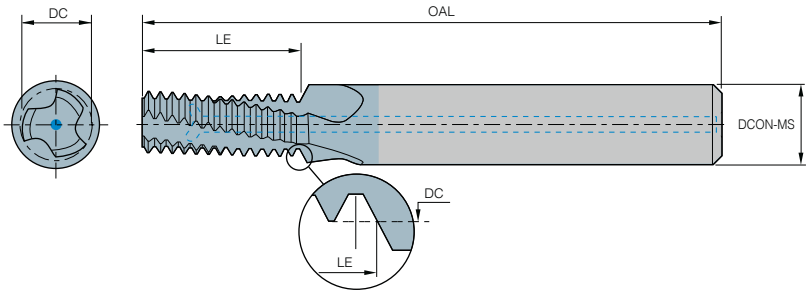
Helical flutes with radial coolant

Inch

Internal



Defined by : R262 (DIN 13)
TCTR : 6H



(LE≤2×Thread diameter)

Thread			Designation		PC9070M	Dimensions (inch)				*Bore dia.
UNC	UNF	UNEF	Internal			DC	DCON-MS	LE	OAL	PHD
	No.10-32	No.12-3/8×32	STMHCR	19150L03-I32UNF		0.150	3/16	0.391	1.772	0.157
	1/4×28	7/16,1/2×28		25203L05-I28UNF		0.203	1/4	0.518	2.244	0.216
No.10-24	5/16, 3/8×24	9/16-11/16×24		19141L04-I24UNC		0.141	3/16	0.396	1.772	0.150
No.12-24	5/16, 3/8×24	9/16-11/16×24		19163L04-I24UNC		0.163	3/16	0.437	1.772	0.177
	5/16, 3/8×24	9/16-11/16×24		31263L06-I24UNF		0.263	5/16	0.646	2.402	0.272
	3/8×24	9/16-11/16×24		37323L07-I24UNF		0.323	3/8	0.771	2.874	0.335
1/4×20	7/16×1/2×20	3/4-1×20		25192L05-I20UNC		0.192	1/4	0.525	2.244	0.201
	1/2×20	3/4-1×20		50437L10-I20UNF		0.437	1/2	1.025	3.150	0.453
5/16×18	9/16, 5/8×18	11/16-1 11/16×18		31242L16-I18UNC		0.242	5/16	0.639	2.402	0.260
3/8×16	3/4×16			31301L07-I16UNC		0.301	5/16	0.781	2.402	0.315
7/16×14	7/8×14			37354L08-I14UNC		0.354	3/8	0.893	2.874	0.370
1/2×13				50407L10-I13UNC		0.407	1/2	1.039	3.150	0.430
9/16×12	1-1 1/2×12			50465L11-I12UNC		0.465	1/2	1.125	3.150	0.484

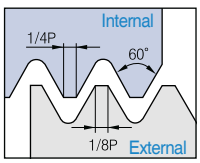
●: Korea Stock ●: US Stock

ISO Metric

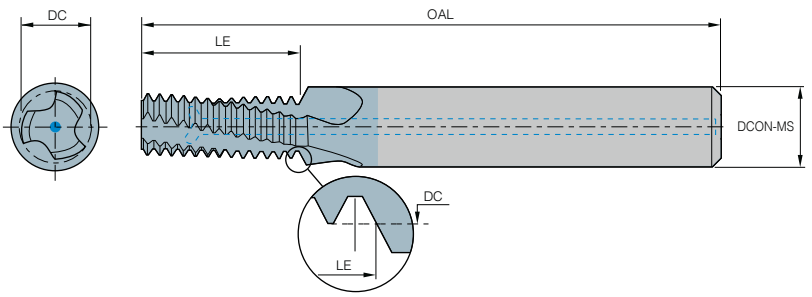
Helical flutes with radial coolant

Metric

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

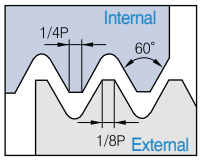
●: Korea Stock ●: US Stock

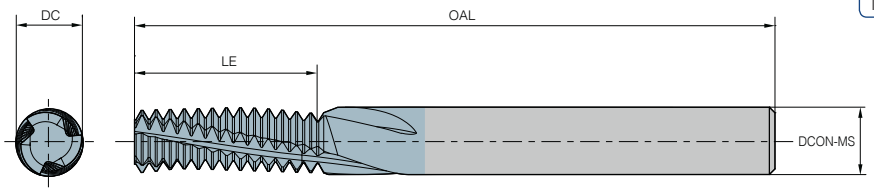
ISO Metric

Helical flutes with External coolant

Metric

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

●: Korea Stock ●: US Stock

• 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

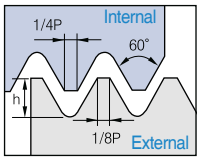
●: Korea Stock ●: US Stock

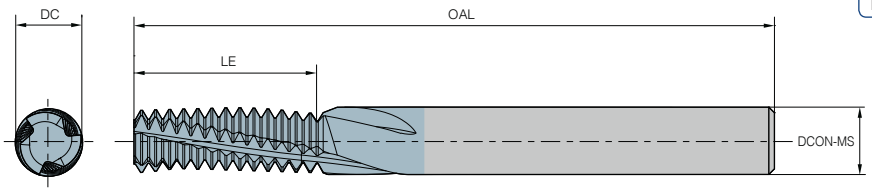
American UN(UNC,UNF,UNEF)

Helical flutes with External coolant

Metric

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

●: Korea Stock ●: US Stock

· 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

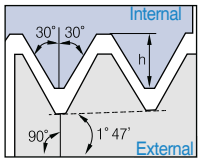
●: Korea Stock ●: US Stock

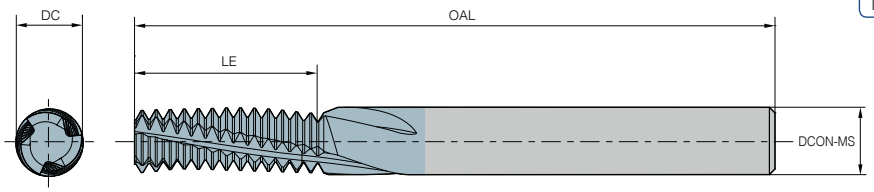
National Pipe Thread(NPT)

Helical flutes with External coolant

Metric

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

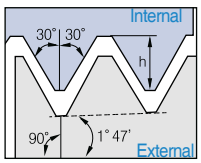
● : Korea Stock ● : US Stock

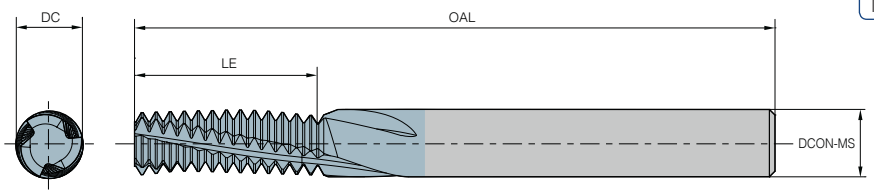
National Pipe Thread(NPTF)

Helical flutes with External coolant

Metric

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

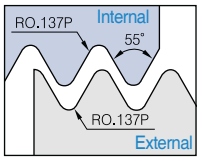
● : Korea Stock ● : US Stock

British Standard Pipe Thread(BSP)

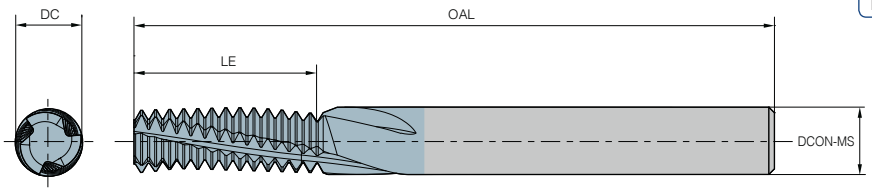
Helical flutes with External coolant

Metric

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

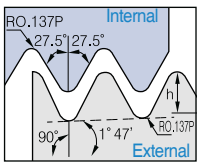
●: Korea Stock ●: US Stock

British Standard Pipe Thread(BSPT)

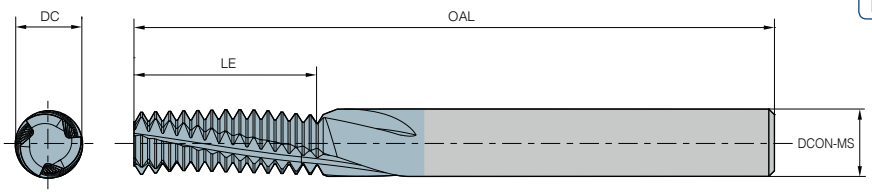
Helical flutes with External coolant

Metric

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

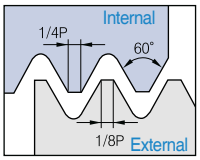
●: Korea Stock ●: US Stock

ISO Metric

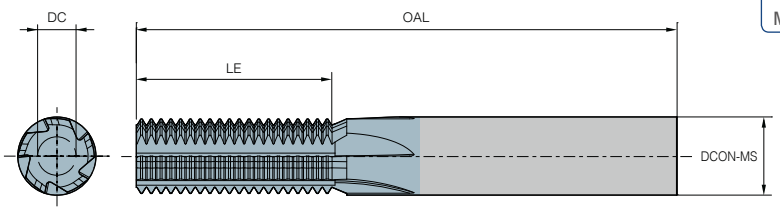
Straight flutes with External coolant

Metric

External/Internal



Defined by : R262 (DIN 13)
TCTR : 6g/6H



· External

Thread Standard	Pitch (mm)	Designation		PC9060M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
					DC	DCON-MS	LE	OAL	NOF	NT	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

● : Korea Stock ● : US Stock

· Internal

Thread Standard	Pitch (mm)	Designation		PC9060M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
					DC	DCON-MS	LE	OAL	NOF	NT	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

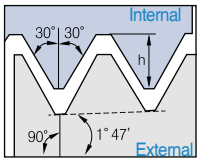
● : Korea Stock ● : US Stock

National Pipe Thread(NPT)

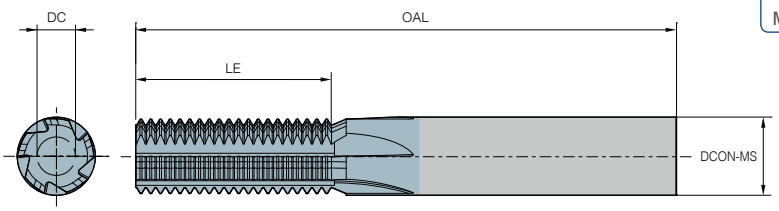
Helical flutes with External coolant

Metric

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

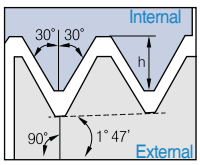
●: Korea Stock ●: US Stock

National Pipe Thread(NPTF)

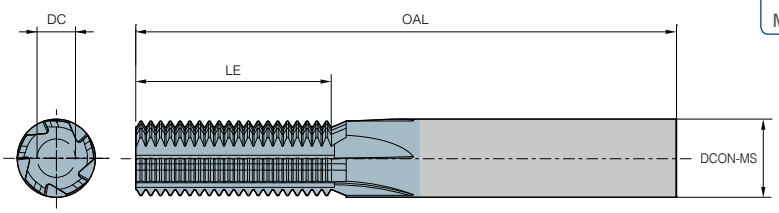
Straight flutes with External coolant

Metric

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

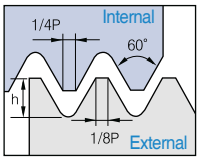
●: Korea Stock ●: US Stock

British Standard Pipe Thread(BSP)

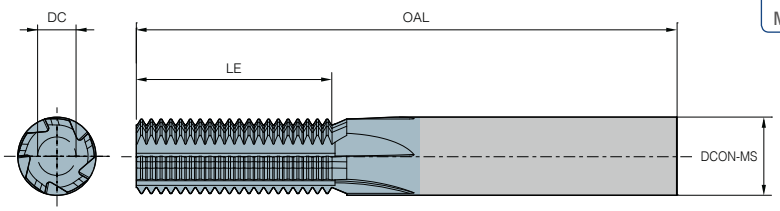
Straight flutes with External coolant

Metric

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

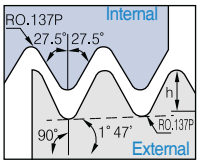
● : Korea Stock ● : US Stock

British Standard Pipe Thread(BSPT)

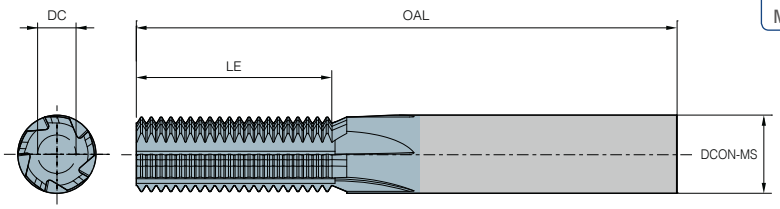
Straight flutes with External coolant

Metric

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

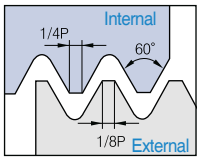
● : Korea Stock ● : US Stock

American UN(UNC,UNF,UNEF)

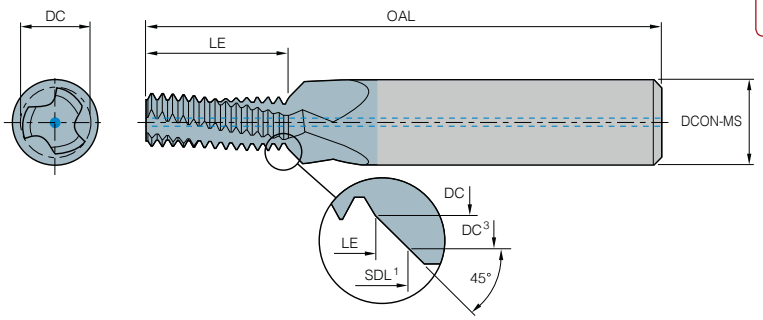
Helical flutes with thru-hole coolant-Thru & Chamfer

Inch

Internal



Defined by : R262 (DIN 13)
TCTR : 6H



(LE≤2×Thread diameter)

Thread			Designation		PC9070M	Dimensions (inch)						*Bore dia.
UNC	UNF	UNEF	Internal			DC	DCON-MS	LE	DC3	SDL1	OAL	PHD
	No.10-32	No.12-3/8×32	STMHCC	25150L03-I32UNF		0.150	1/4	0.391	0.202	0.417	2.244	0.157
	1/4×28	7/16,1/2×28		31203L05-I28UNF		0.203	5/16	0.518	0.262	0.549	2.402	0.216
No.10-24	5/16, 3/8×24	9/16-11/16×24		25141L04-I24UNC		0.141	1/4	0.396	0.202	0.425	2.244	0.150
No.12-24	5/16, 3/8×24	9/16-11/16×24		25163L04-I24UNC		0.163	1/4	0.437	0.228	0.468	2.244	0.177
	5/16, 3/8×24	9/16-11/16×24		37263L06-I24UNF		0.263	3/8	0.646	0.324	0.678	2.874	0.272
	3/8×24	9/16-11/16×24		50323L07-I24UNF		0.323	1/2	0.771	0.387	0.804	3.150	0.335
1/4×20	7/16×1/2×20	3/4-1×20		31192L05-I20UNC		0.192	5/16	0.525	0.262	0.558	2.402	0.201
	1/2×20	3/4-1×20		63437L10-I20UNF		0.437	5/8	1.025	0.512	1.065	3.622	0.453
5/16×18	9/16, 5/8×18	11/16-1 11/16×18		37242L16-I18UNC		0.242	3/8	0.639	0.324	0.676	2.874	0.260
3/8×16	3/4×16			50301L07-I16UNC		0.301	1/2	0.781	0.387	0.814	3.150	0.315
7/16×14	7/8×14			50354L08-I14UNC		0.354	1/2	0.893	0.449	0.937	3.150	0.370
1/2×13				63407L10-I13UNC		0.407	5/8	1.039	0.512	1.087	3.622	0.430
9/16×12	1-1 1/2×12			63465L11-I12UNC		0.465	5/8	1.125	0.574	1.178	3.622	0.484

※ Bore Diameter applies to smallest thread Dia

Maximum thread length = LE − $\frac{\text{Pitch}}{4}$

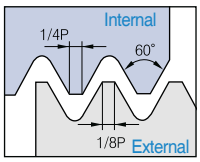
●: Korea Stock ●: US Stock

ISO Metric

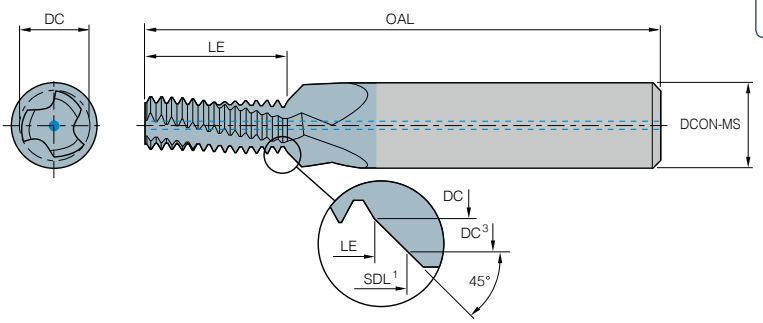
Helical flutes with thru-hole coolant-Thru & Chamfer

Metric

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 − $\frac{\text{Pitch}}{4}$

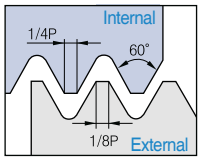
●: Korea Stock ●: US Stock

ISO Metric

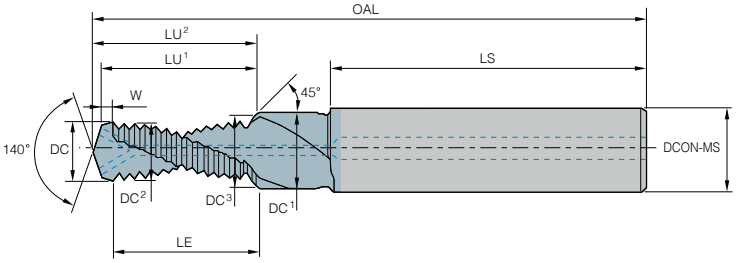
Drill, Chamfer & Thread with thru-hole coolant

Inch

Internal



Defined by : R262 (DIN 13)
TCTR : 6H



Thread	Pitch	Designation		PC9070M	Dimensions (inch)											No.of flute	Tooth
ISO 2D M Coarse	(TP)	Internal			OAL	LU2	LU1	LS	W	LE	DC	DCON-MS	DC1	DC3	DC2	NOF	NT
M6×1.0	1.0	STMHCD-	IM6×1.0ISO-2D		2.441	0.571	0.539	1.417	0.039	0.500	0.197	0.315	0.260	0.248	0.191	2	11
M8×1.25	1.25		IM8×1.25ISO-2D		2.913	0.717	0.673	1.575	0.051	0.622	0.268	0.394	0.354	0.327	0.254	2	11
M10×1.5	1.5		IM10×1.5ISO-2D		3.11	0.921	0.87	1.772	0.059	0.811	0.335	0.472	0.433	0.406	0.318	2	12
M12×1.75	1.75		IM12×1.75ISO-2D		3.504	1.067	1.004	1.772	0.059	0.945	0.406	0.551	0.531	0.484	0.383	2	12

Thread	Pitch	Designation		PC9070M	Dimensions (inch)											No.of flute	Tooth
ISO 2.5D M Coarse	(TP)	Internal			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		2.441	0.650	0.618	1.417	0.039	0.579	0.197	0.315	0.260	0.248	0.191	2	13
M8×1.25	1.25		IM8×1.25ISO-2.5D		2.973	0.913	0.870	1.575	0.051	0.819	0.268	0.394	0.354	0.327	0.254	2	15
M10×1.5	1.5		IM10×1.5ISO-2.5D		3.110	1.098	1.047	1.772	0.059	0.988	0.335	0.472	0.433	0.406	0.318	2	15

Maximum thread length = LE − $\frac{\text{Pitch}}{4}$

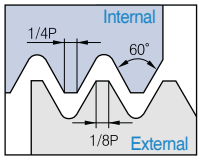
●: Korea Stock ●: US Stock

ISO Metric

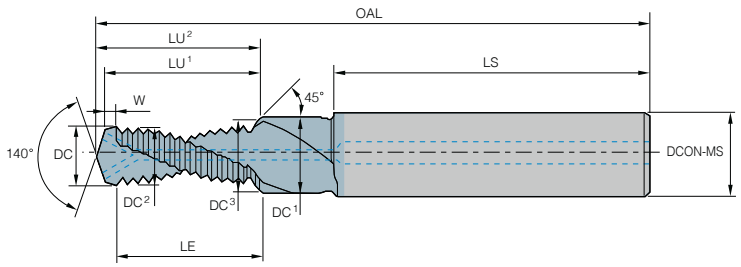
Drill, Chamfer & Thread with thru-hole coolant

Metric

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 − $\frac{\text{Pitch}}{4}$

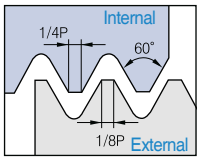
●: Korea Stock ●: US Stock

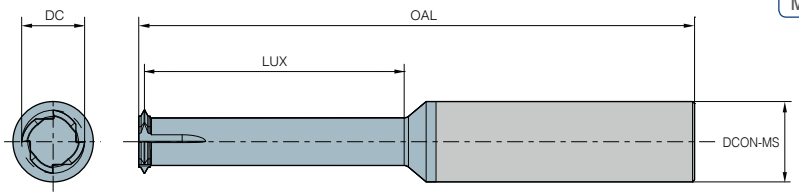
ISO Metric

Deep thread - Long Tools

Metric

Internal





Defined by : R262 (DIN 13)
TCTR : 6H

(LE≤2×Thread diameter)

Thread Standard	Pitch (tpi)	Designation		PC9070M	Dimensions (mm)					No.of flute	Tooth	*Bore dia.
					DC	DCON-MS	LE	LUX	OAL	NOF	NT	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

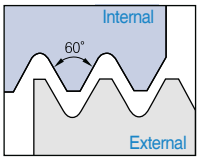
●: Korea Stock ●: US Stock

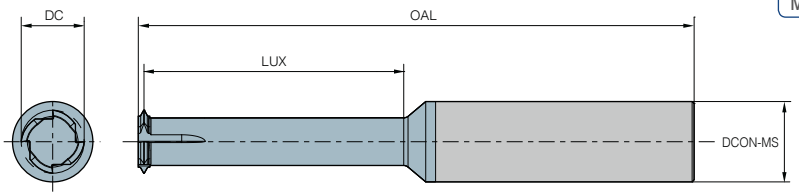
TP60

Deep thread - Long Tools

Metric

Internal





Thread			Pitch		Designation	PC9070M	Dimensions (mm)				No.of flute	Tooth
M Coarse	M Fine	UN, UNF, UNEF	TP	tpi			DC	DCON-MS	LUX	OAL	NOF	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

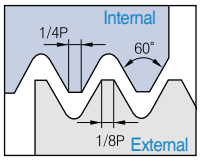
●: Korea Stock ●: US Stock

ISO Metric

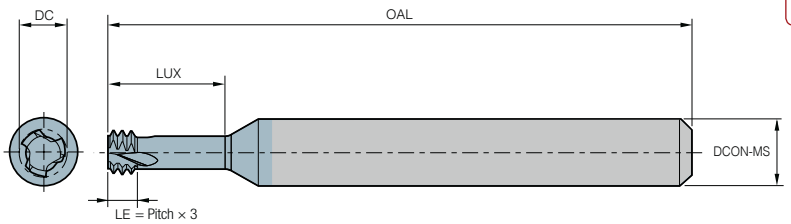
Miniature thread mill

Inch

Internal



Defined by : R262 (DIN 13)
TCTR : 6H



(LE≤2×Thread diameter)

Thread		Pitch (TP)	Designation		PC9070M	Dimensions (inch)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine		Internal			DC	DCON-MS	LUX	OAL	NOF	NT	PHD
M1.6×0.35		0.35	STMD3T	12047L134-I0.35ISO		1/8	1/8	0.134	1.181	3	3	0.049
M2×0.4		0.4		25061L165-I0.4ISO		1/4	1/4	0.165	2.244	3	3	0.063
M2.2×0.45		0.45		25065L181-I0.45ISO		1/4	1/4	0.181	2.244	3	3	0.069
M2.5×0.45		0.45		25077L205-I0.45ISO		1/4	1/4	0.205	2.244	3	3	0.081
M3×0.5	M3.5~M16×0.5	0.5		25094L244-I0.5ISO		1/4	1/4	0.244	2.244	3	3	0.098
M3.5×0.6		0.6		25108L287-I0.6ISO		1/4	1/4	0.287	2.244	3	3	0.114
M4×0.7		0.7		25124L327-I0.7ISO		1/4	1/4	0.327	2.244	3	3	0.130
M5×0.8		0.8		25159L409-I0.8ISO		1/4	1/4	0.409	2.244	3	3	0.165
M6×1.0	M8~M40×1.0	1.0		25189L492-I1.0ISO		1/4	1/4	0.492	2.244	3	3	0.197
M8×1.25		1.25		31256L654-I1.25ISO		5/16	5/16	0.654	2.480	3	3	0.268
M10×1.5	M12~M48×1.50	1.5		37323L819-I1.50ISO		3/8	3/8	0.819	2.874	3	3	0.335
M12×1.75		1.75		37371L984-I1.75ISO		3/8	3/8	0.984	2.874	3	3	0.406

●: Korea Stock ●: US Stock

3D (LE≤2×Thread diameter)

Thread		Pitch (TP)	Designation		PC9070M	Dimensions (inch)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine		Internal			DC	DCON-MS	LUX	OAL	NOF	NT	PHD
M1.6×0.35		0.35	STMD3T	12047L197-I0.35ISO		1/8	1/8	0.197	1.187	3	3	0.079
M2×0.4		0.4		25061L244-I0.4ISO		1/4	1/4	0.244	2.244	3	3	0.063
M2.5×0.45		0.45		25077L276-I0.45ISO		1/4	1/4	0.276	2.244	3	3	0.081
M3×0.5	M3.5~M16×0.5	0.5		25094L362-I0.5ISO		1/4	1/4	0.362	2.244	3	3	0.098
M4×0.7		0.7		25124L484-I0.7ISO		1/4	1/4	0.484	2.244	3	3	0.130
M5×0.8		0.8		25159L606-I0.8ISO		1/4	1/4	0.606	2.244	3	3	0.165
M6×1.0	M8~M40×1.0	1.0		25189L728-I1.0ISO		1/4	1/4	0.728	2.244	3	3	0.197
M8×1.25		1.25		31256L969-I1.25ISO		5/16	5/16	0.969	2.48	3	3	0.268

※ Bore Diameter applies to smallest thread Dia

Maximum thread length = LE − $\frac{\text{Pitch}}{4}$

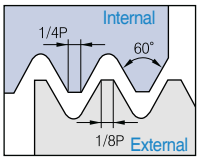
●: Korea Stock ●: US Stock

ISO Metric

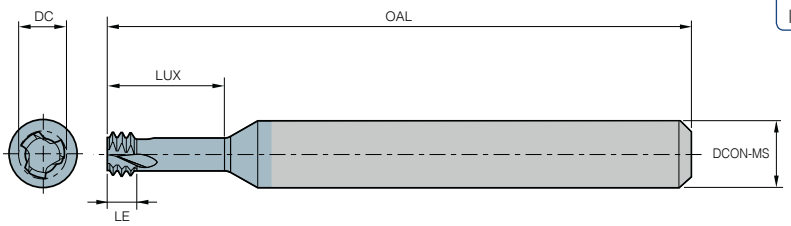
Miniature thread mill

Metric

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

● : Korea Stock ● : US Stock

(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

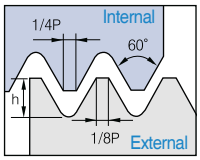
● : Korea Stock ● : US Stock

American UN

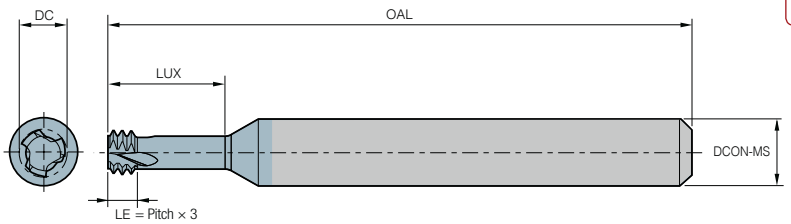
Miniature thread mill

Inch

External/Internal



Defined by : ANSI B1.1.74
TCTR : 2B



(LE≤2×Thread diameter)

Thread		Pitch (tpi)	Designation		PC9070M	Dimensions (inch)				No.of flute	Tooth	*Bore dia.
UNC	UNF		Internal			DC	DCON-MS	LUX	OAL	NOF	NT	PHD
	No.1~72	72	STMD3T	25057L154-I72UN		0.057	1/4	0.154	2.244	3	3	0.059
No.1~64	No.2~64	64		25055L165-I64UN		0.055	1/4	0.165	2.244	3	3	0.059
No.2~56	No.3~56	56		25065L197-I56UN		0.065	1/4	0.197	2.244	3	3	0.071
No.3~48	No.4~48	48		25075L236-I48UN		0.075	1/4	0.263	2.244	3	3	0.079
No.4, No.5~40	No.6~40	40		25083L236-I40UN		0.083	1/4	0.236	2.244	3	3	0.090
No.5~40	No.6~40	40		25096L283-I40UN		0.096	1/4	0.283	2.244	3	3	0.102
	No.8~36	36		25130L343-I36UN		0.130	1/4	0.343	2.244	3	3	0.138
No.6, No.8~32	No.10~32	32		25100L292-I32UN		0.100	1/4	0.292	2.244	3	3	0.110
No.8~32	No.10~32	32		25126L394-I32UN		0.126	1/4	0.394	2.244	3	3	0.134
	1/4″×28	28		25207L520-I28UN		0.207	1/4	0.520	2.244	3	3	0.216
No.10~24	5/16″×24	24		25141L402-I24UN		0.141	1/4	0.402	2.244	3	3	0.150
	5/16″×24	24		31263L650-I24UN		0.263	5/16	0.650	2.480	3	3	0.272
1/4″×20	7/16″×20	20		25192L528-I20UN		0.192	1/4	0.528	2.244	3	3	0.201
	7/16″×20	20		37375L906-I20UN		0.375	3/8	0.906	2.874	3	3	0.390
3/8″×16		16		31264L752-I16UN		0.264	5/16	0.752	2.480	3	3	0.315
7/16″×14		14		7354L917-I14UN		0.354	3/8	0.917	2.874	3	3	0.370

●: Korea Stock ●: US Stock

(LE≤3×Thread diameter)

Thread		Pitch (tpi)	Designation		PC9070M	Dimensions (inch)				No.of flute	Tooth	*Bore dia.
UNC	UNF		Internal			DC	DCON-MS	LUX	OAL	NOF	NT	PHD
	No.1~72	72	STMD3T	25057L226-I72UN		0.057	1/4	0.226	2.244	3	3	0.059
No.4, No.5~40	No.6~40	40		25083L354-I40UN		0.083	1/4	0.354	2.244	3	3	0.091
No.5~40	No.6~40	40		25096L394-I40UN		0.096	1/4	0.394	2.244	3	3	0.102
No.6, No.8~32	No.10~32	32		25100L433-I32UN		0.100	1/4	0.433	2.244	3	3	0.110
No.8~32	No.10~32	32		25126L512-I32UN		0.126	1/4	0.512	2.244	3	3	0.134
	1/4″ 28	28		25207L772-I28UN		0.207	1/4	0.772	2.244	3	3	0.216
	5/16″×24	24		31263L965-I24UN		0.263	5/16	0.965	2.480	3	3	0.272
1/4″×20	7/16″×20	20		25192L780-I20UN		0.192	1/4	0.780	2.244	3	3	0.201

※ Bore Diameter applies to smallest thread Dia

Maximum thread length = LE − $\frac{\text{Pitch}}{4}$

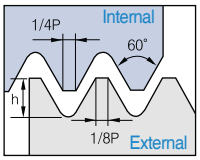
●: Korea Stock ●: US Stock

American UN(UNC,UNF,UNEF)

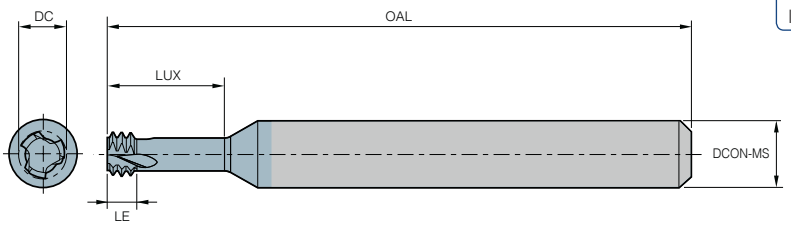
Miniature thread mill

Metric

External/Internal



Defined by : ANSI B1.1.74
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

● : Korea Stock ● : US Stock

(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

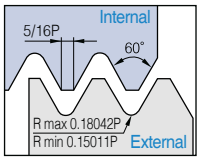
● : Korea Stock ● : US Stock

UNJ(Unified Constant Thread)

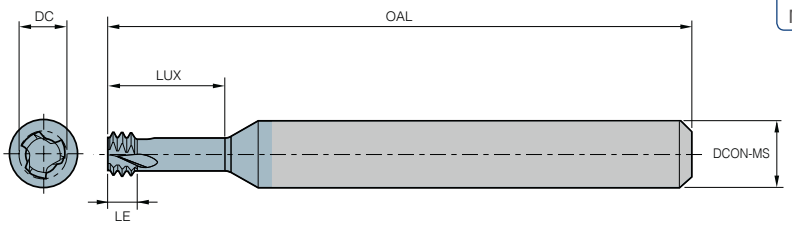
Miniature thread mill

Metric

Internal



Defined by : MIL-S-8879C
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

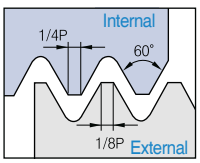
●: Korea Stock ●: US Stock

MJ

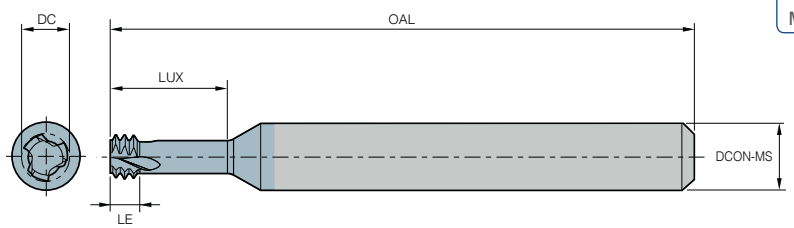
Miniature thread mill

Metric

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

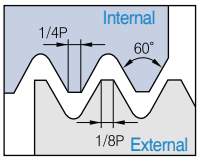
●: Korea Stock ●: US Stock

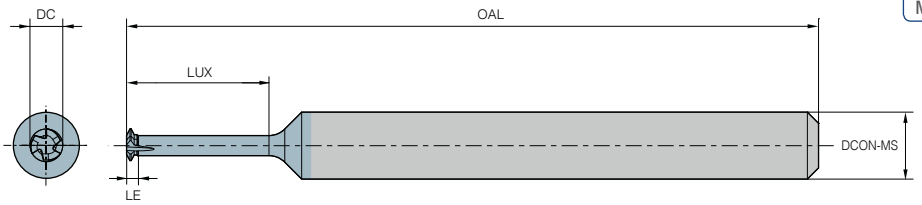
ISO Metric

Miniature thread mill for Dental Implants

Metric

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

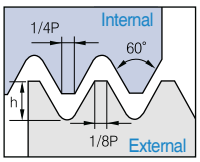
● : Korea Stock ● : US Stock

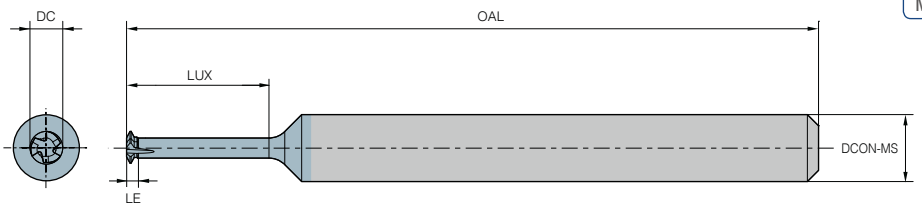
American UN(UNC,UNF,UNEF)

Miniature thread mill for Dental Implants

Metric

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

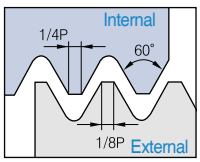
● : Korea Stock ● : US Stock

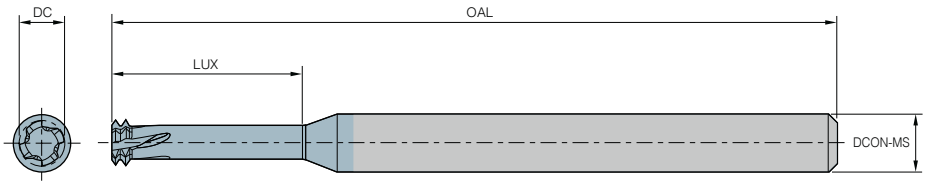
ISO Metric

Miniature thread mill for hard materials (~HRC62)

Inch

Internal





Defined by : R262 (DIN 13)
TCTR : 6H

(LE≤2×Thread diameter)

Thread		Pitch (TP)	Designation		PC9070M	Dimensions (inch)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine		Internal			DC	DCON-MS	LUX	OAL	NOF	NT	PHD
M2×0.4		0.4	STMD2L	25061L165-I0.4ISO		0.061	1/4	0.18	2.99	4	2	0.063
M2.2×0.45		0.45		25065L181-I0.45ISO		0.065	1/4	0.20	2.99	4	2	0.070
M2.5×0.45		0.45		25077L204-I0.45ISO		0.077	1/4	0.22	2.99	4	2	0.081
M3×0.5	M3.5~M16×0.5	0.5		25094L244 -I0.5ISO		0.094	1/4	0.27	2.99	4	2	0.101
M3.5×0.6		0.6		25108L287-I0.6ISO		0.108	1/4	0.31	2.99	4	2	0.116
M4×0.7		0.7		25124L326-I0.7ISO		0.124	1/4	0.36	2.99	4	2	0.128
M5×0.8		0.8		25159L409-I0.8ISO		0.159	1/4	0.44	2.99	4	2	0.169
M6×1.0	M8~M40×1.0	1.0		25189L492-I1.0ISO		0.189	1/4	0.53	2.99	4	2	0.201
M8×1.25		1.25		31256L653-I1.25ISO		0.256	5/16	0.70	3.15	4	2	0.268
M10×1.5	M12~M48×1.50	1.5		31308L818-I1.5ISO		0.308	5/16	0.88	3.15	4	2	0.339
M12×1.75		1.75		37371L984-I1.75ISO		0.371	3/8	1.05	3.98	4	2	0.406

●: Korea Stock ●: US Stock

(LE≤3×Thread diameter)

Thread		Pitch (TP)	Designation		PC9070M	Dimensions (inch)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine		Internal			DC	DCON-MS	LUX	OAL	NOF	NT	PHD
M2×0.4		0.4	STMD2L	25061L244-I0.4ISO		0.061	1/4	0.26	2.99	4	2	0.063
M2.2×0.45		0.45		25077L303-I0.45ISO		0.077	1/4	0.32	2.99	4	2	0.081
M3×0.5	M3.5~M16×0.5	0.5		25094L362-I0.5ISO		0.094	1/4	0.38	2.99	4	2	0.101
M4×0.7		0.7		25124L484-I0.7ISO		0.124	1/4	0.51	2.99	4	2	0.128
M5×0.8		0.8		25159L606-I0.8ISO		0.159	1/4	0.64	2.99	4	2	0.169
M6×1.0	M8~M40×1.0	1.0		25189L728-I1.0ISO		0.189	1/4	0.77	2.99	4	2	0.201
M8×1.25		1.25		31256L968-I1.25ISO		0.256	5/16	1.02	3.15	4	2	0.268

※ Bore Diameter applies to smallest thread Dia

Maximum thread length = LE − $\frac{\text{Pitch}}{4}$

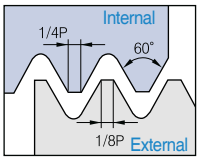
●: Korea Stock ●: US Stock

ISO Metric

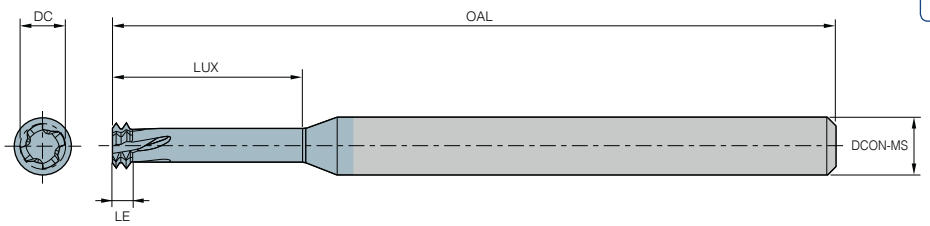
Miniature thread mill for hard materials (~HRC62)

Metric

Internal



Defined by : R262 (DIN 13)
TCTR : 6H



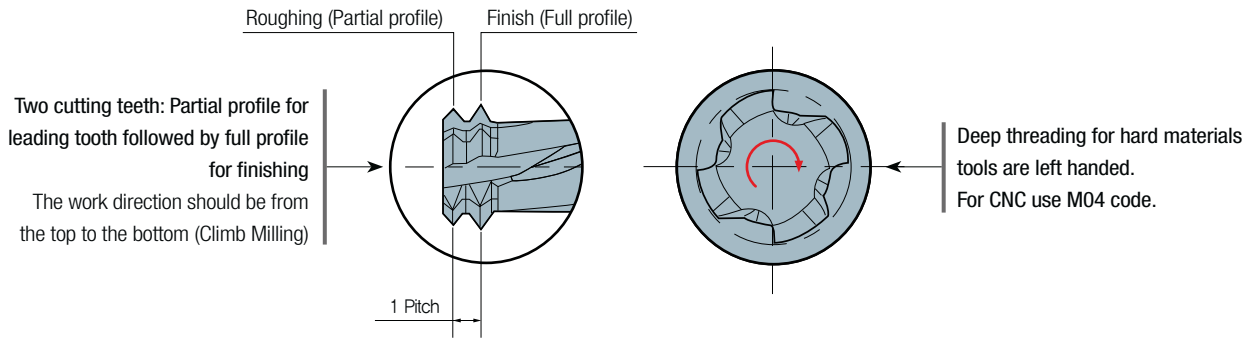
(LE ≤ 2 × Thread diameter)

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

● : Korea Stock ● : US Stock

(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

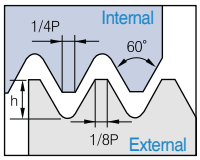


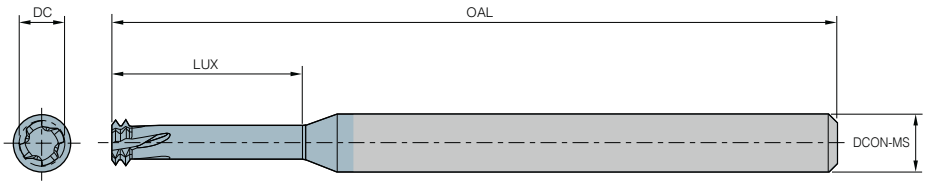
American UN

Miniature thread mill for hard materials (~HRC62)

Inch

Internal





Defined by : ANSI B1.1.74
TCTR : 2B

(LE≤2×Thread diameter)

Thread		Pitch (tpi)	Designation		PC9070M	Dimensions (inch)				No.of flute	Tooth	*Bore dia.
UNC	UNF		Internal			DC	DCON-MS	LUX	OAL	NOF	NT	PHD
No.2~56	No.3~56	56	STMD2L	25065L197-I56UN		0.065	1/4	0.21	3.00	4	2	0.070
No.3~48	No.4~48	48		25075L236-I48UN		0.075	1/4	0.26	3.00	4	2	0.093
No.4~40 ; No.5-40	No.6~40	40		25083L236-I40UN		0.083	1/4	0.26	3.00	4	2	0.093
No.5~40	No.6~40	40		25096L283-I40UN		0.096	1/4	0.31	3.00	4	2	0.116
	No.8~36	36		25130L343-I36UN		0.130	1/4	0.37	3.00	4	2	0.140
No.6~32 ; No.8~32	No.10~32	32		25100L292-I32UN		0.100	1/4	0.32	3.00	4	2	0.161
No.8~32	No.10~32	32		25126L394-I32UN		0.126	1/4	0.42	3.00	4	2	0.136
	1/4″×28	28		25207L520-I28UN		0.207	1/4	0.56	3.00	4	2	0.219
No.10~24	5/16″×24	24		25141L402-I24UN		0.141	1/4	0.44	3.00	4	2	0.154
	5/16″×24	24		31263L650-I24UN		0.263	5/16	0.69	3.15	4	2	0.277
1/4″×20	7/16″×20	20		25192L528-I20UN		0.192	1/4	0.58	3.00	4	2	0.204
	7/16″×20	20		37376L906-I20UN		0.376	3/8	0.96	4.00	4	2	0.390
3/8″×16		16		31301L776-I16UN		0.301	5/16	0.84	3.15	4	2	0.316
7/16″×14		14		37354L917-I14UN		0.354	3/8	0.99	4.00	4	2	0.375
1/2″×13		13		37390L101 -I13UN		0.390	3/8	1.08	4.00	4	2	0.422

●: Korea Stock ●: US Stock

(LE≤3×Thread diameter)

Thread		PITCH (tpi)	Designation		PC9070M	Dimensions (inch)				No.of flute	Tooth	*Bore dia.
UNC	UNF		Internal			DC	DCON-MS	LUX	OAL	NOF	NT	PHD
No.4~40, No.5~40	No.6~40	40	STMD2L	25083L354-I40UN		0.083	1/4	0.38	3	4	2	0.093
No.5~40	No.6~40	40		25096L394-I40UN		0.096	1/4	0.41	3	4	2	0.104
No.6~32, No.8~32	No.10~32	32		25100L433-I32UN		0.1	1/4	0.46	3	4	2	0.111
No.8~32	No.10~32	32		25126L512-I32UN		0.126	1/4	0.54	3	4	2	0.136
	1/4″×28	28		25207L772-I28UN		0.207	1/4	0.81	3	4	2	0.219
	5/16″×24	24		31263L965-I24UN		0.263	5/16	1.01	3.15	4	2	0.272
1/4″~20	7/16″×20	20		25192L780-I20UN		0.192	1/4	0.83	3	4	2	0.204
7/16″×14		14		37354L131-I14UN		0.354	3/8	1.39	4	4	2	0.375

※ Bore Diameter applies to smallest thread Dia

Maximum thread length = $LE - \frac{Pitch}{4}$

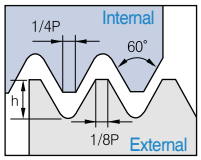
●: Korea Stock ●: US Stock

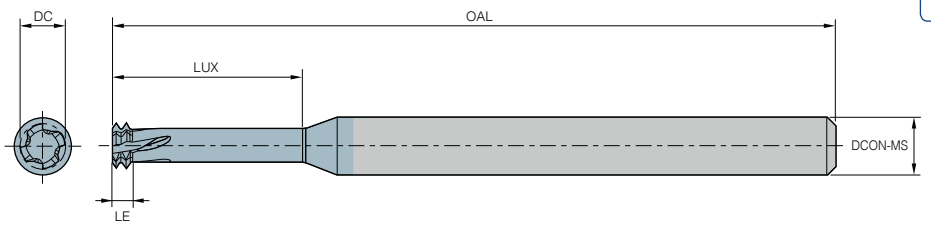
American UN(UNC,UNF)

Miniature thread mill for hard materials (~HRC62)

Metric

Internal





Defined by : ANSI B1.1.74
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.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

● : Korea Stock ● : US Stock

(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

● : Korea Stock ● : US Stock

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

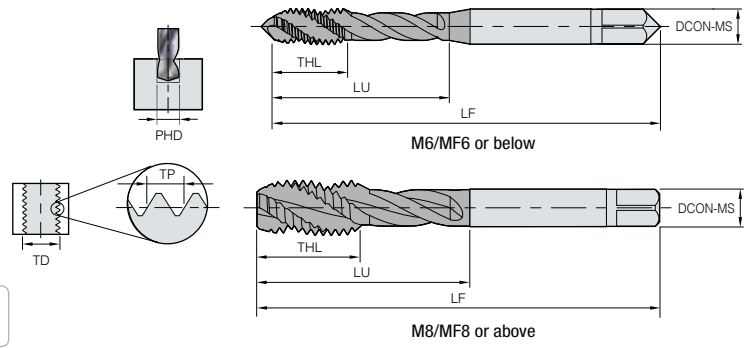
Line-up

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





Metric

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

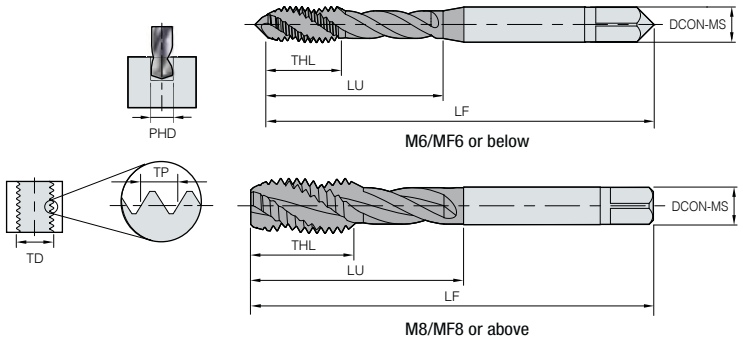
Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	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

Metric





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

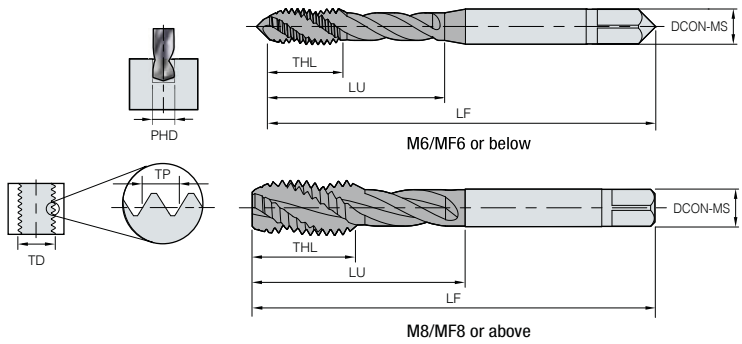
◎ : Excellent ○ : Good

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





Metric

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

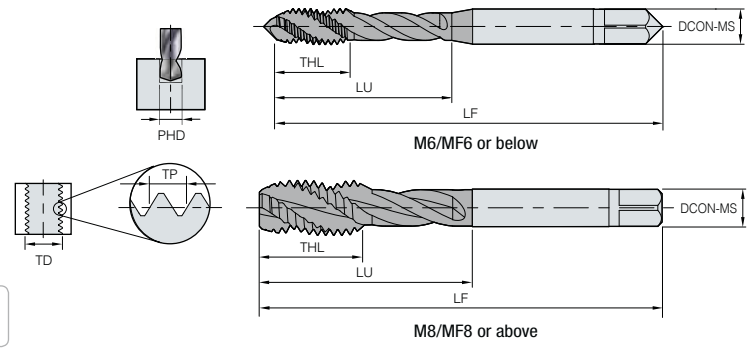
◎ : Excellent ○ : Good

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





Metric

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**

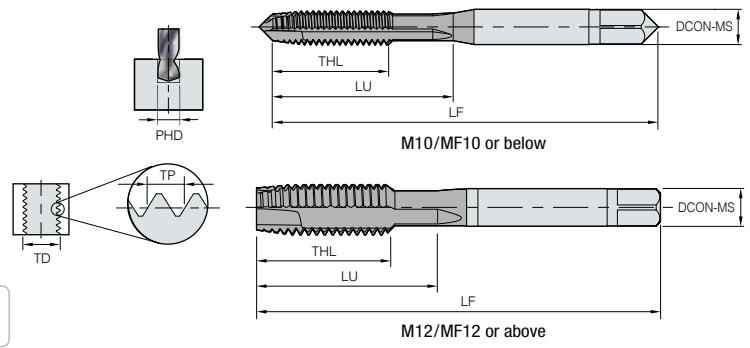
◎ : Excellent ○ : Good

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





Metric

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

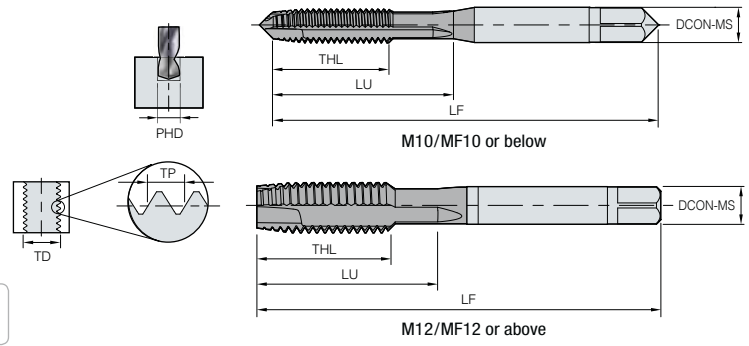
Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	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

Metric





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

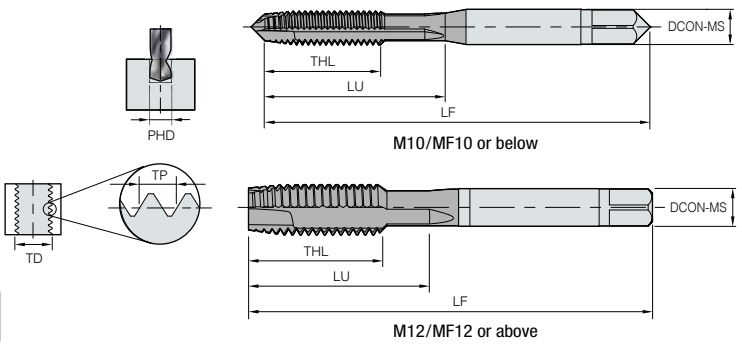
◎ : Excellent ○ : Good

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





Metric

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

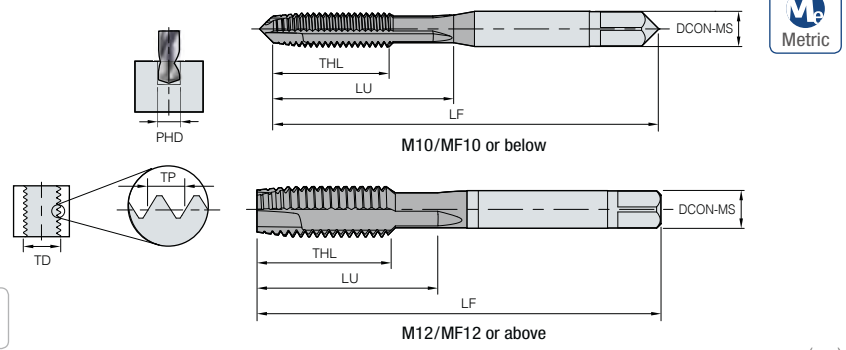
◎ : Excellent ○ : Good

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





Metric

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

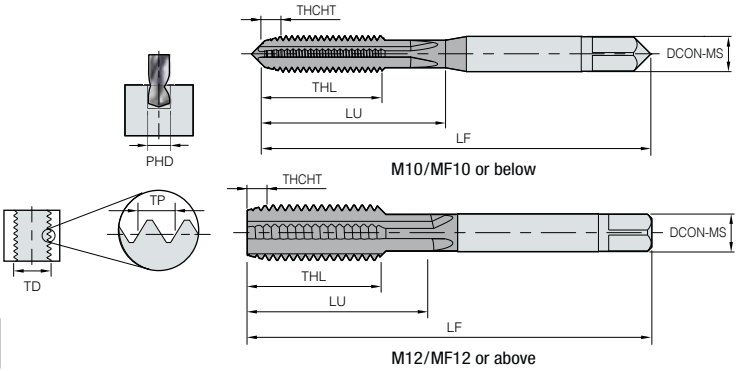
◎ : Excellent ○ : Good

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





Metric

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

- **Applicable workpiece range**

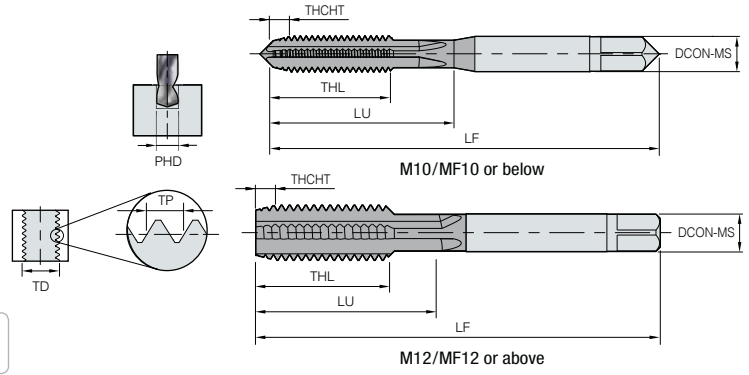
◎ : Excellent ○ : Good

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





Metric

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	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

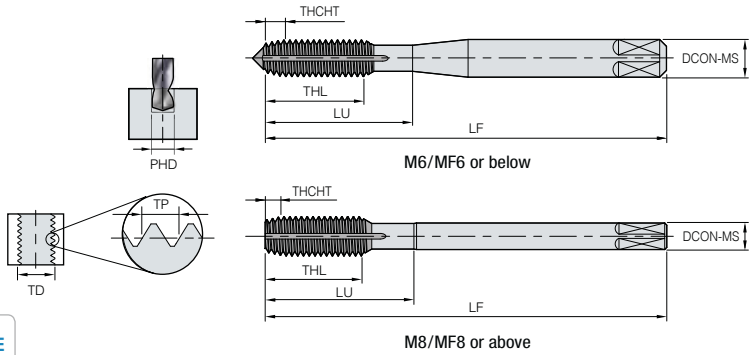
Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	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

Metric





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

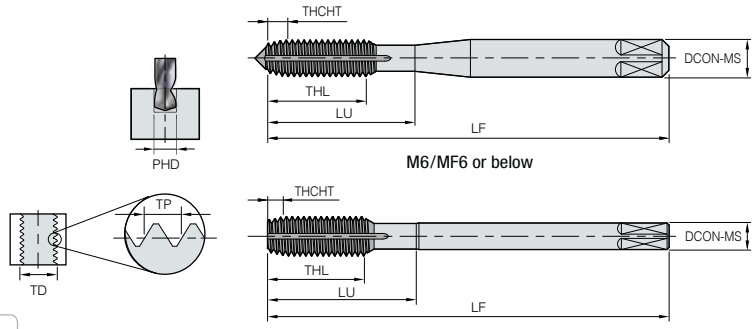
Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	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

Metric





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

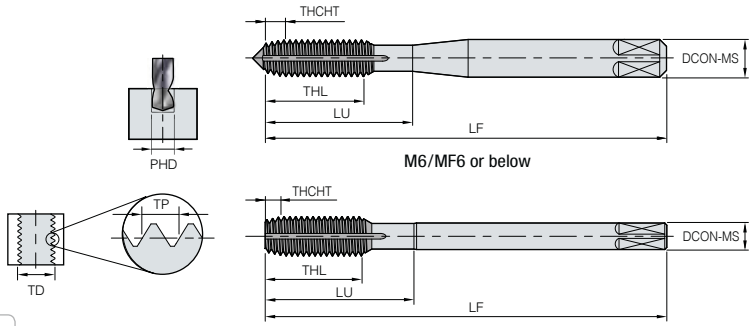
Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	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

Metric





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

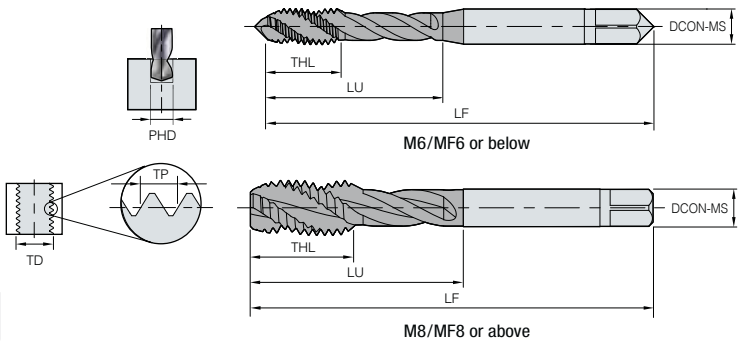
Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	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

Metric





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

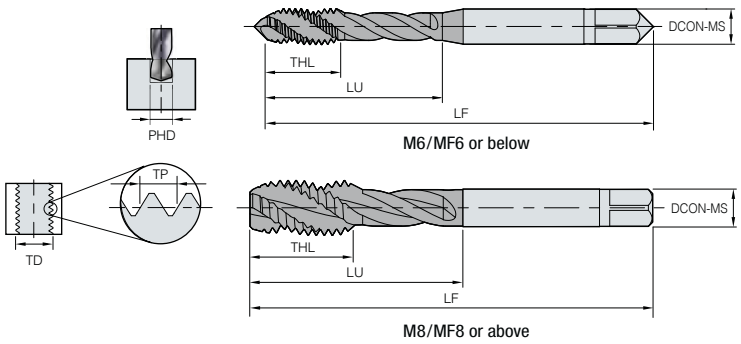
Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	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

Metric





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

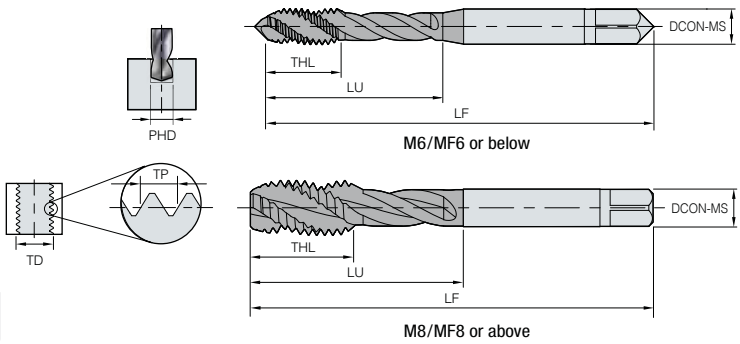
Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	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

Metric





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

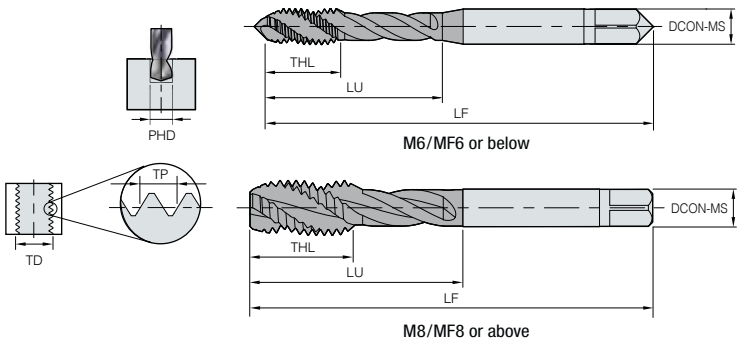
Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	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

Metric





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

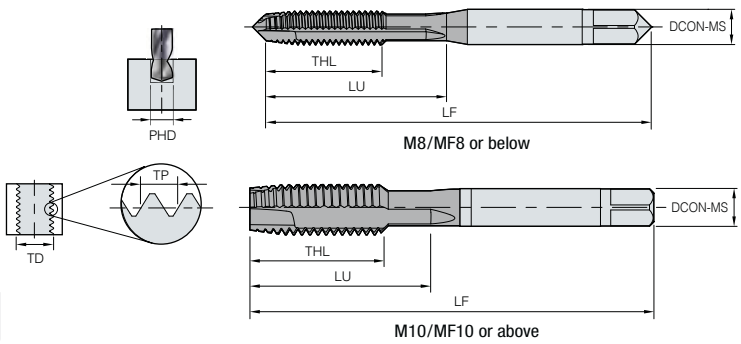
◎ : Excellent ○ : Good

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





Metric

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

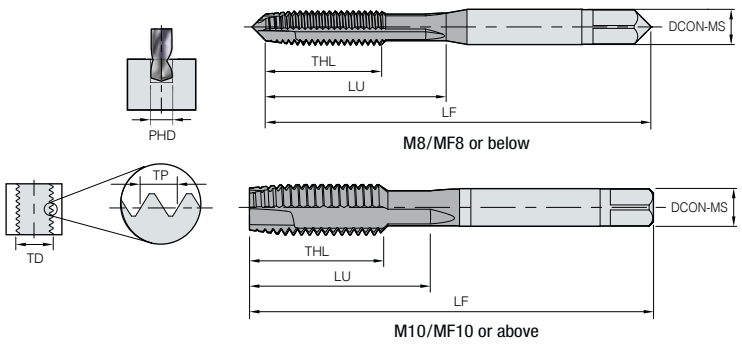
◎ : Excellent ○ : Good

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





Metric

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

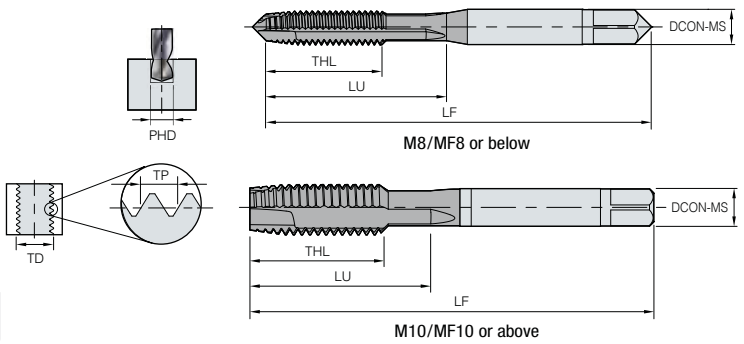
◎ : Excellent ○ : Good

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





Metric

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

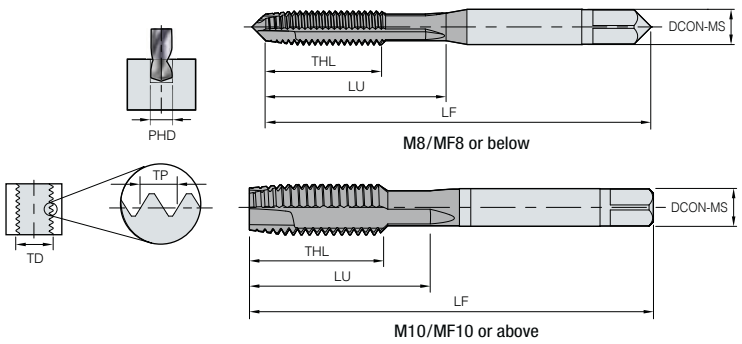
◎ : Excellent ○ : Good

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





Metric

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

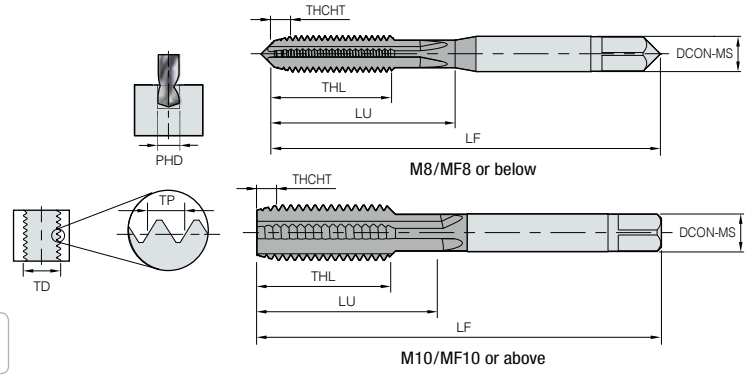
◎ : Excellent ○ : Good

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





Metric

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

• Applicable workpiece range

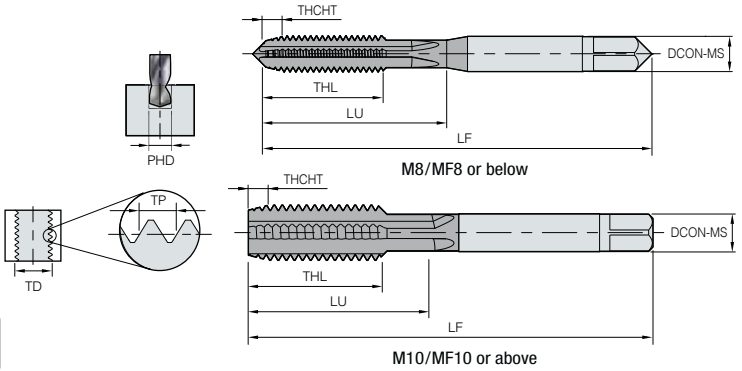
◎ : Excellent ○ : Good

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





Metric

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	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

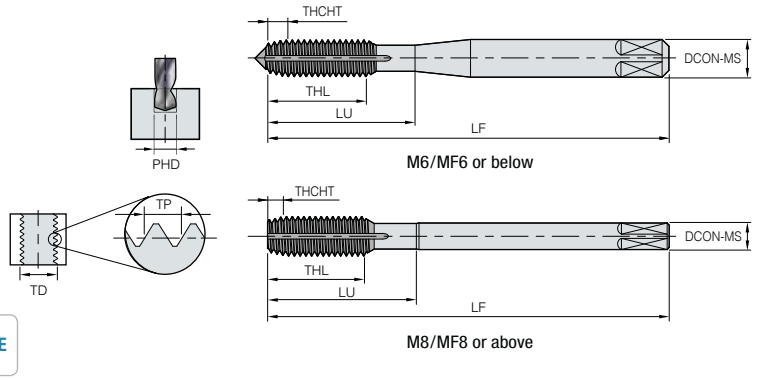
Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	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

Metric





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

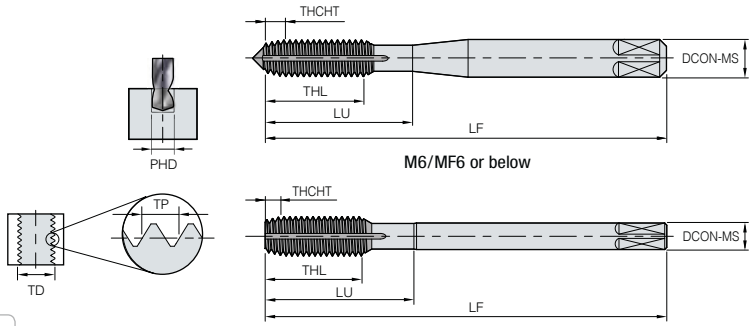
Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	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

Metric





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

• Applicable workpiece range

◎ : Excellent ○ : Good

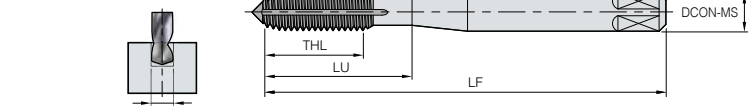
Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	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

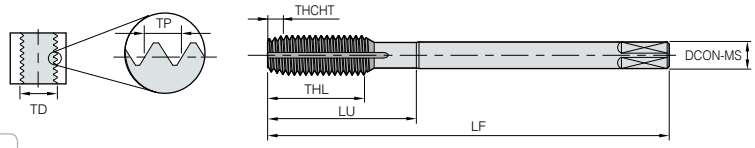
Roll Tap

Metric





M6/MF6 or below



M8/MF8 or above

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

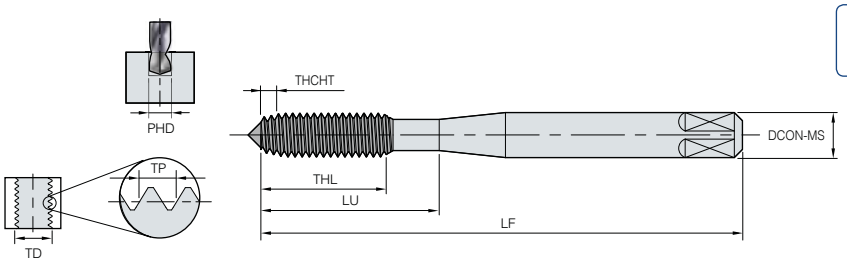
Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	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

Metric





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

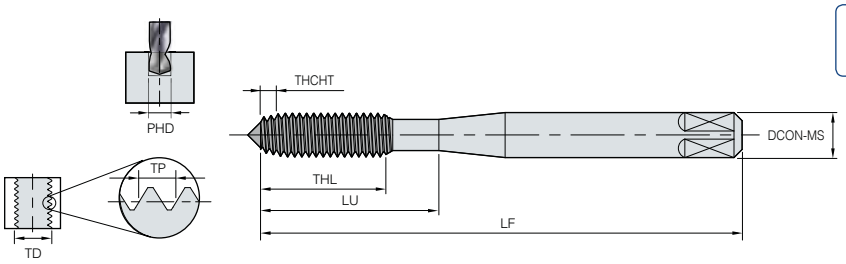
Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	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

Metric





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

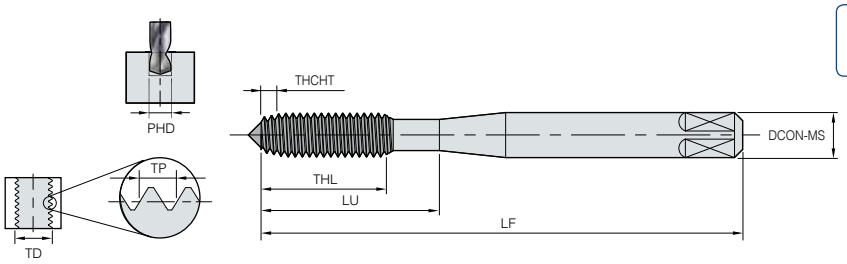
Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stainless steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass cast	Bronze	Aluminum rolled material	Aluminum cast, alloyed	Magnesium cast, alloyed	Zinc cast, alloyed	Titanium alloy	Nickel alloy	Thermo setting plastic	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

Metric





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

RECOMMENDED CUTTING CONDITIONS

E1	Super Endmill for HRSA
E2	Super Endmill for Ti
E8	The Mirror Endmill
E9	H-Star Endmill
E73	U-Star Endmill
E100	G-Star Endmill
E108	R+ Endmill
E112	S-Star Endmill
E116	A-Star Endmill
E117	D Endmill
E118	Composite Router Endmill
E120	T Endmill
E121	C-Max
E121	PCD Endmill
E122	MSD Plus
E122	MSD Plus-S
E123	MSD Plus for CFRP
E123	MSFD
E123	MLD Plus
E124	P-Star Drill
E126	W-Star Drill
E126	SSD-N
E127	Burnishing Drill
E127	PCD Drill
E127	Gun Drill
E128	Chucking/Machine Reamer
E128	PCD Reamer
E128	Cermet Reamer
E129	Chamfer Tool
E129	Counter Sink
E131	Tap-Star

Super Endmill for HRSA

SFESA4000(Flat) / SRESA4000(Radius)

(inch)

Workpiece				Brinell hardness (HB)	ap (Inch)	ae (Inch)	Machining	Diameter (Inch)	1/8	5/32	3/16	1/4	5/16	3/8	1/2	5/8	3/4
ISO	Workpiece materials	ISO	AISI														
S	HRSA (Ni series)	Inconel718 Inconel625	Inconel718 Inconel625	250 ~ 320	1.5D	0.05D	Shouldering	vc(sf/min)	118	125	125	131	131	131	131	131	131
								fz(in)	0.0006	0.0008	0.0009	0.0013	0.0014	0.0016	0.0021	0.0027	0.003
								rpm(min-1)	3,611	3,049	2,541	2,006	1,605	1,337	1,003	802	669
		Waspaloy	Waspaloy	210 ~ 290				feed(in/min)	8.4	9.5	9.5	10	8.8	8.6	8.4	8.7	7.9
					0.3D	1D	Slotting	vc(sf/min)	78	78	78	80	80	80	80	80	80
		Hastelloy	Hastelloy	170 ~ 240				fz(in)	0.0005	0.0007	0.0009	0.0012	0.0016	0.0018	0.0024	0.0024	0.0027
								rpm(min-1)	2,407	1,926	1,605	1,238	991	826	619	495	413
								feed(in/min)	5.2	5.4	5.8	6	6.3	5.9	6	4.8	4.5

SFES4000(Flat) / SRES4000(Radius)

(mm)

Workpiece				Brinell hardness (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	ISO	AISI							Cutting length (mm)	8	10	15	15	20	25	30	42	48
S	HRSA (Ni series)	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
		Waspaloy	Waspaloy	210 ~ 290	1100 ~ 1400					feed	220	240	245	250	225	215	210	210	200
						530	0.3D	1D	Slotting	vc	24	24	24	24	24	24	24	24	24
		Hastelloy	Hastelloy	170 ~ 240	520 ~ 800					fz	0.013	0.018	0.024	0.029	0.041	0.048	0.058	0.058	0.072
										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

SFESA4000(Flat) / SRESA4000(Radius)

(inch)

Workpiece				Brinell hard-ness (HB)	ap (mm)	ae (mm)	Machining	Diameter (Inch)	1/8	5/32	3/16	1/4	5/16	3/8	1/2	5/8	3/4
ISO	Workpiece materials	ISO (DIN)	AISI														
P	Carbon steel	(C22) C40 C45	1020 1039 1045	230	1.5D	0.1D	Shouldering	vc(sf/min)	328	354	374	374	374	374	374	374	374
								fz(in)	0.0008	0.0012	0.0015	0.0021	0.0025	0.0026	0.0033	0.0033	0.0038
								rpm(min-1)	10,031	8,666	7,623	5,717	4,574	3,812	2,859	2,287	1,906
								vf(in/min)	33.4	40.6	45.7	47.6	46.5	40	38.1	30.4	28.6
					0.5D	1D	Slotting	vc(sf/min)	210	213	223	230	230	230	230	230	230
								fz(in)	0.0007	0.0009	0.0011	0.0016	0.0019	0.0019	0.0023	0.0023	0.0026
								rpm(min-1)	6,420	5,216	4,547	3,511	2,809	2,340	1,755	1,404	1,170
								vf(in/min)	17.1	17.9	20.5	22.2	21.1	17.6	16.4	13.2	12.3
	Alloy steel	20NiCrMo2 - - 42CrMo4	8615 4320 4130 4140	280	1.5D	0.1D	Shouldering	vc(sf/min)	463	453	496	496	496	496	496	496	496
								fz(in)	0.0009	0.0013	0.0018	0.0029	0.0026	0.0028	0.0033	0.0037	0.0034
								rpm(min-1)	14,143	11,074	10,097	7,573	6,058	5,049	3,787	3,029	2,524
								vf(in/min)	49.5	55.4	74.2	87.1	63.4	56.8	49.2	45	34.1
					0.5D	1D	Slotting	vc(sf/min)	213	230	233	230	230	226	236	230	226
								fz(in)	0.0006	0.0009	0.0013	0.0021	0.0023	0.0023	0.0029	0.0027	0.003
								rpm(min-1)	6,520	5,617	4,748	3,511	2,809	2,307	1,806	1,404	1,154
								vf(in/min)	16.3	19.3	24.9	29.3	26.3	20.8	21.1	15.4	13.8
M	Ferritic/ martensitic series	X6CrAl13 X6Cr17 X12CrS13 X6CrMo17-1 (X6Cr13) X12Cr13	405 430 416 434 403 410	450 540 450	1.5D	0.1D	Shouldering	vc(sf/min)	328	354	374	374	374	374	374	374	374
								fz(in)	0.0008	0.0012	0.0015	0.0021	0.0025	0.0026	0.0033	0.0033	0.0038
								rpm(min-1)	10,031	8,666	7,623	5,717	4,574	3,812	2,859	2,287	1,906
								vf(in/min)	33.4	40.6	45.7	47.6	46.5	40	38.1	30.4	28.6
					0.5D	1D	Slotting	vc(sf/min)	210	213	223	230	230	230	230	230	230
								fz(in)	0.0007	0.0009	0.0011	0.0016	0.0018	0.0019	0.0023	0.0023	0.0026
								rpm(min-1)	6,420	5,216	4,547	3,511	2,809	2,340	1,755	1,404	1,170
								vf(in/min)	17.1	17.9	20.5	22.2	20.2	17.6	16.4	13.2	12.3
	Austenite series	X10CrNiS18-9 X5CrNi18-9 X5CrNiMo17-12-2	303 304 316	520	1.5D	0.1D	Shouldering	vc(sf/min)	236	249	256	263	263	263	263	263	263
								fz(in)	0.0008	0.0012	0.0015	0.0021	0.0025	0.0026	0.0033	0.0033	0.0038
								rpm(min-1)	7,222	6,099	5,216	4,012	3,210	2,675	2,006	1,605	1,337
								vf(in/min)	24.1	28.6	31.3	33.4	32.6	28.1	26.7	21.3	20.1
					0.5D	1D	Slotting	vc(sf/min)	148	151	158	164	164	164	164	164	164
								fz(in)	0.0007	0.0009	0.0011	0.0016	0.0018	0.0019	0.0023	0.0023	0.0026
								rpm(min-1)	4,514	3,691	3,210	2,508	2,006	1,672	1,254	1,003	836
								vf(in/min)	12	12.7	14.4	15.9	14.4	12.5	11.7	9.4	8.8
S	Ti/ Ti Alloy	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	600 ~ 1800	1.5D	0.1D	Shouldering	vc(sf/min)	230	243	246	249	256	256	256	256	256
								fz(in)	0.0008	0.0011	0.0013	0.0018	0.0021	0.0024	0.003	0.0031	0.0035
								rpm(min-1)	7,021	5,938	5,015	3,812	3,130	2,608	1,956	1,565	1,304
								vf(in/min)	21.1	25.1	26.3	27.3	26.4	25	23.8	19.6	18
					0.5D	1D	Slotting	vc(sf/min)	131	135	141	148	148	148	148	148	148
								fz(in)	0.0006	0.0008	0.001	0.0014	0.0016	0.0017	0.0021	0.0021	0.0024
								rpm(min-1)	4,012	3,290	2,875	2,257	1,806	1,505	1,128	903	752
								vf(in/min)	9.4	10.3	11.6	12.8	11.3	10.2	9.4	7.6	7.1

Super Endmill for Ti

SFES4000(Flat) / SRES4000(Radius)

(mm)

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	ISO (DIN)	AISI						Cutting length (mm)	8	10	15	15	20	25	30	42	48
P	Carbon steel	(C22) C40 C45	1020 1039 1045	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	10,610	8,594	7,257	6,048	4,536	3,629	3,024	2,268	1,814
									feed	849	1,031	1,161	1,210	1,179	1,016	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	6,791	5,173	4,329	3,714	2,785	2,228	1,857	1,393	1,114
									feed	435	455	519	564	512	446	416	334	312
	Alloy steel	20NiCrMo2 - - 42CrMo4	8615 4320 4130 4140	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	15,000	11,000	9,600	8,000	6,000	4,800	4,000	3,000	2,400
									feed	1,250	1,400	1,900	2,200	1,600	1,440	1,250	1,140	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	6,900	5,600	4,500	3,700	2,800	2,200	1,900	1,400	1,100
									feed	410	490	630	740	670	530	530	390	350
M	Ferritic/ martensitic series	X6CrAl13 X6Cr17 X12CrS13 X6CrMo17-1 (X6Cr13) X12Cr13	405 430 416 434 403 410	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	10,610	8,594	7,257	6,048	4,536	3,629	3,024	2,268	1,814
									feed	849	1,031	1,161	1,210	1,179	1,016	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	6,791	5,173	4,329	3,714	2,785	2,228	1,857	1,393	1,114
									feed	435	455	519	564	512	446	416	334	312
	Austenite series	X10CrNiS18-9 X5CrNi18-9 X5CrNiMo17-12-2	303 304 316	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	7,639	6,048	4,966	4,244	3,183	2,546	2,122	1,592	1,273
									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	4,775	3,660	3,056	2,653	1,990	1,592	1,326	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	7,427	5,889	4,775	4,032	3,104	2,483	2,069	1,552	1,241
									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	4,244	3,263	2,737	2,387	1,790	1,432	1,194	895	716
									feed	238	261	296	327	286	258	239	193	180

Super Endmill for Ti

SBETA2000(Ball)

(inch)

Workpiece				Brinell hard-ness (HB)	ap (mm)	ae (mm)	Machining	Diameter (Inch)	1/8	5/32	3/16	7/32	1/4	5/16	3/8	7/16	1/2
ISO	Workpiece materials	ISO (DIN)	AISI														
P	Carbon steel	(C22) C40 C45	1020 1039 1045	230	≤ 0.1D	≤ 0.1D	Copying	vc(sf/min)	410	656	656	656	656	656	656	656	656
								fz(in)	0.0017	0.0017	0.0019	0.0017	0.0021	0.0022	0.0026	0.0031	0.0035
	Alloy steel	20NiCrMo2 - - 42CrMo4	8615 4320 4130 4140	280	≤ 0.1D	≤ 0.1D		rpm(min-1)	12,538	16,049	13,374	11,464	10,031	8,024	6,687	5,732	5,015
								vf(in/min)	41.8	55.2	51.2	39.7	41.8	35.1	35.1	35.2	35.5
M	Ferritic/ martensitic series	X6CrAl13 X6Cr17 X12CrS13 X6CrMo17-1 (X6Cr13) X12Cr13	405 430 416 434 403 410	240	≤ 0.1D	≤ 0.1D	Copying	vc(sf/min)	377	591	591	591	591	591	591	591	591
								fz(in)	0.0014	0.0014	0.0015	0.0016	0.0018	0.0023	0.0026	0.003	0.0034
								rpm(min-1)	11,535	14,444	12,037	10,317	9,028	7,222	6,018	5,159	4,514
					≤ 0.1D	≤ 0.1D		vf(in/min)	31.7	39.5	35.2	32.5	33.1	32.7	30.7	30.5	30.5
	Austenite series	X10CrNiS18-9 X5CrNi18-9 X5CrNiMo17-12-2	303 304 316	200	≤ 0.1D	≤ 0.1D	Copying	vc(sf/min)	312	492	492	492	492	492	492	492	492
								fz(in)	0.0014	0.0014	0.0015	0.0016	0.0018	0.0023	0.0026	0.003	0.0034
								rpm(min-1)	9,529	12,037	10,031	8,598	7,523	6,018	5,015	4,299	3,761
								vf(in/min)	26.2	32.9	29.3	27.1	27.6	27.3	25.6	25.4	25.4
S	Ti/ Ti Alloy	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	320	≤ 0.1D	≤ 0.1D	Copying	vc(sf/min)	312	492	492	492	492	492	492	492	492
								fz(in)	0.0014	0.0014	0.0015	0.0016	0.0018	0.0023	0.0026	0.003	0.0034
								rpm(min-1)	9,529	12,037	10,031	8,598	7,523	6,018	5,015	4,299	3,761
								vf(in/min)	26.2	32.9	29.3	27.1	27.6	27.3	25.6	25.4	25.4

Super Endmill for Ti

SBETA4000(Ball)

(inch)

Workpiece				Brinell hard-ness (HB)	ap (mm)	ae (mm)	Machining	Diameter (Inch)	1/8	5/32	3/16	7/32	1/4	5/16	3/8	7/16	1/2
ISO	Workpiece materials	ISO (DIN)	AISI														
P	Carbon steel	(C22) C40 C45	1020 1039 1045	230	≤0.1D	≤0.1D	Copying	vc(sf/min)	410	656	656	656	656	656	656	656	656
								fz(in)	0.0017	0.0017	0.0019	0.0017	0.0021	0.0022	0.0026	0.0031	0.0035
								rpm(min^{-1})	12,538	16,049	13,374	11,464	10,031	8,024	6,687	5,732	5,015
	Alloy steel	20NiCrMo2 - - 42CrMo4	8615 4320 4130 4140	280	≤0.1D	≤0.1D		vf(in/min)	83.6	110.3	102.3	79.4	83.6	70.2	70.2	70.4	71.1
M	Ferritic/ martensitic series	X6CrAl13 X6Cr17 X12CrS13 X6CrMo17-1 (X6Cr13) X12Cr13	405 430 416 434 403 410	240	≤0.1D	≤0.1D	Copying	vc(sf/min)	377	591	591	591	591	591	591	591	591
								fz(in)	0.0014	0.0014	0.0015	0.0016	0.0018	0.0023	0.0026	0.003	0.0034
								rpm(min^{-1})	11,535	14,444	12,037	10,317	9,028	7,222	6,018	5,159	4,514
					≤0.1D	≤0.1D		vf(in/min)	63.4	79	70.4	65	66.2	65.4	61.4	60.9	60.9
	Austenite series	X10CrNiS18-9 X5CrNi18-9 X5CrNiMo17-12-2	303 304 316	200	≤0.1D	≤0.1D	Copying	vc(sf/min)	312	492	492	492	492	492	492	492	492
								fz(in)	0.0014	0.0014	0.0015	0.0016	0.0018	0.0023	0.0026	0.003	0.0034
								rpm(min^{-1})	9,529	12,037	10,031	8,598	7,523	6,018	5,015	4,299	3,761
								vf(in/min)	52.4	65.8	58.7	54.2	55.2	54.5	51.2	50.8	50.8
S	Ti/ Ti Alloy	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	320	≤0.1D	≤0.1D	Copying	vc(sf/min)	312	492	492	492	492	492	492	492	492
								fz(in)	0.0014	0.0014	0.0015	0.0016	0.0018	0.0023	0.0026	0.003	0.0034
								rpm(min^{-1})	9,529	12,037	10,031	8,598	7,523	6,018	5,015	4,299	3,761
								vf(in/min)	52.4	65.8	58.7	54.2	55.2	54.5	51.2	50.8	50.8

Super Endmill for Ti

SBET2000(Ball)

(mm)

Workpiece				Brinell hardness (HB)	Specific cutting force (N/mm²)	ap (mm)	ae (mm)	Machining	Diameter (mm)	1	2	3	4	5	6	8	10	12
ISO	Workpiece materials	ISO (DIN)	AISI						Cutting length (mm)	1	2	3	8	12	12	16	20	25
P	Carbon steel	(C22) C40 C45	1020 1039 1045	230	400 ~ 600	≤0.1D	≤0.1D	Copying	vc	131	131	122	200	200	200	200	200	200
									fz	0.02	0.028	0.04	0.044	0.051	0.050	0.059	0.070	0.085
	Alloy steel	20NiCrMo2 - - 42CrMo4	8615 4320 4130 4140	280	800 ~ 1000	≤0.1D	≤0.1D		rpm	41,600	20,800	13,000	16,000	12,700	10,600	8,000	6,400	5,300
									feed	1,664	1,165	1,040	1,400	1,300	1,050	950	900	900
M	Ferritic/ martensitic series	X6CrAl13 X6Cr17 X12CrS13 X6CrMo17-1 (X6Cr13) X12Cr13	405 430 416 434 403 410	240	450 540 450	≤0.1D ≤0.1D	≤0.1D ≤0.1D	Copying	vc	121	121	113	180	180	180	180	180	180
									fz	0.013	0.023	0.033	0.035	0.039	0.044	0.058	0.068	0.081
									rpm	38,400	19,200	12,000	14,400	11,520	9,600	7,200	5,760	4,800
									feed	998	883	792	1,008	897	845	835	783	778
	Austenite series	X10CrNiS18-9 X5CrNi18-9 X5CrNiMo17-12-2	303 304 316	200	520	≤0.1D	≤0.1D	Copying	vc	100	100	94	150	150	150	150	150	150
									fz	0.013	0.023	0.033	0.035	0.039	0.044	0.058	0.068	0.081
									rpm	32,000	16,000	10,000	12,000	9,600	8,000	6,000	4,800	4,000
									feed	832	736	660	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	0.013	0.023	0.033	0.035	0.039	0.044	0.058	0.068	0.081
									rpm	32,000	16,000	10,000	12,000	9,600	8,000	6,000	4,800	4,000
									feed	832	736	660	850	750	700	700	650	650

Super Endmill for Ti

SBET4000(Ball)

(mm)

Workpiece				Brinell hardness (HB)	Specific cutting force (N/mm²)	ap (mm)	ae (mm)	Machining	Diameter (mm)	4	5	6	8	10	12
ISO	Workpiece materials	ISO (DIN)	AISI						Cutting length (mm)	8	12	12	16	20	25
P	Carbon steel	(C22) C40 C45	1020 1039 1045	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
	Alloy steel	20NiCrMo2 - - 42CrMo4	8615 4320 4130 4140	280	800 ~ 1000	≤0.1D	≤0.1D		rpm	16,000	12,700	10,600	8,000	6,400	5,300
									feed	2,800	2,600	2,100	1,900	1,800	1,800
M	Ferritic/ martensitic series	X6CrAl13 X6Cr17 X12CrS13 X6CrMo17-1 (X6Cr13) X12Cr13	405 430 416 434 403 410	240	450 540 450	≤0.1D ≤0.1D	≤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	14,400	11,520	9,600	7,200	5,760	4,800
									feed	2,040	1,800	1,680	1,680	1,560	1,560
	Austenite series	X10CrNiS18-9 X5CrNi18-9 X5CrNiMo17-12-2	303 304 316	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	12,000	9,600	8,000	6,000	4,800	4,000
									feed	1,700	1,500	1,400	1,400	1,300	1,300
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	12,000	9,600	8,000	6,000	4,800	4,000
									feed	1,700	1,500	1,400	1,400	1,300	1,300

The Mirror Endmill

PCD Endmill

(mm)

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

(mm)

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.

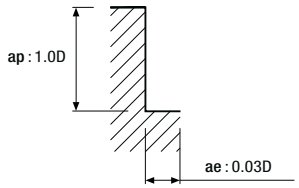
H-Star Endmill

ESE702A, ESE712A series _ Side cutting

(inch)

Workplece / 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(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)
1/32	48,000	41	38,000	32	25,500	20	20,500	12	16,000	7	12,500	5
3/32	33,300	47	26,000	38	17,500	24	14,500	15	11,000	9	9,500	6
1/8	21,800	47	17,300	38	11,500	24	9,500	15	7,500	9	6,400	6
5/32	16,700	49	13,200	39	8,800	25	7,200	15	5,600	9	4,750	7
3/16	15,700	57	12,500	45	8,300	28	6,400	16	5,100	10	4,450	7
1/4	13,100	53	10,350	43	6,900	27	5,300	16	4,200	10	3,700	7
5/16	9,880	52	7,800	41	5,200	25	4,000	14	3,200	9	2,800	7
3/8	7,800	47	6,150	38	4,100	23	3,200	13	2,550	9	2,200	6
1/2	6,650	47	5,250	38	3,500	23	2,650	13	2,100	9	1,860	6
5/8	4,900	41	3,900	33	2,600	20	2,000	12	1,600	7	1,400	6
3/4	3,900	37	3,100	30	2,050	19	1,600	11	1,300	7	1,100	5

Application Tip

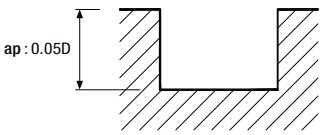


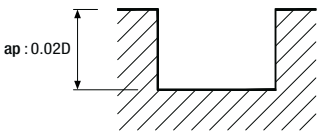
ESE702A, ESE712A series _ Slotting

(inch)

Workplece / 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(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)
1/32	48,000	30	38,000	22	25,500	14	20,500	8	16,000	5	12,500	3
3/32	33,300	33	26,000	27	17,500	17	14,500	10	11,000	6	9,500	5
1/8	21,800	33	17,300	27	11,500	17	9,500	10	7,500	6	6,400	5
5/32	16,700	35	13,200	28	8,800	17	7,200	11	5,600	7	4,750	5
3/16	15,700	39	12,500	32	8,300	20	6,400	11	5,100	7	4,450	5
1/4	13,100	37	10,350	30	6,900	19	5,300	11	4,200	7	3,700	5
5/16	9,880	37	7,800	28	5,200	18	4,000	10	3,200	6	2,800	5
3/8	7,800	33	6,150	27	4,100	16	3,200	9	2,550	6	2,200	5
1/2	6,650	33	5,250	27	3,500	16	2,650	9	2,100	6	1,860	4
5/8	4,900	29	3,900	23	2,600	14	2,000	8	1,600	5	1,400	4

Application Tip





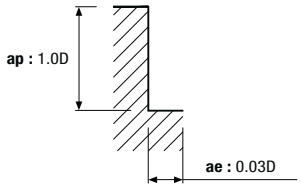
H-Star Endmill

ESE702 series _ Side cutting

(mm)

Workplece / 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

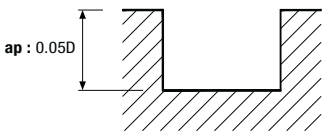


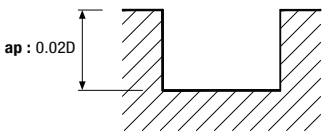
ESE702 series _ Slotting

(mm)

Workplece / 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	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





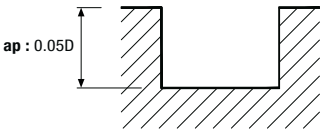
H-Star Endmill

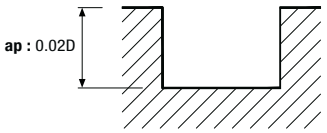
ESE712 series _ Slotting

(mm)

Workplece	Hardened steel Heat resistant alloy		Hardened steels									
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
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)
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



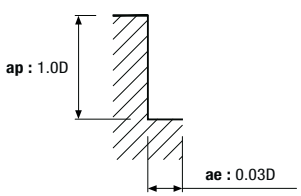


ESE712 series _ Side cutting

(mm)

Workplece	Hardened steel Heat resistant alloy		Hardened steels									
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
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	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



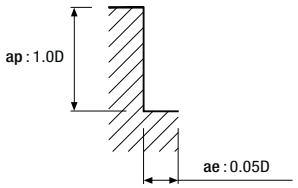
H-Star Endmill

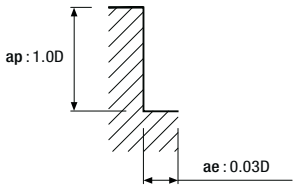
ESE704A, ESE714A, ESE744A series _ Side cutting

(inch)

Workplece / 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(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)
1/32	48,000	58	38,000	41	25,500	28	20,500	17	16,000	11	12,500	7
3/32	33,300	69	26,000	49	17,500	33	14,500	20	11,000	13	9,500	9
1/8	21,800	69	17,300	49	11,500	33	9,500	20	7,500	13	6,400	9
5/32	16,700	71	13,200	51	8,800	35	7,200	21	5,600	13	4,750	9
3/16	15,700	79	12,500	59	8,300	39	6,400	23	5,100	15	4,450	11
1/4	13,100	77	10,350	55	6,900	37	5,300	22	4,200	14	3,700	10
5/16	9,880	74	7,800	53	5,200	35	4,000	20	3,200	13	2,800	9
3/8	7,800	69	6,150	50	4,100	33	3,200	19	2,550	12	2,200	9
1/2	6,650	69	5,250	50	3,500	33	2,650	19	2,100	12	1,860	9
5/8	4,900	59	3,900	43	2,600	29	2,000	17	1,600	11	1,400	8
3/4	3,900	51	3,100	38	2,050	26	1,600	15	1,300	10	1,100	7

Application Tip



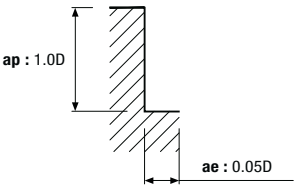


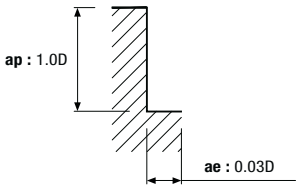
ESE704, ESE714, ESE744 series _ Side cutting

(mm)

Workplece / 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	1,480	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





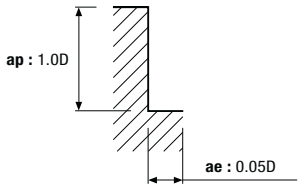
H-Star Endmill

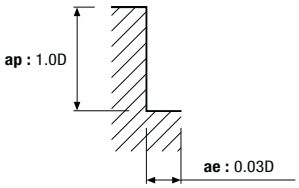
ESE724 series _ Side cutting

(mm)

Workplece	Hardened steel Heat resistant alloy		Hardened steels									
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
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	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



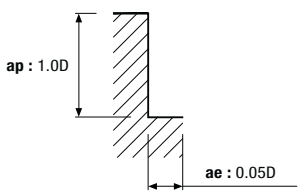


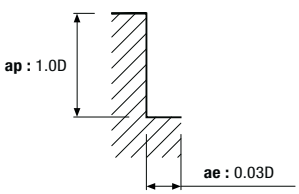
ESE726, ESR736 series

(mm)

Workplece	Hardened steel Heat resistant alloy		Hardened steels									
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
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)
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





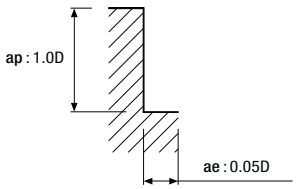
H-Star Endmill

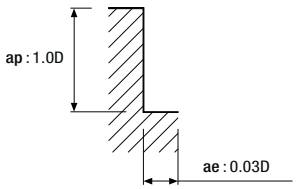
ESE716A series _ Side cutting

(inch)

Workplece / 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(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)
1/4	24,800	211	23,500	193	16,000	193	13,500	130	10,500	83	8,000	57
5/16	20,000	217	19,000	197	12,000	181	10,000	122	8,000	79	6,000	55
3/8	16,000	193	15,500	177	9,500	161	8,000	114	6,400	71	4,800	51
1/2	13,000	177	12,500	161	8,000	150	6,600	98	5,300	63	4,000	45
5/8	10,000	157	9,700	146	6,000	134	5,000	91	4,000	49	3,000	34
3/4	8,000	132	7,800	134	4,800	126	4,000	83	3,200	40	2,400	27

Application Tip



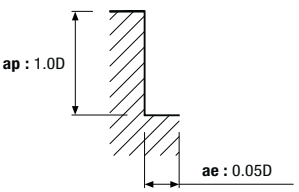


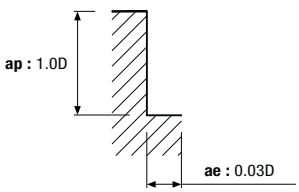
ESE716 series _ Side cutting

(mm)

Workplece / 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

ESRE712 series _ Side cutting

(mm)

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

(mm)

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

(mm)

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

(mm)

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

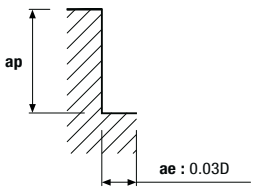
H-Star Endmill

ESRE712 series _ Side cutting

(mm)

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

(mm)

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

H-Star Endmill

ESRE714 series

(mm)

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	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
	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

H-Star Endmill

ESRE714 series

(mm)

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	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
	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

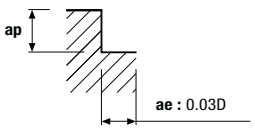
H-Star Endmill

ESRE714 series

(mm)

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	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
	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



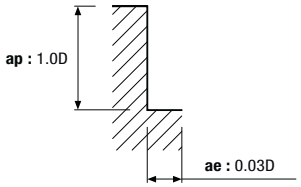
H-Star Endmill

ESXE704, ESXE714, ESXR704 series _ Side cutting

(mm)

Workplece / Conditions / Diameter(Ø)	Hardened steel 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

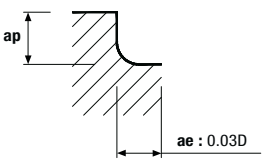


ESLNS20, ESLNS40 series

(mm)

Workplece / 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)
0.4	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



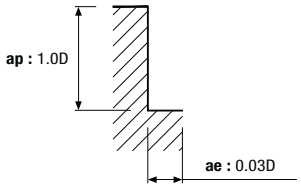
H-Star Endmill

ESR702 series _ Side cutting

(mm)

Workplece	Hardened steel Heat resistant alloy		Hardened steels									
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
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)
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

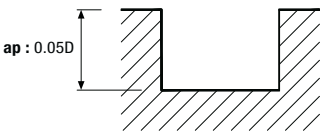


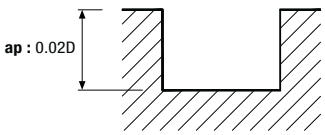
ESR702, ESR732 series _ Slotting

(mm)

Workplece	Hardened steel Heat resistant alloy		Hardened steels									
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
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)
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





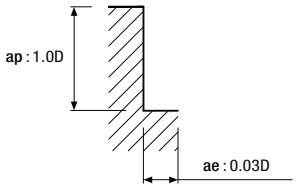
H-Star Endmill

ESR704A, ESR714A series _ Side cutting

(inch)

Workplece / 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(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)
1/8	21,800	55	17,300	39	11,500	26	9,500	16	7,500	10	6,400	7
5/32	16,700	57	13,200	41	8,800	28	7,200	17	5,600	11	4,750	8
3/16	15,700	63	12,500	47	8,300	31	6,400	18	5,100	12	4,450	9
1/4	13,100	61	10,350	44	6,900	30	5,300	18	4,200	11	3,700	8
5/16	9,880	59	7,800	43	5,200	28	4,000	16	3,200	10	2,800	8
3/8	7,800	55	6,150	40	4,100	26	3,200	15	2,550	10	2,200	7
1/2	6,650	55	5,250	40	3,500	26	2,650	15	2,100	9	1,860	7
5/8	4,900	47	3,900	35	2,600	23	2,000	13	1,600	9	1,400	6
3/4	3,900	41	3,100	31	2,050	20	1,600	12	1,300	8	1,100	6

Application Tip

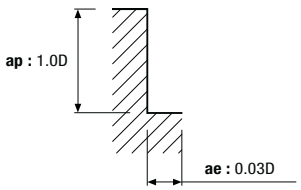


ESR704, ESR714, ESR724, ESR734 series _ Side cutting

(mm)

Workplece / 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)
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



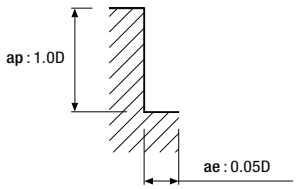
H-Star Endmill

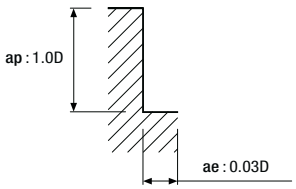
ESR706A, ESR716A series _ Side cutting

(inch)

Workplece	Hardened steel Heat resistant alloy		Hardened steels									
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
Diameter(Ø)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)
1/4	24,800	211	23,500	193	16,000	193	13,500	130	10,500	83	8,000	57
5/16	20,000	217	19,000	197	12,000	181	10,000	122	8,000	79	6,000	55
3/8	16,000	193	15,500	177	9,500	161	8,000	114	6,400	71	4,800	51
1/2	13,000	177	12,500	161	8,000	150	6,600	98	5,300	63	4,000	45
5/8	10,000	157	9,700	146	6,000	134	5,000	91	4,000	49	3,000	34
3/4	8,000	132	7,800	134	4,800	126	4,000	83	3,200	40	2,400	27

Application Tip



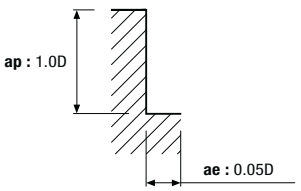


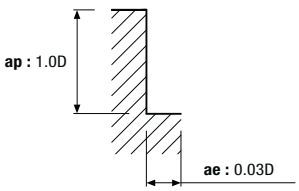
ESR706 series

(mm)

Workplece	Hardened steel Heat resistant alloy		Hardened steels									
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
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)
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





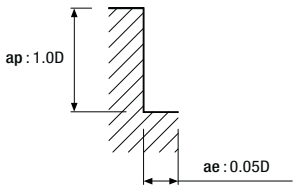
H-Star Endmill

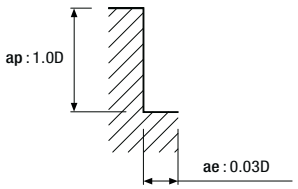
ESR718A series _ Side cutting

(inch)

Workplece / 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(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)
5/16	19,600	175	19,600	175	13,200	172	11,150	115	8,700	73	6,600	51
3/8	1,700	167	17,000	167	11,350	162	9,500	108	7,450	69	5,700	49
1/2	11,800	152	11,800	152	7,550	141	6,250	93	5,000	59	3,800	43
5/8	19,800	147	9,800	147	6,050	135	5,050	92	4,050	50	3,000	34
3/4	8,600	133	8,600	133	5,300	123	4,400	83	3,550	44	2,650	30
1	6,150	106	6,150	106	3,800	100	3,150	65	2,500	31	1,900	22

Application Tip





H-Star Endmill

ESRR712 series

(mm)

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	Neck length	Depth of Cut	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

(mm)

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	Neck length	Depth of Cut	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

(mm)

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	Neck length	Depth of Cut	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

(mm)

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	Neck length	Depth of Cut	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

(mm)

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	Neck length	Depth of Cut	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

(mm)

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	Neck length	Depth of Cut	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

(mm)

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	Neck length	Depth of Cut	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

(mm)

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	Neck length	Depth of Cut	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

(mm)

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	Neck length	Depth of Cut	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

(mm)

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	Neck length	Depth of Cut	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

(mm)

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	Neck length	Depth of Cut	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

(mm)

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	Neck length	Depth of Cut	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

(mm)

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	Neck length	Depth of Cut	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

(mm)

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	Neck length	Depth of Cut	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

(mm)

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	Neck length	Depth of Cut	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

(mm)

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	Neck length	Depth of Cut	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

(mm)

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	Neck length	Depth of Cut	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

(mm)

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	Neck length	Depth of Cut	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

(mm)

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	Neck length	Depth of Cut	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
	0.3	16	0.24	9,154	2,786	7,781	23,68	6,866	1,671	6,408	1,365

H-Star Endmill

ESRR714 series

(mm)

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	Neck length	Depth of Cut	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	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
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

H-Star Endmill

ESRR714 series

(mm)

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	Neck length	Depth of Cut	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	0.3	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
		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

H-Star Endmill

ESRR714 series

(mm)

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	Neck length	Depth of Cut	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	1	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

ESLNR20 series

(mm)

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	Neck length	Depth of Cut	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

(mm)

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	Neck length	Depth of Cut	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
	0.8	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
		20	0.06	11,907	936	10,121	796	8,930	624	8,335	510

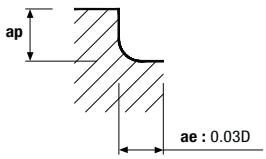
H-Star Endmill

ESLNR20 series

(mm)

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	Neck length	Depth of Cut	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	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

(mm)

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	Neck length	Depth of Cut	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
	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

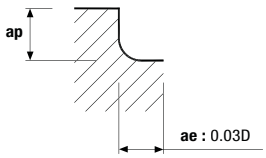
H-Star Endmill

ESTNR20 series

(mm)

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	Neck length	Depth of Cut	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	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

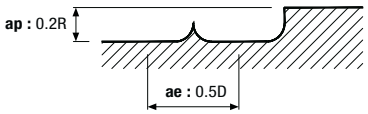
H-Star Endmill

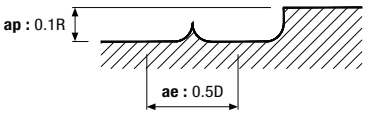
ESPM4A series _ Side cutting

(inch)

Workplece	Hardened steel Heat resistant alloy		Hardened steels							
Conditions	~HRC40		HRC40~50		HRC50~55		HRC55~60		HRC60~65	
Diameter(Ø) × R	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)
1/8 × R2/64	9,550	256	6,900	163	4,550	108	2,850	45	1,900	24
3/16 × R4/64	7,950	276	5,750	181	4,000	126	2,550	53	1,750	28
1/4 × R2/64	5,800	301	4,100	193	2,900	138	1,850	73	1,350	31
1/4 × R4/64	5,800	301	4,100	193	2,900	138	1,850	73	1,350	31
5/16 × R2/64	4,350	301	3,050	193	2,200	138	1,400	73	995	31
5/16 × R6/64	4,350	301	3,050	193	2,200	138	1,400	73	995	31
3/8 × R2/64	3,500	301	2,450	193	1,750	138	1,100	73	795	31
3/8 × R6/64	3,500	301	2,450	193	1,750	138	1,100	73	795	31
1/2 × R6/64	2,900	301	2,050	193	1,450	138	925	73	665	31
1/2 × R8/64	2,900	301	2,050	193	1,450	138	925	73	665	31

Application Tip



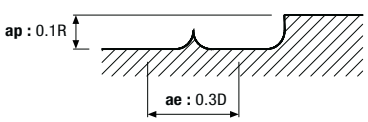


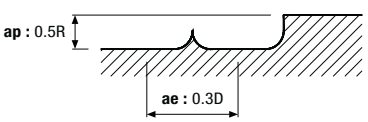
ESPM4A series _ High Speed Cutting

(inch)

Workplece	Hardened steel Heat resistant alloy		Hardened steels							
Conditions	~HRC40		HRC40~50		HRC50~55		HRC55~60		HRC60~65	
Diameter(Ø) × R	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)
1/8 × R2/64	22,000	630	17,000	394	12,500	315	9,500	181	6,900	98
3/16 × R4/64	17,000	689	13,000	472	11,000	362	8,000	217	5,600	114
1/4 × R2/64	13,500	728	10,500	543	9,000	433	6,400	252	4,500	142
1/4 × R4/64	13,500	728	10,500	543	9,000	433	6,400	252	4,500	142
5/16 × R2/64	10,000	728	8,000	551	6,800	433	4,800	264	3,400	161
5/16 × R6/64	10,000	728	8,000	551	6,800	433	4,800	264	3,400	161
3/8 × R2/64	8,000	728	6,400	551	5,400	433	3,800	268	2,700	150
3/8 × R6/64	8,000	728	6,400	551	5,400	433	3,800	268	2,700	150
1/2 × R6/64	6,600	728	5,300	551	4,500	433	3,200	276	2,250	142
1/2 × R8/64	6,600	728	5,300	551	4,500	433	3,200	276	2,250	142

Application Tip





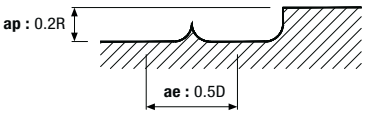
H-Star Endmill

ESPM4 series _ Side cutting

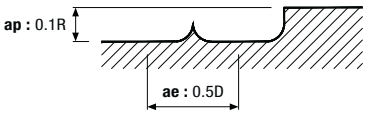
(mm)

Workplece	Hardened steel Heat resistant alloy		Hardened steels							
Conditions	~HRC40		HRC40~50		HRC50~55		HRC55~60		HRC60~65	
Diameter(Ø) × R	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



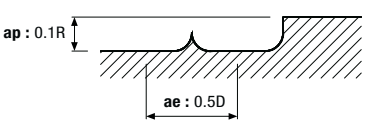
* ae shouldn't be over max. 0.5D

ESPM4 series _ High speed processing

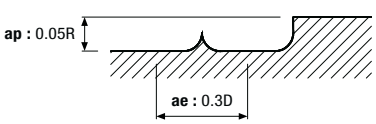
(mm)

Workplece	Hardened steel Heat resistant alloy		Hardened steels							
Conditions	~HRC40		HRC40~50		HRC50~55		HRC55~60		HRC60~65	
Diameter(Ø) × R	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

H-Star Endmill

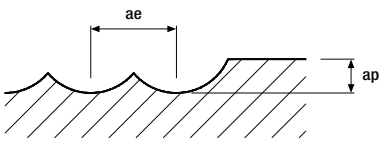
ESB702A, ESB712A series

(inch)

Workplece / 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(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)
1/32	50,000	189	50,000	165	45,000	150	40,000	118	35,000	102	35,000	91
1/16	50,000	213	48,000	177	43,000	157	23,000	122	33,000	106	29,700	91
3/32	49,700	224	47,800	189	40,000	157	35,000	124	32,000	110	28,500	91
1/8	33,100	236	31,800	209	26,500	157	23,500	124	21,000	110	19,000	91
5/32	24,900	236	23,900	209	20,000	157	17,500	124	16,000	110	14,500	91
3/16	18,600	228	17,800	193	15,000	148	13,500	120	11,500	100	10,500	83
1/4	13,900	191	13,400	161	11,000	122	10,000	98	8,800	85	8,000	69
5/16	11,100	165	10,700	138	9,000	106	8,000	85	7,000	73	6,500	61
3/8	9,300	146	8,900	122	7,500	94	6,600	75	5,800	65	5,300	54
1/2	6,950	116	6,680	98	5,600	75	5,000	61	4,400	49	4,000	41
5/8	5,570	104	5,350	87	4,500	67	4,000	53	3,500	39	3,200	34
3/4	4,450	93	4,300	77	3,600	59	3,200	47	2,800	32	2,550	26

Application Tip

- **ap** : D1/32 ~ D5/32 = 0.05 × D
  D3/16 ~ D5/16 = 0.001
  D3/8 ~ D1/2 = 0.0118
- **ae** : 0.1 × D



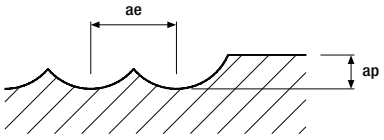
ESB702, ESB712 series

(mm)

Workplece / 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 = 0.25 mm
  D10 ~ D12 = 0.3 mm
- **ae** : 0.1 × D



H-Star Endmill

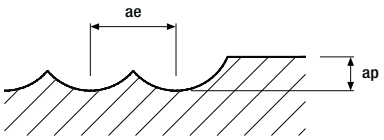
ESB703A series

(inch)

Workplece / 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(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)
3/32	57,000	280	55,000	236	46,000	197	40,300	154	36,800	138	32,800	114
1/8	38,000	295	36,600	260	30,500	197	27,000	154	24,200	138	21,900	114
5/32	28,500	295	27,500	260	23,000	197	20,100	154	18,400	138	16,700	114
3/16	21,500	287	20,500	240	17,300	185	15,500	150	13,200	126	12,100	102
1/4	16,000	240	15,400	201	12,700	154	11,500	122	10,100	106	9,200	87
5/16	12,700	209	12,300	173	10,400	134	9,200	106	8,100	91	7,500	75
3/8	10,700	181	10,200	154	8,600	118	7,600	94	6,700	83	6,100	67
1/2	8,000	146	7,700	122	6,400	94	5,800	75	5,100	63	4,600	51

Application Tip

- **ap** : D1/32 ~ D5/32 = 0.05 × D
  D3/16 ~ D5/16 = 0.001
  D3/8 ~ D1/2 = 0.0118
- **ae** : 0.1 × D



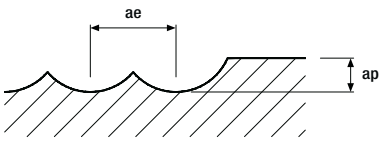
ESB703 series

(mm)

Workplece / Conditions / D×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 = 0.25 mm
  D10 ~ D12 = 0.3 mm
- **ae** : 0.1 × D



H-Star Endmill

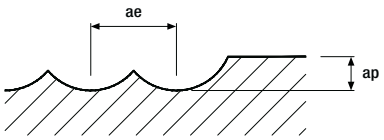
ESB714A, ESB734A series

(inch)

Workplece / 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(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)	R.P.M n(min⁻¹)	Feed vf(in/min)
3/32	62,100	339	59,800	283	50,000	236	43,800	185	40,000	165	35,600	138
1/8	41,400	354	39,800	315	33,100	236	29,400	185	26,300	165	23,800	138
5/32	31,100	354	29,900	315	25,000	236	21,900	185	20,000	165	18,100	138
3/16	23,300	343	22,300	291	18,800	220	16,900	181	14,400	150	13,100	126
1/4	17,400	287	16,800	244	13,800	185	12,500	150	11,000	126	10,000	102
5/16	13,900	248	13,400	209	11,300	161	10,000	126	8,800	110	8,100	91
3/8	11,600	220	11,100	185	9,400	142	8,300	114	7,300	98	6,600	83

Application Tip

- **ap** : D1/32 ~ D5/32 = 0.05 × D
  D3/16 ~ D5/16 = 0.001
  D3/8 ~ D1/2 = 0.0118
- **ae** : 0.1 × D



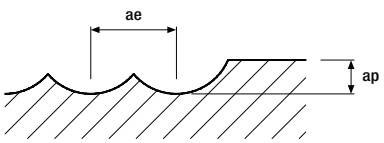
ESB734 series

(mm)

Workplece / 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 = 0.25 mm
  D10 ~ D12 = 0.3 mm
- **ae** : 0.1 × D



H-Star Endmill

ESRB712 series

(mm)

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

(mm)

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

(mm)

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

(mm)

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

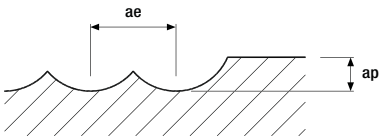
ESRB712 series

(mm)

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 = 0.25 mm
  D10 ~ D12 = 0.3 mm
- **ae** : 0.1 × D



H-Star Endmill

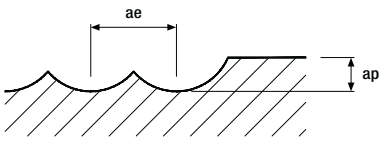
ESLNB20 series

(mm)

Workplece / 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 = 0.25 mm
  D10 ~ D12 = 0.3 mm
- **ae** : 0.1 × D



H-Star Endmill

ESTNB20 series

(mm)

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	Neck Angle (°)	Depth of Cut	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
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

H-Star Endmill

ESTNB20 series

(mm)

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	Neck Angle (°)	Depth of Cut	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	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
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

H-Star Endmill

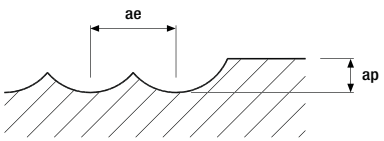
ESTNB20 series

(mm)

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	Neck Angle (°)	Depth of Cut	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	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 = 0.25 mm
  D10 ~ D12 = 0.3 mm
- **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 = 0.17 mm
- 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

(mm)

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	Neck Angle (°)	Depth of Cut	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

(mm)

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	Neck Angle (°)	Depth of Cut	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

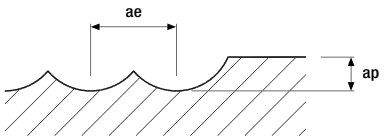
ESTNB30 series

(mm)

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	Neck Angle (°)	Depth of Cut	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

- **ap** : D1 ~ D4 = 0.05 × D
  D5 ~ D8 = 0.25 mm
  D10 ~ D12 = 0.3 mm
- **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 = 0.17 mm
- 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.

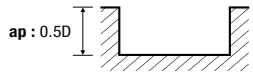
U-Star Endmill

UE502, UXE502 series

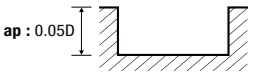
(mm)

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

(mm)

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

(mm)

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

(mm)

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

(mm)

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
4.0	8	8,000	1,300	0.360	7,600	1,160	0.280	6,700	770	0.200

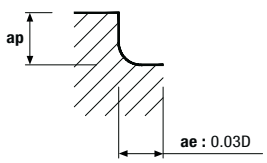
U-Star Endmill

UE512 series

(mm)

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	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



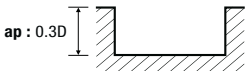
U-Star Endmill

UE522 series

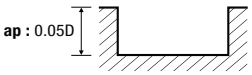
(mm)

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)

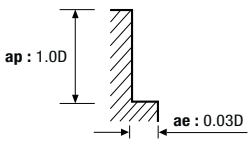


UE504H series

(mm)

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



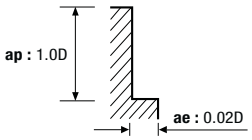
U-Star Endmill

UE514 series

(mm)

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

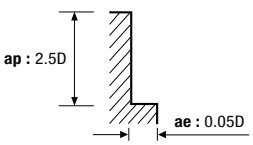


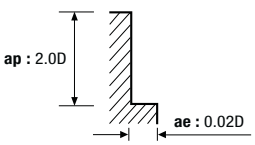
UE514 series

(mm)

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





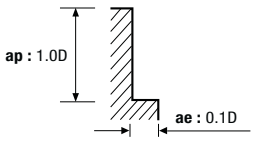
U-Star Endmill

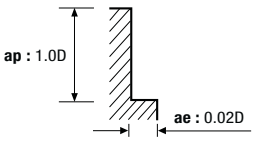
ULE504 series _ General processing

(mm)

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



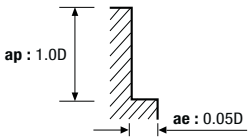


UE504, UXE504 series

(mm)

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



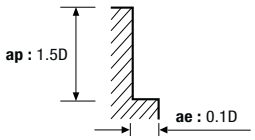
U-Star Endmill

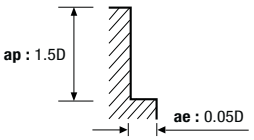
UE506 series _ General processing

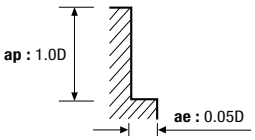
(mm)

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





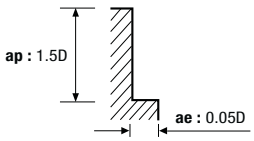


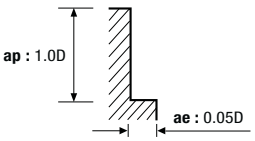
UE506 series _ High speed processing

(mm)

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





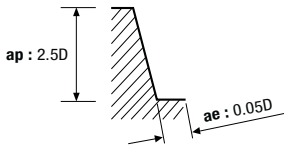
U-Star Endmill

UTE502 series

(mm)

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

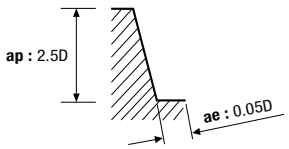


UTE504 series

(mm)

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



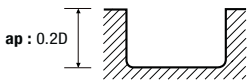
U-Star Endmill

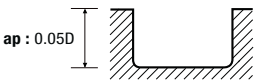
UR502 series

(mm)

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





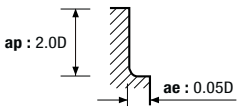
U-Star Endmill

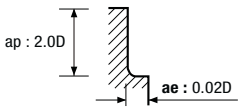
UR504, UR512 series

(mm)

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



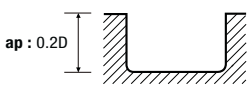


UR542 series

(mm)

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





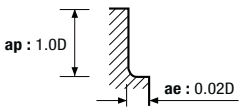
U-Star Endmill

UR544, UXR514 series

(mm)

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

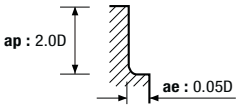


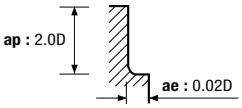
UXR504 series

(mm)

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





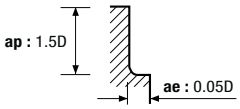
U-Star Endmill

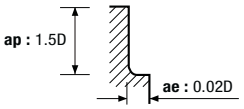
UR506 series

(mm)

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



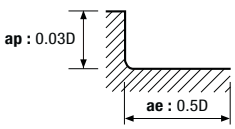


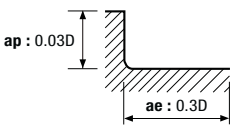
UDR503 series _ General processing

(mm)

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





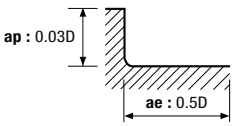
U-Star Endmill

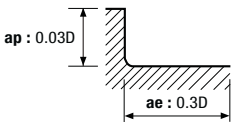
UDR503 series _ High speed processing

(mm)

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



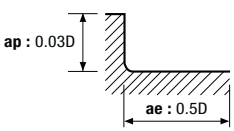


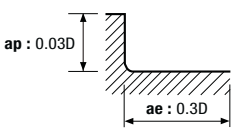
USPM4 series

(mm)

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





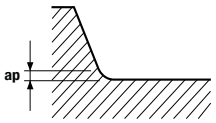
U-Star Endmill

UTR504 series

(mm)

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

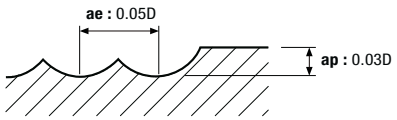


UB502, 502---P series

(mm)

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

(mm)

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

(mm)

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

(mm)

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

(mm)

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

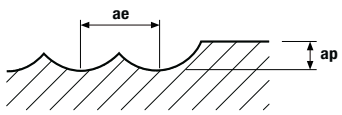
U-Star Endmill

UB512, UB512...S6 series

(mm)

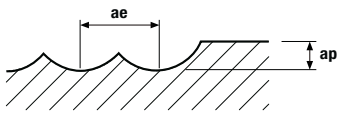
Workpiece		Alloy steels, Carbon steels (Scm, Sncm, S45c)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter(Ø)	Effective Length	R.P.M n(min⁻¹)	Feed vf(mm/min)	ap (mm)	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

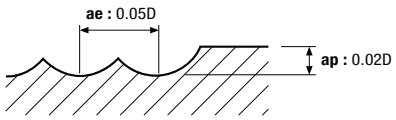
U-Star Endmill

UB532 series

(mm)

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

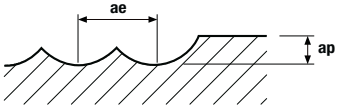


UB542 series _ General processing

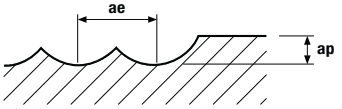
(mm)

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

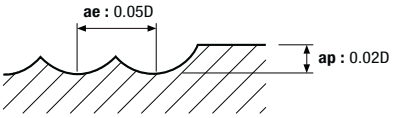
U-Star Endmill

USB502 series

(mm)

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

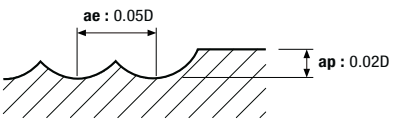


UB503 series

(mm)

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



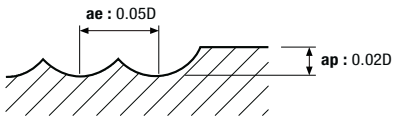
U-Star Endmill

UB504 series

(mm)

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

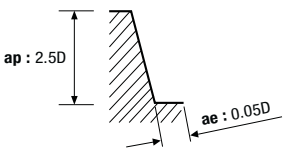


UTB502 series

(mm)

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



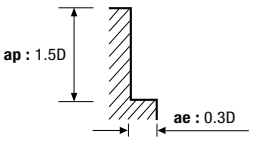
U-Star Endmill

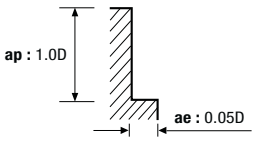
UF50 series

(mm)

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



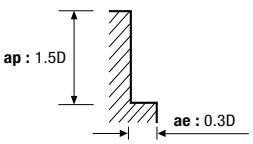


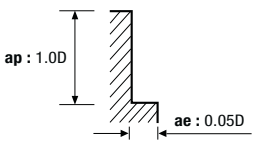
UF51 series

(mm)

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





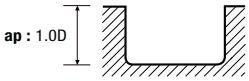
U-Star Endmill

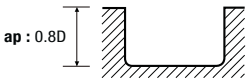
UF51---H series

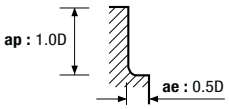
(mm)

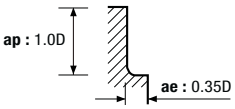
Workpiece	Alloy steels Carbon steels (SCM, S45C, S50C)		Alloy steels Carbon steels Pre-hardened steels (SCM, SKD, NAK, KP4)		Alloy steels Carbon steels (SCM, S45C, S50C)		Alloy steels Carbon steels Pre-hardened steels (SCM, SKD, NAK, KP4)	
Conditions	~HRC25		HRC25~40		~HRC25		HRC25~40	
Diameter(Ø)	R.P.M 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

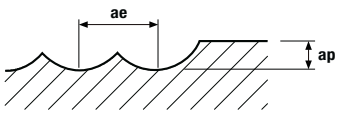
DB312, DB342, DB402, DB502, DB512, DB522, DB54(5)2 _ General cutting

(mm)

Workpiece	Non-alloyed steels alloy steels · Cast iron		Alloy steels, Heat resistant steels		Hardened steels	
Strength	~HRC30		HRC30~45		HRC40~55	
Conditions	~1000N/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.

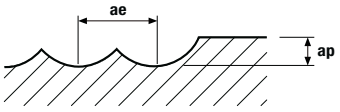
DB312, DB342, DB402, DB502, DB512, DB522, DB54(5)2 _ High speed cutting

(mm)

Workpiece	Non-alloyed steels alloy steels · Cast iron		Alloy steels, Heat resistant steels	
Strength	~HRC45		HRC30~45	
Conditions	~1000N/mm²		1000~1250N/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.

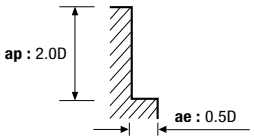
G-Star Endmill

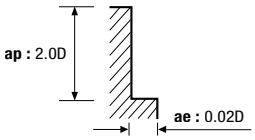
ZR324, ZR504, ZR514, ZR524 series

(mm)

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



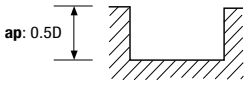


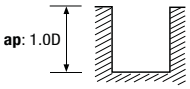
TX202, TX222, TX302 series

(mm)

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





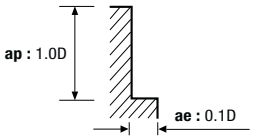
G-Star Endmill

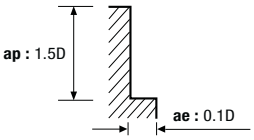
TX204, TX224, TX304 series

(mm)

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%.

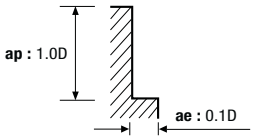
G-Star Endmill

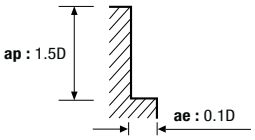
TX304H series

(mm)

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





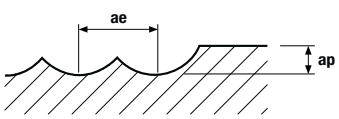
TXB202, TXB222, TXB232, TXB302 series

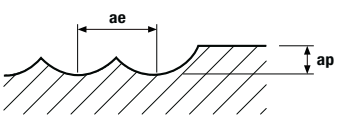
(mm)

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

(mm)

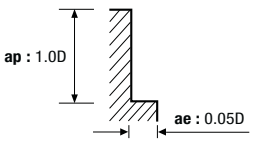
Workpiece	Alloy steels, Tool steels				Hardened steels		Cast iron		Aluminum alloys	
Strength	≤ HRC30		HRC30~45		HRC45~50		-		-	
Conditions	~1000N/mm²		1000~1500N/mm²		1500N/mm²		-		-	
Diameter(Ø)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	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

(mm)

Workpiece	Non-Alloyed steels Alloy steels · Cast iron		Alloy steels, Heat resistant steels		Hardened steels	
Strength	~HRC30		HRC30~45		HRC45~50	
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



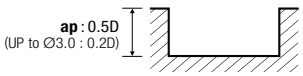
G-Star Endmill

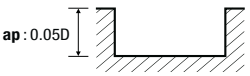
ZE302, ZE322, ZE402, ZE502, ZE522, ZE512 series _ General cutting

(mm)

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





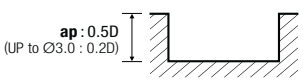
※ Please reduce cutting speed around 20~30% from the above table or ZE522, ZE322 series.

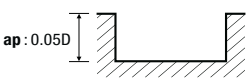
ZE302, ZE322, ZE402, ZE502, ZE522, ZE512 series _ High speed cutting

(mm)

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





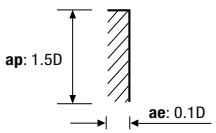
G-Star Endmill

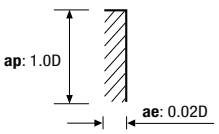
ZE304, ZE324, ZE404, ZE504, ZE524, ZE534, ZE514, ACE4 series _ General cutting

(mm)

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





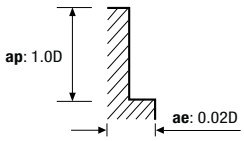
※ Please reduce cutting speed around 20~30% from the above table or ZE524 & ZE324 series.

ZE304, ZE324, ZE404, ZE504, ZE524, ZE534, ZE514, ACE4 series _ High speed cutting

(mm)

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.

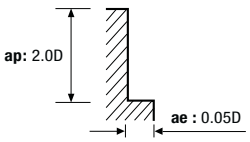
G-Star Endmill

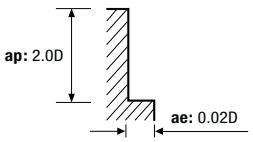
ZR322, ZR502, ZR512, ZR522 series _ Side cutting

(mm)

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



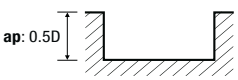


ZR322, ZR502, ZR512, ZR522 series _ Slotting

(mm)

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



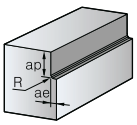
R+ Endmill

RPAE _ For Carbide

(mm)

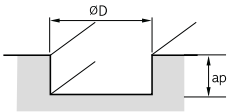
Workpiece / Conditions / Diameter(Ø)	Aluminum, Non-ferrous metal		Aluminum, Non-ferrous metal	
	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)
6.0	13,000	1,125	13,000	1,400
8.0	10,400	1,300	10,400	1,600
10.0	10,400	1,585	10,400	2,000
12.0	10,400	1,950	10,400	1,650
14.0	7,800	1,675	7,800	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

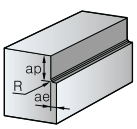
※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

RP(L)E-FP-H _ For Carbide

(mm)

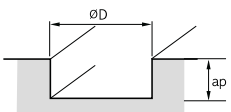
Workpiece / Conditions / Diameter(Ø)	Alloy steels, Carbon steels ≤HRC25		Alloy steels, Carbon steels, Pre-hardened steels HRC25~40		Alloy steels, Carbon steels ≤HRC25		Alloy steels, Carbon steels, Pre-hardened steels HRC25~40	
	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	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

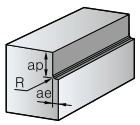
R+ Endmill

RPE-XG _ For Carbide

(mm)

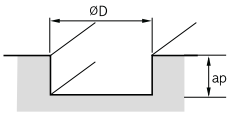
Workpiece / Conditions / Diameter(Ø)	Alloy steels, Carbon steels ≤HRC25		Alloy steels, Carbon steels, Pre-hardened steels HRC25~40		Alloy steels, Carbon steels ≤HRC25		Alloy steels, Carbon steels, Pre-hardened steels HRC25~40	
	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	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)

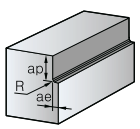
※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

RPE-FP-L _ For Carbide

(mm)

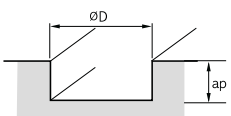
Workpiece / Conditions / Diameter(Ø)	Alloy steel, Carbon steels ≤HRC35		Pre-hardened steels HRC35~45		High hardened steels HRC45~55	
	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)
6.0	12,400	840	8,400	570	3,400	260
8.0	9,200	840	6,300	570	2,400	240
10.0	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

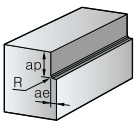
R+ Endmill

RPE-RG _ For Carbide

(mm)

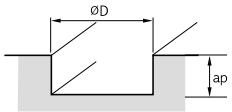
Workpiece / Conditions / Diameter(Ø)	Alloy steels, Carbon steels ≤HRC25		Alloy steels, Carbon steels, Pre-hardened steels HRC25~40		Alloy steels, Carbon steels ≤HRC25		Alloy steels, Carbon steels, Pre-hardened steels HRC25~40	
	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	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)

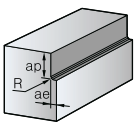
※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

RPE-FF, FP, RG _ For HSS PM

(mm)

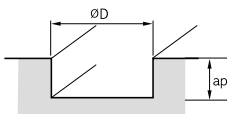
Workpiece / Conditions / Diameter(Ø)	Alloy steels, Carbon steels ≤HRC25		Alloy steels, Carbon steels, Pre-hardened steels HRC25~40		Alloy steels, Carbon steels ≤HRC25		Alloy steels, Carbon steels, Pre-hardened steels HRC25~40	
	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	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

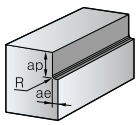
R+ Endmill

RPE-RG _ For HSS PM

(mm)

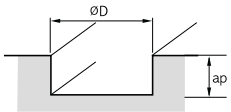
Workpiece / Conditions / Diameter(Ø)	Alloy steels, Carbon steels, Tool steels		Alloy steels, Carbon steels, Tool steels ≤HRC20		Alloy steels, Carbon steels, Tool steels HRC20~30		Alloy steels, Carbon steels, Tool steels HRC30~40	
	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	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)

(mm)

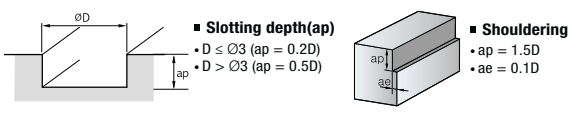
Workpiece / Conditions / Diameter(Ø)	Alloy steel, Cast iron						Stainless steel				Titanium		Inconel	
	~HRC20		~HRC30		HRC30~45		300 Series		400 Series					
	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed 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)

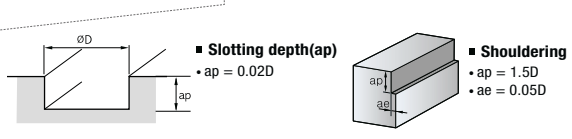
(mm)

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



- **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.

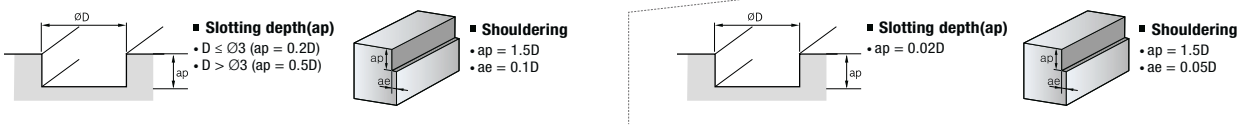
S-Star Endmill

SPFE4000(Flat)/SPRE4000(Radius)

(mm)

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)
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



※ 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)

(mm)

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	1,730	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



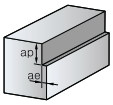
S-Star Endmill

SPRE5000/SPRE7000(Radius)

(mm)

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



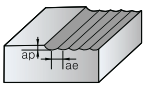
■ **Shouldering**
- ap = 1.5D
- ae = 0.1D

SPBE2000(Ball)

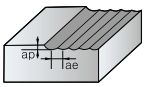
(mm)

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

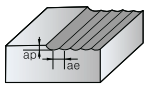
S-Star Endmill

SPBE4000(Ball)

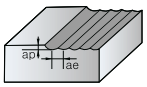
(mm)

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)
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



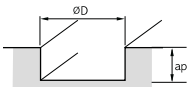
■ **Shouldering**
- ap = 0.05D
- ae = 0.1D

SPXE3000/4000/5000(Roughing)

(mm)

Workpiece	Stainless steel			
Conditions	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)
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

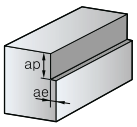
A-Star Endmill

APFE/AFE

(mm)

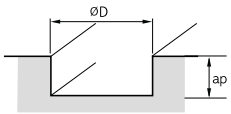
Tool	Shouldering depth(ap)				Slotting depth(ap)			
Workpiece	Aluminum alloy (A7075)		Aluminum alloy mold (AC4B)		Aluminum alloy (A7075)		Aluminum alloy mold (AC4B)	
Conditions / Diameter(Ø)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)
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)

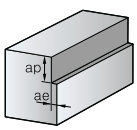
※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

RPAE/APRE

(mm)

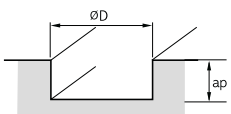
Tool	Shouldering depth(ap)				Slotting depth(ap)			
Workpiece	Aluminum alloy (A7075)		Aluminum alloy mold (AC4B)		Aluminum alloy (A7075)		Aluminum alloy mold (AC4B)	
Conditions / Diameter(Ø)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)
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

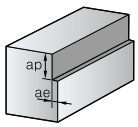
D Endmill

Flat type

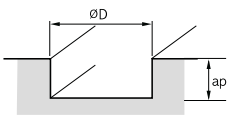
(mm)

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

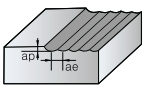
※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

Ball type

(mm)

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

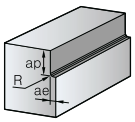
Composite Router Endmill

CCDR

(mm)

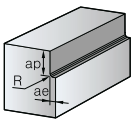
Tool	Rough shouldering				Fine shouldering			
Workpiece	CFRP		GFRP		CFRP		GFRP	
Conditions / Diameter(Ø)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)
6.0	7,960	1,114	3,980	557	10,610	1,910	5,310	743
8.0	5,970	1,075	2,980	536	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

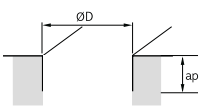


■ **Fine shouldering**

- 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

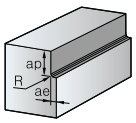
Composite Router Endmill

CCR

(mm)

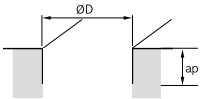
Tool	Roughing shouldering				Slotting			
Workpiece	CFRP		GFRP		CFRP		GFRP	
Conditions / Diameter(Ø)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)
4.0	15,920	1,020	7,960	510	7,960	340	3,980	170
5.0	12,730	1,270	6,370	640	6,370	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)**

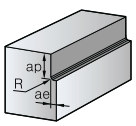
- CFRP, ap : = 1D
- CFRP, ae : = 1D

CCLR/CCRR

(mm)

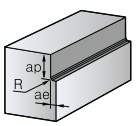
Tool	Roughing shouldering				Fine shouldering			
Workpiece	CFRP		GFRP		CFRP		GFRP	
Conditions / Diameter(Ø)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)	R.P.M n(min⁻¹)	Feed vf(mm/min)
4.0	15,920	1,530	7,960	510	15,920	1,275	7,960	380
5.0	12,730	1,530	6,370	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

Zirconia

(mm)

Size(Ø)	Roughing	Pre-finishing	Finishing	ap (mm)	ae (mm)	rpm (min⁻¹)	vf (mm/min)
0.6			●	0.05	0.05	63500	630
1				0.1	0.2	38000	1050
			●	0.1	0.1	38000	1050
2	●			0.5	1	35000	1400
			●	0.15	0.15	35000	1400
2.5	●			0.5	1.25	28000	1400
			●	0.15	0.15	28000	1400
3	●			0.5	1.5	23500	1600
			●	0.15	0.15	23500	1600

Titanium

(mm)

Size(Ø)	Roughing	Pre-finishing	Finishing	ap (mm)	ae (mm)	rpm (min⁻¹)	vf (mm/min)
0.6			●	0.02	0.02	47750	480
1		●		0.02	0.1	22000	900
			●	0.04	0.04	28500	1050
1.5	●	●		0.05	0.45	15000	1050
			●	0.07	0.07	19000	1150
2	●	●		0.1	0.6	11000	1050
			●	0.1	0.1	14500	1150
2.5	●	●		0.1	0.75	9500	1050
			●	0.1	0.1	11500	1150
3	●			0.15	1	9000	1150
			●	0.12	0.12	10500	1300

Co-Cr

(mm)

Size(Ø)	Roughing	Pre-finishing	Finishing	ap (mm)	ae (mm)	rpm (min⁻¹)	vf (mm/min)
0.6			●	0.02	0.02	63500	635
1		●		0.02	0.1	28500	1150
			●	0.04	0.04	38000	1500
1.5	●	●		0.05	0.45	19000	1500
			●	0.07	0.07	25000	2000
2	●	●		0.1	0.6	14500	1500
			●	0.1	0.1	19000	2000
2.5	●	●		0.1	0.75	11500	1375
			●	0.1	0.1	15500	1850
3	●			0.15	1	14000	1700
			●	0.12	0.12	15900	1900

Caution

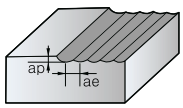
- Please adjust the above cutting conditions according to the state of your machine, the target shape and your purpose.
- Workpieces should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio.

C-Max

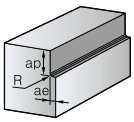
(mm)

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

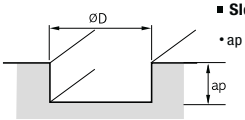
Application Tip



■ **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

(mm)

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

(mm)

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

(mm)

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

(mm)

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

(mm)

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

(mm)

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

(mm)

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

(mm)

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

(mm)

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

(mm)

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

(mm)

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

(mm)

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

(mm)

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

(mm)

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

(mm)

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

(mm)

Workpiece	vc (m/min)	fn (mm/rev)
Aluminum alloy	50~250	0.05~0.20

Cermet Reamer

(mm)

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

(mm)

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

(mm)

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

(mm)

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

(mm)

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

(mm)

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

(mm)

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

(mm)

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

(mm)

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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KORLOY SOLID TOOLS



Workpiece Material Grades

Carbon steel and alloy steel for structural use

Type		U.S.A	Korea	ISO	Japan	Great Britain	Germany	France	Russia
		AISI SAE	KS	ISO	JIS	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Carbon steel		1010	SM10C	C10	S10C	040A10 045A10 045M10	C10E C10R	XC10	-
		1015	SM15C	C15E4 C15M2	S15C	055M15	C15E C15R	-	-
		1020	SM20C	-	S20C	070M20 C22, C22E C22R	C22 C22E C22R	C22 C22E C22R	-
		1025	SM25C	C25 C25E4 C25M2	S25C	C25 C25E C25R	C25 C25E C25R	C25 C25E C25R	-
		1030	SM30C	C30 C30E4 C30M2	S30C	080A30 080M30 CC30 C30E C30R	C30 C30E C30R	C30 C30E C30R	30Г
		1035	SM35C	C35 C35E4 C35M2	S35C	C35 C35E C35R	C35 C35E C35R	C35 C35E C35R	35Г
		1039 1040	SM40C	C40 C40E4 C40M2	S40C	080M40 C40 C40E C40R	C40 C40E C40R	C40 C40E C40R	40Г
		1042 1043	SM43C	-	S43C	080A42	-	-	40Г
		1045 1046	SM43C	C45 C45E4 C45M2	S45C	C45 C45E C45R	C45 C45E C45R	C45 C45E C45R	45Г
		-	SM48C	-	S48C	080A47	-	-	45Г
		1049	SM50C	C50 C50E4 C50M2	S50C	080M50 C50 C50E C50R	C50 C50E C50R	C50 C50E C50R	50Г
		1050 1053	SM53C	-	S53C	-	-	-	50Г
		1055	SM55C	C55 C55E4 C55M2	S55C	070M55 C55 C55E C55R	C55 C55E C55R	C55 C55E C55R	-
		1059 1060	SM58C	C60 C60E4 C60M2	S58C	C60 C60E C60R	C60 C60E C60R	C60 C60E C60R	60Г
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	8615 8617(H) 8620(H) 8622(H)	SNCM220	20NiCrMo2 20NiCrMoS2	SNCM220	805A20 805M20 805A22 805M22	20NiCrMo2 20NiCrMoS2	20NCD2	-
		8637 8640	SNCM240	41CrNiMo2 41CrNiMoS2	SNCM240	-	-	-	-
		- 4320(H) - 4340 - - - - -	SNCM415 SNCM420(H) SNCM431 SNCM439 SNCM447 SNCM616 SNCM625 SNCM630 SNCM815	- - - - - - - - -	SNCM415 SNCM420(H) SNCM431 SNCM439 SNCM447 SNCM616 SNCM625 SNCM630 SNCM815	- - - - - - - - -	- - - - - - - - -	- - - - - - - - -	- 20XH2M(20XHM) - - - - - - -
	Chromium steel	-	SCr415(H)	-	SCr415(H)	-	17Cr3 17CrS3	-	15X 15XA
		5120(H)	SCr420(H)	20Cr4(H) 20CrS4	SCr420(H)	-	-	-	20X
		5130(H) 5132(H)	SCr430(H)	34Cr4 34CrS4	SCr430(H)	34Cr4 34CrS4	34Cr4 34CrS4	34Cr4 34CrS4	30X
		5135(H)	SCr435(H)	34Cr4 34CrS4 37Cr4 37CrS4	SCr435(H)	37Cr4 37CrS4	37Cr4 37CrS4	37Cr4 37CrS4	35X
		5140(H)	SCr440(H)	37Cr4 37CrS4 41Cr4 41CrS4	SCr440(H)	530M40 41Cr4 41CrS4	41Cr4 41CrS4	41Cr4 41CrS4	40X
			SCr445(H)		SCr445(H)				45X

• The above Alloy steel can supplied by domestic manufacturing

Carbon steel and alloy steel for structural use

Type		U.S.A	Korea	ISO	Japan	Great Britain	Germany	France	Russia
		AISI SAE	KS	ISO	JIS	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
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
		4130	SCM430	-	SCM430	-	-	-	30XM 30XMA
		-	SCM432	-	SCM432	-		-	-
		(4135H) 4137(H)	SCM435(H)	34CrMo4 34CrMoS4	SCM435(H)	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	35XM
		4140(H) 4142(H)	SCM440(H)	42CrMo4 42CrMoS4	SCM440(H)	708M70 709M40 42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	-
		4145(H) 4147(H)	SCM445(H)	-	SCM445(H)	-	-	-	-
	Manganese steel and Manganese chromium steel	1522(H) 1534 1541(H) 1541(H) - -	SMn420(H) SMn433(H) SMn438(H) SMn443(H) SMnC420(H) SMnC443(H)	22Mn6(H) - 36Mn6(H) 42Mn6(H) - -	SMn420(H) SMn433(H) SMn438(H) SMn443(H) SMnC420(H) SMnC443(H)	150M19 150M36 150M36 - - -	- - - -	- - - -	- 30Г2 35Г2 35Г2 40Г2 40Г2 45Г2 - -
	Aluminum chromium molybdenum steel	-	SACM645	41CrAlMo74	SACM645	-	-	-	-

• The above Alloy steel can supplied by domestic manufacturing

Tool steel

Type	U.S.A	Korea	ISO	Japan	Great Britain	Germany	France	Russia
	AISI SAE	KS	ISO	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
High speed steel	T1 T4 T5 T15 M2 M3-1 M3-2 M4 M 35 M36 - M7 M42	SKH2 SKH3 SKH4 SKH10 SKH51 SKH52 SKH53 SKH54 SKH55 SKH56 SKH57 SKH58 SKH59	HS18-0-1 - - - HS6-5-2 HS6-6-2 HS6-5-3 HS6-5-4 HS6-5-2-5 - HS10-4-3-10 HS2-9-2 HS2-9-1-8	SKH2 SKH3 SKH4 SKH10 SKH51 SKH52 SKH53 SKH54 SKH55 SKH56 SKH57 SKH58 SKH59	 BM 2 BM 35 	 S6/5/2 S6/5/2/5 S2/9/2 	 Z 85 WDCV 6-5-2-5 	
Alloy tool steel	F2 - - - L6 - - - - W2-9 1/ W2-8 1-2 - - - - - D3 D2 A2 - H21 H11 H13 H12 H10 H19 - L6	STS11 STS2 STS21 STS5 STS51 STS7 STS8 STS4 STS41 STS43 STS44 STS3 STS31 STS93 STS94 STS95 STD1 STD11 STD12 STD4 STD5 STD6 STD61 STD62 STD7 STD8 STF3 STF4	- - - - - - - - - 105V - - 105WCr1 - - - 210Cr12 - 100CrMoV5 - X30WCrV9-3 X37CrMoV5-1 X40CrMoV5-1 X35CrWMoV5 32CrMoV12-28 - - 55NiCrMoV7	SKS11 SKS2 SKS21 SKS5 SKS51 SKS7 SKS8 SKS4 SKS41 SKS43 SKS44 SKS3 SKS31 SKS93 SKS94 SKS95 SKD1 SKD11 SKD12 SKD4 SKD5 SKD6 SKD61 SKD62 SKD7 SKD8 SKT3 SKT4	 BD3 BA2 BH21 BH13 	 105WCr6 X210Cr12 X100CrMoV5 1 X30WCrV9 3 X40CrMoV5 1 55NiCrMoV6	 105WC13 Z200C12 Z100CDV5 Z30WCV9 Z40CDV5 55NCDV7	

• The above Alloy steel can supplied by domestic manufacturing

Tool steel

Type	U.S.A	Korea	ISO	Japan	Great Britain	Germany	France	Russia
	AISI SAE	KS	ISO	JIS	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Free cutting carbon steel	1110	SUM11	-	SUM11				
	1109	SUM12	-	SUM12				
	1212	SUM21	9S20	SUM21				
	1213	SUM22	11SMn28	SUM22	230M07	9SMn28	S250	
	12L13	SUM22L	11SMnPb28	SUM22L		9SMnPb28	S250Pb	
	1215	SUM23	-	SUM23	240M07	9SMn36	S 300	
	-	SUM23L	-	SUM23L				
	12L14	SUM24L	11SMnPb28	SUM24L		9SMnPb36	S300Pb	
	-	SUM25	12SMn35	SUM25				
	1117	SUM31	-	SUM31				
	-	SUM31L	-	SUM31L				
	-	SUM32	-	SUM32				
	1137	SUM41	-	SUM41				
	1141	SUM42	-	SUM42				
	1144	SUM43	44SMn28	SUM43				
High carbon chromiom	-	STB1	-	SUJ1				
	52100	STB2	B1	SUJ2	534A99	100Cr6	100Cr6	
	ASTM A 485 Grade 1	STB3	B2	SUJ3				
	-	STB4	-	SUJ4				
	-	STB5	-	SUJ5				

• The above Special speed steel can supplied by domestic manufacturing

Stainless steel

Type		U.S.A		Korea	ISO	Japan	Great Britain	Germany	France	Russia
		UNS	AISI SAE	KS	ISO	JIS	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Stainless steel	Austenitic	S20100	201	STS201	X12CrMnNiN17-7-5	SUS201	284S16	X12CrNi17-7	Z12CMN17-07Az	12X17ЭAH4
		S20200	202	STS202	X12CrMnNiN18-9-5	SUS202	301S21	X2CrNiN18-7		07X16H6
		S30100	301	STS301	X10CrNi18-8	SUS301		X12CrNi17-7	Z11CN17-08	
				STS301L	X2CrNiN18-7	SUS301L				
				STS301J1		SUS301J1	302S25			12X18H9
		S30200	302	STS302		SUS302		X10CrNiS18-9	Z12CN18-09	
		S30215	302B	STS302B	X12CrNiSi18-9-3	SUS302B	303S21			
		S30300	303	STS303	X10CrNiS18-9	SUS303	303S41		Z8CNF18-09	12X18H10E
		S30323	303Se	STS303Se		SUS303Se		X5CrNi18-10		
				STS303Cu		SUS303Cu	304S31			08X18H10
		S30400	304	STS304	X5CrNi18-9	SUS304		X2CrNi19-11	Z7CN18-09	
					X2CrNi18-9		304S11			03X18H11
		S30403	304L	STS304L	X2CrNi19-11	SUS304L		X2CrNiN18-10	Z3CN19-11	
		S30451	304N	STS304N1	X5CrNiN18-8	SUS304N1			Z6CN19-09Az	
		S30453	304LN	STS304LN	X2CrNiN18-8	SUS304LN		X5CrNi18-12	Z3CN18-10Az	
				STS304J1		SUS304J1	305S19			06X18H11
		S30500	305	STS305	X6CrNi18-12	SUS305			Z8CN18-12	
		S30908	309S	STS309S		SUS309S	310S31	X5CrNiMo27-12-2	Z10CN24-13	10X23H18
		S31008	310S	STS310S	X6CrNi25-20	SUS310S	316S31	X5CrNiMo27-13-3	Z8CN25-20	
		S31600	316	STS316	X5CrNiMo17-12-2	SUS316		X2CrNiMo17-13-2	Z7CND17-12-02	
					X3CrNiMo17-12-3		316S11	X2CrNiMo17-14-3	Z6CND18-12-03	03X17H14M3
		S31603	316L	STS316L	X2CrNiMo17-12-2	SUS316L			Z3CND17-12-02	
					X2CrNiMo17-12-3				Z3CND17-12-03	
					X2CrNiMo18-14-3					
		S31651	316N	STS316N		SUS316N	317S16	X6CrNiTi18-10		
		S31700	317	STS317		SUS317	321S31	X6CrNiNb18-10		08X18H10T
		S32100	321	STS321	X6CrNiTi18-10	SUS321	347S31		Z6CNT18-10	08X18H12
		S34700	347	STS347	X6CrNiNb18-10	SUS347		X6CrAl13	Z6CNNb18-10	
		S38400	384	STS384	X3NiCr18-16	SUS384	405S17		Z6CN18-16	
	Ferritic	S40500	405	STS405	X6CrAl13	SUS405			Z8CA12	
				STS410L		SUS410L		X6Cr17	Z3C14	
		S42900	429	STS429		SUS429	430S17	X7CrS18		12X17
		S43000	430	STS430	X6Cr17	SUS430		X6CrMo17-1	Z8C17	
		S43020	430F	STS430F	X7CrS17	SUS430F	434S17		Z8CF17	
		S43400	434	STS434	X6CrMo17-1	SUS434			Z8CD17-01	
		S44400	444	STS444	X2CrMoTi18-2	SUS444			Z3CDT18-02	
		S44627		STSXM27		SUSXM27		X10Cr13	Z1CD26-01	
	Martensitic	S40300	403	STS403		SUS403	410S21			
		S41000	410	STS410	X12Cr13	SUS410	416S21	X20Cr13	Z13C13	
		S41600	416	STS416	X12CrS13	SUS416	420S29	X20CrNi17-2	Z11CF13	20X13
		S42000	420	STS420J1	X20Cr13	SUS420J1	431S29		Z20C13	20X17H2
		S43100	431	STS431	X19CrNi16-2	SUS431			Z15CN16-02	
		S44002	440A	STS440A	X70CrMo15	SUS440A		X7CrNiAl17-7	Z70C15	
	Precipitation hardening type	S17400	S17400	STS630	X5CrNiCuNb16-4	SUS630			Z6CNU17-04	09X17H7IO
		S17700	S17700	STS631	X7CrNiAl17-7	SUS631			Z9CNA17-07	
				STS631J1		SUS631J1				

• The above Stainless steel can supplied by domestic manufacturing

Casting or forging steel

Type		U.S.A AISI SAE	Korea KS	ISO ISO	Japan JIS	Great Britain BS BS/EN	Germany DIN DIN/EN	France NF NF/EN	Russia ГОСТ
Casting Iron	Grey iron casting	No 20 B No 25 B No 30 B No 35 B No 45 B No 50 B No 55 B	GC100 GC150 GC200 GC250 GC300 GC350	100,150, 200, 250, 300, 350	FC100 FC150 FC200 FC250 FC300 FC350	 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	60-40-18 65-45-12 80-55-06 100-70-03	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	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	Type 1, 2, Type D-2, D-3A Class 1, 2	FCA- FCDA-	L-, S-	FCA- FCDA-	F1, F2, S2W, S5S	GGL-, GGG-	L-, S-	

Non-ferrous alloy

Type		U.S.A AISI SAE	Korea KS	ISO ISO	Japan JIS	Great Britain BS BS/EN	Germany DIN DIN/EN	France NF NF/EN	Russia ГОСТ
Aluminum alloy	Aluminum alloy ingots for casting	204.0 - 319.0 - - - 356.0 A356.0 355.0 242.0 514.0 - - - - -	AC1B AC2A AC2B AC3A AC4A AC4B AC4C AC4CH AC4D AC5A AC7A AC8A AC8B AC8C AC9A AC9B	Al-Cu4MgTi - - - - - Al-Si7Mg(Fe) Al-Si7Mg Al-Si5Cu1Mg Al-Cu4Ni2Mg2 - - - - - -	AC1B AC2A AC2B AC3A AC4A AC4B AC4C AC4CH AC4D AC5A AC7A AC8A AC8B AC8C AC9A AC9B	- - - LM-6 - - LM-25 - LM-16 - LM-5 LM-13 LM-26 - LM-29 -	- - - - G(GK)-AlSi9Cu3 - G(GK)-AlSi7MG - - G(GK)-AlMg5 - - - - - GD-AlSi12 (Cu)	A-U5GT - - - - - A-S7G - - A-U4NT - A-S12UNG A-S10UG A-S10UG - A-S18UNG	
	Aluminum alloy die casting	A413.0 A360.0 518.0 - A380.0 A380.0 383.0 383.0 B390.0	ALDC1 ALDC2 ALDC3 ALDC4 ALDC7 ALDC7Z ALDC8 ALDC8Z ALDC9	Al-Si12CuFe - - - Al-Si8Cu3Fe Al-Si8Cu3Fe - - -	ADC1 ADC3 ADC5 ADC6 ADC10 ADC10Z ADC12 ADC12Z ADC14	LM20 - - - - LM24 LM2 LM2 LM30	GD-AlSi10Mg GD-AlMg9 - GD-AlSi9Cu3 GD-AlSi9Cu3 - - - EN AW-5052	A-S13 A-S9G A-G6 A-G3T - - - - -	
	Aluminum alloy extruded shapes	5052 5454 5083 5086 6061 6063 - - 7075	A5052S A5454S A5083S A5086S A6061S A6063S A7003S A7N01S A7075S	- - AlMg4.5Mn0.7 - AlMg1SiCu AlMg0.7Si - - AlZn5.5MgCu	A5052S A5454S A5083S A5086S A6061S A6063S A7003S A7N01S A7075S	EN AW-5052 EN AW-5454 EN AW-5083 EN AW-5086 EN AW-6061 EN AW-6063 EN AW-7003 - EN AW-7075	EN AW-5454 EN AW-5083 EN AW-5086 EN AW-6061 EN AW-6063 EN AW-7003 - EN AW-7075 -	EN AW-5052 EN AW-5454 EN AW-5083 EN AW-5086 EN AW-6061 EN AW-6063 EN AW-7003 - EN AW-7075	

Heat resistant steel

Type		U.S.A UNS	U.S.A AISI SAE	Korea KS	ISO ISO	Japan JIS	Great Britain BS BS/EN	Germany DIN DIN/EN	France NF NF/EN	Russia ГОСТ
Heat resistant steel	Austenitic	 S63008 S63017 S30900 S31000 N08330 S66286	 309 310 N08330	STR31 STR35 STR36 STR37 STR38 STR309 STR310 STR330 STR660 STR661		SUH31 SUH35 SUH36 SUH37 SUH38 SUH309 SUH310 SUH330 SUH660 SUH661	331S42 349S52 349S54 381S34 309S24 310S24	 X53CrMnNi21-9 CrNi2520 CrAl1205	Z35CNWS14-14 Z52CMN21-09-Az Z55CMN21-09-Az Z15CN24-13 Z15CN25-20 Z12NCS35-16 Z6NCTV25-20	
	Ferritic	R30155 S40900	 409	STR21 STR409 STR409L STR446	X6CrTi12 X2CrTi12	SUH21 SUH409 SUH409L SUH446	 409S19	X6CrTi12 X45CrSi9-3	 Z6CT12 Z3CT12 Z12C25	
	Martensitic	S44600 S65007 S42200	 446	STR1 STR3 STR4 STR11 STR600 STR616		SUH1 SUH3 SUH4 SUH11 SUH600 SUH616	401S45 443S65		Z45CS9 Z40CSD10 Z80CSN20-02	

• The above Heat resistant 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 Suructure	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·°C) cal/(g·°C)
1	2.38889×10^{-4}
4.18605×10^{3}	1

Thermal conductivity

W/(m·k)	kcal/(h·m·°C)
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

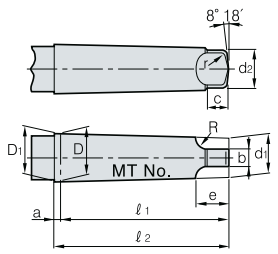
Work piece hardness calculating table

Vickers 50kgf HV	Brinell 3000kgf HB		Rockwell				Shore	Tensile strength (approximate value)
	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	HS	MPa (1)
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
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

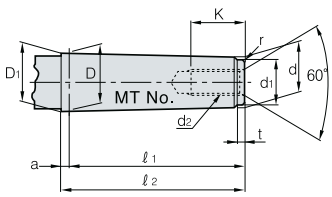
Morse taper (tang type)



(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	3.0	9.201	6.104	56.5	59.5	6.0	3.9	6.5	10.5	4	1.0
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	5.0	18.030	14.034	75.0	80.0	13.5	6.3	10.0	16.0	6	1.6
3	1/19.922	1°26′16″	23.825	5.0	24.076	19.107	94.0	99.0	18.5	7.9	13.0	20.0	7	2.0
4	1/19.254	1°29′15″	31.267	6.5	31.605	25.164	117.5	124.0	24.5	11.9	16.0	24.0	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	19.0	29.0	10	3.0
6	1/19.180	1°29′36″	63.348	8.0	63.765	52.399	210.0	218.0	51.0	19.0	27.0	40.0	13	4.0
7	1/19.231	1°29′22″	83.058	10.0	83.578	68.186	286.0	296.0	66.8	28.6	35.0	54.0	19	5.0

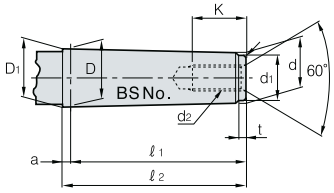
Morse taper (screw type)



(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	3.0	9.201	6.442	50.0	53	6.0	-		4	0.2
1	1/20.047	1°25′43″	12.065	3.5	12.230	9.396	53.5	57	9.0	M6	16	5	0.2
2	1/20.020	1°25′50″	17.780	5.0	18.030	14.583	64.0	69	14.0	M10	24	5	0.2
3	1/19.922	1°26′16″	23.825	5.0	24.076	19.759	81.0	86	19.0	M12	28	7	0.6
4	1/19.254	1°29′15″	31.267	6.5	31.605	25.943	102.5	109	25.0	M16	32	9	1.0
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	8.0	63.765	53.859	182.0	190	51.0	M24	50	12	4.0
7	1/19.231	1°29′22″	83.058	10.0	83.578	70.058	250.0	260	65.0	M33	80	18.5	5.0

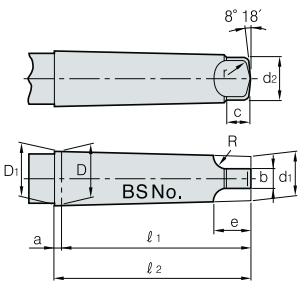
Brown sharp taper (screw type)



(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	M8(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)

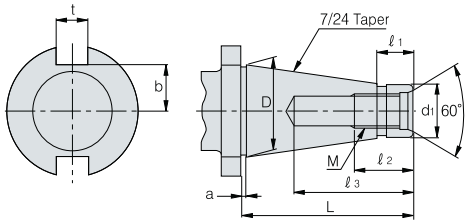


(mm)

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	27.104	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

M This is metric size. We can also provide in inch type

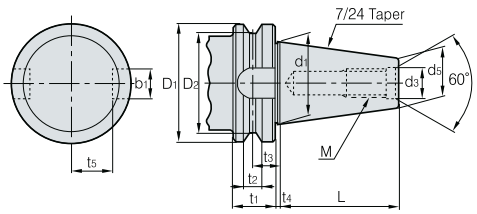
Standard taper of american milling machine



(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	6.0
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	35.0
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	60.0

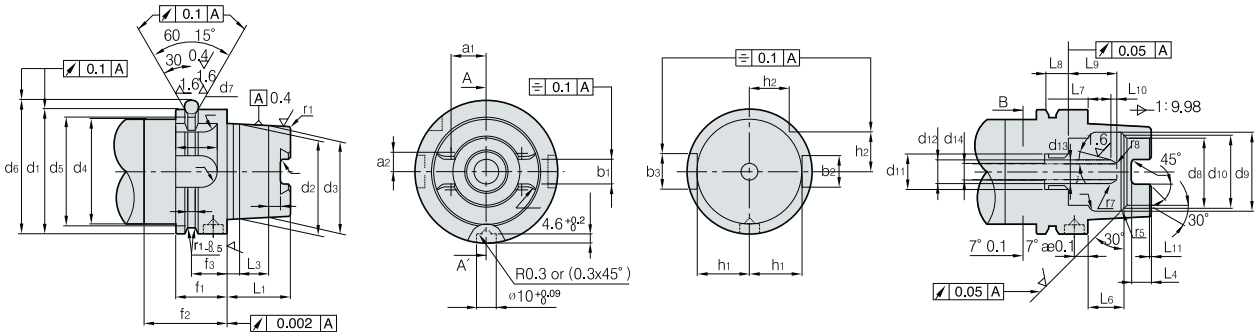
Bottle grip taper



(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)

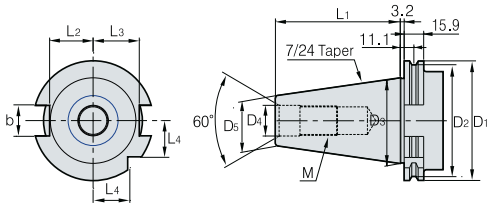
HSK No.	b1	b2	b3	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11	d12	d13	d14	a1	a2
50	10.54	12	14	50	38	36.90	42	43	59.30	7	26	32	29	M16X1	10	6.8	6.8	13.997	7.648
63	12.50	16	14	63	48	46.53	53	55	72.30	7	34	40	37	M18X1	12	8.0	8.4	17.862	9.250
100	20.00	20	14	100	75	72,80	85	92	109.75	7	53	63	58	M24X1.5	16	12.0	12.0	27.329	15.000

(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	2.0	15.5	25	5.0	11.0	7.5	4.5	14.13	10.0	10	23.0	3	1	19	1	1.5	2.38	6	0.5	1.0	2	6
63	26	42	18	3.75	28.5	20.0	32	6.3	14.7	10.0	6.0	18.13	10.0	12	24.5	3	1	21	1.2	1.5	3.00	8	0.6	1.5	3	8
100	29	45	20	3.75	44.0	31.5	50	10.0	24.0	15.0	10.0	28.56	12.5	16	28.0	3	1.5	24	2	2.0	3.00	12	1.0	1.5	3	10

M This is metric size. We can also provide in inch type

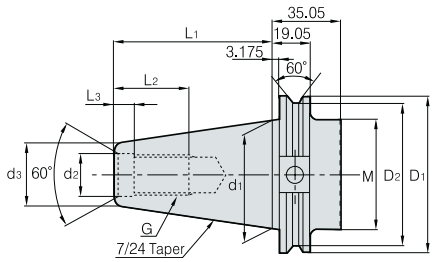
DIN 69871



(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

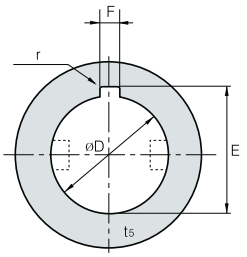
CAT shank



(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)



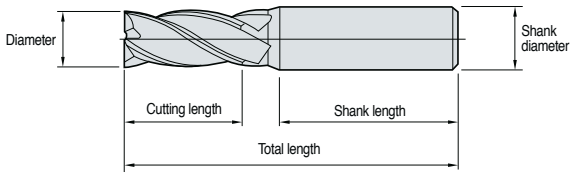
▣ Type B

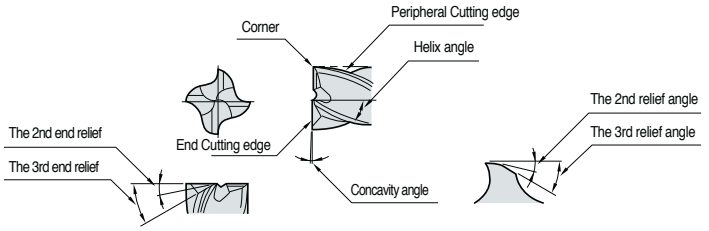
Diameter	øDH7	E	F	r
1/2	12.70 +0.018 0	14.17 +0.25 0	2.38 +0.31 +0.13	0.5
5/8	15.875 +0.018 0	17.74 +0.25 0	3.18 +0.31 +0.13	0.8
3/4	19.050 +0.021 0	20.89 +0.25 0	3.18 +0.31 +0.13	0.8
7/8	22.225 +0.021 0	24.07 +0.25 0	3.18 +0.31 +0.13	0.8
1	25.40 +0.021 0	28.04 +0.25 0	6.35 +0.31 +0.13	1.2
1 1/4	31.750 +0.025 0	35.18 +0.25 0	7.94 +0.32 +0.14	1.6
1 1/2	38.10 +0.025 0	42.32 +0.25 0	9.53 +0.89 +0.25	1.6
1 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 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 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 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

M This is metric size. We can also provide in inch type

Technical Information for Endmills

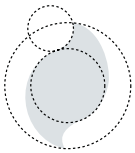
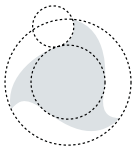
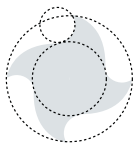
Endmill's shape and names





The comparison according to number of flute

Features of number of flute

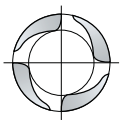
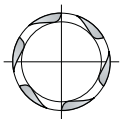
Ø10 mm	2 flutes	3 flutes	4 flutes
Shape			
Cross section	44 mm²	46 mm²	48 mm²
Ratio	56%	58%	61%
Advantages	Good chip flow	Good chip flow	High rigidity
Disadvantages	Weak rigidity	Difficult to measure external diameter	Bad chip flow
Usages	Side facing, Grooving	Side facing, Grooving	Side cutting
	Multi-functional	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

$$vc = \frac{\pi \times D \times n}{12} \qquad n = \frac{12 \times vc}{\pi \times D}$$

• Calculations of feed speed

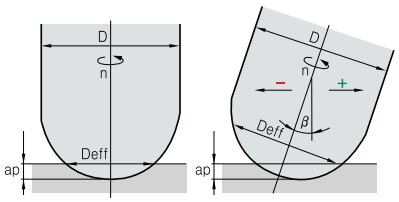
$$vf = n \times fn \text{ or } n \times fz \times z$$

$$fn = \frac{vf}{n} \qquad fz = \frac{fn}{z} \text{ or } \frac{vf}{n \times z}$$

vc: Cutting speed (sfm)
π: Circular constant (3.141592)
D: Endmill diameter (inch)
n: Revolution per minute (min⁻¹)
vf: Feed speed (ipm)
fn: Feed per revolution (ipr)
fz: Feed per flute (ipt)
z: Number of flute

Ball endmills cutting speed calculation formulas

Revolution per minute	$n = \frac{vc \times 12}{D \times \pi}$
Cutting speed	$vc = \frac{D \times \pi \times n}{12}$
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
	$D_{eff} = D \times \sin\left[\beta \pm \arccos\left(\frac{D-2ap}{D}\right)\right]$



The affection of flute length

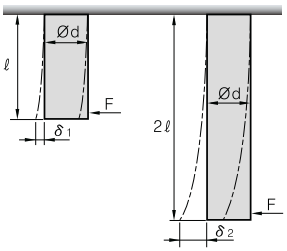
▣ Expression of aspect ratio

- 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 (sfm)															
	20	30	130	160	190	230	260	300	330	400	460	490	590	660	820	990
0.008	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
0.012	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
0.016	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
0.020	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
0.024	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
0028	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
0.032	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
0.036	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
0.040	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
0.059	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
0.079	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
0.098	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
0.118	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
0.138	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
0.158	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
0.177	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
0.197	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
0.217	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
0.236	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
0.256	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
0.276	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
0.295	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
0.315	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
0.335	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
0.354	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
0.374	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
0.394	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
0.433	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
0.472	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
0.512	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
0.551	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
0.591	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
0.630	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
0.669	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
0.709	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
0.748	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
0.787	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
0.827	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
0.866	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
0.906	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
0.945	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
0.984	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

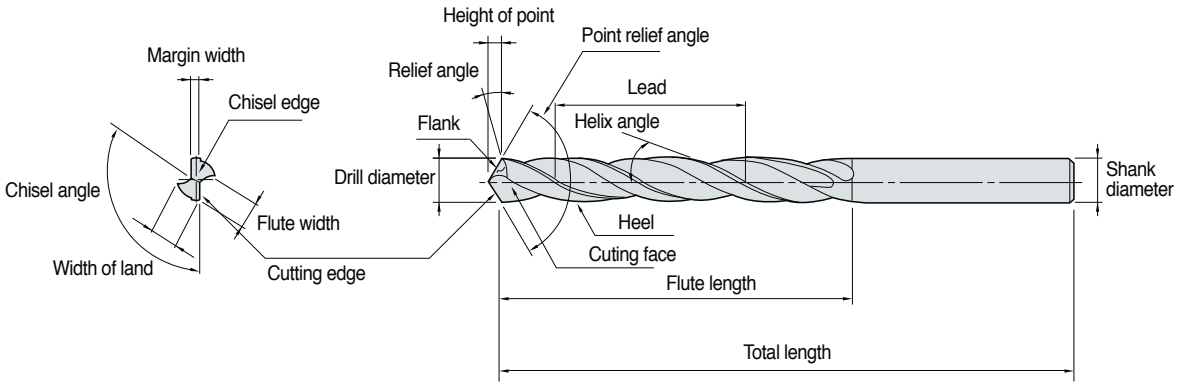
Tool failure and trouble shooting

Trouble		Causes	Solutions																	
			Cutting condition					Tool shape						Grade		etc.				
			Cutting speed	Feed	Depth of cut	Up cut·down cut	Coolant	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



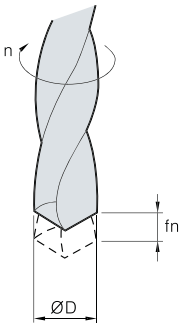
Shape and the feature of cutting

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 0.0015~0.0394 inch. 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
$vc = \frac{\pi \cdot D \cdot n}{1000}$ (sfm)	$fn = \frac{vf}{n}$ (ipr)	$\delta = \tan^{-1}\left(\frac{\pi D}{L}\right)$	$tc = \frac{ld}{n \cdot fn}$ (min)
• vc: Cutting speed (sfm) • D: Drill diameter (inch) • n: Revolution per minute (min^{-1}) • π: Circular constant (3.14)	• fn: Feed per revolution (ipr) • vf: Feed per minute (ipm) • n: Revolution per minute (min-1)	• δ: Helix angle • D: Drill diameter (inch) • L: Lead (inch) • π: Circular constant (3.14)	• tc: Machining time (min) • n: Revolution per minute (min-1) • ld: Drilling time (inch) • fn: Feed (ipr)



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 (inch)
• fn: Feed per revolution (ipr)
• 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 (ipr)
• d: Drill diameter (inch)
• 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		Improper cutting conditions Improper tool shape	⬇				●												
		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

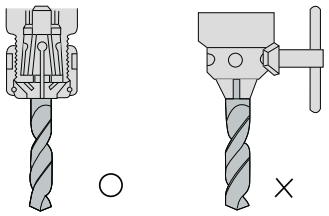
▣ Metric coarse screw threads

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

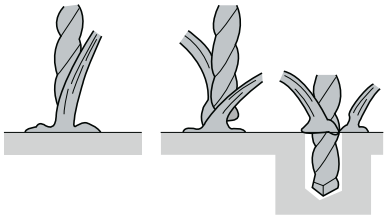
• Collect chuck is favorable Because it has strong grip power
(General drill-chuck and Keyless chuck don't have enough grip power.)



• Collect chuck • General drill-chuck

▣ Coolant supply

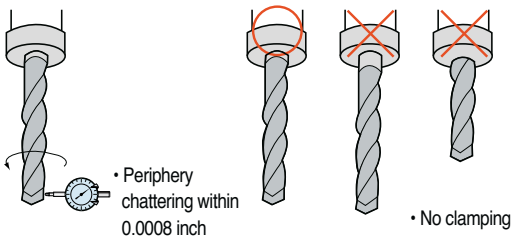
• Supply enough coolant around hole entrance
• Standard cutting oil pressure: 3~5 kg/㎠, Flux: 2~5 ℓ/min



• Supply much coolant at hole entrance

▣ Mounting drill

• When mounting drill Periphery chattering should be within 0.0008 inch
• Flute should not be clamped

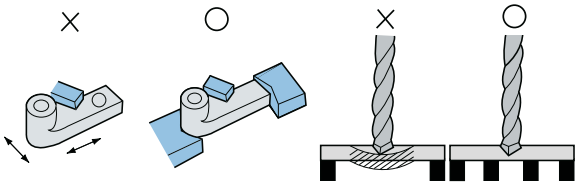


• Periphery chattering within 0.0008 inch

• 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)

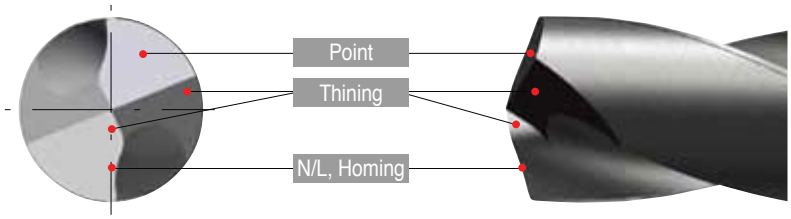
• Strong clamping is needed because bending causes chipping

Notice

1) For better drill's life, small damage and wear are favorable to be regrinding
2) Damage and wear size should be within 0.06 inch 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

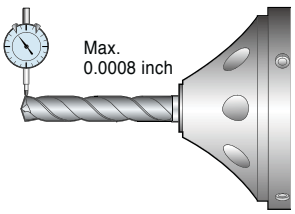
- Check the cutting edge for damage and wear If large fracture is found, remove it by rough grinding





2) Grinding operation Drills setting

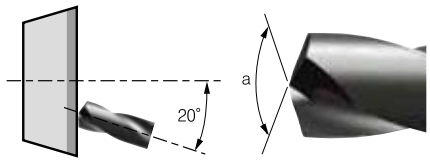
- Drill is clamped to collet chuck Chattering is kept within 0.0008 inch

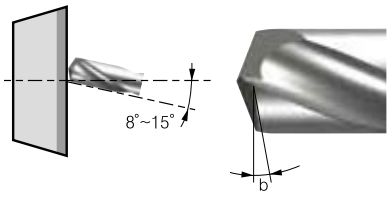


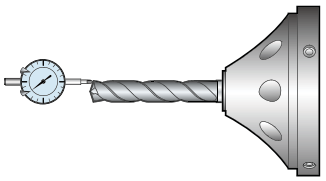
3) Grinding operation-Grinding point

- Check damage and wear at the point and remove it completely
- The difference of the lip height is kept within 0.0008 inch

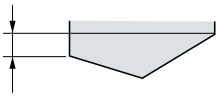
Point angle (a): 140°
Point relief angle (b)t: 8°~15°







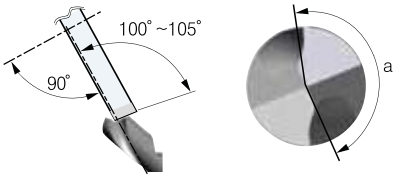
The difference of the
lip height Max. 0.0008 inch

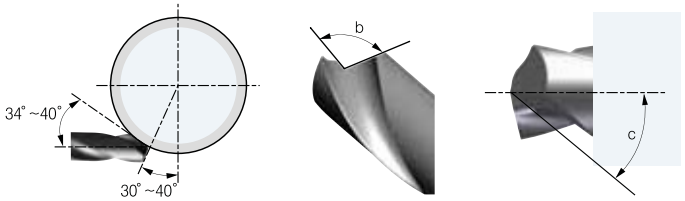


4) Grinding operation-Thinning grinding

- Considering N/L width Cutting edge length from the center of drill axis should be 0.0012~0.0032 inch 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°

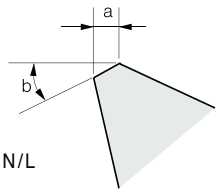


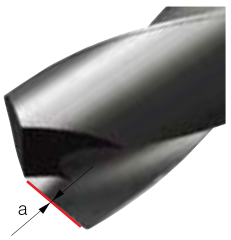


5) Grinding-N/L grinding and honing

- Using diamond chisel Grinds the width flat along point cutting edge
- After negaland operation Finishes with brush or handstone

N/L width (a): 0.0020~0.0063 inch /N/L angle (b): 24°~26°

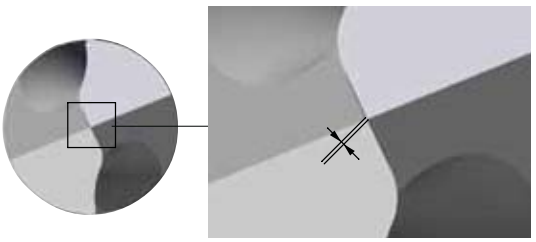




● TIP

· Making point
- Without center drill, the point width should be below 0.004 inch

· Recommended grinding condition
- Diamond wheel: 240~400 mesh
- Diamond chisel: 400~600 mesh
- Diamond hand stone: 800~1500 mesh

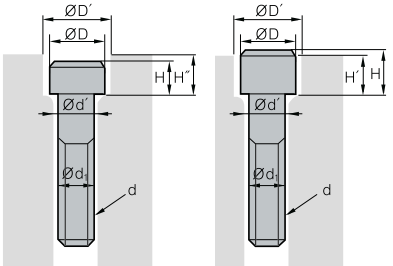


Hexagonal socket bolt (clamping screw) size

▣ Counter boring and size of bolt hole for hexagonal socket bolt

(mm)

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



M This is metric size. We can also provide in inch type

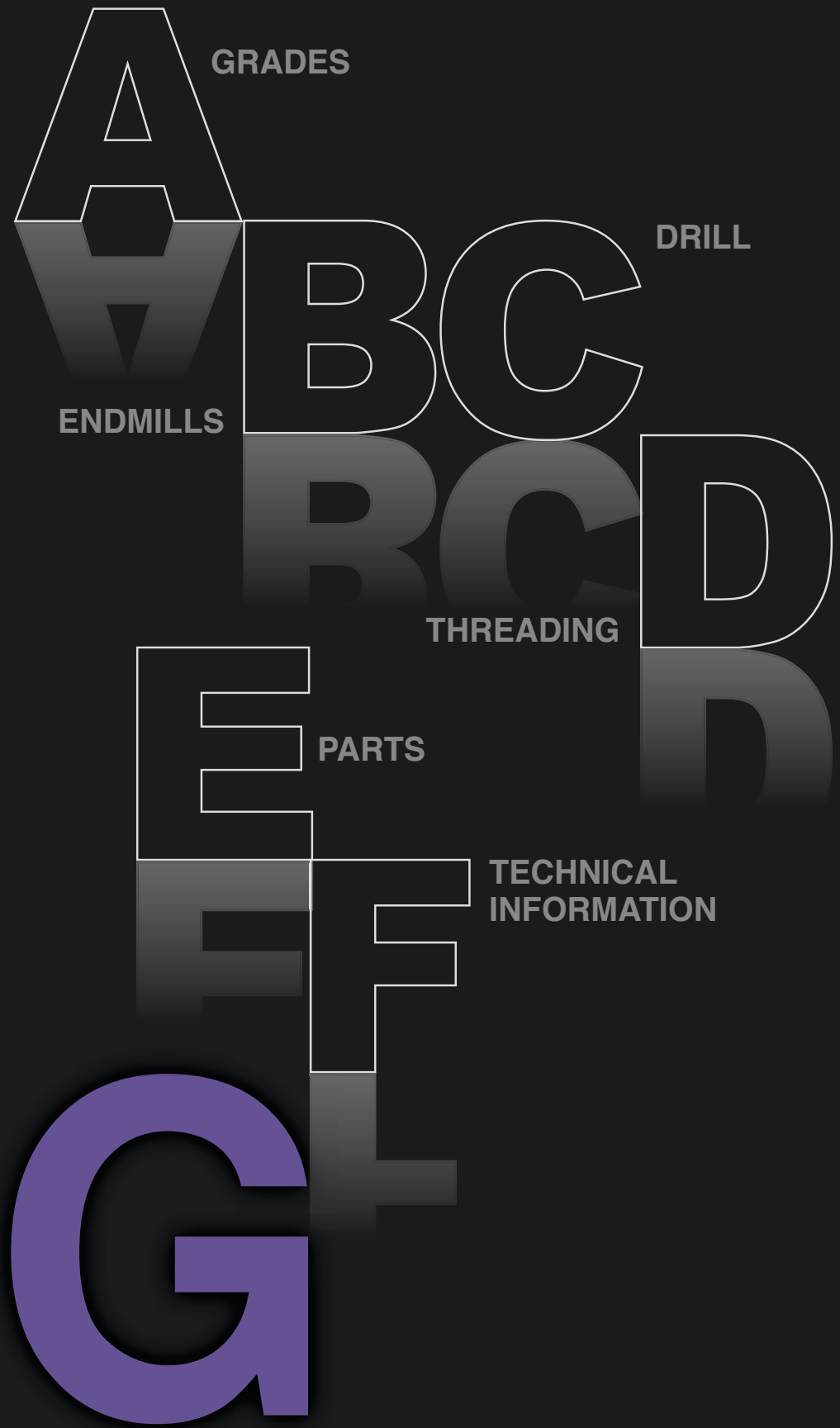
KORLOY Grades

Cat.		Grade	ISO						Turning	Multi functional tools	Threading	Milling	Endmill	Index drill	Solid drill	Brazed tools	Coating layer
			P	M	K	S	N	H									
Coating	CVD	NC3215	P10-P15						●								TiN / Al_2O_3 / MT-TiCN
	CVD	NC3225	P20-P25						●	●							TiN / Al_2O_3 / MT-TiCN
	CVD	NC3120	P20-P25						●	●							Al_2O_3 / TiC / MT-TiCN
	CVD	NC3030	P25-P35						●	●							TiN / Al_2O_3 / TiC / MT-TiCN
	PVD	PC3030T	P35-P45	M25-M35							●						TiAlN
	PVD	PC3035	P30-P40							●							★ New TiAlN film (High hardness/ Oxidation resistance)
	CVD	NC6310			K01-K10				●								TiN / Al_2O_3 / MT-TiCN
	CVD	NC6315			K10-K20				●	●							Al_2O_3 / MT-TiCN
	PVD	PC8105		M05-M15		S01-S10			●								TiAlN
	PVD	PC8110		M10-M20		S05-S15			●	●							★ New TiAlN film (High hardness/ Oxidation resistance)
	PVD	PC8115		M15-M25		S10-S20			●								TiAlN
	PVD	PC8120				S15-S25			●								★ New Al_2O_3 film / TiAlN
	CVD	NC9115		M10-M20					●								TiN / Al_2O_3 / MT-TiCN
	CVD	NC9125		M20-M30		S10-S20			●								TiN / Al_2O_3 / MT-TiCN
	CVD	NC9135		M30-M40		S15-S25			●								TiN / Al_2O_3 / MT-TiCN
	PVD	PC9030		M25-M35					●	●							TiAlN
	PVD	PC9070T		M25-M35							●						TiAlN
	PVD	PC2005						H01-H10				●					TiMeN / TiAlN
	PVD	PC2010						H05-H15				●					TiMeN / TiAlN
	PVD	PC2015						H10-H20				●					AlCrN
	PVD	PC2505						H01-H10				●					★ New TiAlN film (High hardness/ Oxidation resistance)
	PVD	PC2510						H05-H15				●	●				★ New TiAlN film (High hardness/ Oxidation resistance)
	PVD	PC210F						H10-H20				●					★ New TiAlN film (High hardness/ Oxidation resistance)
	CVD	NCM325	P30-P40									●		●			TiN / Al_2O_3 / MT-TiCN
	CVD	NCM335	P35-P45									●					TiN / Al_2O_3 / MT-TiCN
	PVD	PC3700	P25-P40									●		●			TiN / TiAlCrN
	CVD	NC5330	P30-P35	M25-M35	K15-K25				●	●		●		●			TiN / Al_2O_3 / MT-TiCN
	CVD	NCM535	P30-P40		K20-K30					●		●		●			TiN / Al_2O_3 / MT-TiCN
	CVD	NCM545	P40-P50		K30-K40							●					TiN / Al_2O_3 / MT-TiCN

Cat.		Grade	ISO						Turning	Multi functional tools	Threading	Milling	Endmill	Index drill	Solid drill	Brazed tools	Coating layer
			P	M	K	S	N	H									
Coating	PVD	PC5300	P30-P40	M20-M30	K20-K30	S15-S25			●	●	●	●		●			★ New TiAlN film (High hardness/ Oxidation resistance)
	PVD	PC5335	P30-P40	M20-M30										●			★ TiAlCrN film (Lubricative)
	PVD	PC5400	P35-P45	M30-M40	K25-K35	S25-S35			●			●					★ TiAlCrN film (Lubricative)
	PVD	PC6510			K05-K15							●		●			TiN / TiAlN
	PVD	PC9530		M25-M35								●					TiAlN
	PVD	PC9540		M35-M45		S30-S40						●					Al_2O_3 / TiAlN
Cermet	PVD	CC1500	P10-P20		K05-K15				●								★ New TiAlN film (High hardness/ Oxidation resistance)
	PVD	CC2500	P20-P30		K10-K15				●								★ New TiAlN film (High hardness/ Oxidation resistance)
		CN1500	P10-P20		K10-K20				●								
		CN2500	P15-P30		K15-K25				●								
		CN30	P25-P35									●					
Uncoated		ST10	P10-P15								●					●	
		ST20	P15-P20							●						●	
		ST30A	P25-P35							●		●					
		U20		M25-M30												●	
		H01			K05-K10	S01-S10	N10-N20	H05-H10	●	●		●	●	●		●	
		H05			K10-K15	S05-S15	N15-N25		●			●					
		G10				K15-K20			●			●				●	
Coating	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

Cat.		Grade	ISO						Turning	Multi functional tools	Threading	Milling	Endmill	Index drill	Solid drill	Brazed tools	Coating layer
			P	M	K	S	N	H									
Coating	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
Uncoated		H01					N10-N20						●				
		H05S					N10-N20						●				
		FCC			N15-N35								●				
		FG2	P05-P25				N05-N25								●		
		FA1	P05-P25				N05-N25								●		
		DBN500			K05-K15				●								
		DBN700A			K01-K10				●								
		DB7000	S01-S10						●								
		DB1000						H01-H10	●								
		DB2000						H05-H15	●								
		DBNX20						H15-H25	●								
		DBN250						H15-H25	●								
		DBN400						H15-H25	●								
	PVD	DNC100						H01-H10	●								★ New TiAlN film (High hardness)
	PVD	DNC250						H05-H15	●								TiN TiAlN
	PVD	DNC350						H25-H35	●								★ New TiAlN film (High hardness)
	PVD	DNC400						H15-H25	●								TiN TiAlN
		DP90					N01-N20					●					
		DP150					N05-N25					●					
		DP200					N10-N30					●					
DIA	CVD	ND2100					N2.5-N7.5		●			●	●		●		Dia Coating
	CVD	ND3000					N01-N05		●			●	●				Dia Coating
	PVD	PD1005					N05-N10		●			●	●				
	PVD	PD1010					N10-N15		●			●	●				

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W

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A

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B

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C

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D

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E

ELBEN Type	T Endmill	**B311**
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E

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ESRR714	H-Star Endmill	**B97**
ESTNB20	H-Star Endmill	**B138**
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ESXE704	H-Star Endmill	**B59**
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H

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I

IMES-ICORE Type	T Endmill	**B297**
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ISO Metric	Helical flutes with radial coolant	**D14**
ISO Metric	Helical flutes with External coolant	**D15**
ISO Metric	Straight flutes with External coolant	**D19**
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ISO Metric	Drill, Chamfer & Thread with thru-hole coolant	**D24**
ISO Metric	Deep thread - Long Tools	**D24**
ISO Metric	Miniature thread mill	**D26**
ISO Metric	Miniature thread mill for Dental Implants	**D31**
ISO Metric	Miniature thread mill for hard materials (~HRC62)	**D32**

K

KCR	Cermet Reamer	**C80**
KGDS	Gun Drill	**C75**
KGDT	Gun Drill	**C76**

L

LEZIRTH Type	T Endmill	**B302**

G Index by designation

M

MANIX Type	T Endmill	**B307**
MJ	Miniature thread mill	**D30**
MLD-□□ (P/K/N)	Mach Long Solid Drill Plus	**C29**
MSDP-5C	Mach Solid Drill Plus for CFRP	**C20**
MSDPH-□ (P/M/K/N)	Mach Solid Drill Plus	**C6**
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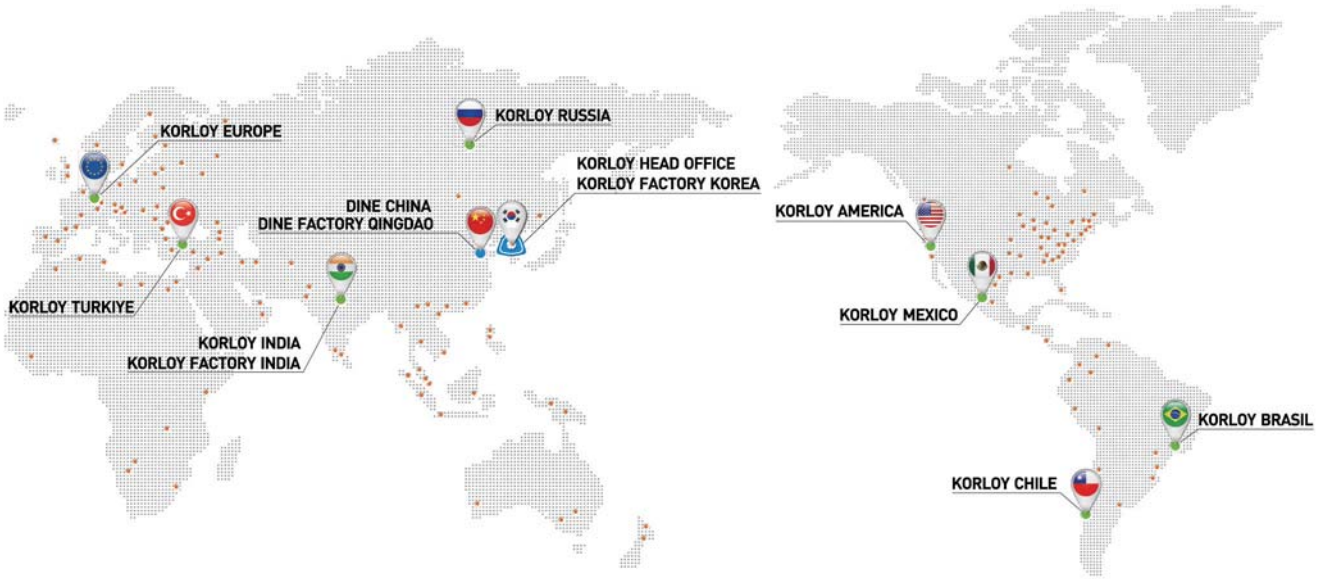
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