XCUT TECHNOLOGIES

Master Catalogue 2025



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XCUT



XCUT TECHNOLOGIES

XCUT is the amalgamation of 40 years of knowledge & experience in the cutting tool industry, with the desire of bringing the best possible cost effective & productive solutions for machining to our customer. provides the finest quality cutting tools for various industries to help them manufacture even more superior quality & products.

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TURNING



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NOTES

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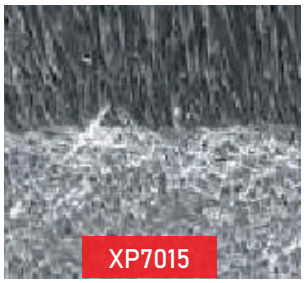
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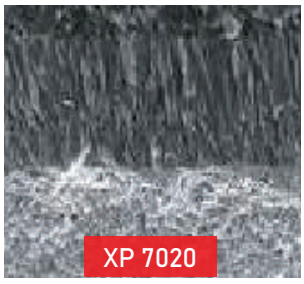
GRADE INFORMATION



P05-P20

Special layer of TiC (N) coating to increase the temperature resistance of the insert.
Using special grade sintering technology to increase the wear resistance and balance the hardness of the insert.
Extremely effective for mild and Alloy Steels.
Special carbide grade developed to sustain wear resistance.
Helps the insert to perform at high speeds in unstable conditions.

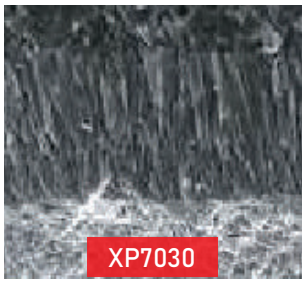




P10-P25

TIALN over TiCN layer with antiwear material abrassion performance lead to the best wear resistance of the face of clearance angle.
Using gradient sintering technology, we increase the impact resistance of insert, so as to improve the ability to resist damage of the insert.
First choice for bearing and preturned/soft automotive steels at high parameters.

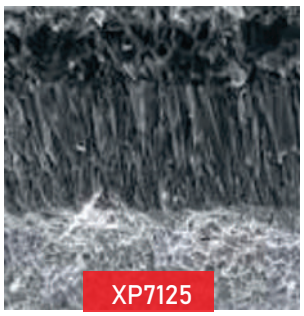




P15-P35

Special structure of Al2O3 settled layer has the best thermal barrier performance, high speed dry cutting, ensure resistance to plastic deformation.
Special layer with antiwear material leads to the best wear resistance of the face of clearance angle.
Special sintering technology, improves the wear resistance of the insert.
First choice for Automotive steels, EN materials and cold forged applications of 16MnCr5 & 20 MnCr5.

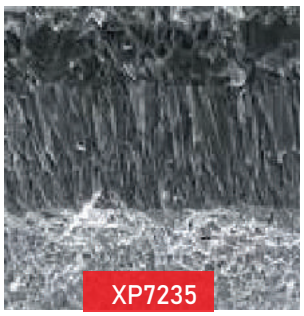




P10-P30 | K10-K20

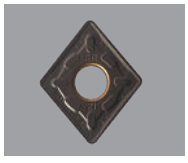
Special structure of Al2O3 settled layer has the best thermal barrier performance, high speed dry cutting, ensuring resistance to plastic deformation.
TiCN layer with anti wear material abrassion performance lead to the best wear resistance of the face of clearance angle.
Carbide with special structure improves the hardness & strengthened the high temperature resistance performance of insert.
First choice for general and production steel applications with higher feeds and dry machining.



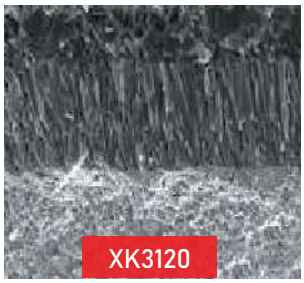


P20-P40

Special structure of Al2O3 settled layer along with TiCN coating which has the best thermal barrier performance, high speed dry cutting, ensure resistance to plastic deformation along with added stability.
TiCN layer with antiwear material abrassion performance lead to the best wear resistant of the face of clearance angle.
Using gradient sintering technology, and increase the impact resistance & wear resistance of insert, so as to improve the ability to resist damage of the insert.
Best suited for heavy roughing and interrupted applications at high feeds in unstable conditions.

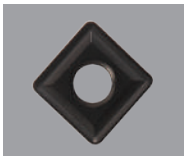


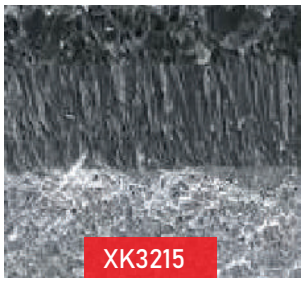
GRADE INFORMATION



K10-K20

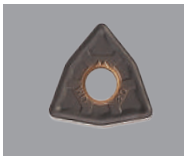
Special Substrate designed for the perfect combination of Wear & Impact resistance.
This special material combined with Al2O3 coating enables high performance at high speed against any competitor

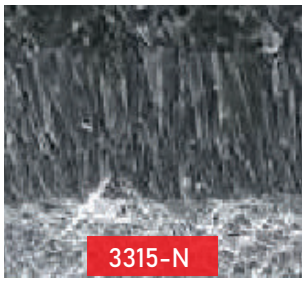




K10-K20 | P05-P15

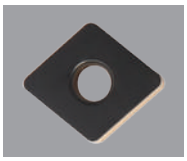
Thick Al2O3 MT-CVD coating combined with strong impact resistance matrix keeps the insert stable at high temperature.
TiCN layer with antiwear material abrassion performance lead to the best wear resistant of the face of clearance angle.
High wear resistance substrate provides added stability to machine Gray & SG Iron.
Can also be used to machine steel at high cutting speed in continuous cuts.

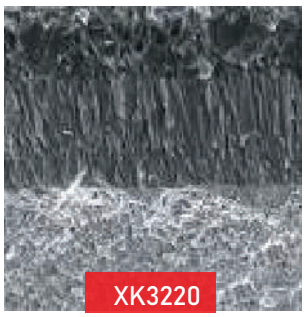




K10-K25

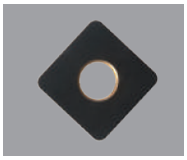
Special structure of Al2O3settled layer has the best thermal barrier performance, high speed dry cutting, ensure resistance to plastic deformation.
Special layer with antiwear material leads to the best wear resistance of the face of clearance angle.
Special sintering technology, improves the wear resistance of the insert.
Carbide with special crystalline structure improves the temperature resistant performance of insert.



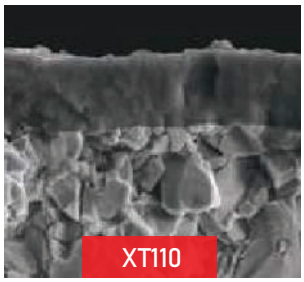


K15-K30

Thick Al2O3 over TiCN coating combined with strong impact resistance matrix keeps the insert stable at high temperature.
TiCN layer with anitwear material abrassion performance lead to the best wear resistant of the face of clearance angle.
High wear resistance substrate provides added stability to machine Gray & Ductile Cast Iron.

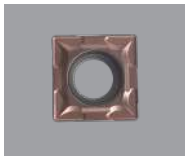


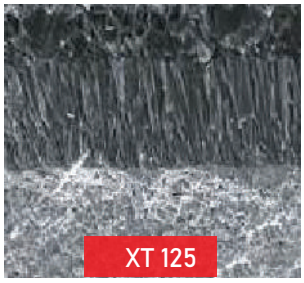
GRADE INFORMATION



P10-P25 | M05-M15 | K10-K25

Special coating designed to be able to cater most materials under different machining environments.
Enhanced performance under low end machining conditions.
Substrate and PVD coating designed to improve strength & wear resistance

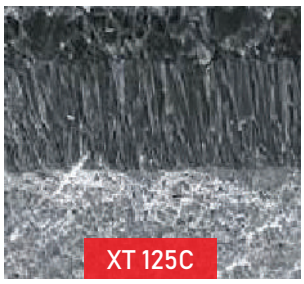




P10-P30 | M10-M25 | K10-K20

2-4 µ ALCrN+AlCrSiN PVD Coated, Combinating with fine particles substrates with High-Toughness, suitable for all materials in light & medium load turning, stainless steel & High-Temprature high hardness alloy in finishing, semi-finishing.

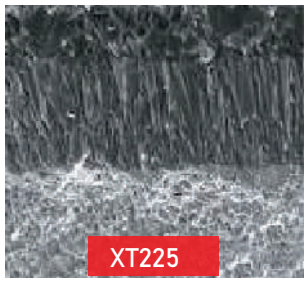




P15-P30 | M15-M30

High adhesion strength to the substrate improves stable tool life.
Due to the excellent heat resistance and oxidation resistance, the XT125-C prevents a failure of tool life even when machining hardened work piece.
Due to the cemented carbide with high wear resistance and fracture resistance, the XT125-C provides stable machining operation.

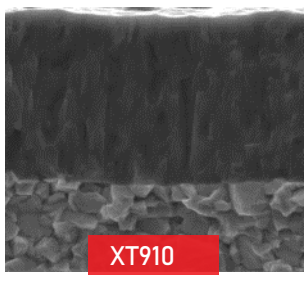




P15-P30 | M15-M30 | S05-S15

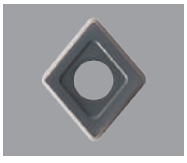
2-4 µ ALCrN+AlCrSIN PVD Coated, Combinating with ultra fine Co particles substrates with High-Toughness.
Suitable for all materials in light & medium load turning.
Suitable stainless steel & High-Temprature high hardness alloy in finishing, semi finishing.



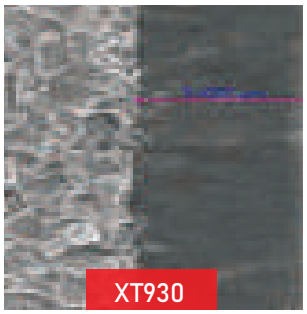


P15-P30 | M10-M20 | K10-K30

Universal Grade for mild cutting conditions
Recommended for mild steel, and cast iron boring aplication
Harder substrate and special PVD coating for excellent wear resistance



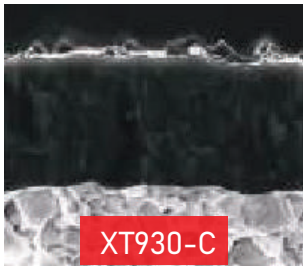
GRADE INFORMATION



P15-P30 | M15-M30 | S05-S15

Ultra-fine grain matrix, nano-multilayer coating of AlTiMeN with good wear resistance and oxidation resistance.
Stable, long-life turning of steel and stainless steel.
Can also work on softer super alloys.

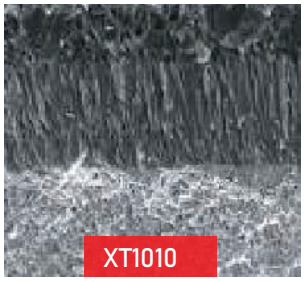




P15-P30 | M15-M30 | S05-S15

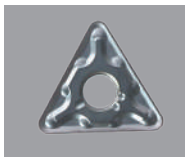
Ultra fine grain matrix, newly upgraded nano composite coating with high heat resistance and high toughness.
Excellent grades for forging steel and stainless steel turning.
Suitable for general milling of cast iron, steel, and stainless steel, with better wear resistance.

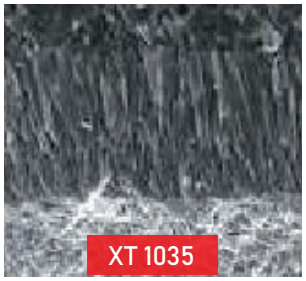




M10-M25 | S05-S20 | H05-H15

The ultra-fine grain matrix strengthened by the bonding phase has excellent heat resistance and wear resistance.
The Special TiAlN nano-coating helps prevent chipping off.
It is extremely suited for finishing/semi-finishing turning of heat-resistant alloys and hardened materials, and general-purpose milling.



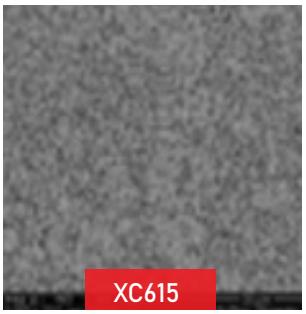


M20-M35 | S15-S35

Excellent high-temperature wear resistance and toughness with nano multilayer coating applied.
High lubrication nano coating prevents rapid wear of cutting edges.
Best suited for machining tough stainless steels, inconels and superalloys in difficult conditions.

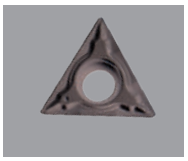


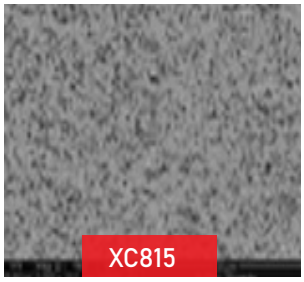
GRADE INFORMATION



P05-P20 | K05-K20

High hardness, good strength and toughness, Fine and uniform hard phase organization, can be processed into a very sharp edge, good wear resistance, not easy to wear during use.
It is suitable for high-speed finishing and semi-finishing of carbon steel, alloy steel, cast iron and stainless steel materials within 45HRC hardness, and the surface of the machined workpiece can reach the mirror surface.

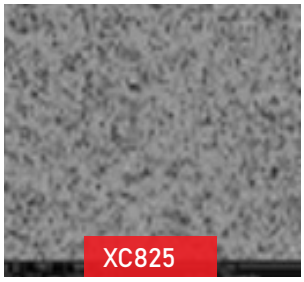




P05-P30 | K05-K30

XC815 is AlCrN Coating, enabling good strength and toughness, moderate hardness, high temperature red hardness and chemical stability, but also has good impact resistance, can be applied to part of the intermitttent processing conditions.
It is suitable for Finishing and semi-Finishing of carbon steel, low alloy steel, cast iron and bearing steel with hardness less than 40HRC, especially for high-speed cutting and large margin machining.

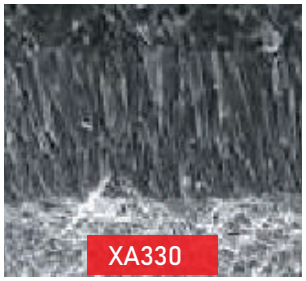




P05-P30 | K05-K30

High hardness, good strength and toughness, Fine and uniform hard phase organization, can be processed into a very sharp edge, good wear resistance, not easy to wear during use.
TiCN layer with antiwear material abrassion performance lead to the best wear resistant of the face of clearance angle.





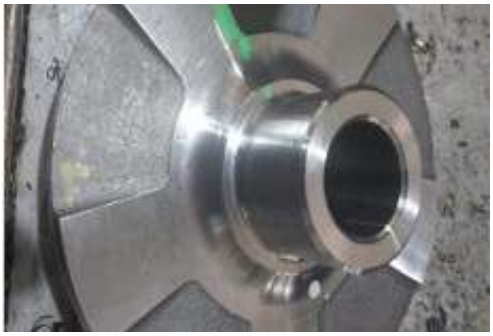
N10-N20 (Si<13%)

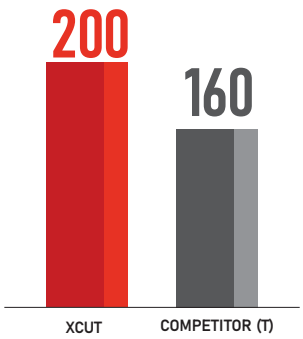
Polished rake surface for smoother flow of chips.
Positive & sharp cutting edge for enhanced tooling performance.
excellent machining & chip flow, reduced built-up edge



CASE STUDIES

XP7235		
PRODUCT DESCRIPTION	CNMG120416GM-XP7235	
MATERIAL & HARDNESS	Forged steel (25-30 HRC)	
PARAMETERS	COMPETITOR (T)	XCUT
Depth of Cut	3mm	3mm
Vc: m/min	320	270
Fz: mm./tooth	0.35	0.42
Life Increased by 25%		

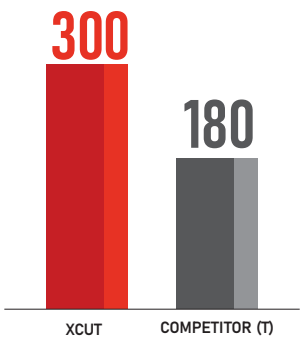




TOOL LIFE (NO. OF COMPONENTS)

XT1010		
PRODUCT DESCRIPTION	TNMG160408SM-XT1010	
MATERIAL & HARDNESS	HARDENED STEEL & 60HRC	
PARAMETERS	COMPETITOR (T)	XCUT
Depth of Cut	0.2mm	0.2mm
Vc: m/min	70	70
Fz: mm./tooth	0.11	0.12
Life Increased by 60%		





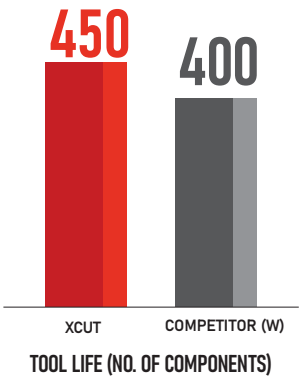
TOOL LIFE (NO. OF COMPONENTS)

TURNING

CASE STUDIES

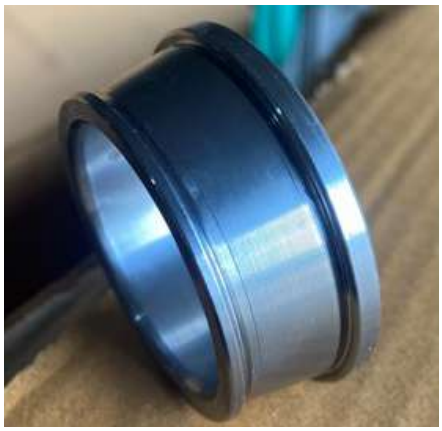
XT930-C		
PRODUCT DESCRIPTION	CNMG120412CR-XT930-C	
MATERIAL & HARDNESS	20MNCR5- (CROWN WHEEL AND PINION)	
PARAMETERS	COMPETITOR (W)	XCUT
Depth of Cut	1.5mm	1.5mm
Vc: m/min	200	220
Fz: mm./tooth	0.22	0.25
Life Increased by 11%		

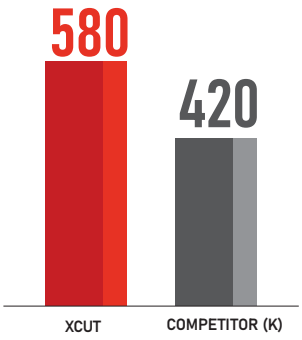




TOOL LIFE (NO. OF COMPONENTS)

ISP-XP7020		
PRODUCT DESCRIPTION	TNMG 160412 ISP XP7020	
MATERIAL & HARDNESS	BEARING STEEL 52100	
PARAMETERS	COMPETITOR (K)	XCUT
Depth of Cut	2mm	2mm
Vc: m/min	300	300
Fz: mm./tooth	0.28	0.28
Tool Life Increased by 38%		





TOOL LIFE (NO. OF COMPONENTS)

GRADE CHART

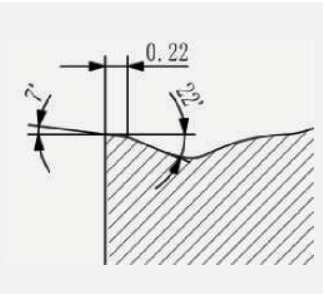
MATERIAL	C.V.D					PVD						CERMET	UNC
P05	XP7015											XC615/XC815/XC825	XA330
P10		XP7020		XP7125			XT110	XT125					
P15			XP7030						XT910	XT930/ XT930-C			
P20					XP7235								
P25													
P30													
P35													
P40													
M05							XT110						
M10						XT1010		XT125		XT910			
M15									XT225/ XT930		XT930-C		
M20							XT1035						
M25													
M30													
M35													
M40													
K05												XC615/XC815/XC825	
K10	XK3120	XK3215	XK3315-N				XT110	XT125		XT910			
K15				XK3220					XT125-C				
K20													
K25													
K30													
S05						XT1010			XT225/ XT930	XT930-C			
S10													
S15							XT1035						
S20													
S25													
S30													
S35													
H10													
H10						XT1010							
H15													
H20													
H25													
N10													
N20													

APPLICABLE CHIPBREAKERS

CHIPBREAKERS FOR NEGATIVE INSERTS (CVD-STEEL)

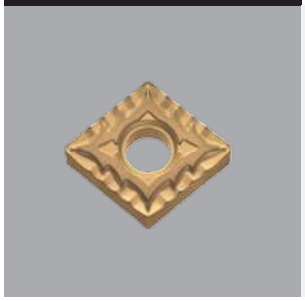
CR

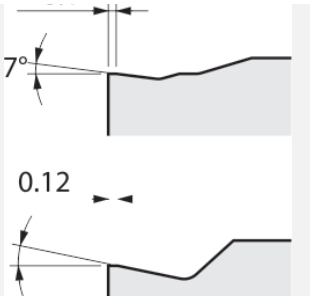




- General Purpose chip-breaker, recommended mainly for Semi Finishing
- Provides excellent cutting edge sharpness due to the positive land geometry.
- Works extremely well for Steel and Stainless Steel applications.

CQ

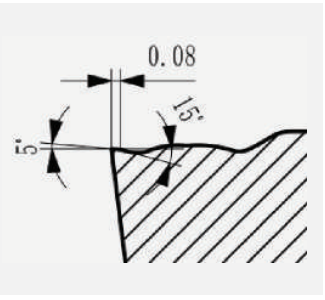




- Semi Finishing chipbreaker
- Good chip control for varied Ap such as copying
- Very suitable for face turning

GF

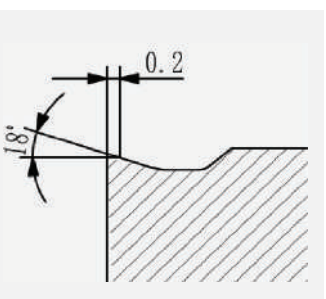




- The double positive rake angle design ensures the sharpness of the insert and low cutting resistance.
- The double chip breaker design broadens the chip breaking range.
- Suitable for finishing of steel, stainless steel and cast iron

GM



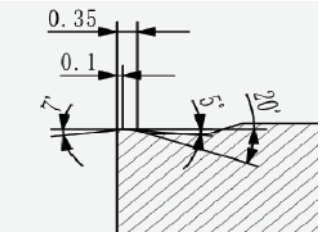


- On the basis of ensuring the sharpness of the cutting edge, the strength of the cutting edge is enhanced.
- General Machining Chipbreaker Suitable for semi-finishing of steel. stainless steel and cast iron.

CHIPBREAKERS FOR NEGATIVE INSERTS (CVD-STEEL)

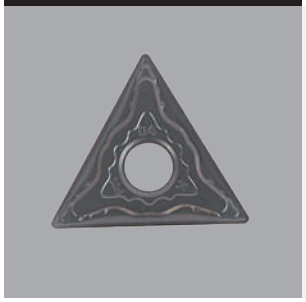
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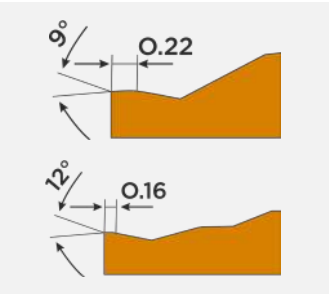




- Negative chamfer design, suitable for large depth of cut and larger feed parameters, to obtain high edge strength and high metal removal rate.
- Effective for heavy interruptions as well

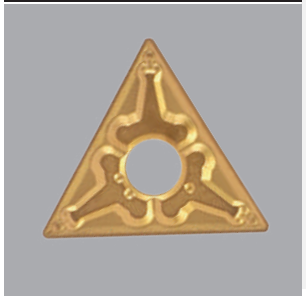
PK

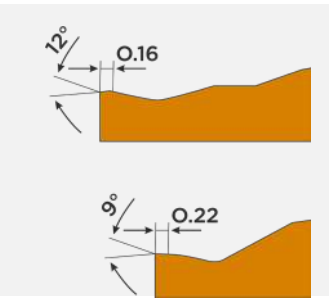




- Double sided chipbreaker combining sharpness with strength
- Suitable for ID roughing and OD semi finishing of steel, stainless steel

TM



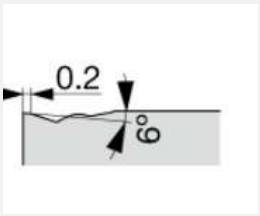


- Preferred chip-breaker for semi-finishing machining of steel to ensure efficient and stable processing.
- Universal chip-breaker with a wide chip-breaking effect and high versatility designed near the tip of the tool, featuring a distinctive shape bulge and front angle.
- This allows the chip-breaker to maintain sharp cutting performance and low cutting force

CHIPBREAKERS FOR NEGATIVE INSERTS (CVD-STEEL)

PR

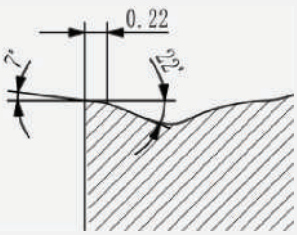




- Strong chip breaking ability , highly suitable for roughing processing of different steels .
- Can take Ap upto 3mm depending on the insert.

VF

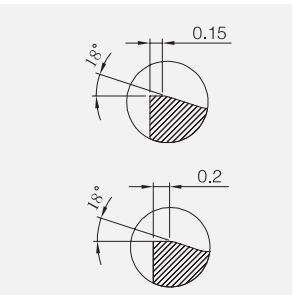




- Good chip control for varied Ap such as copying and undercutting
- Extremely suitable for ball pin turning

XM



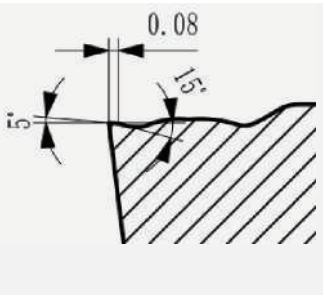


- Medium processing groove type, suitable for steel, forged steel, -EN Series.
- Wide edge and wide chip flute design, high edge strength, good cutting performance, can be used for high feed cutting under unstable conditions.

CHIPBREAKERS FOR POSITIVE INSERTS (CVD-STEEL)

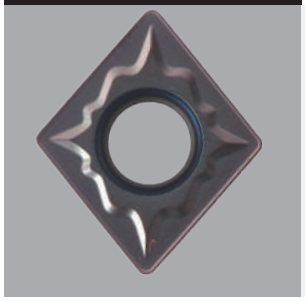
GF

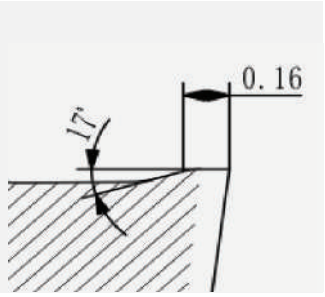




- The double positive rake angle design ensures the sharpness of the insert and low cutting resistance.
- The double chip breaker design broadens the chip breaking range.
- Suitable for finishing of steel, stainless steel and cast iron

GM

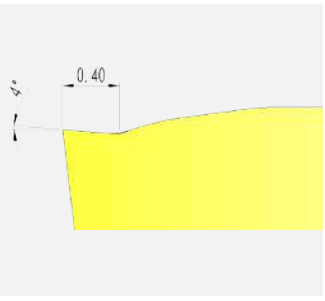




- On the basis of ensuring the sharpness of the cutting edge, the strength of the cutting edge is enhanced.
- General Machining Chipbreaker Suitable for semi - finishing of steel stainless steel and cast iron.

HF

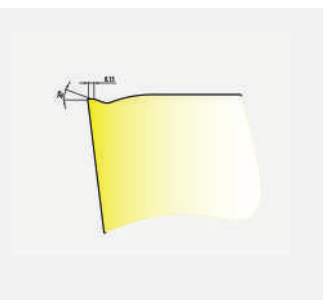




- Chipbreaker for finishing with wide application With M-level tolerance inserts,
- It is suitable for internal and external finishing of various materials such as steel, stainless steel and cast iron.

HM

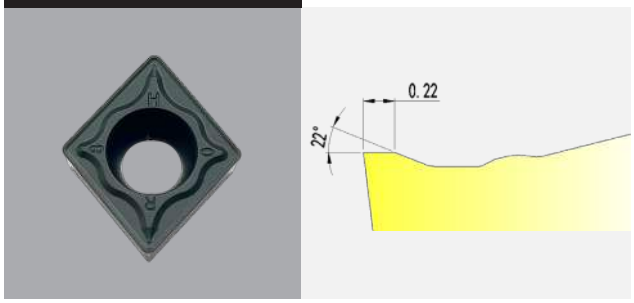




- Chipbreaker for semi-finishing with wide application of positive inserts with M-level tolerance,
- It is suitable for internal and external semi - finishing of materials like steel, stainless steel, cast iron, etc

CHIPBREAKERS FOR POSITIVE INSERTS (CVD-STEEL)

HR

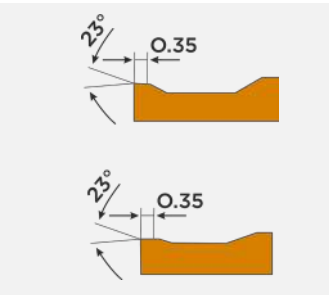


- General chipbreaker for positive inserts for roughing with M-level tolerance,
- It is suitable for both internal and external roughing of materials such as steel, stainless steel, cast iron, etc.

CHIPBREAKERS FOR NEGATIVE INSERTS (CVD-CAST IRON)

GH

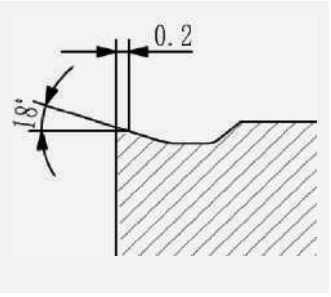




- K type double sided chipbreaker, ensures lighter load on heavy roughing,
- Can achieve both high level metal removal rate and good life on interrupted cutting of Cast Irons also

GM

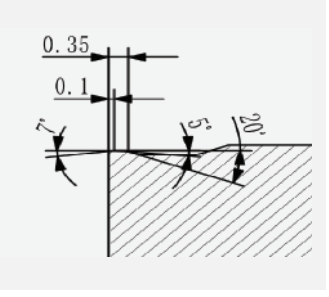




- On the basis of ensuring the sharpness of the cutting edge, the strength of the cutting edge is enhanced.
- General Machining Chipbreaker Suitable for semi-finishing of steel stainless steel and cast iron.

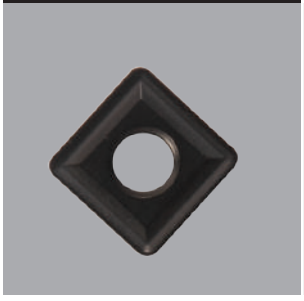
GR

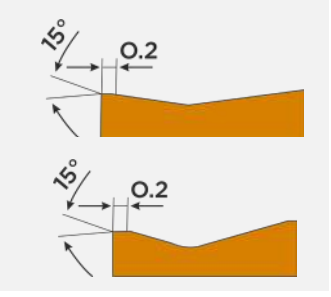




- Negative chamfer design, suitable for large depth of cut and larger feed parameters, to obtain high edge strength and high metal removal rate.
- Effective for heavy interruptions as well

UC



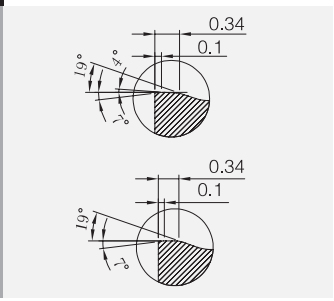


- Double Sided Chipbreaker, good edge strength,
- Recommend for semi finishing of Grey and Ductile Cast Iron

CHIPBREAKERS FOR NEGATIVE INSERTS (MULTI-GRADE PVD)

AR

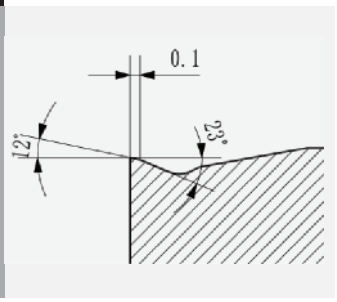




- The cutting edge has high strength and performs a long service life in roughing and harsh working.

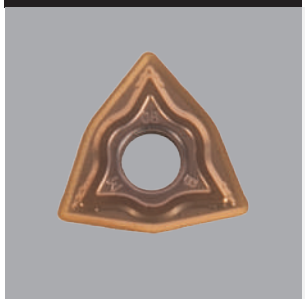
BF

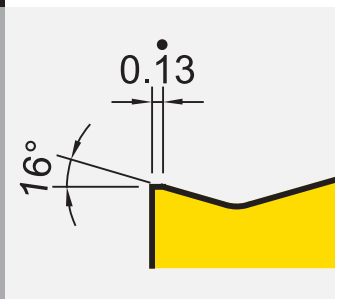




- M-level double-sided chipbreaker, small edge width + double positive rake angle, sharp blade edge.
- Low cutting resistance, special edge inclination design, can obtain high-quality machined surface.

BM

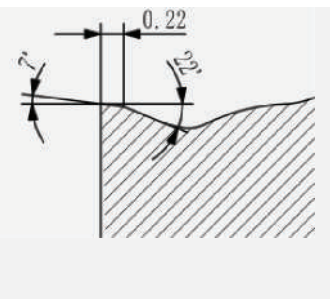




- M-level double-sided chipbreaker, double positive rake angle.
- Higher edge strength than BF.
- Widely application for the general processing of stainless steel.

CR



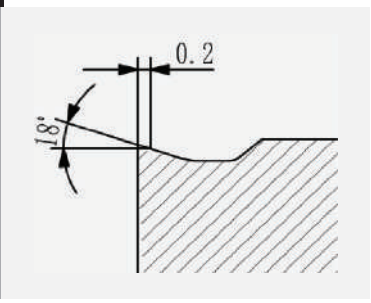


- General Purpose chip-breaker, recommended mainly for Semi - Finishing
- Provides excellent cutting edge sharpness due to the positive land geometry.
- Works extremely well for Steel and Stainless Steel applications.

CHIPBREAKERS FOR NEGATIVE INSERTS (MULTI-GRADE PVD)

GM

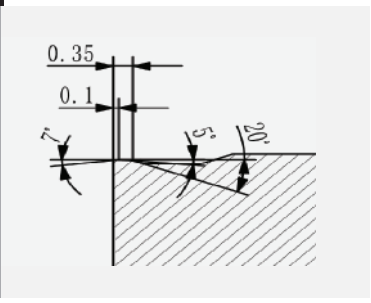




- On the basis of ensuring the sharpness of the cutting edge, the strength of the cutting edge is enhanced.
- General Machining Chipbreaker Suitable for semi-finishing of steel stainless steel and cast iron.

GR

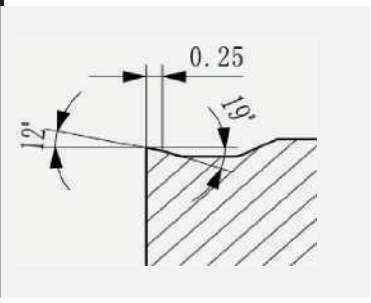




- Negative chamfer design, suitable for large depth of cut and larger feed parameters, to obtain high edge strength and high metal removal rate.
- Effective for heavy interruptions as well.

MS

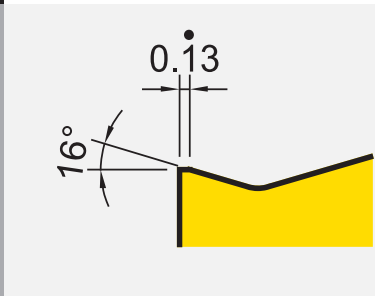




- Superior cutting edge sharpness and strength achieved by a large positive land
- Extra strength of cutting edge inhibits damage from chipping and improves impact resistance

NN



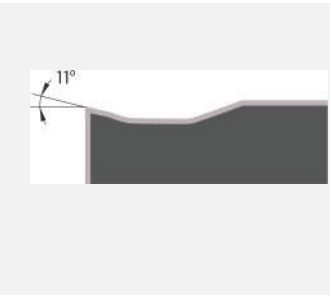


- All purpose chipbreaker with combination of sharpness and strength suitable for semi finish, especially on difficult to cut materials

CHIPBREAKERS FOR NEGATIVE INSERTS (MULTI-GRADE PVD)

NM

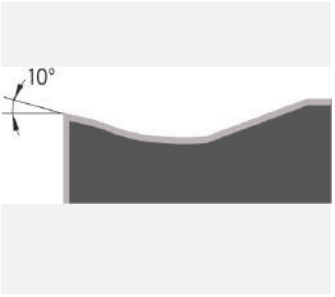




- Shape designed for stable chip processing
- Optimised chipbreaker for ISO S, M machining
- Sharp edges prevents welding
- Variable land helps in delaying crater wear

NR

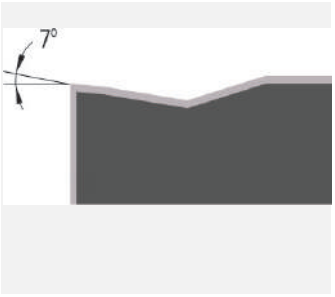




- Optimised geometry for S Series semi roughing
- Applies sharp cutting edge to reduce the load and ensure good finish
- Stable processing possible with wide land

NR1

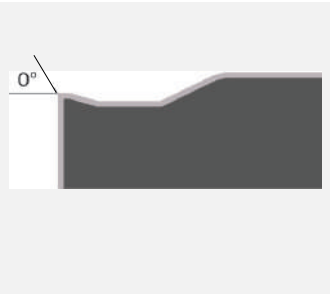




- Designed for heavy roughing of S, M type materials
- Reinforced edge helps for managing high load
- Large land ensures in stable machining and avoiding early chip off

NR2



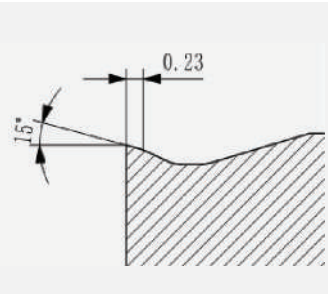


- Chipbreaker for roughing of larger inserts
- Wide chip pocket enables high speed roughing
- High DoC possible due to reinforced cutting edge

CHIPBREAKERS FOR NEGATIVE INSERTS (MULTI-GRADE PVD)

SM

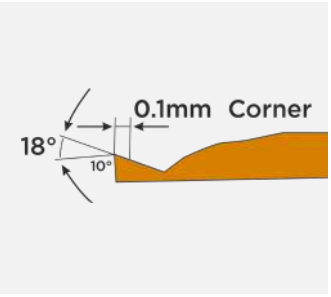




- M-level double-sided chipbreaker.
- Adopting the double positive rake angle combines the sharpness and strength of the insert.
- The cutting resistance is small, and the wider chipbreaker ensures enough space for chip deformation, reducing groove wear.

XS



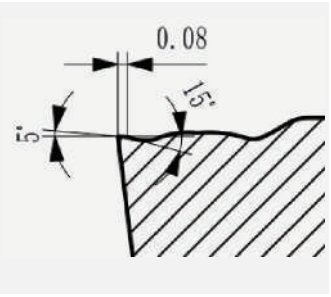


- Single sided chipbreaker
- Mainly for general use in semi finishing of Steel, Stainless Steel and Cast Iron

CHIPBREAKERS FOR POSITIVE INSERTS (MULTI-GRADE PVD)

GF

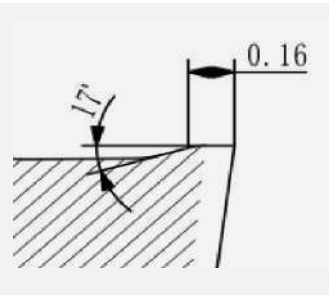




- The double positive rake angle design ensures the sharpness of the insert and low cutting resistance.
- The double chip breaker design broadens the chip breaking range.
- Suitable for finishing of steel, stainless steel and cast iron

GM

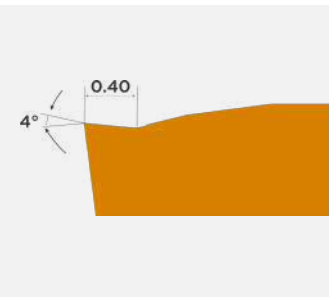




- On the basis of ensuring the sharpness of the cutting edge, the strength of the cutting edge is enhanced.
- General Machining Chipbreaker Suitable for semi-finishing of steel stainless steel and cast iron.

HF

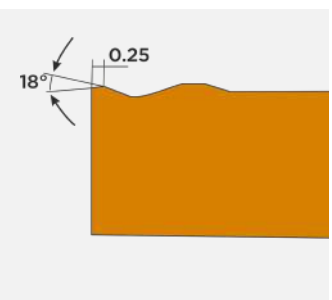




- Chipbreaker for finishing with wide application with M-level tolerance inserts, it is suitable for internal and external finishing of various materials such as steel, stainless steel and cast iron.

HM

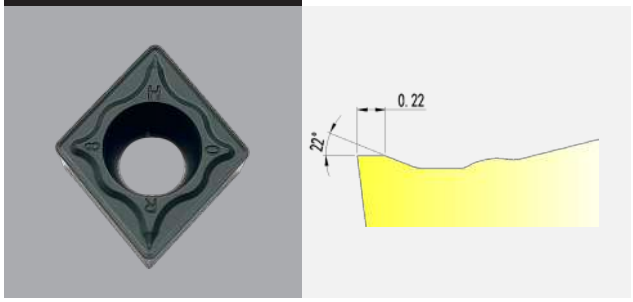




- Chipbreaker for semi-finishing with wide application of positive inserts with M-level tolerance,
- It is suitable for internal and external semi - finishing of materials like steel, stainless steel,cast iron, etc

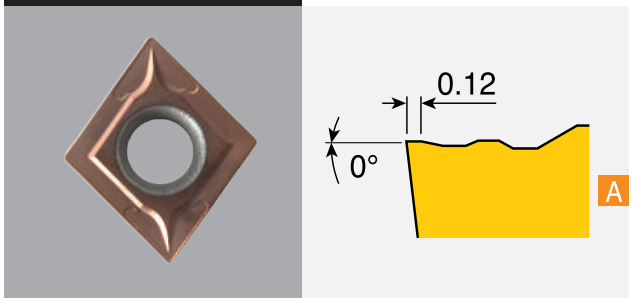
CHIPBREAKERS FOR POSITIVE INSERTS (MULTI-GRADE PVD)

HR



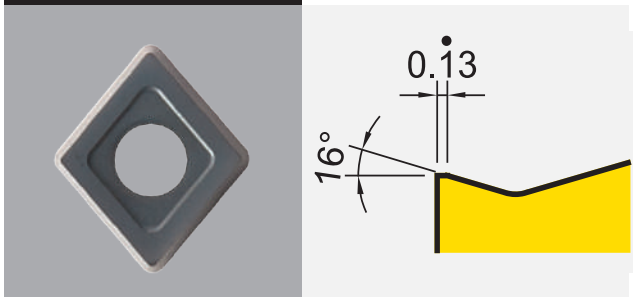
- General chipbreaker for positive inserts for roughing with M-level tolerance,
- It is suitable for both internal and external roughing of materials such as steel, stainless steel, cast iron, etc.

MT



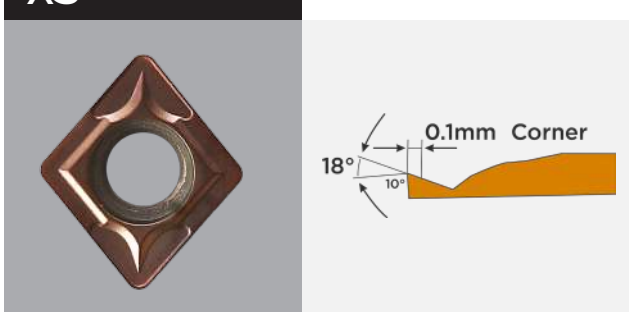
- Negative rake geometry for general use
- For medium to medium rough applications of Steel, stainless steel and cast iron machining

NN



- All purpose chipbreaker with combination of sharpness and strength suitable for semi finish, especially on difficult to cut materials

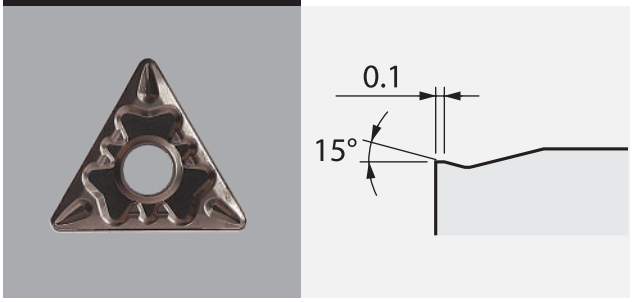
XS



- Single sided chipbreaker
- Mainly for general use in semi finishing of Steel, Stainless Steel and Cast Iron

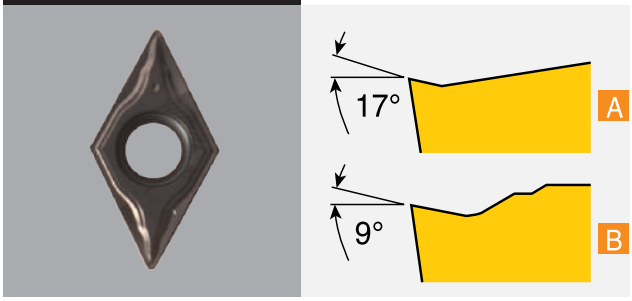
CHIPBREAKERS FOR CERMET INSERTS

FQ



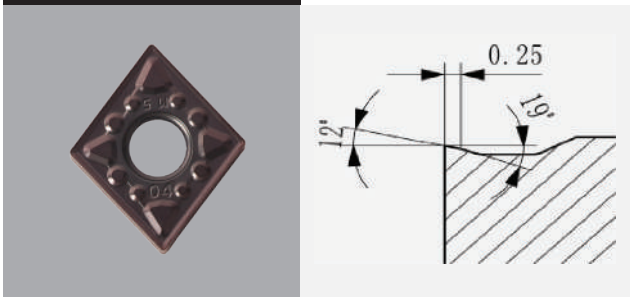
- Used for semi finish to finish applications
- Double sided chipbreaker with bulged rake angle enables sharp cutting

FG



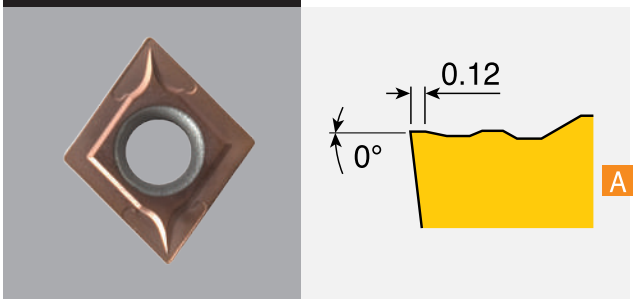
- Used mainly for finishing
- Low cutting forces
- Excellent chip control
- For finish and semi finish applications for Steel, stainless steel and cast iron machining

MS



- Superior cutting edge sharpness and strength achieved by a large positive land
- Extra strength of cutting edge inhibits damage from chipping and improves impact resistance

MT

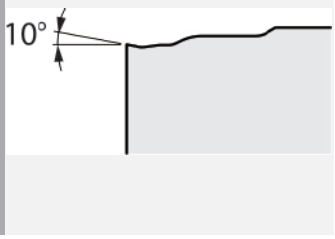


- Negative rake geometry for general use
- For medium to medium rough applications of Steel, stainless steel and cast iron machining

CHIPBREAKERS FOR CERMET INSERTS

PP





- 3 step dot structure realizes stables chip control at a wide range of feed rate.
- Less cutting forced due to sharp cutting.

Turning Insert Identification System

Symbol	Shape
H	Hexagon
O	Octagon
P	Pentagon
S	Square
T	Triangle
C	80° Rhombic
D	55° Rhombic
E	75° Rhombic
F	50° Rhombic
M	86° Rhombic
V	35° Rhombic
W	Hexagon
L	Rectangle
A	85° Parallelogram
B	82° Parallelogram
K	55° Parallelogram
R	Round

Shown angle stand for acute angle for rhombic and parallelogram inserts.

(1) Shape Symbol

Symbol	Relief Angle
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°

(2) Relief Angle Symbol

Symbol (class)	Tolerance(mm)		
	Corner Height	Thickness	I.C. Size
A	± 0.05	±0.025	±0.025
F			±0.013
C	± 0.013		±0.025
H			±0.013
E	± 0.025		±0.025
G		± 0.13	
J	± 0.005	±0.025	±0.05~ ±0.15
K*	± 0.013		
L*	± 0.025		
M*	± 0.08~ ± 0.18	±0.13	
M*		±0.025	
U*	± 0.13~ ± 0.38	±0.13	±0.08~ ±0.25

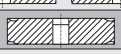
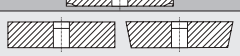
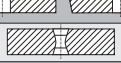
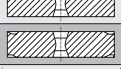
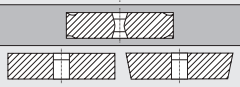
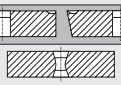
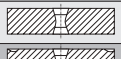
*Insert's Periphery is as fired
Tolerances differences is depending on insert size

(3) Tolerance Symbol

ISO (METRIC)	C	N	M	G
	(1)	(2)	(3)	(4)

(5) Edge Length Symbol (ISO)							I.C. Size (mm)
C	D	R	S	T	V	W	
03	04		03	06			3.97
04	05		04	08	08		4.76
		05					5
05	06		05	09		03	5.56
		06					6
06	07		06	11	11	04	6.35
08	09		07	13		05	7.94
		08					8
09	11	09	09	16	16	06	9.525
	12	10					10
		12					12
12	15	12	12	22	22	08	12.7
16	19	15	15	27	27	10	15.857
		16					16
19	23	19	19	33	33	13	19.05
		20					20
22	27		22	38			22.225
		25					25
25	31	25	25	44	44	17	25.4
32	38	21	21	54	54	21	31.75
		32					32

·Expressed as edge length for ISO.
·ANSI expresses the inscribed circle diameter in inches

Symbol (class)	Hole	Hole Shape	Insert Chipbreaker	Shape
N	NO		No	
R			One Sides	
F			Two Sides	
A	YES	White Hole	No	
M			One Sides	
G			Two Sides	
W		With Hole and One Countersink 40°-60°	No	
T			One Sides	
Q		With Hole and Two Countersink 40°-60°	No	
U			Two Sides	
B		With Hole and One Countersink 70°-90°	No	
H			One Sides	
C		With Hole and Two Countersink 70°-90°	No	
J			Two Sides	
X	-	-		

(4) How/ Chipbreaker Symbol

12 (5)

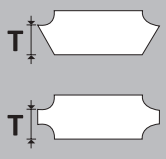
04 (6)

08 (7)

GM (8)

(6) Thickness Symbol

ISO	
Thickness (mm)	Symbol
1.59	01
1.98	T1
2.38	T2
3.18	03
3.97	T3
4.76	04
5.56	05
6.35	06
7.94	07
9.525	09



Thikness displayed as the distance between bottom surface & highest point on cutting edge.

(7) Corner-R() Symbol

ISO	
Corner-R(mm)	Symbol
Sharp Corner	00
0.03	003
0.05	005
0.1	01
0.2	02
0.4	04
0.8	08
1.2	12
1.6	16
2.0	20
2.4	24
2.8	28
3.2	32
Round insert	00 (inch) or M0 (metric)

(8) Manufacture's Option

Hans Symbol Chipbreaker Symbol, etc.

TURNING



CNMG

NEGATIVE 80
RHOMBIC INSERTS

Dimensions (mm)			
Size	d	t	r
09	9.2	4.76	0.4-0.8
12	12.7	4.76	0.4-1.6
16	15.88	6.35	0.8-1.6
19	19.05	6.35	0.8-1.6

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated								PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
CNMG	090304	XM	0.10-0.30	0.4-3.0						●															
	090308	XM	0.15-0.40	0.5-3.0						●															
CNMG	120404		0.15-0.40	0.8-4.0									●	●		●									●
	120404	BF	0.12-0.30	0.5-3.0														●				●	●	○		
	120404	CR	0.15-0.40	0.8-4.0														●	●	●		○	●	●		
	120404	GF	0.12-0.30	0.5-3.0							●															
	120404	GM	0.1-0.3	0.5-4.0							●															
	120404	MS	0.1-0.4	0.5-4.0	●	●	●															●	●	○		
	120404	NN	0.15-0.40	0.8-4.0																	●					
	120404	PK	0.1-0.3	0.5-4.0					●																	
	120404	PR	0.1-0.40	0.5-0.35					●																	
	120404	TM	0.08-0.30	0.1-3.0				●																		
	120404	XM	0.08-0.30	0.1-3.0						●																
	120404	XS	0.12-0.30	0.5-3.0													●									

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



CNMG

NEGATIVE 80
RHOMBIC INSERTS

Dimensions (mm)			
Size	d	t	r
09	9.2	4.76	0.4-0.8
12	12.7	4.76	0.4-1.6
16	15.88	6.35	0.8-1.6
19	19.05	6.35	0.8-1.6

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated								PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930- C	XT1010	XT1035	XA330
CNMG	120408		0.17-0.55	1.2-5.0									●		●	●										●
	120408	BF	0.1-0.4	1.0-4.0														●		○		●	●	●		
	120408	BM	0.17-0.55	1.2-5.0														●		○		○	○	○		
	120408	CR	0.15-0.55	1.0-5.0							●							●	●	●		●	●	●		
	120408	GM	0.15-0.50	1.0-4.0							●			●												
	120408	GH	0.1-0.4	1.0-0.35												●										
	120408	GR	0.15-0.55	1.0-5.0							●	●								●						
	120408	MS	0.12-0.4	1.0-5.0	●	●	○															●	●	○		
	120408	NM	0.15-0.50	1.0-5.0																					○	
	120408	NN	0.15-0.55	1.0-5.0																	●					
	120408	PK	0.12-0.4	1.0-5.0					●																	
	120408	PR	0.15-0.5	1.0-5.0					●																	
	120408	SM	0.15-0.4	1.0-4.0																		●	○	○		
	120408	TM	0.12-0.35	0.8-4.0				●	○		○															
	120408	UC	0.15-0.4	1.0-4.0											●	●										
	120408	XS	0.08-0.35	1.0-4.0													●									
	120408	XM	0.15-0.45	1.0-4.0						●																

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TURNING



CNMG

NEGATIVE 80
RHOMBIC INSERTS

Dimensions (mm)			
Size	d	t	r
09	9.2	4.76	0.4-0.8
12	12.7	4.76	0.4-1.6
16	15.88	6.35	0.8-1.6
19	19.05	6.35	0.8-1.6

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated								PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930 - C	XT1010	XT1035	XA330
CNMG	120412		0.20-0.55	1.5-5.0									●	●		●										
	120412	BM	0.20-0.55	1.2-5.0														●		●						
	120412	CR	0.15-0.5	1.5-5.0															●	●		○	●	●		
	120412	GH	0.15-0.45	1.2-5.0												●										
	120412	GM	0.15-0.6	1.5-5.0							●	○						●		○			○			
	120412	GR	0.20-0.55	2.0-5.0							●	●		○				●		●			○			
	120412	MS	0.20-0.5	1.5-5.0	○																	●	●			
	120412	NN	0.17-0.55	1.0-5.0																	●					
	120412	NR	0.20-0.55	2.0-5.0																					●	
	120412	PK	0.15-0.55	1.2-5.0					●																	
	120412	PR	0.20-0.55	1.5-5.0					●																	
	120412	SM	0.17-0.55	1.2-5.0																		●	●	○		
	120412	TM	0.12-0.4	1.0-5.0				●			○															
	120412	UC	0.17-0.45	1.2-5.0											●	●										
	120412	XM	0.15-0.4	1.0-5.0						●																
CNMG	120416		0.20-0.55	1.5-6.0										●												
	120416	GM	0.20-0.6	2.0-6.0							○	●						○								
	120416	NR	0.18-0.55	1.5-6.0																					●	
	120416	XM	0.20-0.55	1.5-5.0						●																

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CNMG

NEGATIVE 80
RHOMBIC INSERTS

Dimensions (mm)			
Size	d	t	r
09	9.2	4.76	0.4-0.8
12	12.7	4.76	0.4-1.6
16	15.88	6.35	0.8-1.6
19	19.05	6.35	0.8-1.6

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated								PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
CNMG	160608	GM	0.15-0.55	2.0-6.5							●	○						○		○						
	160608	GR	0.20-0.55	2.0-6.5							○	○						○								
	160608	SM	0.20-0.6	2.0-6.5																		○	●			
CNMG	160612	AS	0.20-0.6	2.0-6.5																		○	●			
	160612	GM	0.15-0.55	2.0-6.5							●	○						●		○						
	160612	GR	0.18-0.55	2.0-6.5							○	●						○		○						
	160612	XM	0.15-0.55	2.0-6.5						●																
CNMG	160616	BM	0.25-0.55	2.0-6.5																		○	●			
	160616	GM	0.25-0.55	2.0-6.5							●	○						○								
	160616	GR	0.30-0.55	2.0-6.5							○	○						○		○						
	160616	XM	0.30-0.55	2.0-6.5						●																
CNMG	190608	GM	0.23-0.55	3.0-8.0							●	○						●		○						
	190608	SM	0.23-0.55	3.0-8.0																		●	○			
CNMG	190612	GR	0.30-0.55	3.0-8.0							●	○						●		○						
	190612	NM	0.25-0.55	3.0-8.0																					●	
	190612	SM	0.30-0.55	2.5-8.0																		●	●			
CNMG	190616	AR	0.30-0.55	3.0-8.0																		○	●			
	190616	GR	0.30-0.55	3.0-8.0						●	●	●						○								
	190616	NR2	0.30-0.55	3.0-8.0																					●	
CNMA	120404		0.15-0.45	1.5-5.0									●	○	○	●										
	120408		0.20-0.55	1.5-5.0									●	●	●	●										
	120412		0.20-0.55	1.5-5.0									●	●	●	●										

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



DNMG

Negative 55° rhombic inserts

Dimensions (mm)			
Size	d	t	r
11	9.52	4.76	0.4-1.2
15	12.7	4.76-6.35	0.4-1.6

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated								PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
DNMG	110404	BM	0.07-0.20	0.5-2.0	●													●							
	110404	GM	0.07-0.20	0.5-2.0							●							●		○					
	110404	PK	0.07-0.20	0.5-2.0					●																
	110404	XM	0.07-0.15	0.5-1.5						●															
DNMG	110408	BM	0.10-0.25	0.7-2.5							○							●		○					
	110408	GM	0.10-0.25	0.7-2.0							●							○							
	110408	PK	0.08-0.20	0.7-2.5					●																
	110408	XM	0.08-0.25	0.7-2.0						●															
DNMG	110412	GM	0.07-0.20	0.5-2.0							●														
DNMG	150404	CR	0.05-0.2	0.1-2.0							○							●		●					
	150404	GF	0.05-0.18	0.1-1.5							●							○							
	150404	GM	0.05-0.2	0.1-2.0							●							○							
	150404	NN	0.05-0.2	0.1-1.5																	●				
	150404	TM	0.05-0.2	0.1-1.5						○	●														
DNMG	150408	CR	0.13-0.50	0.5-5.0														●		●					
	150408	GF	0.13-0.40	0.5-4.0							●	○						○							
	150408	GM	0.10-0.45	0.5-4.0							●							○							
	150408	NN	0.13-0.50	0.1-5.0																	●				
	150408	TM	0.10-0.50	0.1-5.0						○	●														
DNMG	150412	GM	0.08-0.40	0.5-3.0							●							○							

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



DNMG

Negative 55° rhombic inserts

Dimensions (mm)			
Size	d	t	r
11	9.52	4.76	0.4-1.2
15	12.7	4.76-6.35	0.4-1.6

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated								PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
DNMG	150604		0.05-0.30	0.2-2.5										●		●										
	150604	BF	0.05-0.30	0.2-2.5																		○	●	○		
	150604	CR	0.08-0.32	0.4-3.0							○							●		●						
	150604	GF	0.05-0.30	0.2-2.0							●	○														
	150604	GM	0.05-0.35	0.2-3.0							●	○						○								
	150604	NN	0.08-0.35	0.4-2.5																	●					
	150604	PK	0.05-0.32	0.2-3.0					●																	
	150604	PR	0.08-0.35	0.4-2.5					●																	
	150604	SM	0.08-0.35	0.5-2.5																		●	○	●		
	150604	TM	0.05-0.25	0.2-2.5				○			●															
	150604	UC	0.05-0.30	0.4-2.5											○	●										
	150604	XM	0.08-0.30	0.2-2.5						●																
DNMG	150608		0.08-0.35	0.5-4.0										●		●										
	150608	BF	0.08-0.35	0.4-5.0																		○	●	○		
	150608	BM	0.1-0.35	0.6-5.0														○				○	●	●		
	150608	CR	0.08-0.35	0.5-4.0							○							●		●						
	150608	GF	0.07-0.35	0.3-3.5							●	●						○								
	150608	GH	0.1-0.35	1.0-4.0									●		○	●										
	150608	GM	0.1-0.4	0.5-5.0							●	○		●					○							
	150608	GR	0.1-0.5	0.8-4.0							○	●		○												
	150608	NM	0.08-0.4	0.5-5.0																					●	
	150608	NN	0.08-0.4	1.0-4.5																	●					
	150608	PK	0.1-0.4	0.5-4.0					●																	
	150608	PR	0.12-0.5	1.2-5.0					●																	
	150608	SM	0.12-0.4	1.0-4.0																		●	○	●		
	150608	TM	0.08-0.35	0.5-4.0					○		●															
	150608	XM	0.08-0.35	0.3-4.5						●																
	150608	UC	0.08-0.35	0.3-4.5											○	●										

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE

TURNING



DNMG

Negative 55° rhombic inserts

Dimensions (mm)			
Size	d	t	r
11	9.52	4.76	0.4-1.2
15	12.7	4.76-6.35	0.4-1.6

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cemet			CVD Coated								PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
DNMG	150612		0.15-0.55	0.5-5.0									●		○	●										
	150612	GH	0.15-0.55	0.5-5.0									●		○	●										
	150612	GM	0.15-0.55	0.5-5.0							●	●						○								
	150612	GR	0.15-0.55	1.2-5.0							●	●						○								
	150612	NN	0.17-0.55	1.2-5.0																	●					
	150612	NR	0.17-0.55	0.5-5.5																					●	
	150612	PK	0.15-0.55	1.0-5.5					●																	
	150612	PR	0.17-0.55	1.0-5.5					●																	
	150612	TM	0.12-0.5	0.5-5.0				○	○																	
	150612	UC	0.12-0.55	0.5-5.0											○	●										
	150612	XM	0.12-0.55	0.5-5.0						●																
DNMG	150616	GR	0.17-0.55	1.2-5.0							○	●						○								

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



SNMG

Negative Square Inserts

Dimensions (mm)			
Size	d	t	r
12	12.7	4.6	0.4-1.6
15	15.88	6.35	1.2
19	19.05	6.35	0.8-1.6
25	25.4	7.94-9.52	2.4

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated								PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
SNMG	120404		0.05-0.20	0.1-1.5									●			○										
	120404	HA	0.05-0.20	0.1-1.5																						●
	120404	BM	0.08-0.22	0.1-2.0														●		○						
	120404	GM	0.05-0.20	0.1-2.0							●	○														
	120404	MS	0.05-0.22	0.1-2.5																		●	○			
	120404	UC	0.05-0.22	0.1-2.0									○		○	●										
SNMG	120408		0.13-0.50	0.8-3.0									●		○	●										
	120408	BF	0.12-0.45	0.8-4.0														●		○						
	120408	BM	0.12-0.45	0.8-4.0														●		○			●			
	120408	FQ	0.12-0.50	0.8-4.0	●																					
	120408	GM	0.15-0.50	0.8-4.0							●	○		○												
	120408	GR	0.15-0.50	0.9-4.0							○	●														
	120408	HA	0.13-0.50	0.8-4.0																						●
	120408	MS	0.12-0.40	0.8-3.5																		●	●	○		
	120408	NN	0.15-0.50	0.8-4.5																	●					
	120408	NR	0.17-0.50	0.7-4.5																						●
	120408	SM	0.15-0.40	1.0-5.0																		○	○	●		
	120408	TM	0.10-0.50	0.8-3.5					●		○															
	120408	UC	0.13-0.50	0.8-4.0									○			●										
	120408	XM	0.13-0.50	0.8-4.0						●																

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



SNMG

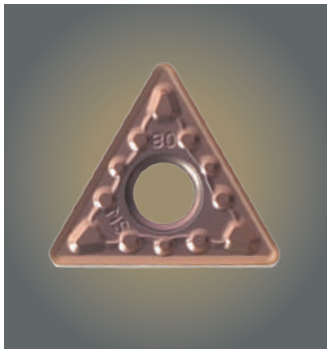
Negative Square Inserts

Dimensions (mm)			
Size	d	t	r
12	12.7	4.6	0.4-1.6
15	15.88	6.35	1.2
19	19.05	6.35	0.8-1.6
25	25.4	7.94-9.52	2.4

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated								PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
SNMG	120412		0.25-0.60	2.0-5.0									●			○										
	120412	BM	0.20-0.50	2.0-5.0														●		●						
	120412	GM	0.25-0.60	2.0-5.0							●	○		○												
	120412	GR	0.27-0.60	2.5-5.0							●	○		○												
	120412	MS	0.25-0.60	2.5-5.0																		●	●	○		
	120412	PK	0.27-0.60	2.0-5.0					●																	
	120412	TM	0.25-0.60	1.5-4.5					○	○																
	120412	UC	0.27-0.60	1.5-5.0									○			●										
	120412	XM	0.25-0.60	2.0-5.0						●																
SNMG	150612	GR	0.25-0.60	2.0-6.0							●															
SNMG	190608	SM	0.25-0.60	3.0-8.0																		●	○	○		
SNMG	190612	GM	0.27-0.60	3.0-8.0							●	○														
	190612	GR	0.30-0.60	3.0-8.0							●	○														
	190612	SM	0.27-0.60	3.0-8.0																		○	●			
	190612	XM	0.30-0.60	3.0-8.0						●																
SNMG	190616	AR	0.35-0.70	3.0-8.0																		○	●			
	190616	GM	0.27-0.6	3.0-6.0							●	○														
	190616	GR	0.35-0.70	3.0-8.0							●	○														
	190616	XM	0.30-0.70	2.5-7.0						●																
SNMG	250724	GR	0.50-1.00	5.0-12.0								●														
SNMA	120404		0.15-0.35	1.0-4.0									●	○	○	○										
	120408		0.15-0.70	1.0-6.0									●	●	○	●										
	120412		0.20-0.80	1.5-6.0									●	●	○	●										
	120416		0.20-0.80	1.5-6.0									●			○										

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



TNMG

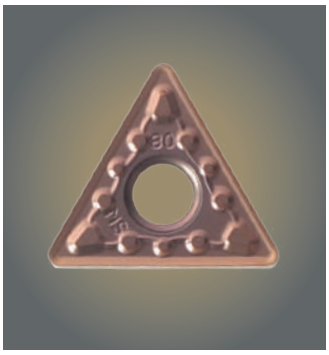
Negative Triangular Insert

Dimensions (mm)			
Size	d	t	r
16	9.52	4.76	0.4-1.6
22	15.88	4.76	0.4-1.6

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated								PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
TNMG	160404		0.17-0.45	1.5-3.5									●	○	○	●										
	160404	BF	0.12-0.40	1.5-3.5														●		○		○	●	●		
	160404	BM	0.12-0.40	1.5-3.5														●		○						
	160404	CR	0.17-0.45	1.5-4.0														●	●	○		○	○	○		
	160404	CQ	0.17-0.45	1.5-4.0					●	○																
	160404	FQ	0.15-0.40	1.5-3.5	●	○	●																			
	160404	GF	0.15-0.40	1.5-3.5							●	○														
	160404	GM	0.17-0.45	1.5-4.0							●	○		○				○		○						
	160404	HA	0.17-0.45	1.5-3.5																						●
	160404	MS	0.15-0.45	1.5-4.0	●	○	●																			
	160404	NN	0.15-0.45	1.2-2.0																	●					
	160404	PK	0.12-0.45	1.3-3.5					●	○																
	160404	PR	0.12-0.45	1.5-3.5					●																	
	160404	TM	0.15-0.35	1.2-3.5				●	○	○	○															
	160404	UC	0.15-0.45	1.5-4.0									○		○	○										
	160404	XM	0.15-0.40	1.5-3.5						●																
	160404	XS	0.15-0.40	1.5-3.5													●									

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



TNMG

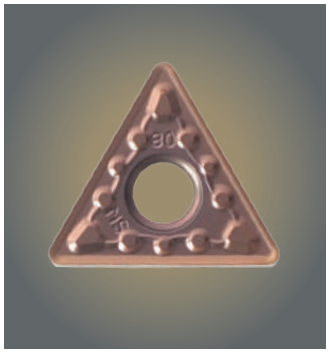
Negative Triangular Insert

Dimensions (mm)			
Size	d	t	r
16	9.52	4.76	0.4-1.6
22	15.88	4.76	0.4-1.6

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated								PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
TNMG	160408		0.17-0.55	2.0-3.5									●	○	○	●										
	160408	BF	0.15-0.50	1.5-3.5														●		○		●	●	●		
	160408	BM	0.15-0.55	2.0-4.0														●		○		○	○	○		
	160408	CQ	0.15-0.55	2.0-3.5				○	●	○																
	160408	CR	0.17-0.55	2.0-4.0							○						○	●	●	●		○	●	●		
	160408	FG	0.15-0.45	1.5-3.5	●	○	○																			
	160408	FQ	0.17-0.50	1.5-3.5	●	○	●																			
	160408	GF	0.12-0.50	1.2-3.5							●	○														
	160408	GH	0.17-0.55	2.0-3.5									○			●										
	160408	GM	0.15-0.55	1.5-3.5							●	●		●				○		●						
	160408	GR	0.17-0.55	2.0-4.5							○	○		○				○		●						
	160408	HA	0.12-0.4	2.0-3.5																						●
	160408	ISP	0.17-0.55	2.0-4.5					●	○																
	160408	MS	0.17-0.50	2.0-4.0	●		●															●	●	○		
	160408	NM	0.15-0.55	2.0-4.0																					○	
	160408	NN	0.15-0.50	1.5-4.5																	●					
	160408	PK	0.15-0.5	1.5-4.0					●	○																
	160408	PR	0.18-0.50	2.0-4.5					●	○																
	160408	SM	0.15-0.55	1.5-4.5																		●	○	●		
	160408	TM	0.12-0.45	2.0-3.5				●	●	○	○															
	160408	UC	0.17-0.55	2.0-4.0									○		○	●										
	160408	XM	0.15-0.50	1.2-3.5						●																
	160408	XS	0.17-0.55	1.5-3.5													●									

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



TNMG

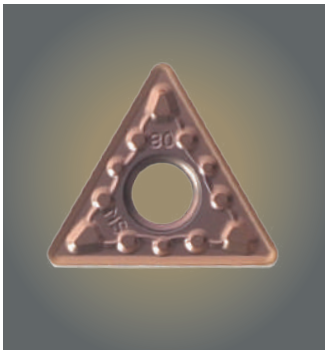
Negative Triangular Insert

Dimensions (mm)			
Size	d	t	r
16	9.52	4.76	0.4-1.6
22	15.88	4.76	0.4-1.6

Designation		CHIP BREAKER	Feed (mm/ rev)	ap (mm)	Cermet			CVD Coated								PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
TNMG	160412		0.15-0.55	0.8-4.5									●	○	○	●										
	160412	CR	0.15-0.55	0.8-5.0														●	●	●		○	●	○		
	160412	CQ	0.15-0.55	1.0-4.5					●	○																
	160412	GF	0.17-0.55	1.0-4.5							○															
	160412	GH	0.17-0.55	2.0-4.5									○			●										
	160412	GM	0.15-0.55	1.0-5.0							●	●		○				○		○						
	160412	GR	0.15-0.55	2.0-5.0							●	●		○				○		○						
	160412	ISP	0.17-0.55	1.0-5.0					●	○																
	160412	MS	0.12-0.50	1.0-5.0																		●	●	○		
	160412	NN	0.15-0.55	1.5-5.0																	●					
	160412	NR	0.15-0.55	1.5-5.0																					○	
	160412	PK	0.17-0.55	1.0-5.5					●																	
	160412	PR	0.15-0.55	1.0-5.5					●	○																
	160412	UC	0.12-0.45	0.8-4.5									●		○	●										
	160412	XM	0.12-0.50	1.0-4.5						●																

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



TNMG

Negative Triangular Insert

Dimensions (mm)			
Size	d	t	r
16	9.52	4.76	0.4-1.6
22	15.88	4.76	0.4-1.6

Designation		CHIP BREAKER	Feed (mm/ rev)	ap (mm)	Cermet			CVD Coated								PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
TNMG	220404	GM	0.18-0.45	1.5-4.5							●	○														
TNMG	220408	GM	0.13-0.50	1.0-6.0							●	○														
	220408	XM	0.15-0.55	1.2-6.0						●																
TNMG	220412	GM	0.15-0.55	1.5-6.0							●	○														
	220412	XM	0.20-0.55	1.5-6.0						●																
TNMG	220416	GR	0.15-0.55	1.0-6.0							○	○														
	220416	XM	0.20-0.55	1.0-6.0						○																
TNMA	160404		0.17-0.45	1.5-3.5									●	○	○	●										
	160408		0.17-0.55	2.0-3.5									●	●	●	●										
	160412		0.15-0.55	0.8-4.5									●	●	●	●										

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



VNMG

Negative 35° rhombic inserts

Dimensions (mm)			
Size	d	t	r
12	7.15	3.99	0.4.0.8
16	9.52	4.76	0.2-1.2

Designation		CHIP BREAKER	Feed (mm/ rev)	ap (mm)	Cermet			CVD Coated											PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
VNMG	12T304	GM	0.08-0.20	0.5-2.0					●	●																		
VNMG	12T308	GM	0.10-0.25	0.5-2.5					●	●																		
VNMG	160402	HA	0.08-0.17	0.1-1.2																								●
VNMG	160404		0.08-0.20	0.5-2.0									●															
	160404	BF	0.08-0.20	0.4-2.0																				○	●	○		
	160404	CR	0.10-0.20	0.7-2.0																	●							
	160404	FQ	0.10-0.20	0.5-2.0	●		○																					
	160404	GF	0.08-0.20	0.3-2.0							●																	
	160404	GM	0.10-0.25	0.5-2.2							●	○								●		●						
	160404	HA	0.07-0.20	0.5-2.5																								●
	160404	MT	0.08-0.22	0.5-2.5	●		●																					
	160404	NN	0.10-0.25	0.5-2.5																			●					
	160404	PK	0.10-0.25	0.5-2.5					●																			
	160404	SM	0.07-0.20	0.7-2.5																				●	○	●		
	160404	TM	0.08-0.20	0.7-22				●																				
	160404	VF	0.09-0.18	0.5-1.5					●	●																		
	160404	XM	0.05-0.0.18	0.5-2.0						●																		

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE

TURNING



VNMG

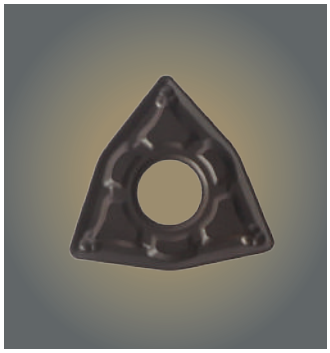
Negative 35° rhombic inserts

Dimensions (mm)			
Size	d	t	r
12	7.15	3.99	0.4-0.8
16	9.52	4.76	0.2-1.2

Designation		CHIP BREAKER	Feed (mm/ rev)	ap (mm)	Cermet			CVD Coated											PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
VNMG	160408		0.17-0.36	1.0-2.5									●	○														
	160408	BF	0.15-0.30	1.0-2.5																				○	●	○		
	160408	CR	0.17-0.30	1.0-3.0																	●							
	160408	GF	0.15-0.30	0.8-2.5							●									○								
	160408	GM	0.17-0.36	1.0-3.0							●	○		○						●		●						
	160408	HA	0.15-0.30	1.0-2.5																								●
	160408	MA	0.15-0.30	1.0-3.0	●	●	○																					
	160408	NN	0.17-0.35	1.0-2.5																			●					
	160408	PK	0.17-0.35	0.8-2.5					●																			
	160408	SM	0.15-0.35	1.0-3.0																				●	○	●		
	160408	TM	0.15-0.35	1.0-2.5				●			○																	
	160408	VF	0.17-0.35	1.0-2.5					●	●																		
	160408	XM	0.17-0.35	1.0-3.0						●																		
VNMG	160412	GM	0.17-0.35	0.5-3.0							●	○							○									

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



WNMG

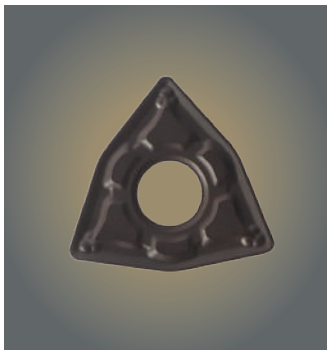
Negative 35° Trigon inserts

Dimensions (mm)			
06	9.52	4.76	0.4-1.2
08	12.7	4.76	0.4-1.2

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated								PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
WNMG06	060404	AR	0.05-0.20	0.1-2.0							●															
	060404	EF	0.05-0.20	0.1-1.5																		●	○			
	060404	GM	0.05-0.20	0.1-2.0							●	○						○								
	060404	NN	0.08-0.20	0.1-2.0																	●					
	060404	XM	0.10-0.20	0.1-2.0						●																
WNMG06	060408		0.13-0.50	0.8-3.0										●												
	060408	EF	0.13-0.50	0.8-3.0																		●	○			
	060408	GM	0.15-0.50	1.0-3.0							●	○						○		○						
	060408	NN	0.15-0.45	1.0-3.0																	●					
	060408	TM	0.13-0.40	0.8-3.0				○	○																	
	060408	XM	0.13-0.40	0.8-3.0						●																
WNMG06	060412	AR	0.15-0.55	1.0-3.0							●	○						○								
WNMG08	080404		0.07-0.20	0.5-2.0									●	○		●										
	080404	CR	0.08-0.20	0.5-2.5														●	●	○		○	●			
	080404	GM	0.05-0.20	0.5-2.0							●			○												
	080404	HA	0.05-0.20	0.5-2.0																						●
	080404	MS	0.08-0.20	0.5-3.0	●																					
	080404	TM	0.07-0.20	0.5-2.0				●	○																	
	080404	XM	0.07-0.20	0.5-2.0						●																

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



WNMG

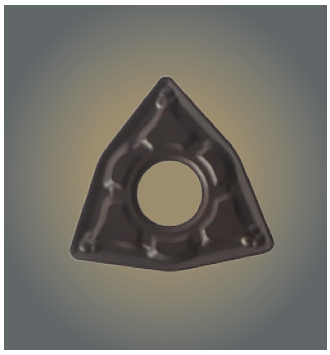
Negative 35° Trigon inserts

Dimensions (mm)			
06	9.52	4.76	0.4-1.2
08	12.7	4.76	0.4-1.2

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated								PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
WNMG08	080408		0.15-0.50	0.8-4.0									●	○	○	●										
	080408	BM	0.15-0.50	1.0-4.0														●		○						
	080408	CQ	0.17-0.50	0.8-4.0					●	○																
	080408	CR	0.18-0.50	1.0-4.5														●	●	●		○	●	○		
	080408	FQ	0.15-0.50	0.8-3.5	●																					
	080408	GH	0.17-0.50	1.0-4.0									○		○	●										
	080408	GM	0.15-0.50	1.0-4.0							●	●		●				○		○						
	080408	GR	0.17-0.50	0.8-4.0							○	○		○				○								
	080408	HA	0.15-0.50	0.5-4.0																						●
	080408	MS	0.12-0.50	1.0-4.5	●																					
	080408	NN	0.12-0.50	1.0-4.5																	●					
	080408	PK	0.12-0.50	1.0-4.5					●																	
	080408	PR	0.12-0.50	1.0-4.5					●																	
	080408	TM	0.15-0.50	0.8-4.0				●	○	○																
	080408	UC	0.12-0.50	1.0-4.0									○		○	●										
	080408	XM	0.15-0.50	1.0-4.5						●																

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



WNMG

Negative 35° Trigon inserts

Dimensions (mm)			
06	9.52	4.76	0.4-1.2
08	12.7	4.76	0.4-1.2

Designation		CHIP BREAKER	Feed (mm/ rev)	ap (mm)	Cermet			CVD Coated								PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
WNMG08	080412	AW	0.20-0.50	0.8-4.5									●	○	○	●										
	080412	BM	0.20-0.50	0.8-4.5														●		●						
	080412	CQ	0.20-0.50	1.0-4.5					●	○																
	080412	CR	0.18-0.50	1.0-4.5														●	●	○		○	●	○		
	080412	GF	0.20-0.50	0.8-4.0							○															
	080412	GM	0.17-0.50	1.0-4.5							●	○		○												
	080412	GH	0.20-0.50	1.0-4.5									○			●										
	080412	GR	0.20-0.50	1.2-4.5								●		●												
	080412	NN	0.18-0.50	1.0-4.5																	●					
	080412	NR	0.20-0.50	1.0-4.5																					●	
	080412	PK	0.18-0.50	0.8-4.5					●																	
	080412	PR	0.20-0.50	0.5-4.5					●																	
	080412	SM	0.18-0.50	0.8-4.5																		●	○	○		
	080412	TM	0.15-0.40	0.8-4.0				●	○	○																
	080412	UC	0.15-0.50	1.0-4.5									○		○	●										
	080412	XM	0.20-0.55	1.0-4.5						●																
WNMA	080404		0.15-0.50	0.8-4.0									●	○	○	●										
	080408		0.17-0.50	0.8-4.0									●	●	●	●										
	080412		0.20-0.50	0.8-4.5									●	●	●	●										

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



CCMT 06

POSITIVE 7°
CLEARANCE 80°
RHOMBIC INSERTS

Dimensions (mm)			
Size	d	t	r
06	6.35	2.38	0.2-0.8
09	9.52	3.97	0.2-0.8
12	12.7	3.97	0.4-.12

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated									PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT1110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
CCGT	060202		0.13-0.30	1.3-5.0																						●
CCMT	060202	FG	0.05-0.15	0.2-1.5	●	○																				
	060202	FQ	0.05-0.13	0.2-1.5	●		○																			
	060202	GF	0.05-0.13	0.2-1.5																		○	●	○		
	060202	HF	0.05-0.15	0.2-1.5														●		○						
	060202	PP	0.05-0.15	0.2-1.5	●		○																			
CCGT	060204		0.13-0.30	1.3-5.0																						●
CCMT	060204	FG	0.05-0.15	0.2-1.5	●	●	○																			
	060204	FQ	0.05-0.17	0.2-1.5	●	○	●																			
	060204	GF	0.05-0.15	0.2-1.5																		○	●	●		
	060204	GM	0.07-0.17	0.2-2.0														●				○	○	○		
	060204	HF	0.05-0.157	0.2-1.5							●							●		●						
	060204	HM	0.04-0.15	0.2-2.0							●							●		○						
	060204	MT	0.05-0.17	0.2-2.0	●		○												●							
	060204	NN	0.05-0.15	0.3-2.0																	●					
	060204	PK	0.05-0.17	0.2-2.0					●																	
	060204	PP	0.08-0.15	0.2-1.5	●		○																			
	060204	XS	0.05-0.17	0.2-1.5													●									
CCGT	060208		0.13-0.30	1.3-5.0																						●
CCMT	060208	GM	0.13-0.35	0.5-2.5																		○	●	○		
	060208	HM	0.13-0.30	0.7-2.0							●							●		○						
	060208	MT	0.10-0.30	0.7-2.5	●		○												●							
	060208	NN	0.13-0.35	0.5-2.5																	●					
	060208	PK	0.10-0.30	0.5-3.0					●																	
	060208	XS	0.13-0.30	0.7-2.5													●									

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



CCMT 09

POSITIVE 7°
CLEARANCE 80°
RHOMBIC INSERTS

Dimensions (mm)			
Size	d	t	r
06	6.35	2.38	0.2-0.8
09	9.52	3.97	0.2-0.8
12	12.7	3.97	0.4-.12

Designation		CHIP BREAKER	Feed (mm/ rev)	ap (mm)	Cermet			CVD Coated								PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
CCGT	09T302		0.10-0.25	0.7-2.5																					●
CCMT	09T302	FQ	0.10-0.25	0.7-2.5	●		○																		
	09T302	GF	0.10-0.27	0.7-2.5																		○	●	○	
	09T302	HM	0.10-0.22	0.7-2.0							○							●		○					
CCGT	09T304		0.10-0.25	0.7-3.0																					●
CCMT	09T304		0.10-0.25	0.7-2.5									●			○									
	09T304	FG	0.09-0.25	0.7-2.5	●	●	○																		
	09T304	FQ	0.10-0.27	0.7-2.7	●	○	●																		
	09T304	GF	0.08-0.25	0.7-2.5																		○	●	●	
	09T304	HF	0.08-0.25	0.5-2.5							●							●		○					
	09T304	HM	0.08-0.25	0.7-2.7							●			○				●		●					
	09T304	MT	0.10-0.25	0.5-2.5	●		○												●						
	09T304	NN	0.12-0.25	0.7-2.5																	●				
	09T304	PK	0.10-0.25	0.7-2.5					●																
	09T304	XS	0.08-0.25	0.7-2.5													●								
CCGT	09T308		0.10-0.25	0.7-3.5																					●
CCMT	09T308		0.10-0.25	0.8-3.0									●			○									
	09T308	FG	0.08-0.25	0.8-3.0	●	●	○																		
	09T308	FQ	0.10-0.27	0.8-3.0	●	○	●																		
	09T308	GM	0.10-0.25	0.8-3.5																		○	●	●	
	09T308	HM	0.10-0.30	1.0-3.0							●			○				●		●					
	09T308	MT	0.12-0.27	0.8-3.5	●		○												●						
	09T308	NN	0.08-0.25	0.8-3.0																	●				
	09T308	PK	0.10-0.30	0.9-3.0					●																
	09T308	XS	0.10-0.25	0.8-3.0													●								

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



CCMT 12

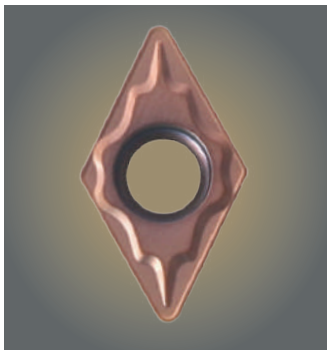
POSITIVE 7°
CLEARANCE 80°
RHOMBIC INSERTS

Dimensions (mm)			
Size	d	t	r
06	6.35	2.38	0.2-0.8
09	9.52	3.97	0.2-0.8
12	12.7	3.97	0.4-.12

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated									PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
CCGT	120404		0.13-0.30	1.3-5.0																						●
CCMT	120404	HM	0.10-0.25	1.0-4.5							●			○				●		○						
	120404	GM	0.10-0.27	1.0-4.5																		○	○			
	120404	MT	0.10-0.25	1.0-4.5															●							
	120404	NN	0.08-0.25	1.0-4.5																	●					
	120404	PK	0.10-0.25	1.0-4.5					●																	
	120404	XS	0.08-0.25	1.0-4.0													●									
CCGT	120408		0.13-0.30	1.3-5.0																						●
CCMT	120408	GM	0.10-0.30	1.0-5.0																		●	○			
	120408	HM	0.12-0.30	1.2-5.0							●							●		○						
	120408	HR	0.15-0.30	1.5-5.0							●			○				●		○						
	120408	MT	0.12-0.30	1.0-4.5															●							
	120408	NN	0.12-0.35	1..0-5.0																	●					
	120408	PK	0.12-0.32	1.3-4.5					●																	
	120408	XS	0.08-0.27	1.2-4.5													●									

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



DCMT

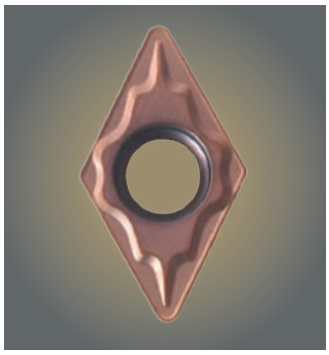
Positive 7° clearance 55° rhombic inserts

Dimensions (mm)			
Size	d	t	r
07	6.35	2.38	0.2-0.8
11	9.52	3.97	0.2-1.2

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated									PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
DCGT	070202		0.07-0.20	0.5-1.5																						●
DCMT	070202	FQ	0.05-0.20	0.3-1.5	●		○																			
	070202	HF	0.05-0.20	0.3-1.5														●		○						
DCGT	070204		0.07-0.20	0.4-1.5																						●
DCMT	070204	FG	0.07-0.20	0.3-1.5	●		○																			
	070204	FQ	0.05-0.20	0.3-1.5	●		○																			
	070204	GM	0.06-0.22	0.4-1.5																			●	○		
	070204	HF	0.07-0.20	0.4-1.7														●		○						
	070204	HM	0.07-0.20	0.4-1.7							●			○				●								
	070204	MS	0.07-0.22	0.3-1.5	○																					
	070204	MT	0.06-0.20	0.3-1.8															●							
	070204	NN	0.05-0.20	0.5-2.0																	●					
	070204	PK	0.5-0.20	0.4-1.5					●																	
	070204	XS	0.07-0.20	0.4-1.5													●									
DCGT	070208		0.07-0.23	0.4-1.7																						●
DCMT	070208	FQ	0.07-0.22	0.6-1.5	●		○																			
	070208	GM	0.08-0.20	0.8-1.5																			●	○		
	070208	HM	0.10-0.20	0.8-1.7							●							●		○						
	070208	MT	0.12-0.20	0.7-1.5															●							
	070208	PK	0.10-0.22	0.7-1.5					●																	

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



DCMT

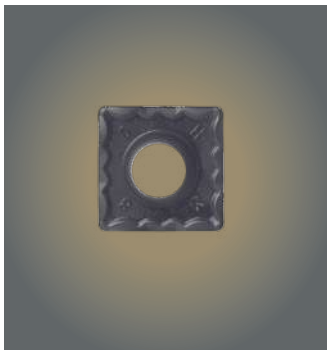
Positive 7° clearance 55° rhombic inserts

Dimensions (mm)			
Size	d	t	r
07	6.35	2.38	0.2-0.8
11	9.52	3.97	0.2-1.2

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated								PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
DCGT	11T302		0.05-0.20	0.5-2.0																					●
DCMT	11T302	FQ	0.07-0.25	0.5-2.2	●		○																		
	11T302	HF	0.05-0.25	0.5-2.2																		○	●	○	
	11T302	HM	0.07-0.22	0.5-2.3							○							●		○					
DCGT	11T304		0.08-0.25	0.5-2.5																					●
DCMT	11T304	FG	0.08-0.25	0.5-2.0	●		○																		
	11T304	GF	0.07-0.22	0.4-2.0																		○	●	○	
	11T304	GM	0.07-0.22	0.5-2.0																			●	○	
	11T304	HF	0.08-0.22	0.5-2.2							●			○				●		○					
	11T304	MT	0.05-0.20	0.4-1.8															●						
	11T304	NN	0.08-0.22	0.5-2.0																	●				
	11T304	PK	0.08-0.20	0.5-2.0					●																
	11T304	XS	0.08-0.20	0.5-2.0													●								
DCGT	11T308		0.10-0.25	0.8-2.5																					●
DCMT	11T308	FG	0.10-0.23	0.8-2.2	●	○	○																		
	11T308	GM	0.08-0.23	0.8-2.2																		○	●	○	
	11T308	HM	0.08-0.25	0.9-2.5							●			○				●		○					
	11T308	MT	0.10-0.23	0.9-2.5															●						
	11T308	NN	0.10-0.25	0.7-2.5																	●				
	11T308	PK	0.10-0.25	0.7-2.5					●																
	11T308	XS	0.10-0.25	0.8-2.5													●								
DCMT	11T312	HM	0.10-0.30	0.8-2.5							○			○				○							

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



SCMT

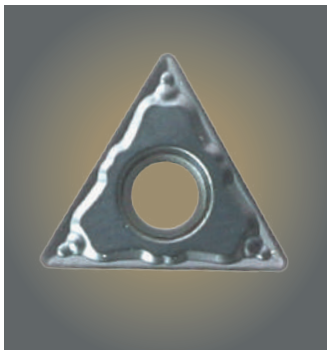
Positive 7° clearance square inserts

Dimensions (mm)			
Size	d	t	r
09	9.52	3.97	0.4-0.8
12	12.7	4.76	0.4-0.8

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated									PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
SCGT	09T304		0.08-0.25	0.6-2.5																						●
SCMT	09T304	GM	0.05-0.25	0.5-2.0																		○	●	○		
	09T304	HM	0.05-0.25	0.6-2.0							○			○				●		○						
	09T304	NN	0.08-0.25	0.6-2.0																	●					
	09T304	PK	0.08-0.25	0.6-2.0					●																	
	09T304	XS	0.05-0.25	0.6-2.0													●									
SCGT	09T308		0.10-0.25	0.5-3.0																						●
SCMT	09T308	GM	0.12-0.30	1.0-3.5																		○	●	○		
	09T308	HM	0.12-0.30	1.0-3.0							●			○				●		○						
	09T308	NN	0.15-0.30	1.0-3.5																	●					
	09T308	PK	0.12-0.30	1.0-3.5					●																	
	09T308	XS	0.12-0.30	1.0-3.5													●									
SCGT	120404		0.06-0.25	0.4-2.5																						●
SCMT	120404	GM	0.08-0.25	0.4-3.0																		○	●			
SCGT	120408		0.10-0.30	0.6-0.35																						●
SCMT	120408	GM	0.10-0.35	0.7-4.0																		○	●			
	120408	HM	0.10-0.35	0.7-4.0							●			○				○								
	120408	XS	0.10-0.30	0.7-4.0													●									

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



TCMT 09

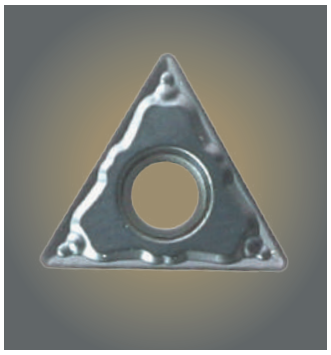
Positive 7° clearance triangular inserts

Dimensions (mm)			
Size	d	t	r
09	5.56	2.38	0.2-0.8
11	6.35	2.38-3.18	0.2-0.8
16	9.52	3.97	0.4-1.2

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated								PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
TCGT	090202		0.08-0.20	0.2-1.5																					●
TCGT	090204		0.08-0.22	0.3-1.5																					●
TCMT	090204	FQ	0.05-0.20	0.4-2.0	●																				
	090204	HF	0.05-0.20	0.3-1.5							○							●							
	090204	HM	0.08-0.20	0.3-1.5							●			○				○		○					
	090204	PK	0.05-0.20	0.3-2.0					●																
TCGT	090208		0.12-0.30	0.8-2.0																					
																									○
TCMT	090208	HM	0.12-0.30	0.8-2.0							●			○				○							

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



TCMT 11

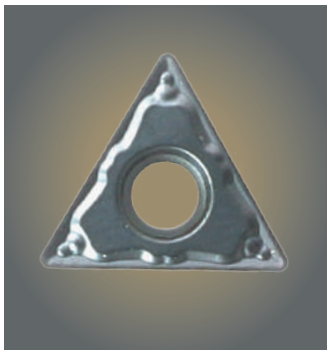
Positive 7° clearance triangular inserts

Dimensions (mm)			
Size	d	t	r
09	5.56	2.38	0.2-0.8
11	6.35	2.38-3.18	0.2-0.8
16	9.52	3.97	0.4-1.2

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated								PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
TCGT	110202		0.07-0.20	0.3-1.5																					○
TCMT	110202	FQ	0.07-0.20	0.3-1.5	●		○																		
TCGT	110204		0.06-0.20	0.3-2.5																					●
TCMT	110204		0.06-0.20	0.3-2.5									○			○									
	110204	FG	0.06-0.20	0.3-2.5	●		○																		
	110204	FQ	0.05-0.20	0.3-2.5	●		●																		
	110204	GF	0.06-0.20	0.3-2.5																		○	●	○	
	110204	HF	0.05-0.20	0.3-2.5							●			○				○		○					
	110204	MT	0.05-0.20	0.3-2.5															●						
	110204	NN	0.0650.20	0.3-2.5																	●				
	110204	PK	0.06-0.20	0.3-2.5					●																
	110204	PSF	0.06-0.20	0.3-2.5	○		○																		
	110204	XS	0.06-0.20	0.3-2.5													●								
TCGT	110208		0.06-0.20	0.3-2.5																					○
TCMT	110208		0.06-0.20	0.3-2.5									○			○									
	110208	FQ	0.06-0.22	0.5-2.5	●																				
	110208	HM	0.06-0.20	0.5-2.7							●			○				○							
	110208	GM	0.06-0.20	0.5-2.5																		○	●	○	
	110208	MT	0.06-0.20	0.3-2.5															●						
	110208	NN	0.08-0.20	0.5-2.7																	●				
	110208	PK	0.05-0.20	0.5-2.7					●																
	110208	PSF	0.08-0.20	0.5-2.7	○																				
	110208	XS	0.06-0.20	0.3-2.7													●								

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



TCMT 16

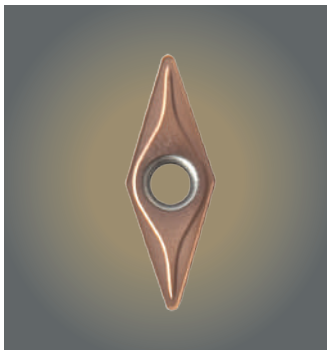
Positive 7° clearance triangular inserts

Dimensions (mm)			
Size	d	t	r
09	5.56	2.38	0.2-0.8
11	6.35	2.38-3.18	0.2-0.8
16	9.52	3.97	0.4-1.2

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated									PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
TCGT	16T304		0.08-0.25	0.35-3.0																						●
TCMT	16T304	FG	0.08-0.25	0.35-3.0	●		○																			
	16T304	FQ	0.08-0.25	0.35-3.0	●		○																			
	16T304	GF	0.08-0.25	0.35-3.0																		○	●	○		
	16T304	HF	0.08-0.25	0.35-3.0							●							○								
	16T304	HM	0.08-0.25	0.35-3.0							●							○		○						
	16T304	MT	0.08-0.25	0.35-3.0															●							
	16T304	NN	0.08-0.25	0.35-3.0																	●					
	16T304	PK	0.08-0.25	0.35-3.0					●																	
	16T304	XS	0.08-0.25	0.35-3.0													●									
TCGT	16T308		0.08-0.25	0.35-3.0																						●
TCMT	16T308		0.10-0.28	0.5-3.0									●			●										
	16T308	FG	0.10-0.28	0.5-3.0	●		○																			
	16T308	GM	0.10-0.28	0.5-3.0							●											○	●	○		
	16T308	HM	0.10-0.28	0.5-3.0							●							○								
	16T308	MT	0.10-0.28	0.5-3.0															●							
	16T308	NN	0.10-0.28	0.5-3.0																	●					
	16T308	PK	0.10-0.28	0.5-3.0					●																	
	16T308	XS	0.10-0.28	0.5-3.0													●									
TCMT	16T312	HM	0.10-0.32	0.7-3.2							●			○				○								

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



VBMT

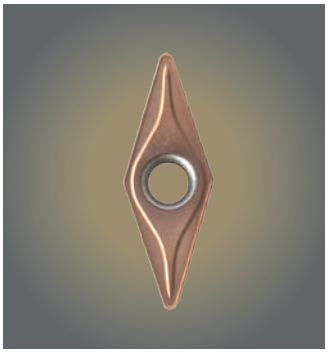
Positive 7° clearance triangular inserts

Dimensions (mm)			
Size	d	t	r
11	6.35	3.18	0.4-0.8
16	9.52	4.76	0.4-0.12

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated									PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
VBGT	110302		0.05-0.15	0.2-1.5																		○				●
VBGT	110304		0.08-0.20	0.5-1.5																		○				●
VBMT	110304	FQ	0.05-0.20	0.4-1.5	●		○																			
	110304	GF	0.08-0.20	0.4-1.5																		○	●	○		
	110304	XS	0.05-0.20	0.4-1.5													●									
VBGT	110308		0.08-0.20	0.5-2.0																						●
VBMT	110308	GM	0.10-0.20	0.5-2.0																		○	●	○		
VBGT	160404		0.05-0.15	0.5-1.5																		○				●
VBMT	160404		0.05-0.20	0.2-2.0							○			○				○								
	160404	CR	0.05-0.20	0.2-2.0							●															
	160404	FQ	0.07-0.20	0.2-2.2	●	●	●			○																
	160404	GF	0.07-0.20	0.2-2.2																		○	●	●		
	160404	GM	0.80-0.20	0.2-2.2							●												○			
	160404	NN	0.80-0.25	0.2-2.2																	●					
	160404	PK	0.80-0.25	0.2-2.2					●																	
	160404	PSF	0.80-0.20	0.2-2.2	●		○																			
	160404	XS	0.80-0.20	0.2-2.0													●									

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



VBMT

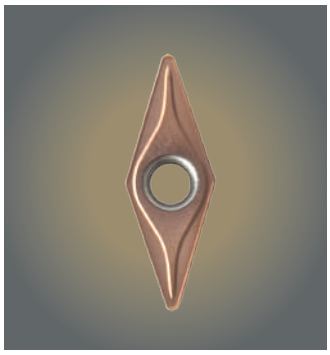
Positive 7° clearance triangular inserts

Dimensions (mm)			
Size	d	t	r
11	6.35	3.18	0.4-0.8
16	9.52	4.76	0.4-0.12

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated								PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
VBGT	160408		0.1-0.20	0.9-3.0																	○				●
VBMT	160408		0.1-0.20	0.9-3.0							●														
	160408	BF	0.08-0.20	0.9-3.0													○					○	○			
	160408	FG	0.08-0.20	0.7-3.0	●		○																		
	160408	FQ	0.08-0.22	0.7-3.0	●	●	●																		
	160408	**GF**	**0.10-0.22**	**0.7-3.0**					○		○											○	●	○		
	160408	GM	0.10-0.22	0.7-3.5							○													●		
	160408	HR	0.08-0.22	0.9-3.0							●							●								
	160408	NN	0.1-0.25	0.8-3.5																	●					
	160408	PK	0.1-0.25	0.8-3.5					●																	
	160408	PSF	0.1-0.25	0.9-3.0	●		○																		
	160408	XS	0.1-0.25	0.9-3.0													●								
VBMT	160412		0.1-0.20	0.9-3.0							○							○								
	160412	HR	0.1-0.20	0.9-3.0							○							●								

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE



VCMT

Positive
7° Clearance
35° Rhombic inserts

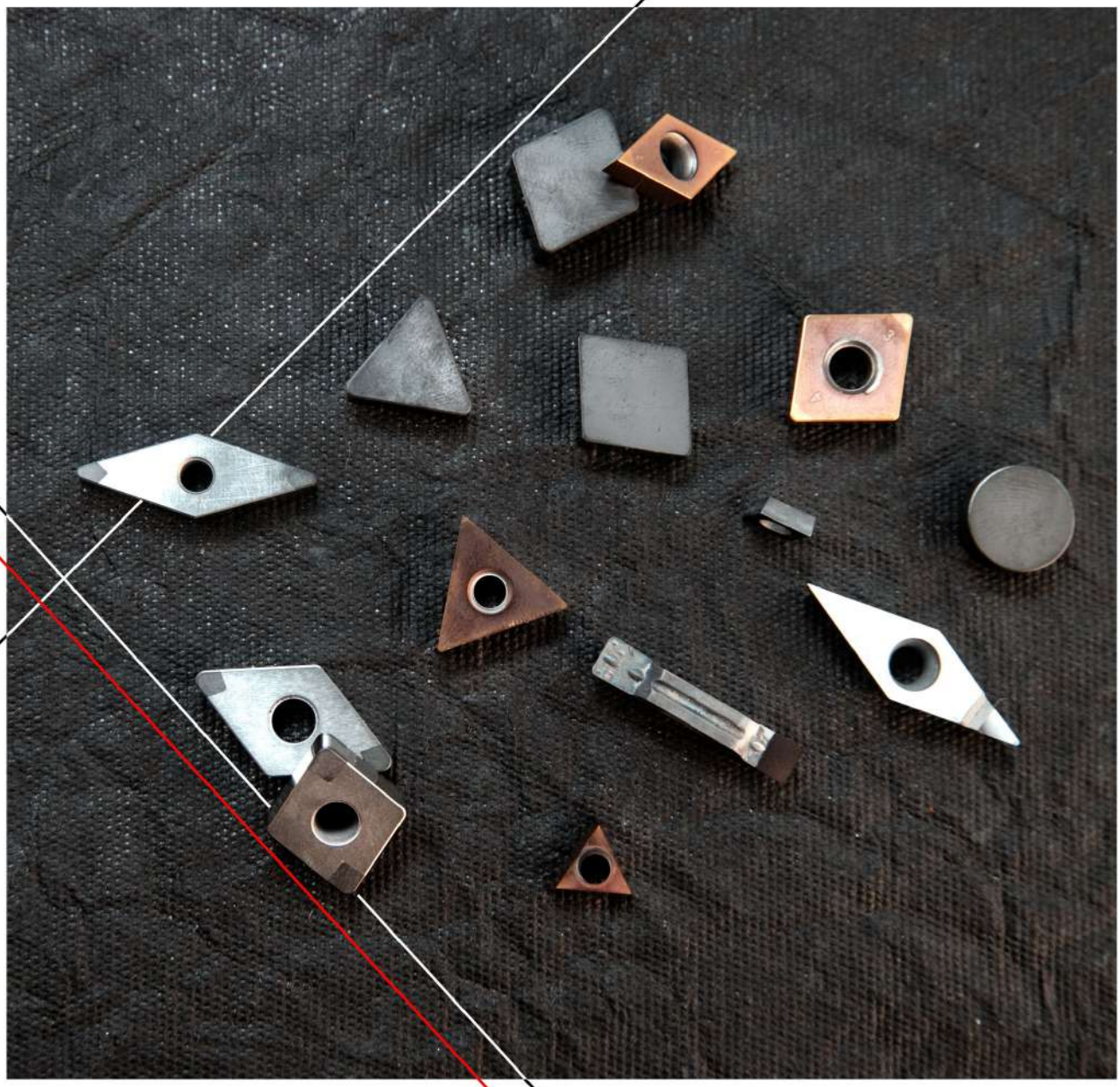
Dimensions (mm)			
Size	d	t	r
11	6.35	3.18	0.4-0.8
16	9.52	4.76	0.4-0.12

Designation		CHIP BREAKER	Feed (mm/rev)	ap (mm)	Cermet			CVD Coated									PVD Coated									UNC
					XC615	XC815	XC825	XP7015	XP7020	XP7030	XP7125	XP7235	XK3120	XK3215	3315-N	XK3220	XT110	XT125	XT125C	XT225	XT910	XT930	XT930-C	XT1010	XT1035	XA330
VCGT	110302		0.02-0.15	0.2-1.5																						●
VCMT	110302	GF	0.02-0.15	0.2-1.5																			○	○	○		
VCGT	110304		0.02-0.20	0.2-2.0																						●
VCMT	110304	GF	0.05-0.20	0.3-2.0																			○	●	○		
	110304	GM	0.05-0.20	0.3-2.0																			○	○	○		
	110304	XS	0.05-0.20	0.3-2.0													●										
VCGT	110308		0.02-0.20	0.2-2.0																						●
VCMT	110308	GM	0.05-0.25	0.5-2.5																			○	●	○		
VCGT	160404		0.02-0.20	0.2-1.5																						●
VCMT	160404	GF	0.05-0.25	0.3-2.2																			○	●	○		
	160404	GM	0.05-0.25	0.3-2.2				○															○	○			
	160404	XM	0.05-0.25	0.3-2.2						○																	
VCGT	160408		0.07-0.20	0.3-2.5																						●
VCMT	160408	GM	0.07-0.20	0.3-2.5																			○	●	○		
	160408	XM	0.07-0.20	0.3-2.5						○																	

UNC = Uncoated

● STOCKABLE ○ NON STOCKABLE

NOTES



PCD & CBN

PCD and CBN are both materials used to make cutting tools, and are among the hardest materials available:

PCD

Polycrystalline Diamond is a material made by combining diamond particles at high pressure and temperature. PCD tools are used to machine non-ferrous and non-metallic materials like aluminum, brass, and fiberglass.

CBN

Cubic Boron Nitride is a material made by sintering micron-sized pieces of cubic boron nitride with ceramic materials under extreme pressure and temperatures. CBN tools are used to machine ferrous materials like hardened steels, cast iron, and powdered metals.

PCD & CBN INDEX

PCD & CBN	64-77
XPD 300	67-69
Brazed CBN	70-72
Solid CBN	73-74
Delta CBN	75-76

XPD300

Grade for PCD Turning



Poly- Crystalline Diamond Grade Suitable For Turning Of Aluminium, Aluminium Car Alloys, Wood, Ceramic, Glass, Bakelite, Brass, Copper, Hard Titanium (Only In Certain Cases)

The Diamond for these inserts comes from the most reputed sources in the world.

This ensures enhanced performance of these tools with stable quality & consistency.

Price to performance ratio allows to compete anyone in the market.

XPD300

Grade for PCD Turning

Insert Table						
Designation	B	L	F	E	R	XPD 300
CCGT060204	6.35	6.4	2.38	2.8	0.4	●
CCGT09T302	9.525	9.7	3.97	4.4	0.2	○
CCGT09T304	9.525	9.7	3.97	4.4	0.4	●
CCGT09T308	9.525	9.7	3.97	4.4	0.8	●
CCGT120402	12.7	12.9	4.76	5.5	0.2	○
CCGT120404	12.7	12.9	4.76	5.5	0.1	○
CCGT120408	12.7	12.9	4.76	5.5	0.8	○
CNMG120402	12.7	12.9	4.76	5.5	0.2	○
CNMG120404	12.7	7.7	4.76	5.5	0.1	●
CNMG120408	12.7	7.7	4.76	5.5	0.8	●
DCGT070202	6.35	7.7	2.38	2.5	0.2	○
DCGT070204	6.35	7.7	2.38	2.5	0.4	●
DCGT11T302	9.525	11.6	3.97	4.4	0.2	○
DCGT11T304	9.525	11.6	3.97	4.4	0.4	●
DCGT11T308	9.525	11.6	3.97	4.4	0.8	●
SCGT09T302	9.525	9.525	3.97	4.4	0.2	○
SCGT09T304	9.525	9.525	3.97	4.4	0.4	○
TCGT110202M2.5	6.35	11	2.38	2.8	0.2	○
TCGT110204M2.5	6.35	11	2.38	2.8	0.4	●
TCGT16T302	9.525	16.5	3.97	4.4	0.2	○
TCGT16T304	9.525	16.5	3.97	4.4	0.4	○
TCGT16T308	9.525	16.5	3.97	4.4	0.8	○
TNMG160402	9.525	16.5	4.76	4.4	0.2	○
TNMG160404	9.525	16.5	4.76	4.4	0.4	●
TNMG160408	9.525	16.5	4.76	4.4	0.8	●
VBGT110302	6.35	11.1	3.18	2.8	0.2	○
VBGT110304	6.35	11.1	3.18	2.8	0.4	●

* Additional Sizes Available on Request. ● STOCKABLE ○ NON STOCKABLE

XPD300

Grade for PCD Turning

Insert Table						
Designation	B	L	F	E	R	XPD 300
VBGT160402	9.525	16.6	4.76	4.4	0.2	○
VBGT160404	9.525	16.6	4.76	4.4	0.4	●
VCGT110302	6.35	11.1	3.18	2.8	0.2	○
VCGT110304	6.35	11.1	3.18	2.8	0.4	●
VCGT160402	9.525	16.6	4.76	4.4	0.2	○
VCGT160404	9.525	16.6	4.76	4.4	0.4	●
VCGT160408	9.525	16.6	4.76	4.4	0.8	●
VCGT160412	9.525	16.6	4.76	4.4	1.2	○
VNMG160402	9.525	16.6	4.76	4.4	0.2	○
VNMG160404	9.525	16.6	4.76	4.4	0.4	●
WBGT060102	9.525	6.5	1.59	4.4	0.2	○
WBGT060104	9.525	6.5	1.59	4.4	0.4	○

* Additional Sizes Available on Request. ● STOCKABLE ○ NON STOCKABLE

Parameter

	VC (M/ MIN)	FEED (MM/ REV)	AP (MM)
ALUMINIUM			
4-8% SI	900-3500	0.1-0.4	0.1-0.4
8-13% SI	600-2400	0.1-0.4	0.1-0.4
>13% SI	300-700	0.1-0.4	0.1-0.4
AL SYNTHETIC MATERIALS			
A1/10-20%SI	300-600	0.1-0.4	0.2-1.5
COPPER ALLOYS			
CU/ZN/ BRASS	400-1260	0.03-0.3	0.05-2.0
CERAMICS			
	70-100	0.1-0.4	0.2-1.0
WOOD			
	1000/4000	0.1-0.4	0.1-4.0
COMPOSITE MATERIALS			
CARBON FIBERS	200-2000	0.05-0.3	0.1-3.0

BRAZED CBN

Solution for Hard Part Machining.

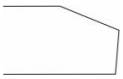
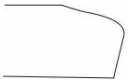


World Class Quality of Brazed CBN inserts capable of Outperforming any Competitor in the Market. All Kinds of Special Inserts & Geometries Available on Request.

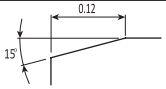
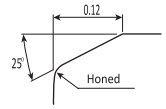
Sr. No.	GRADE	MACHINING MODE	WORK PIECE & APPLICATION
1	XBK7540	BRAZED CBN	Suitable for Continuous Finishing and Semi Finishing of Hardened Steel. Especially Automobile components like gears, shafts, pinions etc
2	XBK7550	BRAZED CBN	Premium Grade Suitable for Continuous Finishing and Semi Finishing of Hardened Steel works on medium interruption as well for automotive components; sometimes available in XBK7500 as well
3	XBK7560	BRAZED CBN	Premium High Content CBN Grade Suitable for heavy interruption of Automobile Hardened Steel components
4	XBK715	BRAZED CBN	Low Content CBN Grade for high speed finishing of Hardened Steel
5	XBK3015	BRAZED CBN	High Content CBN Grade for Cast Iron machining , best suited for boring, upgraded version of XBK315
6	XBK3520	BRAZED CBN	High Content CBN Grade for continuous and interrupted Cast Iron machining, can work on certain SS and high Chrome applications as well

BRAZED CBN

Solution for Hard Part Machining.

Cutting Edge Preparation			Main Function
CODE	CUTTING EDGE PREPARATION	DRAWING	
F	SHARP EDGE		Sharp edge can help to improve surface roughness, and is not easy to cause vibration marks. Over sharp will result in reducing tool life, hence sharp edge is used to machine gray cast iron which requires high roughness.
T	HONING		Honing can reduce micro chipping and improve the integrity of the cutting edge and increase tool life. The heavier the honing, cutting edge strength increase but the heat generation also increases. Hence its used in heavy rigid machines for interrupted cutting.
E	CHAMFER		Chamfer helps to improve impact resistance of the cutting edge. Compared to S cutting edge, it helps to improve surface quality and dimensional stability.
S	CHAMFER + HONING		The cutting edge strength and performance are the best in this geometry. S02020 is widely used in gray cast iron. S01020 is used in hardened steel.

How To Identify Edge Preparation

EDGEPREP				
Symbol	Cutting Edge Spec.	Example		Shape
E	BRAHoned Cutting EdgeZED	E008	R0.08mm Honed	
T	Chamfered Cutting Edge	T01215	0.12mm x 150 Chamfered Cutting Edge	
S	Chamfered Cutting Edge + Honed Cutting Edge	S01225	0.12mm x 250 Chamfered + Honed Cutting Edge	

Cutting Parameters and Coating Details

Material	Application Condition	Cutting Speed(m/min)
HARDENED STEEL	CONTINUOUS	80-200
HARDENED STEEL	CONTINUOUS	80-220
HARDENED STEEL	CONTINUOUS	80-180
HARDENED STEEL	MEDIUM INTERRUPTION	50-120
HARDENED STEEL	HEAVY INTERRUPTION	50-150
CAST IRON	CONTINUOUS	50-350
CHILLED CAST IRON	CONTINUOUS	50-300

COATING	COATING DETAILS	APPLICATION
(C06)	TiCN BASED	CONTINUOUS TO MEDIUM INTERRUPTION MACHINING
(C07)	TIALN BASED	MEDIUM TO HEAVY INTERRUPTED MACHINING

BRAZED CBN

Solution for Hard Part Machining.

INSERT TABLE							
DESIGNATION	POPULAR CHAMFERS	XBK7540*	XBK7550*	XBK7560*	XBK715	XBK3520	XBK3015
CNGAl20404-2S	S01020 S01225 S01525 S02025 S04030	●	●	○	●	○	○
CNGAl20408-2S		●	●	●	●	●	○
CNGAl20408-4S		○	●	○	○	●	○
CNGAl20412-2S		○	●	●	○	○	○
DNGA150404-25		●	●	○	○	●	○
DNGA150408-2S		●	●	●	○	●	○
TNGA160404-3S		●	●	○	●	○	○
TNGA160408-35		●	●	●	●	●	○
TNGA160408-6S		○	●	○	○	○	○
TNGA160412-3S		○	●	●	●	○	○
VNGA160402-2S		●	●	○	○	●	○
VNGA160404-2S		●	●	●	●	○	○
VNGA160408-2S		○	●	●	●	○	○
WNGA080408-3S		○	○	○	○	○	○
CCGW060204-2S		●	●	○	○	○	●
CCGW060208-2S		●	●	●	●	○	●
CCGW09T304-2S		●	●	○	●	○	●
CCGW09T308-2S		○	○	○	○	○	●
DCGW11T302-2S	S01020 S01225 S01525 T00815 T01015 T01020	●	●	○	●	○	●
DCGW11T304-2S		●	●	○	●	●	●
DCGW11T308-2S		○	●	●	●	●	●
TCGW090202-3S		●	●	○	○	○	●
TCGW090204-3S		○	●	○	○	○	●
TCGW110204-3S		●	●	○	○	●	●
TCGW110208-3S		○	●	●	○	●	●
TPGW090202-3S		○	○	○	○	○	●
TPGW090204-3S		○	●	○	○	○	●
TPGW110304-3S		○	●	○	○	●	●
TPGW110308-3S		○	●	●	○	○	●
VBGW160402-2S		●	○	○	●	○	●
VBGW160404-2S		●	●	○	●	●	●
VBGW160408-2S		○	○	○	●	○	●

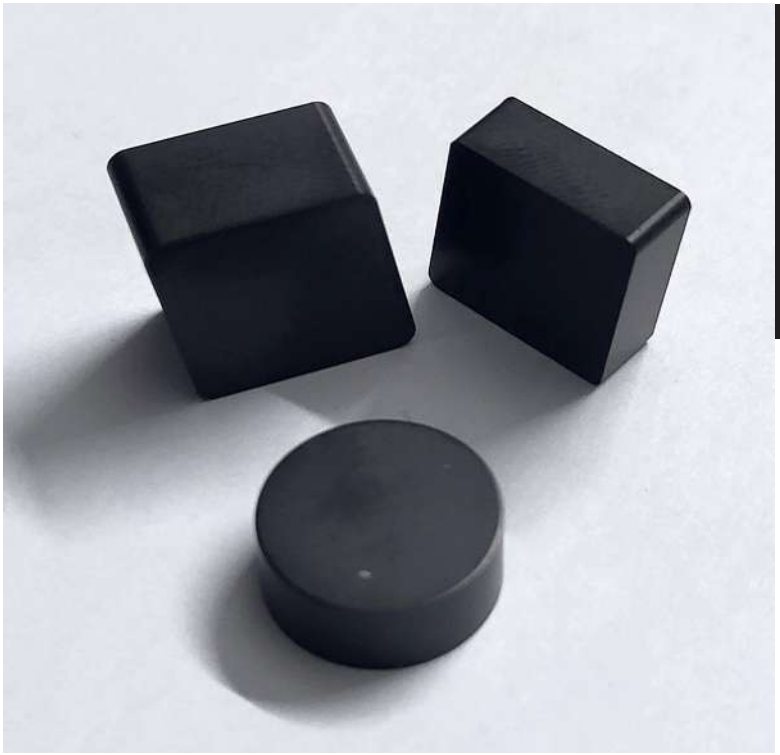
THE ABOVE * MARKED INSERTS ARE OUR POPULER COATING

● STOCKABLE ○ NON STOCKABLE

* Additional Sizes & Chamfers Available on Request & Application Basis.
- Standard Application Tools.
* Ordering Code: CNGA120408-2SS01225-XBK7540(C06)

SOLID CBN

Solution for Hard Part Machining.



World Class Quality of Solid CBN inserts capable of Outperforming any Competitor in the Market. All Kinds of Special Inserts for Brake Drum, Disc, Liner and Mining Industry.

Sr. No.	GRADE	MACHINING MODE	WORKPIECE & APPLICATION
1	XBN7500	Solid CBN	Suitable For Heavy Roughing Of Hi Chrome Steel In Industries Like Mining, Pumps, Construction Etc, better for continuous applications
2	XBN3600-XBN3200	Solid CBN	Premium Grade Suitable For Heavy Roughing To Semi-Finishing Of Cast Iron In Industries Like Brake Drum, Brake Disc, Liners etc. XBN3600 For Negative inserts, XBN3200 for inserts with finishing/Wiper Geometry
3	XBN7000	Solid CBN	Suitable For Heavy Roughing Of Hi Chrome Steel In Industries Like Mining, Pumps, Impellers Etc., better suited for Interrupted applications
4	XBN3000	Solid CBN	Suitable For Heavy Roughing To Semi-Finishing Of Cast Iron In Industries Like Brake Drum, Brake Disc, Liners Etc.

SOLID CBN

Solution for Hard Part Machining.

INSERT TABLE						
DESIGNATION	POPULAR CHAMFERS	XBN3600	XBN3200	XBN3000	XBN7500	XBN7000
CNGN120408	T01010 S02020 S05020 T02020	●	●	●	●	●
CNGN120412		●	●	●	●	●
CNGN120416		●	●	●	●	●
CNGN120708		●	●	●	●	●
CNGN120712		●	●	●	●	●
CNGN120716		●	●	●	●	●
SNGN090408		●	●	●	●	●
SNGN090412		●	●	●	●	●
SNGN120408		●	●	●	●	●
SNGN120412		●	●	●	●	●
TNGN160408		●	●	●	●	●
TNGN160412		●	●	●	●	●
SNGN090408	S01020	●	●	●	●	●
SCGN090408		●	●	●	●	●
RNGN060300	S02020 S05020 S10030 S20020	●	●	●	●	●
RNGN090300		●	●	●	●	●
RNGN120400		●	●	●	●	●
RNGN120700		●	●	●	●	●

● STOCKABLE ○ NON STOCKABLE

- Additional Sizes & Chamfers Available on Request & Application Basis.
- Standard Application Tools.
- Ordering Code:CNGN120412-S02020-XBN3600
- Coated inserts available in XBN7000& XBN7500 on request

COATING	COATING DETAILS	APPLICATION
(C06)	TiCN BASED	Continuous to medium interruption machining
(C07)	TIALN BASED	Medium to heavy interrupted machining

XBN3000	MATERIAL	CUTTING SPEED (m/min)
XBN7000 | XBN7500	Alloy steel	80-200
XBN7500 | XBN3600	Hi-Chrome Steel	50-150
XBN7000	Tempered Steel	80-250
XBN3000	Cast Iron	80-800
XBN3200	Cast Iron	100-800
XBN3600	Cast Iron	100-800

DELTA CBN

Competitive entry point grade for Hard Part & Cast Iron machining !!!



2 Extremely popular and competitive grades XBK3000 & XBK7000 works on all continuous and medium interrupted applications. Can replace carbide and ceramic as well on CPC basis !!!

XCUT GRADE	MACHINING MODEL	FEATURE	MACHINED MATERIAL	
XBK3000	· ROUGH MACHINING · SEMI-FINISHING	· EXCELLENT IMPACT & WEAR RESISTANCE · EXCELLENT UNIVERSAL PERFORMANCE	· HIGH NICKEL-CHROMIUM, HIGH HARDNESS ALLOY CAST IRON AND CAST HIGH SPEED STEEL · GRAY CAST IRON · HIGH MANGANESE STEEL	· ROLL, SLURRY PUMP · BRAKE DISC · ROLLING MORTAR WALL · BRAKE DRUM · PARTS OF COMPRESSOR
XBK7000	· SEMI-FINISHING · FINISHING	· GOOD IMPACT AND WEAR RESISTANCE · EXCELLENT UNIVERSAL PERFORMANCE	· QUENCHED STEEL (HRC45-HRC70) · SURFACE HARDENED MATERIAL	· GEAR · BEARING · MINING MACHINERY · PARTS OF COMPRESSOR

DELTA CBN

Competitive entry point grade for Hard Part & Cast Iron machining !!!

INSERT TABLE					
INSERT	CHAMFER	XBK7000	XBK3000	NO OF CORNERS	
CNGA120404	S01020	CNGA120404-4E-XBK7000	CNGA120404-4E-XBK3000	4	●
CNGA120408	S01020	CNGA120408-4E-XBK7000	CNGA120408-4E-XBK3000	4	●
CNGA120408	S02020	CNGA120408-4E-XBK7000	CNGA120408-4E-XBK3000	4	●
CNGA120412	S02020	CNGA120412-4E-XBK7000	CNGA120412-4E-XBK3000	4	●
DNGA150404	S01020	DNGA150404-4E-XBK7000	DNGA150404-4E-XBK3000	4	●
DNGA150408	S02020	DNGA150408-4E-XBK7000	DNGA150408-4E-XBK3000	4	●
TNGA160404	S01020	TNGA160404-6E-XBK7000	TNGA160404-6E-XBK3000	6	●
TNGA160408	S02020	TNGA160404-6E-XBK7000	TNGA160404-6E-XBK3000	6	●
TNGA160412	S02020	TNGA160404-6E-XBK7000	TNGA160404-6E-XBK3000	6	●
VNGA160404	S01020	VNGA160404-4E-XBK7000	VNGA160404-4E-XBK7000	4	●
VNGA160408	S02020	VNGA160408-4E-XBK7000	VNGA160408-4E-XBK3000	4	●
WNGA080408	S01020	WNGA080408-6E-XBK7000	WNGA080408-6E-XBK3000	6	●
WNGA080412	S02020	WNGA080412-6E-XBK7000	WNGA080412-6E-XBK3000	6	●

● STOCKABLE ○ NON STOCKABLE

Parameter

MATERIAL	RECOMMENDED CUTTING SPEED (m/min)
HARDENED STEEL	60 - 300
GREY CAST IRON	60-600
MANGANESE STEEL	60-300

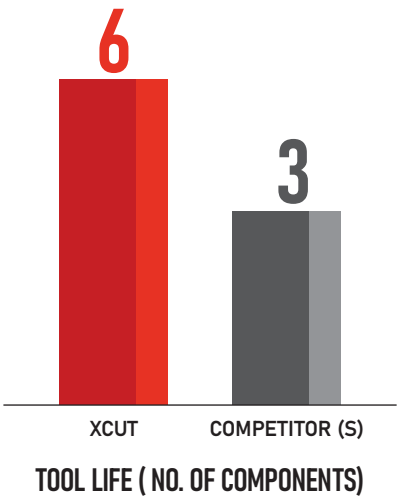
CASE STUDIES

Solution for Hard Part Machining.



DELTA CBN

PRODUCT DESCRIPTION	TNGA160404-6E-XBK7000	
MATERIAL HARDNESS	Con Rod | S48C (58HrC)	
PARAMETERS	COMPETITOR (H)	XCUT
Depth of Cut	0.1 MM	0.1 MM
Vc: m/min	80	80
Fz: mm/tooth	0.08	0.08

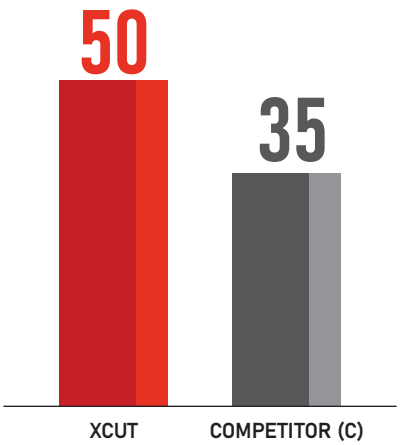


TOOL LIFE (NO. OF COMPONENTS)



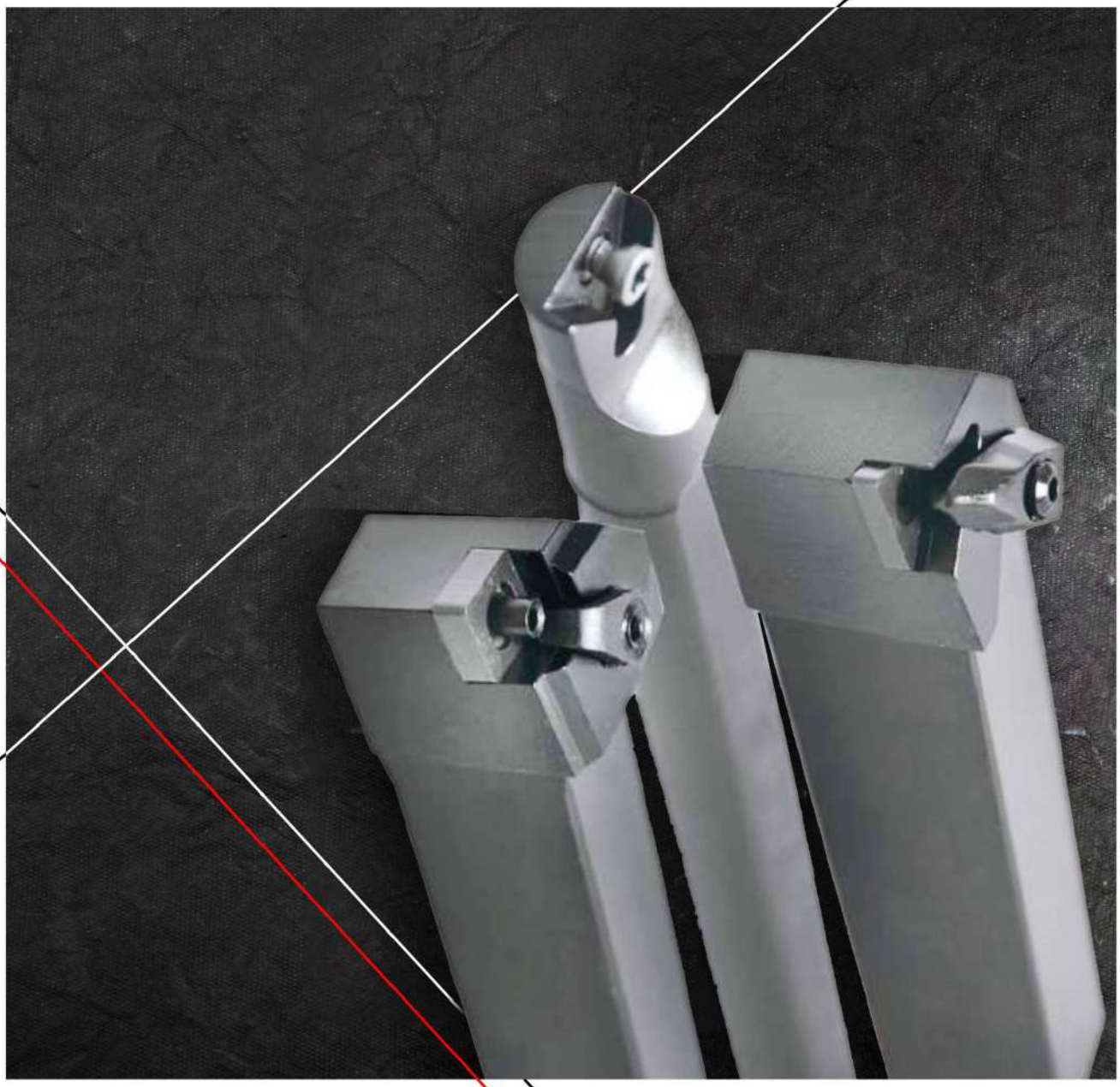
SOLID CBN

PRODUCT DESCRIPTION	CNGN120712-S02020-XBN3000	
MATERIAL & HARDNESS	Brake Drum | Cast Iron (32-35HRC)	
PARAMETERS	COMPETITOR (C)	XCUT
Depth of Cut	1.5 MM	3.0 MM
Vc: m/min	480	600
Fz: mm/tooth	0.25	0.32



TOOL LIFE (NO. OF COMPONENTS)

NOTES



TURNING HOLDER

Best quality screw type and double clamp turning holders & boring bars , which apart from being economically priced and readily available, will increase your tool life as well.

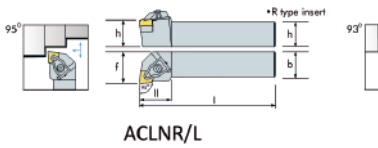
TURNING HOLDERS & BORING BARS

Tool Holders for General Purpose Machining.

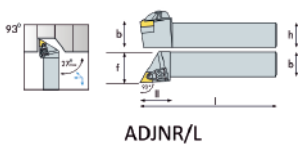


A - Type Holders

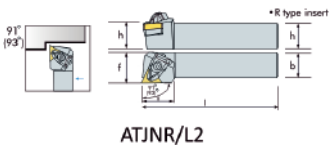
Designation	b	h	l	l1	F	Inserts	Shim	Clamp	Clamp Screw	Insert Screw	Wrench	Spring	Availability
X-ACLNR/L2525-M12	25	25	150	30	32	CNMG12	TC1203	DLM4	DLS4	M5x12T	L3.0 / T20	DSP4	o
X-ADJNR/L2525-M15	25	25	150	39	32	DNMG1506	TD1503	DLM4	DLS4	M5x12T	L3.0 / T20	DSP4	o
X-ATJNR/L2525-M16	25	25	150	25	32	TNMG16	MT1603	DLM3	DLS3	A-M4	L2.5	DSP3	o
X-AWLNR/L2525-M08	25	25	150	25	32	WNMG08	TW0803	DLM4	DLS4	M5x12T	L3.0 / T20	DSP4	o



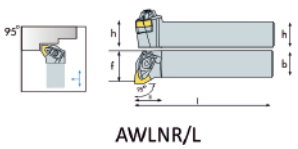
ACLNR/L



ADJNR/L



ATJNR/L2



AWLNR/L

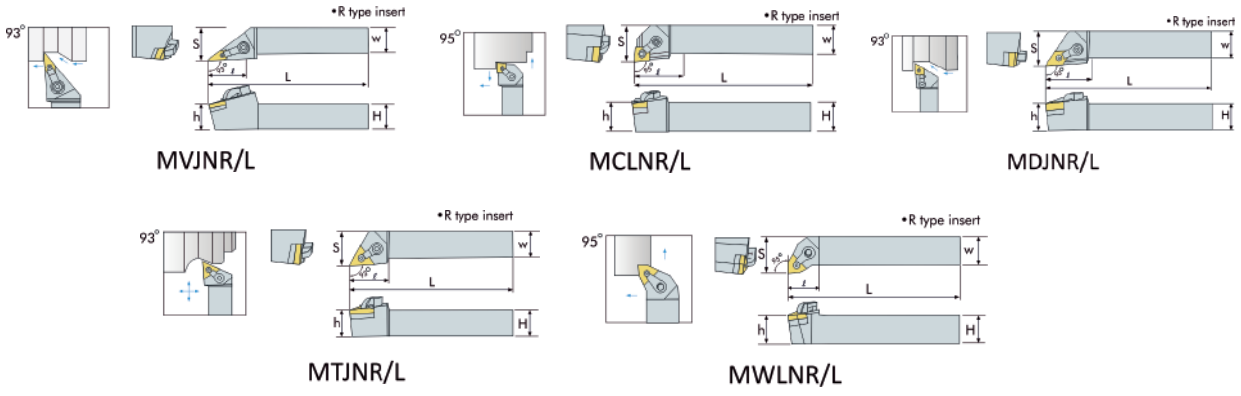


TURNING HOLDERS & BORING BARS

Tool Holders for General Purpose Machining.

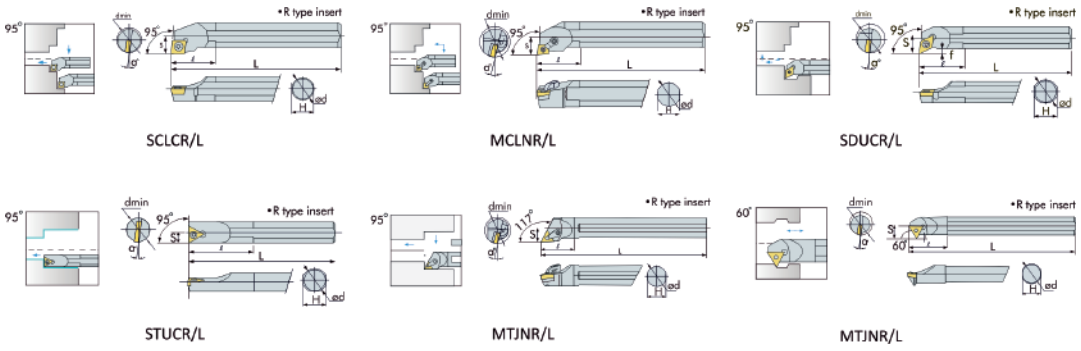
M - Type Holders

Designation	H	W	L	l	H	S	Inserts	Shim	Pin	Clamp	Clamp Screw	Wrench
X-MCLNR/L2020-K12	20	20	125	32	20	25	CNMG12	MC1204	CTM617	HL1814	ML0625	L2.5 / L3.0
X-MCLNR/L2525-M12	25	25	150	32	25	32	CNMG12	MC1204	CTM617	HL1814	ML0625	L2.5 / L3.0
X-MCLNR/L2525-M16	25	25	150	32	25	32	CNMG16	MC1604	CTM822	HL2217	ML0830	L3.0 / L4.0
X-MDJNR/L2525-M15	25	25	150	38	25	32	DNMG1506	MD1506	CTM619	HL2114	ML0625	L2.5 / L3.0
X-MTJNR/L2020-K16	20	20	125	28	20	25	TNMG16	MC1204	CTM617	HL1814	ML0625	L2.5 / L3.0
X-MTJNR/L2525-M16	25	25	150	28	25	32	TNMG16	MC1204	CTM617	HL1814	ML0625	L2.5 / L3.0
X-MVJNR/L2525-M16	25	25	150	42	25	32	VNMG16	MC1604	CTM822	HL2114	ML0625	L2.5 / L3.0
X-MWLNR/L2020-K06	20	20	125	27	20	25	WNMG06	MD1506	CTM619	HL1814	ML0625	L2.5 / L3.0
X-MWLNR/L2020-K08	20	20	125	27	20	25	WNMG06	MC1604	CTM617	HL1814	ML0625	L2.5 / L3.0
X-MWLNRL2525-M06	25	25	150	27	25	32	WNMG06	MD1506	CTM822	HL1814	ML0625	L2.5 / L3.0
X-MWLNR/L2525-M08	25	25	150	27	25	32	WNMG06	MD1506	CTM619	HL1814	ML0625	L2.5 / L3.0



S - Type Boring Bars

Designation	D MIN	Ø D	S	L	l	H	F	a°	INSERTS
X-S08K-SCLCR/L06	9	8	5.5	125	18	7	-	13°	CCMT06
X-S10K-SCLCR/L06	11	10	7	125	22	9	-	12°	CCMT06
X-S12M-SCLCR/L06	13	12	8	150	25	11	-	10°	CCMT06
X-S16Q-SCLCR/L09	17	16	11	180	34	15	-	10°	CCMT09
X-S20Q-SCLCR/L09	21	20	13	180	38	18	-	8°	CCMT09
X-S20Q-MCLNR/L12	23	20	13	180	45	18	-	15°	CNMG12
X-S25R-MCLNR/L12	30	25	17	200	45	23	-	12°	CNMG12
X-S32S-MCLNR/L12	38	32	22.5	250	50	30	-	17°	CNMG12
X-S20Q-SDUCR/L11	23	20	13	180	40	18	2.7	6°	DCMT11
X-S25R-SDUCR/L11	29	25	17	200	42	23	4	5°	DCMT11
X-S10K-STUCR/L11	11	10	6	125	24	9	-	12°	TCMT11
X-S16Q-STUCR/L11	13	12	8	150	27	11	-	10°	TCMT11
X-S20Q-STUCR/L11	17	16	9	180	32	15	-	8°	TCMT11
X-S25R-STUCR/L16	21	20	11	180	37	18	-	6°	TCMT11
X-S25R-MTJNR/L16	26	25	14	200	45	23	-	6°	TCMT16
X-S32S-MTJNR/L16	30	25	17	200	45	23	-	12°	TNMG16
X-S32S-MCLNR/L12	38	32	22	250	54	30	-	17°	TNMG16
X-S20Q-SDUCR/L11	29	20	19	200	45	18	8.5	8°	VBMT16
X-S25R-SDUCR/L11	32	25	20	200	50	23	7	6°	VBMT16
X-S10K-STUCR/L11	38	32	22	200	50	30	5.5	6°	VBMT16



Boring Bar Spares P.T.O

Spares List For S-Type Boring Bar

Designation	Shim	Pin	Clamp	Clamp Screw	Insert Screw	Anvil Screw	Wrench
X-S08K-SCLCR/L06	-	-	-	-	18	-	T-8
X-S10K-SCLCR/L06	-	-	-	-	22	-	T-8
X-S12M-SCLCR/L06	-	-	-	-	25	-	T-8
X-S16Q-SCLCR/L09	-	-	-	-	34	-	T-15
X-S20Q-SCLCR/L09	-	-	-	-	38	-	T-15
X-S20Q-MCLNR/L12	-	CTM613	HL1814	ML0625	-	-	L2.5 / L3.0
X-S25R-MCLNR/L12	-	CTM613	HL1814	ML0625	-	-	L2.5 / L3.0
X-S32S-MCLNR/L12	MC1204	CTM617	HL1814	ML0625	-	-	L2.5 / L3.0
X-S20Q-SDUCR/L11	-	-	13	180	40	-	T-15
X-S25R-SDUCR/L11	-	-	17	200	42	-	T-15
X-S10K-STUCR/L11	-	-	6	125	24	-	T-8
X-S12M-STUCR/L11	-	-	8	150	27	-	T-8
X-S16Q-STUCR/L11	-	-	9	180	32	-	T-8
X-S20Q-STUCR/L11	-	-	11	180	37	-	T-8
X-S25R-STUCR/L16	-	-	14	200	45	-	T-8
X-S25R-MTJNR/L16	-	CTM510	HL1814	ML0625	45	-	L2.5 / L3.0
X-S32S-MTJNR/L16	-	CTM513	HL1814	ML0625	54	-	L2.5 / L3.0
X-S20R-SVUBR/L16	-	-	-	-	M3.5x9	-	T-15
X-S25R-SVUBR/L16	-	-	-	-	M3.5x9	-	T-15
X-S32R-SVUBR/L16	-	-	-	-	M3.5x9	-	T-15



Spares Kit All Type

M Type Holders Spare Kit
SPARE KIT M TYPE CNMG12
SPARE KIT M TYPE CNMG16
SPARE KIT M TYPE DNMG15
SPARE KIT M TYPE TNMG16
SPARE KIT M TYPE VNMG16
SPARE KIT M TYPE WNMG06
SPARE KIT M TYPE WNMG08

A Type Holders Spare Kit
SPARE KIT A TYPE CNMG12
SPARE KIT A TYPE DNMG15
SPARE KIT A TYPE TNMG16
SPARE KIT A TYPE WNMG08

Boring Bar Spare Kit
SPARE KIT BORING BAR CCMT06
SPARE KIT BORING BAR CCMT09
SPARE KIT BORING BAR CNMG12
SPARE KIT BORING BAR DCMT11
SPARE KIT BORING BAR TCMT11
SPARE KIT BORING BAR TNMG16
SPARE KIT BORING BAR VBMT16

NOTES

GROOVING



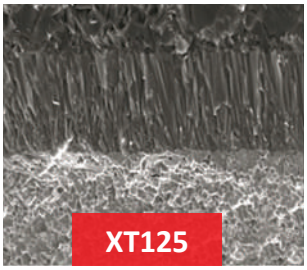
www.xcut.in

NOTES

GROOVING INDEX

Grooving	85-100
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XGDB-XGJ-XDT	97-99

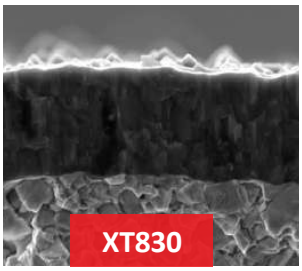
GRADE INFORMATION



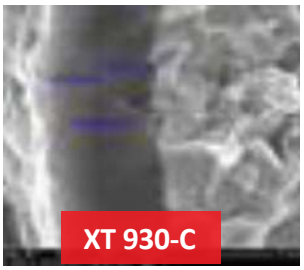
2-4 µ ALCrN+AlCrSiN PVD Coated, Combinating with ultra fine particles substrates with High-Toughness, suitable for all materials in light & medium load Milling. Suitable for Steels, Stainless Steel & High-Temperature high hardness alloys.(Less Chromium & Nickel)



PVD coating with optimal thermal resistance & added strength. Tough carbide substrate designed for demanding application. Suitable for all materials from steels to superalloys.

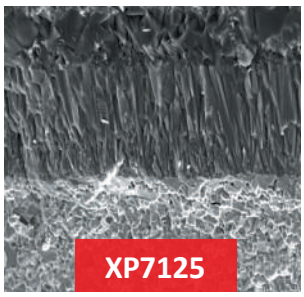


PVD coating with optimal thermal resistance & added strength. Tough carbide substrate designed for demanding application. Suitable for all materials from steels to superalloys.

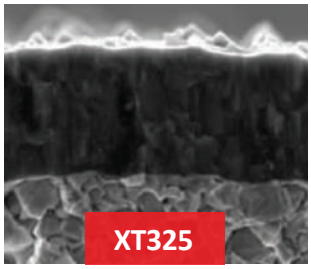


PVD coating with optimal thermal resistance & added strength. Tough carbide substrate designed for demanding application. Suitable for all materials from steels to superalloys.

GRADE INFORMATION



Special structure of Al_2O_3 settled layer has the best thermal barrier performance, high speed dry cutting, ensure resistance to plastic deformation of blade matrix.



PVD coating with optimal thermal resistance & added strength. Tough carbide substrate designed for demanding application. Suitable for all materials from steels to superalloys.

Cutting Speed Recommendation

XTGP-P/GT/R

Workpiece Material		Hardness HB	Coated Carbide		
			XT830	XT930	XP7125
P	Non Alloyed Steel 0.15%-0.45%C	150 - 250	80-180	110-190	80-150
	Low Alloy Steel Tempered	250 - 300	60-150	110-180	70-120
	High Alloy Steel Tempered	350	50-120	70-160	60 - 100
	Corrosion Resistant Steel Annealed	200	50-200	120-200	90-160
M	Annealed Pearlitic	200	50-200	120-200	100-180
	Quenched Austenitic	180	50-180	100-170	80-150
	Quenched Duplex	230-260	50-100	70-110	70-110
	Hardened Martensitic	330	50-80	60-90	60-90
K	Grey Cast Iron	180	100-200	90-180	100-180
	Spheroidal	160	100-180	100-160	80-150
	Malleable Pearlitic	130	80-160	80-150	70-110

Cutting Speed Recommendation

XGDB-XGJ-XDT-XGM-MGMN

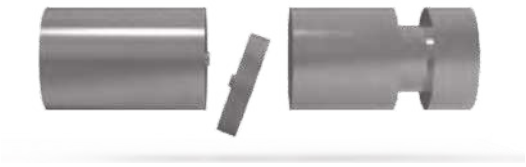
Workpiece Material		Hardness HB		Coated Carbide			
			XT125	XT310	XT325	XT930-C	XP7125
P	Non Alloyed Steel 0.15%-0.45%C	150 - 250	80-180	80-180	80-200	110-190	80-220
	Low Alloy Steel Tempered	250 - 300	60-150	60-160	60-170	110-180	70-140
	High Alloy Steel Tempered	350	50-120	50-120	50-110	100-180	50-150
	Corrosion Resistant Steel Annealed	200	50-200			120-200	90-160
M	Annealed Pearlitic	200	50-200	50-150	50-150	120-200	100-180
	Quenched Austenitic	180	50-180	50-120	50-120	100-170	80-150
	Quenched Duplex	230-260	70-110			70-110	
	Hardened Martensitic	330	60-90			60-90	
K	Grey Cast Iron	180	100-200	100-200	80-200	90-180	
	Spheroidal	160	100-180	100-180	100-180	100-160	80-150
	Malleable Pearlitic	130	80-160	80-160	80-150	80-150	70-110

XTGP
CHIPBREAKER OVERVIEW

P-Medium Cutting Chipbreaker



- Insert with narrow negative chamfer
- Suitable for all steel materials with high strength
- Suitable for all application
- For steel and gray cast iron



Parting Grooving

GT-Grooving and Turning



- For grooving and turning
- Suitable for all steel and stainless steel material
- Very good chip control



Parting Grooving Turning

R-Radius Grooves



- Insert for radius grooves
- For copy turning
- Suitable for all steel and cast iron materials



Grooving Turning

XTGP



DESIGNATION	INSERT WIDTH	Insert Length	CORNER RADIUS	XT830	XT930	XP7125	FEED RATE
XTGP2002-P	2	24	0.2	●	○	○	0.05-0.16
XTGP2002-GT	2	24	0.2	●	●	○	0.05-0.12
XTGP2010-R	2	24	1.0	●	●	○	0.08 0.25
XTGP3002-P	3	24	0.2	●	○	○	0.11-0.20
XTGP3003-GT	3	24	0.3	●	○	○	0.06-0.16
XTGP3015-R	3	24	1.5	●	●	○	0.11-0.30
XTGP4003- P	4	24	0.3	●	○	○	0.13-0.22
XTGP4004-GT	4	24	0.4	●	●	○	0.11-0.21
XTGP4020-R	4	24	2.0	●	●	○	0.15-0.36
XTGP5004-P	5	24	0.4	●	○	○	0.16-0.31
XTGP5004-GT	5	24	0.4	●	○	○	0.11-0.23
XTGP5025--R	5	24	2.5	●	○	○	0.17-0.30
XTGP6004-P	6	24	0.4	●	○	○	0.16-0.35
XTGP6004-GT	6	24	0.4	●	●	○	0.13-0.25
XTGP6030-R	6	24	3.0	●	●	○	0.14-0.40

● STOCKABLE ○ NON STOCKABLE

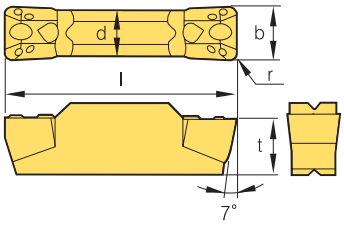
HOLDER SPECIFICATION

HOLDER DESIGNATION	HOLDER TYPE -ORIENTATION	SHANK DIA	OAL	TMAX	"APPLICABLE INSERT"	AVAILABILITY
XTGMEL-16-J-02T13	EXTERNAL-LEFT HAND	16	110	13	XTGP20 ...	○
XTGMEL-20-K-02T13	EXTERNAL-LEFT HAND	20	125	13	XTGP20 ...	●
XTGMEL-25-K-02T13	EXTERNAL-LEFT HAND	25	125	13	XTGP20 ...	●
XTGMEL-25-K-02T20	EXTERNAL-LEFT HAND	25	125	20	XTGP20 ...	○
XTGMEL-20-K-03T13	EXTERNAL-LEFT HAND	20	125	13	XTGP30 ...	●
XTGMEL-20-K-03T25	EXTERNAL-LEFT HAND	20	125	25	XTGP30 ...	○
XTGMEL-25-K-03T13	EXTERNAL-LEFT HAND	25	125	13	XTGP30...	●
XTGMEL-25-K-03T25	EXTERNAL-LEFT HAND	25	125	25	XTGP30 ...	●
XTGMEL-20-K-04T15	EXTERNAL-LEFT HAND	20	125	15	XTGP40 ...	○
XTGMEL-20-K-04T25	EXTERNAL-LEFT HAND	20	125	25	XTGP00 ...	○
XTGMEL-25-K-04T15	EXTERNAL-LEFT HAND	25	125	15	XTGP40 ...	○
XTGMEL-25-K-04T25	EXTERNAL-LEFT HAND	25	125	25	XTGP40 ...	●
XTGMEL-25-M-05T25	EXTERNAL-LEFT HAND	25	125	25	XTGP50 ...	●
XTGMEL-25-M-06T25	EXTERNAL-LEFT HAND	25	150	25	XTGP60 ...	○
XTGMEL-32-M-06T32	EXTERNAL-LEFT HAND	32	150	32	XTGP60 ...	○
XTGMER-16-J-02T13	EXTERNAL-LEFT HAND	16	150	13	XTGP20 ...	○
XTGMER-20-K-02T13	EXTERNAL-RIGHT HAND	20	110	13	XTGP20 ...	●
XTGMER-25-K-02T13	EXTERNAL-RIGHT HAND	25	125	13	XTGP20 ...	●
XTGMER-25-K-02T20	EXTERNAL-RIGHT HAND	25	125	20	XTGP20 ...	○
XTGMER-20-K-03T13	EXTERNAL-RIGHT HAND	20	125	25	XTGP30...	●
XTGMER-20-K-03T25	EXTERNAL-RIGHT HAND	25	125	13	XTGP30...	○
XTGMER-25-K-03T13	EXTERNAL-RIGHT HAND	25	125	25	XTGP30...	●
XTGMER-25-K-03T25	EXTERNAL-RIGHT HAND	25	125	15	XTGP30...	●
XTGMER-20-K-04T15	EXTERNAL-RIGHT HAND	20	125	25	XTGP40 ...	○
XTGMER-20-K-04T25	EXTERNAL-RIGHT HAND	20	125	15	XTGP40 ...	○
XTGMER-25-K-04T15	EXTERNAL-RIGHT HAND	25	125	25	XTGP40 ...	●
XTGMER-25-K-04T25	EXTERNAL-RIGHT HAND	25	125	25	XTGP40 ...	●
XTGMER-25-M-05T25	EXTERNAL-RIGHT HAND	25	150	25	XTGP50...	○
XTGMER-25-M-06T25	EXTERNAL-RIGHT HAND	25	150	25	XTG P60...	○
XTGMER-32-M-06T32	EXTERNAL-RIGHT HAND	32	150	32	XTGP60 ...	○

● STOCKABLE ○ NON STOCKABLE

XGM-MGMN

DESIGNATION		b	r	l	d	t	XT310	XT125	XP7125	XT930-C
MGMN150-G	XGM150-P	1.5	0.15	16	1.2	3.5	●			○
MGMN200-T	XGM02002-N	2.0	0.2	16	1.6	3.5	●	●	●	●
	XGM02520-N	2.5	0.2	18.5	2.0	3.85	●	●	●	●
MGMN300-T	XGM03004-N	3.0	0.4	21	2.35	4.8	●	●	●	●
MGMN400-T	XGM04004-N	4.0	0.4	21	3.3	4.8	●	●	●	●
MGMN500-T	XGM05008-N	5.0	0.8	26	4.1	5.8	●	●	●	●
	XGM12010-R	2.0	1.0	16	1.55	3.5	○			●
	XGM3015-R	3.0	1.5	21	2.35	4.8	○			●
	XGM4020- R	4.0	2.0	21	3.3	4.8	○			●



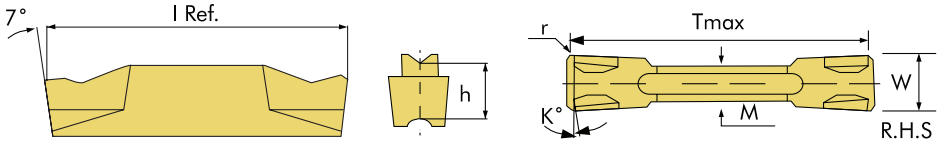
● STOCKABLE ○ NON STOCKABLE

MGEHR / L

DESIGNATION	H=h	W	L	S	T-max	INSERTS	SCREW	WRENCH	AVAILABILITY
MGEHR/L2020-02	20	20	125	20.25	15	MGMN200	M5X16N	L4.0	●
MGEHR/L2525-02	25	25	150	25.25	15				○
MGEHR/L2020-03	20	20	125	20.4	19	MGMN300	M6X20N	L5.0	●
MGEHR/L2525-03	25	25	150	25.4	19				●
MGEHR/L2020-04	20	20	125	20.4	19	MGMN400			●
MGEHR/L2525-04	25	25	150	25.4	19				○
MGEHR/L2525-05	25	25	150	25.5	24	MGMN500			●

● STOCKABLE ○ NON STOCKABLE

Insert Details



XGDB: Double ended inserts for parting and grooving with "C" type chip breaker

Description	W+/-0.05	r	M	l	K	h	Feed range(mm/rev)	XT110	XT310	XT325
XGDB02	2.0	0.20	1.7	20	0-15	4.7	0.05-018	●	●	●
XGDB03	3.0	0.20	2.4	20	0-15	4.7	0.05-0.2	●	●	●
XGDB04	4.0	0.30	3.0	20	0-15	4.7	0.05-0.2	●	●	●
XGDB05	5.0	0.30	4	25	0-4	5.2	0.07-0.22			●
XGDB06	6.0	0.30	5	25	0.00	5.20	0.08-0.24			●

● STOCKABLE ○ NON STOCKABLE

XGJ: Double ended inserts for parting and grooving with "J" type chip breaker

Description	W+/-0.05	r	M	l	K	h	Feed range(mm/rev)	XT310	XT325
XGJ02	2.0	0.20	1.70	20	0.15	4.70	0.04-018	●	●
XGJ03	3.0	0.20	2.40	20	0.15	4.70	0.04-0.2	●	●
XGJ04	4.0	0.30	3.0	20	0.15	4.70	0.05-0.2	●	●

● STOCKABLE ○ NON STOCKABLE

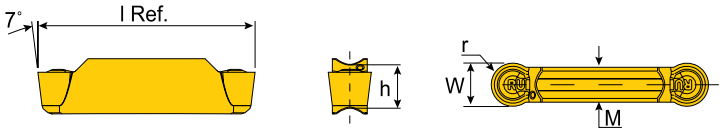
XDT: Double ended inserts for parting and grooving with "T" type chip breaker

Description	W+/-0.05	r	M	l	h	Ap range(mm)	Feed range(mm/rev)	XT110	XT310	XT325
XDT03	3.0	0.20	2.4	20	4.7	0.3-2.0	0.07-0.2	●	●	●
XDT04	4.00	0.30	3.00	20.00	4.7	0.5-2.4	0.09-0.22	●	●	●
XDT05	5.00	0.40	4.00	25.00	5.20	0.5-2.3	0.08-0.23			●

● STOCKABLE ○ NON STOCKABLE

XDT FULL RADIUS:

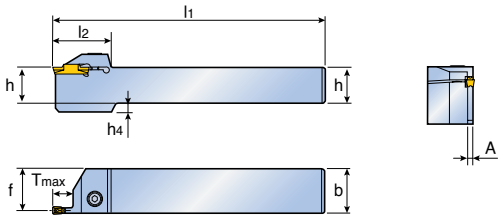
Suitable for Radius grooving and Turning



Description	W+/-0.05	r	M	l	h	R	AP range(mm)	Feed range(mm/rev)	XT325
XDT02-010	2	1	2.	20	5.	010R	0-1.0	0.05-0.15	●
XDT03-150	3.0	1.50	2.	20	5.	015R	0-1.50.0	0.08-018	●
XDT04-020	4.0	2.00	3.0	20	5.	020R	0-2.00.0	0.1-0.2	●
XDT05-025	5	2.50	4	25	5.	025R	0-2.5.0	0.1-0.23	●

● STOCKABLE ○ NON STOCKABLE

TTER / L



Designation	H	B	L	F	E	A	Tmax	Inserts	Screw	Wrench	AVAILABILTY
TTER/L 2020-2T08	20	20	125	19.1	33	1.8	8.0	XGDB02 / XGJ02	M5x16N	L-W4	○
TTER/L 2525-2T08	25	25	150	24.1							○
TTER/L 2020-02	20	20	125	19.1	32		12.0				●
TTER/L 2525-02	25	25	150	24.1							●
TTER/L 2020-2T17	20	20	125	19.1	37		17.0				●
TIER/L 2525-2T17	25	25	150	24.1							●
TTER/L 2020-3T09	20	20	125	18.8	32	2.4	9.0	XGDB03 / XGJ03/ XDT03			○
TTER/L 2525-3T09	25	25	150	23.8							○
TTER/L 2020-03	20	20	125	18.8			12.0				●
TIER/L 2525-03	25	25	150	23.8							●
TTER/L 2020-3T20	20	20	125	18.8	38		20.0				●
TTER/L 2525-3T20	25	25	150	23.8							●
TIER/L 2020-4T10	20	20	125	18.8	32	3.0	10	XGDB04 / XGJ04/ XDT04	M6x16N	L-W5	○
TTER/L 2525-4T10	25	25	150	23.8							○
TTER/L 2020-04	20	20	125	18.8	33		15.0				●
TTER/L 2525-04	25	25	150	23.8							●
TTER/L 2020-4T25	20	20	125	18.8	45		25.0				●
TTER/L 2525-4T25	25	25	150	23.8							●

● STOCKABLE ○ NON STOCKABLE

Holder For Swiss Machines



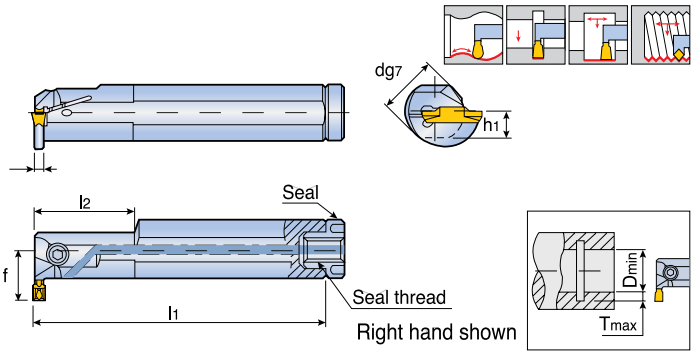


Description	Stock		Dimensions (mm)							Spare Parts		
	R	L	h	b	f2	A	h4	H2	Dmax	Screw	Wrench	Insert
TTER/L12-02T12	●	●	12	12	125	20	12	1	16	M4.0*16	T20	XG...02
TTER/L12-03T12	●	●	12	12	125	20	12	1	16	M4.0*16	T20	XG...03/XD...03
TTER/L16-02T12	●	●	16	16	125	24	16	1	20	M4.0*16	T20	XG...02
TTER/L16-03T12	●	●	16	16	125	24	16	1	20	M4.0*16	T20	XG...03/XD...03

TTIR / L

Internal Grooving Holder





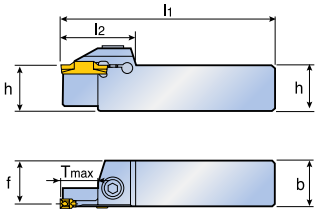
Description	Insert seat size	Size								Inserts	Availability
		D	L1	L2	F	H1	A	T-Max	D-Min		
TTIR/L 16-2C	2	16	125	-	16.5	7.5	1.8	8.5	25	XGDB/ XGJ/ XDT	●
TTIR/L 20-2C		20	160	40	15.8	9.0	1.6	6.0	25		●
TTIR/L 25-2C		25	200		17.5	11.5		5.0	25		●
TTIR/L 32-2C-T8		32	250		24.8	14.0	1.8	8.0	36		○
TTIR/L 20-3C	3	20	160		15.8	9.0	2.1	6.0	25		●
TTIR/L 25-3C		25	200		17.5	11.5		5.1	25		●
TTIR/L 32-3C		32	250	60	20.8	14.0	2.1	4.7	31		○
TTIR/L 20-4C	4	20	160	40	15.8	9.0	2.9	6.0	25		○
TTIR/L 25-4C		25	200		17.5	11.5		5.2	25		●
TTIR/L 32-4C		32	250	60	20.8	14.0	2.9	4.7	31		○
TTIR/L 32-4C-T10		32	250		27.0	15.0	3.0	10	40		○
TTIR/L 25-5C	5	25	200	40	17.3	11.5	3.9	5.2	31		●
TTIR/L 32-5C		32	250	60	20.8	14.0		4.7	31		○
TTIR/L 32-5C-T10		32	250		27.0	15.0	3.85	10	40		○

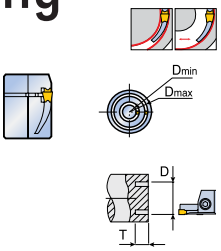
● STOCKABLE ○ NON STOCKABLE

TTFR / L-RN (RENEWED TYPE)

Deep Face Grooving and Turning







Descriptio	Insert seat size	Size								Inserts	Availability
		H	B	Ll	F	L2	T-Max	D-Min	D-Max		
TTFR/L 20-21-30-3T10RN	3	20	20	140	19.0	31	10	21	30	XGDB/ XGJ/ XDT	O
TTFR/L 20-24-35-3T10RN								24	35		O
TTFR/L 20-29-40-3T10RN								29	40		O
TTFR/L 20-34-50-3T10RN								34	50		O
TTFR/L 20-44-70-3T15RN						35	15	44	70		O
TTFR/L 20-64-100-3T10RN								64	100		O
TTFR/L 25-30-3 RN		25	25	150	24.0	38	10	24	35		O
TTFR/L 25-35-3 RN								29	40		O
TTFR/L 25-40-3 RN								34	50		O
TTFR/L 25-50-3 RN							15	44	70		O
TTFR/L 25-70-3 RN								64	100		O
TTFR/L 20-19-30-4T10RN	4	20	20	140	18.6	31	10	19	30		O
TTFR/L 20-22-36-4T10 RN								22	36		O
TTFR/L 20-28-42-4116 RN						36	16	28	42		O
TTFR/L 20-34-50-4T16 RN								34	50		O
TTFR/L 20-42-70-4T16 RN								42	70		O
TTFR/L 20-62-120-4T16 RN								62	120		O
TTFR/L 20-112-200-4T16 RN								112	200		O
TTFR/L 25-30-4 RN		25	25	150	23.6	39	10	22	36		O
TTFR/L 25-36-4 RN							20	28	42		O
TTFR/L 25-42-4 RN								34	50		O
TTFR/L 25-50-4 RN								42	70		O
TTFR/L 25-70-4 RN								62	120		O
TTFR/L 25-120-4 RN								112	200		O
TTFR/L 25-200-4 RN								200	0		O
TTFR/L 25-60-5T15 RN	5				231.	41	15	50	80		O
TTFR/L 25-60-5 RN						49	25	50	80		O
TTFR/L 25-80-5T15 RN						41	15	70	110		O
TTFR/L 25-80-5 RN						49	25	70	110		O
TTFR/L 25-110-5 RN								100	150		O
TTFR/L 25-150-5 RN								140	200		O
TTFR/L 25-200-5 RN								200			O

● STOCKABLE ○ NON STOCKABLE

NOTES


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THREADING

NOTES

THREADING INDEX

Threading	101-162
Grade Information	104-105
Thread Turning Inserts-Moulded	106-113
Thread Turning Inserts-Ground	114-150
Thread Turning ToolHolders	151-156
Thread Turning Technical Section	157-162

GRADE INFORMATION



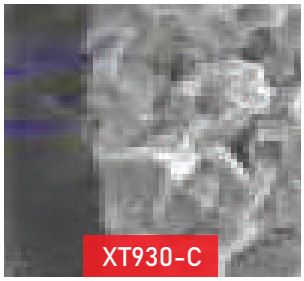
P20-P35 | M10-M20 | K20-K30

- Grade For Moulded Insert
- SPECIAL TiAlN Coating With added toughness
- Universal grade which workon all materials and all applications
- Wide Variety of threads including ISO, UN, W, NPT, BSPT and partical Profile



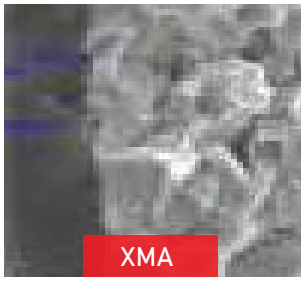
P10-P25 | M10-M25 | K10-K20

- Grade For Moulded Insert
- 2-4 µ ALCrN+AlCrSiN PVD Coated, Combinating with ultra fine particles'substrates with High-Toughness, suitable for threading.
- Suitable for Steels, Stainless Steel & High-Temprature high hardness alloys. (Less Chromium & Nickel)
- Extremely useful in production applications



P10-P25 | M10-M25 | S05-S15

- Grade For Moulded Insert
- Ultrafine grain matrix, newly upgraded nano composite coating with high heat resistance and high toughness
- Suitable for steel, and stainless steel, with better wear resistance.



P20-P40 | K20-K30

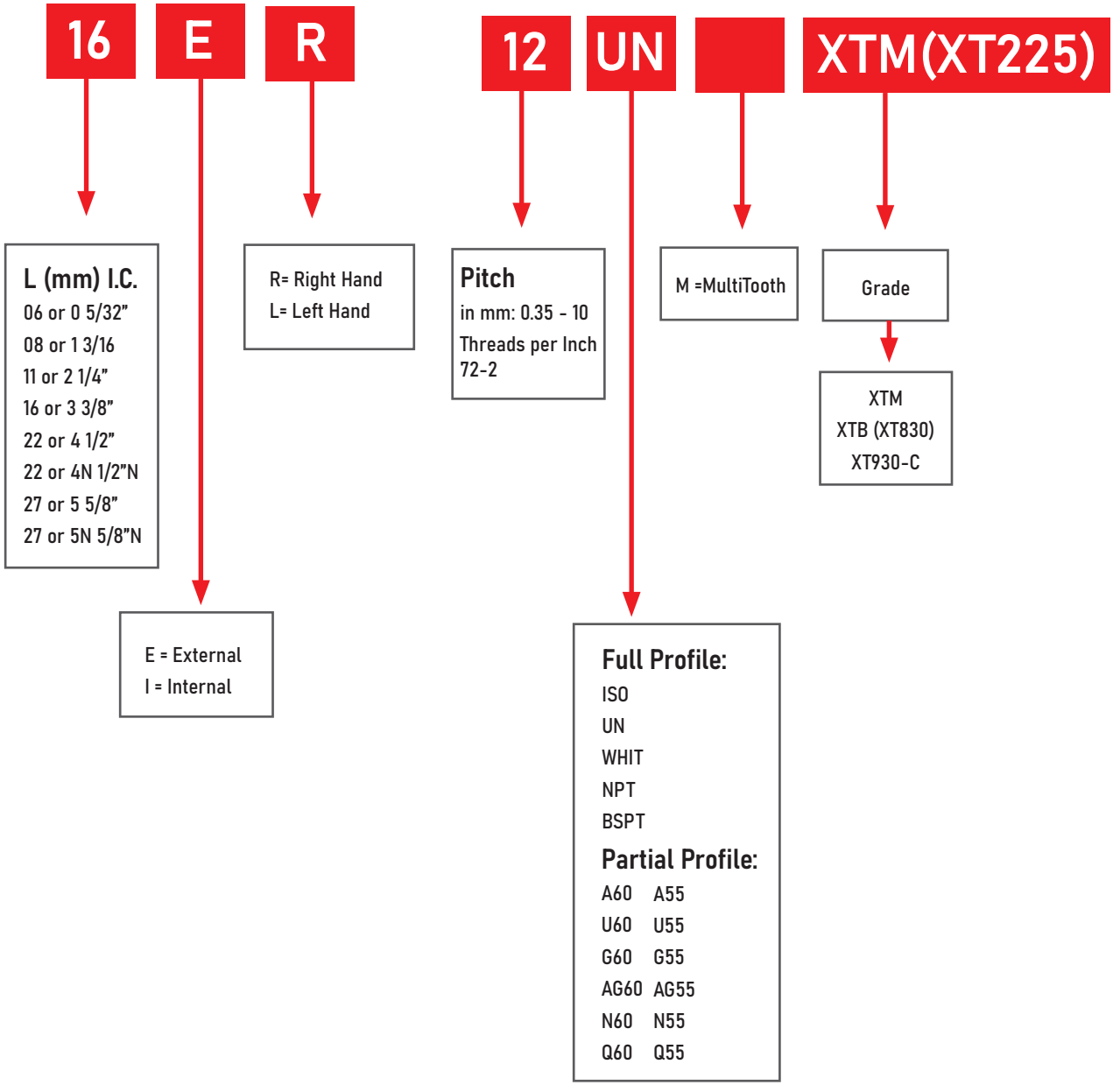
- Ground Insert
- PVD TiALN coated sub-micrograin grade for steels and sticky/exotic materials, at medium to high cutting speeds

THREAD TURNING INSERTS-MOULDED

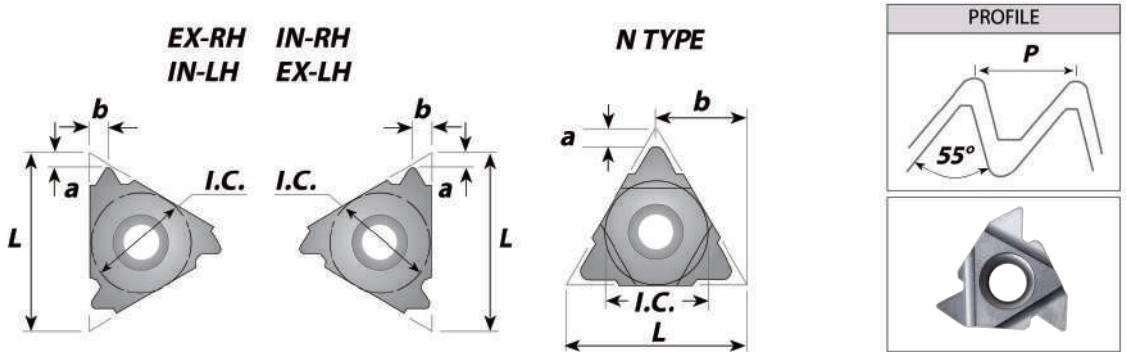
THREAD TURNING NOMENCLATURE

| PRODUCT DESIGNATION

| EXAMPLE: 16ER12UN



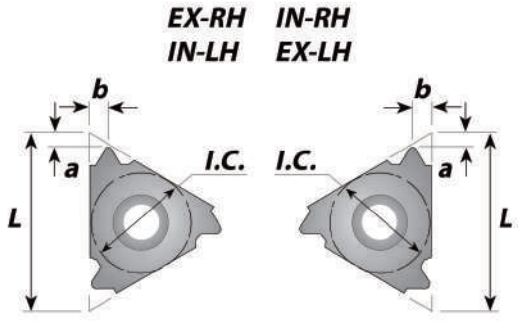
PARTIAL PROFILE 55°

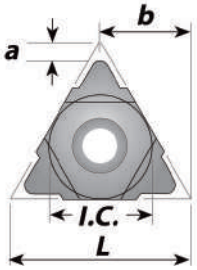


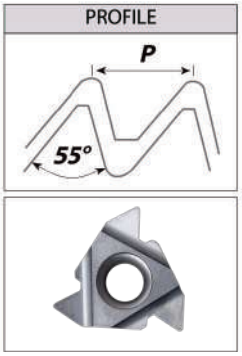
(Item Number)	(Pitch)		(Length)	(Dimensions in mm)		XTM	XTB	XT930-C
	mm	(TPI)	L	a	b			
11ERA55	0.5	48	11	0.8	0.9	●	●	○
11IRA55	1.5	16	50	7		●	●	○
16ERAG55	0.5 - 3.0	48 - 8	16	1.2	1.7	●	●	●
16IRAG55								
16ERA55	0.5 - 1.5	48 - 16	16	0.8	0.9	●	●	●
16IRA55								
161ERG55	1.75 - 3.0	14 - 8	16	1.2	1.7	●	●	●
16IRG55								

● STOCKABLE ○ NON STOCKABLE

ISO-METRIC



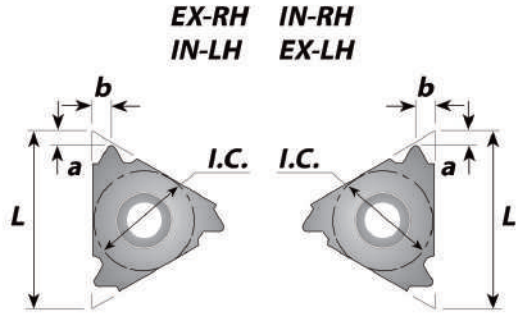


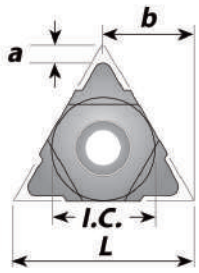


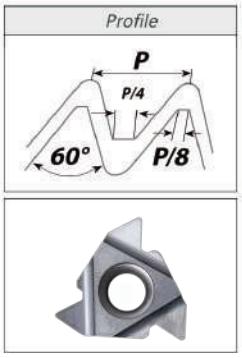
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XTM	XTB	XT930-C
	mm	L	a	b			
11ER1.0ISO	1.0	11	0.7	0.7	●	●	○
11IR1.0ISO			0.6	0.7	●	●	○
11ER1.25ISO	1.25	11	1.2	1.7	●	●	○
11IR1.25ISO							
11ER1.5ISO	1.5	11	0.8	0.9	●	●	○
11IR1.5ISO							
11ER2.0ISO	2.0	11	0.8	1.1	●	●	○
11IR2.0ISO	2.0	11	0.8	0.9	●	●	○

● STOCKABLE ○ NON STOCKABLE

ISO-METRIC



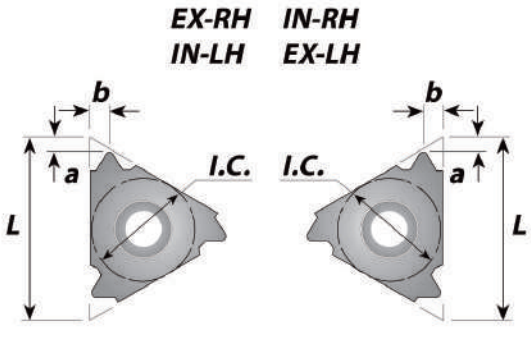


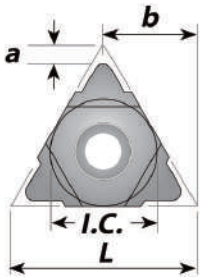


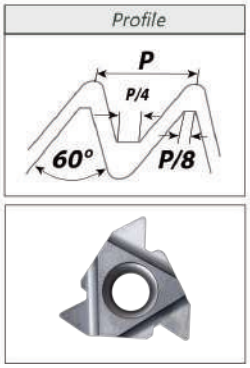
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XTM	XTB	XT930-C
	mm	L	a	b			
16ER1.0ISO	1.0	16	0.7	0.7	●	●	●
16IR1.0ISO			0.6	0.7	●	●	●
16ER1.25ISO	1.25	16	0.8	0.9	●	●	●
16IR1.25ISO							
16ER1.5ISO	1.5	16	0.8	1.0	●	●	●
16IR1.5ISO							
16ER1.75ISO	1.75	16	0.8	1.2	●	●	●
16IR1.75ISO							
16ER2.0ISO	2.0	16	1.0	1.3	●	●	●
16IR2.0ISO							
16ER2.5ISO	2.5	16	1.1	1.5	●	●	●
16IR2.5ISO							
16ER3.0ISO	3.0	16	1.2	1.6	●	●	●
16IR3.0ISO			1.1	1.5	●	●	●
16ER3.5ISO	3.5	16	1.2	1.7	●	●	●
16IR3.5ISO							

● STOCKABLE ○ NON STOCKABLE

ISO-METRIC



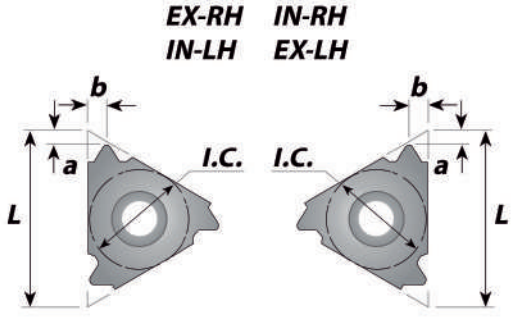


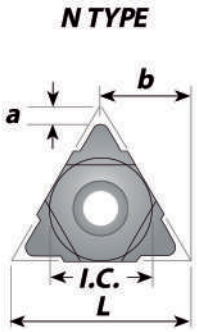


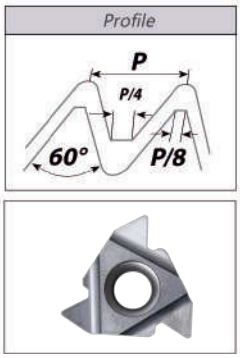
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XTM	XTB	XT930-C
	mm	L	a	b			
22ER3.5ISO	3.5	22	1.6	2.3	●	●	○
22IR3.5ISO							
22ER4.0ISO	4.0	22	1.6	2.3	●	●	○
22IR4.0ISO							
22ER4.5ISO	4.5	22	1.7	2.4	●	●	○
22IR4.5ISO			1.6	2.4	●	●	○
22ER5.0ISO	5.0	22	1.7	2.5	●	●	○
22IR5.0ISO			1.6	2.3	●	●	○
22IR5.5ISO	5.5	22	1.6	2.3	●	●	○
22ER6.0ISO*	6.0	22	1.9	2.7	●	●	○
22IR6.0ISO			1.6	2.4	●	●	○

● STOCKABLE ○ NON STOCKABLE

UN UNIFIED UNC, UNF, UNEF, UNS



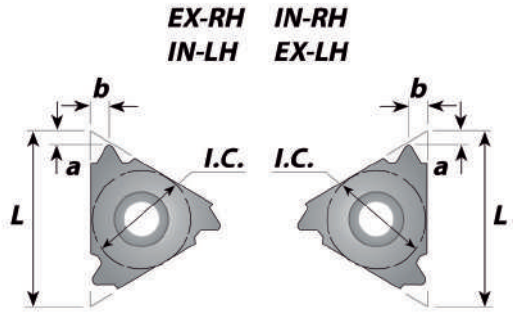


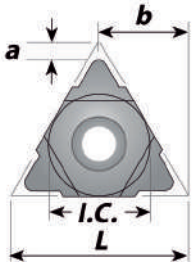


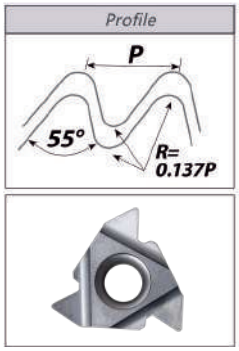
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XTM	XTB	XT930-C
	mm	L	a	b			
16ER24UN	24	16	0.7	0.8	●	●	●
16IR24UN							
16ER20UN	20	16	0.8	0.9	●	●	●
16IR20UN							
16ER18UN	18	16	0.8	1.0	●	●	●
16IR18UN							
16ER16UN	16	16	0.9	1.1	●	●	●
16IR16UN							
16ER14UN	14	16	1.0	1.2	●	●	●
16IR14UN			0.9	1.2			
16ER12UN	12	16	1.1	1.4	●	●	●
16IR12UN							
16ER10UN	10	16	1.1	1.5	●	●	●
16IR10UN							
16ER8UN	8	16	1.2	1.6	●	●	●
16IR8UN			1.1	1.5			

● STOCKABLE ○ NON STOCKABLE

WHITWORTH 550 BSW,BSF, BSP, BSB



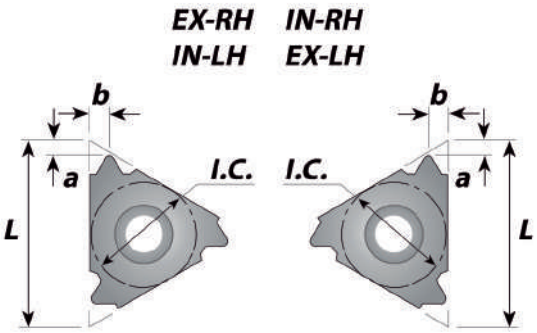


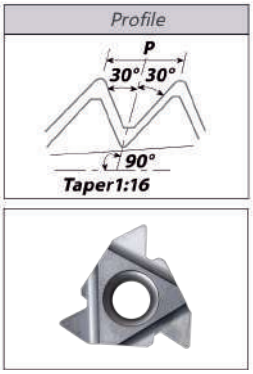


(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XTM	XTB	XT930-C
	(TPI)	L	a	b			
16ER19W	19	16	0.8	1.0	●	●	○
16IR19W	19	16	0.8	1.0	●	●	○
16ER14W	14	16	1.0	1.2	●	●	○
16IR14W	14	16	1.0	1.2	●	●	○
16ER12W	12	16	1.1	1.4	●	●	○
16IR12W	12	16	1.1	1.4	●	●	○
16ER11W	11	16	1.1	1.5	●	●	○
16IR11W	11	16	1.1	1.5	●	●	○

● STOCKABLE ○ NON STOCKABLE

NPT

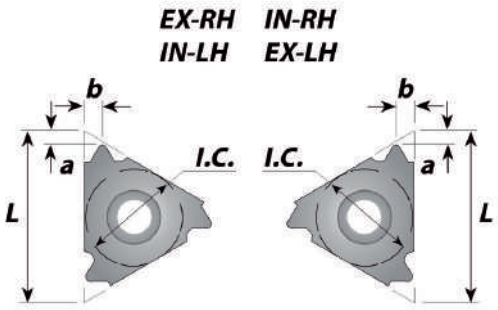


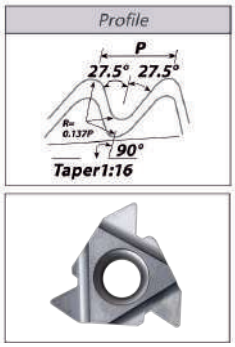


(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XTM	XTB	XT930-C
	mm	L	a	b			
16ER18NPT	18	16	0.8	1.0	●	●	○
16IR18NPT							
16ER14NPT	14	16	0.9	1.2	●	●	○
16IR14NPT							
16ER11.5NPT	11.5	16	1.1	1.5	●	●	○
16IR11.5NPT							
16ER8NPT	8	16	1.3	1.8	●	●	○
16IR8NPT							

● STOCKABLE ○ NON STOCKABLE

BSPT





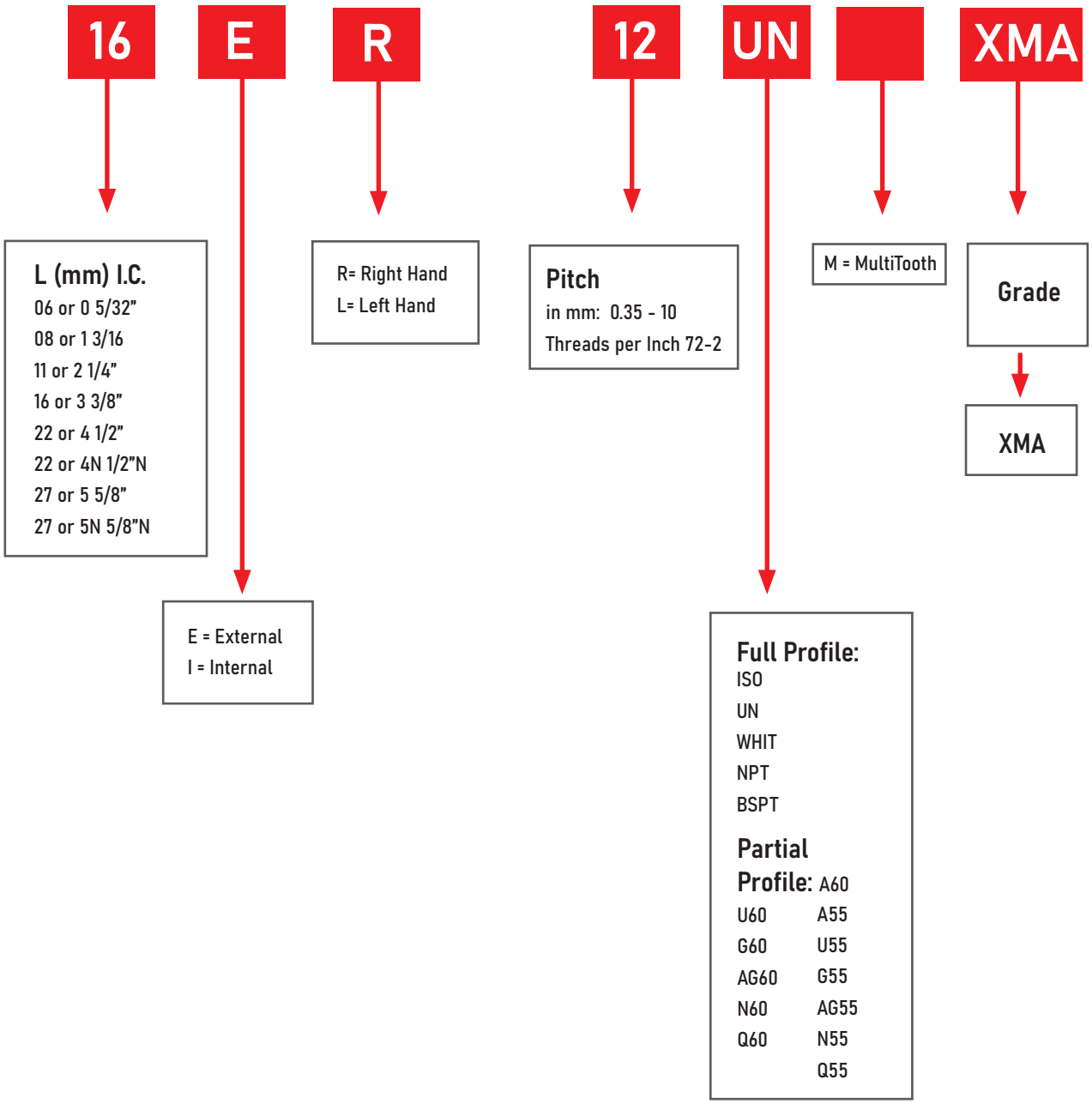
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XTM	XTB	XT930-C
	mm	L	a	b			
16ER19BSPT	19	16	0.8	0.9	●	●	○
16IR19BSPT	19	16	0.8	0.9	●	●	○
16ER14BSPT	14	16	1.0	1.2	●	●	○
16IR14BSPT	14	16	1.0	1.2	●	●	○
16ER11BSPT	11	16	1.1	1.5	●	●	○
16IR11BSPT	11	16	1.1	1.5	●	●	○

● STOCKABLE ○ NON STOCKABLE

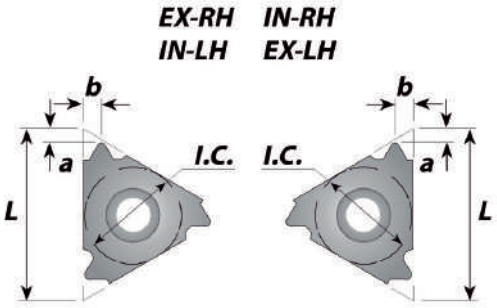
THREAD TURNING INSERTS-GROUND

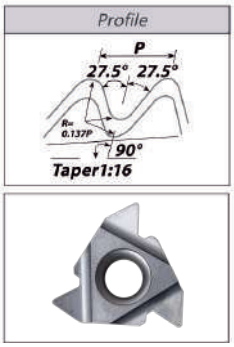
THREAD TURNING NOMENCLATURE

| PRODUCT DESIGNATION
| EXAMPLE: 16ER12UN



PARTIAL PROFILE 60°

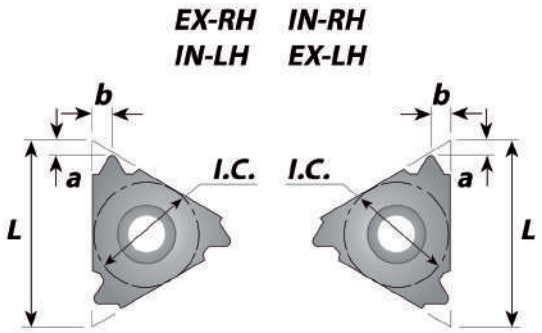


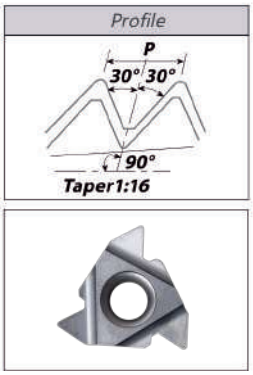


(Item Number)	(Pitch)		(Length)	(Dimensions in mm)		XMA
	mm	(TPI)	L	a	b	
06IRA60	0.5 - 1.25	48 - 20	6	0.6	0.6	○
08IRA60	0.5 - 1.5	48 - 16	8	0.6	0.7	○
11ERA60	0.5 - 1.5	48 - 16	11	0.8	0.9	○
11IRA60						
16ERA60	0.5 - 1.5	48 - 1.6	16	0.8	0.9	○
16IRA60						
16ERG60	1.75 - 3.0	14 - 8	16	1.2	1.7	○
16IRG60						

● STOCKABLE ○ NON STOCKABLE

PARTIAL PROFILE 60°

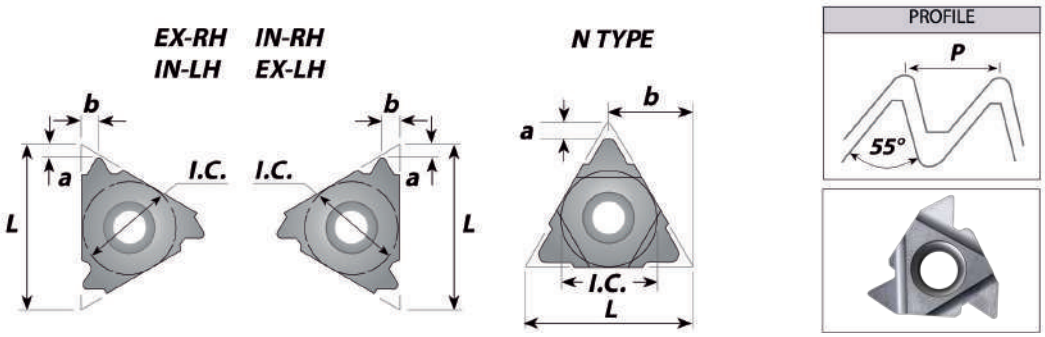




(Item Number)	(Pitch)		(Length)	(Dimensions in mm)		XMA
	mm	(TPI)	L	a	b	
16ERAG60	0.5 - 3.0	48 - 8	16	1.2	1.7	○
16IRAG60						
22ERN60	3.5 - 5.0	7 - 5	22	1.7	2.5	○
22IRN60						
27ERQ60	5.5 - 6.0	4.5 - 2.75	27	2.1	3.1	○
27IRQ60						

● STOCKABLE ○ NON STOCKABLE

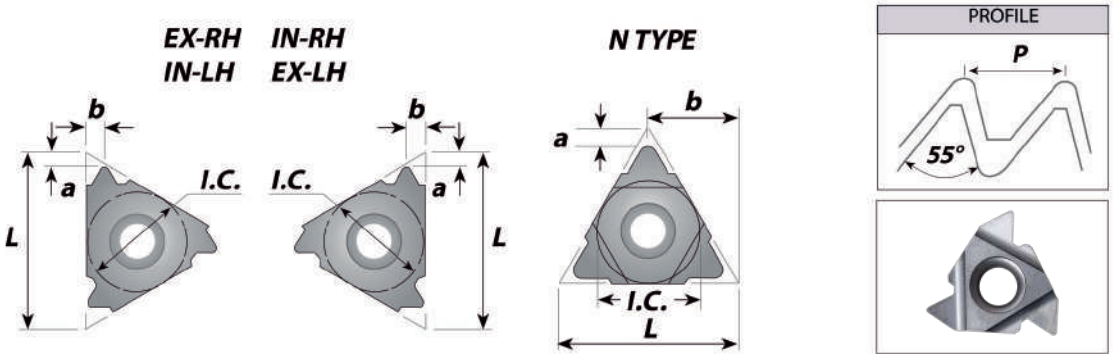
PARTIAL PROFILE 55°



(Item Number)	(Pitch)		(Length)	(Dimensions in mm)		XMA
	mm	(TPI)	L	a	b	
06IRA55	0.5 - 3.0	48 - 20	6	0.5	0.6	○
08IRA55	0.5 - 1.5	48 - 16	8	0.6	0.7	○
11ERA55	0.5 - 1.5	48 - 16	11	0.8	0.9	○
11IRA55						
16ERA55	0.5 - 1.5	48 - 16	16	0.8	0.9	○
16IRA55						
16ERG55	1.75 - 3.0	14 - 8	16	1.2	1.7	○
16IRG55						

● STOCKABLE ○ NON STOCKABLE

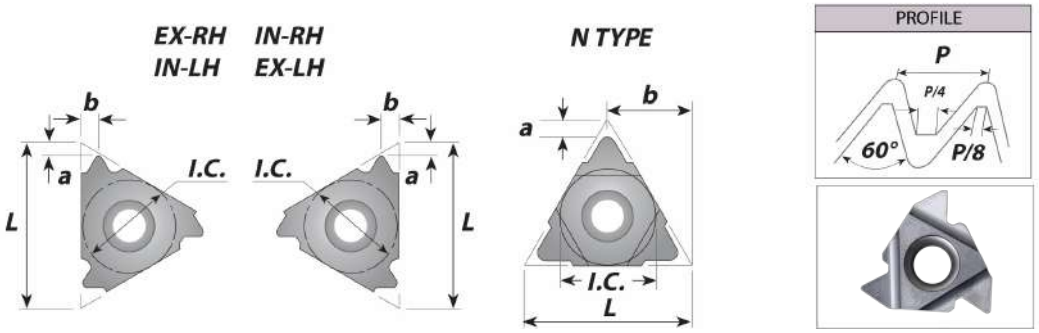
PARTIAL PROFILE 55°



(Item Number)	(Pitch)		(Length)	(Dimensions in mm)		XMA
	mm	(TPI)	L	a	b	
16ERAG55	0.5 - 3.0	48 - 8	16	1.2	1.7	○
16IRAG55						
22ERN55	3.5 - 5.0	7 - 5	22	1.7	2.5	○
22IRN55						
27ERQ55	5.5 - 6.0	4.5 - 4	27	2.0	2.9	○
27IRQ55						

● STOCKABLE ○ NON STOCKABLE

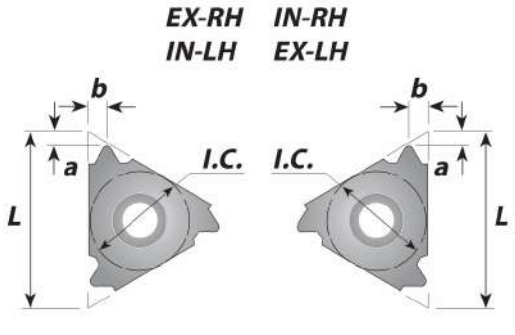
ISO-METRIC

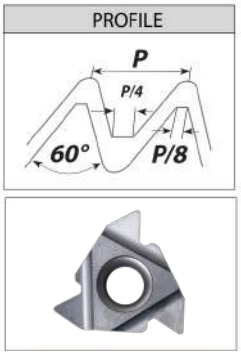


(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
06IR0.5ISO	0.5	6	0.9	0.5	○
06IR0.75ISO	0.75	6	0.8	0.5	○
06IR1.0ISO	1.0	6	0.7	0.6	○
06IR1.25ISO	1.25	6	0.6	0.6	○
08IR0.5ISO	0.5	6	0.6	0.5	○
08IR0.75ISO	0.75	8	0.6	0.5	○
08IR1.0ISO	1.0	8	0.6	0.6	○
08IR1.25ISO	1.25	8	0.6	0.7	○
08IR1.5ISO	1.5	8	0.6	0.7	○
08IR1.75ISO	1.75	8	0.6	0.8	○
11ER0.35ISO	0.35	11	0.6	0.4	○
11IR0.35ISO			0.8	0.3	○

● STOCKABLE ○ NON STOCKABLE

ISO-METRIC

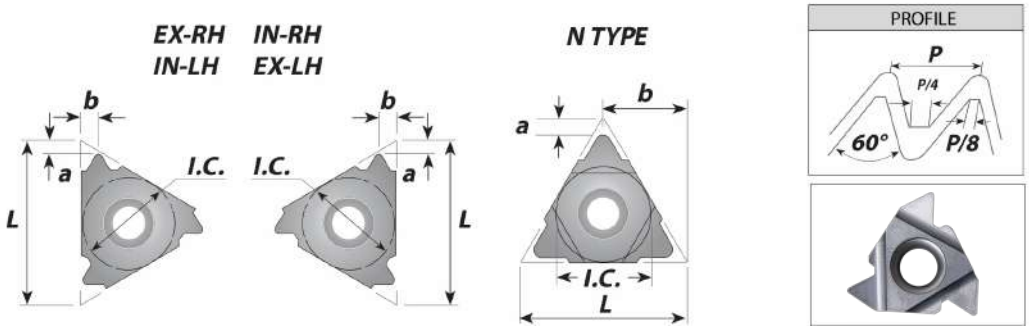




(Item Number)	(Pitch)		(Length)	(Dimensions in mm)		XMA
	mm	(TPI)	L	a	b	
11ER0.4ISO	0.4	11	16	0.7	0.4	○
11IR0.4ISO				0.8	0.4	○
11ER0.45ISO	0.45	11	22	0.7	0.4	○
11IR0.45ISO				0.8	0.4	○
11ER0.5ISO	0.5	11	27	0.6	0.6	○
11IR0.5ISO						
11ER0.6ISO	0.6	11		0.6	0.6	○
11IR0.6ISO						
11ER0.7ISO	0.7	11		0.6	0.6	○
11IR0.7ISO						
11ER0.75ISO	0.75	11		0.6	0.6	○
11IR0.75ISO						

● STOCKABLE ○ NON STOCKABLE

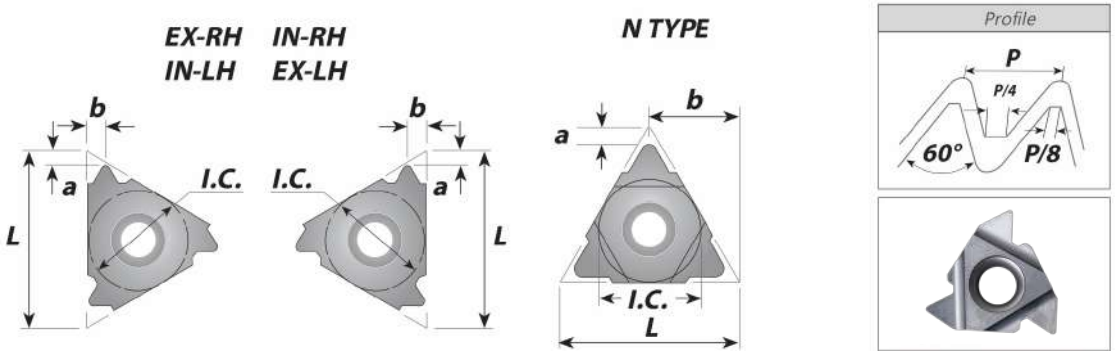
ISO-METRIC



(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
11ER0.8ISO	0.8	11	0.6	0.6	O
11IR0.8ISO					
11ER1.0ISO	1.0	11	0.7	0.7	O
11IR1.0ISO			0.6	0.7	O
11ER1.25ISO	1.25	11	0.8	0.9	O
11IR1.25ISO			0.8	0.8	O
11ER1.5ISO	1.5	11	0.8	1.0	O
11IR1.5ISO					
11ER1.75ISO	1.75	11	0.8	1.1	O
11IR1.75ISO					
11ER2.0ISO	2.0	11	0.8	1.1	O
11IR2.0ISO			0.8	0.9	O
11IR2.5ISO	2.5	11	0.8	1.2	O

● STOCKABLE ○ NON STOCKABLE

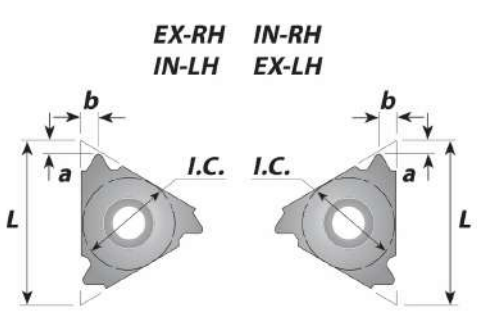
ISO-METRIC

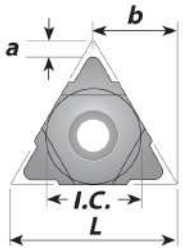


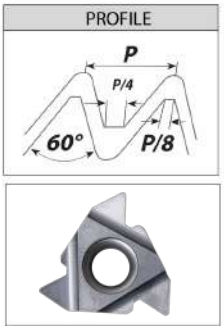
(Item Number)	(Pitch)		(Length)	(Dimensions in mm)		XMA
	mm	(TPI)	L	a	b	
16ER0.35ISO	0.35	16	16	0.8	0.4	O
16IR0.35ISO				0.8	0.3	O
16ER0.4ISO	0.4	16	22	0.7	0.4	O
16IR0.4ISO				0.8	0.4	O
16ER0.45ISO	0.45	16	27	0.7	0.4	O
16IR0.45ISO				0.8	0.4	O
16ER0.5ISO	0.5	16		0.6	0.6	O
16IR0.5ISO						
16ER0.6ISO	0.6	16		0.6	0.6	O
16IR0.6ISO						
16ER0.7ISO	0.7	16		0.6	0.6	O
16IR0.7ISO						
16ER0.75ISO	0.75	16		0.6	0.6	O
16IR0.75ISO						
16ER0.8ISO	0.8	16		0.6	0.6	O
16IR0.8ISO						

● STOCKABLE O NON STOCKABLE

ISO-METRIC



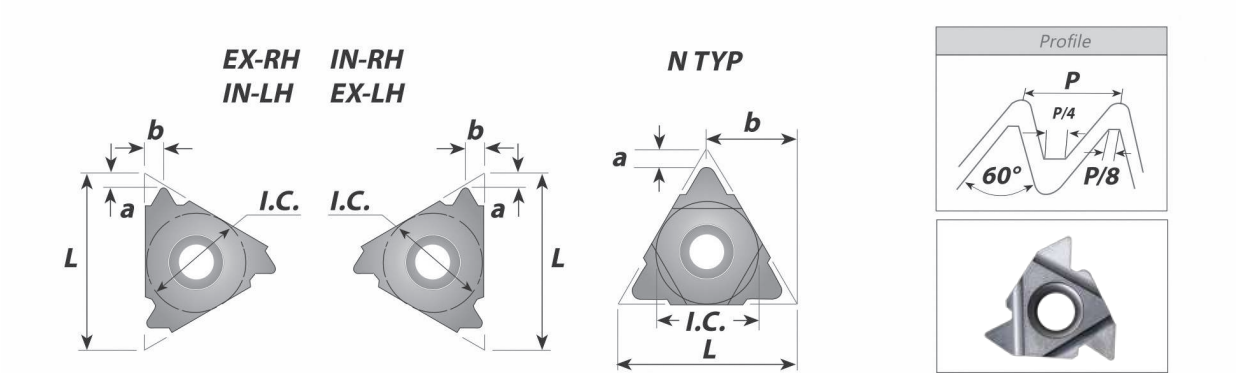




(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
16ER0.35ISO	0.35	16	0.8	0.4	O
16IR0.35ISO			0.8	0.3	O
16ER0.4ISO	0.4	16	0.7	0.4	O
16IR0.4ISO			0.8	0.4	O
16ER0.45ISO	0.45	16	0.7	0.4	O
16IR0.45ISO			0.8	0.4	O
16ER0.5ISO	0.5	16	0.6	0.6	O
16IR0.5ISO					
16ER0.6ISO	0.6	16	0.6	0.6	O
16IR0.6ISO					
16ER0.7ISO	0.7	16	0.6	0.6	O
16IR0.7ISO					
16ER0.75ISO	0.75	16	0.6	0.6	O
16IR0.75ISO					
16ER0.8ISO	0.8	16	0.6	0.6	O
16IR0.8ISO					

● STOCKABLE O NON STOCKABLE

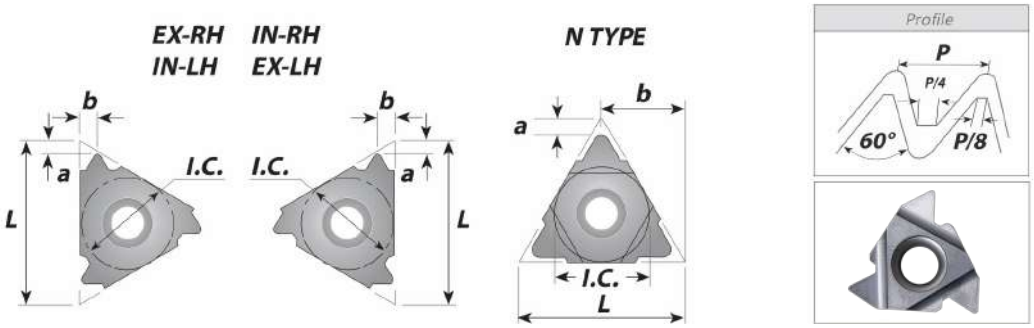
ISO-METRIC



(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
22ER3.5ISO	3.5	22	1.6	2.3	○
22IR3.5ISO					
22ER4.0ISO	4.0	22	1.6	2.3	○
22IR4.0ISO					
22ER4.5ISO	4.5	22	1.7	2.4	○
22IR4.5ISO			1.6	2.4	○
22ER5.0ISO	5.0	22	1.7	2.5	○
22IR5.0ISO			1.6	2.4	○
22IR5.5ISO	5.5	22	1.6	2.3	○
22ER6.0ISO*	6.0	22	1.9	2.7	○
22IR6.0ISO			1.6	2.4	○

● STOCKABLE ○ NON STOCKABLE

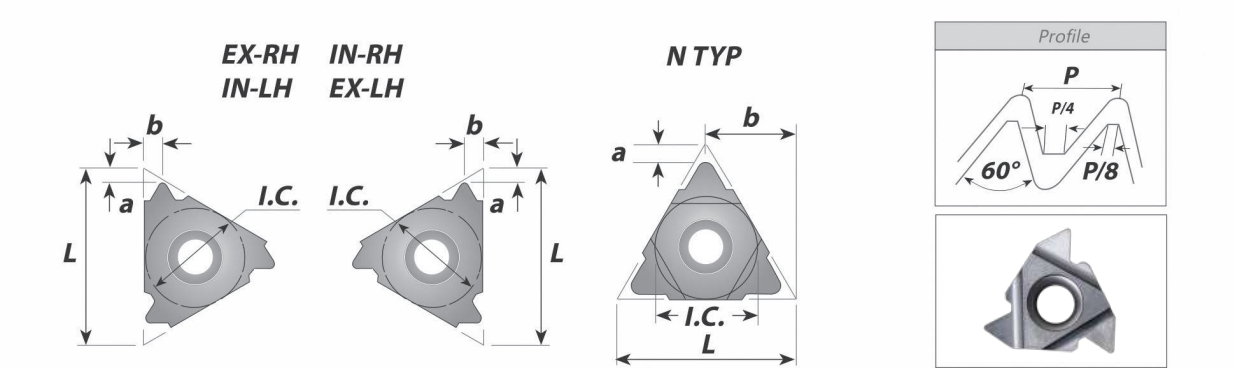
ISO-METRIC



(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
22NER5.5ISO	5.5	22N	2.3	11.0	○
22NIR5.5ISO			2.4	11.0	○
22NER6.0ISO	6.0	22N	2.6	11.0	○
22NIR6.0ISO			2.1	11.0	○
27ER5.5ISO	5.5	27	1.9	2.7	○
27IR5.5ISO			1.6	2.3	○
27ER6.0ISO	6.0	27	2.0	2.9	○
27IR6.0ISO			1.8	2.5	○

● STOCKABLE ○ NON STOCKABLE

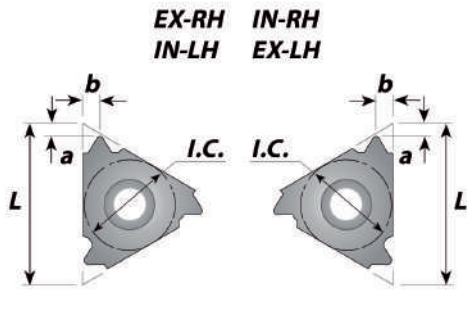
UN UNIFIED UNC, UNF, UNEF, UNS

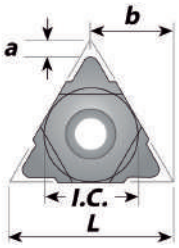


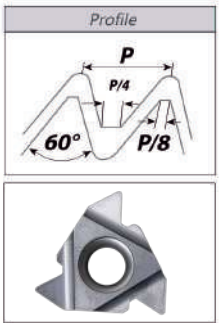
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
06IR32UN	32	6	0.8	0.5	O
06IR28UN	28	6	0.8	0.6	O
06IR24UN	24	6	0.7	0.6	O
06IR20UN	20	6	0.6	0.6	O
06IR18UN	18	6	0.6	0.7	O

● STOCKABLE O NON STOCKABLE

UN UNIFIED UNC, UNF, UNEF, UNS



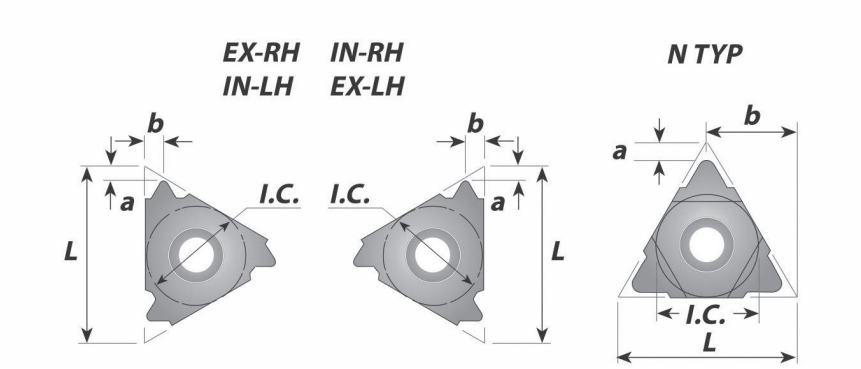


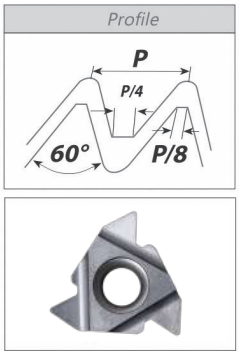


(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
08IR32UN	32	8	0.6	0.5	○
08IR28UN	28	8	0.6	0.6	○
08IR24UN	24	8	0.6	0.6	○
08IR20UN	20	8	0.6	0.7	○
08IR18UN	18	8	0.6	0.7	
08IR16UN	16	8	0.6	0.7	○
08IR14UN	14	8	0.6	0.8	○
08IR13UN	13	8	0.8	0.9	○
11ER72UN	72	11	0.8	0.4	○
11IR72UN			0.8	0.3	○
11ER64UN	64	11	0.8	0.4	○
11IR64UN					
11ER56UN	56	11	0.7	0.4	○
11IR56UN					

● STOCKABLE ○ NON STOCKABLE

UN UNIFIED UNC, UNF, UNEF, UNS

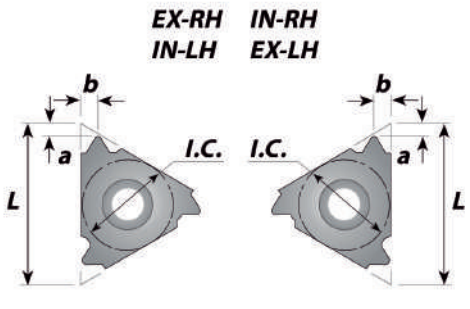


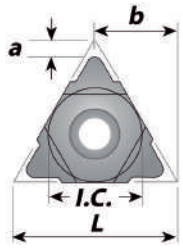


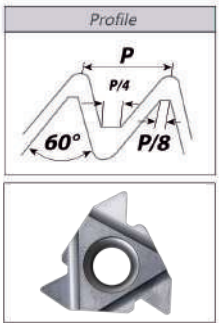
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
11ER48UN	48	11	0.6	0.6	O
11IR48UN					
11ER44UN	44	11	0.6	0.6	O
11IR44UN					
11ER40UN	40	11	0.6	0.6	O
11IR40UN					
11ER36UN	36	11	0.6	0.6	O
11IR36UN					
11ER32UN	32	11	0.6	0.6	O
11IR32UN					
11ER28UN	28	11	0.6	0.7	O
11IR28UN					
11ER27UN	27	11	0.7	0.8	O
11IR27UN					

● STOCKABLE ○ NON STOCKABLE

UN UNIFIED UNC, UNF, UNEF, UNS



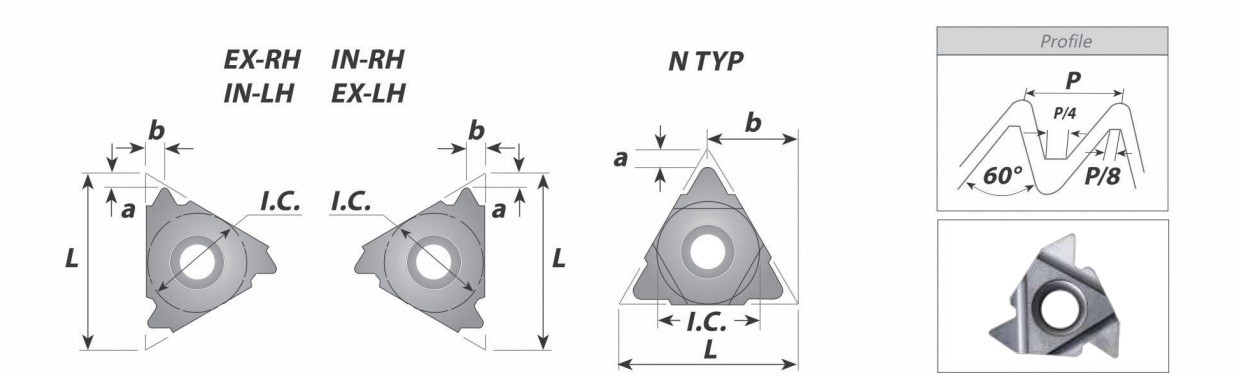




(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
11ER24UN	24	11	0.7	0.8	○
11IR24UN					
11ER20UN	20	11	0.8	0.9	○
11IR20UN					
11ER18UN	18	11	0.8	1.0	○
11IR18UN					
11ER16UN	16	11	0.9	1.1	○
11IR16UN					
11ER14UN	14	11	0.9	1.1	○
11IR14UN					
16ER72UN	72	16	0.8	0.4	○
16IR72UN			0.8	0.3	○
16ER64UN	64	16	0.8	0.4	○
16IR64UN					

● STOCKABLE ○ NON STOCKABLE

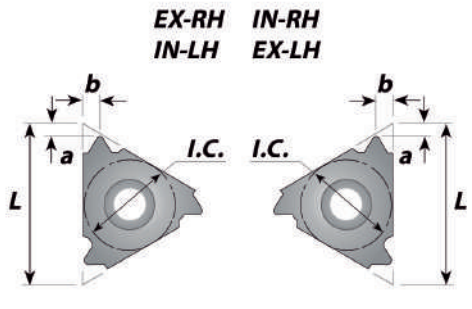
UN UNIFIED UNC, UNF, UNEF, UNS

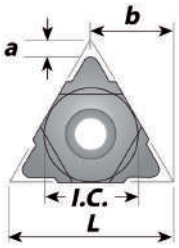


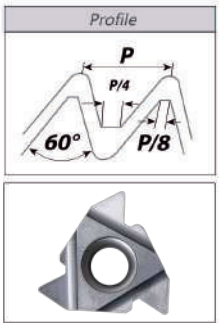
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
11ER13UN	13	11	0.8	1.0	○
11IR13UN					
11ER12UN	12	11	0.8	1.1	○
11IR12UN					
11ER11UN	11	11	0.8	1.1	○
11IR11UN					
16ER72UN	72	16	0.8	0.4	○
16IR72UN			0.8	0.3	○
16ER64UN	64	16	0.8	0.4	○
16IR64UN					
16ER56UN	56	16	0.7	0.4	○
16IR56UN					
16ER48UN	48	16	0.6	0.6	○
16IR48UN					
16ER44UN	44	16	0.6	0.6	○
16IR44UN					
16ER40UN	40	16	0.6	0.6	○
16IR40UN					

● STOCKABLE ○ NON STOCKABLE

UN UNIFIED UNC, UNF, UNEF, UNS



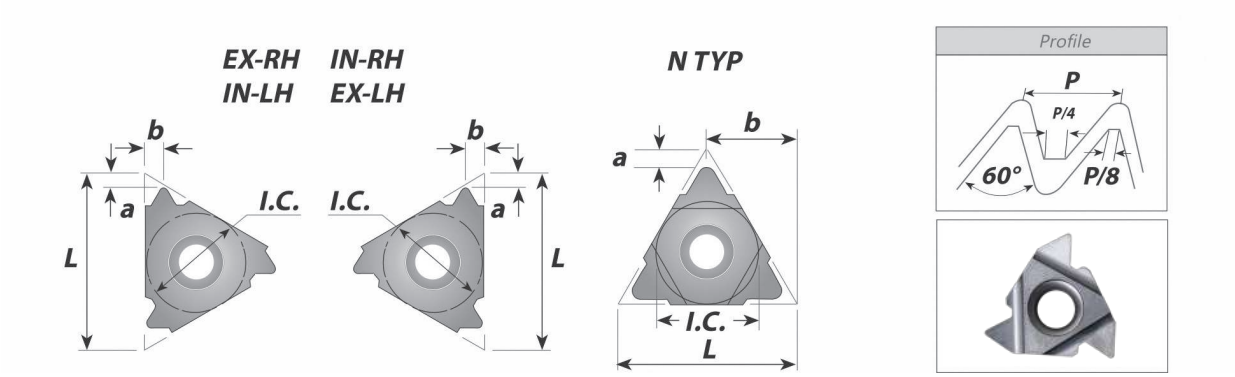




(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
16ER36UN	36	16	0.6	0.6	○
16IR36UN					
16ER32UN	32	16	0.6	0.6	○
16IR32UN					
16ER28UN	28	16	0.6	0.7	○
16IR28UN					
16ER27UN	27	16	0.7	0.8	○
16IR27UN					
16ER24UN	24	16	0.7	0.8	○
16IR24UN					
16ER20UN	20	16	0.8	0.9	○
16IR20UN					
16ER18UN	18	16	0.8	1.0	○
16IR18UN					
16ER16UN	16	16	0.9	1.1	○
16IR16UN					

● STOCKABLE ○ NON STOCKABLE

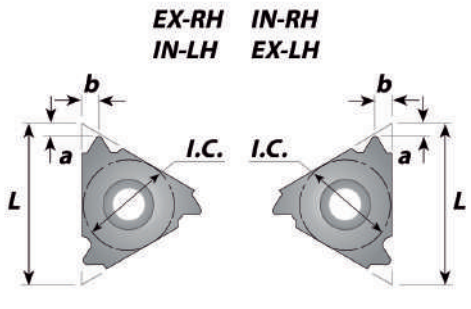
UN UNIFIED UNC, UNF, UNEF, UNS

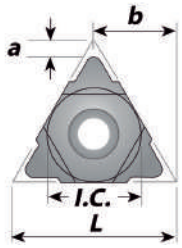


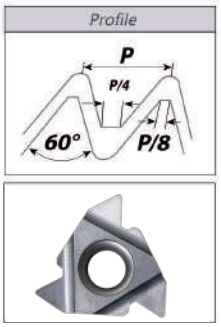
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
16ER14UN	14	11	1.0	1.2	O
16IR14UN			0.9	1.2	O
16ER13UN	13	11	1.1	1.3	O
16IR13UN					
16ER12UN	12	11	1.1	1.4	O
16IR12UN					
16ER11.5UN	11.5	16	1.1	1.5	O
16IR11.5UN			1.1		
16ER11UN	11	16	1.1	1.5	O
16IR11UN					
16ER10UN	10	16	1.1	1.5	O
16IR10UN					
16ER9UN	9	16	1.1	1.7	O
16IR9UN					
16ER8UN	8	16	1.2	1.6	O
16IR8UN			1.1	1.5	O

● STOCKABLE O NON STOCKABLE

UN UNIFIED UNC, UNF, UNEF, UNS



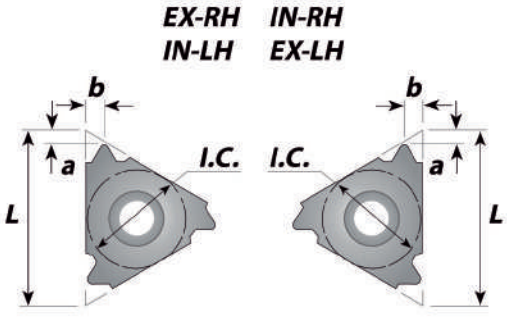


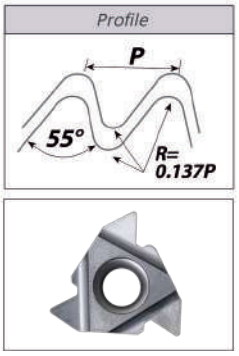


(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
22ER7UN	7	22	1.6	2.3	○
22IR7UN					
22ER6UN	6	22	1.6	2.3	○
22IR6UN					
22ER5UN	5	22	1.7	2.5	○
22IR5UN			1.6	2.3	○
27ER4.5UN	4.5	27	1.9	2.7	○
27IR4.5UN			1.7	2.4	○
27ER4UN	4	27	2.5	13.7	○
27IR4UN			2.8	16.5	○

● STOCKABLE ○ NON STOCKABLE

WHITWORTH 55° BSW, BSF, BSP, BSB

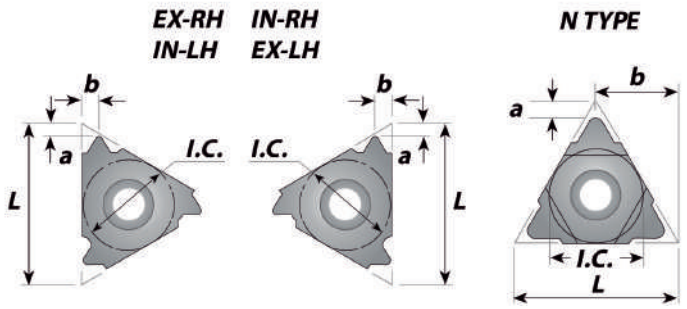


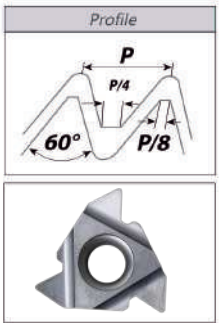


(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
06IR26W	26	6	0.7	0.6	○
06IR22W	22	6	0.6	0.6	○
06IR20W	20	6	0.6	0.7	○
06IR18W	18	6	0.6	0.7	○
08IR28W	28	8	0.6	0.6	○
08IR24W	24	8	0.6	0.6	○
08IR20W	20	8	0.6	0.7	○
08IR19W	19	8	0.6	0.7	○
08IR18W	18	8	0.6	0.7	○
08IR16W	16	8	0.6	0.7	○

● STOCKABLE ○ NON STOCKABLE

WHITWORTH 55° BSW, BSF, BSP, BSB

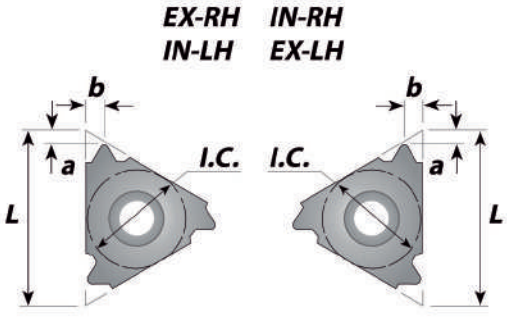


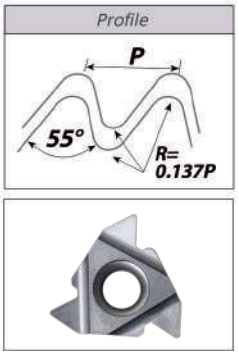


(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
11ER72W	72	11	0.7	0.4	○
11IR72W					
11ER60W	60	11	0.7	0.4	○
11IR60W					
11ER56W	56	11	0.7	0.4	○
11IR56W					
11ER48W	48	11	0.6	0.6	○
11IR48W					
11ER40W	40	11	0.6	0.6	○
11IR40W					
11ER36W	36	11	0.6	0.6	○
11IR36W					
11ER32W	32	11	0.6	0.6	○
11IR32W					
11ER28W	28	11	0.6	0.7	○
11IR28W					

● STOCKABLE ○ NON STOCKABLE

WHITWORTH 55° BSW, BSF, BSP, BSB

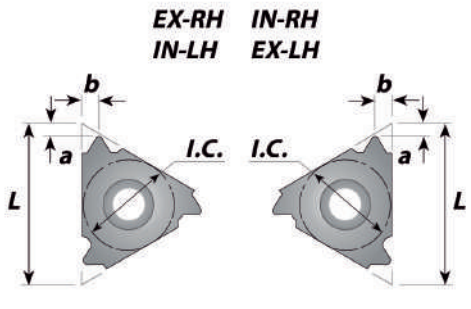


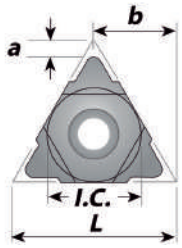


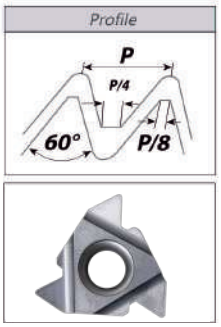
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
11ER26W	26	11	0.7	0.7	○
11IR26W					
11ER24W	24	11	0.7	0.8	○
11IR24W					
11ER22W	22	11	0.8	0.9	○
11IR22W					
11ER20W	20	11	0.8	0.9	○
11IR20W					
11ER19W	19	11	0.8	1.0	○
11IR40W					
11ER18W	18	11	0.8	1.0	○
11IR18W					
11ER16W	16	11	0.9	1.1	○
11IR16W					

● STOCKABLE ○ NON STOCKABLE

WHITWORTH 55° BSW, BSF, BSP, BSB



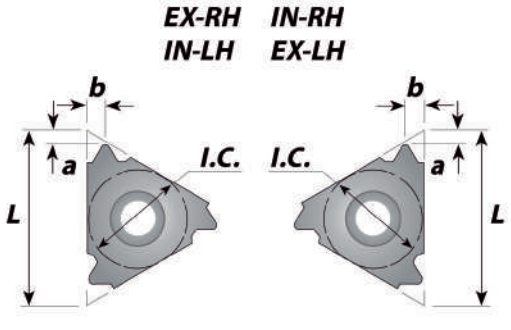


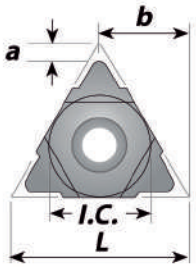


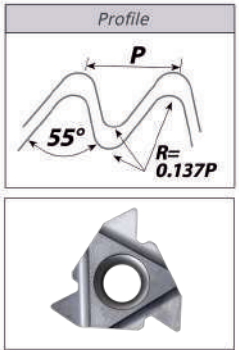
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
11ER72W	72	11	0.7	0.4	○
11IR72W					
11ER60W	60	11	0.7	0.4	○
11IR60W					
11ER56W	56	11	0.7	0.4	○
11IR56W					
11ER48W	48	11	0.6	0.6	○
11IR48W					
11ER40W	40	11	0.6	0.6	○
11IR40W					
11ER36W	36	11	0.6	0.6	○
11IR36W					
11ER32W	32	11	0.6	0.6	○
11IR32W					
11ER28W	28	11	0.6	0.7	○
11IR28W					

● STOCKABLE ○ NON STOCKABLE

WHITWORTH 55° BSW, BSF, BSP, BSB



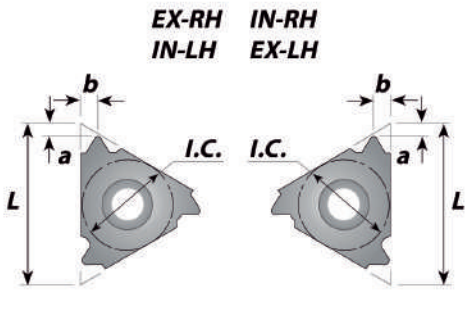


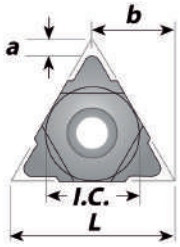


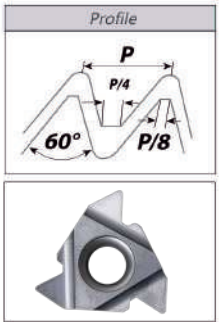
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
11ER26W	26	11	0.7	0.7	○
11IR26W					
11ER24W	24	11	0.7	0.8	○
11IR24W					
11ER22W	22	11	0.8	0.9	○
11IR22W					
11ER20W	20	11	0.8	0.9	○
11IR20W					
11ER19W	19	11	0.8	1.0	○
11IR19W					
11ER18W	18	11	0.8	1.0	○
11IR18W					
11ER16W	16	11	0.9	1.1	○
11IR16W					

● STOCKABLE ○ NON STOCKABLE

WHITWORTH 55° BSW, BSF, BSP, BSB



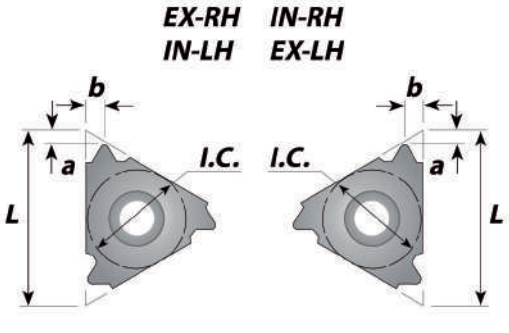


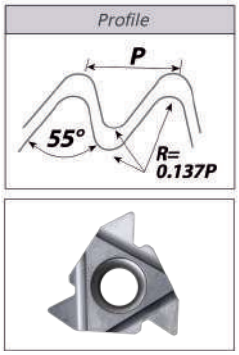


(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
11ER14W	14	11	0.9	1.1	○
11IR14W					
11IR12W	12	11	1.0	1.1	○
11IR11W	11	11	0.9	1.2	○
16ER72W	72	16	0.7	0.4	○
16IR72W					
16ER60W	60	16	0.7	0.6	○
16IR60W					
16ER56W	56	16	0.7	0.4	○
16IR56W					
16ER48W	48	16	0.6	0.6	○
16IR48W					
16ER40W	40	16	0.6	0.6	○
16IR40W					

● STOCKABLE ○ NON STOCKABLE

WHITWORTH 55° BSW, BSF, BSP, BSB

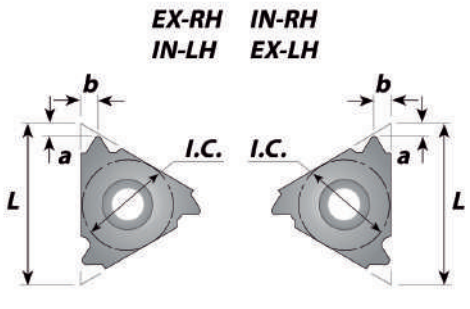


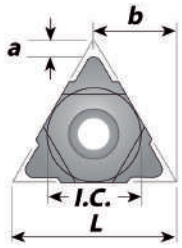


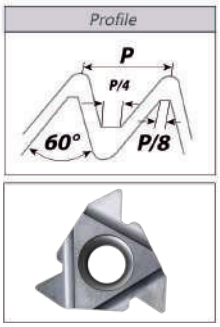
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
16ER36W	36	16	0.6	0.6	○
16IR36W					
16ER32W	32	16	0.6	0.6	○
16IR32W					
16ER28W	28	16	0.6	0.7	○
16IR28W					
16ER26W	26	16	0.7	0.7	○
16IR26W					
16ER24W	24	16	0.7	0.8	○
16IR24W					
16ER22W	22	16	0.7	0.9	○
16IR22W					
16ER20W	20	16	0.9	0.9	○
16IR20W					

● STOCKABLE ○ NON STOCKABLE

WHITWORTH 55° BSW, BSF, BSP, BSB



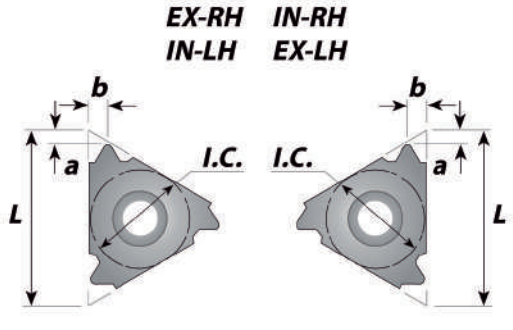


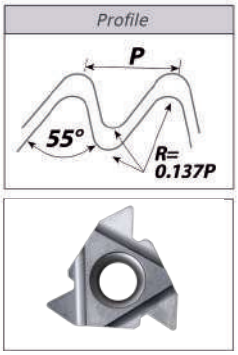


(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
16ER19W	19	16	0.8	1.0	○
16IR19W					
16ER18W	18	16	0.8	1.0	○
16IR18W					
16ER16W	16	16	0.9	1.1	○
16IR16W					
16ER14W	14	16	1.0	1.2	○
16IR14W					
16ER12W	12	16	1.1	1.4	○
16IR12W					
16ER11W	11	16	1.1	1.5	○
16IR11W					
16ER10W	10	16	1.1	1.5	○
16IR10W					
16ER9W	9	16	1.2	1.7	○
16IR9W					

● STOCKABLE ○ NON STOCKABLE

WHITWORTH 55° BSW, BSF, BSP, BSB



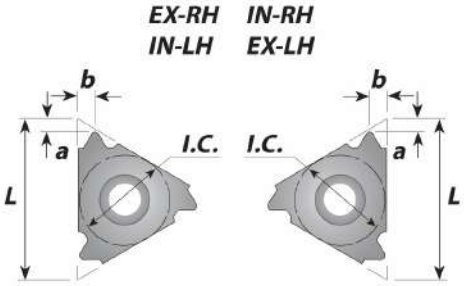


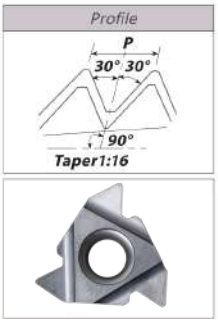
THREADING

(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
16ER36W	8	16	1.2	1.5	○
16IR8W					
22ER7W	7	22	1.4	2.3	○
22IR7W					
22ER6W	6	22	1.6	2.3	○
22IR6W					
22ER5W	5	22	1.7	2.4	○
22IR5W					
27ER4.5W	4.5	27	1.8	2.6	○
27IR4.5W					
27ER4W	4	27	2.0	2.9	○
27IR4W					

● STOCKABLE ○ NON STOCKABLE

NPT

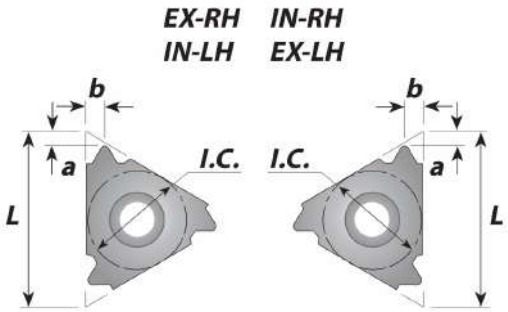


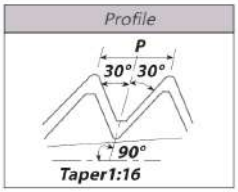


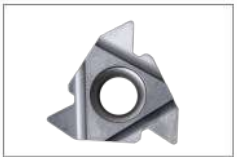
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
06IR27NPT	27	6	0.6	0.6	○
08IR27NPT	27	8	0.6	0.6	○
08IR18NPT	18	8	0.6	0.6	○
11ER27NPT	27	11	0.7	0.8	○
11IR27NPT					
11ER18NPT	18	11	0.8	1.0	○
11IR18NPT					
11ER14NPT	14	11	0.8	1.0	○
11IR14NPT					
16ER27NPT	27	16	0.7	0.8	○
16IR27NPT					

● STOCKABLE ○ NON STOCKABLE

NPT



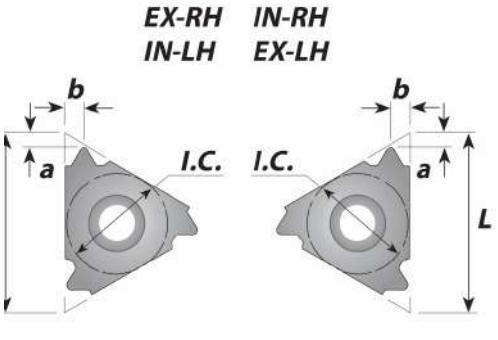


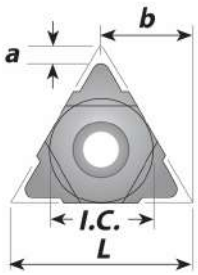


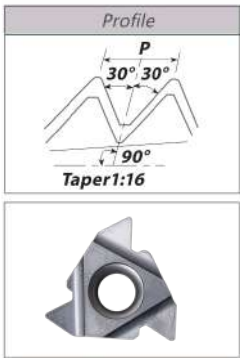
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
16ER18NPT	18	16	0.8	1.0	○
16IR18NPT					
16ER14NPT	14	16	0.9	1.2	○
16IR14NPT					
16ER11.5NPT	11.5	16	1.1	1.5	○
16IR11.5NPT					
16ER8NPT	8	16	1.3	1.8	○
16IR8NPT					

● STOCKABLE ○ NON STOCKABLE

NPTF DRYSEAL



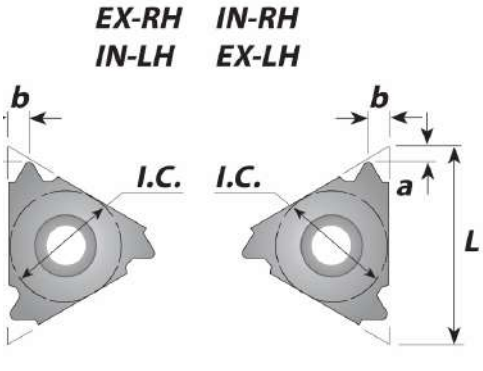


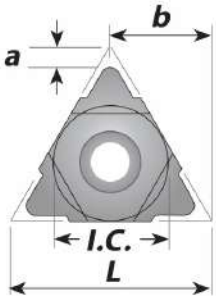


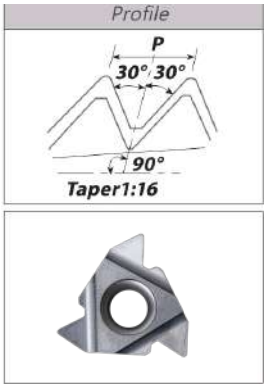
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
06IR27NPTF	27	6	0.7	0.6	○
08IR27NPTF	27	8	0.6	0.6	○
08IR18NPTF	18	8	0.6	0.6	○
11ER27NPTF	27	11	0.7	0.7	○
11IR27NPTF					
11ER18NPTF	18	11	0.8	1.0	○
11IR18NPTF					
11ER14NPTF	14	11	0.8	1.0	○
11IR14NPTF					
11ER14NPTF	14	11	0.8	1.0	○
11IR14NPFT					
16ER27NPTF	18	16	0.8	1.0	○
16IR27NPTF					
16ER18NPTF	14	16	0.9	1.2	○
16IR18NPTF					

● STOCKABLE ○ NON STOCKABLE

NPTF DRYSEAL



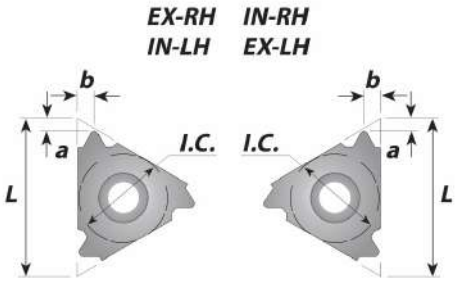




(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
16ER14NPTF	14	16	0.9	1.2	○
16IR14NPTF					
16ER11.5NPTF	11.5	16	1.1	1.5	○
16IR11.5NPTF					
16ER8NPTF	8	16	1.3	1.8	○
16IR8NPTF					

● STOCKABLE ○ NON STOCKABLE

BSPT

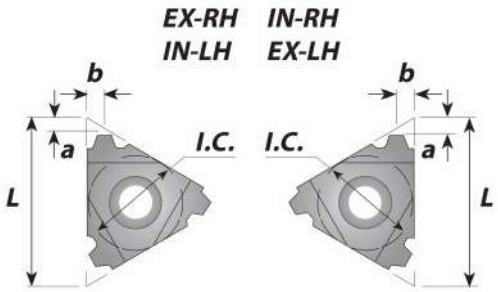


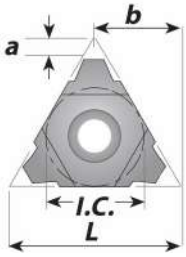


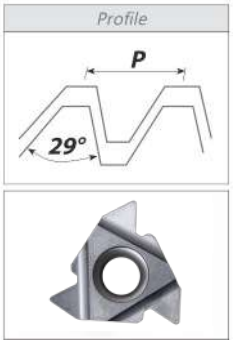
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
06IR28BSPT	28	6	0.7	0.6	○
08IR28BSPT	28	8	0.6	0.6	○
08IR19BSPT	19	8	0.6	0.6	○
11IR28BSPT	28	11	0.6	0.6	○
11IR19BSPT	19	11	0.8	0.9	○
11IR14BSPT	14	11	0.8	1.0	○
11IR11BSPT*	11	11	0.9	1.2	○
16ER28BSPT	28	16	0.6	0.6	○
16IR28BSPT					
16ER19BSPT	19	16	0.8	1.0	○
16IR19BSPT					
16ER14BSPT	14	16	1.0	1.2	○
16IR14BSPT					
16ER11BSPT	11	16	1.1	1.5	○
16IR11BSPT					

● STOCKABLE ○ NON STOCKABLE

ACME



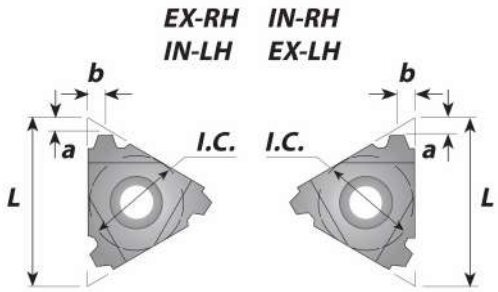


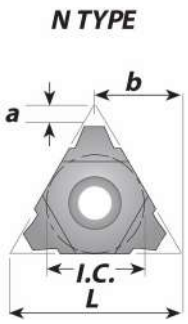


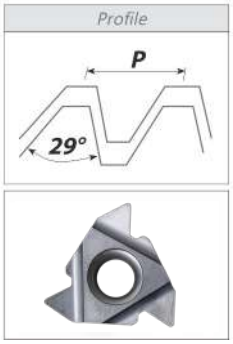
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
11ER16ACME	16	11	0.9	1.0	○
11IR16ACME					
16ER16ACME	16	16	0.9	1.0	○
16IR16ACME					
16ER14ACME	14	16	1.0	1.2	○
16IR14ACME					
16ER12ACME	12	16	1.1	1.2	○
16IR12ACME					
16ER10ACME	10	16	1.3	1.3	○
16IR10ACME					
16ER8ACME	8	16	1.5	1.5	○
16IR8ACME					

● STOCKABLE ○ NON STOCKABLE

ACME



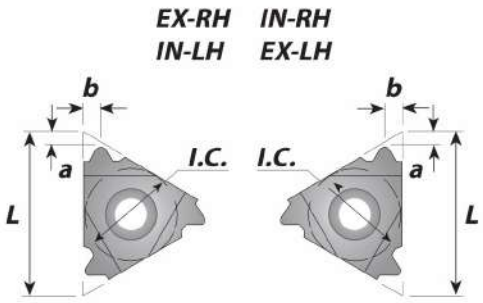


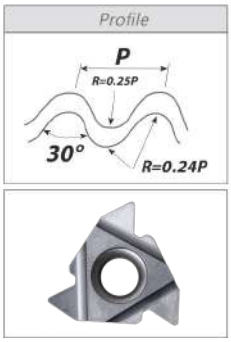


(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
16ER6ACME*	6	16	1.7	1.8	○
16IR6ACME*					
22ER6ACME	6	22	1.8	2.1	○
22IR6ACME					
22ER5ACME	5	22	2.0	2.3	○
22IR5ACME					
22ER4ACME*	4	22	2.1	2.2	○
22IR4ACME*					
27ER4ACME	4	27	2.3	2.7	○
27IR4ACME					

● STOCKABLE ○ NON STOCKABLE

ROUND DIN 405





(Item Number)	(Pitch)	(Length)	(Dimensions in mm)		XMA
	mm	L	a	b	
16ER10RD	10	16	1.1	1.2	○
16IR10RD			1.1	1.2	○
16ER8RD	8	16	1.4	1.3	○
16IR8RD			1.4	1.4	○
16ER6RD	6	16	1.5	1.7	○
16IR6RD			1.4	1.5	○
22ER6RD	6	22	1.5	1.7	○
22IR6RD					
22ER4RD	4	22	2.2	2.3	○
22IR4RD					
27ER4RD	4	27	2.2	2.3	○
27IR4RD					

● STOCKABLE ○ NON STOCKABLE

THREAD TURNING TOOLHOLDERS

| PRODUCT DESIGNATION
| EXAMPLE: AR20-3

A **R** **20** **-** **3** **[ ]**

A = External
I = Internal

R= Right Hand
L= Left Hand

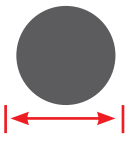
Shank Cross Section:

External toolholders
square shank

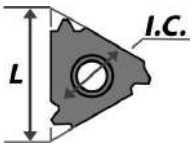
20 = 20 mm x 20 mm



Internal toolholders &
boring bars
round shank
20 = Diam. of 20 mm



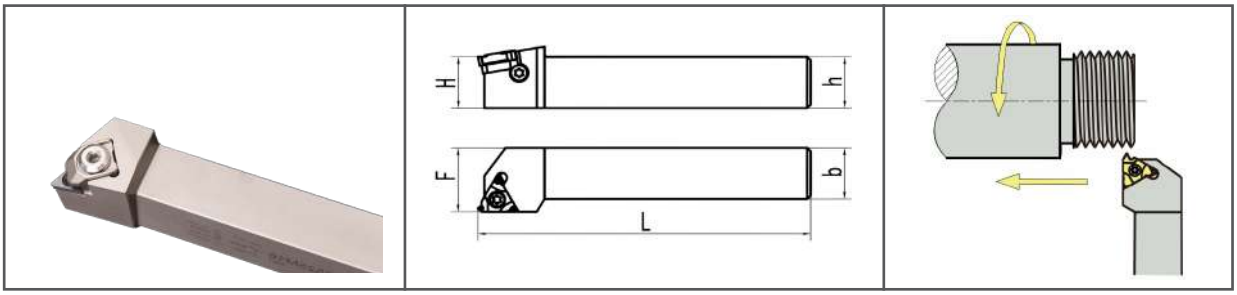
Insert Size



L	I.C.
0	5/32"
1	3/16"
2	1/4"
3	3/8"
4	1/2"
4N	1/2"N
5	5/8"
5N	5/8N

B =with internal coolant
C = Carbide shank
V = vertical

EXTERNAL TOOLHOLDERS

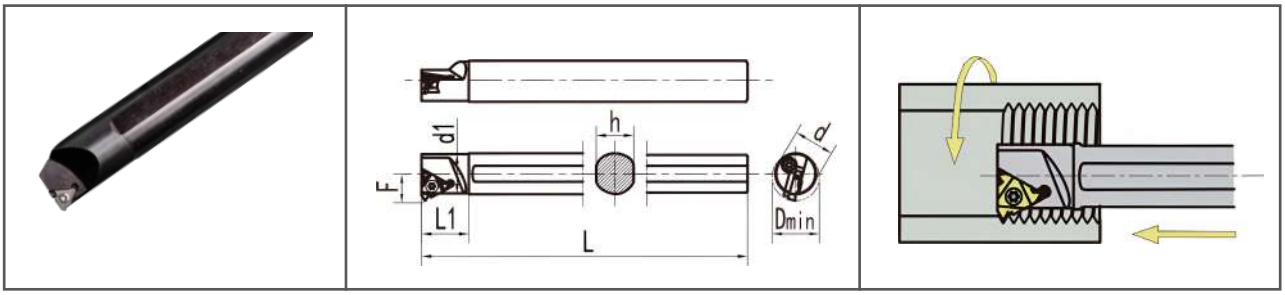


Toolholder Type		Insert Type	Dimensions (mm)							Insert Screw	Toru Kay	Anvil	Anvil Screw	Hex Wrench
			Dmin	L1	di	d	F	L	h					
SER	0612H06	06NR**	6.5	16	5.3	12	3.65	100	11.4	L60M2*4	T-06	-	-	-
	0712H06		7.2	18	6	12	4	100	11.4	L60M2*4	T-06	-	-	-
	0912H06		8.8	24	7.6	12	4.8	100	11.4	L60M2*4	T-06	-	-	-
	0008H08	08NR**	8.5	15	7	8	5	100	7.4	L60M2*5	T-06	-	-	-
	0010H11	11NR** T11N**	12	12	10	10	7.4	100	9	L60M2.5*6	T-08	-	-	-
	3232P16		15	15	12	12	8.4	125	11	L60M2.5*6	T-08	-	-	-
	0013M11		15	25	13	13	8.9	150	12	L60M2.5*6	T-08	-	-	-
	0013M16	16NR** T16N**	16	25	13	16	10.2	150	15	L60M3.5*12	T-15	-	-	-
	0013M16-Z		16	25	13	13	10.2	150	12	L60M3.5*12	T-15	-	-	-
	0016M16		19	25	15	16	11.7	150	15	L60M3.5*12	T-15	-	-	-
	0020Q16		24	24	19	20	13.7	180	18	L60M3.5*12	T-15	IGM-16	MQ030080	T10
	0025R16		29	29	24	25	16.2	200	23	L60M3.5*12	T-15	IGM-16	MG030080	T10
	0032S16		36	36	31	32	19.7	250	30	L60M3.5*12	T-15	IGM-16	MG030080	T10
	0040T16		44	44	38	40	23.7	300	37	L60M3.5*12	T-15	IGM-16	MQ030080	T10
	0050U16		54	54	47	50	28.7	350	46	L60M3.5*12	T-15	IGM-16	MQ030080	T10
	0020Q22	22NR**	24	24	19	20	15.6	180	18	L60M4.5*14	T-20	IGM-22	MG040080	S2.5
	0025R22		29	29	24	25	18.1	200	23	L60M4.5*14	T-20	IGM-22	MQ040080	S2.5
	0032S22		38	38	31	32	21.6	250	30	L60M4.5*14	T-20	IGM-22	MQ040080	S2.5
	0040T22		46	46	38	40	25.6	300	37	L60M4.5*14	T-20	IGM-22	MQ040080	S2.5
	0050U22		56	56	47	50	30.6	350	350	L60M4.5*14	T-20	IGM-22	MQ040080	S2.5
	0032T27	27NR**	37	65	30	32	21.6	300	30	L60M6*16	T-20	IGM-27	MQ040080	S2.5
	0040U27		46	70	38	40	26.6	350	38	L60M6*16	T-20	IGM-27	MQ040080	S2.5

EXTERNAL TOOLHOLDERS

SNL	0008H08	08NL**	8.5	15	7	8	5	100	7.4	L60M2*5	T-06	-	-	-
	0010H11	11NL**	12	12	10	10	7.4	100	9	L60M2.5*6	T-08	-	-	-
	0012K11		15	15	12	12	8.4	125	11	L60M2.5*6	T-08	-	-	-
	0013M11		15	25	13	16	8.9	150	15	L60M2.5*6	T-08	-	-	-
	0013M16	16NL**	16	25	13	16	10.2	150	15	L60M3.5*12	T-15	-	-	-
	0016M16		19	25	15	16	11.7	150	15	L60M3.5*12	T-15	-	-	-
	0020Q16		24	24	19	20	13.7	180	18	L60M3.5*12	T-15	IGM-16	MQ030080	T10
	0025R16		29	29	24	25	16.2	200	23	L60M3.5*12	T-15	IGM-16	MQ030080	T10
	0032S16		36	36	31	32	19.7	250	30	L60M3.5*12	T-15	IGM-16	MQ030080	T10
	0040T16		44	44	38	40	23.7	300	37	L60M3.5*12	T-15	IGM-16	MQ030080	T10
	0050U16		54	54	47	50	28.7	350	46	L60M3.5*12	T-15	IGM-16	MQ040080	T10
	0020Q22	22NL**	24	24	19	20	15.6	180	18	L60M4.5*14	T-20	IGM-22	MQ040080	T10
	0025R22		29	29	24	25	18.1	200	23	L60M4.5*14	T-20	IGM-22	MQ040080	S2.5
	0032S22		38	38	31	32	21.6	250	30	L60M4.5*14	T-20	IGM-22	MQ040080	S2.5
	0040T22		46	46	38	40	25.6	300	37	L60M4.5*14	T-20	IGM-22	MQ040080	S2.5
	0050U22		56	56	47	50	30.6	350	46	L60M4.5*14	T-20	IGM-22	MQ040080	S2.5
	0040T27	27NL**	48	46	38	40	25.6	300	37	L60M6*16	T-20	IGM-27	MQ040080	S2.5
	0050U27		58	56	47	50	30.6	350	46	L60M6*16	T-20	NGM-27	MQ040080	S2.5

INTERNAL TOOL HOLDER

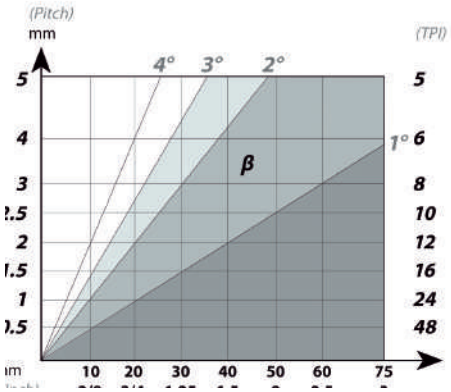


Toolholder Type		Insert Type	Dimensions (mm)							Insert Screw	Toru Kay	Anvil	Anvil Screw	Hex Wrench
			Dmin	L1	di	d	F	L	h					
SNR	0612H06	06IR**	6.5	16	5.3	12	3.65	100	11.4	L60M2*4	T-06	-	-	-
	0712H06		7.2	18	6	12	4	100	11.4	L60M2*4	T-06	-	-	-
	0912H06		8.8	24	7.6	12	4.8	100	11.4	L60M2*4	T-06	-	-	-
	0008H08	08IR**	8.5	15	7	8	5	100	7.4	L60M2*5	T-06	-	-	-
		11R** T11I** T11I** T11I**	12	12	10	10	7.4	100	9	L60M2.5*6	T-08	-	-	-
	0012K11		15	15	12	12	8.4	125	11	L60M2.5*6	T-08	-	-	-
	0013M11		15	25	13	13	8.9	150	12	L60M2.5*6	T-08	-	-	-
	0013M16	16IR** T16I** T16I**	16 25	25	13	16	10.2	150	15	L60M3.5*12	T-15	-	-	-
	0013M16-Z		16	25	13	13	10.2	150	12	L60M3.5*12	T-15	-	-	-
	0016M16		19	25	15	16	11.7	150	15	L60M3.5*12	T-15	-	-	-
	0020016		24	24	19	20	13.7	180	18	L60M3.5*12	T-15	IGM-16	MQ030080	T10
	0025R16		29	29	24	25	16.2	200	23	L60M3.5*12	T-15	IGM-16	MG030080	T10
	0032516		36	36	31	32	19.7	250	30	L60M3.5*12	T-15	IGM-16	MG030080	T10
	0040T16		44	44	38	40	23.7	300	37	L60M3.5*12	T-15	IGM-16	MQ030080	T10
	0050U16		54	54	47	50	28.7	350	46	L60M3.5*12	T-15	IGM-16	MQ030080	T10
	0020022	22IR**	24	24	19	20	15.6	180	18	L60M4.5*14	T-20	IGM-22	MG040080	S2.5
	0025R22		29	29	24	25	18.1	200	23	L60M4.5*14	T-20	IGM-22	MQ040080	S2.5
	0032522		38	38	31	32	21.6	250	30	L60M4.5*14	T-20	IGM-22	MQ040080	S2.5
	0040T22		46	46	38	40	25.6	300	37	L60M4.5*14	T-20	IGM-22	MQ040080	S2.5
	0050U22		56	56	47	50	30.6	350	350	L60M4.5*14	T-20	IGM-22	MQ040080	S2.5
	0032T27	27IR**	37	65	30	32	21.6	300	30	L60M6*16	T-20	IGM-27	MQ040080	S2.5
	0040027		46	70	38	40	26.6	350	38	L60M6*16	T-20	IGM-27	MQ040080	S2.5

INTERNAL TOOL HOLDER

SNL	0008H08	08IL**	8.5	15	7	8	5	100	7.4	L60M2*5	T-06	-	-	-
	0010H11	11IL**	12	12	10	10	7.4	100	9	L60M2.5*6	T-08	-	-	-
	0013M11		15	15	12	12	8.4	125	11	L60M2.5*6	T-08	-	-	-
	0013M16		15	25	13	16	8.9	150	15	L60M2.5*6	T-08	-	-	-
	0016M16	16IL**	16	25	13	16	10.2	150	15	L60M3.5*12	T-15	-	-	-
	0020Q16		19	25	15	16	11.7	150	15	L60M3.5*12	T-15	-	-	-
	0025R16		24	24	19	20	13.7	180	18	L60M3.5*12	T-15	IGM-16	MQ030080	T10
	0032516		29	29	24	25	16.2	200	23	L60M3.5*12	T-15	IGM-16	MQ030080	T10
	0040T16		36	36	31	32	19.7	250	30	L60M3.5*12	T-15	IGM-16	MQ030080	T10
	0050016		44	44	38	40	23.7	300	37	L60M3.5*12	T-15	IGM-16	MQ030080	T10
	0020016		54	54	47	50	28.7	350	46	L60M3.5*12	T-15	IGM-16	MQ040080	T10
	0020022	22IL**	24	24	19	20	15.6	180	18	L60M4.5*14	T-20	IGM-22	MQ040080	T10
	0025R22		29	29	24	25	18.1	200	23	L60M4.5*14	T-20	IGM-22	MQ040080	S2.5
	0032522		38	38	31	32	21.6	250	30	L60M4.5*14	T-20	IGM-22	MQ040080	S2.5
	0040T22		46	46	38	40	25.6	300	37	L60M4.5*14	T-20	IGM-22	MQ040080	S2.5
	0050022		56	56	47	50	30.6	350	46	L60M4.5*14	T-20	IGM-22	MQ040080	S2.5
	0040T27	22IL**	48	46	38	40	25.6	300	37	L60M6*16	T-20	IGM-27	MQ040080	S2.5
	0050U27		58	56	47	50	30.6	350	46	L60M6*16	T-20	NGM-27	MQ040080	S2.5

(THREAD HELIX ANGLE)



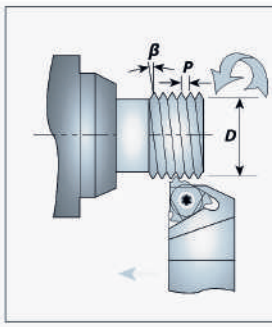
$$\text{Tan } \beta = \frac{P}{\pi \times D}$$

(Simplified formula)

$\beta = 20P/D$

(Example)
D = 30 mm (1.18")
P = 1.5 mm (16 TPI)

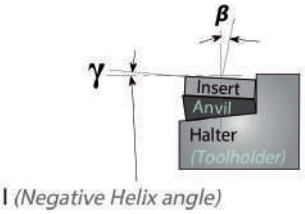
$$\beta = \frac{20 \times 1.5}{30} = 1°$$



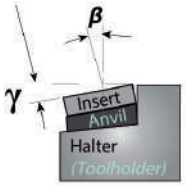
THREADING

(STANDARD AND SLANTED ANVILS)

(Toolholder Pockets have a built in 1.5° helix angle. This angle may be adjusted to better match the thread helix angle by simply changing the anvil. Negative helix angle is usually used when threading RH thread with LH Holder or LH thread with RH holder.)



I *(Negative Helix angle)*



L	IC	(Pocket Angle) γ	4.5°	3.5°	2.5°	1.5° Standard	0.5°	-0.5°	-1.5°
16	3/8	EX-RH OR IN-LH	AE3+4.5	AE3+3.5	AE3+2.5	AE3	AE3+0.5	AE3-0.5	AE3-1.5
16	3/8	EX-LH OR IN-RH	AI3+4.5	AI3+3.5	AI3+2.5	AI3	AI3+0.5	AI3-0.5	AI3-1.5
22	1/2	EX-LH OR IN-RH	AE4+4.5	AE4+3.5	AE4+2.5	AE4	AE4+0.5	AE4-0.5	AE4-1.5
22	1/2	EX-LH OR IN-RH	AI4+4.5	AI4+3.5	AI4+2.5	AI4	AI4+0.5	AI4-0.5	AI4-1.5
22N	1/2N	EX-RH OR IN-LH	AE4N+4.5	AE4N+3.5	AE4N+2.5	AE4N	AE4N+0.5	AE4N-0.5	AE4N-1.5
22N	1/2N	EX-LH OR IN-RH	AI4N+4.5	AI4N+3.5	AI4N+2.5	AI4N	AI4N+0.5	AI4N-0.5	AI4N-1.5
27	5/8	EX-RH OR IN-LH	AE5+4.5	AE5+3.5	AE5+2.5	AE5	AE5+0.5	AE5-0.5	AE5-1.5
27	5/8	EX-LH OR IN-RH	AI5+4.5	AI5+3.5	AI5+2.5	AI5	AI5+0.5	AI5-0.5	AI5-1.5
27N	5/8N	EX-RH OR IN-LH	AE5N+4.5	AE5N+3.5	AE5N+2.5	AE5N	AE5N+0.5	AE5N-0.5	AE5N-1.5
27N	5/8N	EX-LH OR IN-RH	AI5N+4.5	AI5N+3.5	AI5N+2.5	AI5N	AI5N+0.5	AI5N-0.5	AI5N-1.5

THREAD TURNING TECHNICAL SECTION

(Coated Grades):

XMA (P20-P40, K20-K30):
PVD TiAlN coated sub-micrograin grade forsteel, stainless steels and exotic materials at medium to high cutting speedsPVD TiAlN coated sub-micrograin grade forsteel, stainless steels and exotic materials at medium to high cutting speeds

(Uncoated Grades):
upon Request :

Grade	XMA
(Insert sizes)	0(06), 1(08), 2(11) 3(16),4(22), 5(27)

RECOMMENDED CUTTING CONDITIONS

ISO	Material		Condition	XTM | XTB | XT930-C | XMA
P	Non-Alloy Steel and Cast Steel, Free Cutting Steel	<0.25%C	Annealed	30 - 80
		≥0.25%C	Annealed	
		<0.55%C	Quenched & Tempered	
		≥0.55%C	Annealed	
		≥0.55%C	Quenched & Tempered	
	Low Alloy Steel and Cast Steel (lessthan 5% alloying elements)		Annealed	25 - 90
			Quenched & Tempered	
	High Alloy Steel, Cast Steel and Tool Steel		Annealed	25 - 90
			Quenched & Tempered	
M	Stainless Steel and Cast Steel		Martensitic	30 - 70
			Martensitic	
			Austenitic	
K	Nodular Cast Iron (GGG)		Pearlitic	30 - 80
			Pearlitic	
	Grey Cast Iron (GG)		Ferritic	30 - 100
			Pearlitic	
	Malleable Cast Iron		Ferritic	20 - 50
			Pearlitic	
N	Aluminum-Wrought Alloy		Not Hardened	60 - 120
			Precipation Hardened	
	Aluminum-Cast, Alloyed	<=12% S	Not Hardened	50 - 90
			Precipation Hardened	
		>12% Si	High Temperature	
	Copper Alloys	>1% Pb	Free Cutting	30 - 70
			Brass	
			Electrolytic Copper	
	Copper Alloys		Thermoplastics, Fiber Plastics	
			Hard Rubber	

RECOMMENDED CUTTING CONDITIONS

ISO	Material		Condition	XTM | XTB | XT930-C | XMA
S	Hardended steel		Annealed	15 - 40
			Cured	
		Ni or Co based	Annealed	
			Cured	
			Cast	
			Alpha + Beta Alloys Cured	10 - 30
H	Hardened Steel		Hardened 45-50 HRc	15 - 40
			Hardened 51-55 HRc	
			Hardened 56-62 HRc	
	Chilled Cast Iron		Cast	10 - 30
	Cast Iron		Hardened	10 - 20

(Pitch):	mm (TPI):	0.5 48	0.7 36	0.8 32	1.0 24	1.25 20	1.5 16	2-5 14-5
(Number of Passes):		6-12	7-14	7-16	8-18	8-20	10-22	20-38

THREAD TURNING TECHNICAL SECTION

(Thread Profile)	Standard	(Thread tolerance class)
ISO	DIN 13	6g / 6H
UN	ANSI B1.1-1989	2A / 2B
WHITWORTH	B.S. 84: 1956	Medium Class
NPT	ANSI B1.20.1-1983	-
NPTF	ANSI B1.20.3-1976	-
BSPT	B.S. 21: 1957	-
ACME	ANSI B1.5-1988	3G
STUB ACME	ANSI B1.5-1988	2G
TRAPEZ	DIN 103	7e / 7H
Rund	DIN 405	Class 7
UNJ	MIL-S-8879C	3A / 3B
MJ	ISO 5855	4h/6h 4H/5H
AMERICAN BUTTRESS	ANSI B1.9-1973	
SÄGENGEWINDE	DIN 513	Class 2
PG	DIN 40430	-
V-0.040	API Spec7	-
V-0.038R	API Spec7	-
V-0.050	API Spec7	-
V-0.055	API Spec7	-
API Rund	API Spec Standard 5B	-
EXTREME – LINE CASING	API Spec Standard 5B	-
BUTTRESS CASING	API Spec Standard 5B	-

DIN: Deutsches Institut Normung
ANSI: American National Standards Institute
API: American Petroleum Institute
B.S.: British Standards
ISO: Internationale Organisation Normung

NOTES

NOTES

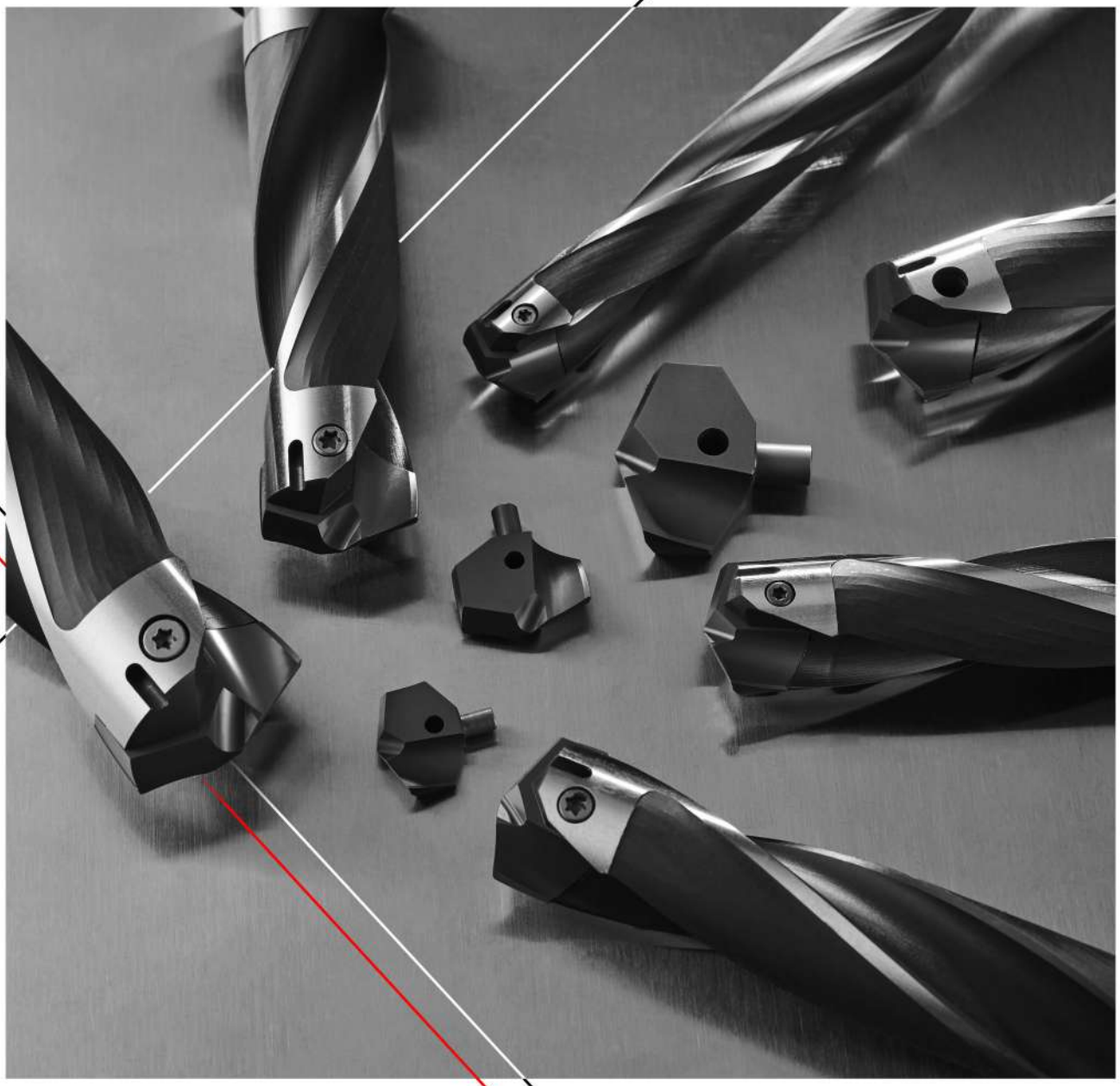

DRILLING
SP-C25-SD19-3D-06
SPMG060204 VM2.2 T6
www.xcut.in

NOTES

DRILLING INDEX

Drilling	163-242
Rapid Drill	167-188
Indexable U Drill	189-198
Spade Drill	199-242

NOTES



RAPID DRILL

Introducing the Rapid X, a groundbreaking modular highperformance indexable insert drill. Featuring a patented triple positioning structure, the Rapid X by XCUT TECHNOLOGIES ensure exceptional connection strength and accurate positioning. Its optimal geometric design and premium materials deliver outstanding drilling speed and durability. With its split replaceable construction, it offers flexible combination options for inserts and holders, catering to various materials, drilling depths, and applications. Experience minimized tool investment and reduced inventory, along with unparalleled performance and versatility with the Rapid X


RAPID
DRILL

RAPID DRILL HOLDER

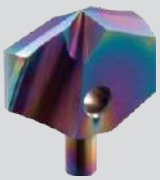
XRD - 1000 - S16 - 3D

XRD	1000	S16	3D
TYPE	MIN.INSERT DIAMETER	SHANK DIAMETER	MAXIMUM DRILLING DEPTH
	1800-18.0MM	16 - 16.0 mm	03 - 03XD
RAPID DRILL HOLDER		20 - 20.0 mm	05 - 05XD
		25 - 25.0 mm	08 - 08XD
		32 - 32.0 mm	

RAPID DRILL INSERT

XRD - I - 1800 - XT840

XRD	I	1800	XT840
SERIES	TYPE	DRILL DIAMETER	PRODUCT GRADE
		1000-10.0 MM	XT840
XRD	INSERT	1270 - 12.7 MM	XT125C
			XT930
			XT430
			XA330

ILLUSTRATION	NAME	MODEL	DIAMETER	SPEC RANGE	WORKPIECE MATERIAL			
					P	P	P	P
					MILD STEEL	STRUCTURE STEEL	ALLOY STEEL	TOOLS STEEL
					<500N	<700N	<1400N	<1200N
	RAPID DRILL SHANK	XRD	3xD 5XD 8XD	10 ~ 39.99	-	-	-	-
	CARBIDE INSERT OF RAPID DRILL	XT840		10 ~ 39.99	○	●	●	●
	CARBIDE INSERT OF RAPID DRILL	XT125C		10 ~ 39.99	●			
	CARBIDE INSERT OF RAPID DRILL	XT930		10 ~ 39.99		○	○	○
	CARBIDE INSERT OF RAPID DRILL	XT430		10 ~ 39.99				
	CARBIDE INSERT OF RAPID DRILL	XA330		10 ~ 39.99				

DRILLING

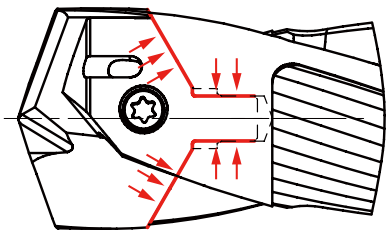
WORKPIECE MATERIAL									
M	K	K	N	N	N	S	S	H	H
STAINESS STEEL	CASTIRON	MALLEABLE CAST IRON	ALLUMINIUM ALLOY	CAST ALLUMINIUM ALLOYS	COOPER ALLOYS	SUPER ALLOYS	TITANIUM ALLOYS	HARDENDED STEEL	HARDENDED STEEL
<900N	<750N	<1100N	SI<12%	SI<12%	<750N	<1100N	<1100N	<1400N	<1600N
-	-	-	-	-	-	-	-	-	-
O	O	O	O	O	O	O	O	O	O
	O	O							
●	O	O	O	O	O	O	O		
	●	●	O	O					
			●	●	●				

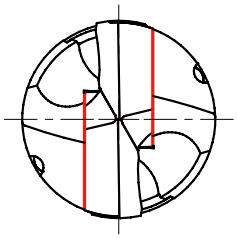
● FIRST CHOICE O SECOND CHOICE

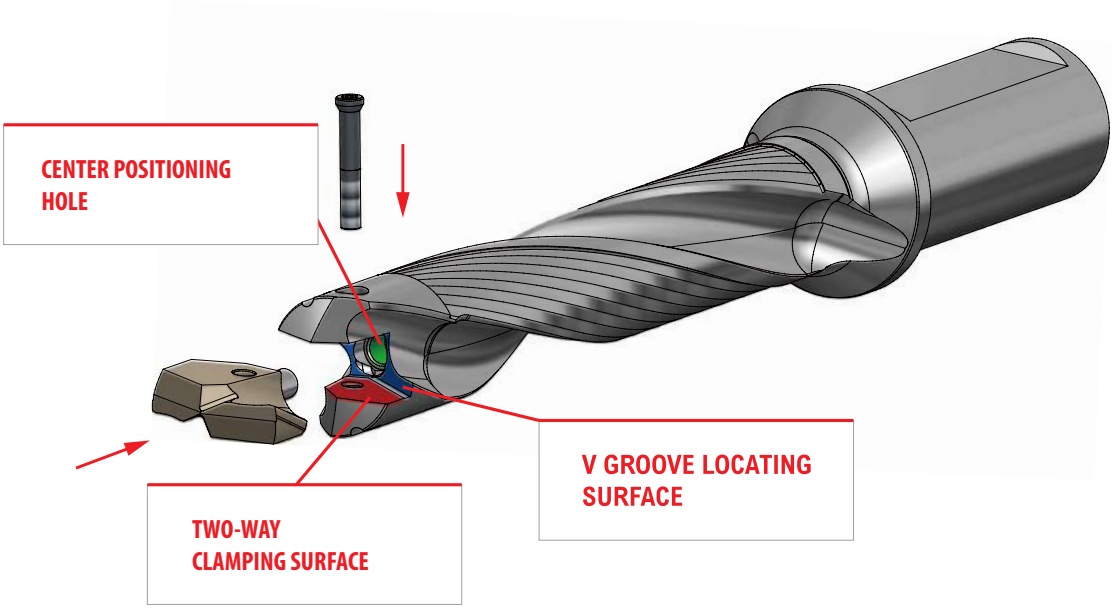
FEATURES

- The replaceable adapter which is stable and easy to operate facilitates the replacement of insert on machine tools.
- The positioning combination of center lock screw, V groove and cylinder maintains consistent, stable and reliable locking force and drilling force.
- Optimal materials, top-class coating and precision grinding technology maximize its performance.
- The high-strength insert construction makes it competent for drilling with high feeds.
- With the unique dual material system of cemented carbide and HSS-PM, it can realize high speed drilling on CNC machines and low-to-medium speed drilling on common machines.

TRIPLE POSITIONING STRUCTURE



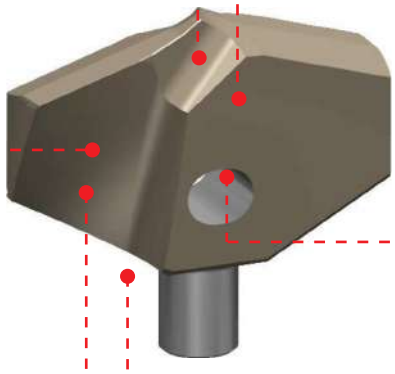




XCUT RAPID DRILL TIP -> XRD SELF-CENTERING DRILL TIP

CONVEX DRILL TIP ANGLE

The innovative convex drill tip structure, with XY bi-directional centering function, can excellently meet the centering function during and after drilling under long-diameter working conditions, achieving good drilling stability and hole-making accuracy.



HIGH STRENGTH DRILL TIP

The high-strength drill tip is designed to work well under harsh working conditions.

GRADIENT FRONT ANGLE

Gradient Circumferential angle for more balanced cutting forces, effectively reducing the occurrence of chip tumors and chipping.

CONVEX DRILL TIP ANGLE

The circular tooth gap chip holding slot design has low chip removal resistance and high chip guiding force, which ensures stable chip formation.

EDGE STRENGTHENING

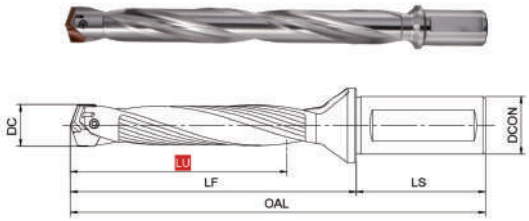
The reinforced structure of the cutting edge ensures reliable chip breaking and good chipping resistance when drilling long chip materials.

CHIP SPACE

Low roughness polish and high chip capacity geometry for good chip removal and insert strength.

XRD HELICAL FLUTE HOLDER WITH WELDON SHANK

- Internal coolant structure, excellent cooling effect and chip removal performance.
- Convenient and high-precision head interface, the blade can be replaced directly
- Side-locked tool holder, with 3D, 5D, 8D Series.



3×D

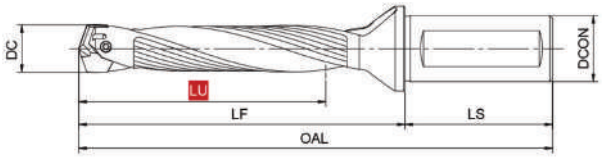
ISO 9766

		Size					Availability
CODE	DC	LU	DCON	LF	OAL	LS	
XRD-1000-S16-3D	10.0~10.49	31.5	16	48	96	48	O
XRD-1050-S16-3D	10.5~10.99	33.0	16	50	98	48	O
XRD-1100-S16-3D	11.0~11.49	34.4	16	52	100	48	O
XRD-1150-S16-3D	11.5~11.99	36.0	16	54	102	48	O
XRD-1200-S16-3D	12.0~12.49	37.5	16	57	105	48	O
XRD-1250-S16-3D	12.5~12.99	39.0	16	59	107	48	O
XRD-1300-S16-3D	13.0~13.49	40.5	16	61	109	48	O
XRD-1350-S16-3D	13.5~13.99	42.0	16	63	111	48	O
XRD-1400-S16-3D	14.0~14.49	43.5	16	65	113	48	O
XRD-1450-S16-3D	14.5~14.99	45.0	16	67	115	48	O
XRD-1500-S20-3D	15.0~15.99	48.0	20	72	122	50	O
XRD-1600-S20-3D	16.0~16.99	51.0	20	77	127	50	O
XRD-1700-S20-3D	17.0~17.99	54.0	20	81	131	50	O
XRD-1800-S25-3D	18.0~18.99	57.0	25	85	141	56	O
XRD-1900-S25-3D	19.0~19.99	60.0	25	90	146	56	O
XRD-2000-S25-3D	20.0~20.99	63.0	25	94	150	56	O
XRD-2100-S25-3D	21.0~21.99	66.0	25	98	154	56	O
XRD-2200-S25-3D	22.0~22.99	69.0	25	102	158	56	O
XRD-2300-S25-3D	23.0~23.99	72.0	25	107	163	56	O
XRD-2400-S32-3D	24.0~24.99	75.0	32	112	172	60	O
XRD-2500-S32-3D	25.0~25.99	78.0	32	116	176	60	O
XRD-2600-S32-3D	26.0~26.99	81.0	32	121	181	60	O
XRD-2700-S32-3D	27.0~27.99	84.0	32	125	185	60	O
XRD-2800-S32-3D	28.0~28.99	87.0	32	129	189	60	O
XRD-2900-S32-3D	29.0~29.99	90.0	32	133	193	60	O
XRD-3000-S32-3D	30.0~30.99	93.0	32	138	198	60	O
XRD-3100-S32-3D	31.0~31.99	96.0	32	142	202	60	O
XRD-3200-S32-3D	32.0~32.99	99.0	32	146	206	60	O
XRD-3300-S32-3D	33.0~33.99	102.0	32	151	211	60	O
XRD-3400-S40-3D	34.0~34.99	105.0	40	156	226	70	O
XRD-3500-S40-3D	35.0~35.99	108.0	40	160	230	70	O
XRD-3600-S40-3D	36.0~36.99	111.0	40	164	234	70	O
XRD-3700-S40-3D	37.0~37.99	114.0	40	169	239	70	O
XRD-3800-S40-3D	38.0~38.99	117.0	40	173	243	70	O
XRD-3900-S40-3D	39.0~39.99	123.0	40	182	252	70	O

● STOCKABLE ○ NON STOCKABLE

XRD HELICAL FLUTE HOLDER WITH WELDON SHANK





5×D

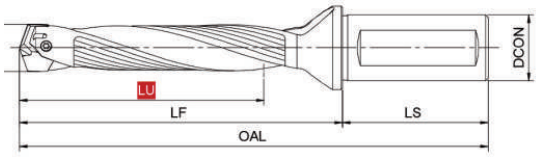
ISO 9766

		Size					Availability
CODE	DC	LU	DCON	LF	OAL	LS	LS
XRD-1000-S16-5D	10.0~10.49	52.5	16	69	117	48	O
XRD-1050-S16-5D	10.5~10.99	55.0	16	72	120	48	O
XRD-1100-S16-5D	11.0~11.49	57.5	16	75	123	48	O
XRD-1150-S16-5D	11.5~11.99	60.0	16	78	126	48	O
XRD-1200-S16-5D	12.0~12.49	62.5	16	82	130	48	O
XRD-1250-S16-5D	12.5~12.99	65.0	16	85	133	48	O
XRD-1300-S16-5D	13.0~13.49	67.5	16	88	136	48	O
XRD-1350-S16-5D	13.5~13.99	70.0	16	91	139	48	O
XRD-1400-S16-5D	14.0~14.49	72.5	16	94	142	48	O
XRD-1450-S16-5D	14.5~14.99	75.0	16	97	145	48	O
XRD-1500-S20-5D	15.0~15.99	80.0	20	104	154	50	O
XRD-1600-S20-5D	16.0~16.99	85.0	20	111	161	50	O
XRD-1700-S20-5D	17.0~17.99	90.0	20	117	167	50	O
XRD-1800-S25-5D	18.0~18.99	95.0	25	123	179	56	O
XRD-1900-S25-5D	19.0~19.99	100.0	25	130	186	56	O
XRD-2000-S25-5D	20.0~20.99	105.0	25	136	192	56	O
XRD-2100-S25-5D	21.0~21.99	110.0	25	142	198	56	O
XRD-2200-S25-5D	22.0~22.99	115.0	25	148	204	56	O
XRD-2300-S25-5D	23.0~23.99	120.0	25	155	211	56	O
XRD-2400-S32-5D	24.0~24.99	125.0	32	162	222	60	O
XRD-2500-S32-5D	25.0~25.99	130.0	32	168	228	60	O
XRD-2600-S32-5D	26.0~26.99	135.0	32	175	235	60	O
XRD-2700-S32-5D	27.0~27.99	140.0	32	181	241	60	O
XRD-2800-S32-5D	28.0~28.99	145.0	32	187	247	60	O
XRD-2900-S32-5D	29.0~29.99	150.0	32	193	253	60	O
XRD-3000-S32-5D	30.0~30.99	155.0	32	200	260	60	O
XRD-3100-S32-3D	31.0~31.99	160.0	32	206	266	60	O
XRD-3200-S32-5D	32.0~32.99	165.0	32	212	272	60	O
XRD-3300-S32-5D	33.0~33.99	170.0	32	219	279	60	O
XRD-3400-S40-5D	34.0~34.99	175.0	40	226	296	70	O
XRD-3500-S40-5D	35.0~35.99	180.0	40	232	302	70	O
XRD-3600-S40-5D	36.0~36.99	185.0	40	238	308	70	O
XRD-3700-S40-5D	37.0~37.99	190.0	40	245	315	70	O
XRD-3800-S40-5D	38.0~38.99	195.0	40	251	321	70	O
XRD-3900-S40-5D	39.0~39.99	205.0	40	264	334	70	O

● STOCKABLE ○ NON STOCKABLE

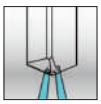
XRD HELICAL FLUTE HOLDER WITH WELDON SHANK





8×D

ISO 9766

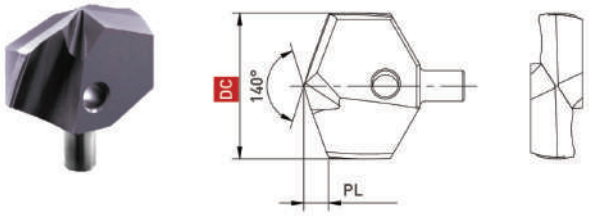


		Size					Availability
CODE	DC	LU	DCON	LF	OAL	LS	LS
XRD-1000-S16-8D	10.0-10.49	84	16	100	148	48	O
XRD-1050-S16-8D	10.5-10.99	88	16	105	153	48	O
XRD-1100-S16-80	11.0-11.49	92	16	110	158	48	O
XRD-1150-S16-8D	11.5-11.99	96	16	114	162	48	O
XRD-1200-S16-80	12.0-12.49	100	16	119	167	48	O
XRD-1250-S16-8D	12.5-12.99	104	16	124	172	48	O
XRD-1300-S16-80	13.0-13.49	108	16	128	176	48	O
XRD-1350-S16-80	13.5-13.99	112	16	133	181	48	O
XRD-1400-S16-8D	14.0-14.49	116	16	138	186	48	O
XRD-1450-S16-8D	14.5-14.99	120	16	142	190	48	O
XRD-1500-S20-80	15.0-15.99	128	20	152	202	50	O
XRD-1600-S20-8D	16.0-16.99	136	20	162	212	50	O
XRD-1700-S20-80	17.0-17.99	144	20	171	221	50	O
XRD-1800-S25-8D	18.0-18.99	152	25	180	236	56	O
XRD-1900-S25-80	19.0-19.99	160	25	190	246	56	O
XRD-2000-S25-8D	20.0-20.99	168	25	199	255	56	O
XRD-2100-S25-80	21.0-21.99	176	25	208	264	56	O
XRD-2200-S25-80	22.0-22.99	184	25	217	273	56	O
XRD-2300-S25-8D	23.0-23.99	192	25	227	283	56	O
XRD-2400-S32-80	24.0-24.99	200	32	237	297	60	O
XRD-2500-S32-8D	25.0-25.99	208	32	246	306	60	O
XRD-2600-S32-80	26.0-26.99	216	32	256	316	60	O
XRD-2700-S32-80	27.0-27.99	224	32	265	325	60	O
XRD-2800-S32-80	28.0-28.99	232	32	274	334	60	O
XRD-2900-S32-80	29.0-29.99	240	32	283	343	60	O
XRD-3000-S32-80	30.0-30.99	248	32	293	353	60	O
XRD-3100-S32-80	31.0-31.99	256	32	302	362	60	O
XRD-3200-S32-80	32.0-32.99	264	32	311	371	60	O
XRD-3300-S32-80	33.0-33.99	272	32	321	381	60	O
XRD-3400-S40-80	34.0-34.99	280	40	331	401	70	O
XRD-3500-S40-80	35.0-35.99	288	40	340	410	70	O
XRD-3600-S40-80	36.0-36.99	296	40	349	419	70	O
XRD-3700-S40-80	37.0-37.99	304	40	359	429	70	O
XRD-3800-S40-80	38.0-38.99	312	40	368	438	70	O
XRD-3900-S40-8D	39.0-39.99	328	40	387	457	70	O

● STOCKABLE ○ NON STOCKABLE

XRD -XT840 CARBIDE INSERT OF RAPID DRILL

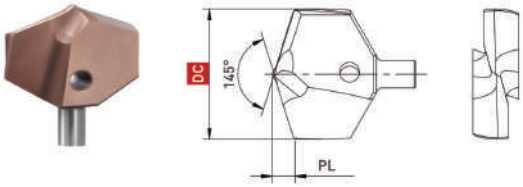
- Diameter range : 10.0-39.99mm
- Triple Positioning structure to improve drilling stability
- Drilling accuracy : IT9~IT10
- CS drill tip
- Special for alloy steels



P CARBIDE MINCRO GRAIN HSC HPC

XRD -XT125C CARBIDE INSERT OF RAPID DRILL

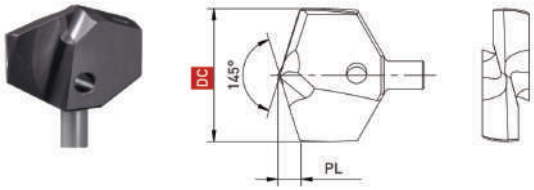
- Diameter range : 10.0-39.99mm
- Triple Positioning structure to improve drilling stability
- Drilling accuracy : IT9~IT10
- CS drill tip
- Special for low carbon steel



P CARBIDE MINCRO GRAIN HSC HPC

XRD -XT930 CARBIDE INSERT OF RAPID DRILL

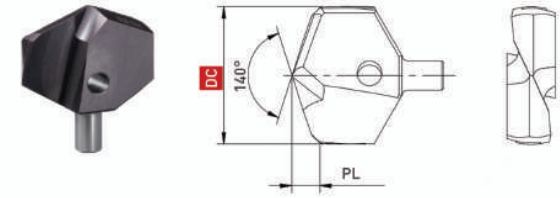
- Diameter range : 10.0-39.99mm
- Triple Positioning structure to improve drilling stability
- Drilling accuracy : IT9~IT10
- CS drill tip
- Special for stainless steel



M CARBIDE MINCRO GRAIN HSC HPC

XRD- XT430 CARBIDE INSERT OF RAPID DRILL

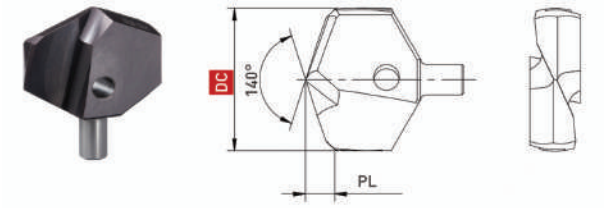
- Diameter range : 10.0-39.99mm
- Triple Positioning structure to improve drilling stability
- Drilling accuracy : IT9~IT10
- CS drill tip
- Special for cast iron



K CARBIDE MINCRO GRAIN HSC HPC

XRD -XA330 CARBIDE INSERT OF RAPID DRILL

- Diameter range : 10.0-39.99mm
- Triple Positioning structure to improve drilling stability
- Drilling accuracy : IT9~IT10
- CS drill tip
- Special for non-ferrous materials



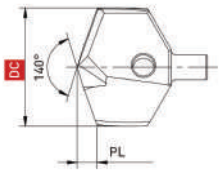
N CARBIDE MINCRO GRAIN HSC HPC

DRILLING

XRD- INSERT SPECIFICATION OF RAPID DRILL

- Diameter range : 10.0X39.99mm.
- Conveient Triple Posting Structure to improve drilling stablity
- Drilling accuracy: IT9~IT10.







CARBIDE
MINCRO GRAIN
HSC
HPC

(UNIT): MM

INSERT MODEL	DC	PL	XT840	XT125C	XT930	XT430	XA330	MATCHING HOLDER MODEL
XRD-I-1000	10	1.8	O	O	O	O	O	XRD-1000-S16-3D
XRD-I-1010	10.1	1.8	O	O	O	O	O	
XRD-I-1020	10.2	1.9	O	O	O	O	O	XRD-1000-S16-5D
XRD-I-1030	10.3	1.9	O	O	O	O	O	
XRD-I-1040	10.4	1.9	O	O	O	O	O	XRD-1000-S16-8D
XRD-I-1050	10.5	1.9	O	O	O	O	O	XRD-1050-S16-30
XRD-I-1060	10.6	1.9	O	O	O	O	O	
XRD-I-1070	10.7	1.9	O	O	O	O	O	XRD-1050-S16-50
XRD-I-1080	10.8	2	O	O	O	O	O	
XRD-I-1090	10.9	2	O	O	O	O	O	XRD-1050-S16-8D
XRD-I-1100	11	2	O	O	O	O	O	XRD-1100-S16-3D
XRD-I-1110	11.1	2	O	O	O	O	O	
XRD-I-1120	11.2	2	O	O	O	O	O	XRD-1100-S16-5D
XRD-I-1130	11.3	2.1	O	O	O	O	O	
XRD-I-1140	11.4	2.1	O	O	O	O	O	XRD-1100-S16-8D
XRD-I-1150	11.5	2.1	O	O	O	O	O	XRD-1150-S16-3D
XRD-I-1160	11.6	2.1	O	O	O	O	O	
XRD-I-1170	11.7	2.1	O	O	O	O	O	XRD-1150-S16-5D
XRD-I-1180	11.8	2.1	O	O	O	O	O	
XRD-I-1190	11.9	2.2	O	O	O	O	O	XRD-1150-S16-8D
XRD-I-1200	12	2.2	O	O	O	O	O	XRD-1200-S16-3D
XRD-I-1210	12.1	2.2	O	O	O	O	O	
XRD-I-1220	12.2	2.2	O	O	O	O	O	XRD-1200-S16-5D
XRD-I-1230	12.3	2.2	O	O	O	O	O	
XRD-I-1240	12.4	2.3	O	O	O	O	O	XRD-1200-S16-8D
XRD-I-1250	12.5	2.3	O	O	O	O	O	XRD-1250-S16-3D
XRD-I-1260	12.6	2.3	O	O	O	O	O	
XRD-I-1270	12.7	2.3	O	O	O	O	O	XRD-1250-S16-5D
XRD-I-1280	12.8	2.3	O	O	O	O	O	
XRD-I-1290	12.9	2.3	O	O	O	O	O	XRD-1250-S16-8D
XRD-I-1300	13	2.4	O	O	O	O	O	XRD-1300-S16-3D
XRD-I-1310	13.1	2.4	O	O	O	O	O	
XRD-I-1320	13.2	2.4	O	O	O	O	O	XRD-1300-S16-5D
XRD-I-1330	13.3	2.4	O	O	O	O	O	
XRD-I-1340	13.4	2.4	O	O	O	O	O	XRD-1300-S16-8D
XRD-I-1350	13.5	2.5	O	O	O	O	O	

● STOCKABLE O NON STOCKABLE

DRILLING

INSERT MODEL	DC	PL	XT840	XT125C	XT930	XT430	XA330	MATCHING HOLDER MODEL
XRD-I-1360	13.60	2.50	O	O	O	O	O	XRD-1350-S16-3D
XRD-I-1370	13.70	2.50	O	O	O	O	O	
XRD-I-1380	13.80	2.50	O	O	O	O	O	XRD-1350-S16-5D
XRD-I-1390	13.90	2.50	O	O	O	O	O	XRD-1350-S16-8D
XRD-I-1400	14.00	2.50	O	O	O	O	O	XRD-1400-S16-3D
XRD-I-1410	14.10	2.60	O	O	O	O	O	
XRD-I-1420	14.20	2.60	O	O	O	O	O	XRD-1400-S16-5D
XRD-I-1430	14.30	2.60	O	O	O	O	O	
XRD-I-1440	14.40	2.60	O	O	O	O	O	XRD-1400-S16-8D
XRD-I-1450	14.50	2.60	O	O	O	O	O	XRD-1450-S16-3D
XRD-I-1460	14.60	2.70	O	O	O	O	O	
XRD-I-1470	14.70	2.70	O	O	O	O	O	XRD-1450-S16-5D
XRD-I-1480	14.80	2.70	O	O	O	O	O	
XRD-I-1490	14.90	2.70	O	O	O	O	O	XRD-1450-S16-8D
XRD-I-1500	15.00	2.70	O	O	O	O	O	
XRD-I-1510	15.10	2.70	O	O	O	O	O	
XRD-I-1520	15.20	2.80	O	O	O	O	O	
XRD - I-1530	15.30	2.80	O	O	O	O	O	XRD-1500-S20-3D
XRD-I-1540	15.40	2.80	O	O	O	O	O	
XRD-I-1550	15.50	2.80	O	O	O	O	O	XRD-1500-S20-5D
XRD-I-1560	15.60	2.80	O	O	O	O	O	
XRD-I-1570	15.70	2.90	O	O	O	O	O	XRD-1500-S20-8D
XRD-I-1580	15.80	2.90	O	O	O	O	O	
XRD-I-1590	15.90	2.90	O	O	O	O	O	
XRD-I-1600	16.00	2.90	O	O	O	O	O	
XRD-I-1610	16.10	2.90	O	O	O	O	O	
XRD-I-1620	16.20	2.90	O	O	O	O	O	
XRD-I-1630	16.30	3.00	O	O	O	O	O	XRD-1600-S20-3D
XRD-I-1640	16.40	3.00	O	O	O	O	O	
XRD-I-1650	16.50	3.00	O	O	O	O	O	XRD-1600-S20-5D
XRD-I-1660	16.60	3.00	O	O	O	O	O	
XRD-I-1670	16.70	3.00	O	O	O	O	O	XRD-1600-S20-8D
XRD-I-1680	16.80	3.10	O	O	O	O	O	
XRD-I-1690	16.90	3.10	O	O	O	O	O	
XRD-I-1700	17.00	3.10	O	O	O	O	O	
XRD-I-1710	17.10	3.10	O	O	O	O	O	
XRD-I-1720	17.20	3.10	O	O	O	O	O	
XRD-I-1730	17.30	3.10	O	O	O	O	O	XRD-1700-S20-3D
XRD-I-1740	17.40	3.20	O	O	O	O	O	
XRD-I-1750	17.50	3.20	O	O	O	O	O	XRD-1700-S20-5D
XRD-I-1760	17.60	3.20	O	O	O	O	O	
XRD-I-1710	17.70	3.20	O	O	O	O	O	XRD-1700-S20-8D
XRD-I-1780	17.80	3.20	O	O	O	O	O	
XRD-I-1790	17.90	3.30	O	O	O	O	O	
XRD-I-1800	18.00	3.30	O	O	O	O	O	

● STOCKABLE O NON STOCKABLE

INSERT MODEL	DC	PL	XT840	XT125C	XT930	XT430	XA330	MATCHING HOLDER MODEL
XRD-I-1810	18.1	3.3	O	O	O	O	O	XRD-1800-S25-3D XRD-1800-S25-5D XRD-1800-S25-8D
XRD-I-1820	18.2	3.3	O	O	O	O	O	
XRD-I-1830	18.3	3.3	O	O	O	O	O	
XRD-I-1840	18.4	3.3	O	O	O	O	O	
XRD-I-1850	18.5	3.4	O	O	O	O	O	
XRD-I-1860	18.6	3.4	O	O	O	O	O	
XRD-I-1870	18.7	3.4	O	O	O	O	O	
XRD-I-1880	18.8	3.4	O	O	O	O	O	
XRD-I-1890	18.9	3.4	O	O	O	O	O	
XRD-I-1900	19	3.5	O	O	O	O	O	XRD-1900-S25-3D XRD-1900-S25-5D XRD-1900-S25-8D
XRD-I-1910	19.1	3.5	O	O	O	O	O	
XRD-I-1920	19.2	3.5	O	O	O	O	O	
XRD-I-1930	19.3	3.5	O	O	O	O	O	
XRD-I-1940	19.4	3.5	O	O	O	O	O	
XRD-I-1950	19.5	3.5	O	O	O	O	O	
XRD-I-1960	19.6	3.6	O	O	O	O	O	
XRD-I-1970	19.7	3.6	O	O	O	O	O	
XRD-I-1980	19.8	3.6	O	O	O	O	O	
XRD-I-1990	19.9	3.6	O	O	O	O	O	
XRD-I-2000	20	3.6	O	O	O	O	O	XRD-2000-S25-30 XRD-2000-S25-5D XRD-2000-S25-8D
XRD-I-2010	20.1	3.7	O	O	O	O	O	
XRD-I-2020	20.2	3.7	O	O	O	O	O	
XRD-I-2030	20.3	3.7	O	O	O	O	O	
XRD-I-2040	20.4	3.7	O	O	O	O	O	
XRD-I-2050	20.5	3.7	O	O	O	O	O	
XRD-I-2060	20.6	3.7	O	O	O	O	O	
XRD-I-2070	20.7	3.8	O	O	O	O	O	
XRD-I-2080	20.8	3.8	O	O	O	O	O	
XRD-I-2090	20.9	3.8	O	O	O	O	O	
XRD-I-2100	21.0	3.8	O	O	O	O	O	XRD-2100-S25-3D XRD-2100-S25-5D XRD-2100-S25-8D
XRD-I-2110	21.1	3.8	O	O	O	O	O	
XRD-I-2120	21.2	3.9	O	O	O	O	O	
XRD-I-2130	21.3	3.9	O	O	O	O	O	
XRD-I-2140	21.4	3.9	O	O	O	O	O	
XRD-I-2150	21.5	3.9	O	O	O	O	O	
XRD-I-2160	21.6	3.9	O	O	O	O	O	
XRD-I-2170	21.7	3.9	O	O	O	O	O	
XRD-I-2180	21.8	4	O	O	O	O	O	
XRD-I-2190	21.9	4.	O	O	O	O	O	
XRD-I-2200	22	4.	O	O	O	O	O	XRD-2200-S25-3D XRD-2200-S25-5D
XRD-I-2210	22.1	4	O	O	O	O	O	
XRD-I-2220	22.2	4	O	O	O	O	O	
XRD-I-2230	22.3	4.1	O	O	O	O	O	
XRD-I-2240	22.4	4.1	O	O	O	O	O	
XRD-I-2250	22.5	4.1	O	O	O	O	O	

● STOCKABLE ○ NON STOCKABLE

INSERT MODEL	DC	PL	XT840	XT125C	XT930	XT430	XA330	MATCHING HOLDER MODEL
XRD-I-2260	22.6	4.1	O	O	O	O	O	XRD-2200-S25-8D
XRD-I-2270	22.7	4.1	O	O	O	O	O	
XRD-I-2280	22.8	4.1	O	O	O	O	O	
XRD-I-2290	22.9	4.2	O	O	O	O	O	
XRD-I-2300	23	4.2	O	O	O	O	O	XRD-2300-S25-3D XRD-2300-S25-5D XRD-2300-S25-8D
XRD-I-2310	23.1	4.2	O	O	O	O	O	
XRD-I-2320	23.2	4.2	O	O	O	O	O	
XRD-I-2330	23.3	4.2	O	O	O	O	O	
XRD-I-2340	23.4	4.3	O	O	O	O	O	
XRD-I-2350	23.5	4.3	O	O	O	O	O	
XRD-I-2360	23.6	4.3	O	O	O	O	O	
XRD-I-2370	23.7	4.3	O	O	O	O	O	
XRD-I-2380	23.8	4.3	O	O	O	O	O	
XRD-I-2390	23.9	4.3	O	O	O	O	O	
XRD-I-2400	24.0	4.4	O	O	O	O	O	XRD-2400-S32-3D XRD-2400-S32-5D XRD-2400-S32-8D
XRD-I-2410	24.1	4.4	O	O	O	O	O	
XRD-I-2420	24.2	4.4	O	O	O	O	O	
XRD-I-2430	24.3	4.4	O	O	O	O	O	
XRD-I-2440	24.4	4.4	O	O	O	O	O	
XRD-I-2450	24.5	4.5	O	O	O	O	O	
XRD-I-2460	24.6	4.5	O	O	O	O	O	
XRD-I-2470	24.7	4.5	O	O	O	O	O	
XRD-I-2480	24.8	4.5	O	O	O	O	O	
XRD-I-2490	24.9	4.5	O	O	O	O	O	
XRD-I-2500	25.0	4.5	O	O	O	O	O	XRD-2500-S32-3D XRD-2500-S32-5D XRD-2500-S32-8D
XRD-I-2510	25.1	4.6	O	O	O	O	O	
XRD-I-2520	25.2	4.6	O	O	O	O	O	
XRD-I-2530	25.3	4.6	O	O	O	O	O	
XRD-I-2540	25.4	4.6	O	O	O	O	O	
XRD-I-2550	25.5	4.6	O	O	O	O	O	
XRD-I-2560	25.6	4.7	O	O	O	O	O	
XRD-I-2570	25.7	4.7	O	O	O	O	O	
XRD-I-2580	25.8	4.7	O	O	O	O	O	
XRD-I-2590	25.9	4.7	O	O	O	O	O	
XRD-I-2600	26.0	4.7	O	O	O	O	O	XRD-2600-S32-3D XRD-2600-S32-5D XRD-2600-S32-8D
XRD-I-2610	26.1	4.7	O	O	O	O	O	
XRD-I-2620	26.2	4.80	O	O	O	O	O	
XRD-I-2630	26.3	4.8	O	O	O	O	O	
XRD-I-2640	26.4	4.8	O	O	O	O	O	
XRD-I-2650	26.5	4.8	O	O	O	O	O	
XRD-I-2660	26.6	4.8	O	O	O	O	O	
XRD-I-2670	26.7	4.9	O	O	O	O	O	
XRD-I-2680	26.8	4.9	O	O	O	O	O	
XRD-I-2690	26.9	4.9	O	O	O	O	O	
XRD-I-2700	27	4.9	O	O	O	O	O	

● STOCKABLE ○ NON STOCKABLE

INSERT MODEL	DC	PL	XT840	XT125C	XT930	XT430	XA330	MATCHING HOLDER MODEL
XRD-I-2710	27.1	4.9	O	O	O	O	O	XRD-2700-S32-3D XRD-2700-S32-5D XRD-2700-S32-8D
XRD-I-2720	27.2	4.9	O	O	O	O	O	
XRD-I-2730	27.3	5	O	O	O	O	O	
XRD-I-2740	27.4	5	O	O	O	O	O	
XRD-I-2750	27.5	5	O	O	O	O	O	
XRD-I-2760	27.6	5	O	O	O	O	O	
XRD-I-2770	27.7	5	O	O	O	O	O	
XRD-I-2780	27.8	5.1	O	O	O	O	O	
XRD-I-2790	27.9	5.1	O	O	O	O	O	
XRD-I-2800	28	5.1	O	O	O	O	O	XRD-2800-S32-3D XRD-2800-S32-5D XRD-2800-S32-8D
XRD-I-2810	28.1	5.1	O	O	O	O	O	
XRD-I-2820	28.2	5.1	O	O	O	O	O	
XRD-I-2830	28.3	5.2	O	O	O	O	O	
XRD-I-2840	28.4	5.2	O	O	O	O	O	
XRD-I-2850	28.5	5.2	O	O	O	O	O	
XRD-I-2860	28.6	5.2	O	O	O	O	O	
XRD-I-2870	28.7	5.2	O	O	O	O	O	
XRD-I-2880	28.8	5.2	O	O	O	O	O	
XRD-I-2890	28.9	5.3	O	O	O	O	O	
XRD-I-2900	29	5.3	O	O	O	O	O	XRD-2900-S32-3D XRD-2900-S32-5D XRD-2900-S32-8D
XRD-I-2910	29.1	5.3	O	O	O	O	O	
XRD-I-2920	29.2	5.3	O	O	O	O	O	
XRD-I-2930	29.3	5.3	O	O	O	O	O	
XRD-I-2940	29.4	5.4	O	O	O	O	O	
XRD-I-2950	29.5	5.4	O	O	O	O	O	
XRD-I-2960	29.6	5.4	O	O	O	O	O	
XRD-I-2970	29.7	5.4	O	O	O	O	O	
XRD-I-2980	29.8	5.4	O	O	O	O	O	
XRD-I-2990	29.9	5.4	O	O	O	O	O	
XRD-I-3000	30	5.5	O	O	O	O	O	XRD-3000-S32-3D XRD-3000-532-5D XRD-3000-S32-8D
XRD-I-3010	30.1	5.5	O	O	O	O	O	
XRD-I-3020	30.2	5.5	O	O	O	O	O	
XRD-I-3030	30.3	5.5	O	O	O	O	O	
XRD-I-3040	30.4	5.5	O	O	O	O	O	
XRD-I-3050	30.5	5.6	O	O	O	O	O	
XRD-I-3060	30.6	5.6	O	O	O	O	O	
XRD-I-3070	30.7	5.6	O	O	O	O	O	
XRD-I-3080	30.8	5.6	O	O	O	O	O	
XRD-I-3090	30.9	5.6	O	O	O	O	O	
XRD-I-3100	31	5.6	O	O	O	O	O	XRD-3100-S32-3D XRD-3100-S32-5D
XRD-1-3110	31.1	5.7	O	O	O	O	O	
XRD-I-3120	31.2	5.7	O	O	O	O	O	
XRD-I-3130	31.3	5.7	O	O	O	O	O	
XRD-I-3140	31.4	5.7	O	O	O	O	O	
XRD-I-3150	31.5	5.7	O	O	O	O	O	

● STOCKABLE ○ NON STOCKABLE

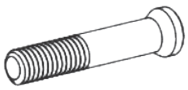
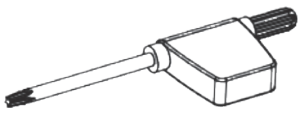
INSERT MODEL	DC	PL	XT840	XT125C	XT930	XT430	XA330	MATCHING HOLDER MODEL
XRD-I-3160	31.6	5.8	O	O	O	O	O	XRD-3100-S32-8D
XRD-I-3170	31.7	5.8	O	O	O	O	O	
XRD-I-3180	31.8	5.8	O	O	O	O	O	
XRD-I-3190	31.9	5.8	O	O	O	O	O	
XRD-I-3200	32	5.8	O	O	O	O	O	XRD-3200-S32-30 XRD-3200-S32-50 XRD-3200-S32-80
XRD-I-3210	32.1	5.8	O	O	O	O	O	
XRD-I-3220	32.2	5.9	O	O	O	O	O	
XRD-I-3230	32.3	5.9	O	O	O	O	O	
XRD-I-3240	32.4	5.9	O	O	O	O	O	
XRD-I-3250	32.5	5.9	O	O	O	O	O	
XRD-I-3260	32.6	5.9	O	O	O	O	O	
XRD-I-3270	32.7	6	O	O	O	O	O	
XRD-I-3280	32.8	6	O	O	O	O	O	
XRD-I-3290	32.9	6	O	O	O	O	O	
XRD-I-3300	33	6	O	O	O	O	O	XRD-3300-S32-30 XRD-3300-S32-50 XRD-3300-S32-8D
XRD-I-3310	33.1	6	O	O	O	O	O	
XRD-I-3320	33.2	6	O	O	O	O	O	
XRD-I-3330	33.3	6.1	O	O	O	O	O	
XRD-I-3340	33.4	6.1	O	O	O	O	O	
XRD-I-3350	33.5	6.1	O	O	O	O	O	
XRD-I-3360	33.6	6.1	O	O	O	O	O	
XRD-I-3370	33.7	6.1	O	O	O	O	O	
XRD-I-3380	33.8	6.2	O	O	O	O	O	
XRD-I-3390	33.9	6.2	O	O	O	O	O	
XRD-I-3400	34	6.2	O	O	O	O	O	XRD-3400-S40-30 XRD-3400-S40-50 XRD-3400-S40-8D
XRD-I-3410	34.1	6.2	O	O	O	O	O	
XRD-I-3420	34.2	6.2	O	O	O	O	O	
XRD-I-3430	34.3	6.2	O	O	O	O	O	
XRD-I-3440	34.4	6.3	O	O	O	O	O	
XRD-I-3450	34.5	6.3	O	O	O	O	O	
XRD-I-3460	34.6	6.3	O	O	O	O	O	
XRD-I-3470	34.7	6.3	O	O	O	O	O	
XRD-I-3480	34.8	6.3	O	O	O	O	O	
XRD-I-3490	34.9	6.4	O	O	O	O	O	
XRD-I-3500	35	6.4	O	O	O	O	O	XRD-3500-S40-30 XRD-3500-S40-50 XRD-3500-S40-80
XRD-I-3510	35.1	6.4	O	O	O	O	O	
XRD-I-3520	35.2	6.4	O	O	O	O	O	
XRD-I-3530	35.3	6.4	O	O	O	O	O	
XRD-I-3540	35.4	6.4	O	O	O	O	O	
XRD-I-3550	35.5	6.5	O	O	O	O	O	
XRD-I-3560	35.6	6.5	O	O	O	O	O	
XRD-I-3570	35.7	6.5	O	O	O	O	O	
XRD-I-3580	35.8	6.5	O	O	O	O	O	
XRD-I-3590	35.9	6.5	O	O	O	O	O	
XRD-I-3600	36	6.6	O	O	O	O	O	

● STOCKABLE O NON STOCKABLE

INSERT MODEL	DC	PL	XT840	XT125C	XT930	XT430	XA330	MATCHING HOLDER MODEL
XRD-I-3610	36.1	6.6	O	O	O	O	O	
XRD-I-3620	36.2	6.6	O	O	O	O	O	
XRD-I-3630	36.3	6.6	O	O	O	O	O	XRD-3600-S40-3D
XRD-I-3640	36.4	6.6	O	O	O	O	O	
XRD-I-3650	36.5	6.6	O	O	O	O	O	XRD-3600-S40-5D
XRD-I-3660	36.6	6.7	O	O	O	O	O	
XRD-I-3670	36.7	6.7	O	O	O	O	O	XRD-3600-S40-8D
XRD-I-3680	36.8	6.7	O	O	O	O	O	
XRD-I-3690	36.9	6.7	O	O	O	O	O	
XRD-I-3700	37	6.7	O	O	O	O	O	
XRD-I-3710	37.1	6.8	O	O	O	O	O	
XRD-I-3720	37.2	6.8	O	O	O	O	O	
XRD-I-3730	37.3	6.8	O	O	O	O	O	XRD-3700-S40-3D
XRD-I-3740	37.4	6.8	O	O	O	O	O	
XRD-I-3750	37.5	6.8	O	O	O	O	O	XRD-3700-S40-5D
XRD-I-3760	37.6	6.8	O	O	O	O	O	
XRD-I-3770	37.7	6.9	O	O	O	O	O	XRD-3700-S40-8D
XRD-I-3780	37.8	6.9	O	O	O	O	O	
XRD-I-3790	37.9	6.9	O	O	O	O	O	
XRD-I-3800	38	6.9	O	O	O	O	O	
XRD-I-3810	38.1	6.9	O	O	O	O	O	
XRD-I-3820	38.2	7	O	O	O	O	O	
XRD-I-3830	38.3	7	O	O	O	O	O	XRD-3800-S40-3D
XRD-I-3840	38.4	7	O	O	O	O	O	
XRD-I-3850	38.5	7	O	O	O	O	O	XRD-3800-S40-5D
XRD-I-3860	38.6	7	O	O	O	O	O	
XRD-I-3870	38.7	7	O	O	O	O	O	XRD-3800-S40-8D
XRD-I-3880	38.8	7.1	O	O	O	O	O	
XRD-I-3890	38.9	7.1	O	O	O	O	O	
XRD-I-3900	39	7.1	O	O	O	O	O	
XRD-I-3910	39	7.1	O	O	O	O	O	
XRD-I-3920	39.2	7.1	O	O	O	O	O	
XRD-I-3930	39.3	7.2	O	O	O	O	O	XRD-3900-S40-3D
XRD-I-3940	39.4	7.2	O	O	O	O	O	
XRD-I-3950	39.5	7.2	O	O	O	O	O	XRD-3900-S40-5D
XRD-I-3960	39.6	7.2	O	O	O	O	O	
XRD-I-3970	39.7	7.2	O	O	O	O	O	XRD-3900-S40-8D
XRD-I-3980	39.8	7.2	O	O	O	O	O	
XRD-I-3990	39.9	7.3	O	O	O	O	O	
XRD-I-3999	39.99	7.3	O	O	O	O	O	

● STOCKABLE O NON STOCKABLE

ACCESSORIES

SCREWS AND WRENCHES					
INSERT DIAMETER RANGE					
	SPEC.	ITEM NO.	SPEC.	ITEM NO.	SHAPE
10.0-10.99 11.0-12.49 12.5-13.99 14.0-15.99 16.0-17.99	M2.9X9 M2X10 M2X11.5 M2.5X13 M2.5X15	XRD SCREW 2102223 XRD SCREW 2102223 XRD SCREW 2102224 XRD SCREW 2102225 XRD SCREW 2102226	6IP 6IP 6IP 7IP 7IP	2502035 2502036 	
18.0-18.99 19.0-20.99 21.0-23.99 24.0-25.99 26.0-27.99	M3X16 M3X17 M3X20 M3.5X22 M3.5X24	XRD SCREW 2102225 XRD SCREW 2102227 XRD SCREW 2102228 XRD SCREW 2102229 XRD SCREW 2102210	9IP 9IP 9IP 10IP 10IP	2502037 2502038 	
28.0-30.99 31.0-33.99 34.0-36.99 37.0-39.99	M4X26 M5X29 M5X32 M6X35	XRD SCREW 2102211 XRD SCREW 2102212 XRD SCREW 2102213 XRD SCREW 2102214	15IP 20IP 20IP 25IP	2502039 2502040 2502041	



INSERT INSTALLATION PROCEDURE

- First clean the insert and mounting groove with compressed
- Load the insert into the mounting groove in the holder and slightly push the insert air.
- Fix the insert with the fastning bolt. it is recomended that users use a torque wrench as far as possible and the tigethning torques are shown in the figure.

RECOMMENDED VALUE OF SCREW LOCKING FORCE

RANGE OF DIAMETER	TIGHTNING TORQUE (NM)
10.0-13.99	0.5
14.0-17.99	1.0
18.0-23.99	2.0
24.0-27.99	3.0
28.0-30.99	5.0
31.0-36.99	7.5
37.0-39.99	15.0

APPLICATION

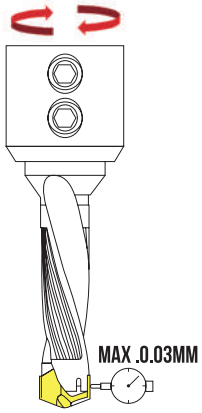
APPLICATION POINTS AND PRECAUTIONS

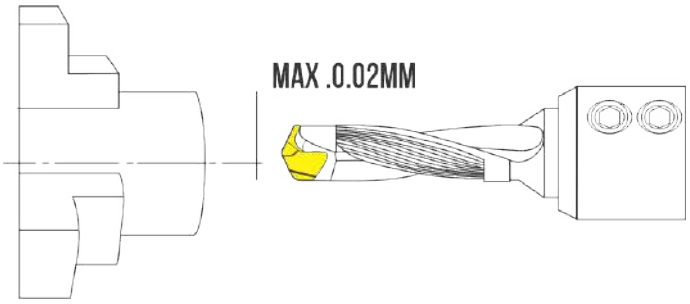
INSTALLATION

Good Working Condition & reliable clamping are requirements for service life and accuracy of drills.

MAX. RUNOUT AND MISALIGNMENT

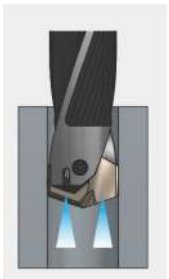
RUNOUT	MISALIGNMENT



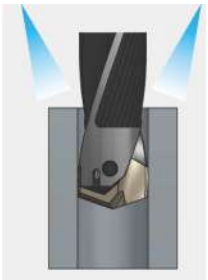


COOLING PRESSURE

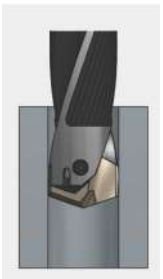
INTERNAL COOLING	EXTERNAL COOLING	QUASI-DRY CUTTING



3xD : 5bar ☑
5xD : 10bar ☑
8xD : 15bar ☑
10xD : 20bar ☑



3xD : 5bar ☑
5xD : 10bar ☒
8xD : 15bar ☒
10xD : 20bar ☒



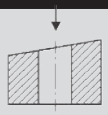
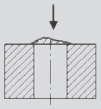
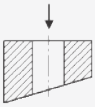
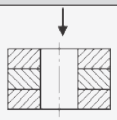
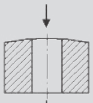
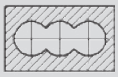
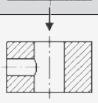
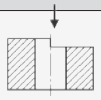
3xD : 5bar ☑

STANDARD OF DRILL BIT REPLACEMENT

WEAR LIMIT



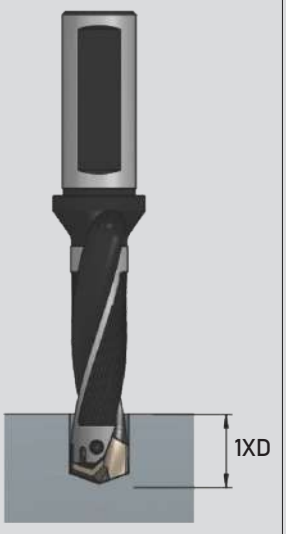
CARBIDE INSERT : VB=0.3 MM

OPERATING CONDITION	INSTRUCTIONS		OPERATING CONDITION	UCTIONS
	THE ENTRY SURFACE IS SLANTED			THE ENTRY SURFACE IS WELDED Level it through spot facing before maching.
	SLOPE <3°	FEED RATE <3°		
	THE OUTLET IS SLANTED			STACKED PLATES The Workpiece shall be properly clamped
	SLOPE <3°	FEED RATE <3°		
	THE ENTRY SURFACE IS ARC Drilling at the center at reduced feed rate is allowed. Spot facing is required if the entry point is not at the center of the arc.			DRILL INCOMPLETE HOLE NOT ALLOWED
	THROUGH HOLE NOT ALLOWED			STEP ON ENTRY SURFACE NOT ALLOWED(THE ENTRY POINT MUST BE ON A HORIZONTAL PLANE

APPLICATION

PRECAUTIONS

Drilling process for holders with a length of 8D

1	2	3	4
	 2-5mm from the bottom		
Drill a pilot hole to 1D to 1.5D with a short drill bit	Enter the pilot hole at a low speed and low feed rate	Keep the coolant for 2 to 3 s	Carry out continuous Speed drilling according to the recommended parameters. Reduce the speed and feed.

CUTTING PARAMETERS

ISO	WORKPIECE MATERIAL		HEAT TREATMENT	BRINELL HARDNESS HB	STRENGTH N/mm²	STRENGTH N/mm²
P	NON-ALLOY STEEL Y13, 1215, 1.0736 Y15, 1213, 1.0715 LOW CARBON STEEL 45, 1045, 1.0503 Q345B, 1140, 1.7026	<0.25% C	Annealed	100-150	370-500	CPC
		≥0.25% C	Annealed	175-225	600-775	CPC
		<0.55% C	Quenched and tempered	225-275	775-940	CPC
		≥0.55% C	Annealed	275-325	940-1090	CPA
			Quenched and tempered	300	1000	CPA
	HIGH ALLOY STEEL, TOOL STEEL, CAST STEEL CR12, D3, 1.2080; 4CR5MOVSI, H13, 1.2344		Annealed	175-275	600-775	CPA
			Tempered	225-275	775-940	CPA
			Annealed	275-325	940-1090	CPA
			Tempered	325-375	1090-1265	CPA
	STAINLESS STEEL FERRITIC/MARTENSITIC OCR13, 403, 1.400, 2CR13, 410, 1.4021		Annealed	225-300	600-1020	CPA
			Tempered	300-350	1020-1180	CPA
			Annealed	185-275	640-940	CPA
			Tempered	275-350	940-1180	CPA
M	STAINLESS STEEL AUSTENITIC OCR18N19, 304, 1.4301 OCR17NI11M02, 316, 1.4401		Annealed	135-185	480-640	CMA
			Cast	185-275	640-940	CMA
	SUPER DUPLEX STAINLESS STEEL	N< 0.1%	Ferrtic	120-150	480-640	CMA
		N≥0.1%	Ferrtic	150-200	640-940	CMA
K	GREY CAST IRON HT 200, NO.30, GG20 HT250, NO.35 GG25		Ferrtic	200-220	430-500	CKA
			Pearlitic	150-200	500-700	CKA
	CAST IRON NODULAR QT400-18, 60-40-18,GGG40 QT 600-3, 80-60-03, GGG60		Ferrtic	200-220	700-755	CKA
			Pearlitic	220-260	755-890	CKA
	MALLEABIE CAST IRON		Ferrtic	120-150	430-500	CKA
			Pearlitic	260-320	890-1020	CKA

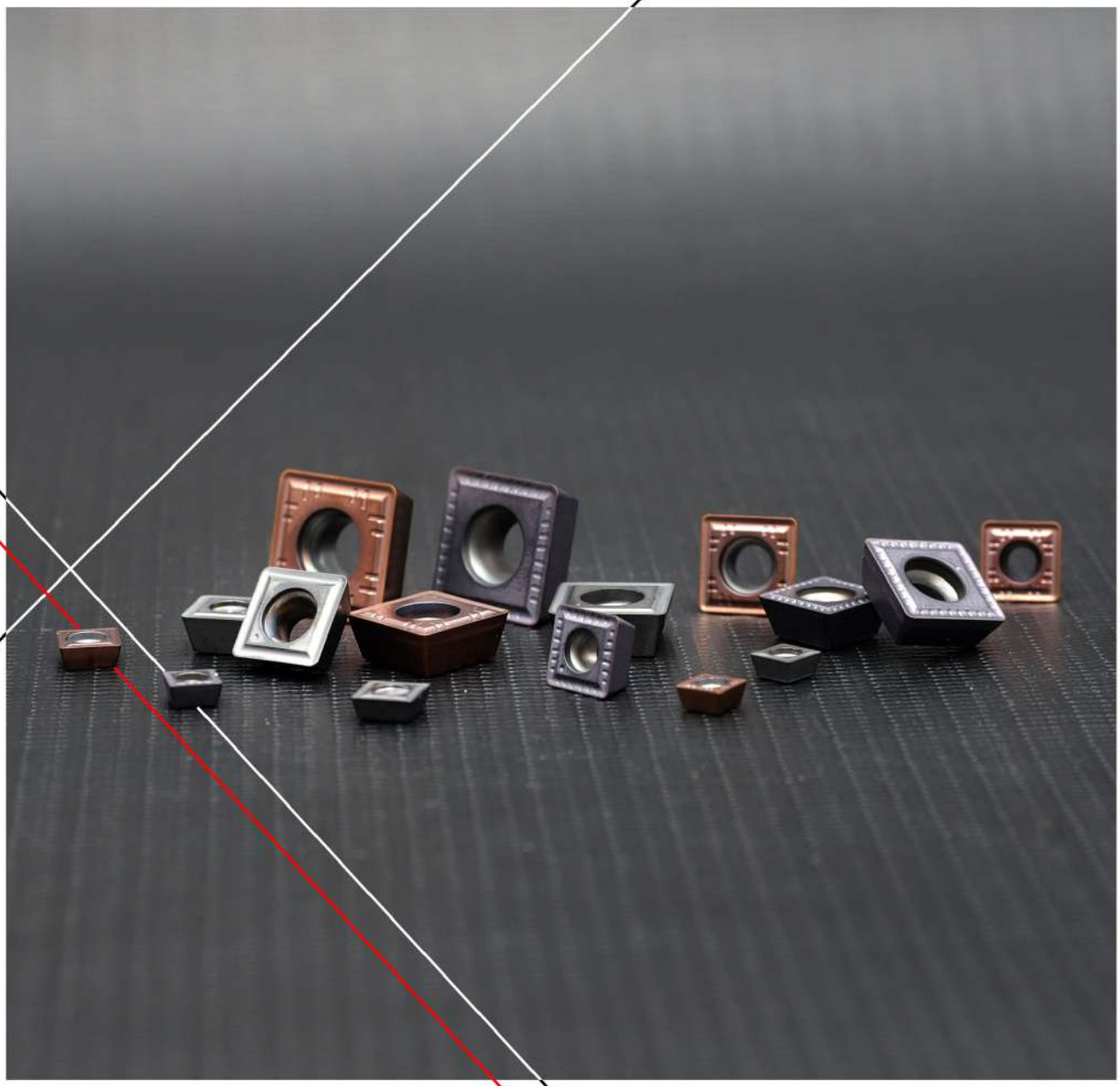
CUTTING SPEED Vc(m/min)			⌀ 10.00-11.99mm			⌀ 12.00-13.99mm			⌀ 14.00-15.99mm			⌀ 16.99-19.99mm			⌀ 20.00-25.99mm			⌀ 26.00-32.99mm			⌀ 33.00-39.99mm		
MIN	REC	MAX	MIN	REC	MAX	MIN	REC	MAX	MIN	REC	MAX	MIN	REC	MAX	MIN	REC	MAX	MIN	REC	MAX	MIN	REC	MAX
84	120	156	0.10	0.14	0.19	0.11	0.16	0.21	0.14	0.20	0.26	0.18	0.25	0.33	0.19	0.28	0.36	0.21	0.30	0.40	0.22	0.32	0.42
77	110	143	0.10	0.14	0.19	0.11	0.16	0.21	0.14	0.20	0.26	0.18	0.25	0.33	0.19	0.28	0.36	0.21	0.30	0.40	0.22	0.32	0.42
70	100	130	0.10	0.14	0.19	0.11	0.16	0.21	0.14	0.20	0.26	0.18	0.25	0.33	0.19	0.28	0.36	0.21	0.30	0.40	0.22	0.32	0.42
56	80	104	0.10	0.14	0.19	0.11	0.16	0.21	0.14	0.20	0.26	0.18	0.25	0.33	0.19	0.28	0.36	0.21	0.30	0.40	0.22	0.32	0.42
49	70	19	0.9	0.13	0.17	0.10	0.14	0.19	0.13	0.18	0.24	0.17	0.24	0.31	0.18	0.26	0.33	0.20	0.29	0.37	0.21	0.30	0.40
74	105	137	0.10	0.14	0.19	0.11	0.16	0.21	0.13	0.19	0.25	0.17	0.24	0.31	0.20	0.28	0.36	0.22	0.32	0.42	0.25	0.36	0.47
70	100	130	0.10	0.14	0.19	0.11	0.16	0.21	0.13	0.19	0.25	0.17	0.24	0.31	0.20	0.28	0.36	0.22	0.32	0.42	0.25	0.36	0.47
63	19	117	0.10	0.14	0.18	0.11	0.15	0.20	0.13	0.18	0.24	0.16	0.23	0.30	0.19	0.27	0.35	0.22	0.31	0.41	0.25	0.35	0.46
53	75	98	0.09	0.13	0.17	0.10	0.14	0.19	0.21	0.18	0.23	0.16	0.22	0.29	0.18	0.26	0.34	0.21	0.30	0.40	0.24	0.34	0.45
49	70	91	0.09	0.13	0.17	0.11	0.15	0.20	0.12	0.18	0.23	0.14	0.20	0.26	0.17	0.24	0.31	0.17	0.24	0.31	0.18	0.26	0.33
42	60	78	0.09	0.13	0.17	0.11	0.15	0.20	0.12	0.18	0.23	0.14	0.20	0.26	0.17	0.24	0.31	0.17	0.24	0.31	0.18	0.26	0.33
30	40	50	0.10	0.14	0.18	0.11	0.16	0.21	0.13	0.18	0.23	0.17	0.24	0.31	0.20	0.28	0.36	0.20	0.28	0.36	0.20	0.28	0.36
60	75	90	0.08	0.12	0.16	0.08	0.12	0.16	0.10	0.14	0.18	0.13	0.18	0.23	0.15	0.22	0.29	0.15	0.22	0.29	0.15	0.22	0.29
40	50	60	0.08	0.12	0.16	0.8	0.12	0.16	0.10	0.14	0.18	0.11	0.16	0.21	0.13	0.18	0.23	0.14	0.20	0.26	0.16	0.23	0.30
50	60	70	0.08	0.12	0.16	0.08	0.12	0.16	0.10	0.14	0.18	0.11	0.16	0.21	0.13	0.18	0.23	0.14	0.20	0.26	0.16	0.23	0.30
40	55	70	0.07	0.10	0.13	0.07	0.10	0.13	0.08	0.12	0.16	0.10	0.14	0.18	0.11	0.16	0.21	0.11	0.16	0.21	0.13	0.19	0.25
20	40	60	0.06	0.09	0.12	0.06	0.37	0.12	0.07	0.10	0.13	0.08	0.12	0.16	0.32	0.14	0.18	0.35	0.14	0.18	0.12	0.17	0.22
76	108	140	0.18	0.25	0.33	0.20	0.29	0.38	0.26	0.37	0.48	0.28	0.41	0.53	0.32	0.45	0.59	0.34	0.48	0.63	0.35	0.50	0.65
69	99	129	0.18	0.25	0.33	0.20	0.29	0.38	0.26	0.37	0.48	0.28	0.41	0.53	0.32	0.45	0.59	0.34	0.48	0.63	0.35	0.50	0.65
63	90	117	0.18	0.25	0.33	0.20	0.29	0.38	0.26	0.37	0.48	0.28	0.41	0.53	0.32	0.45	0.59	0.34	0.48	0.63	0.35	0.50	0.65
63	90	117	0.18	0.25	0.33	0.20	0.29	0.38	0.26	0.37	0.48	0.28	0.41	0.53	0.32	0.45	0.59	0.34	0.48	0.63	0.35	0.50	0.65
63	90	117	0.18	0.25	0.33	0.20	0.29	0.38	0.26	0.37	0.48	0.28	0.41	0.53	0.32	0.45	0.59	0.34	0.48	0.63	0.35	0.50	0.65
63	90	117	0.18	0.25	0.33	0.20	0.29	0.38	0.26	0.37	0.48	0.28	0.41	0.53	0.32	0.45	0.59	0.34	0.48	0.63	0.35	0.50	0.65

CUTTING PARAMETERS

ISO	WORKPIECE MATERIAL		HEAT TREATMENT	BRINELL HARDNESS HB	STRENGTH N/mm²
N	Wrought Aluminium		Not cureabie	30	100
			Cured	180	600
	Cast Aluminium	≤12% Si	Not cureabie	30	100
			Cured	180	600
		> 12% Si	High temperature	—	—
	Aluminium Bronze	> 12% Si	Free cutting	100-200	370-670
			Brass	200-250	670-855
			Electrolitic copper	100	370
	Non metallic		Duroplastics fiber plastics		—
			Hard rubber	60	200
S	High Temp. Alloy Hastelloy B, Inconel	Fe base	Annealed	140-220	480-755
			Cured	223-310	755-990
		Ni or co base	Annealed	250	—
			Cured	350	—
			Cast	320	—
H	Titanium Alloy		—	320	Rm 400
			Alloys cured		Rm 1050
	Wear Plate Hardox, AR400, T-1,		Harden	400	Rm 1050
			Harden	500	1600
	Hardened Steel		Harden	300-400	1020-1365
			Harden	400-500	1365+

CUTTING SPEED Vc(m/min)			⌀ 10.00-11.99mm			⌀ 12.00-13.99mm			⌀ 14.00-15.99mm			⌀ 16.99-19.99mm			⌀ 20.00-25.99mm			⌀ 26.00-32.99mm			⌀ 33.00-39.99mm		
MIN	REC	MAX	MIN	REC	MAX	MIN	REC	MAX	MIN	REC	MAX	MIN	REC	MAX	MIN	REC	MAX	MIN	REC	MAX	MIN	REC	MAX
105	150	195	0.18	0.25	0.33	0.20	0.28	0.36	0.26	0.37	0.48	0.28	0.40	0.52	0.32	0.45	0.59	0.35	0.50	0.65	0.39	0.55	0.72
91	130	169	0.18	0.25	0.33	0.20	0.28	0.36	0.26	0.37	0.48	0.28	0.40	0.52	0.32	0.45	0.59	0.35	0.50	0.65	0.39	0.55	0.72
105	150	195	0.18	0.25	0.33	0.20	0.28	0.36	0.26	0.37	0.48	0.28	0.40	0.52	0.32	0.45	0.59	0.35	0.50	0.65	0.39	0.55	0.72
91	130	169	0.18	0.25	0.33	0.20	0.28	0.36	0.26	0.37	0.48	0.28	0.40	0.52	0.32	0.45	0.59	0.35	0.50	0.65	0.39	0.55	0.72
91	130	169	0.18	0.25	0.33	0.20	0.28	0.13	0.26	0.37	0.48	0.28	0.40	0.52	0.32	0.45	0.59	0.35	0.50	0.65	0.39	0.55	0.72
105	150	195	0.18	0.25	0.33	0.20	0.28	0.13	0.26	0.37	0.48	0.28	0.40	0.52	0.32	0.45	0.59	0.35	0.50	0.65	0.39	0.55	0.72
105	150	195	0.18	0.25	0.33	0.20	0.28	0.13	0.26	0.37	0.48	0.28	0.40	0.52	0.32	0.45	0.59	0.35	0.50	0.65	0.39	0.55	0.72
105	150	195	0.18	0.25	0.33	0.20	0.28	0.13	0.26	0.37	0.48	0.28	0.40	0.52	0.32	0.45	0.59	0.35	0.50	0.65	0.39	0.55	0.72
105	150	195	0.18	0.25	0.33	0.20	0.28	0.13	0.26	0.37	0.48	0.28	0.40	0.52	0.32	0.45	0.59	0.35	0.50	0.65	0.39	0.55	0.72
105	150	195	0.18	0.25	0.33	0.20	0.28	0.13	0.26	0.37	0.48	0.28	0.40	0.52	0.32	0.45	0.59	0.35	0.50	0.65	0.39	0.55	0.72
32	45	59	0.06	0.08	0.10	0.10	0.10	0.13	0.10	0.14	0.18	0.11	0.16	0.21	0.13	0.18	0.23	0.14	0.20	0.26	0.15	0.22	0.29
25	35	46	0.06	0.08	0.10	0.07	0.10	0.13	0.10	0.14	0.18	0.11	0.16	0.21	0.13	0.18	0.23	0.14	0.20	0.26	0.15	0.22	0.29
25	35	46	0.06	0.08	0.10	0.07	0.10	0.13	0.10	0.14	0.18	0.11	0.16	0.21	0.13	0.18	0.23	0.14	0.20	0.26	0.15	0.22	0.29
25	35	46	0.06	0.08	0.10	0.07	0.10	0.13	0.10	0.14	0.18	0.11	0.16	0.21	0.13	0.18	0.23	0.14	0.20	0.26	0.15	0.22	0.29
25	35	46	0.06	0.08	0.10	0.07	0.10	0.13	0.10	0.14	0.18	0.11	0.16	0.21	0.13	0.18	0.23	0.14	0.20	0.26	0.15	0.22	0.29
25	35	46	0.06	0.08	0.10	0.07	0.10	0.13	0.10	0.14	0.18	0.11	0.16	0.21	0.13	0.18	0.23	0.14	0.20	0.26	0.15	0.22	0.29
25	35	46	0.06	0.08	0.10	0.07	0.10	0.13	0.10	0.14	0.13	0.11	0.16	0.21	0.13	0.18	0.23	0.14	0.20	0.26	0.15	0.22	0.29
21	30	39	0.06	0.08	0.10	0.07	0.10	0.13	0.10	0.14	0.13	0.08	0.16	0.16	0.13	0.18	0.23	0.11	0.16	0.21	0.11	0.16	0.21
15	21	30	0.06	0.08	0.10	0.07	0.10	0.13	0.10	0.14	0.13	0.08	0.12	0.16	0.13	0.18	0.23	0.11	0.16	0.21	0.11	0.16	0.21
28	40	52	0.06	0.08	0.10	0.07	0.10	0.13	0.10	0.14	0.13	0.08	0.12	0.16	0.13	0.18	0.23	0.11	0.16	0.21	0.11	0.16	0.21
18	25	35	0.06	0.08	0.10	0.07	0.10	0.13	0.10	0.14	0.13	0.08	0.12	0.16	0.13	0.18	0.23	0.11	0.16	0.21	0.11	0.16	0.21

NOTES

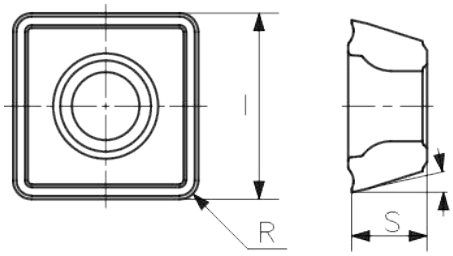


INDEXABLE U DRILL

We have 2 popular types of Indexable U Drills, one with 3 corners and other with 4 corners
The central and peripheral inserts are the same .
U Drill range is from 13mm upto 50mm

INSERT DESIGNATION
SPMG

4 Corner Drilling Insert
Same insert for centre and periphery.



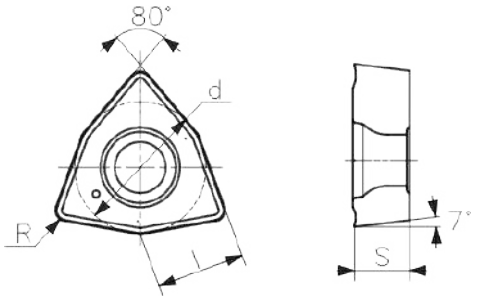
Description	L	S	r	d	FEED(mm/tooth)		XT110	XT125-C	XT830	GM-XT840	GM-XT930C
					MIN	MAX					
SPMG050204	5	2.38	0.4	2.25	0.04	0.12	●	●	●	●	●
SPMG060204	6	2.38	0.4	2.61	0.04	0.12	●	●	●	●	●
SPMG07T308	7.94	3.97	0.8	2.85	0.05	0.15	●	●	●	●	●
SPMG090408	9.8	4.3	0.8	4.05	0.06	0.15	●	●	●	○	●
SPMG110408	11.5	4.8	0.8	4.45	0.06	0.18	●	●	●	○	●
SPMG140512	14.3	5.2	1.2	5.75	0.08	0.20	●	●	●	○	●

● STOCKABLE ○ NON STOCKABLE

INSERT DESIGNATION
WCMX

DRILLING

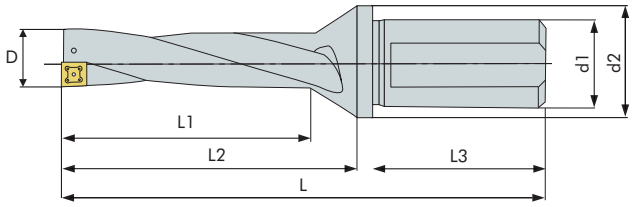
3 Corner Drilling Insert
Same insert for centre periphery



Description	L	S	r	d	iC	FEED(mm/tooth)		XT110	XT830	XT840	XT930-C
						MIN	MAX				
WCMX030208	3.40	2.38	2.80	0.80	5.56	0.04	0.09	●	○	○	●
WCMX040208	4.30	2.38	3.10	0.80	6.35	0.04	0.11	●	○	○	●
WCMX050308	5.40	3.18	3.20	0.80	7.94	0.04	0.11	●	○	○	●
WCMX06T308	6.50	3.97	3.70	0.80	9.53	0.06	0.13	●	○	○	●
WCMX080412	8.70	4.76	4.30	1.20	12.70	0.08	0.18	●	○	○	●

● STOCKABLE ○ NON STOCKABLE

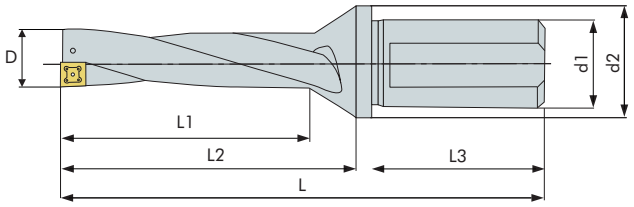
U-DRILL BODY
L / D 2 SERIES



Description	D	1	L1	L2	L3	dl	d2	Insert	Screw	Wrench	Stock
H-MDR2130-20T2-05	13.00	101	31	46	50	20	25	SPMG05	M2.0*5	T-6	o
H-MDR2135-20T2-05	13.50	102	32	47							o
H-MDRt2140-20T2-05	14.00	103	33	48							●
H-MDR2145-20T2-05	14.50	104	34	49							●
H-MDR2150-20T2-05	15.00	112	35	50							●
H-MDR2155-25T2-06	15.50	113	36	50	56	25	32	SPMG06	M2.2*5	T-7	●
H-MDR2160-25T2-06	16.00	114	37	51							●
H-MDR2165-25T2-06	16.50	115	38	52							●
H-MDR2170-25T2-06	17.00	116	39	53							●
H-MDR2175-25T2-06	17.50	117	40	54							●
H-MDR2180-25T2-06	18.00	118	41	55							●
H-MDR2185-25T2-06	18.50	119	42	56							●
H-MDR2190-25T2-06	19.00	120	43	57							●
H-MDR2195-25T2-06	19.50	121	44	58							●
H-MDR2200-25T2-06	20.00	122	45	59							●
H-MDR2205-25T2-06	20.50	123	46	60							o
H-MDR2210-25T2-06	21.00	124	47	61							o
H-MDR2215-25T2-06	21.50	125	48	62							o
H-MDR2220-32T2-07	22	126	49	63	60	32	44	SPMG07	M2.5*8	T-8	o
H-MDR2225-32T2-07	22.5	127	50	64							o
H-MDR2230-32T2-07	23	136	51	69							o
H-MDR2235-32T2-07	23.5	137	52	70							o
H-MDR2240-32T2-07	24	138	53	71							o
H-MDR2245-32T2-07	24.5	139	54	72							o
H-MDR2250-32T2-07	25	140	55	73							o
H-MDR2255-32T2-07	25.5	141	56	74							o
H-MDR2260-32T2-07	26	142	57	75							o
H-MDR2265-32T2-07	26.5	143	58	76							o
H-MDR2270-32T2-07	27	144	59	77							o
H-MDR2275-32T2-07	27.5	145	60	78							o

● STOCKABLE ○ NON STOCKABLE

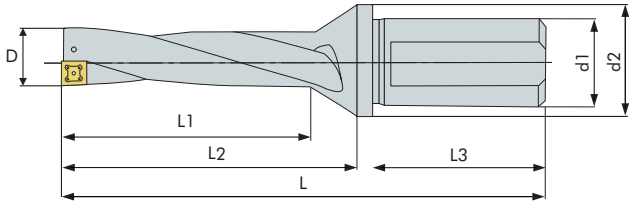
U-DRILL BODY
L / D 2 SERIES



Description	D	L	Ll	L2	L3	dl	d2	Insert	Screw	Wrench	Stock
H-MDR2280-32T2-09	28	146	61	79	60	32	44	SPMG09	M3.5*9	T-15	○
H-MDR2285-32T2-09	28.5	147	62	80							○
H-MDR2290-32T2-09	29	148	63	81							○
H-MDR2295-32T2-09	29.5	149	64	82							○
H-MDR2300-32T2-09	30	150	65	83							○
H-MDR2305-32T2-09	30.5	151	66	84							○
H-MDR2310-32T2-09	31	152	67	85							○
H-MDR2315-32T2-09	31.5	153	68	86							○
H-MDR2320-32T2-09	32	154	69	87							○
H-MDR2325-32T2-09	32.5	155	70	88							○
H-MDR2330-32T2-09	33	156	71	89							○
H-MDR2335-32T2-09	33.5	157	72	90							○
H-MDR2340-32T2-11	34	158	73	91	60	32	44	SPMG11	M4.0*10	T-15	○
H-MDR2350-32T2-11	35	159	74	92							○
H-MDR2360-32T2-11	36	160	75	93							○
H-MDR2370-32T2-11	37	161	76	94							○
H-MDR2380-32T2-11	38	162	77	95							○
H-MDR2390-32T2-11	39	163	78	96							○
H-MDR2400-32T2-11	40	164	79	97							○
H-MDR2410-32T2-11	41	165	80	98							○
H-MDR2420-40T2-14	42	166	81	99	70	40	54	SPMG14	M5.0*11	T-20	○
H-MDR2430-40T2-14	43	167	82	100							○
H-MDR2440-40T2-14	44	168	83	101							○
H-MDR2450-40T2-14	45	169	84	102							○
H-MDR2460-40T2-14	46	170	85	103							○
H-MDR2470-40T2-14	47	171	86	101							○
H-MDR2480-40T2-14	48	172	87	102							○
H-MDR2490-40T2-14	49	173	88	103							○
H-MDR2500-40T2-14	50	174	89	104							○

● STOCKABLE ○ NON STOCKABLE

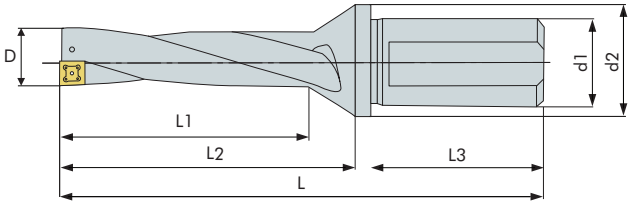
U-DRILL BODY
L / D 3 SERIES



Description	D	L	L1	L2	L3	d1	d2	Insert	Screw	Wrench	Stock
H-MDR3130-20T2-05	13	114	44	59	50	20	25	SPMG05	M2.0*5	T-6	●
H-MDR3135-20T2-05	13.5	115.5	45.5	60.5							●
H-MDR3140-20T2-05	14	117	47	62							●
H-MDR3145-20T2-05	14.5	118.5	48.5	63.5							●
H-MDR3150-20T2-05	15	128	50	65							●
H-MDR3155-25T2-06	15.5	128.5	51.5	65.5	57	25	32	SPMG06	M2.2*5	T-7	●
H-MDR3160-25T2-06	16	130	53	67							●
H-MDR3165-25T2-06	16.5	131.5	54.5	68.5							●
H-MDR3170-25T2-06	17	133	56	70							●
H-MDR3175-25T2-06	17.5	134.5	57.5	71.5							●
H-MDR3180-25T2-06	18	136	59	73							●
H-MDR3185-25T2-06	18.5	137.5	60.5	74.5							●
H-MDR3190-25T2-06	19	139	62	76							●
H-MDR3195-25T2-06	19.5	140.5	63.5	77.5							●
H-MDR3200-25T2-06	20	142	65	79							●
H-MDR3205-25T2-06	20.5	143.5	66.5	80.5							●
H-MDR3210-25T2-06	21	145	68	82							●
H-MDR3215-25T2-06	21.5	146.5	69.5	83.5							●
H-MDR3220-32T2-07	22	148	71	85	60	32	44	SPMG07	M2.5*8	T-8	●
H-MDR3225-32T2-07	22.5	149.5	72.5	86.5							●
H-MDR3230-32T2-07	23	159	74	92							●
H-MDR3235-32T2-07	23.5	160.5	75.5	93.5							●
H-MDR3240-32T2-07	24	162	77	95							●
H-MDR3245-32T2-07	24.5	163.5	78.5	96.5							●
H-MDR3250-32T2-07	25	165	80	98							●
H-MDR3255-32T2-07	25.5	166.5	81.5	99.5							●
H-MDR3260-32T2-07	26	168	83	101							●
H-MDR3265-32T2-07	26.5	169.5	84.5	102.5							●
H-MDR3270-32T2-07	27	171	86	104							●
H-MDR3275-32T2-07	27.5	172.5	87.5	105.5							●

● STOCKABLE ○ NON STOCKABLE

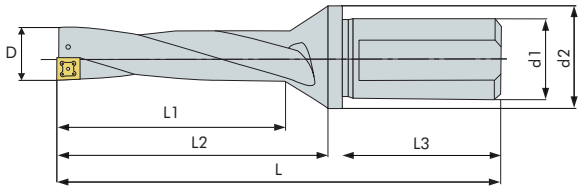
U-DRILL BODY
L / D 3 SERIES



Description	D	L	L1	L2	L3	d1	d2	Insert	Screw	Wrench	Stock
H-MDR3280-32T2-09	28	174	89	107	60	32	44	SPMG09	M3.5*9	T-15	●
H-MDR3285-32T2-09	28.5	175.5	90.5	108.5							●
H-MDR3290-32T2-09	29	177	92	110							●
H-MDR3295-32T2-09	29.5	178.5	93.5	111.5							●
H-MDR3300-32T2-09	30	180	95	113							●
H-MDR3305-32T2-09	30.5	181.5	96.5	114.5							●
H-MDR3310-32T2-09	31	183	98	116							●
H-MDR3315-32T2-09	31.5	184.5	99.5	117.5							●
H-MDR3320-32T2-09	32	186	101	119							●
H-MDR3325-32T2-09	32.5	187.5	102.5	120.5							●
H-MDR3330-32T2-09	33	189	104	122							●
H-MDR3335-32T2-09	33.5	190.5	105.5	123.5							●
H-MDR3340-32T2-11	34	192	107	125	60	32	44	SPMG11	M4.0*10	T-15	●
H-MDR3350-32T2-11	35	195	110	128							●
H-MDR3360-32T2-11	36	198	113	131							○
H-MDR3370-32T2-11	37	201	116	134							○
H-MDR3380-32T2-11	38	204	119	137							○
H-MDR3390-32T2-11	39	207	122	140							○
H-MDR3400-32T2-11	40	210	125	143							○
H-MDR3410-32T2-11	41	218	128	143							○
H-MDR3420-40T2-14	42	221	131	146	70	40	54	SPMG14	M5.0*11	T-20	○
H-MDR3430-40T2-14	43	224	134	149							○
H-MDR3440-40T2-14	44	227	137	152							○
H-MDR3450-40T2-14	45	230	140	155							○
H-MDR3460-40T2-14	46	233	143	158							○
H-MDR3470-40T2-14	47	236	146	161							○
H-MDR3480-40T2-14	48	239	149	164							○
H-MDR3490-40T2-14	49	242	152	167							○
H-MDR3500-40T2-14	50	245	155	170							○

● STOCKABLE ○ NON STOCKABLE

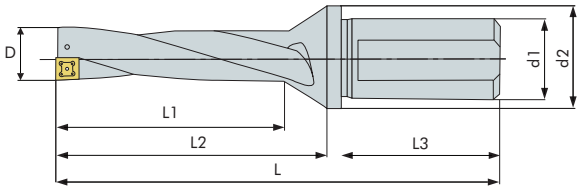
U-DRILL BODY
L / D 4 SERIES



Description	D	L	L1	L2	L3	d1	d2	Insert	Screw	Wrench	Stock
H-MDR4130-20T2-05	13	127	57	72	50	20	25	SPMG05	M2.0*5	T-6	○
H-MDR4135-20T2-05	13.5	129	59	74							○
H-MDR4140-20T2-05	14	131	61	76							○
H-MDR4145-20T2-05	14.5	133	63	78							○
H-MDR4150-20T2-05	15	142	65	80							○
H-MDR4155-25T2-06	15.5	144	67	81	56	25	32	SPMG06	M2.2*5	T-7	●
H-MDR4160-25T2-06	16	146	69	83							●
H-MDR4165-25T2-06	16.5	148	71	85							●
H-MDR4170-25T2-06	17	150	73	87							●
H-MDR4175-25T2-06	17.5	152	75	89							●
H-MDR4180-25T2-06	18	154	77	91							●
H-MDR4185-25T2-06	18.5	156	79	93							●
H-MDR4190-25T2-06	19	158	81	95							●
H-MDR4195-25T2-06	19.5	160	83	97							●
H-MDR4200-25T2-06	20	162	85	99							●
H-MDR4205-25T2-06	20.5	164	87	101							●
H-MDR4210-25T2-06	21	166	89	103							●
H-MDR4215-25T2-06	21.5	168	91	105							●
H-MDR4220-32T2-07	22	170	93	107	60	32	44	SPMG07	M2.5*8	T-8	●
H-MDR4225-32T2-07	22.5	172	95	109							●
H-MDR4230-32T2-07	23	182	97	115							●
H-MDR4235-32T2-07	23.5	184	99	117							●
H-MDR4240-32T2-07	24	186	101	119							●
H-MDR4245-32T2-07	24.5	188	103	121							●
H-MDR4250-32T2-07	25	190	105	123							●
H-MDR4255-32T2-07	25.5	192	107	125							●
H-MDR4260-32T2-07	26	194	109	127							●
H-MDR4265-32T2-07	26.5	196	111	129							●
H-MDR4270-32T2-07	27	198	113	131							●
H-MDR4275-32T2-07	27.5	200	115	133							●

● STOCKABLE ○ NON STOCKABLE

U-DRILL BODY
L / D 4 SERIES



Description	D	L	L1	L2	L3	d1	d2	Insert	Screw	Wrench	Stock
H-MDR4280-32T2-09	28	202	117	135	60	32	44	SPMG09	M3.5*9	T-15	o
H-MDR4285-32T2-09	28.5	204	119	137							o
H-MDR4290-32T2-09	29	206	121	139							o
H-MDR4295-32T2-09	29.5	208	123	141							o
H-MDR4300-32T2-09	30	210	125	143							o
H-MDR4305-32T2-09	30.5	212	127	145							o
H-MDR4310-32T2-09	31	214	129	147							o
H-MDR4315-32T2-09	31.5	216	131	149							o
H-MDR4320-32T2-09	32	218	133	151							o
H-MDR4325-32T2-09	32.5	220	135	153							o
H-MDR4330-32T2-09	33	222	137	155							o
H-MDR4335-32T2-09	33.5	224	139	157							o
H-MDR4340-32T2-11	34	226	141	159	60	32	44	SPMG11	M4.0*10	T-15	o
H-MDR4350-32T2-11	35	228	143	161							o
H-MDR4360-32T2-11	36	230	145	163							o
H-MDR4370-32T2-11	37	232	147	165							o
H-MDR4380-32T2-11	38	234	149	167							o
H-MDR4390-32T2-11	39	236	151	169							o
H-MDR4400-32T2-11	40	238	153	171							o
H-MDR4410-32T2-11	41	240	155	173							o
H-MDR4420-40T2-14	42	242	157	175	70	40	54	SPMG14	M5.0*11	1-20	o
H-MDR4430-40T2-14	43	244	159	177							o
H-MDR4440-40T2-14	44	246	161	179							o
H-MDR4450-40T2-14	45	248	163	181							o
H-MDR4460-40T2-14	46	250	165	183							o
H-MDR4470-40T2-14	47	252	167	185							o
H-MDR4480-40T2-14	48	254	169	187							o
H-MDR4490-40T2-14	49	256	171	189							o
H-MDR4500-40T2-14	50	258	173	191							o

● STOCKABLE ○ NON STOCKABLE

NOTES

NOTES



SPADE DRILL

Spade drill is a modular insert drills. Spade drill can be used in traditional and CNC machine with directly insert replacement, no need to regrind. Higher drilling speed and other characteristics can greatly improve the effciency of drilling. It has much higher efficiency compared to the twist drill & has become the best choice for traditional CNC machines to improve the quality and effciency of hole making. Spade drill consists of tool holder and insert, and with a set of oil ring to Provide the cooling system of the traditional machine tool from external cooling to internal cooling. The tool holder is made of high strength heat-resistant alloy steel after heat treatment and precision machining. The insert is made of powder metallurgy HSS / cemented carbide(on request). Insert diameter range :0 9.5 mm to 114 mm, can drill respectively in steel, stainless steel, alloy steel, cast iron, steel, aluminum alloy materials etc.

XSD-H-*-MMT
XSD-H HELICAL FLUTE HOLDER WITH TAPER SHANK

XSD-S-*-MMT
XSD-S STRAIGHT FLUTE HOLDER WITH TAPER SHANK

XSD-H-*-MW
XSD-H HELICAL FLUTE HOLDER WITH WELDON SHANK

XSD-S-*-MW
XSD-S STRAIGHT FLUTE HOLDER WITH WELDON SHANK

XSD-I-*-10XH
XSD-I HSS INSERT OF SPADE DRILL

METRIC
INCH

XSD-I-*-15XH
XSD-I HSS INSERT OF SPADE DRILL

METRIC
INCH

XSD-I-*-25XH
XSD-I HSS INSERT OF SPADE DRILL

METRIC
INCH

TECHNICAL DETAILS

FEATURES

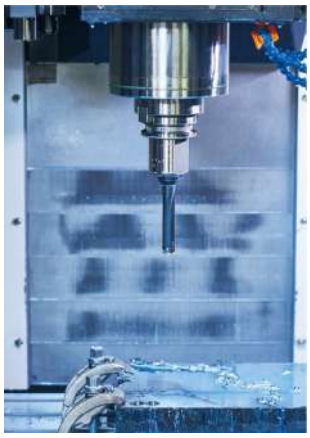
1. High wear resistant material, top-level coating and precision grinding technology, 50% ~ 200% more effcient than traditional twist drill;
2. The simple and convenient interchangeable insert structure can make inserts replacement on the machine tool directly;
3. With powder high speed steel and cemented carbide two materials, Have wide application range;
4. With Morse taper and Weldon type shank, it can be used for both traditional machine tools and CNC machine tools;
5. Only 16 holders can cover inserts 9.5 - 114mm;
6. The holder internal cooling design has excellent chip removal performance and cooling effect.

SPADE DRILL SELECTION

The spade drill is composed of a tool holder and insert. The center of the tool holder is designed with internal cooling. One kind of holder can be adapted to several inderts of different specifcations to reduce the purchase cost of it. The inserts have two series of powder high-speed steel and carbide. Please choose the right type according to your working condition.



For traditional machine tools, please choose powder high speed steel series.



For CNC machines, please select 15% or 25% Co HSS Inserts

10% / 15% & 25% CO HSS INSERTS



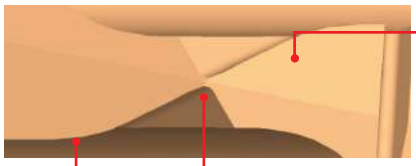
CHIP DIVIDING GROOVE
Reduce
drilling torque

LOCATION GROOVE
Ensure the accuracy of the radial direction

FIXED SCREW HOLES
Safe and reliable clamping, Ensure the stability during drilling

CHIP BREAKER
Broken chips,easy to remove chips

BEVELING
Increase the strength of insert
Reduce the wear tear of outer diameter
Improve the smoothness on the surface of workpiece



FOUR-FACET RELIEF ANGLE
Reduce the friction with the work piece
Better self-centering
Reduce the axial resistance

XR CHISEL EDGE REGNINDING
Improve the strength of cutting edges
Increase the stability

CORE DRILLING
Thinner core drilling, which reduce 20% axial resistance
compared with nomal drilling products
Better self-centering

SPADE DRILL HOLDER MODEL INSTRUCTIONS

XSD-H-0-MW-020-40N

XSD	H	00 -			M	W	020-	40N
	FLUTE TYPE	CONNECTOR CODE			METRIC AND INCH	SHANK TYPE	SHANK DIAMETER	LENGTH
		CONNECTOR	METRIC	INCH				
Xcut Spade Drill	H - Helical Fute S - Straight Fute	Y0 Z0 00 1 1 2 2 3 3 4 4 5 5 6 7 8	9.5 ~11.49 11.5~12.97 12.98~15.49 15.5 ~17.85 17.86~21.99 22.0~ 24.6 24.61~29.99 30.0~35.5 35.51~41.99 42.0~47.99 48~55.99 56~63.49 63.5 ~76.99 77.0 ~89.09 89.1~101.6 101.61~114.3	0.374"~0.452" 0.453"~0.511" 0.511"~0.61" 0.61"~0.703" 0.703"~0.866" 0.866"~0.969" 0.969"~1.181" 1.181"~1.398" 1.398"~1.653" 1.654"~1.889" 1.89"~2.204" 2.205"~2.5" 2.5"~3.031" 3.031"~3.507" 3.508"~4" 4"~4.5"	M-Metric I-Inch	W -one fat shank MT - morse taper shank	016 - 16mm 020 - 20mm 032 - 32mm 040 - 40mm MT2 - #2 MT3 - #3 MT4 - #4 MT5 - #5	10N- ultrashort 20N- short series 30N- intermediate 40N- standard 50N- extend length series 60N- lengthening series 70N- extra length series 90N- ocerlength series

SPADE DRILL INSERT MODEL INSTRUCTIONS

XSD-I-0-M0130-15-XH

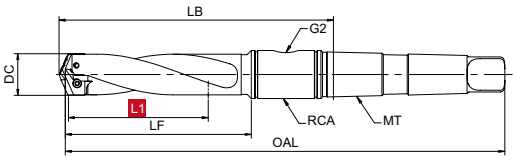
XSD	I-	0 -			M	0130	15	XH	
	FLUTE TYPE	CONNECTOR CODE			METRIC AND INCH	INSERT DIAMETER	MATERIAL	GEOMETRY	
		CONNECTOR	METRIC	INCH				X	H
Xcut Spade Drill	I - Insert	Y Z 0 1 2 3 4 5 6 7 8	9.50 ~11.49 11.50~12.97 12.98~17.85 17.86~24.6 24.61~35.5 35.51~47.99 48.00~65.00 63.5 ~76.99 77.00~89.09 89.1~101.6 101.61~114.3	0.374"~0.452" 0.453"~0.511" 0.511"~0.703" 0.703"~0.969" 0.969"~1.398" 1.398"~1.889" 1.89"~2.559" 2.5"~3.031" 3.031"~3.507" 3.508"~4" 4"~4.5"	M-Metric I-Inch	M0130-13mm I0750-0.75"	10- HSS with 10% Co 15- HSS with 15% Co 25- HSS with 25% Co 50-Carbide	wX - Standard Drill Point C - Cast Iron Drill Point	T-TiN Coating A - TiAlN Coating H - Special A/CrN Coating

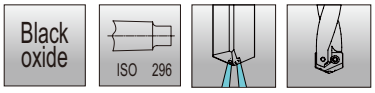
SPADE DRILL HOLDER MODEL INSTRUCTIONS

XSD-H-*-MMT

- The inner cooling structure of holder has excellent cooling effect and chip removal performance
- Interchangeable insert structure can make inserts replacement on the machine tool directly.



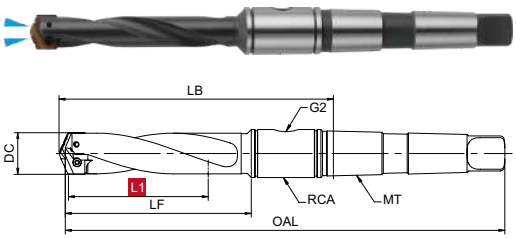




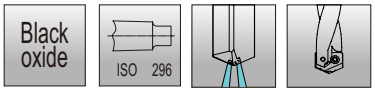
TYPE	CONNECTOR	DC	SIZE						ACCESSORIES		
			L1	LF	LB	OAL	MT	G2 Inch	RCA		
XSD-H-Y-MMT-MT2-20N	Y	9.5~11.49 0.374"~0.452"	32	52	88	160	2	Rc1/16	SH-1905R	2102047	SH-1905R
XSD-H-Y-MMT-MT2-40N			60	80	117	189	2	Rc1/16	SH-1905R	2102047	SH-1905R
XSD-H-Y-MMT-MT2-50N			111	131	167	240	2	Rc1/16	SH-1905R	2102047	SH-1905R
XSD-H-Z-MMT-MT2-20N	Z	11.50 ~ 12.97 0.453"~0.511"	32	52	88	160	2	Rc1/16	SH-1905R	2102048	SH-1905R
XSD-H-Z-MMT-MT2-40N			60	80	117	189	2	Rc1/16	SH-1905R	2102048	SH-1905R
XSD-H-Z-MMT-MT2-50N			111	131	167	240	2	Rc1/16	SH-1905R	2102048	SH-1905R
XSD-H-0-MMT-MT2-20N	0	12.98 ~ 15.49 0.511"~0.61"	35	56	92	164	2	Rc1/16	SH-1905R	2102230	2502017
XSD-H-0-MMT-MT2-40N			64	84	121	193	2	Rc1/16	SH-1905R	2102230	2502017
XSD-H-0-MMT-MT2-50N			114	135	172	244	2	Rc1/16	SH-1905R	2102230	2502017
XSD-H-0-MMT-MT2-60N			178	199	235	307	2	Rc1/16	SH-1905R	2102230	2502017
XSD-H-0-MMT-MT2-20N	0	15.50 ~ 17.85 0.61"~0.703"	35	56	92	164	2	Rc1/16	SH-1905R	2102046	2502017
XSD-H-0-MMT-MT2-40N			64	84	121	193	2	Rc1/16	SH-1905R	2102046	2502017
XSD-H-0-MMT-MT2-50N			114	135	172	244	2	Rc1/16	SH-1905R	2102046	2502017
XSD-H-0-MMT-MT2-60N			178	199	235	307	2	Rc1/16	SH-1905R	2102046	2502017
XSD-H-1-MMT-MT3-20N	1	17.86 ~ 21.99 0.703"~0.866"	70	98	143	233	3	Rc1/8	SH-2540R	2102049	2502016
XSD-H-1-MMT-MT3-30N			121	149	193	283	3	Rc1/8	SH-2540R	2102049	2502016
XSD-H-1-MMT-MT3-40N			172	200	244	334	3	Rc1/8	SH-2540R	2102049	2502016
XSD-H-1-MMT-MT3-50N			273	302	346	436	3	Rc1/8	SH-2540R	2102049	2502016
XSD-H-1-MMT-MT3-60N			363	395	439	529	3	Rc1/8	SH-2540R	2102049	2502016

SPADE DRILL HOLDER MODEL INSTRUCTIONS

XSD-H-*-MMT



- The inner cooling structure of holder has excellent cooling effect and chip removal performance
- Interchangeable insert structure can make inserts replacement on the machine tool directly.



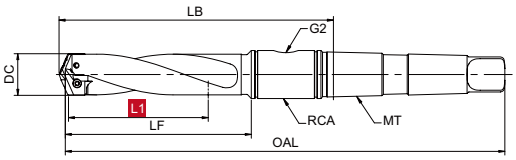
TYPE	CONNECTOR	DC	SIZE						ACCESSORIES		
			L1	LF	LB	OAL	MT	G2 Inch	RCA		
XSD-H-1-MMT-MT3-20N	1	22.00 ~ 24.60 0.866"~0.969"	70	98	142	232	3	Rc1/8	SH-2540R	2102049	2502016
XSD-H-1-MMT-MT3-30N			121	149	193	283	3	Rc1/8	SH-2540R	2102049	2502016
XSD-H-1-MMT-MT3-40N			172	200	244	334	3	Rc1/8	SH-2540R	2102049	2502016
XSD-H-1-MMT-MT3-50N			273	302	346	436	3	Rc1/8	SH-2540R	2102049	2502016
XSD-H-1-MMT-MT3-60N			363	395	439	529	3	Rc1/8	SH-2540R	2102049	2502016
XSD-H-2-MMT-MT4-20N	2	24.61 ~ 29.99 0.969"~1.181"	86	114	160	274	4	Rc1/8	SH-2540R	2102045	2502020
XSD-H-2-MMT-MT4-30N			137	165	211	325	4	Rc1/8	SH-2540R	2102045	2502020
XSD-H-2-MMT-MT4-40N			187	216	262	375	4	Rc1/8	SH-2540R	2102045	2502020
XSD-H-2-MMT-MT4-40N			289	318	364	477	4	Rc1/8	SH-2540R	2102045	2502020
XSD-H-2-MMT-MT4-60N			400	429	475	588	4	Rc1/8	SH-2540R	2102045	2502020
XSD-H-2-MMT-MT4-20N	2	30.00 ~ 35.50 1.181"~1.398"	86	114	168	281	4	Rc1/4	SH-3175R	2102045	2502020
XSD-H-2-MMT-MT4-30N			137	165	218	332	4	Rc1/4	SH-3175R	2102045	2502020
XSD-H-2-MMT-MT4-40N			187	216	269	383	4	Rc1/4	SH-3175R	2102045	2502020
XSD-H-2-MMT-MT4-50N			289	318	371	484	4	Rc1/4	SH-3175R	2102045	2502020
XSD-H-2-MMT-MT4-60N			400	429	482	595	4	Rc1/4	SH-3175R	2102045	2502020
XSD-H-3-MMT-MT4-20N	3	35.51 ~ 41.99 1.398"~1.653"	121	152	206	319	4	Rc1/4	SH-3175R	2102044	2502015
XSD-H-3-MMT-MT4-30N			165	197	251	364	4	Rc1/4	SH-3175R	2102044	2502015
XSD-H-3-MMT-MT4-40N			210	241	295	408	4	Rc1/4	SH-3175R	2102044	2502015
XSD-H-3-MMT-MT4-50N			349	381	435	548	4	Rc1/4	SH-3175R	2102044	2502015
XSD-H-3-MMT-MT4-20N	3	42.00 ~ 47.991. 654"~1.899"	121	152	206	319	4	Rc1/4	SH-3175R	2102044	2502015
XSD-H-3-MMT-MT4-30N			165	197	251	364	4	Rc1/4	SH-3175R	2102044	2502015
XSD-H-3-MMT-MT4-40N			210	241	295	408	4	Rc1/4	SH-3175R	2102044	2502015
XSD-H-3-MMT-MT4-50N			349	381	435	548	4	Rc1/4	SH-3175R	2102044	2502015

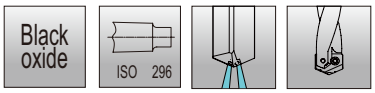
SPADE DRILL HOLDER MODEL INSTRUCTIONS

XSD-H-*-MMT

- The inner cooling structure of holder has excellent cooling effect and chip removal performance
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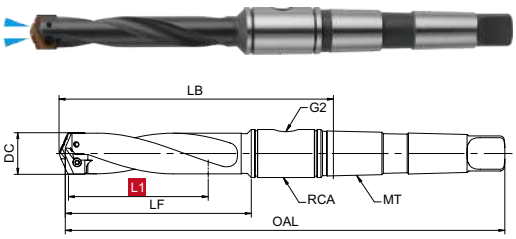




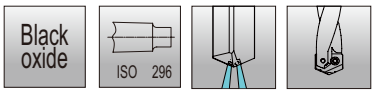
TYPE	CONNECTOR	DC	SIZE						ACCESSORIES		
			L1	LF	LB	OAL	MT	G2 Inch	RCA		
XSD-H-4-MMT-MT5-20N	4	48.00 ~ 55.99 1.89"- 2.204"	130	165	219	364	5	Rc1/4	SH-4445R	2102044	2502015
XSD-H-4-MMT-MT5-40N			232	267	321	465	5	Rc1/4	SH-4445R	2102044	2502015
XSD-H-4-MMT-MT5-50N			422	457	511	656	5	Rc1/4	SH-4445R	2102044	2502015
XSD-H-4-MMT-MT5-20N	4	56.00 ~ 65.09 2.205"-2.563"	130	165	219	364	5	Rc1/4	SH-4445R	2102044	2502015
XSD-H-4-MMT-MT5-40N			232	267	321	465	5	Rc1/4	SH-4445R	2102044	2502015
XSD-H-4-MMT-MT5-50N			422	457	511	656	5	Rc1/4	SH-4445R	2102044	2502015
XSD-H-5-MMT-MT5-20N	5	63.50 ~ 76.9 2.5"~3.031"	172	216	287	430	5	Rc1/2	SH-5715R	2102043	2502019
XSD-H-5-MMT-MTLQ 5-40N			273	318	389	532	5	Rc1/2	SH-5715R	2102043	2502019
XSD-H-5-MMT-MT55-50N			464	508	579	722	5	Rc1/2	SH-5715R	2102043	2502019
XSD-H-6-MMT-MT5-20N	6	77.00 ~ 89.09 3.031"~3.507"	172	216	287	430	5	Rc1/2	SH-5715R	2102043	2502019
XSD-H-6-MMT-MT5-40N			273	318	389	532	5	Rc1/2	SH-5715R	2102043	2502019
XSD-H-6-MMT-MT5-40N			464	508	579	722	5	Rc1/2	SH-5715R	2102043	2502019
XSD-H-7-MMT-MT5 LQ-20N	7	89.10 ~ 101.60 3.508"~4"	172	225	297	440	5	Rc1/2	SH-5715R	2102043	2502019
XSD-H-7-MMT-MT5-40N			273	327	399	541	5	Rc1/2	SH-5715R	2102043	2502019
XSD-H-7-MMT-MT5-50N			556	610	681	824	5	Rc1/2	SH-5715R	2102043	2502019
XSD-H-8-MMT-MT5-20N	8	101.61 ~ 114.30 4"~4.5"	172	225	297	440	5	Rc1/2	SH-5715R	2102043	2502019
XSD-H-8-MMT-MT5-40N			273	327	399	541	5	Rc1/2	SH-5715R	2102043	2502019
XSD-H-8-MMT-MT5-50N			556	610	681	824	5	Rc1/2	SH-5715R	2102043	2502019

SPADE DRILL HOLDER MODEL INSTRUCTIONS

XSD-H-*-MMT



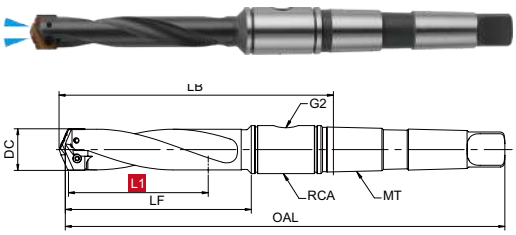
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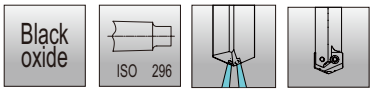
TYPE	CONNECTOR	DC	SIZE						ACCESSORIES		
			L1	LF	LB	OAL	MT	G2 Inch	RCA		
XSD-H-Y-MMT-MT2-20N	Y	9.50 ~ 11.49 0.374"~0.452"	32	52	88	160	2	Rc1/16	SH-1905R	2102047	2502018
XSD-H-Z-MMT-MT2-20N	z	11.50 ~ 12.97 0.453"~0.511"	32	52	88	160	2	Rc1/16	SH-1905R	2102048	2502018
XSD-H-0-MMT-MT2-20N	0	12.98 ~ 15.49 0.511"~0.61"	35	56	92	164	2	Rc1/16	SH-1905R	2102230	2502017
XSD-H-0-MMT-MT2-60N			178	199	235	307	2	Rc1/16	SH-1905R	2102230	2502017
XSD-H-0-MMT-MT2-20N	0	15.50 ~ 17.85 0.61"~0.703"	35	56	92	164	2	Rc1/16	SH-1905R	2102046	2502017
XSD-H-0-MMT-MT2-60N			178	199	235	307	2	Rc1/16	SH-1905R	2102046	2502017
XSD-H-1-MMT-MT3-20N	1	17.86 ~ 21.99 0.703"~0.866"	70	98	143	233	3	Rc1/8	SH-2540R	2102049	2502016
XSD-H-1-MMT-MT3-60N			363	395	439	529	3	Rc1/8	SH-2540R	2102049	2502016
XSD-H-1-MMT-MT3-20N	1	22.00 ~ 24.60 0.866"~0.969"	70	98	143	233	3	Rc1/8	SH-2540R	2102049	2502016
XSD-H-1-MMT-MT3-60N			363	395	439	529	3	Rc1/8	SH-2540R	2102049	2502016
XSD-H-2-MMT-MT4-20N	2	24.61 ~ 29.99 0.969"~1.181"	86	114	160	274	4	Rc1/8	SH-2540R	2102045	2502020
XSD-H-2-MMT-MT4-60N			400	429	475	588	4	Rc1/8	SH-2540R	2102045	2502020
XSD-H-2-MMT-MT4-20N	2	30.00 ~ 35.50 1.181"~1.398"	86	114	168	281	4	Rc1/4	SH-3175R	2102045	2502020
XSD-H-2-MMT-MT4-60N			400	429	482	595	4	Rc1/4	SH-3175R	2102045	2502020
XSD-H-3-MMT-MT4-20N	3	35.51 ~ 41.99 1.398"~1.653"	121	152	206	319	4	Rc1/4	SH-3175R	2102044	2502015
XSD-H-3-MMT-MT4-50N			349	381	435	548	4	Rc1/4	SH-3175R	2102044	2502015
XSD-H-3-MMT-MT4-70N			559	591	645	757	4	Rc1/4	SH-3175R	2102044	2502015
XSD-H-3-MMT-MT4-90N			787	819	873	986	4	Rc1/4	SH-3175R	2102044	2502015

STRAIGHT FLUTE HOLDER WITH TAPER SHANK

XSD-S-*-MMT



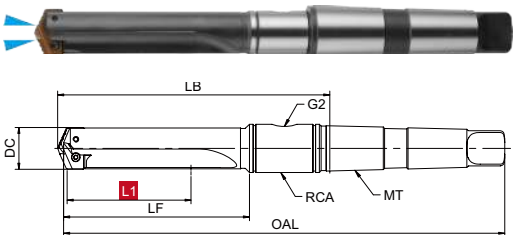
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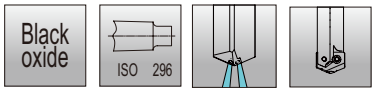
TYPE	CONNECTOR	DC	SIZE						ACCESSORIES		
			L1	LF	LB	OAL	MT	G2 Inch	RCA		
XSD-S-3-MMT-MT4-20N	3	42.00 ~ 47.99 1.654"~1.899"	121	152	206	319	4	Rc1/4	SH-3175R	2102044	2502015
XSD-S-3-MMT-MT4-50N			349	381	435	548	4	Rc1/4	SH-3175R	2102044	2502015
XSD-S-3-MMT-MT4-70N			559	591	645	757	4	Rc1/4	SH-3175R	2102044	2502015
XSD-S-3-MMT-MT4-90N			787	819	873	986	4	Rc1/4	SH-3175R	2102044	2502015
XSD-S-4-MMT-MT5-20N			130	165	219	364	5	Rc1/4	SH-4445R	2102044	2502015
XSD-S-4-MMT-MT5-50N	4	48.00 ~ 55.99 1.89"~ 2.204"	422	457	511	656	5	Rc1/4	SH-4445R	2102044	2502015
XSD-S-4-MMT-MT5-70N			625	660	714	859	5	Rc1/4	SH-4445R	2102044	2502015
XSD-S-4-MMT-MT5-90N			879	914	968	1113	5	Rc1/4	SH-4445R	2102044	2502015
XSD-S-4-MMT-MT5-20N	4	56.00 ~ 65.09 2.205"~2.563"	130	165	219	364	5	Rc1/4	SH-4445R	2102044	2502015
XSD-S-4-MMT-MT5-50N			422	457	511	656	5	Rc1/4	SH-4445R	2102044	2502015
XSD-S-5-MMT-MT5-70N			625	660	714	859	5	Rc1/4	SH-4445R	2102044	2502015
XSD-S-5-MMT-MT5-90N			879	914	968	111	5	Rc1/4	SH-4445R	2102044	2502015
XSD-S-5-MMT-MT5-20N	5	63.50 ~ 76.99 2.5"~3.031"	172	216	287	430	5	Rc1/2	SH-5715R	2102043	2502019
XSD-S-5-MMT-MT5-50N			464	508	579	722	5	Rc1/2	SH-5715R	2102043	2502019
XSD-S-5-MMT-MT5-70N			660	705	776	919	5	Rc1/2	SH-5715R	2102043	2502019
XSD-S-5-MMT-MT5-90N			889	933	1005	114	5	Rc1/2	SH-5715R	2102043	2502019
XSD-S-5-MMT-MT5-20N	6	77.00 ~ 89.09 3.031"~3.507"	172	216	287	430	5	Rc1/2	SH-5715R	2102043	2502019
XSD-S-5-MMT-MT5-50N			464	508	579	722	5	Rc1/2	SH-5715R	2102043	2502019
XSD-S-5-MMT-MT5-70N			660	705	776	919	5	Rc1/2	SH-5715R	2102043	2502019
XSD-S-5-MMT-MT5-90N			889	933	1005	1148	5	Rc1/2	SH-5715R	2102043	2502019

STRAIGHT FLUTE HOLDER WITH TAPER SHANK

XSD-S-*-MMT



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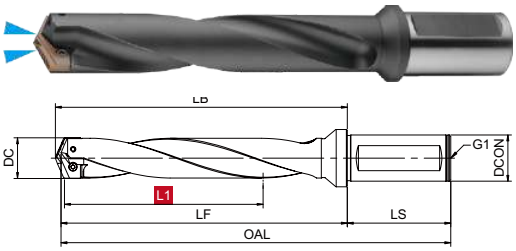


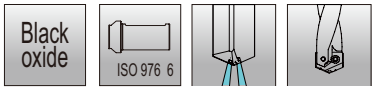
TYPE	CONNECTOR	DC	SIZE						ACCESSORIES		
			L1	LF	LB	OAL	MT	G2 Inch	RCA		
XSD-S-7-MMT-MT5-20N	7	89.10 ~ 101.60 3.508"~4"	172	225	297	440	5	Rc1/2	SH-5715R	2102043	2502019
XSD-S-7-MMT-MT5-50N			556	610	681	824	5	Rc1/2	SH-5715R	2102043	2502019
XSD-S-7-MMT-MT5-70N			685	740	811	954	5	Rc1/2	SH-5715R	2102043	2502019
XSD-S-7-MMT-MT5-90N			939	994	1065	120	5	Rc1/2	SH-5715R	2102043	2502019
XSD-S-8-MMT-MT5-20N	8	101.61 ~ 114.30 4"~4.5"	172	225	297	440	5	Rc1/2	SH-5715R	2102043	2502019
XSD-S-8-MMT-MT5-50N			556	610	681	824	5	Rc1/2	SH-5715R	2102043	2502019
XSD-S-8-MMT-MT5-70N			685	740	811	954	5	Rc1/2	SH-5715R	2102043	2502019
XSD-S-8-MMT-MT5-90N			939	994	1065	1208	5	Rc1/2	SH-5715R	2102043	2502019

HELICAL FLUTE HOLDER WITH ONE FLAT SHANK

XSD-H-*-MW

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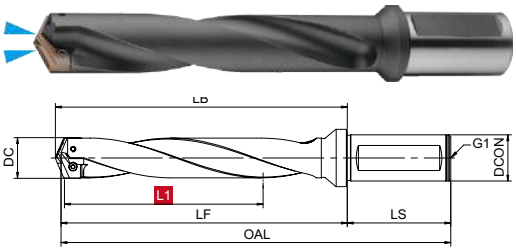


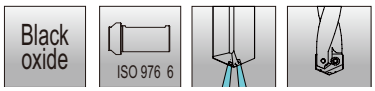
TYPE	CONNECTOR	DC	SIZE							ACCESSORIES	
			L1	LF	LB	OAL	DCON	LS	G1 inch		
XSD-H-Y-MW-20-40N	Y	9.5~11.49 0.374"~0.452"	60	90	92	140	20	50	Rc1/8	2102047	2502018
XSD-H-Y-MW-20-50N			111	141	143	191	20	50	Rc1/8	2102047	2502018
XSD-H-Z-MW-20-40N	Z	11.50 ~ 12.97 0.453"~0.511"	60	90	92	140	20	50	Rc1/8	2102048	2502018
XSD-H-Z-MW-20-50N			111	141	143	191	20	50	Rc1/8	2102048	2502018
XSD-H-0-MW-20-40N	0	12.98 ~ 15.49 0.511"~0.61"	64	92	95	142	20	50	Rc1/8	2102230	2502017
XSD-H-0-MW-20-50N			114	143	146	193	20	50	Rc1/8	2102230	2502017
XSD-H-0-MW-20-60N			178	206	209	256	20	50	Rc1/8	2102230	2502017
XSD-H-0-MW-20-40N	0	15.50 ~ 17.85 0.61"~0.703"	64	92	95	142	20	50	Rc1/8	2102046	2502017
XSD-H-0-MW-20-50N			114	143	146	193	20	50	Rc1/8	2102046	2502017
XSD-H-0-MW-20-60N			178	206	209	256	20	50	Rc1/8	2102046	2502017

HELICAL FLUTE HOLDER WITH ONE FLAT SHANK

XSD-H-*-MW

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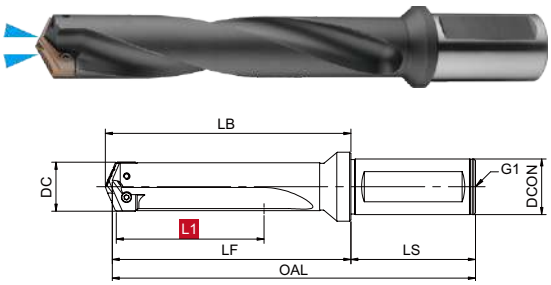




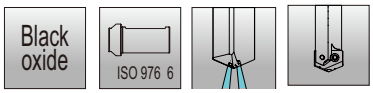
TYPE	CONNECTOR	DC	SIZE							ACCESSORIES	
			L1	LF	LB	OAL	DCON	LS	G1 inch		
XSD-H-2-MW-32-30N	2	24.61 ~ 29.99 0.969"~1.181"	137	179	183	239	32	60	Rc1/4	2102045	2502020
XSD-H-2-MW-32-40N			187	230	234	290	32	60	Rc1/4	2102045	2502020
XSD-H-2-MW-32-50N			289	332	335	392	32	60	Rc1/4	2102045	2502020
XSD-H-2-MW-32-60N			400	443	447	503	32	60	Rc1/4	2102045	2502020
XSD-H-2-MW-32-30N	2	30.00 ~ 35.50 1.181"~1.398"	137	179	183	239	32	60	Rc1/4	2102045	2502020
XSD-H-2-MW-32-40N			187	230	234	290	32	60	Rc1/4	2102045	2502020
XSD-H-2-MW-32-50N			289	332	335	392	32	60	Rc1/4	2102045	2502020
XSD-H-2-MW-32-60N			400	443	447	503	32	60	Rc1/4	2102045	2502020
XSD-H-3-MW-40-30N	3	35.51 ~ 41.99 1.398"~1.653"	165	218	222	288	40	70	Rc1/4	2102044	2502015
XSD-H-3-MW-40-40N			210	262	267	332	40	70	Rc1/4	2102044	2502015
XSD-H-3-MW-40-50N			349	364	368	434	40	70	Rc1/4	2102044	2502015
XSD-H-3-MW-40-60N			454	468	473	538	40	70	Rc1/4	2102044	2502015
XSD-H-3-MW-40-30N	3	42.00 ~ 47.99 1.654"~1.899"	165	218	222	288	40	70	Rc1/4	2102044	2502015
XSD-H-3-MW-40-40N			210	262	267	332	40	70	Rc1/4	2102044	2502015
XSD-H-3-MW-40-50N			349	364	368	434	40	70	Rc1/4	2102044	2502015
XSD-H-4-MW-40-30N			454	468	473	538	40	70	Rc1/4	2102044	2502015
XSD-H-4-MW-40-40N	4	48.00 ~ 55.99 1.89"~ 2.204"	232	281	286	351	40	707	Rc1/4	2102044	2502015
XSD-H-4-MW-40-50N			422	484	490	554	40	70	Rc1/4	2102044	2502015

STRAIGHT FLUTE HOLDER WITH ONE FLAT SHANK

XSD-H-*-MW



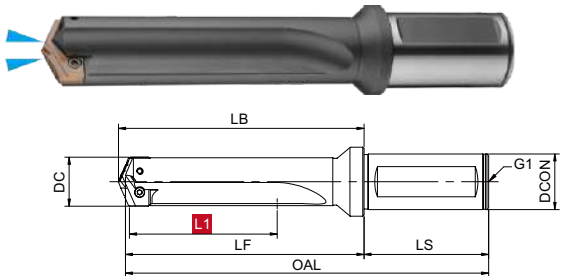
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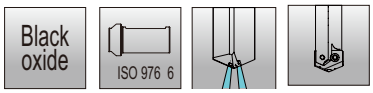
TYPE	CONNECTOR	DC	SIZE							ACCESSORIES	
			L1	LF	LB	OAL	DCON	LS	G1 inch		
XSD-H-Y-MW-20-20N	Y	9.5~11.49 0.374"~0.452"	32	61	64	111	20	50	Rc1/8	2102047	2502018
XSD-H-Y-MW-20-50N			111	141	143	191	20	50	Rc1/8	2102047	2502018
XSD-H-Y-MW-20-70N			222	252	254	302	20	50	Rc1/8	2102047	2502018
XSD-H-Y-MW-20-90N			290	320	322	370	20	50	Rc1/8	2102047	2502018
XSD-H-Z-MW-20-20N	Z	11.50 ~ 12.97 0.453"~0.511"	32	61	64	111	20	50	Rc1/8	2102048	2502018
XSD-H-Z-MW-20-50N			111	141	143	191	20	50	Rc1/8	2102048	2502018
XSD-H-Z-MW-20-70N			222	252	254	302	20	50	Rc1/8	2102048	2502018
XSD-H-Z-MW-20-90N			290	320	322	370	20	50	Rc1/8	2102048	2502018
XSD-H-0-MW-20-20N	0	12.98 ~ 15.49 0.511"~0.61"	35	64	66	114	20	50	Rc1/8	2102230	2502017
XSD-H-0-MW-20-50N			114	143	146	193	20	50	Rc1/8	2102230	2502017
XSD-H-0-MW-20-60N			178	206	209	256	20	50	Rc1/8	2102230	2502017
XSD-H-0-MW-20-70N			295	324	327	374	20	50	Rc1/8	2102230	2502017
XSD-H-0-MW-20-90N			387	416	419	466	20	50	Rc1/8	2102230	2502017
XSD-H-5-MW-20-20N	0	15.50 ~ 17.85 0.61"~0.703"	35	64	66	114	20	50	Rc1/8	2102046	2502017
XSD-H-5-MW-20-50N			114	143	146	193	20	50	Rc1/8	2102046	2502017
XSD-H-5-MW-20-60N			178	206	209	256	20	50	Rc1/8	2102046	2502017
XSD-H-5-MW-20-70N			295	324	327	374	20	50	Rc1/8	2102046	2502017
XSD-H-5-MW-20-90N			387	416	419	466	20	50	Rc1/8	2102046	2502017
XSD-H-1-MW-25-20N	1	17.86 ~ 21.99 0.703"~0.866	67	107	111	163	25	56	Rc1/8	2102049	2502016
XSD-H-1-MW-25-50N			270	307	310	363	25	56	Rc1/8	2102049	2502016
XSD-H-1-MW-25-60N			363	401	404	457	25	56	Rc1/8	2102049	2502016
XSD-H-1-MW-25-70N			457	495	498	551	25	56	Rc1/8	2102049	2502016
XSD-H-1-MW-25-90N			569	603	606	659	25	56	Rc1/8	2102049	2502016

STRAIGHT FLUTE HOLDER WITH ONE FLAT SHANK

XSD-H-*-MW



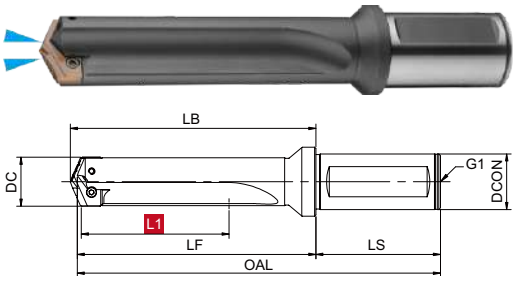
- The inner cooling structure of holder has excellent cooling effect and chip removal performance
- Interchangeable insert structure can make inserts replacement on the machine tool directly.



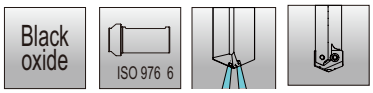
TYPE	CONNECTOR	DC	SIZE							ACCESSORIES	
			L1	LF	LB	OAL	DCON	LS	G1 inch		
XSD-H-1-MW-25-20N	1	22.00 ~ 24.60 0.866"~0.969"	67	107	111	163	25	Rc1/8	56	2102049	2502016
XSD-H-1-MW-25-50N			270	307	310	363	25	Rc1/8	56	2102049	2502016
XSD-H-1-MW-25-60N			363	401	404	457	25	Rc1/8	56	2102049	2502016
XSD-H-1-MW-25-70N			457	495	498	551	25	Rc1/8	56	2102049	2502016
XSD-H-1-MW-25-90N			569	603	606	659	25	Rc1/8	56	2102049	2502016
XSD-H-2-MW-32 22-20N	2	24.61 ~ 29.99 0.969"~1.181"	86	129	132	89	32	Rc1/4	60	2102045	2502020
XSD-H-2-MW-32 22-50N			289	332	336	392	32	Rc1/4	60	2102045	2502020
XSD-H-2-MW-32 22-60N			400	443	447	503	32	Rc1/4	60	2102045	2502020
XSD-H-2-MW-32-70N			511	554	558	614	32	Rc1/4	60	2102045	2502020
XSD-H-2-MW-32 22-90N			692	735	739	795	32	Rc1/4	60	2102045	2502020
XSD-H-2-MW-32 22-20N	2	30.00 ~ 35.50 1.181"~1.398	86	129	132	189	32	Rc1/4	60	2102045	2502020
XSD-H-2-MW-32 22-50N			289	332	336	392	32	Rc1/4	60	2102045	2502020
XSD-H-2-MW-32 22-60 N			400	443	447	503	32	Rc1/4	60	2102045	2502020
XSD-H-2-MW-32 22-70N			511	554	558	614	32	Rc1/4	60	2102045	2502020
XSD-H-2-MW-32 22-90N			692	735	739	795	32	Rc1/4	60	2102045	2502020
XSD-H-3-MW-40-20N	3	35.51 ~ 41.99 1.398"~1.653"	121	173	178	243	40	Rc1/4	70	2102044	2502015
XSD-H-3-MW-40-50N			349	402	406	472	40	Rc1/4	70	2102044	2502015
XSD-H-3-MW-40-60 N			454	468	473	538	40	Rc1/4	70	2102044	2502015
XSD-H-3-MW-40-70N			559	611	616	681	40	Rc1/4	70	2102044	2502015
XSD-H-3-MW-40-90N			787	840	845	910	40	Rc1/4	70	2102044	2502015

STRAIGHT FLUTE HOLDER WITH ONE FLAT SHANK

XSD-S-*-MW



- The inner cooling structure of holder has excellent cooling effect and chip removal performance
- Interchangeable insert structure can make inserts replacement on the machine tool directly.

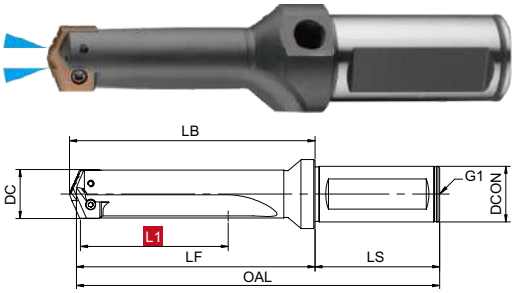


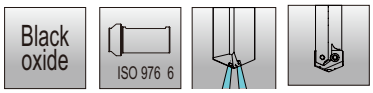
TYPE	CONNECTOR	DC	SIZE							ACCESSORIES	
			L1	LF	LB	OAL	DCON	LS	G1 inch		
XSD-S-3-MW-40-20N	3	42.00 ~ 47.99 1.654"~1.899"	121	173	178	243	40	70	Rc1/4	2102044	2502015
XSD-S-3-MW-40-50N			349	402	406	472	40	70	Rc1/4	2102044	2502015
XSD-S-3-MW-40-60N			454	468	473	538	40	70	Rc1/4	2102044	2502015
XSD-S-3-MW-40-70N			559	611	616	681	40	70	Rc1/4	2102044	2502015
XSD-S-3-MW-40-90N			787	840	845	910	40	70	Rc1/4	2102044	2502015
XSD-S-4-MW-40-20N	4	48.00 ~ 55.99 1.89"~ 2.204"	130	179	184	249	40	70	Rc1/4	2102044	2502015
XSD-S-4-MW-40-50N			422	472	476	542	40	70	Rc1/4	2102044	2502015
XSD-S-4-MW-40-60N			524	586	591	656	40	70	Rc1/4	2102044	2502015
XSD-S-4-MW-40-70N			625	675	680	745	40	70	Rc1/4	2102044	2502015
XSD-S-4-MW-40-90N			879	929	934	999	40	70	Rc1/4	2102044	2502015
XSD-S-4-MW-40-20N	4	56.00 ~ 65.09 2.205"~2.563"	130	179	184	249	40	70	Rc1/4	2102044	2502015
XSD-S-4-MW-5-50N			422	472	476	542	40	70	Rc1/4	2102044	2502015
XSD-S-4-MW-5-60N			524	586	591	656	40	70	Rc1/4	2102044	2502015
XSD-S-4-MW-40-70N			625	675	680	745	40	70	Rc1/4	2102044	2502015
XSD-S-4-MW-40-90N			879	929	934	999	40	70	Rc1/4	2102044	2502015

STRAIGHT FLUTE HOLDER WITH ONE FLAT SHANK

XSD-S-*-MW

- The inner cooling structure of holder has excellent cooling effect and chip removal performance
- Interchangeable insert structure can make inserts replacement on the machine tool directly.





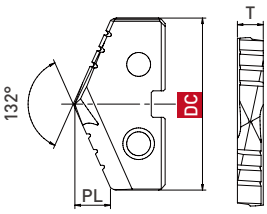
TYPE	CONNECTOR	DC	SIZE								ACCESSORIES	
			L1	LF	LB	OAL	DCON	LS	G1 inch	G2 inch		
XSD-S-Y-MW-16-10N	Y	9.5~11.49 0.374"~0.452"	19.0	48.0	50.0	96.0	16.0	48.0	Rc 1/16	Rc1/8	2102047	2502018
XSD-S-Z-MW-16-10N	Z	11.50 ~ 12.97 0.453"~0.511"	19.0	48.0	50.0	96.0	16.0	48.0	Rc 1/16	Rc1/8	2102048	2502018
XSD-S-0-MW-20-10N	0	12.98 ~ 15.49 0.511"~0.61"	22.0	48.0	50.0	98.0	20.0	50.0	Rc 1/8	Rc1/8	2102230	2502017
XSD-S-0-MW-20-10N	0	15.50 ~ 17.85 0.61"~0.703"	22.0	48.0	50.0	98.0	20.0	50.0	Rc 1/8	Rc1/8	2102046	2502017
XSD-S-1-MW-25-10N	1	17.86 ~ 21.99 0.703"~0.866"	48.0	76.0	79.0	132.0	25.0	56.0	Rc 1/8	Rc1/8	2102049	2502016
XSD-S-1-MW-25-10N	1	22.00 ~ 24.60 0.866"~0.969"	48.0	76.0	79.0	132.0	25.0	56.0	Rc 1/8	Rc1/8	2102049	2502016
XSD-S-2-MW-32-10N	2	24.61 ~ 29.99 0.969"~1.181"	57.0	89.0	92.0	149.0	32.0	60.0	Rc 1/4	Rc1/8	2102045	2502020
XSD-S-2-MW-32-10N	2	30.00 ~ 35.50 1.181"~1.398"	57.0	89.0	92.0	149.0	32.0	60.0	Rc 1/4	Rc1/8	2102045	2502020
XSD-S-3-MW-40-10N	3	35.51 ~ 41.99 1.398"~1.653"	76.0	125.0	130.0	195.0	40.0	70.0	Rc 1/4	Rc 1/4	2102044	2502015
XSD-S-3-MW-40-10N	3	42.00 ~ 47.99 1.654"~1.899"	76.0	125.0	130.0	195.0	40.0	70.0	Rc 1/4	Rc 1/4	2102044	2502015

HSS INSERT OF SPADE DRILL

XSD-I-*-10XH

- Diameter range: 13~114.3 mm.
- Drilling accuracy: IT10~IT11.
- HPM10-Powder HSS for steel with hardness below Hb275.





HSS HPC

MODEL	SIZE			CONNECTOR	INVENTORY
	DC	PL	T		
XSD-I-0-M0130-10XH	13.00	2.9	3.18	0	○
XSD-I-0-M0135-10XH	13.50	3.0			○
XSD-I-0-M0140-10XH	14.00	3.1			○
XSD-I-0-M0145-10XH	14.50	3.2			○
XSD-I-0-M0150-10XH	15.00	3.3			○
XSD-I-0-M0155-10XH	15.50	3.5	3.18	0	○
XSD-I-0-M0160-10XH	16.00	3.6			○
XSD-I-0-M0165-10XH	16.50	3.7			○
XSD-I-0-M0170-10XH	17.00	3.8			○
XSD-I-0-M0175-10XH	17.50	3.9			○
XSD-I-1-M0180-10XH	18.00	4.0	3.97	1	○
XSD-I-1-M0185-10XH	18.50	4.1			○
XSD-I-1-M0190-10XH	19.00	4.2			○
XSD-I-1-M0195-10XH	19.50	4.3			○
XSD-I-1-M0200-10XH	20.00	4.5			○
XSD-I-1-M0205-10XH	20.50	4.6			○
XSD-I-1-M0210-10XH	21.00	4.7			○
XSD-I-1-M0215-10XH	21.50	4.8			○
XSD-I-1-M0220-10XH	22.00	4.9	3.97	1	○
XSD-I-1-M0230-10XH	23.00	5.1			○
XSD-I-1-M0240-10XH	24.00	5.3			○
XSD-I-2-M0250-10XH	25.00	5.6	4.76	2	○
XSD-I-2-M0260-10XH	26.00	5.8			○
XSD-I-2-M0270-10XH	27.00	6.0			○
XSD-I-2-M0280-10XH	28.00	6.2			○
XSD-I-2-M0290-10XH	29.00	6.5			○
XSD-I-2-M0300-10XH	30.00	6.7	4.76	2	○
XSD-I-2-M0310-10XH	31.00	6.9			○
XSD-I-2-M0320-10XH	32.00	7.1			○

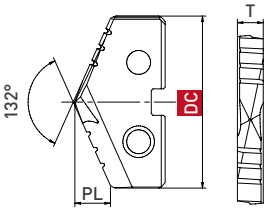
● STOCKABLE ○ NON STOCKABLE

HSS INSERT OF SPADE DRILL

XSD-I-*-10XH

- Diameter range: 13~114.3 mm.
- Drilling accuracy: IT10~IT11.
- HPM10-Powder HSS for steel with hardness below Hb275.





HSS HPC

MODEL	SIZE			CONNECTOR	INVENTORY
	DC	PL	T		
XSD-I-2-M0330-10XH	33.00	7.3	4.76	2	O
XSD-I-2-M0340-10XH	34.00	7.6			O
XSD-I-2-M0350-10XH	35.00	7.8			O
XSD-I-3-M0360-10XH	36.00	8.0	6.35	3	O
XSD-I-3-M0370-10XH	37.00	8.2			O
XSD-I-3-M0380-10XH	38.00	8.5			O
XSD-I-3-M0390-10XH	39.00	8.7			O
XSD-I-3-M0400-10XH	40.00	8.9			O
XSD-I-3-M0410-10XH	41.00	9.1			O
XSD-I-3-M0420-10XH	42.00	9.3	6.35	3	O
XSD-I-3-M0430-10XH	43.00	9.6			O
XSD-I-3-M0440-10XH	44.00	9.8			O
XSD-I-3-M0450-10XH	45.00	10.0			O
XSD-I-3-M0460-10XH	46.00	10.2			O
XSD-I-3-M0470-10XH	47.00	10.5			O

MODEL	SIZE			CONNECTOR	INVENTORY
	DC	PL	T		
XSD-I-4-M0480-10XH	48.00	10.7	7.94	4	O
XSD-I-4-M0490-10XH	49.00	10.9			O
XSD-I-4-M0500-10XH	50.00	11.1			O
XSD-I-4-M0510-10XH	51.00	11.4			O
XSD-I-4-M0520-10XH	52.00	11.6			O
XSD-I-4-M0530-10XH	53.00	11.8			O
XSD-I-4-M0540-10XH	54.00	12.0			O
XSD-I-4-M0550-10XH	55.00	12.2			O
XSD-I-4-M0560-10XH	56.00	12.5	7.94	4	O
XSD-I-4-M0570-10XH	57.00	12.7			O
XSD-I-4-M0580-10XH	58.00	12.9			O
XSD-I-4-M0590-10XH	59.00	13.1			O
XSD-I-4-M0600-10XH	60.00	13.4			O
XSD-I-4-M0610-10XH	61.00	13.6			O

● STOCKABLE O NON STOCKABLE

DRILLING

APPLICABLE TABLE OF PROCESSED MATERIALS

WORK PEICE MATERIAL	P	P	P	P	M	K	K	N	N	N	S	S	H	H
	MILD STEEL	STRUCTURAL STEEL	ALLOR STEEL	TOOL STEEL	STAINLESS STEEL	CASTIRON	MALLEABLE CAST IRON	ALUMINUM ALLOY	CAST ALUMINUM ALLOY	COPPER ALLOY	SUPER ALLOY	TITANIUM ALLOY	HARDENED STEEL	HARDENED STEEL
	<500N	<750N	<1400N	<1100N	<900N	<750N	<1100N	Si<12%	Si>12%	<750N	<1100N	<1100N	<1400N	<1600N
10XH	●	●	O	O	O	O		O	O	O				

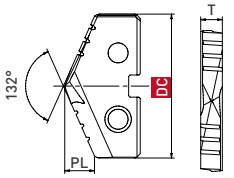
● VERY SUITABLE O SUITABLE

HSS INSERT OF SPADE DRILL

XSD-I-*-10XH

- Diameter range: 13~114.3 mm.
- Drilling accuracy: IT10~IT11.
- HPM10-Powder HSS for steel with hardness below Hb275.





T=11.11 drill tip angle is 144 °

HSS HPC

MODEL	SIZE			CONNECTOR	INVENTORY
	DC	PL	T		
XSD-I-4-M0620-10XH	62.00	13.8	7.94	4	O
XSD-I-4-M0630-10XH	63.00	14.0			O
XSD-I-4-M0640-10XH	64.00	14.2			O
XSD-I-4-M0650-10XH	65.00	14.5			O
XSD-I-5-M0640-10XH	64.00	10.4	11.11	5	O
XSD-I-5-M0650-10XH	65.00	10.6			O
XSD-I-5-M0660-10XH	66.00	10.7			O
XSD-I-5-M0680-10XH	68.00	11.0			O
XSD-I-5-M0700-10XH	70.00	11.4			O
XSD-I-5-M0720-10XH	72.00	11.7			O
XSD-I-5-M0740-10XH	74.00	12.0			O
XSD-I-5-M0760-10XH	76.00	12.3			O
XSD-I-6-M0770-10XH	77.00	12.5	11.11	6	O
XSD-I-6-M0780-10XH	78.00	12.7			O
XSD-I-6-M0800-10XH	80.00	13.0			O
XSD-I-6-M0820-10XH	82.00	13.3			O
XSD-I-6-M0840-10XH	84.00	13.6			O
XSD-I-6-M0860-10XH	86.00	14.0			O
XSD-I-6-M0880-10XH	88.00	14.3			O
XSD-I-6-M0890-10XH	89.00	14.5			O
XSD-I-7-M0900-10XH	90.00	14.6	11.11	7	O
XSD-I-7-M0920-10XH	92.00	14.9			O
XSD-I-7-M0940-10XH	94.00	15.3			O
XSD-I-7-M0960-10XH	96.00	15.6			O
XSD-I-7-M0980-10XH	98.00	15.9			O
XSD-I-7-M1000-10XH	100.00	16.2			O
XSD-I-8-M1020-10XH	102.00	16.6	11.11	8	O
XSD-I-8-M1040-10XH	104.00	16.9			O
XSD-I-8-M1060-10XH	106.00	17.2			O

MODEL	SIZE			CONNECTOR	INVENTORY
	DC	PL	T		
XSD-I-8-M1080-10XH	108.00	17.5	11.11	8	O
XSD-I-8-M1100-10XH	110.00	17.9			O
XSD-I-8-M1120-10XH	112.00	18.2			O
XSD-I-8-M1140-10XH	114.00	18.5			O

● STOCKABLE O NON STOCKABLE

APPLICABLE TABLE OF PROCESSED MATERIALS

ISO	P	P	P	P	M	K	K	N	N	N	S	S	H	H
WORK PEICE MATERIAL	MILD STEEL	STRUCTURAL STEEL	ALLOR STEEL	TOOL STEEL	STAIN-LESS STEEL	CASTIRON	MALLEABLE CAST IRON	ALUMINUM ALLOY	CAST ALU-MINUM ALLOY	COP-PER ALLOY	SUPER ALLOY	TITANIUM ALLOY	HARDENED STEEL	HARDENED STEEL
	<500N	<750N	<1400N	<1100N	<900N	<750N	<1100N	Si<12%	Si<12%	<750N	<1100N	<1100N	<1400N	<1600N
10XH	●	●	O	O	O	O		O	O	O				

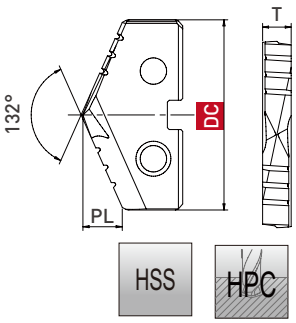
● VERY SUITABLE O SUITABLE

HSS INSERT OF SPADE DRILL

XSD-I-*-15XH

- Diameter range: 13~114 mm.
- Drilling accuracy : IT10~IT11.
- HPM10-Powder HSS for steel with hardness below HB400.





MODEL	SIZE			CONNECTOR	INVENTORY
	DC	PL	T		
XSD-I-Y-M0095-25XH	9.5	2.9	3.18	Y	○
XSD-I-Y-M0098-25XH	9.8	3.0			○
XSD-I-Y-M0100-25XH	10.0	3.1			○
XSD-I-Y-M0102-25XH	10.2	3.2			○
XSD-I-Y-M0105-25XH	10.5	3.3			○
XSD-I-Y-M0108-25XH	10.8	3.5			○
XSD-I-Y-M0110-25XH	11.0	3.6			○
XSD-I-Z-M0115-25XH	11.5	3.7	3.18	Z	○
XSD-I-Z-M0120-25XH	12.0	3.8			○
XSD-I-Z-M0125-25XH	12.5	4.0			○
XSD-I-0-M0130-25XH	13.0	4.1	3.97	0	○
XSD-I-0-M0135-25XH	13.5	4.2			○
XSD-I-0-M0140-25XH	14.0	4.3			○
XSD-I-0-M0145-25XH	14.5	4.5			○
XSD-I-0-M0150-25XH	15.0	4.6			○
XSD-I-1-M0155-25XH	15.5	4.7	3.97	1	○
XSD-I-1-M0160-25XH	16.0	4.8			○
XSD-I-1-M0165-25XH	16.5	4.9			○
XSD-I-1-M0170-25XH	17.0	5.1			○
XSD-I-1-M0175-25XH	17.5	5.3			○
XSD-I-1-M0180-25XH	18.0	5.6	4.76	1	○
XSD-I-1-M0185-25XH	18.5	5.8			○
XSD-I-1-M0190-25XH	19.0	6.0			○
XSD-I-1-M0195-25XH	19.5	6.2			○
XSD-I-1-M0200-25XH	20.0	6.5			○
XSD-I-1-M0205-25XH	20.5	6.7			○
XSD-I-1-M0210-25XH	21.0	6.9			○
XSD-I-1-M0215-25XH	21.5	7.1			○
XSD-I-1-M0220-25XH	22.0	7.1			○

MODEL	SIZE			CONNECTOR	INVENTORY
	DC	PL	T		
XSD-I-1-M0230-25XH	23.0	7.3	3.97	1	○
XSD-I-1-M0240-25XH	24.0	7.6			○
XSD-I-2-M0250-25XH	25.0	7.8	4.76	2	○
XSD-I-2-M0260-25XH	26.0	8.0			○
XSD-I-2-M0270-25XH	27.0	8.2			○
XSD-I-2-M0280-25XH	28.0	8.5			○
XSD-I-2-M0290-25XH	29.0	8.7			○
XSD-I-2-M0300-25XH	30.0	8.9	4.76	2	○
XSD-I-2-M0310-25XH	31.0	9.1			○
XSD-I-2-M0320-25XH	32.0	9.3			○
XSD-I-2-M0330-25XH	33.0	9.6			○
XSD-I-2-M0340-25XH	34.0	9.8			○
XSD-I-2-M0350-25XH	35.0	10.0			○
XSD-I-3-M0360-25XH	36.0	10.2	6.35	3	○
XSD-I-3-M0370-25XH	37.0	10.5			○
XSD-I-3-M0380-25XH	38.0	10.7			○
XSD-I-3-M0390-25XH	39.0	10.9			○
XSD-I-3-M0400-25XH	40.0	11.1			○
XSD-I-3-M0410-25XH	41.0	11.4			○
XSD-I-3-M0420-25XH	42.0	11.6			○
XSD-I-3-M0430-25XH	43.0	11.8			○
XSD-I-3-M0440-25XH	44.0	12.0			○
XSD-I-3-M0450-25XH	45.0	12.2			○
XSD-I-3-M0460-25XH	46.0	12.5			○
XSD-I-3-M0470-25XH	47.0	12.7			○
XSD-I-4-M0480-25XH	48.0	12.9	7.94	4	○
XSD-I-4-M0490-10XH	49.00	10.9			○
XSD-I-4-M0500-10XH	50.00	11.1			○
XSD-I-4-M0510-10XH	51.00	11.4			○

● STOCKABLE ○ NON STOCKABLE

APPLICABLE TABLE OF PROCESSED MATERIALS

WORK PEICE MATERIAL	P	P	P	P	M	K	K	N	N	N	S	S	H	H
	MILD STEEL	STRUCTURAL STEEL	ALLOR STEEL	TOOL STEEL	STAINLESS STEEL	CASTIRON	MALLEABLE CAST IRON	ALUMINUM ALLOY	CAST ALUMINUM ALLOY	COPPER ALLOY	SUPER ALLOY	TITANIUM ALLOY	HARDENED STEEL	HARDENED STEEL
	<500N	<750N	<1400N	<1100N	<900N	<750N	<1100N	Si<12%	Si>12%	<750N	<1100N	<1100N	<1400N	<1600N
10XH	●	●	●	●	●	○	○	○	○	○	○			

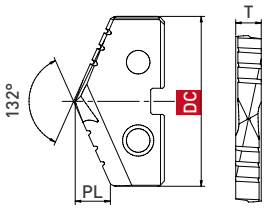
● VERY SUITABLE ○ SUITABLE

HSS INSERT OF SPADE DRILL

XSD-I-*-15XH

- Diameter range: 13~114 mm.
- Drilling accuracy : IT10~IT11.
- HPM10-Powder HSS for steel with hardness below HB400.





T=11.11 drill tip angle is 144 °

HSS HPC

MODEL	SIZE			CONNECTOR	INVENTORY
	DC	PL	T		
XSD-I-4-M0520-10XH	52.00	11.6	7.94	4	O
XSD-I-4-M0530-10XH	53.00	11.8			O
XSD-I-4-M0540-10XH	54.00	12.0			O
XSD-I-4-M0550-10XH	55.00	12.2			O
XSD-I-4-M0560-10XH	56.00	12.5	7.94	4	O
XSD-I-4-M0570-10XH	57.00	12.7			O
XSD-I-4-M0580-10XH	58.00	12.9			O
XSD-I-4-M0590-10XH	59.00	13.1			O
XSD-I-4-M0600-10XH	60.00	13.4			O
XSD-I-4-M0610-10XH	61.00	13.6			O
XSD-I-4-M0620-15XH	62.00	13.8			O
XSD-I-4-M0630-15XH	63.00	14.0			O
XSD-I-4-M0640-15XH	64.00	14.2			O
XSD-I-4-M0650-15XH	65.00	14.5			O
XSD-I-5-M0660-15XH	66.00	10.7	11.11	5	O
XSD-I-5-M0670-15XH	67.00	10.7			
XSD-I-5-M0680-15XH	68.00	11.0			O
XSD-I-5-M0690-15XH	69.00	11.0			
XSD-I-5-M0700-15XH	70.00	11.4			O
XSD-I-5-M0710-15XH	71.00	11.4			
XSD-I-5-M0720-15XH	72.00	11.7			O
XSD-I-5-M0730-15XH	73.00	11.7			
XSD-I-5-M0740-15XH	74.00	12.0			O
XSD-I-5-M0750-15XH	75.00	12.0			
XSD-I-5-M0760-15XH	76.00	12.3			O
XSD-I-6-M0770-15XH	77.00	12.5	11.11	6	
XSD-I-6-M0780-15XH	78.00	12.7			
XSD-I-6-M0790-15XH	79.00	12.7			
XSD-I-6-M0800-15XH	80.00	13.0			

MODEL	SIZE			CONNECTOR	INVENTORY
	DC	PL	T		
XSD-I-6-M0810-15XH	81.00	13.0	11.11	6	O
XSD-I-6-M0820-15XH	82.00	13.3			O
XSD-I-6-M0830-15XH	83.00	13.3			O
XSD-I-6-M0840-15XH	84.00	13.6			O
XSD-I-6-M0850-15XH	85.00	13.6			O
XSD-I-6-M0860-15XH	86.00	14.0			O
XSD-I-6-M0870-15XH	87.00	14.0			O
XSD-I-6-M0880-15XH	88.00	14.3			O
XSD-I-6-M0890-15XH	89.00	14.5			O
XSD-I-7-M0900-15XH	90.00	14.6	11.11	7	O
XSD-I-7-M0910-15XH	91.00	14.6			O
XSD-I-7-M0920-15XH	92.00	14.9			O
XSD-I-7-M0930-15XH	93.00	14.9			O
XSD-I-7-M0940-15XH	94.00	15.3			O
XSD-I-7-M0950-15XH	95.00	15.3			O
XSD-I-7-M0960-15XH	96.00	15.6			O
XSD-I-7-M0970-15XH	97.00	15.6			O
XSD-I-7-M0980-15XH	98.00	15.9			O
XSD-I-7-M1000-15XH	100.00	16.2			O
XSD-I-7-M1010-15XH	101.00	16.2			
XSD-I-8-M1020-15XH	102.00	16.6	11.11	8	O
XSD-I-8-M1030-15XH	103.00	16.6			
XSD-I-8-M1040-15XH	104.00	16.9			O
XSD-I-8-M1050-15XH	105.00	16.9			
XSD-I-8-M1060-15XH	106.00	17.2			O
XSD-I-8-M1080-15XH	108.00	17.5			O
XSD-I-8-M1100-15XH	110.00	17.9			O
XSD-I-8-M1120-15XH	112.00	18.2			O
XSD-I-8-M1140-15XH	114.00	18.5			O

APPLICABLE TABLE OF PROCESSED MATERIALS

WORK PEICE MATERIAL	P	P	P	P	M	K	K	N	N	N	S	S	H	H
	MILD STEEL	STRUCTURAL STEEL	ALLOR STEEL	TOOL STEEL	STAINLESS STEEL	CASTIRON	MALLEABLE CAST IRON	ALUMINUM ALLOY	CAST ALUMINUM ALLOY	COPPER ALLOY	SUPER ALLOY	TITANIUM ALLOY	HARDENED STEEL	HARDENED STEEL
	<500N	<750N	<1400N	<1100N	<900N	<750N	<1100N	Si<12%	Si>12%	<750N	<1100N	<1100N	<1400N	<1600N
10XH	●	●	●	●	●	O	O	O	O	O	O			

● VERY SUITABLE O SUITABLE

● STOCKABLE O NON STOCKABLE

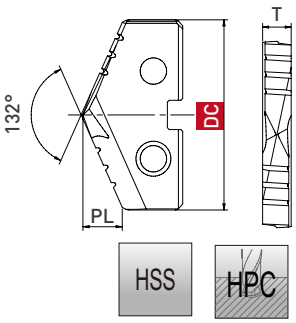
DRILLING

HSS INSERT OF SPADE DRILL

XSD-I-*-25XH

- Diameter range: 9.5~65 mm.
- Drilling accuracy : IT10~IT11.
- HPM10-Powder HSS for steel with hardness below HB400.





MODEL	SIZE			CONNECTOR	INVENTORY
	DC	PL	T		
XSD-I-Y-M0095-25XH	9.50	2.1	2.38	Y	O
XSD-I-Y-M0098-25XH	9.80	2.2			O
XSD-I-Y-M0100-25XH	10.00	2.2			O
XSD-I-Y-M0102-25XH	10.20	2.3			O
XSD-I-Y-M0105-25XH	10.50	2.3			O
XSD-I-Y-M0108-25XH	10.80	2.4			O
XSD-I-Y-M0110-25XH	11.00	2.4			O
XSD-I-Z-M0115-25XH	11.50	2.6	2.38	Z	O
XSD-I-Z-M0120-25XH	12.00	2.7			O
XSD-I-Z-M0125-25XH	12.50	2.8			O
XSD-I-0-M0130-25XH	13.00	2.9	3.18	0	O
XSD-I-0-M0135-25XH	13.50	3.0			O
XSD-I-0-M0140-25XH	14.00	3.1			O
XSD-I-0-M0145-25XH	14.50	3.2			O
XSD-I-0-M0150-25XH	15.00	3.3			O
XSD-I-0-M0155-25XH	15.50	3.5	3.18	0	O
XSD-I-0-M0160-25XH	16.00	3.6			O
XSD-I-0-M0165-25XH	16.50	3.7			O
XSD-I-0-M0170-25XH	17.00	3.8			O
XSD-I-0-M0175-25XH	17.50	3.9			O
XSD-I-1-M0180-25XH	18.00	4.0	3.97	1	O
XSD-I-1-M0185-25XH	18.50	4.1			O
XSD-I-1-M0190-25XH	19.00	4.2			O
XSD-I-1-M0195-25XH	19.50	4.3			O
XSD-I-1-M0200-25XH	20.00	4.5			O
XSD-I-1-M0205-25XH	20.50	4.6			O
XSD-I-1-M0210-25XH	21.00	4.7			O
XSD-I-1-M0215-25XH	21.50	4.8			O
XSD-I-1-M0220-25XH	22.00	4.9	3.97	1	O

MODEL	SIZE			CONNECTOR	INVENTORY
	DC	PL	T		
XSD-I-1-M0230-25XH	23.00	5.1	3.97	1	O
XSD-I-1-M0240-25XH	24.00	5.3			O
XSD-I-2-M0250-25XH	25.00	5.6	4.76	2	O
XSD-I-2-M0260-25XH	26.00	5.8			O
XSD-I-2-M0270-25XH	27.00	6.0			O
XSD-I-2-M0280-25XH	28.00	6.2			O
XSD-I-2-M0290-25XH	29.00	6.5			O
XSD-I-2-M0300-25XH	30.00	6.7	4.76	2	O
XSD-I-2-M0310-25XH	31.00	6.9			O
XSD-I-2-M0320-25XH	32.00	7.1			O
XSD-I-2-M0330-25XH	33.00	7.3			O
XSD-I-2-M0340-25XH	34.00	7.6			O
XSD-I-2-M0350-25XH	35.00	7.8			O
XSD-I-3-M0360-25XH	36.00	8.0	6.35	3	O
XSD-I-3-M0370-25XH	37.00	8.2			O
XSD-I-3-M0380-25XH	38.00	8.5			O
XSD-I-3-M0390-25XH	39.00	8.7			O
XSD-I-3-M0400-25XH	40.00	8.9			O
XSD-I-3-M0410-25XH	41.00	9.1			O
XSD-I-3-M0420-25XH	42.00	9.3	6.35	3	O
XSD-I-3-M0430-25XH	43.00	9.6			O
XSD-I-3-M0440-25XH	44.00	9.8			O
XSD-I-3-M0450-25XH	45.00	10.0			O
XSD-I-3-M0460-25XH	46.00	10.2			O
XSD-I-3-M0470-25XH	47.00	10.5			O
XSD-I-4-M0480-25XH	48.00	10.7	7.94	4	O
XSD-I-4-M0500-25XH	50.00	11.1			O
XSD-I-4-M0510-25XH	51.00	11.4			O
XSD-I-4-M0520-25XH	52.00	11.6			O

● STOCKABLE ○ NON STOCKABLE

APPLICABLE TABLE OF PROCESSED MATERIALS

WORK PEICE MATERIAL	P	P	P	P	M	K	K	N	N	N	S	S	H	H
	MILD STEEL	STRUCTURAL STEEL	ALLOR STEEL	TOOL STEEL	STAINLESS STEEL	CASTIRON	MALLEABLE CAST IRON	ALUMINUM ALLOY	CAST ALUMINUM ALLOY	COPPER ALLOY	SUPER ALLOY	TITANIUM ALLOY	HARDENED STEEL	HARDENED STEEL
	<500N	<750N	<1400N	<1100N	<900N	<750N	<1100N	Si<12%	Si>12%	<750N	<1100N	<1100N	<1400N	<1600N
10XH	●	●	●	●	●	●	●	○	○	○	○	○	●	

● VERY SUITABLE ○ SUITABLE

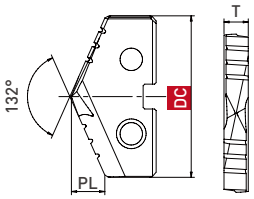
DRILLING

HSS INSERT OF SPADE DRILL

XSD-I-*-25XH

- Diameter range: 9.5~65 mm.
- Drilling accuracy : IT10~IT11.
- HPM10-Powder HSS for steel with hardness below HB400.





T=11.11 drill tip angle is 144 °

HSS HPC

MODEL	SIZE			CONNECTOR	INVENTORY
	DC	PL	T		
XSD-I-4-M0530-25XH	53.00	11.8	7.94	4	○
XSD-I-4-M0540-25XH	54.00	12.0			○
XSD-I-4-M0550-25XH	55.00	12.2			○
XSD-I-4-M0560-25XH	56.00	12.5	7.94	4	○
XSD-I-4-M0570-25XH	57.00	12.7			○
XSD-I-4-M0580-25XH	58.00	12.9			○
XSD-I-4-M0590-25XH	59.00	13.1			○
XSD-I-4-M0600-25XH	60.00	13.4			○
XSD-I-4-M0610-25XH	61.00	13.6			○
XSD-I-4-M0620-25XH	62.00	13.8			○
XSD-I-4-M0630-25XH	63.00	14.0			○
XSD-I-4-M0640-25XH	64.00	14.2			○
XSD-I-4-M0650-25XH	65.00	14.5			○

● STOCKABLE ○ NON STOCKABLE

APPLICABLE TABLE OF PROCESSED MATERIALS

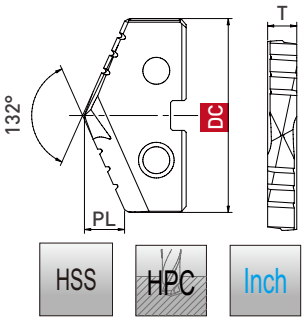
WORK PEICE MATERIAL	P	P	P	P	M	K	K	N	N	N	S	S	H	H
	MILD STEEL	STRUCTURAL STEEL	ALLOR STEEL	TOOL STEEL	STAINLESS STEEL	CASTIRON	MALLEABLE CAST IRON	ALUMINUM ALLOY	CAST ALUMINUM ALLOY	COPPER ALLOY	SUPER ALLOY	TITANIUM ALLOY	HARDENED STEEL	HARDENED STEEL
	<500N	<750N	<1400N	<1100N	<900N	<750N	<1100N	Si<12%	Si>12%	<750N	<1100N	<1100N	<1400N	<1600N
10XH	●	●	●	●	●	●	●	○	○	○	○	○	●	

● VERY SUITABLE ○ SUITABLE

HSS INSERT OF SPADE DRILL

XSD-I-*-10XH





- Diameter range: 14~114 mm.
- Drilling accuracy : IT10~IT11.
- HPM25-Powder HSS for steel with hardness below HB400.

MODEL	SIZE				CONNECTOR	INVENTORY
	DC		PL	T		
XSD-I-0-I0562-10XH	9/16"	14.29	0.126	1/8" (3.18)	0	O
XSD-I-5-I0625-10XH	5/8"	15.88	0.138	1/8" (3.18)	0	O
XSD-I-10-I0687-10XH	11/16"	17.46	0.154			O
XSD-I-10-I0750-10XH	3/4"	19.05	0.165	5/32" (3.97)	1	O
XSD-I-15-I0812-10XH	13/16"	20.64	0.181			O
XSD-I-15-I0875-10XH	7/8"	22.23	0.193	5/32" (3.97)	1	O
XSD-I-20-I0937-10XH	15/16"	23.81	0.209			O
XSD-I-20-I1000-10XH	1"	25.40	0.224	3/16" (4.76)	2	O
XSD-I-20-I1062-10XH	1-1/16"	26.99	0.236			O
XSD-I-25-I1125-10XH	1-1/8"	28.58	0.252			O
XSD-I-25-I1187-10XH	1-3/16"	30.16	0.264	1/4" (6.35)	2	O
XSD-I-25-I1250-10XH	1-1/4"	31.75	0.28			O
XSD-I-30-I1312-10XH	1-5/16"	33.34	0.291			O
XSD-I-30-I1343-10XH	1-11/32"	34.13	0.299			O
XSD-I-30-I1375-10XH	1-3/8"	34.93	0.307			O
XSD-I-30-I1437-10XH	1-7/16"	36.51	0.319	1/4" (6.35)	3	O
XSD-I-30-I1500-10XH	1-1/2"	38.10	0.335			O
XSD-I-35-I1562-10XH	1-9/16"	39.69	0.346			O
XSD-I-35-I1625-10XH	1-5/8"	41.28	0.362			O
XSD-I-35-I1687-10XH	1-1/16"	42.68	0.374	1/4" (6.35)	3	O
XSD-I-35-I1750-10XH	1-3/4"	44.45	0.390			O
XSD-I-40-I1812-10XH	1-13/16"	46.04	0.402			O
XSD-I-40-I1875-10XH	1-7/8"	47.63	0.417			O
XSD-I-40-I1937-10XH	1-15/16"	49.21	0.433	5/16" (7.94)	4	O
XSD-I-40-I2000-10XH	2"	50.80	0.445			O
XSD-I-45-I2062-10XH	2-1/16"	52.39	0.461			O
XSD-I-45-I2125-10XH	2-1/8"	53.98	0.472			O
XSD-I-45-I2187-10XH	2-3/16"	55.56	0.488			O
XSD-I-45-I2250-10XH	2-1/4"	57.15	0.5	5/16" (7.94)	4	O

● STOCKABLE O NON STOCKABLE

APPLICABLE TABLE OF PROCESSED MATERIALS

WORK PEICE MATERIAL	P	P	P	P	M	K	K	N	N	N	S	S	H	H
	MILD STEEL	STRUCTURAL STEEL	ALLOR STEEL	TOOL STEEL	STAINLESS STEEL	CASTIRON	MALLEABLE CAST IRON	ALUMINUM ALLOY	CAST ALUMINUM ALLOY	COPPER ALLOY	SUPER ALLOY	TITANIUM ALLOY	HARDENED STEEL	HARDENED STEEL
	<500N	<750N	<1400N	<1100N	<900N	<750N	<1100N	Si<12%	Si>12%	<750N	<1100N	<1100N	<1400N	<1600N
10XH	●	●	O	O	O	O		O	O	O				

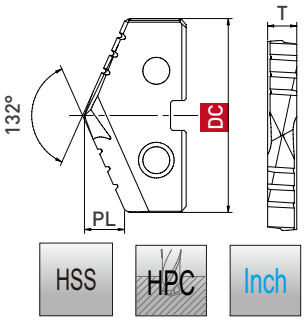
● VERY SUITABLE O SUITABLE

DRILLING

HSS INSERT OF SPADE DRILL

XSD-I-*-10XH





- Diameter range: 14~114 mm.
- Drilling accuracy : IT10~IT11.
- HPM25-Powder HSS for steel with hardness below HB400.

MODEL	SIZE				CONNECTOR	INVENTORY
	DC		PL	T		
XSD-I-45-I2312-10XH	2-5/16"	58.74	0.516	5/16" (7.94)	4	O
XSD-I-45-I2375-10XH	2-3/8"	60.33	0.528			O
XSD-I-45-I2437-10XH	2-7/16"	61.91	0.543			O
XSD-I-45-I2500-10XH	2-1/2"	63.50	0.555			O
XSD-I-45-I2562-10XH	2-9/16"	65.09	0.571			O
XSD-I-50-I2500-10XH	2-1/2"	63.50	0.406			O
XSD-I-50-I2562-10XH	2-9/16"	65.09	0.417	7/16" (11.11)	5	O
XSD-I-50-I2625-10XH	2-5/8"	66.68	0.425			O
XSD-I-50-I2812-10XH	2-13/16"	71.44	0.457			O
XSD-I-50-I2875-10XH	2-7/8"	73.03	0.469			O
XSD-I-50-I2937-10XH	2-15/16"	74.61	0.476			O
XSD-I-50-I3000-10XH	3"	76.20	0.488			O
XSD-I-50-I3031-10XH	3-1/32"	76.99	0.492			O
XSD-I-55-I3062-10XH	3-1/16"	77.79	0.496	7/16" (11.11)	6	O
XSD-I-55-I3125-10XH	3-1/8"	79.38	0.508			O
XSD-I-55-I3187-10XH	3-3/16"	80.96	0.52			O
XSD-I-55-I3250-10XH	3-1/4"	82.55	0.528			O
XSD-I-55-I3312-10XH	3-5/16"	84.14	0.539			O
XSD-I-55-I3375-10XH	3-3/8"	85.73	0.547			O
XSD-I-55-I3437-10XH	3-7/16"	87.31	0.559			O
XSD-I-55-I3500-10XH	3-1/2"	88.90	0.567			O

● STOCKABLE O NON STOCKABLE

APPLICABLE TABLE OF PROCESSED MATERIALS

WORK PEICE MATERIAL	P	P	P	P	M	K	K	N	N	N	S	S	H	H
	MILD STEEL	STRUCTURAL STEEL	ALLOR STEEL	TOOL STEEL	STAINLESS STEEL	CASTIRON	MALLEABLE CAST IRON	ALUMINUM ALLOY	CAST ALUMINUM ALLOY	COPPER ALLOY	SUPER ALLOY	TITANIUM ALLOY	HARDENED STEEL	HARDENED STEEL
	<500N	<750N	<1400N	<1100N	<900N	<750N	<1100N	Si<12%	Si>12%	<750N	<1100N	<1100N	<1400N	<1600N
10XH	●	●	O	O	O	O		O	O	O				

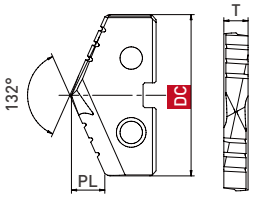
● VERY SUITABLE O SUITABLE

DRILLING

HSS INSERT OF SPADE DRILL

XSD-I-*-10XH





T=11.11 drill tip angle is 144 °

HSS HPC Inch

- Diameter range: 14~114 mm.
- Drilling accuracy : IT10~IT11.
- HPM25-Powder HSS for steel with hardness below HB400.

MODEL	SIZE				CONNECTOR	INVENTORY
	DC		PL	T		
XSD-I-70-13531-10XH	3-17/32"	89.96	0.575	7/16" (11.11)	7	O
XSD-I-70-13562-10XH	3-9/16"	90.49	0.579			O
XSD-I-70-13625-10XH	3-5/8"	92.08	0.591			O
XSD-I-70-13687-10XH	3-11/16"	93.66	0.598			O
XSD-I-70-13750-10XH	3-3/4"	95.25	0.61			O
XSD-I-70-13812-10XH	3-13/16"	96.84	0.618			O
XSD-I-70-13875-10XH	3-7/8"	98.43	0.63			O
XSD-I-70-13937-10XH	3-15/16"	100.01	0.638			O
XSD-I-70-14000-10XH	4"	101.60	0.65			O
XSD-I-80-14125-10XH	4-1/8"	104.78	0.669	7/16" (11.11)	8	O
XSD-I-80-14250-10XH	4-1/4"	107.95	0.689			O
XSD-I-80-14500-10XH	4-1/2"	114.30	0.732			O

● STOCKABLE O NON STOCKABLE

DRILLING

APPLICABLE TABLE OF PROCESSED MATERIALS

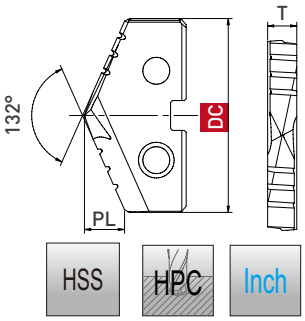
WORK PEICE MATERIAL	P	P	P	P	M	K	K	N	N	N	S	S	H	H
	MILD STEEL	STRUCTURAL STEEL	ALLOR STEEL	TOOL STEEL	STAINLESS STEEL	CASTIRON	MALLEABLE CAST IRON	ALUMINUM ALLOY	CAST ALUMINUM ALLOY	COPPER ALLOY	SUPER ALLOY	TITANIUM ALLOY	HARDENED STEEL	HARDENED STEEL
	<500N	<750N	<1400N	<1100N	<900N	<750N	<1100N	Si<12%	Si>12%	<750N	<1100N	<1100N	<1400N	<1600N
10XH	●	●	O	O	O	O		O	O	O				

● VERY SUITABLE O SUITABLE

HSS INSERT OF SPADE DRILL

XSD-I-*-15XH





- Diameter range: 14~114 mm.
- Drilling accuracy : IT10~IT11.
- HPM25-Powder HSS for steel with hardness below HB400.

MODEL	SIZE				CONNECTOR	INVENTORY
	DC		PL	T		
XSD-I-0-I0562-15XH	9/16"	14.29	0.126	1/8" (3.18)	0	O
XSD-I-5-I0625-15XH	5/8"	15.88	0.138	1/8" (3.18)	0	O
XSD-I-10-I0687-15XH	11/16"	17.46	0.154			O
XSD-I-10-I0750-15XH	3/4"	19.05	0.165	5/32" (3.97)	1	O
XSD-I-15-I0812-15XH	13/16"	20.64	0.181			O
XSD-I-15-I0875-15XH	7/8"	22.23	0.193	5/32" (3.97)	1	O
XSD-I-20-I0937-15XH	15/16"	23.81	0.209			O
XSD-I-20-I1000-15XH	1"	25.40	0.224	3/16" (4.76)	2	O
XSD-I-20-I1062-15XH	1-1/16"	26.99	0.236			O
XSD-I-25-I1125-15XH	1-1/8"	28.58	0.252			O
XSD-I-25-I1187-15XH	1-3/16"	30.16	0.264	1/4" (6.35)	2	O
XSD-I-25-I1250-15XH	1-1/4"	31.75	0.28			O
XSD-I-30-I1312-15XH	1-5/16"	33.34	0.291			O
XSD-I-30-I1343-15XH	1-11/32"	34.13	0.299			O
XSD-I-30-I1375-15XH	1-3/8"	34.93	0.307			O
XSD-I-30-I1437-15XH	1-7/16"	36.51	0.319	1/4" (6.35)	3	O
XSD-I-30-I1500-15XH	1-1/2"	38.10	0.335			O
XSD-I-35-I1562-15XH	1-9/16"	39.69	0.346			O
XSD-I-35-I1625-15XH	1-5/8"	41.28	0.362			O
XSD-I-35-I1687-15XH	1-1/16"	42.68	0.374	1/4" (6.35)	3	O
XSD-I-35-I1750-15XH	1-3/4"	44.45	0.390			O
XSD-I-40-I1812-15XH	1-13/16"	46.04	0.402			O
XSD-I-40-I1875-15XH	1-7/8"	47.63	0.417			O
XSD-I-40-I1937-15XH	1-15/16"	49.21	0.433	5/16" (7.94)	4	O
XSD-I-40-I2000-15XH	2"	50.80	0.445			O
XSD-I-45-I2062-15XH	2-1/16"	52.39	0.461			O
XSD-I-45-I2125-15XH	2-1/8"	53.98	0.472			O
XSD-I-45-I2187-15XH	2-3/16"	55.56	0.488			O
XSD-I-45-I2250-15XH	2-1/4"	57.15	0.5	5/16" (7.94)	4	O

● STOCKABLE O NON STOCKABLE

APPLICABLE TABLE OF PROCESSED MATERIALS

WORK PEICE MATERIAL	P	P	P	P	M	K	K	N	N	N	S	S	H	H
	MILD STEEL	STRUCTURAL STEEL	ALLOR STEEL	TOOL STEEL	STAINLESS STEEL	CASTIRON	MALLEABLE CAST IRON	ALUMINUM ALLOY	CAST ALUMINUM ALLOY	COPPER ALLOY	SUPER ALLOY	TITANIUM ALLOY	HARD-ENED STEEL	HARDENED STEEL
	<500N	<750N	<1400N	<1100N	<900N	<750N	<1100N	Si<12%	Si>12%	<750N	<1100N	<1100N	<1400N	<1600N
10XH	●	●	●	●	●	O	O	O	O	O	O			

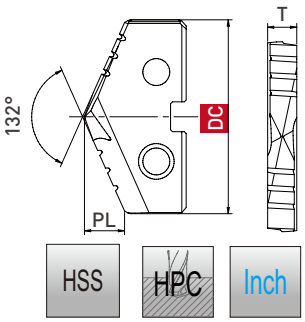
● VERY SUITABLE O SUITABLE

DRILLING

HSS INSERT OF SPADE DRILL

XSD-I-*-15XH





- Diameter range: 14~114 mm.
- Drilling accuracy : IT10~IT11.
- HPM25-Powder HSS for steel with hardness below HB400.

MODEL	SIZE				CONNECTOR	INVENTORY
	DC		PL	T		
XSD-I-45-12312-10XH	2-5/16"	58.74	0.516	5/16" (7.94)	4	O
XSD-I-45-12375-10XH	2-3/8"	60.33	0.528			O
XSD-I-45-12437-10XH	2-7/16"	61.91	0.543			O
XSD-I-45-12500-10XH	2-1/2"	63.50	0.555			O
XSD-I-45-12562-10XH	2-9/16"	65.09	0.571			O
XSD-I-50-12500-10XH	2-1/2"	63.50	0.406	7/16" (11.11)	5	O
XSD-I-50-12562-10XH	2-9/16"	65.09	0.417			O
XSD-I-50-12625-10XH	2-5/8"	66.68	0.425			O
XSD-I-50-12812-10XH	2-13/16"	71.44	0.457			O
XSD-I-50-12875-10XH	2-7/8"	73.03	0.469			O
XSD-I-50-12937-10XH	2-15/16"	74.61	0.476			O
XSD-I-50-13000-10XH	3"	76.20	0.488			O
XSD-I-50-13031-10XH	3-1/32"	76.99	0.492			O
XSD-I-55-13062-10XH	3-1/16"	77.79	0.496	7/16" (11.11)	6	O
XSD-I-55-13125-10XH	3-1/8"	79.38	0.508			O
XSD-I-55-13187-10XH	3-3/16"	80.96	0.52			O
XSD-I-55-13250-10XH	3-1/4"	82.55	0.528			O
XSD-I-55-13312-10XH	3-5/16"	84.14	0.539			O
XSD-I-55-13375-10XH	3-3/8"	85.73	0.547			O
XSD-I-55-13437-10XH	3-7/16"	87.31	0.559			O
XSD-I-55-13500-10XH	3-1/2"	88.90	0.567			O
XSD-I-70-13531-10XH	3-17/32"	89.96	0.575	7/16" (11.11)	7	O
XSD-I-70-13562-10XH	3-9/16"	90.49	0.579			O
XSD-I-70-13625-10XH	3-5/8"	92.08	0.591			O
XSD-I-70-13687-10XH	3-11/16"	93.66	0.598			O
XSD-I-70-13750-10XH	3-3/4"	95.25	0.61			O
XSD-I-70-13812-10XH	3-13/16"	96.84	0.618			O
XSD-I-70-13875-10XH	3-7/8"	98.43	0.63			O
XSD-I-70-13937-10XH	3-15/16"	100.01	0.638			O

● STOCKABLE O NON STOCKABLE

APPLICABLE TABLE OF PROCESSED MATERIALS

WORK PEICE MATERIAL	P	P	P	P	M	K	K	N	N	N	S	S	H	H
	MILD STEEL	STRUCTURAL STEEL	ALLOR STEEL	TOOL STEEL	STAINLESS STEEL	CASTIRON	MALLEABLE CAST IRON	ALUMINUM ALLOY	CAST ALUMINUM ALLOY	COPPER ALLOY	SUPER ALLOY	TITANIUM ALLOY	HARDENED STEEL	HARDENED STEEL
	<500N	<750N	<1400N	<1100N	<900N	<750N	<1100N	Si<12%	Si>12%	<750N	<1100N	<1100N	<1400N	<1600N
10XH	●	●	●	●	●	O	O	O	O	O	O			

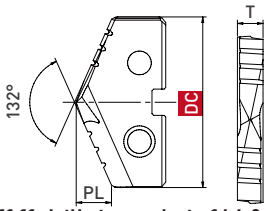
● VERY SUITABLE O SUITABLE

DRILLING

HSS INSERT OF SPADE DRILL

XSD-I-*-15XH





T=11.11 drill tip angle is 144 °

- Diameter range: 14~114 mm.
- Drilling accuracy : IT10~IT11.
- HPM25-Powder HSS for steel with hardness below HB400.

HSS HPC Inch

MODEL	SIZE				CONNECTOR	INVENTORY
	DC		PL	T		
XSD-I-70-1101.6-15XH	4"	101.60	0.65	7/16" (11.11)	7	○
XSD-I-80-1104.78-15XH	4-1/8"	104.78	0.669	7/16" (11.11)	8	○
XSD-I-80-1107.95-15XH	4-1/4"	107.95	0.689			○
XSD-I-80-1114.3-15XH	4-1/2"	114.30	0.732			○

● STOCKABLE ○ NON STOCKABLE

APPLICABLE TABLE OF PROCESSED MATERIALS

WORK PEICE MATERIAL	P	P	P	P	M	K	K	N	N	N	S	S	H	H
	MILD STEEL	STRUCTURAL STEEL	ALLOR STEEL	TOOL STEEL	STAINLESS STEEL	CASTIRON	MALLEABLE CAST IRON	ALUMINUM ALLOY	CAST ALUMINUM ALLOY	COPPER ALLOY	SUPER ALLOY	TITANIUM ALLOY	HARDENED STEEL	HARDENED STEEL
	<500N	<750N	<1400N	<1100N	<900N	<750N	<1100N	Si<12%	Si>12%	<750N	<1100N	<1100N	<1400N	<1600N
10XH	●	●	●	●	●	○	○	○	○	○	○			

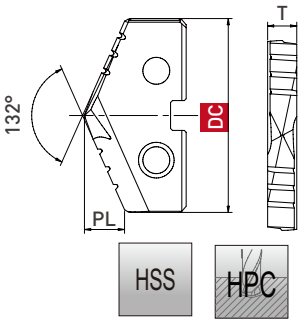
● VERY SUITABLE ○ SUITABLE

DRILLING

HSS INSERT OF SPADE DRILL

XSD-I-*-25XH





- Diameter range: 9.5~65 mm.
- Drilling accuracy : IT10~IT11.
- HPM25-Powder HSS for steel with hardness below HB400.

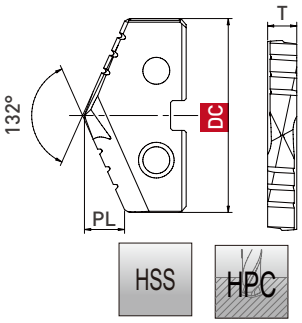
MODEL	SIZE				CONNECTOR	INVENTORY
	DC		PL	T		
XSD-Y0-I0375-25XH	3/8"	9.53	0.083	3/32" (2.38))	Y	O
XSD-Y0-I0421-25XH	27/64"	10.72	0.094			O
XSD-Z0-I0437-25XH	7/16"	11.11	0.098			O
XSD-Z0-I0453-25XH	29/64"	11.51	0.102	3/32" (2.38)	Z	O
XSD-Z0-I0484-25XH	31/64"	12.30	0.106			O
XSD-00-I0500-25XH	1/2"	12.70	0.11			O
XSD-00-I0562-25XH	9/16"	14.29	0.126	1/8" (3.18)	0	O
XSD-5-I0625-25XH	5/8"	15.88	0.138	1/8" (3.18)	0	O
XSD-5-I0687-25XH	11/16"	17.46	0.154			O
XSD-10-I0750-25XH	3/4"	19.05	0.165	5/32" (3.97)	1	O
XSD-10-I0812-25XH	13/16"	20.64	0.181			O
XSD-15-I0875-25XH	7/8"	22.23	0.193	5/32" (3.97)	1	O
XSD-15-I0937-25XH	15/16"	23.81	0.209			O
XSD-20-I1000-25XH	1"	25.40	0.224	3/16" (4.76)	2	O
XSD-20-I1062-25XH	1-1/16"	26.99	0.236			O
XSD-25-I1125-25XH	1-1/8"	28.58	0.252			O
XSD-25-I1187-25XH	1-3/16"	30.16	0.264	3/16" (4.76)	2	O
XSD-25-I1250-25XH	1-1/4"	31.75	0.28			O
XSD-25-I1312-25XH	1-5/16"	33.34	0.291			O
XSD-30-I1343-25XH	1-11/32"	34.13	0.299			O
XSD-30-I1375-25XH	1-3/8"	34.93	0.307			O
XSD-30-I1437-25XH	1-7/16"	36.51	0.319	1/4" (6.35)	3	O
XSD-30-I1500-25XH	1-1/2"	38.10	0.335			O
XSD-35-I1562-25XH	1-9/16"	39.69	0.346			O
XSD-35-I1625-25XH	1-5/8"	41.28	0.362			O
XSD-35-I1687-25XH	1-1/16"	42.68	0.374	1/4" (6.35)	3	O
XSD-35-I1750-25XH	1-3/4"	44.45	0.39			O
XSD-35-I1812-25XH	1-13/16"	46.04	0.402			O
XSD-35-I1875-25XH	1-7/8"	47.63	0.417			O

● STOCKABLE ○ NON STOCKABLE

HSS INSERT OF SPADE DRILL

XSD-I-*-25XH





- Diameter range: 9.5~65 mm.
- Drilling accuracy : IT10~IT11.
- HPM25-Powder HSS for steel with hardness below HB400.

MODEL	SIZE				CONNECTOR	INVENTORY
	DC		PL	T		
XSD-40-I1937-25XH	1-15/16"	49.21	0.433	5/16" (7.94)	4	O
XSD-40-I2000-25XH	2"	50.80	0.445			O
XSD-40-I2062-25XH	2-1/16"	52.39	0.461			O
XSD-40-I2125-25XH	2-1/8"	53.98	0.472			O
XSD-40-I2187-25XH	2-3/16"	55.56	0.488			O
XSD-45-I2250-25XH	2-1/4"	57.15	0.5	5/16" (7.94)	4	O
XSD-45-I2312-25XH	2-5/16"	58.74	0.516			O
XSD-45-I2375-25XH	2-3/8"	60.33	0.528			O
XSD-45-I2437-25XH	2-7/16"	61.91	0.543			O
XSD-45-I2500-25XH	2-1/2"	63.50	0.555			O
XSD-45-I2562-25XH	2-9/16"	65.09	0.571			O

MODEL	SIZE				CONNECTOR	INVENTORY
	DC		PL	T		
XSD-20-I1000-25XH	1"	25.40	0.366	3/16" (4.76)	2	O
XSD-25-I1187-25XH	1-3/16"	30.16	0.433		2	O
XSD-25-I1344-25XH	1-11/32"	34.13	0.528		2	O
XSD-30-I1562-25XH	1-9/16"	39.69	0.555	1/4" (6.35)	3	O
XSD-35-I1750-25XH	1-3/4"	44.45	0.642		3	O
XSD-45-I2344-25XH	2-11/32"	59.53	0.858	5/16" (7.94)	4	O

● STOCKABLE O NON STOCKABLE

APPLICABLE TABLE OF PROCESSED MATERIALS

WORK PEICE MATERIAL	P	P	P	P	M	K	K	N	N	N	S	S	H	H
	MILD STEEL	STRUCTURAL STEEL	ALLOR STEEL	TOOL STEEL	STAINLESS STEEL	CASTIRON	MALLEABLE CAST IRON	ALUMINUM ALLOY	CAST ALUMINUM ALLOY	COPPER ALLOY	SUPER ALLOY	TITANIUM ALLOY	HARDENED STEEL	HARDENED STEEL
	<500N	<750N	<1400N	<1100N	<900N	<750N	<1100N	Si<12%	Si>12%	<750N	<1100N	<1100N	<1400N	<1600N
10XH	●	●	O											

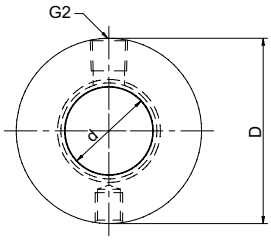
● VERY SUITABLE O SUITABLE

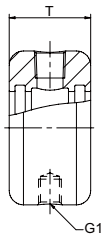
DRILLING

ACCESSORIES

OIL RING



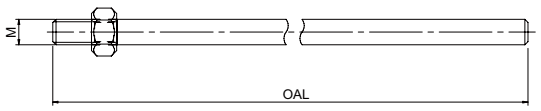




INSERT DIAMETER RANGE	d	D	T	G1	G2	O-RING
	INSIDE DIAMETER	OUTSIDE DIAMETER	THICKNESS	DRIVING ROD THREAD	CODING NOZZLE THREAD	
SH-1905R	19.05	44.45	22.23	M8×1.25	Rc1/8	2104028
SH-2540R	25.40	53.97	28.57	M8×1.25	Rc1/8	2104030
SH-3175R	31.75	63.50	34.92	M10×1.5	Rc1/4	2104026

DRIVE ROD





TYPE	M	OAL	MATCHING OIL RING
	THREAD	TOTAL LENGTH	
SG-M8-250	M8×1.25	250	SH-1905R
SG-M8-250	M8×1.25	250	SH-2540R
SG-M10-250	M10×1.5	250	SH-3175R
SG-M10-250	M10×1.5	250	SH-4445R
SG-M12-250	M12×1.75	250	SH-5715R

TECHNICAL DETAILS

INSERT INSTALLATION



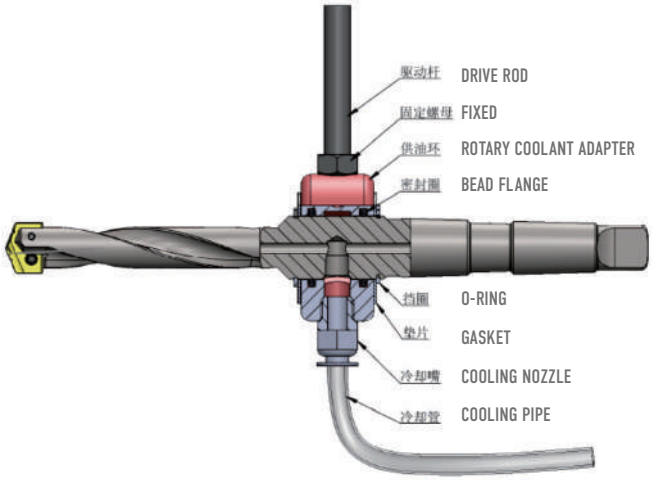
RECOMMENDED VALUE OF SREW LOCK FORCE

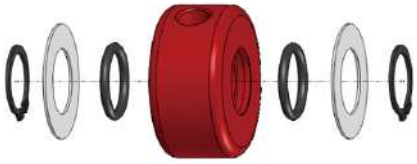
RANGE OF DIAMETER Φ	TIGHTENING TORQUE (NM)
9.5--12.5	0.5
13.0--17.5	1.0
18.0--24.5	1.8
25.0--35.5	3.5
36.0--65.0	5.0
66.0--114.0	7.0

INSTALLATION PROCEDURE

1. First, clean the mounting position with an air gun.
2. Properly load the insert into the mounting groove in the holder and slightly push the insert.
3. Fix the insert with the fastening bolt.

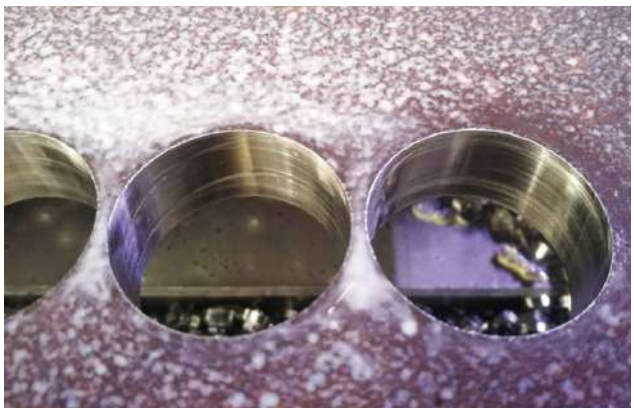
SCHEMATIC DIAGRAM OF OIL RING ASSEMBLY





PROCESSING CASE 2





HRC32

Work material: PD3 (HRC32)

Equipment: VMC

Coolant: Emulsified liquid (5bar)

Bore diameter: 31.0mm

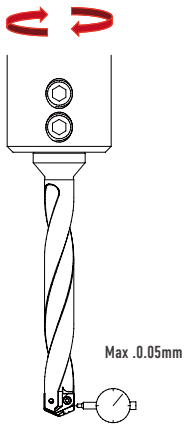
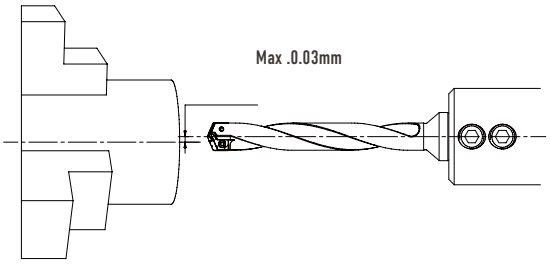
Hole depth: 17mm (through holel)

Parameter: Vc-40m/min fn-0.20mm/r

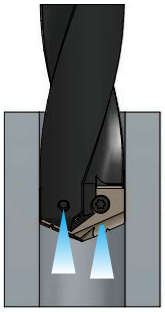
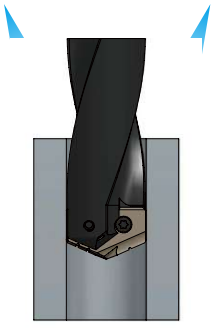
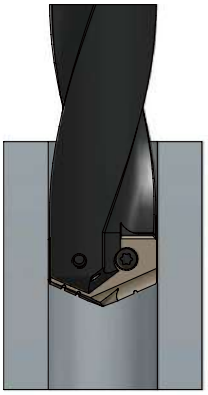
APPLICATION POINTS AND PRECAUTIONS INSTALLATION

Good working condition & reliable claming are requirement for service life and accuracy of drills.

MAX. RUNOUT AND MISALIGNMENT

RUNOUT	MISALIGNMENT
	

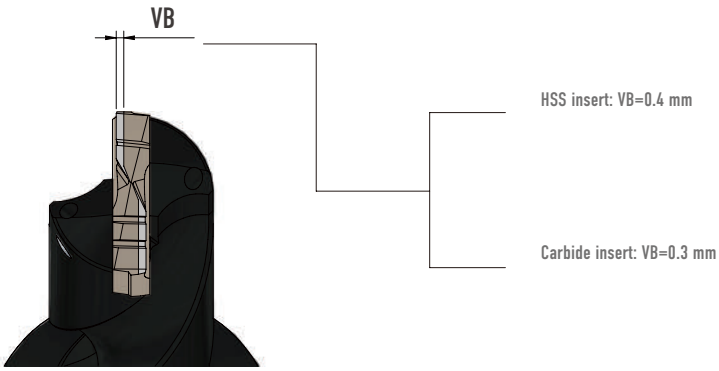
COOLING PRESSURE

INTERNAL COOLING	EXTERNAL COOLING	QUASI-DRY
		
<30 : 5bar √ 40 : 10bar √ 50 : 15bar √ >60 : 20bar √	<20 : 5bar √ 40 : 10bar × 50 : 15bar × >60 : 20bar ×	<20 : MQL √

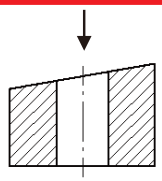
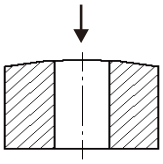
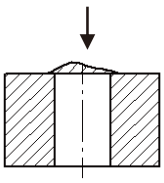
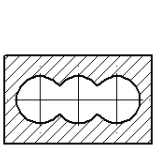
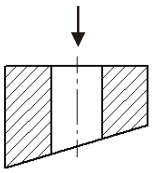
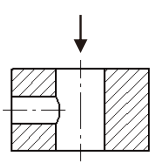
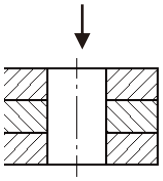
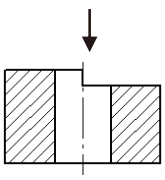
TECHNICAL DETAILS

STANDARD OF DRILL BIT REPLACEMENT

WEAR LIMIT



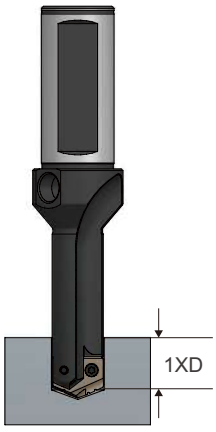
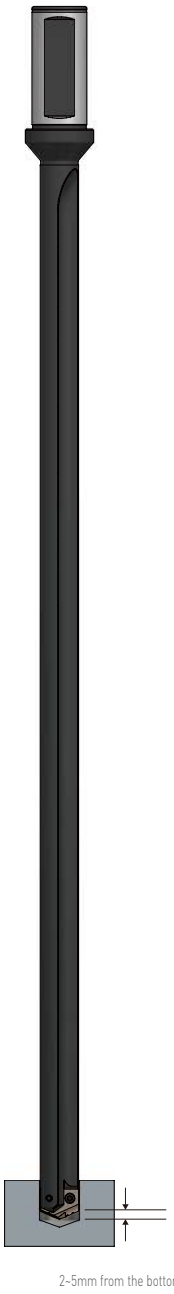
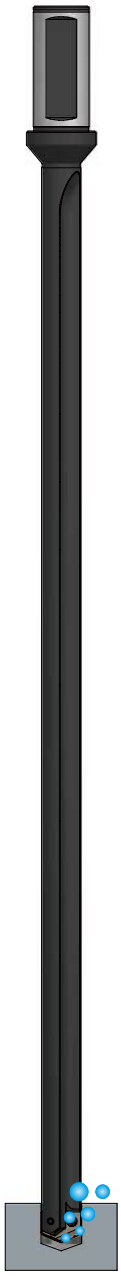
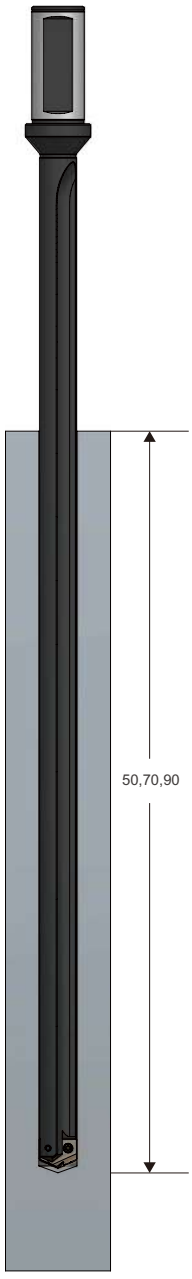
COOLING PRESSURE

OPERATING CONDITION	INSTRUCTIONS	OPERATING CONDITION	OPERATING CONDITION
	THE ENTRY SURFACE IS WELDED		THE ENTRY SURFACE IS WELDED Level it through spot facing before maching.
	THE OUTLET IS SLANTED SLOPE FEED RATE <3° 50%		THE OUTLET IS SLANTED SLOPE FEED RATE <3° 50%
	THE ENTRY SURFACE IS ARC Drilling at the center at reduced feed rate is allowed. Spot facing is required if the entry point is not at the center of the arc.		THE ENTRY SURFACE IS ARC Drilling at the center at reduced feed rate is allowed. Spot facing is required if the entry point is not at the center of the arc.
	THROUGH HOLE NOT ALLOWED		THROUGH HOLE NOT ALLOWED

APPLICATION

PRECAUTIONS

Drilling process for holder with long drilling depth (50/70/90)

1	2	3	
			
Drill a pilot hole to 1D to 1.5D with a short drill bit	Enter the pilot hole at a low speed and low feed rate	Keep the coolant for 2 to 3 s	Carry out continuous Speed drilling according to the ecommended parameters. Reduce the speed and feed.

CUTTING PARAMETERS

ISO	WORKPIECE MATERIAL		BRINELL HARDNESS HB	TENSILE STRENGTH N/mm²
P	NON-ALLOY STEEL Y13, 1215 1.0736 Y15, 1213 1.0715 LOW CARBON STEEL 45, 1045, 1.0503 Q345B, 1140, 1.7026	<0.25% C	100-150	1000
		>0.25% C	175-225	600-775
		<0.55% C	225-275	775-940
			275-325	940-1090
			300	1090-1265
	HIGH ALLOY STEEL, TOOL STEEL, CAST STEEL CR12, D3, 1.2080; 4CR5MOVSI, H13, 1.2344		175-275	600-1020
			225-275	1020-1180
	STAINLESS STEEL FERRITIC/MARTENSITIC OCR13, 403, 1.400, 2CR13, 410, 1.4021		275-325	640-940
			325-375	940-1180
M	STAINLESS STEEL AUSTENITIC OCR18N19, 304, 1.4301 OCR17NI11M02, 316, 1.4401		225-300	480-640
			300-350	640-940
	SUPER DUPLEX STAINLESS STEEL	N<0.1%	185-275	480-640
			135-185	640-940
		N≥0.1%	185-275	430-500
K	GREY CAST IRON HT 200, NO.30, GG20 HT250, NO.35 GG25		120-150	500 - 700
			150-200	700-750
	CAST IRON NODULAR QT400-18, 60-40-18,GGG40 QT 600-3, 80-60-03, GGG60		200-220	755 - 890
			220-260	430 - 500
	MALLEABIE CAST IRON		120-150	890 - 1020
			260-320	

CUTTING SPEED Vc(m/min)			Ø 9.5-12.5mm			Ø 9.5-12.5mm			Ø 9.5-12.5mm			Ø 9.5-12.5mm			Ø 9.5-12.5mm			Ø 9.5-12.5mm			Ø 9.5-12.5mm		
38	54	70	0.09	0.12	0.17	0.13	0.17	0.23	0.17	0.22	0.31	0.21	0.28	0.39	0.26	0.34	0.47	0.29	0.39	0.54	0.36	0.48	0.66
35	50	64	0.07	0.09	0.12	0.1	0.14	0.19	0.13	0.17	0.23	0.19	0.25	0.34	0.23	0.31	0.43	0.27	0.36	0.5	0.31	0.42	0.57
32	45	59	0.07	0.09	0.12	0.1	0.14	0.19	0.13	0.17	0.23	0.19	0.25	0.34	0.23	0.31	0.43	0.27	0.36	0.5	0.31	0.42	0.57
25	36	47	0.05	0.07	0.10	0.09	0.12	0.17	0.12	0.16	0.22	0.16	0.21	0.29	0.21	0.28	0.39	0.25	0.33	0.45	0.29	0.38	0.53
22	32	41	0.04	0.06	0.08	0.08	0.10	0.14	0.12	0.16	0.22	0.16	0.21	0.29	0.19	0.26	0.35	0.22	0.30	0.41	0.26	0.34	0.47
33	47	62	0.07	0.09	0.12	0.1	0.14	0.18	0.13	0.17	0.23	0.19	0.25	0.34	0.22	0.3	0.14	0.25	0.33	0.45	0.29	0.38	0.53
32	45	59	0.07	0.09	0.12	0.09	0.12	0.17	0.13	0.17	0.23	0.19	0.25	0.34	0.22	0.3	0.14	0.25	0.33	0.45	0.29	0.38	0.53
28	41	53	0.05	0.07	0.1	0.08	0.1	0.14	0.12	0.16	0.22	0.16	0.21	0.29	0.19	0.26	0.35	0.22	0.3	0.41	0.26	0.34	0.47
24	34	44	0.04	0.06	0.08	0.08	0.1	0.14	0.12	0.16	0.22	0.16	0.21	0.29	0.19	0.26	0.35	0.22	0.3	0.41	0.26	0.34	0.47
22	32	41	0.07	0.09	0.12	0.09	0.12	0.17	0.12	0.16	0.22	0.13	0.17	0.23	0.19	0.25	0.34	0.22	0.30	0.14	0.26	0.34	0.47
19	27	35	0.05	0.07	0.1	0.09	0.12	0.17	0.12	0.16	0.22	0.13	0.17	0.23	0.19	0.25	0.34	0.22	0.30	0.41	0.26	0.34	0.47
16	23	29	0.08	0.1	0.14	0.10	0.14	0.19	0.12	0.16	0.22	0.13	0.17	0.23	0.19	0.25	0.34	0.21	0.28	0.39	0.26	0.34	0.47
19	27	35	0.07	0.09	0.12	0.09	0.12	0.17	0.10	0.14	0.19	0.10	0.14	0.19	0.16	0.21	0.29	0.19	0.25	0.34	0.23	0.31	0.43
18	25	32	0.04	0.06	0.08	0.09	0.12	0.17	0.10	0.14	0.19	0.13	0.17	0.23	0.19	0.25	0.34	0.21	0.28	0.39	0.26	0.34	0.47
18	25	32	0.04	0.06	0.08	0.08	0.10	0.14	0.09	0.12	0.17	0.10	0.14	0.19	0.16	0.21	0.29	0.19	0.25	0.34	0.23	0.31	0.43
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	54	70	0.09	0.12	0.17	0.16	0.21	0.29	0.21	0.28	0.39	0.26	0.34	0.47	0.31	0.42	0.57	0.35	0.47	0.65	0.39	0.52	0.72
35	50	34	0.08	0.10	0.14	0.14	0.19	0.26	0.19	0.25	0.34	0.23	0.31	0.43	0.29	0.38	0.53	0.32	0.43	0.59	0.36	0.48	0.66
32	45	59	0.08	0.10	0.14	0.12	0.06	0.22	0.16	0.21	0.29	0.21	0.28	0.39	0.23	0.31	0.43	0.27	0.36	0.50	0.31	0.42	0.57
32	45	59	0.07	0.09	0.12	0.09	0.12	0.17	0.12	0.16	0.22	0.16	0.21	0.29	0.19	0.25	0.34	0.22	0.30	0.41	0.26	0.34	0.47
32	45	59	0.09	0.012	0.17	0.16	0.21	0.29	0.21	0.28	0.39	0.36	0.34	0.47	0.31	0.42	0.57	0.35	0.47	0.65	0.39	0.52	0.72
32	45	59	0.05	0.07	0.10	0.08	0.10	0.14	0.09	0.12	0.17	0.12	0.16	0.22	0.16	0.21	0.29	0.19	0.25	0.34	0.21	0.28	0.39

CUTTING PARAMETERS

ISO	WORKPIECE MATERIAL		BRINELL HARDNESS HB	TENSILE STRENGTH N/mm²
N	WROUGHT ALUMINIUM		30	100
			180	600
	CAST ALUMINIUM	<0.55% C	30	100
			180	600
			-	-
	ALUMINIUM BRONZE		100-200	370-670
	NON METALLIC		200-250	670-855
			100	370
			60	200
S	HIGH TEMP. ALLOY HASTELLOY B, INCONEL 600,	FE BASE	140-220	480-750
			223-310	755-990
		NI OR CO BASE	250	-
			350	-
			320	-
	TITANIUM ALLOY		320	RM 400
			-	RM 1050
H	WEAR PLATE HARDOX, AR400, T-1		400	1365
			500	1600
	HARDENED STEEL		300-400	1020- 1365
			400-500	1365+

CUTTING SPEED Vc(m/min)			ϕ 9.5-12.5mm			ϕ 9.5-12.5mm			ϕ 9.5-12.5mm			ϕ 9.5-12.5mm			ϕ 9.5-12.5mm			ϕ 9.5-12.5mm			ϕ 9.5-12.5mm		
47	68	88	0.05	0.07	0.10	0.08	0.10	0.4	0.3	0.17	0.23	0.16	0.21	0.29	0.29	0.38	0.53	0.32	0.49	0.59	0.32	0.43	0.59
41	59	76	0.10	0.14	0.19	0.17	0.22	0.31	0.21	0.28	0.39	0.23	0.31	0.43	0.29	0.38	0.53	0.38	0.43	0.59	0.32	0.43	0.59
47	68	88	0.10	0.14	0.19	0.17	0.22	0.31	0.21	0.28	0.39	0.26	0.34	0.47	0.29	0.38	0.53	0.32	0.43	0.59	0.32	0.43	0.59
41	59	76	0.10	0.14	0.19	0.17	0.22	0.31	0.21	0.28	0.39	0.23	0.31	0.43	0.29	0.38	0.53	0.32	0.43	0.59	0.32	0.43	0.59
41	59	76	0.01	0.14	0.19	0.17	0.22	0.31	0.21	0.28	0.39	0.23	0.31	0.43	0.29	0.38	0.53	0.32	0.43	0.59	0.32	0.43	0.59
47	38	88	0.08	0.10	0.14	0.14	0.19	0.26	0.19	0.25	0.34	0.23	0.31	0.43	0.29	0.38	0.53	0.34	0.45	0.62	0.36	0.48	0.66
47	68	88	0.07	0.09	0.12	0.09	0.12	0.17	0.12	0.16	0.22	0.16	0.21	0.29	0.19	0.25	0.34	0.22	0.30	0.41	0.26	0.34	0.47
47	68	88	0.09	0.12	0.17	0.16	0.21	0.29	0.21	0.28	0.39	0.26	0.34	0.47	0.31	0.42	0.57	0.36	0.48	0.66	0.39	0.52	0.72
47	68	88	0.10	0.14	0.19	0.17	0.22	0.31	0.21	0.28	0.39	0.23	0.31	0.43	0.29	0.38	0.53	0.32	0.43	0.59	0.32	0.43	0.59
47	68	88	0.10	0.14	0.19	0.17	0.22	0.31	0.21	0.28	0.39	0.23	0.31	0.43	0.29	0.38	0.53	0.32	0.43	0.59	0.32	0.43	0.59
14	20	27	0.04	0.06	0.08	0.09	0.12	0.17	0.10	0.14	0.09	0.13	0.17	0.23	0.16	0.21	0.29	0.19	0.26	0.35	-	-	-
11	16	21	0.04	0.06	0.08	0.08	0.10	0.14	0.09	0.12	0.17	0.10	0.14	0.19	0.13	0.17	0.23	0.16	0.21	0.29	-	-	-
11	16	21	0.04	0.06	0.08	0.09	0.12	0.17	0.10	0.14	0.09	0.13	0.17	0.23	0.16	0.21	0.29	0.19	0.26	0.35	-	-	-
11	16	21	0.04	0.06	0.08	0.08	0.10	0.14	0.09	0.12	0.17	0.10	0.14	0.19	0.13	0.17	0.23	0.16	0.21	0.29	-	-	-
11	16	21	0.04	0.06	0.08	0.08	0.10	0.14	0.09	0.12	0.17	0.10	0.14	0.19	0.13	0.17	0.23	0.16	0.21	0.29	-	-	-
11	16	21	0.04	0.06	0.08	0.09	0.12	0.17	0.10	0.14	0.19	0.13	0.17	0.23	0.16	0.21	0.29	0.19	0.26	0.35	-	-	-
11	16	21	0.04	0.06	0.08	0.08	0.10	0.14	0.09	0.12	0.17	0.10	0.14	0.19	0.13	0.17	0.23	0.16	0.21	0.29	-	-	-
7	10	13	0.04	0.06	0.08	0.08	0.10	0.14	0.10	0.14	0.19	0.12	0.16	0.22	0.16	0.21	0.29	0.21	0.28	0.39	0.23	0.31	0.43
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	13	16	0.04	0.06	0.08	0.08	0.10	0.14	0.10	0.14	0.19	0.12	0.16	0.22	0.16	0.21	0.29	0.21	0.28	0.39	0.23	0.31	0.43
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note:
1.In the case of intermittent processing, the feed rate should be reduced by 30 to 50%.
2.The above recommended cutting parameters are based on the 20 series. When using series 30,40,50,60,70,90 etc, the parameters should be appropriately reduced according to the working condition.
Parameter:20 series=100% 30
40series=below80%=50 series=below70%.

NOTES

MILLING



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NOTES

MILLING INDEX

Milling	**243-398**
Face Milling	247-268
HiFeed Milling	269-287
ISO Milling	288-308
Shoulder Milling	309-326
Solid Carbide	327-390
X-Fin Line	391-398

NOTES



FACE MILLING

- Face milling is a common machining operation used to create flat surfaces on a workpiece using a milling cutter with multiple cutting teeth.
- It is the process of cutting a flat surface perpendicular to the axes of the milling cutter.
- Multiple approach angles are possible - 45°, 65°,88° etc. XCUT has multiple solutions in multiple corners for different materials and applications including SNMX style (8 corner) , XNKU style (14 corner) and ONMU style (16 corner)

NOTES

FACE MILLING INDEX

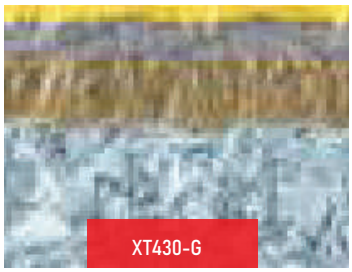
Face Milling	**247-268**
Grade Information	250-251
Recommended Cutting Condition	252-253
OFMT 05T3	254
SEHT 1204	255
SNMX 1205	256
SNMX 1206	257
SNMX 1306	258
ONMX 1306	259
ONMU 0806	260-261
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CBN Milling-88°	265-268

GRADE INFORMATION



P10-P25 | M10-M20 |K05-K15

PVD coated grade, suitable for cast iron & processing whenever it is required high toughness and excellent resistance. Used with coolant in medium cutting speed, this quality ensures a remarkable insert life.



K05-K20 | P05-P20 |M10-M25

Yellow coating. ALTiN and TIN. The total thickness of coating is 3~4um. Protest insert sharpness to improve well resistance and impact.



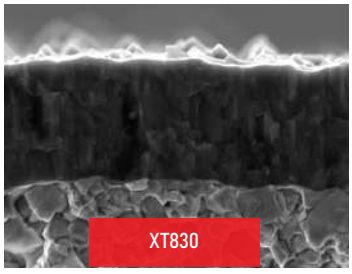
P05-P25 |K05-K30

Uses heat-resistance PVD Al203 coating which has best hot hardness compared to previous PVD coatings, has better wear resistance. The smooth rake face and sharp cutting edge due to advanced technology with PVD coating, to ensure the workpiece without burr, also reduce the built-up edge. Suitable for Steels & Cast Iron



M10-M35 | P10-P35 | S05-S15

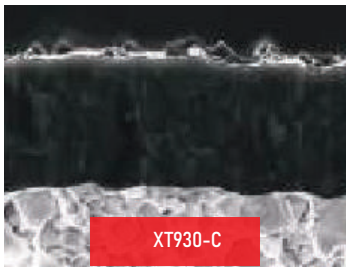
Composition: Co 10.0% other 1.5%; rest TC | Grain size: coarse Coating: PVD TIAITAN Particularly suitable for the machining of high-alloy steels, Stainless Steels and Superalloys (austenitic).



P05-P30 | M05-M20 | K05-K20 | S05-S15 | H05-H10

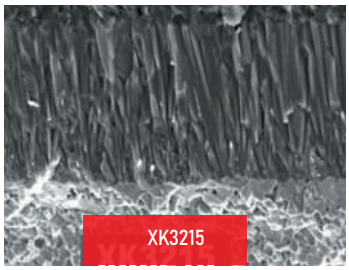
PVD coating with optimal thermal resistance & added strength. Tough carbide substrate designed for demanding application. Suitable for all materials from steels to superalloys

GRADE INFORMATION



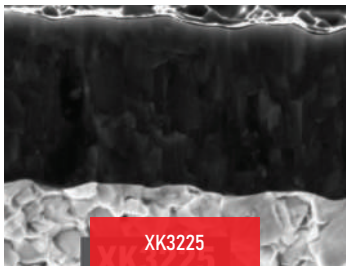
P15-P35 | M15-M35 | H05-H15

Ultra find grade with Nano coating for high heat resistance and toughness. Special AlTiMeN coating gives it a bronze shade and higher temperature resistance! The first choice for general-purpose machining of stainless steel. It can be used for supplementary machining of soft steels.



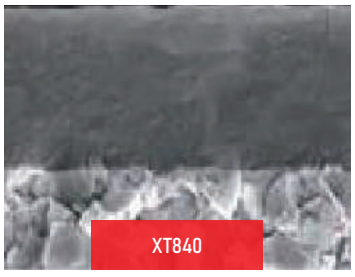
K10-K25 | P10-P20

Ultra find grade with Nano coating for high heat resistance and toughness.Special AlTiMeN coating gives it a bronze shade and higher temperature resistance! The first choice for general-purpose machining of stainless steel. It can be used for supplementary machining of soft steels.



K15-K35 | P15-P25

Low cobalt, ultra-fine wear-resistant and heat-resistant grain structure.
PVD high alumina coating to improve oxidation and wear resistance.
Suitable for high feed milling of hardened materials & superalloys.



P10-P30 | K10-K25 | M10-M25

Composition: Co 10.5 %; mixed carbides 2.0 %; WC balance | Grain size: 1-2 µm | Hardness: HV30 1400 Coating specification: PVD TiAlTaN
First choice for dry machining of steels and CI at high cutting speeds

RECOMMENDED CUTTING CONDITIONS

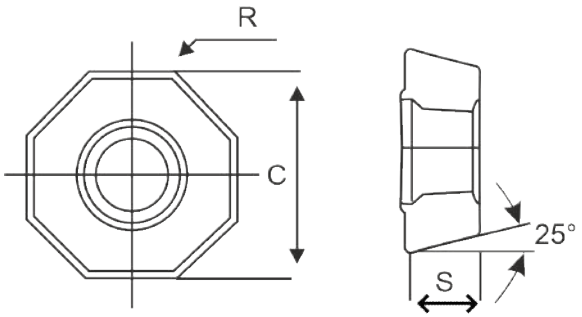
ISO	Material Group	Relative Materials (DIN)	Hardness HB	Cutting speed (m/min)				
				XT 430	XT 430-G	XT480	XT 830	XT 840
P	Non-alloy steel	9 SMn 28, C35C50, C40E, C45E, 49 CrMo 4	125 - 250	90-250	90-250		150 - 250	90-250
	Low alloy steel	13 CrMo 44, 40NiCrM022, 58 CrV 4	200 - 350	80-200	80-200		140 - 200	80-220
	High alloy steel	X 40 CrMoV 5 1, X100 CrMoV 5 1, S6-5-5	200 - 325				80 - 130	80-180
M	Ferritic/ martensitic Stainless steel	X6Cr13, X10CrA118, X20CrNi175	200 - 240	80-200	80-200		130 - 190	
	Austenitic Stainless steel	X5 CrNi 18 9, X5 CrNiMo 17 13 3 X6 CrNiTi 18 9	180	60-180	60-160		100 -200	
K	Grey cast iron	GG15, GG20, GGG40, GG-35	180 - 260	90 - 200	90 - 200	70-320	160 - 200	
	Malleable castiron	GTS-35-10, GTS-35,GTS70-02, 20mN5	130 - 230	90 - 200	90 - 200	70-280	130 - 180	90-240
S	Fe, Ni or Co based	X12 NICrALTi 31 20, TiAl5Sn2	200 - 350				30 - 50	
	Titanium and Ti-alloy based	TiCu2, TiAl6V4, TiAl6V4ELI					35 - 75	
H	Hardended steel	C 105 W1,75 CrMoNiW 6 7	55 - 60 HRc				55 - 65	
	Chilled cast iron	G-X 260 NiCr 4 2, X15 CrNiSi 25 20	400			50-150	45 - 55	
	Cast iron	G-X 300 CrMo 15 3	55 HRc			50-120	55 - 65	

RECOMMENDED CUTTING CONDITIONS

ISO	Material Group	Relative Materials (DIN)	Hardness HB			
				XT 930-C	XK 3215	XK 3225
P	Non-alloy steel	9 SMn 28, C35C50, C40E, C45E, 49 CrMo 4	125 - 250	80-200		
	Low alloy steel	13 CrMo 44, 40NiCrMO22, 58 CrV 4	200 - 350	80-180		
	High alloy steel	X 40 CrMoV 5 1, X100 CrMoV 5 1, S6-5-5	200 - 325	60-160		
M	Ferritic/ martensitic Stainless steel	X6Cr13, X10CrA118, X20CrNi175	200 - 240	60-220		
	Austenitic Stainless steel	X5 CrNi 18 9, X5 CrNiMo 17 13 3 X6 CrNiTi 18 9	180	60-180		
K	Grey cast iron	GG15, GG20, GGG40, GG-35	180 - 260		80 -160	80 -210
	Malleable castiron	GTS-35-10, GTS-35,GTS70-02, 20mN5	130 - 230		80 -160	80 -190
S	Fe, Ni or Co based	X12 NICrAlTi 31 20, TiAl5Sn2	200 - 350	40-120		
	Titanium and Ti-alloy based	TiCu2, TiAl6V4, TiAl6V4ELI		30-100		
H	Hardended steel	C 105 W1,75 CrMoNiW 6 7	55 - 60 HRc	30-120		
	Chilled cast iron	G-X 260 NiCr 4 2, X15 CrNiSi 25 20	400			
	Cast iron	G-X 300 CrMo 15 3	55 HRc			

OFMT05T3





8 CORNER 45 DEGREE LEAD ANGLE FACE MILLING INSERT.
SUITABLE FOR: SURFACING / CHAMFERING

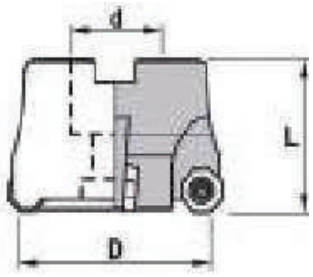
Designation	Dimensions					Feed (mm/tooth)		DEPTH OF CUT(MM)		XT830
	l	D	S	Ø	r	min	max	min	max	
OFMT05T3 TN	-	12.7	4	25	-	0.12	0.40	0.4	3.5	●

● STOCKABLE ○ NON STOCKABLE

SHELL CUTTER

Designation	D	d	L	Z	Stockable
xtsm-d63-a22-z5-ofmt05t3	63	22	40	5	○
xtsm-d80-a27-z6-ofmt05t3	80	27	50	6	○
xtsm-d100-a32-z7-ofmt05t3	100	32	50	7	○
xtsm-d125-a40-z8-ofmt05t3	125	40	63	8	○

● STOCKABLE ○ NON STOCKABLE

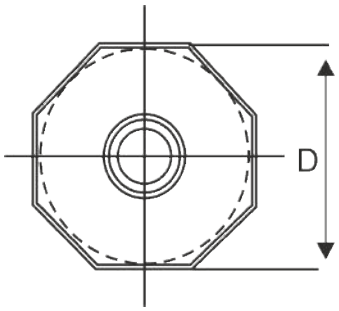


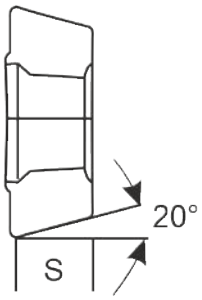
MILLING

SCREW - SCREW FOR OFMT05

SEHT1204







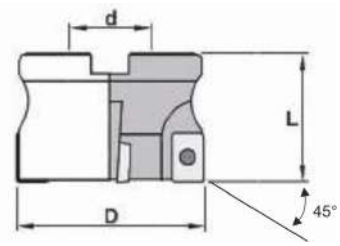
45 DEGREE LEAD ANGLE INSERT
4 CUTTING CORNER INSERT SUITABLE FOR FACE MILLING OF ALUMINIUM

Designation	Dimensions				Feed (mm/tooth)		DEPTH OF CUT(MM)		XA330
	di	F	S	r	min	max	min	max	
SEHT1204AFFN	13.29	12.7	4	-	0.12	0.40	0.4	3.5	●

● STOCKABLE ○ NON STOCKABLE

SHELL MILL CUTTER

Designation	D	D1	d	l	z	Stockable
XTSM-D50-A22-Z4-SEHT12	50	60.4	4	40	22	○
XTSM-D63-A22-Z5-SEHT12	63	73.4	8	40	22	○
XTSM-D80-A27-Z6-SEHT12	80	90.4	7	50	27	○
XTSM-D100-A32-Z7-SEHT12	100	110.4	8	50	32	○
XTSM-D125-A40-Z8-SEHT12	125	135.6	10	63	40	○

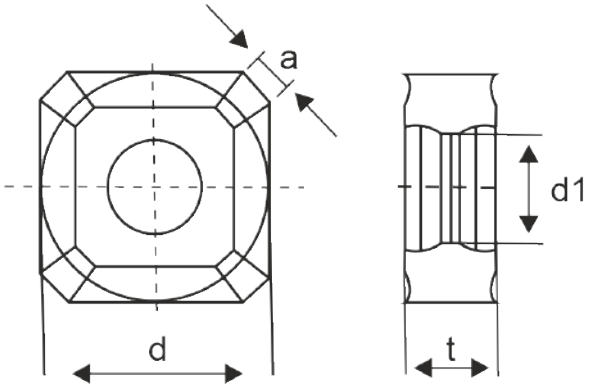


● STOCKABLE ○ NON STOCKABLE

SCREW - SCREW M4 FOR SEHT12

SNMX1205





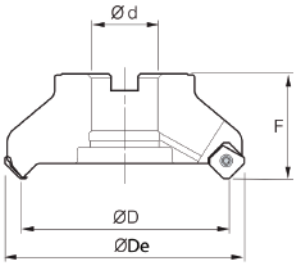
8 CORNER 45 DEGREE LEAD ANGLE FACE MILLING INSERT.
SUITABLE FOR: SURFACING / CHAMFERING

Designation	Dimensions				Feed (mm/tooth)		DEPTH OF CUT(MM)		XT110	XT820	XT840	XT930-C	XK3215
	d	a	d1	t	MIN	MAX	MIN	MAX					
SNMX1205ANN	12.7	1.8	6	5.5	0.08	0.32	0.5	5	●	●	●	●	●

● STOCKABLE ○ NON STOCKABLE

SHELL MILL CUTTER

Designation	D	De	d	f	z	Stockable
XTSM-D50-Z4-SNMX1205-45	50	63	22	40	4	●
XTSM-D63-Z6-SNMX1205-45	63	76	22	40	6	●
XTSM-D80-Z7-SNMX1205-45	80	93	27	50	7	●
XTSM-D100-Z8-SNMX1205-45	100	113	32	63	8	●
XTSM-D125-Z10-SNMX1205-45	125	138	40	63	10	●
XTSM-D160-Z12-SNMX1205-45	160	173	40	63	12	●



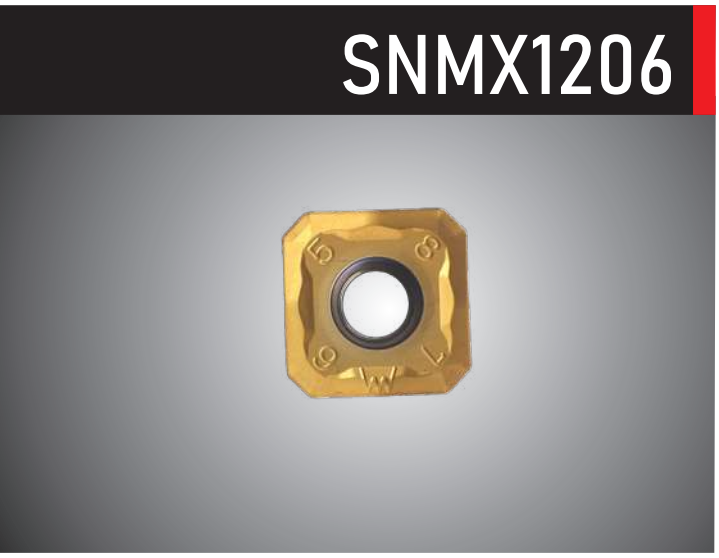
● STOCKABLE ○ NON STOCKABLE

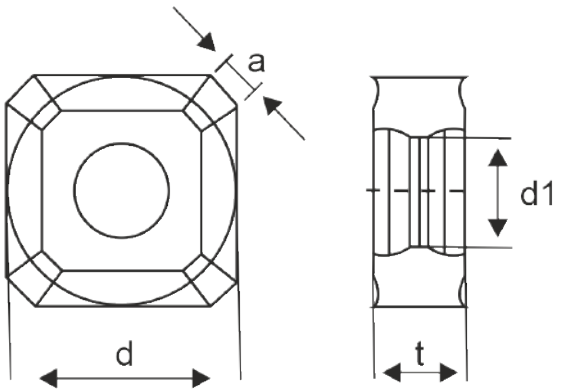
SCREW - SCREW M4 FOR SNMX1205

*LH Cutters available on request

*Corner Radius 1.2 available on request

SNMX1206





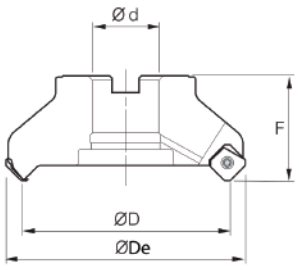
45 DEGREE LEAD ANGLE INSERT
8 CUTTING CORNER INSERT SUITABLE FOR FACE MILLING

Designation	Dimensions				Feed (mm/tooth)		DEPTH OF CUT(MM)		XT430-G	XT480	XT830	XT840	XT930-C
	d	a	d1	t	MIN	MAX	MIN	MAX					
SNMX1206ANN	12.7	1.8	6	5.5	0.08	0.25	0.5	5	●	●	●	●	●

● STOCKABLE ○ NON STOCKABLE

SHELL MILL CUTTER

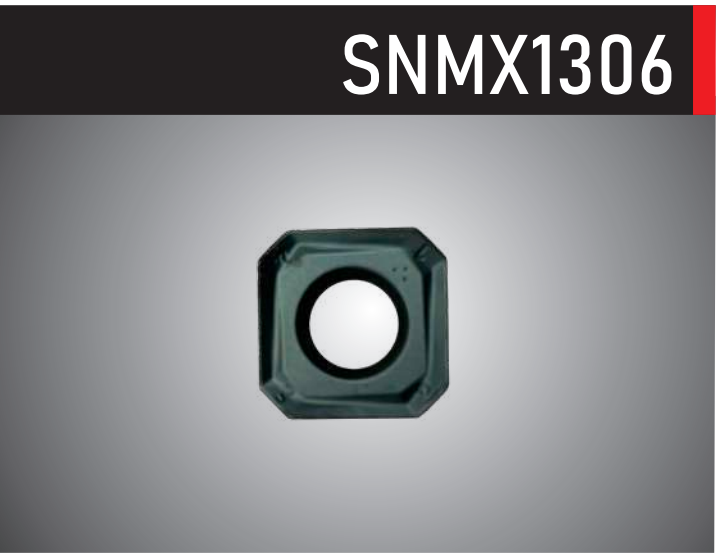
Designation	D	D1	d	l	z	Stockable
XTSM-D50-Z4-SNMX1206-45	50	63	22	40	4	●
XTSM-D63-Z6-SNMX1206-45	63	76	22	40	6	●
XTSM-D80-Z7-SNMX1206-45	80	93	27	50	7	●
XTSM-D100-Z8-SNMX1206-45	100	113	32	63	8	●
XTSM-D125-Z10-SNMX1206-45	125	138	40	63	10	●
XTSM-D160-Z12-SNMX1206-45	160	173	40	63	12	●

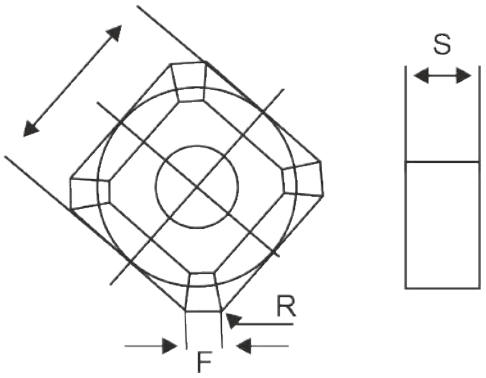


● STOCKABLE ○ NON STOCKABLE

SCREW - SCREW M4 FOR SNMX1206
*LH Cutters available on request

SNMX1306





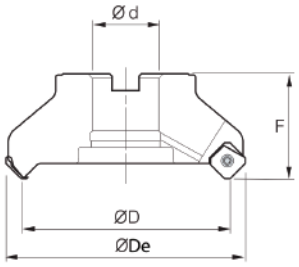
45 DEGREE LEAD ANGLE INSERT
8 CUTTING CORNER INSERT SUITABLE FOR FACE MILLING

Designation	Dimensions				Feed (mm/tooth)		DEPTH OF CUT(MM)		XT480
	dl	F	S	R	MIN	MAX	MIN	MAX	
SNMX130605	13	3	6.2	0.5	0.05	0.2	0.5	4	O

● STOCKABLE O NON STOCKABLE

SHELL MILL CUTTER

Designation	D	D1	d	L	Z	Stockable
H-SOSF45-8/16-D40-04-22R	40	50.4	4	40	22	O
H-SOSF45-8/16-D50-04-22R	50	60.4	4	40	22	O
H-SOSF45-8/16-D63-08-22R	63	73.4	8	40	22	O
H-SOSF45-8/16-D80-07-27R	80	90.4	7	50	27	O
H-SOSF45-8/16-D100-08-32R	100	110.4	8	50	32	O
H-SOSF45-8/16-D125-10-40R	125	135.6	10	63	40	O
H-SOSF45-8/16-D160-12-40R	160	170.4	12	63	40	O



● STOCKABLE O NON STOCKABLE

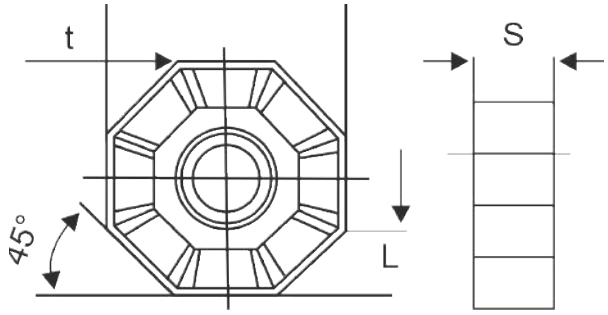
SCREW - SCREW FOR SNMX13

*CUTTER CAN BE USED WITH 2 TYPES OF INSERTS
SNMX130605 & ONMX130605 (PG. 318)

MILLING

ONMX1306





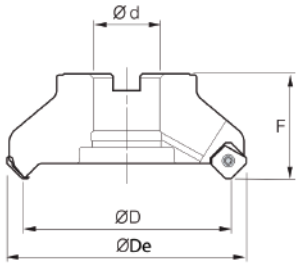
45 DEGREE LEAD ANGLE INSERT
16 CUTTING CORNER INSERT SUITABLE FOR FACE MILLING

Designation	Dimensions				Feed (mm/tooth)		DEPTH OF CUT(MM)		XT480
	L	D	S	r	min	max	min	max	
ONMX130605	13	3.5	5.5	0.5	0.08	0.22	0.5	2.5	●

● STOCKABLE ○ NON STOCKABLE

SHELL MILL CUTTER

Designation	D	D1	d	l	z	Stockable
H-SOSF45-8/16-D040-04-22R	40	45	22	40	4	○
H-SOSF45-8/16-D050-04-22R	50	55	22	50	4	○
H-SOSF45-8/16-D063-06-22R	63	68	22	50	6	○
H-SOSF45-8/16-D080-07-27R	80	85	27	50	7	○
H-SOSF45-8/16-D100-08-32R	100	105	32	50	8	○
H-SOSF45-8/16-D125-10-40R	125	130	40	63	10	○
H-SOSF45-8/16-D160-12-40R	160	165	40	63	12	○



● STOCKABLE ○ NON STOCKABLE

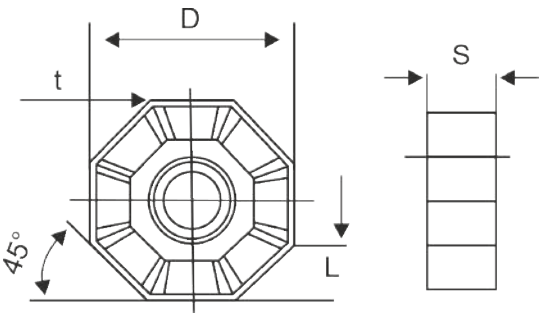
SCREW - SCREW FOR ONMX13

*CUTTER CAN BE USED WITH 2 TYPES OF INSERTS

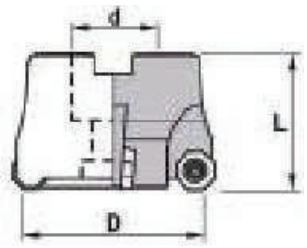
SNMX130605 (PG.317) & ONMX130605
605 (PG.317) & ONMX130605

ONMU0806





45 DEGREE LEAD ANGLE INSERT
16 CUTTING CORNER INSERT SUITABLE FOR FACE MILLING
Can Take DOC UPTO 3MM ON VMC/ HMC/ SPM



INDUSTRY APPLICATION

- Automotive
- General Engineering
- Defence
- Valve Industry

Designation	Dimensions					Feed (mm/tooth)		DEPTH OF CUT(MM)		XT430	XT430-G	XT830	XT930-C	XK3215	XK3225
	L	D	S	Ø	R	min	max	min	max						
ONMU080608	6	20.2	6	-	0.8	0.1	0.3	0.5	3.5	O	●	●	●	●	●

SHELL MILL CUTTER

Designation	D	d	L	Z	Stockable
XTSM-D50-Z4-ONMU0806	50	22	40	4	●
XTSM-D63-Z5-ONMU0806	63	22	40	5	●
XTSM-D80-Z6-ONMU0806	80	27	50	6	●
XTSM-D100-Z7-ONMU0806	100	32	50	7	●
XTSM-D125-Z8-ONMU0806	125	40	63	8	●
XTSM-D160-Z10-ONMU0806	160	40	63	10	●
XTSM-D160-Z12-ONMU08	160	40	63	12	●
XTSM-D200-Z14-ONMU08	200	60	63	14	●
XTSM-D250-Z16-ONMU08	250	60	63	16	O
XTSM-D315-Z20-ONMU08	315	60	63	20	O

*LH Cutter available on request
SCREW - SCREW M5 FOR ONMU08
SCREW - SCREW M5 FOR ONMU08

● STOCKABLE O NON STOCKABLE

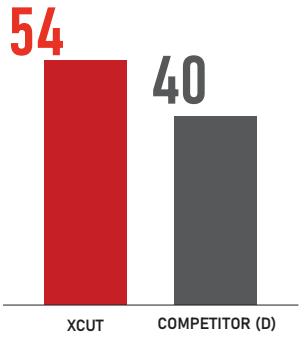
ONMU WEDGE TYPE CUTTER

Designation	D	Z	A	CLAMPING WEDGE CODE	SCREW CODE	Stockable
XTSM-D63-Z8-ONMU0806WG	63	8	22	CLAMPING WEDGE FOR ONMU08	WEDGESCREW FOR ONMU08	○
XTSM-D80-Z10-ONMU0806WG	80	10	27			●
XTSM-D100-Z14-ONMU0806WG	100	14	32			●
XTSM-D125-Z18-ONMU0806WG	125	18	40			○

TRIAL REPORTS

PRODUCT DESCRIPTION	ONMU080608-XT830	
FORGED STEEL		
PARAMETERS	COMPETITOR (D)	XCUT
Depth of Cut	1.5mm	1.5mm
Vc: m/min	188	207
Fz: mm./tooth	0.1	0.12
Life increased by 35%		





TOOL LIFE (NO. OF COMPONENTS)

XNKU2007



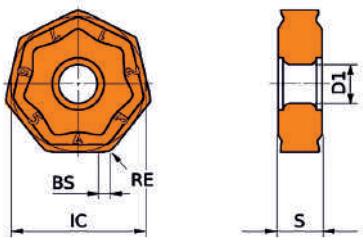
XNKU2006



14 CORNER FACE MILLING INSERT FOR HIGH PERFORMANCE INDEXABLE MILLING CAN TAKE DOC UPTO 5MM!

INDUSTRY APPLICATION

- Automotive
- General Engineering
- Defence

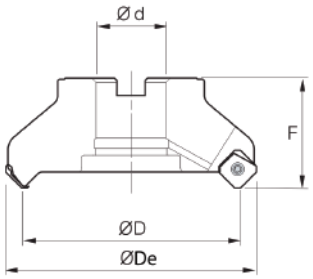


INSERT DETAILS

DESIGNATION	DIMENSIONS					FEED (MMTOOTH)		DEPTH OF CUT(MM)		XT820	XK3215	XK3225	XT930-C
	BS	D1	IC	S	SE	MIN	MAX	MIN	MAX				
XNKU2006ZN	0.99	5.69	20	6.1	0.8	0.1	0.35	0.5	5.5	●	●	●	
XNKU200708EN	0.99	5.68	19.98	7.28	0.8	0.12	0.35	0.5	5.5				●

● STOCKABLE ○ NON STOCKABLE

CUTTER DETAILS

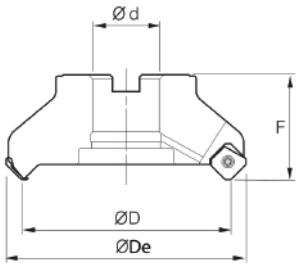


DESIGNATION	D	d	De	F	Z	AVAILABILITY
XTSM-D50-24-XNKU2006	50	22	63	40	4	●
XTSM -D63-Z5-XNKU2006	63	22	76	40	5	●
XTSM-D80-Z6-XNKU2006	80	27	93	50	6	●
XTSM -D100-Z7-XNKU2006	100	32	113	50	7	●
XTSM-D125-28-XNKU2006	125	40	138	63	8	●
XTSM -D160-29-XNKU2006	160	40	173	63	9	●
XTSM-D200-Z12-XNKU2006	200	60	213	63	12	●
XTSM -D250-Z16-XNKU2006	225	60	263	63	16	○

● STOCKABLE ○ NON STOCKABLE

CUTTER DETAILS





DESIGNATION	D	d	De	F	Z	AVAILABILITY
XTSM-D63-Z6-WG-XNKU2006	63	27	76	40	6	●
XTSM-D80-Z8-WG-XNKU2006	80	27	93	50	8	●
XTSM-D100-Z10-WG-XNKU2006	100	32	113	50	10	○
XTSM-D100-Z12-WG-XNKU2006	100	32	113	50	12	●
XTSM-D125-Z12-WG-XNKU2006	125	40	138	63	12	○
XTSM-D125-Z18-WG-XNKU2006	125	40	138	63	18	●
XTSM-D160-Z16-WG-XNKU2006	165	40	173	63	19	○

● STOCKABLE ○ NON STOCKABLE

SPARE PARTS

IMAGE	DESCRIPTION	XCUT CODE
	Insert Screw	Screw M5 for XNKU2006
	Wrench	T15
	Wedge	Wedge - XN20
	Wedge Screw	Wedge Screw - XN20(M6)



CBN MILLING

- CBN milling is used in the automotive, aerospace, and general machining industries.
- It's ideal for high-speed cutting and long tool life.
- It's ideally used for cast iron machining

FEATURES

- High Machining Productivity
- Excellent Surface Finish
- Improvement In CPC

GRADE OVERVIEW

GRADE	TYPE OF MACHINING	SUITABLE WORKPIECE	FEATURES	STOCKABLE
XBN3000	Roughing, Semi Finishing And Finishing	Grey Cast Iron	High Con Content Grade With Perfect Balance Of Hardness And Toughness; Suitable For High Vc Milling Of Continuous And Light Interrupted Applications	●
XBN3600			Excellent Combination Of Toughness And Wear Resistance, Excellent Edge Stability, Suitable For High Speed Roughing And Finishing On Continuous And Interrupted Applications	O

● STOCKABLE O NON STOCKABLE

INDUSTRY APPLICATIONS

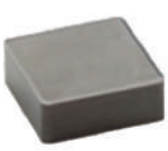
- Cylinder Block
- Housing Components
- Cylinder Head

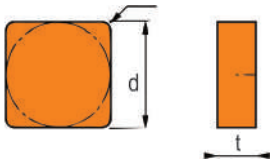
Automotive Components

- General Engineering

RECOMMENDED CUTTING CONDITIONS

GRADE	TYPE OF MACHINING	CUTTING SPEED(M/MIN)
XBN3000	K	250-800
XBN3600		250-800





INSERT DESCRIPTION

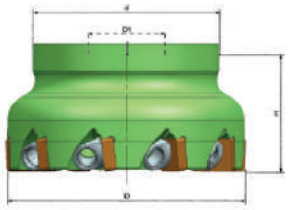
DESCRIPTION	EDGE PREPARATION	DIMENSIONS			GRADE	
		d	l	r	XBN3000	XIN3600
SNGN 120408	T02020	12.7	4.70	0.8	●	O
SNGN120412	T02020	12.7	4.70	12	●	O
SNEX120412	W	12.7	4.70	12	●	O

● STOCKABLE O NON STOCKABLE

MILLING

CUTTERS WITHOUT ADJUSTABLE WIPER

Not adjustable. It is suitable for rough milling, installing rough milling inserts, fast installation, no adjustment required. High processing efficiency can be obtained.



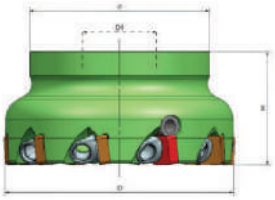
DESCRIPTION	NO OF TEETH		DIMENSIONS					SPARES		AVAILABILITY
	MI*	WI*	D	D1	H	d	INSERT	CLAMP	CLAMP SCREW	
XTSM-D50-A22-24- SN12-WG88-FP	4	0	50	22	50	45	SNGN 1204...	Clamping Wedge M6-D50-SN12	Wedge screw M6-D50-SN12	O
XTSM-D63-A22-26- SN12-WG88-FP	6	0	63	22	50	50		Clamping wedge-CBN Cutters	Wedge screw M8 X 21L- CBN Cutters	●
XTSM-D80-A27-28- SN12-WG88-FP	8	0	80	27	50	70				●
XTSM-D100-A32-210- SN12-WG88-FP	10	0	100	32	50	78				●
XTSM-D125-A40-Z12- SN12-WG88-FP	12	0	125	40	63	80				●
XTSM-D160-A40-216- SN12-WG88-FP	16	0	125	40	63	80				O

*MI is Milling Insert, WI is Wiper Insert

● STOCKABLE O NON STOCKABLE

CUTTERS WITH ADJUSTABLE WIPER

Wiper is adjustable. It is suitable for fine milling. It can be used in combination with cutting inserts + wiper inserts. Only the wiper inserts can be adjusted to obtain high surface processing quality.



DESCRIPTION	NO OF TEETH		DIMENSIONS					SPARES				
	MI*	WI*	D	D1	H	d	INSERT	CLAMP	CLAMP SCREW	CLAMP	CLAMP SCREW	AVAILABILITY
XTSM-D50-A22- Z4-SN12-WG88	3	1	50	22	50	45	SNGN 1204... SNEX 120412...	Clamping Wedge M6-D50-SN12	Wedge screw M6-D50-SN12	Clamping Wedge M6-D50-SN12	Wedge screw M6-D50-SN12	O
XTSM-D63-A22- Z6-SN12-WG88	5	1	63	22	50	50		Clamping wedge-CBN Cutters	Wedge screw M8 X 21L-CBN Cutters	ADJ Wedge for Wiper-CBN Cutters	Wiper Wedge Screw M6-SN12	O
XTSM-D80-A27- Z8-SN12-WG88	7	1	80	27	50	70						O
XTSM-D100-A32- Z10-SN12-WG88	9	1	100	32	50	78						O
XTSM-D125-A40- Z12-SN12-WG88	11	1	125	40	63	80						O
XTSM-D160-A40- Z16-SN12-WG88	14	2	125	40	63	120						O

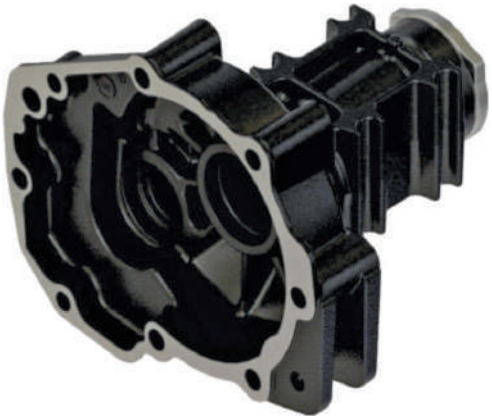
*MI is Milling Insert, WI is Wiper Insert

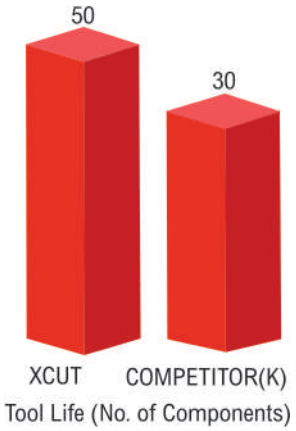
● STOCKABLE O NON STOCKABLE

TRIAL REPORT

CBN MILLING

PRODUCT DESCRIPTION	SNGN120412-T02020-XBN3000	
Material Hardness	Rear Axle -G Cast Iron (32-35HRC)	
PARAMETERS	COMPETITOR (h)	XCUT
Depth of Cut	3.0mm	3.0mm
Vc: m/min	800	750
Fz: mm/tooth	0.15/tooth (4750	0.20/tooth (6000)







HI-FEED MILLING

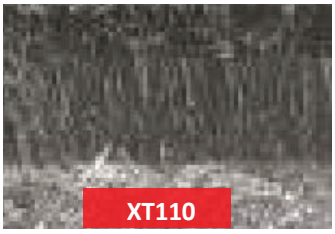
- High-feed milling is a machining method that combines a shallow depth of cut with a high feed rate to remove a large amount of metal from a part in a short amount of time.
- Some benefits of high-feed milling include
  a. Increased productivity
  b. Reduced vibrations
  c. Low radial force
  d. Chip thinning
- XCUT has a very strong portfolio in Hi-Feed with products like XOGU/SDKW for Die/Mould and SPLX for Valve and Aerospace industries

NOTES

HI FEED MILLING INDEX

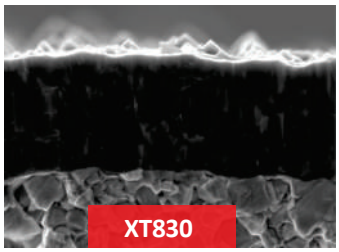
Hi Feed Milling	**269-287**
Grade Information	272-273
Recommended Cutting Conditions	274-275
SPLX Series (07, 10 , 13)	276-278
SDKW 13	279-280
XOGU 11	281-283
ZNMU 10	284-285
ZOMW 06	286-287

GRADE INFORMATION



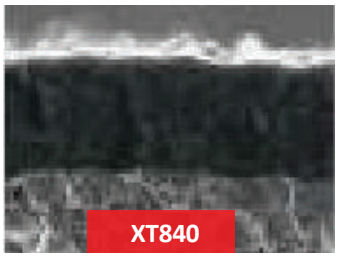
P05-P30 | M05-M20 | K05-K30

4 µ AlCrN PVD Coated, Combining with fine particles substrates with High-Toughness, suitable for all materials in light to medium load Machining. Suitable for Steels. Stainless Steel & Cast Iron.



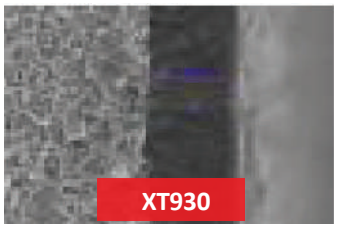
P05-P30 M05-M20 | K05-K20 | 505-515 |H05-H10

PVD coating with optimal thermal resistance & added strength. Tough carbide substrate designed for demanding application. Suitable for all materials from steels to superalloys



P10-P30 | K10-K25 | M10-M25

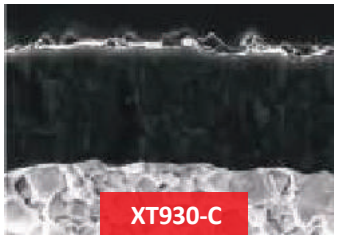
Composition: Co 10.5%; mixed carbides 2.0%; WC balance | Grain size: 1-2 µm | Hardness: HV30 1400 | Coating specification: PVD TIAlN variant.
First choice for dry machining of steels and CI at high cutting speeds.



M10-M35 | P10-P35 | S05-515

Composition: Co 10.0% other 1.5%; rest TC | Grain size: coarse Coating: PVD TIAlTAN Particularly suitable for the machining of high-alloy steels, Stainless Steels and Superalloys (austenitic).

GRADE INFORMATION



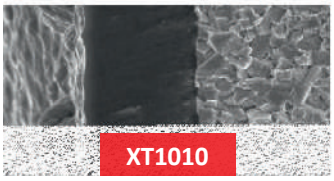
P15-P35 | M15-M35 | H05-H15

Ultra find grade with Nano coating for high heat resistance and toughness. Special AlTiMeN coating gives it a bronze shade and higher temperature resistance! The first choice for general-purpose machining of stainless steel. It can be used for supplementary machining of soft steels.



P05-P30 | M05-M20 |K05-K30

Composition: Co 10.0%; other 1.5%; rest TC | Grain size: coarse Coating: PVD TIAITN Particularly suitable for the machining of high-alloy steels, Stainless Steels and Superal-loys (austenitic).



H10-H20 | S05-S15

- Low cobalt, ultra-fine wear-resistant and heat-resistant grain structure.
- PVD high alumina coating to improve oxidation and wear resistance.
- Suitable for high feed milling of hardened materials & superalloys.

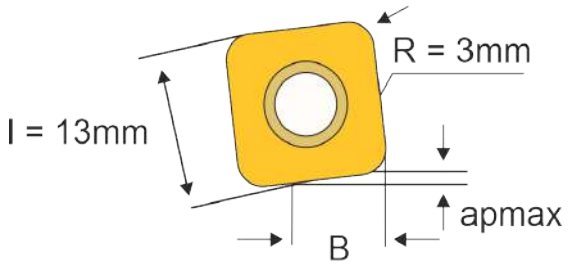
RECOMMENDED CUTTING CONDITIONS

ISO	Material Group	Relative Materials (DIN)	Hardness HB	Cutting speed (m/min)		
				XT 110	XT 830	XT 840
P	Non-alloy steel	9 SMn 28, C35C50, C40E, C45E, 49 CrMo 4	125 - 250	80 - 180	100 - 250	90 -250
	Low alloy steel	13 CrMo 44, 40NiCrM022, 58 CrV 4	200 - 350	80 - 150	100 - 200	80 -220
	High alloy steel	X 40 CrMoV 5 1, X100 CrMoV 5 1, S6-5-5	200 - 325	80 -130	80 - 130	80 -180
M	Ferritic/ martensitic Stainless steel	X6Cr13, X10CrA118, X20CrNi175	200 - 240	80 -180	130 - 190	
	Austenitic Stainless steel	X5 CrNi 18 9, X5 CrNiMo 17 13 3 X6 CrNiTi 18 9	180	60 -160	100 - 200	
K	Grey cast iron	GG15, GG20, GGG40, GG-35	180 - 260	90 - 200	160 - 200	
	Malleable castiron	GTS-35-10, GTS-35,GTS70-02, 20mN5	130 - 230	90 - 200	130 - 180	90 -240
S	Fe, Ni or Co based	X12 NICrAlTi 31 20, TiAl5Sn2	200 - 350		30 - 50	
	Titanium and Ti-alloy based	TiCu2, TiAl6V4, TiAl6V4ELI			35- 75	
H	Hardended steel	C 105 W1,75 CrMoNiW 6 7	55 - 60 HRc		55 - 65	
	Chilled cast iron	G-X 260 NiCr 4 2, X15 CrNiSi 25 20	400		45 - 55	
	Cast iron	G-X 300 CrMo 15 3	55 HRc		55 - 65	

ISO	Material Group	Relative Materials (DIN)	Hardness HB	XT 930	XT 930-C	XT 960	XT 1010
P	Non-alloy steel	9 SMn 28, C35C50, C40E, C45E, 49 CrMo 4	125 - 250		80 - 200		
	Low alloy steel	13 CrMo 44, 40NiCrM022, 58 CrV 4	200 - 350	80 -220	80 -180		
	High alloy steel	X 40 CrMoV 5 1, X100 CrMoV 5 1, S6-5-5	200 - 325	80 -180	60 -160		
M	Ferritic/ martensitic Stainless steel	X6Cr13, X10CrA118, X20CrNi175	200 - 240	80 -220	60 -220	80 -160	60 -140
	Austenitic Stainless steel	X5 CrNi 18 9, X5 CrNiMo 17 13 3 X6 CrNiTi 18 9	180	80 -200	60 -180		
K	Grey cast iron	GG15, GG20, GGG40, GG-35	180 - 260				
	Malleable castiron	GTS-35-10, GTS-35,GTS70-02, 20mN5	130 - 230				
S	Fe, Ni or Co based	X12 NICrAlTi 31 20, TiAl5Sn2	200 - 350	40 -120	40 -120	30 -90	30 -90
	Titanium and Ti-alloy based	TiCu2, TiAl6V4, TiAl6V4ELI		30 -100	30 -100		
H	Hardended steel	C 105 W1,75 CrMoNiW 6 7	55 - 60 HRc	30 -90	30 -120		30 -120
	Chilled cast iron	G-X 260 NiCr 4 2, X15 CrNiSi 25 20	400				
	Cast iron	G-X 300 CrMo 15 3	55 HRc				

SPLX





Application

1) Face milling



2) Angled milling



3) Helical plunging



4) Shoulder milling



5) Slot milling



6) Peripheral milling



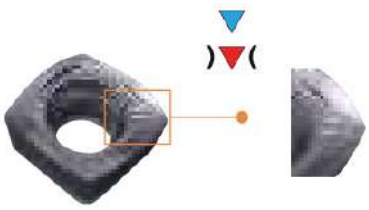
7) Trochoidal slot milling



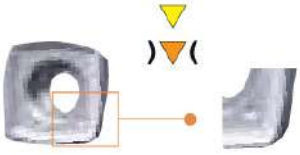
Customer Benefits

With feed rates up to 3 mm/ tooth and closely pitched tools, very high chip removal rates are achieved. Maximum tool life thanks to special coating. Maximised economy thanks to 4 cutting edges. Reduced machining noise and vibration. light cutting geometries.

Which Chipbreaker to use?



HP
Strong cutting edge for general steel applications and hard conditions milling.



SM
Sharp cutting edge for general stainless steel applications and for finishing in steels.

MILLING

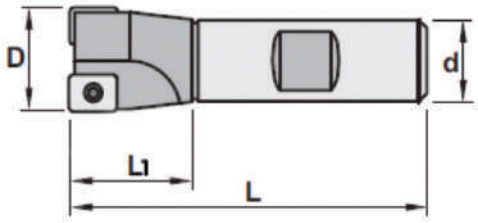
INSERTS

INSERT DESIGNATION	F_z(mm/t)	A_p(mm)	XT840	XT930	XT930-C	XT960	XT1010
SPLX070305HP	0.25-1.50	0.30-1.0	●				
SPLX070305SM	0.25-1.50	0.30-1.0		●	●	●	●
SPLX10T308HP	0.2-1.50	0.10-1.2	●				
SPLX10T308SM	0.2-1.50	0.10-1.2		●		○	
SPLX130410HP	0.10-1.30	0.10-1.7	●				
SPLX130410SM	0.10-1.30	0.10-1.7		●			

● STOCKABLE ○ NON STOCKABLE

CUTTER DETAILS - END MILL TYPE

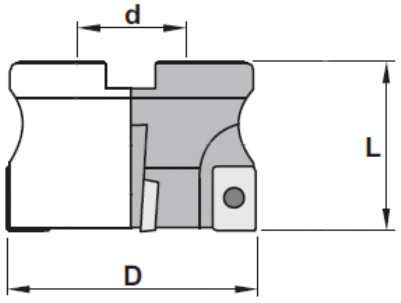
DESIGNATION	D	L1	D	L	Z	AVAILABILTY
XTFFC-1616-50FL-T2-SPLX07	16	50	16	200	2	●
XTFFC-2020-50FL-T3-SPLX07	20	50	20	200	3	●
XTFFC-2525-60FL-T4-SPLX07	25	60	25	200	4	●
XTFFC-3232-50FL-T4-SPLX07	32	50	32	200	4	●
XTFFC-2525-60FL-T2-SPLX10	25	60	25	200	2	●
XTFFC-3232-50FL-T3-SPLX10	32	50	32	200	3	●



● STOCKABLE ○ NON STOCKABLE

CUTTER DETAILS - SHELL MILL TYPE

DESIGNATION	D	D	L	Z	Availabilty
XTFFC-D40-A16-Z4-SPLX10	40	16	40	4	●
XTFFC-D50-A22-Z5-SPLX10	50	22	40	5	●
XTFFC-D63-A22-Z6-SPLX10	63	22	50	6	○
XTFFC-D50-A22-Z4-SPLX13	50	22	40	4	○
XTFFC-D63-A22-Z5-SPLX13	63	22	50	5	●
XTFFC-D80-A27-Z6-SPLX13	80	27	50	6	●
XTFFC-D100-A32-Z7-SPLX13	100	32	32	7	●
XTFFC-D125-A40-Z8-SPLX13	125	40	40	8	○



● STOCKABLE ○ NON STOCKABLE

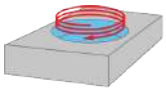
INSERT SIZE	SCREW SIZE
SPLX07	M2.5 X 5-T8
SPLX10	M3.5 X 8.6-T15
SPLX13	M4.5 X 10.5-T20

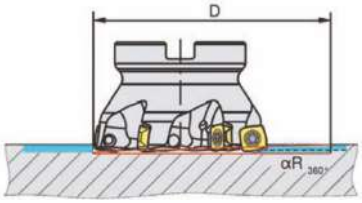
Thru-Coolant Bodies Available On Request!

SPLX Technical Information

Application data (angled ramping)

DESIGNATION	d_1[mm]	α_R [°]
XTFFC-1616-50FL-T2-SPLX07	16	5.9
XTFFC-2020-50FL-T3-SPLX07	20	3.2
XTFFC-2525-60FL-T4-SPLX07	25	2.0
XTFFC-2525-60FL-T2-SPLX10	25	3.6
XTFFC-D40-A16-Z4-SPLX10	40	1.2
XTFFC-D50-A22-Z5-SPLX10	50	0.9
XTFFC-D63-A22-Z6-SPLX10	63	0.8
XTFFC-D50-A22-Z4-SPLX13	50	1.5
XTFFC-D63-A22-Z5-SPLX13	63	1.1
XTFFC-D80-A27-Z6-SPLX13	80	1.3

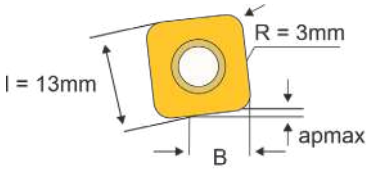


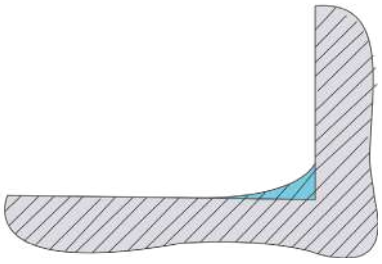


SPLX Technical Information

Depth of Cut and Remaining Material

DESIGNATION	l[mm]	R[mm]	B[mm]	r[mm]	$a_{p\ max}$ [mm]
SPLX07	7	1.2	4.3	0.5	0.8
SPLX10	10	2.0	0.8	0.8	1.0
SPLX13	13	3.0	1.0	1.0	2.0





Recommended

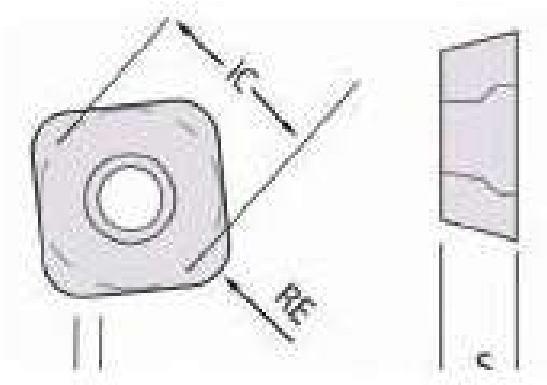
$f_z \geq 0.5$ / tooth

R = programmed radius

MILLING

SDKW13





4 CORNER HIGH FEED INSERT
REDUCES TOOL PRESSURE AND RAKE ANGLES FOR SMOOTHER CUTTING

Industry Application

- Die & Mould
- General Engineering
- Valves
- Aerospace

Insert Details

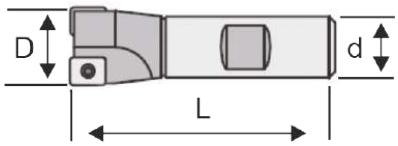
DESIGNATION	BS	IC	S	RE	FZ	AP MAX	XT830	XT930-C	XT960	XT1010
SDKW130420-HF	1.45	12.7	4.7	2	0.4-1.4	0.3-2	●	●	●	●

● STOCKABLE ○ NON STOCKABLE

Cutter Details

END MILL CUTTER

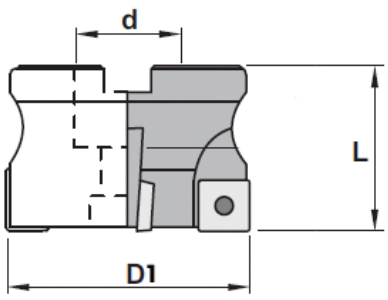
DESIGNATION	D	DE	D	L	Z	Availability
XTFFC-3232-50FL-T2-SDKW1304	32	-	32	200	3	●



SHELL MILL CUTTER

DESIGNATION	D	d	L	Z	Availability
XTFFC-D50-Z4-SDKW1304	50	22	40	4	●
XTFFC-D63-Z5-SDKW1304	63	22	40	5	●
XTFFC-D80-Z6-SDKW1304	80	27	50	6	●
XTFFC-D100-Z7-SDKW1304	100	32	63	7	●
XTFFC-D125-210-SDKW1304	125	40	63	10	○

- Thru Coolant Cutters Available on Requestzzzz

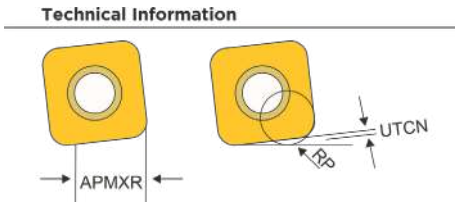


SPARES

SCREW CODE	T-KEY
SCREW M4 FOR SDKW 13	T15

Programming Radius Info

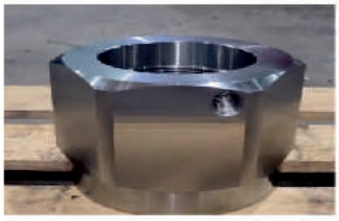
APMXR	RP	BS	OVERCUT
RADIAL AP MAX	PROGRAMMED CORNER R	UNCUT THICKNESS	
8,6	R2.5	1.16	0
	R3.0	1.06	0
	R3.5	0.97	0.03

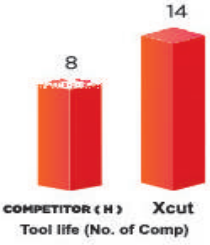


Trail Reports

MILLING (PRODUCTION)

PRODUCT DESCRIPTION	SDKW130420-HF-XT930-C	
MATERIALS & HARDNESS	STEEL/HEX NUT-35HRC	
PARAMETERS Depth of Cut	COMPETITOR (H)	XCUT
	1	1
Vc: m/min	144 (575)	163 (650)
Fz: mm/tooth	0.55/tooth	0.98/tooth
CPC Reduced by 52% ↓		





MILLING (DIE MOULD)

PRODUCT DESCRIPTION	SDKW130420-HF-XT1010	
MATERIALS & HARDNESS	Forging Die, 50 TO 55HRC	
PARAMETERS Depth of Cut	COMPETITOR (D)	XCUT
	0.5 mm	0.5 mm
Vc: m/min	62	86
Fz: mm/tooth	1200/0.75	1200/0.54
CPC Reduced by 40% ↓		



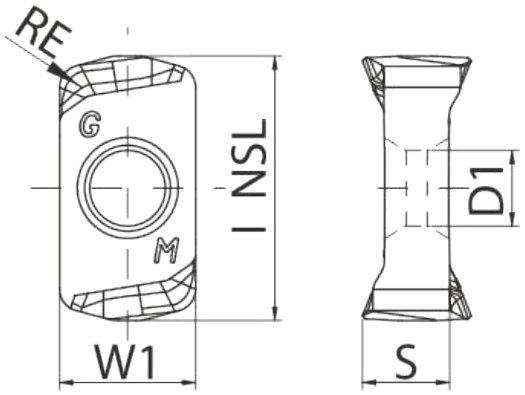




MILLING

XOGU11





Benefits

- Wide range of application.
- Good chip evacuation prevents chip-biting enabling trouble freeoperation.
- Multi-edge design allows for cost economy.
- Periphery ground inserts help for high efficiency machineing

1) Face milling



2) Angled milling



3) Helical plunging



4) Shoulder milling



5) Slot milling



6) Peripheral milling



7) Trochoidal slot milling

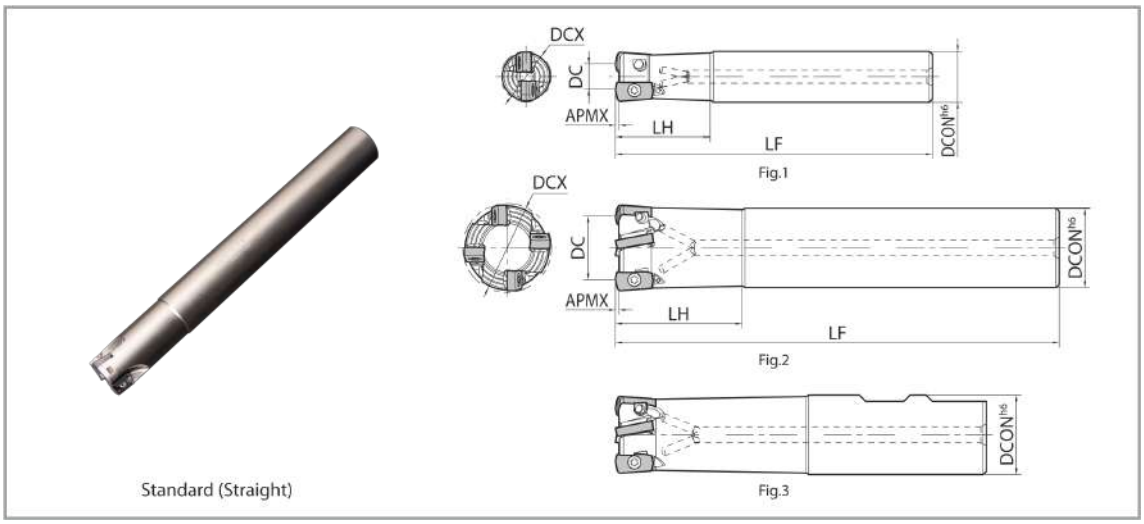


HFL | Applicable inserts

DESIGNATION	DIMENSIONS (MM)								
	W1	S	D2	INSL	RE	XT830	XT930-C	XT960	XT1010
XOGU110310-GM	6.2	3.96	3.96	11.9	1.0	●	●	●	●

● STOCKABLE ○ NON STOCKABLE

HFL | End mill



Toolholder Dimensions

DESIGNATION	DESIGNATION	NO OF INSERTS	D	DE	D	L	Availability
Standard (Straight)	HFL16-S16-03-2T-100L-XOGU11	2	16	16	30	100	●
	HFL20-S20-03-3T-130L-XOGU11	3	20	20	50	130	●
	HFL25-S25-03-4T-140L-XOGU11	4	25	25	50	140	●
	HFL32-S32-03-5T-150L-XOGU11	5	32	32	60	150	●
Arbour Type	HFL40R-A16-03-6T-XOGU11	6	40	16	-	-	●
	HFL50R-A22-03-8T-XOGU11	8	50	22			●

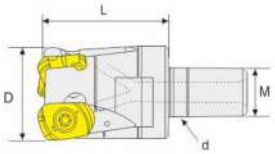
● STOCKABLE ○ NON STOCKABLE

MODULAR HEADS

*THRU-COOLANT CUTTER BODIES AVAILABLE.







Item Code	Stock	Teeth	Dimension				Coresponding Inserts	Acessories
			D	d	L	M		Locking Screw
XMH-XOGU11-16-M8-2T	●	2	16	8.5	30	M08	XOGU11	MS300E
XMH-XOGU11-20-M10-3T	●	2	20	10.5	35	M10		
XMH-XOGU11-25-M12-4T	●	3	25	12.5	35	M12		
XMH-XOGU11-32-M16-5T	●	3	32	17.0	40	M16		

● STOCKABLE ○ NON STOCKABLE

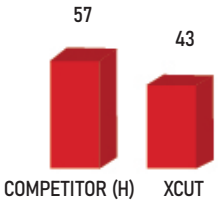
Spare Parts and Applicable Inserts

Description	RP	BS	APPLICABLE INSERTS
	INSERT SCREW	TORQUE	
			
HFL...-XOGU11-...	M3X7	T-8	XOGU110310-GM

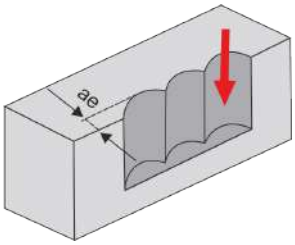
Milling (Production)

PRODUCT DESCRIPTION	XOGU110310-HF-XT930-C	
MATERIALS & HARDNESS	Steel 40HRC	
PARAMETERS	COMPETITOR (H)	XCUT
Depth of Cut	0.5 mm	0.5 mm
Vc: m/min	125	157
Fz: mm/tooth	2500	3500
CPC Reduced by 25%		





Pluging



Description on	Maximum width of cut (ae)
HFL	3.5

Reduce feed rate to fz ≤ 0.2mm/t when plunging

Approxiamate programming radius adjustment



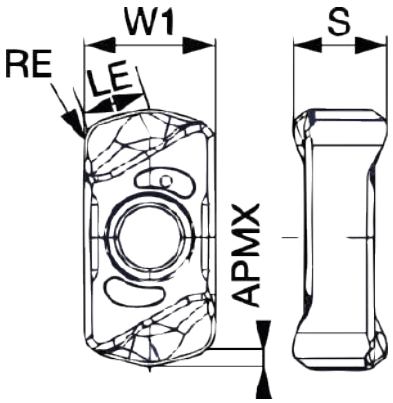
HFL		
Programmable R. (mm)	Overcut Portion (mm)	Undercut Portion (mm
R1.6 (Recommended)	0	0.39
R2.0	0.09	0.39
R2.5	0.26	0.35
R3.0	0.46	0.17

Ramping reference data

Description	Cutter Dia (mm)	16	18	20	22	25	32	40	50
HFL	Max. ramping angle θ	2.8 °	2.1 °	1.7 °	1.4°	1.2 °	0.8 °	0.5 °	0.4 °
	Tan θ	0.049	0.037	0.030	0.024	0.021	0.014	0.009	0.007

ZNMU10





APPLICATION

1) Face milling 

2) Angled milling 

5) Slot milling 

6) Peripheral milling 

3) Helical plunging 

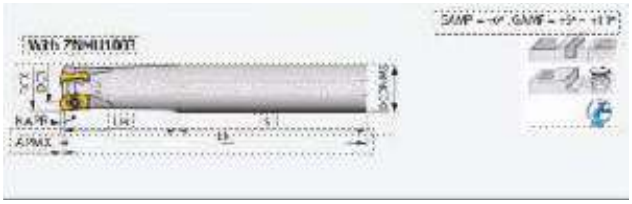
4) Shoulder milling 

7) Trochoidal slot milling 

4 CORNER HI-FEED INSERT

DESIGNATION	RE	APMX	IC	S	XT110	XT830	XT840	XT930-C
ZNMU 100312-HF	1.2	3.2	6	4.3	●	●	○	●

● STOCKABLE ○ NON STOCKABLE



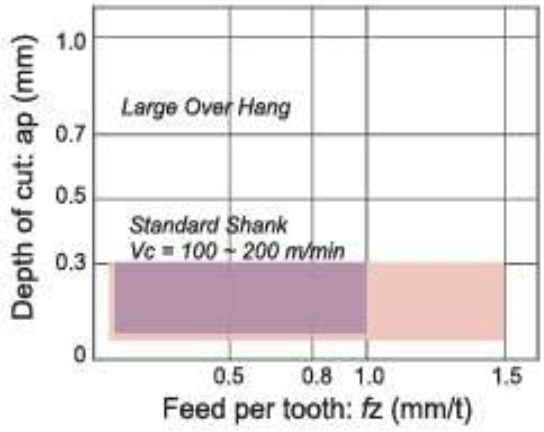
END MILL CUTTER

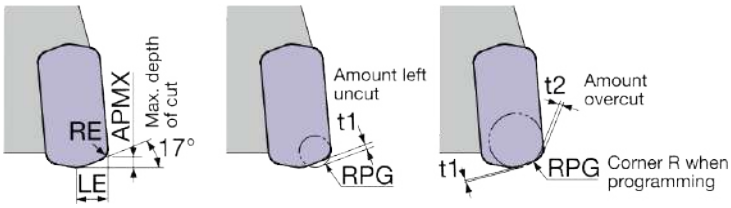
DESIGNATION	D	d	L1	L	Z	Availability
XTFFC-1616-30FL-T2-ZNMU100	16	16	60	200	2	●
XTFFC-1616-30FL-T2-ZNMU100	20	20	60	200	3	●
XTFFC-2525-40FL-T4-ZNMU100	25	25	60	200	4	●

● STOCKABLE ○ NON STOCKABLE

TOOL GEOMETRY ON PROGRAMMING:

The tool should be considered as radius cutter, when programming for CAM. The corner radius should be set as R = 1.5mm. If larger radius is used, overcutting will occur. The following table shows the amount left uncut (t1) and overcut (t2).





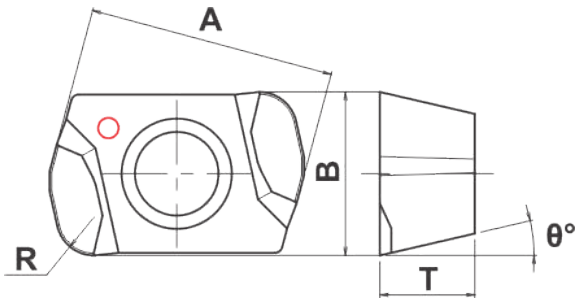
MAX.DEPT OF CUT APMX (MM)	CORNER RADIUS RE (MM)	LE (MM)	CORNER R WHEN PRO-GRAMMING RPG	AMOUNT LEFT UNCUT T1(MM)	AMOUNT LEFT UNCUT T2(MM)
1.0	1.2	3.0	1.0	0.6	-
1.0	1.2	3.0	1.5	0.5	-
1.0	1.2	3.0	2.0	0.25	0.08
1.0	1.2	3.0	2.5	0.14	0.26

SPARES

SCREW CODE	T-KEY
SCREW FOR ZNMU 10(M2.5 X 7-D6)	T-8

ZOMW06





2 CORNER HI FEED INSERT WITH CORNER RADIUS
3D GEOMETRY ALLOWS FOR LOWER CUTTING FORCE AND MULTI BLADE POSSIBILITY

DESIGNATION	DIMENSION (MM)					GRADE	
	A	T	B	R	E	XT930	XT930-C
ZOMW060210	6.5	2.5	4.3	1.0	1.3	●	●

● STOCKABLE ○ NON STOCKABLE

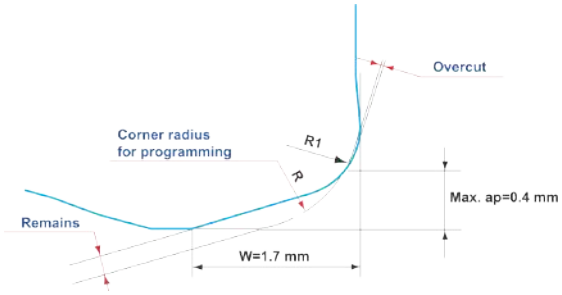


END MILL CUTTER

Type	Item	No. of Inserts	Dimension (mm)					AVAILABILITY
		T	Dc	l2	ls	L	D	○
Regular	XTFFC-0808-25FL-T1- 75L-ZOMW06	1	8	25	50	75	8	○
	XTFFC-0908-25FL-T1- 75L-ZOMW06	1	9	25	50	75	8	○
	XTFFC-1010-25FL-T2- 80L-ZOMW06	2	10	25	55	80	10	●
	XTFFC-1110-25FL-T2- 80L-ZOMW06	2	11	25	55	80	10	○
	XTFFC-1212-30FL-T2- 100L-ZOMW06	2	12	30	70	100	12	●
	XTFFC-1312-30FL-T2- 100L-ZOMW06	2	13	30	70	100	12	○
	XTFFC-1414-30FL-T3- 110L-ZOMW06	3	14	30	80	110	14	●
Long Length	XTFFC-1010-75FL-T2- 135L-ZOMW06	2	10	75	60	135	10	○
	XTFFC-1212-80FL-T2- 140L-ZOMW06	2	12	80	60	140	12	○
	XTFFC-1414-85FL-T3- 150L-ZOMW06	3	14	85	65	150	14	○

● STOCKABLE ○ NON STOCKABLE

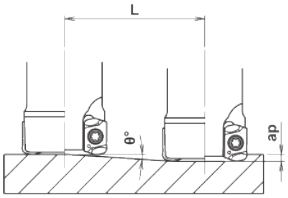
● Definition of Corner Radius for Programming



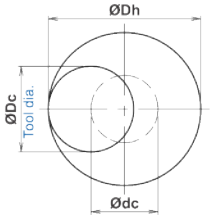
Corner Radius for Programming	Over Cut	Remains (mm)
R1.0 (Recommended)	0	0.17
R1.5	0.09	0.08
R2.0	0.30	0

Instructions for Profile Milling with "ZOMW06" Type Insert

Ramping



Helical Interpolation



- Calculation of Tool Pass Dia.

- Depth of cut per one circle should not exceed max. depth of cut ap.
- Down cutting is recommented, so tool pass rotation should becounterclockwise

			Ramping		Helical interplation	
Tool Dia.Dc (mm)	Effective cutting dia. (mm)	Max.Depth of Cut ap (mm)	Max.Ramping	Total Cutting Length L(mm) at max.ap	Min,bore dia. Dh min (mm)	Max.bore dia. Dh max (mm)
8	4.7	0.25	2 54'	5.5	11	14
9	5.7	0.25	2 36'	6.5	13	16
10	6.6	0.3	2 18'	7.5	15	18
11	7.6	0.3	1 54	9	17	20
12	8.5	0.3	1 36	10.7	19	22
13	9.5	0.3	1 24	12.3	21	24
14	10.5	0.3	1 18	13.2	23	26

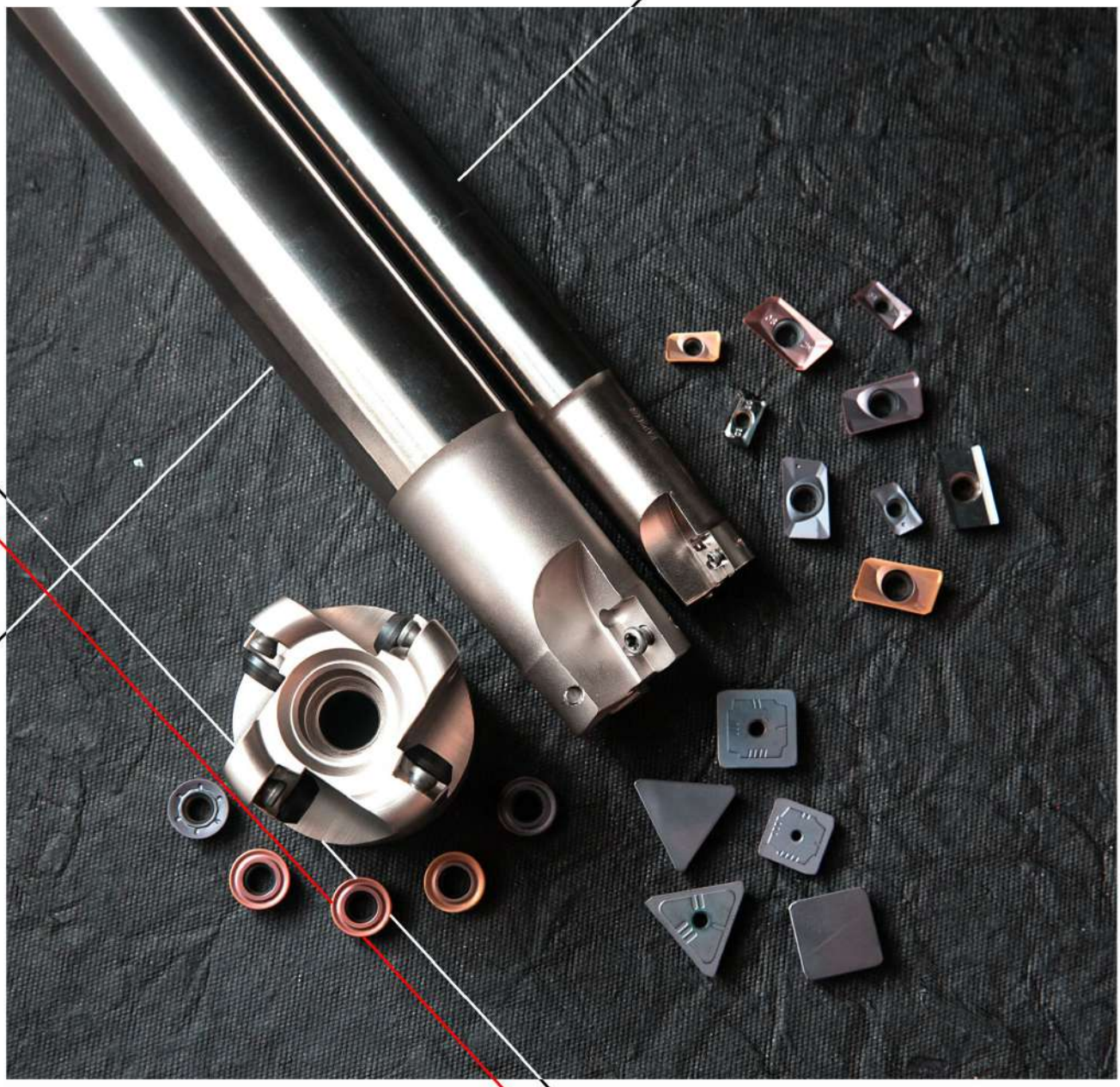
In case of ramping and helical interpolation, apply 70% or less feed speed standard cutting condition table.

In case of drilling, apply 50% or less Z axis feed speed from standard cutting condition table.

SPARES

SCREW CODE	T-KEY
SCREW FOR ZOMW 06(M1.8 X 4-A)	T-6

NOTES



ISO MILLING

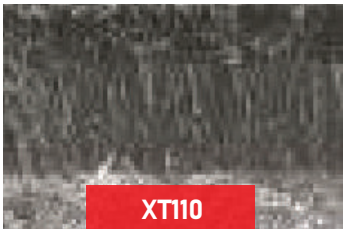
- ISO milling is a process that uses ISO codes to select milling inserts for machining operations.
- These are common with a lot of manufacturers and can be interchanged with their cutter bodies as well.
- Popular inserts include APMT for Shoulder Milling , RDMT for Copy Milling and SPKN/TPKN for conventional milling

NOTES

ISO MILLING INDEX

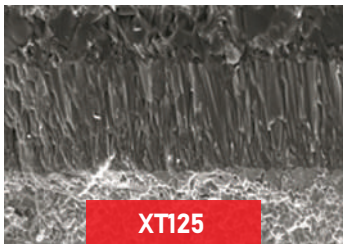
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GRADE INFORMATION



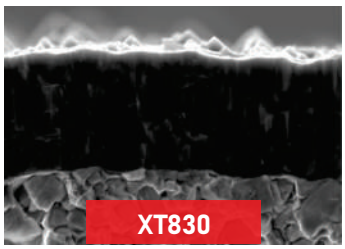
P05-P30 | M05-M20 | K05-K30

4 µ AlCrN PVD Coated, Combining with fine particles'substrates with High-Toughness, suitable for all materials in light to medium load Machining. Suitable for Steels.
Stainless Steel & Cast Iron.



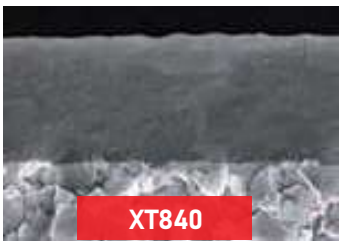
P10-P30 | K10-K25 | M10-M25

2-4 µ ALCrN+AlCrSiN PVD Coated, Combinating with ultra fine particles'substrates with High-Toughness, suitable for all materials in light & medium load Milling. Suitable for Steels, Stainless Steel & High-Temperature high hardness alloys.(Less Chromium & Nickel)



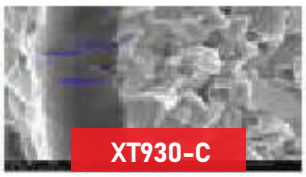
P10-P30 | K10-K25 | M10-M25

PVD coating with optimal thermal resistance & added strength. Tough carbide substrate designed for demanding application.
Suitable for all materials from steels to superalloys.



P10-P30 | K10-K25 | M10-M25

Composition: Co 10.5%; mixed carbides 2.0 %; WC balance | Grain size: 1-2 µm | Hardness: HV30 1400 | Coating specification: PVD TIAITAN
First choice for dry machining of steels and Cl at high cutting speeds



M10-M35 | P10-P35 | S05-S15

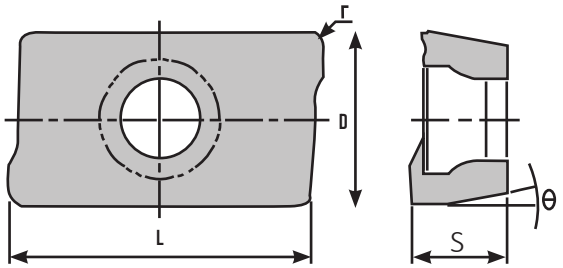
Ultra fine grade with Nano coating for high heat resistance and toughness.
Special AlTiMeN coating gives it a bronze shade and higher temperature resistance.
The first choice for general-purpose machining of stainless steel. It can be used for supplementary machining of soft steels.

RECOMMENDED CUTTING CONDITIONS

ISO	Material Group	Relative Materials (DIN)	Hardness HB	Cutting speed (m/min)				
				XT 110	XT 125	XT 830	XT 840	XT 930-C
P	Non-alloy steel	9 SMn 28, C35C50, C40E, C45E, 49 CrMo 4	125 - 250	120 - 200	150 - 250	150 - 250	90 - 250	80 - 200
	Low alloy steel	13 CrMo 44, 40NiCrM022, 58 CrV 4	200 - 350	140 - 200	150 - 250	140 - 200	80 - 220	80 -180
	High alloy steel	X 40 CrMoV 5 1, X100 CrMoV 5 1, S6-5-5	200 - 325	80 - 120	80 - 200	80 - 130	80 -180	60 -160
M	Ferritic/ martensitic Stainless steel	X6Cr13, X10CrA118, X20CrNi175	200 - 240	130 - 190	80 - 160	130 - 190		60 -220
	Austenitic Stainless steel	X5 CrNi 18 9, X5 CrNiMo 17 13 3 X6 CrNiTi 18 9	180	100 -200	80 -200	100 -200		60 -180
K	Grey cast iron	GG15, GG20, GGG40, GG-35	180 - 260	120 - 200		160 - 200		
	Malleable castiron	GTS-35-10, GTS-35,GTS70-02, 20mN5	130 - 230	110 - 180		130 - 180	90 - 240	
S	Fe, Ni or Co based	X12 NICrAlTi 31 20, TiAl5Sn2	200 - 350	30 - 50		30 - 50		40 -120
	Titanium and Ti-alloy based	TiCu2, TiAl6V4, TiAl6V4ELI		35 - 75		35 - 75		30 -100
H	Hardended steel	C 105 W1,75 CrMoNiW 6 7	55 - 60 HRc	55 - 65	35 - 65	55 - 65		30 -120
	Chilled cast iron	G-X 260 NiCr 4 2, X15 CrNiSi 25 20	400	45 - 55	35 - 55	45 - 55		
	Cast iron	G-X 300 CrMo 15 3	55 HRc	55 - 65	35 - 65	55 - 65		

AOMT1236





90 DEGREE MILLING INSERT.
SUITABLE FOR: SURFACING / SLOTTING/SHOULDER MILLING

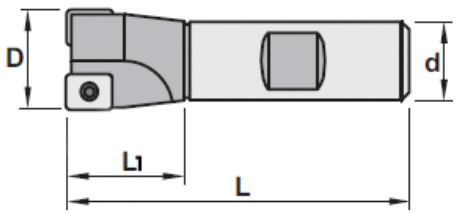
DESIGNATION	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)		XT830
	L	D	S	Ø	R	MIN	MAX	MIN	MAX	
AOMT123608PEER	12	6.6	3.6	11	0.8	0.07	0.22	0.5	11	O

● STOCKABLE O NON STOCKABLE

END MILL CUTTER

DESIGNATION	D	d	L1	L	Z	STOCKABLE
016-85-AOMT12-T2	16	16	22	85	2	O
020-90-AOMT12-T3	20	20	25	90	3	O
025-95-AOMT12-T3	25	25	25	95	3	O

● STOCKABLE O NON STOCKABLE

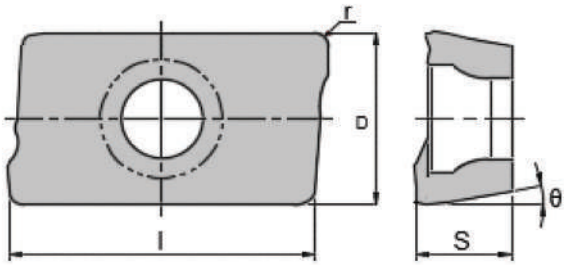


MILLING

SCREW: SCREW FOR AOMT12

APKT1003





90 DEGREE LEAD ANGLE INSERT
2 CORNER INSERT SUITABLE FOR POCKET MILLING, COPYING & SURFACING

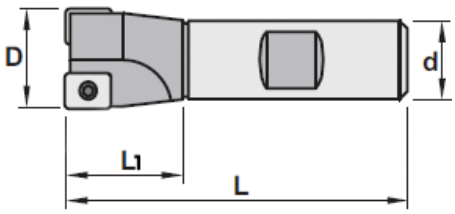
DESIGNATION	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)		XT110	XT830
	L	D	S	Ø	R	MIN	MAX	MIN	MAX		
APKT1003PDTR	10.5	6.7	3.5	11	0.5	0.06	0.20	0.50	9.00	●	○
APKT100308PDTR	10.5	6.7	3.5	11	0.8	0.07	0.26	0.50	9.00		○

● STOCKABLE ○ NON STOCKABLE

END MILL CUTTER

DESIGNATION	D	d	L1	L	Z	STOCKABLE
APKT10-DIA16-2FL-L200	16	16	50	200	2	○
APKT10-DIA20-2FL-L200	20	20	50	200	2	○
APKT10-DIA25-3FL-L200	25	25	50	200	3	○

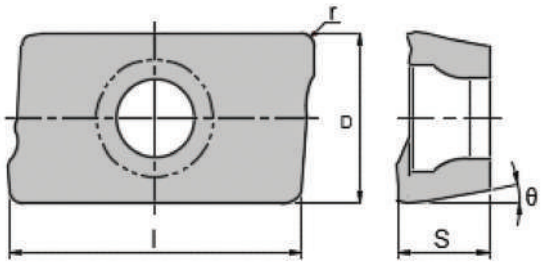
● STOCKABLE ○ NON STOCKABLE



SCREW - SCREW FOR APKT10

APKT1604





90 DEGREE LEAD ANGLE INSERT
2 CORNER INSERT SUITABLE FOR POCKET MILLING, COPYING & SURFACING

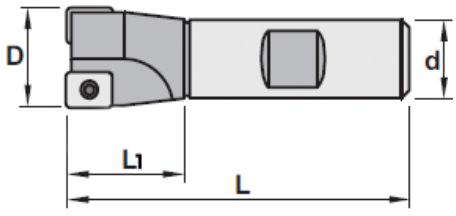
DESIGNATION	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)		XT110	XT840
	L	D	S	Ø	R	MIN	MAX	MIN	MAX		
APKT160408	16.3	9.5	5.3	11	0.8	0.10	0.32	0.50	15	O	O
APKT160420	16.3	9.5	5.3	11	2.0	0.10	0.32	1.0	15		O
APKT160425	16.3	9.5	5.3	11	2.5	0.10	0.32	1.5	15		O
APKT160440	16.3	9.5	5.3	11	4.0	0.10	0.32	1.5	15		O

● STOCKABLE O NON STOCKABLE

END MILL CUTTER

DESIGNATION	D	d	L1	L	Z	STOCKABLE
APKT16-DIA25-2FL-L200	25	25	50	200	2	O
APKT16-DIA32-3FL-L200	32	32	50	200	3	O

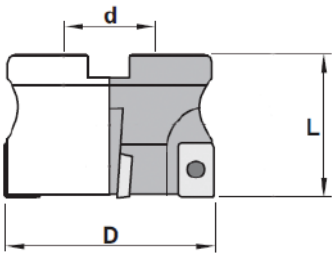
● STOCKABLE O NON STOCKABLE



SHELL MILL CUTTER

DESIGNATION	D	d	L	Z	STOCKABLE
APKT16-DIA50-5FL	50	22	50	5	O
APKT16-DIA63-6FL	63	22	50	6	O
APKT16-DIA80-7FL	80	27	60	7	O

● STOCKABLE O NON STOCKABLE

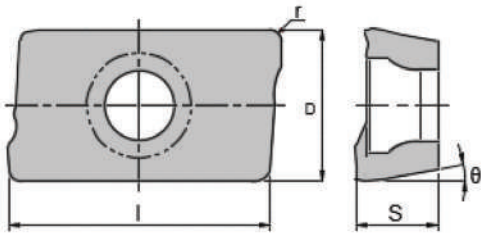


SCREW: SCREW FOR APKT16

MILLING

APMT1135





90 DEGREE LEAD ANGLE INSERT
2 CORNER INSERT SUITABLE FOR POCKET MILLING, COPYING & SURFACING

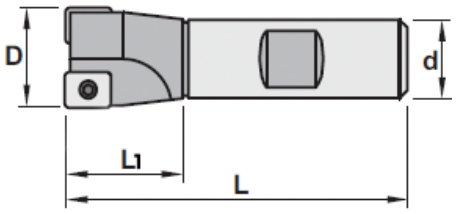
DESIGNATION	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)		XT110	XT125	XT830	XT930-C
	L	D	S	Ø	R	MIN	MAX	MIN	MAX				
APMT1135PDTR	11.18	6.2	3.5	11	0.4	0.07	0.15	0.5	10			O	
APMT113508PDTR	11.18	6.2	3.5	11	0.8	0.07	0.22	0.5	10			O	
APMT1135PDERH2	11.18	6.2	3.5	11	0.8	0.07	0.22	0.5	10		●		●
APMT1135PDERM2	11.18	6.2	3.5	11	0.8	0.07	0.22	0.5	10		●		●
APMT1135PDER	11.18	6.2	3.5	11	0.4	0.07	0.25	0.5	10	●			

● STOCKABLE O NON STOCKABLE

END MILL CUTTER

DESIGNATION	D	d	L1	L	Z	STOCKABLE
BAP300R-1616-200-2T	16	16	50	200	2	●
BAP300R-2020-200-2T	20	20	50	200	2	●
BAP300R-2525-200-3T	25	25	50	200	3	●
BAP300R-2525-200-4T	25	25	50	200	4	●

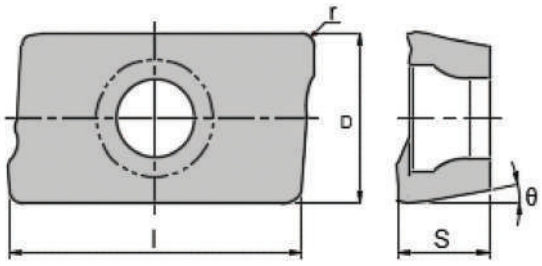
● STOCKABLE O NON STOCKABLE



SCREW - SCREW FOR APMT11

APMT1604





90 DEGREE LEAD ANGLE INSERT
2 CORNER INSERT SUITABLE FOR POCKET MILLING, COPYING & SURFACING

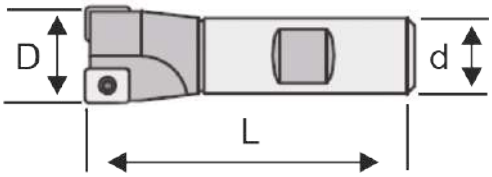
DESIGNATION	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)		XT110	XT125	XT830	XT930-C
	L	D	S	Ø	R	MIN	MAX	MIN	MAX				
APMT1604PDTR	17.19	5.5	4.76	11	0.8	0.09	0.3	0.5	13	●		●	
APMT1604PDERH2	17.19	9.5	5.5	11	0.8	0.09	0.3	0.5	13		●		●
APMT1604PDERM2	17.19	9.5	5.5	11	0.8	0.09	0.3	0.5	13		●		●
APMT160420-GW	17.19	5.5	4.76	11	2	0.09	0.3	0.5	13	●			
APMT160430PDER	17.19	5.5	4.76	11	3	0.09	0.3	0.5	13		●		

● STOCKABLE ○ NON STOCKABLE

END MILL CUTTER

DESIGNATION	D	d	L1	L	Z	STOCKABLE
BAP400R-2525-200-2T	25	25	50	200	2	●
BAP400R-3232-200-3T	32	32	50	200	3	●

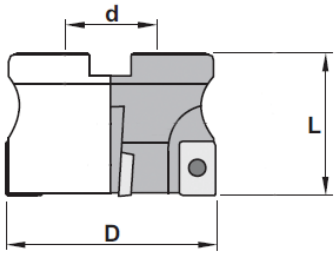
● STOCKABLE ○ NON STOCKABLE



SHELLMILLCUTTER

DESIGNATION	D	d	L	Z	STOCKABLE
BAP400R-50-22-4T	50	22	50	4	●
BAP400R-63-22-5T	63	22	50	5	●
BAP400R-80-27-6T	80	27	50	6	●

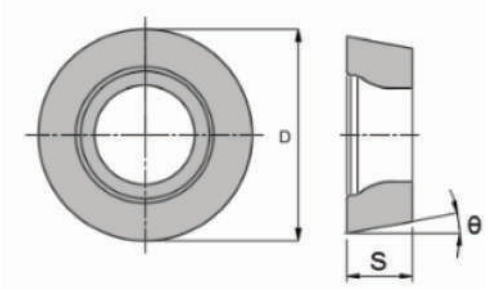
● STOCKABLE ○ NON STOCKABLE



SCREW: SCREW FOR APMT16

RDMT10T3





90 DEGREE LEAD ANGLE INSERT
2 CORNER INSERT SUITABLE FOR POCKET MILLING, COPYING & SURFACING

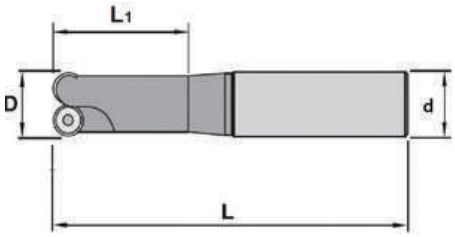
DESIGNATION	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)		XT125	XT830	XT930-C
	L	D	S	Ø	R	MIN	MAX	MIN	MAX			
RDMT10T3MO	-	10	3.97	15	-	0.1	0.60	0.3	2.5		O	
RDMW10T3MO	-	10	3.97	15	-	0.1	0.60	0.3	2.5	●	O	
RDMT10T3MOTN	-	10	3.97	15	-	0.1	0.60	0.3	2.5	●		●

● STOCKABLE O NON STOCKABLE

END MILL CUTTER

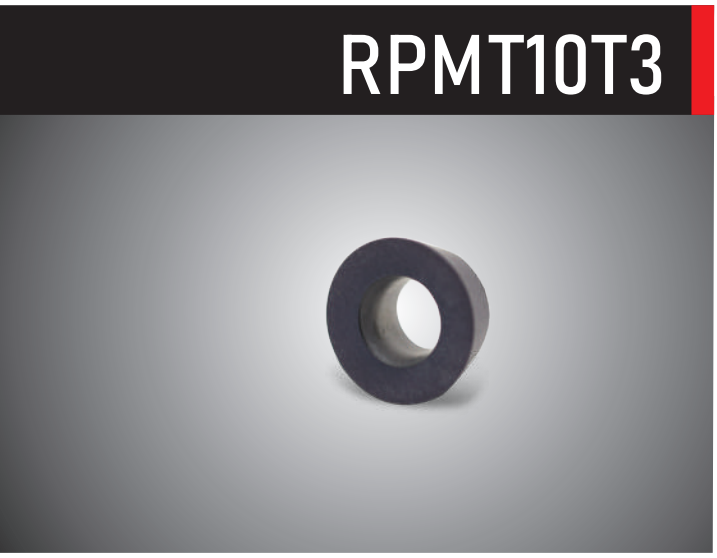
DESIGNATION	D	d	L1	L	Z	STOCKABLE
TRS-5R-25-160-C25-2T	25	25	50	160	2	●
TRS-5R-32-160-C32-3T	32	32	50	160	3	●

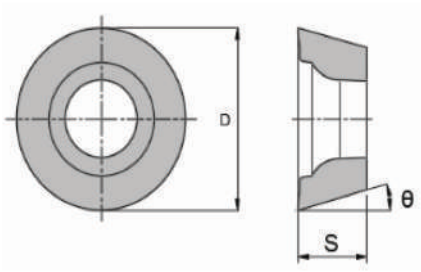
● STOCKABLE O NON STOCKABLE



SCREW - Spare kit R5

RPMT10T3





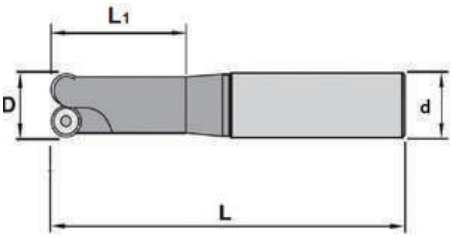
90 DEGREE LEAD ANGLE INSERT
SUITABLE FOR POCKET MILLING, COPYING & SURFACING

DESIGNATION	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)		XT125	XT930-C
	L	D	S	Ø	R	MIN	MAX	MIN	MAX		
RPMT10T3MO	-	10	3.97	11	-	0.1	0.64	0.3	2.5	O	O
RPMW10T3MO	-	10	3.97	11	-	0.1	0.64	0.3	2.5	●	

● STOCKABLE O NON STOCKABLE

END MILL CUTTER

DESIGNATION	D	d	L1	L	Z	STOCKABLE
020-180-RPMT10-2T	20	20	80	180	2	O
025-180-RPMT10-3T	25	25	80	180	3	●
032-200-RPMT10-3T	32	32	105	200	3	●

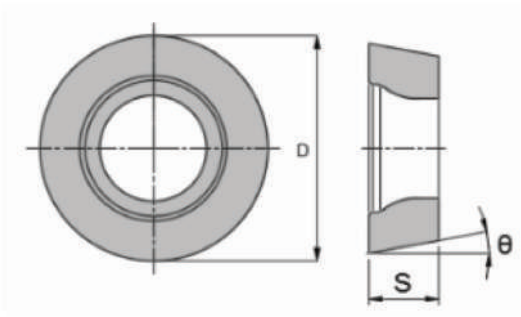


● STOCKABLE O NON STOCKABLE

SCREW - Spare kit R5

RDMT1204





90 DEGREE LEAD ANGLE INSERT
SUITABLE FOR POCKET MILLING, COPYING & SURFACING

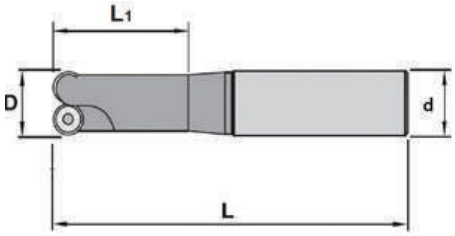
DESIGNATION	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)		XT125	XT830	XT930-C
RDMT1204M0	-	12	4.76	15	-	0.14	0.74	0.3	3		●	
RDMT1204M0TN	-	12	4.76	15	-	0.1	0.74	0.3	3	●		●

● STOCKABLE ○ NON STOCKABLE

END MILL CUTTER

DESIGNATION	D	d	L1	L	Z	STOCKABLE
025-160L-RDMT1204 Z-2	25	25	50	160	2	●
032-160L-RDMT1204 Z-3	32	32	50	160	3	●

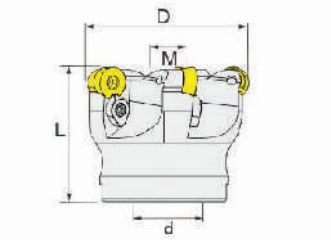
● STOCKABLE ○ NON STOCKABLE



SHELL MILL CUTTER

DESIGNATION	D	d	L	Z	STOCKABLE
050-A22-RDMT1204 Z-4	50	22	50	4	●
052-A22-RDMT1204 Z-4	52	22	50	4	●
063-A22-RDMT1204-Z-5	63	22	50	5	●
080-A27-RDMT1204-Z-6	80	27	60	6	○
0100-A32-RDMT1204-Z-7	100	32	60	7	○

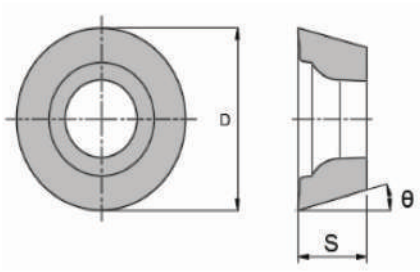
● STOCKABLE ○ NON STOCKABLE



SCREW - Spare kit R6

RPMT1204





90 DEGREE LEAD ANGLE INSERT
SUITABLE FOR POCKET MILLING, COPYING & SURFACING

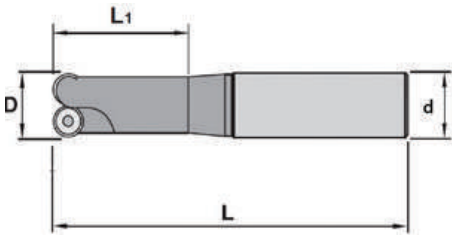
DESIGNATION	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)		XT125	XT830	XT930-C
	L	D	S	Ø	R	MIN	MAX	MIN	MAX			
RPMT1204M0	-	12	4.76	11	-	0.14	0.74	0.3	3	O	O	●
RPMW1204M0	-	12	4.76	11	-	0.14	0.74	0.3	3	●		

● STOCKABLE O NON STOCKABLE

END MILL CUTTER

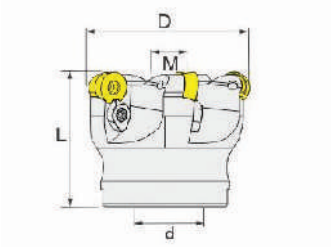
DESIGNATION	D	d	L1	L	Z	STOCKABLE
025-160L-RPMT1204-Z2	25	25	50	160	2	●
032-160L-RPMT1204-Z3	32	32	50	160	3	●

● STOCKABLE O NON STOCKABLE



SHELL MILL CUTTER

DESIGNATION	D	d	L	Z	STOCKABLE
050-A22-RPMT1204 Z-4	50	22	50	4	●
052-A22-RPMT1204 Z-4	52	22	50	4	O
063-A22-RPMT1204-Z-5	63	22	50	5	O
080-A27-RPMT1204-Z-6	80	27	60	6	O
0100-A32-RPMT1204-Z-7	100	32	60	7	O



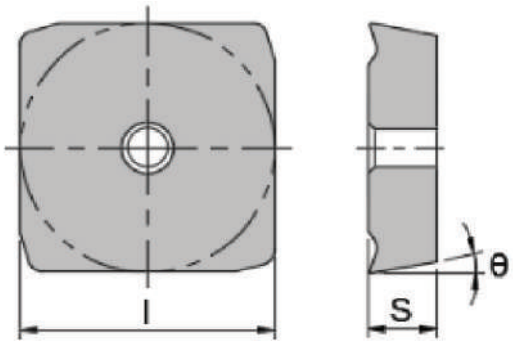
SCREW - Spare kit R6

● STOCKABLE O NON STOCKABLE

MILLING

SPKN1203





75 DEGREE LEAD ANGLE INSERT
APPLICATION : HIGH DEPTH OF CUT FACE MILLING

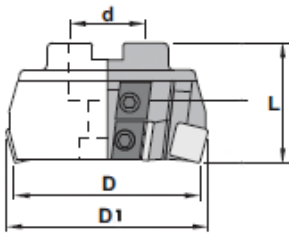
DESIGNATION	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)		XT830	XT840	XT930-C
	L	D	S	Ø	R	MIN	MAX	MIN	MAX			
SPKN1203EDTR	-	12.7	3.18	20	-	0.1	0.46	0.5	6	O		
SPKN1203EDR	-	12.7	3.18	20	-	0.1	0.46	0.5	6		●	O

● STOCKABLE O NON STOCKABLE

SHELL MILL CUTTER

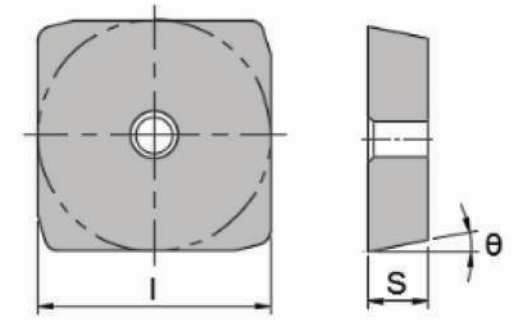
DESIGNATION	D	D1	d	L	Z	STOCKABLE
063-A22-Z4-SPKN12	50	25	50	160	2	O
080-A22-Z5-SPKN12	52	32	50	160	3	O
100-A32-Z7-SPKN12	63	32	60	160	4	O
125-A40-Z8-SPKN12	80	68	32	50	6	O

● STOCKABLE O NON STOCKABLE



SPKN1504





75 DEGREE LEAD ANGLE INSERT
APPLICATION : HIGH DEPTH OF CUT FACE MILLING

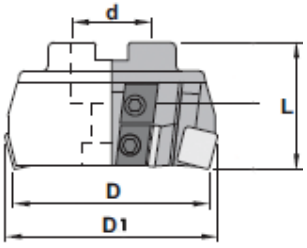
DESIGNATION	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)		XT830	XT840	XT930-C
	L	D	S	Ø	R	MIN	MAX	MIN	MAX			
SPKN1504EDTR	-	15.88	4.76	20	-	0.1	0.5	0.5	8	O		
SPKN1504EDR	-	15.88	4.76	20	-	0.1	0.5	0.5	8		●	O

● STOCKABLE O NON STOCKABLE

SHELL MILL CUTTER

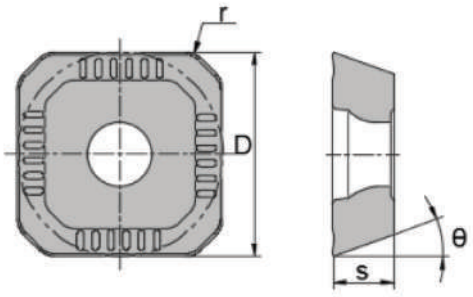
DESIGNATION	D	D1	d	L	Z	STOCKABLE
063-22-SPKN15-4T	63	69	22	40	4	O
080-27-SPKN15-5T	80	86	27	40	5	O
0100-32-SPKN15-7T	100	106	27	32	7	O
0125-40-SPKN15-8T	125	131	40	50	8	O
0160-40-SPKN15-10T	160	166	40	43	10	O
0200-60-SPKN15-12T	200	206	60	63	12	O
0250-60-SPKN15-14T	250	256	60	63	14	O
0160-40-SPKN15-10T	100	88	40	50	7	O

● STOCKABLE O NON STOCKABLE



SPMT1204





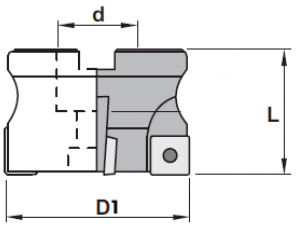
90 DEGREE LEAD ANGLE INSERT
4 CORNER INSERT SUITABLE FOR POCKET MILLING, COPYING & SURFACING

DESIGNATION	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)		XT830
	L	D	S	Ø	R	MIN	MAX	MIN	MAX	
SPMT120408	-	13.29	4.76	11	0.8	0.07	0.29	0.5	9.0	●

● STOCKABLE ○ NON STOCKABLE

SHELL MILL CUTTER

DESIGNATION	D	D1	d	L	Z	STOCKABLE
XTSM-D50-SPMT120408	56	50	22	40	4	●
XTSM-D63-SPMT120408	69	63	22	50	5	●
XTSM-D80-SPMT120408	86	80	27	50	6	●
XTSM-D100-SPMT120408	106	100	32	50	7	○
XTSM-D125-SPMT120408	131	125	40	63	8	○

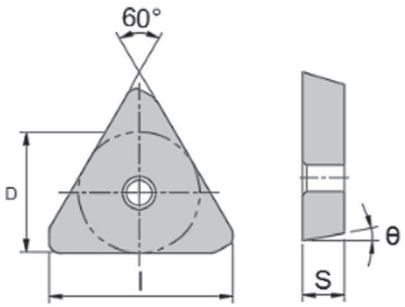


● STOCKABLE ○ NON STOCKABLE

SCREW - SCREW M4 FOR SPMT12
OTHER CORNER RADII ON REQUEST BUT IN M4.5 SCREW

TPKN1603





75 DEGREE LEAD ANGLE INSERT
APPLICATION : HIGH DEPTH OF CUT FACE MILLING

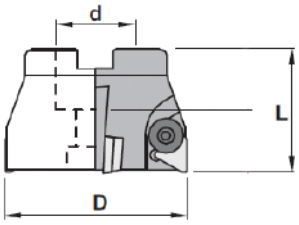
DESIGNATION	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)		XT830	XT840	XT930-C
	L	D	S	Ø	R	MIN	MAX	MIN	MAX			
TPKN1603	16.4	16.4	3.18	11	-	0.08	0.27	0.5	12	O	●	O

● STOCKABLE O NON STOCKABLE

SHELL MILL CUTTER

DESIGNATION	D	D1	d	L	Z	STOCKABLE
063-A22-TPKN16-6T	63	22	22	50	6	O
080-A27-TPKN16-6T	80	27	27	50	6	O
100-A32-TPKN16-7T	100	32	27	50	7	O
125-A40-TPKN16-8T	125	40	40	63	8	O

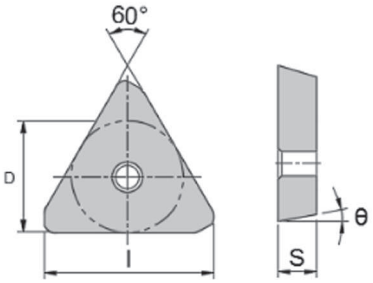
● STOCKABLE O NON STOCKABLE



MILLING

TPKN2204





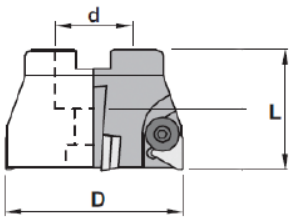
75 DEGREE LEAD ANGLE INSERT
APPLICATION : HIGH DEPTH OF CUT FACE MILLING

DESIGNATION	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)		XT830	XT840	XT930-C
	L	D	S	Ø	R	MIN	MAX	MIN	MAX			
TPKN2204PDTR	22.1	12.7	4.76	11	-	0.09	0.27	0.5	0.5	O		
TPKN2204PDR	22.1	12.7	4.76	11	-	0.09	0.27	0.5	0.5		●	O

● STOCKABLE O NON STOCKABLE

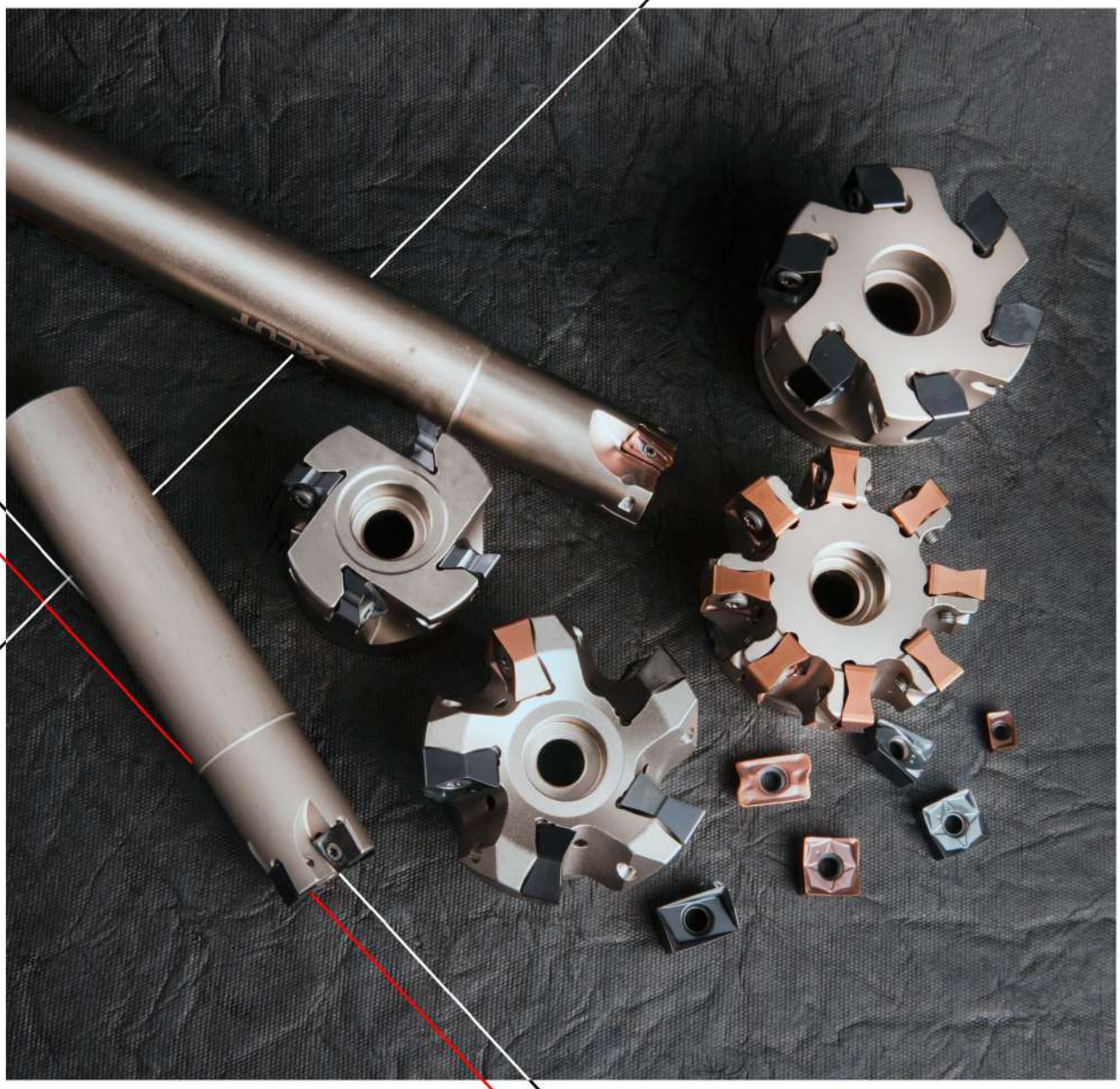
SHELL MILL CUTTER

DESIGNATION	D	D1	d	L	Z	STOCKABLE
080-A27-TPKN22-5T	80	27	22	50	5	O
100-A32-TPKN22-6T	100	32	22	50	6	O
125-A40-TPKN22-7T	125	40	27	60	7	O
160-A40-TPKN22-9T	160	40	32	60	9	O



● STOCKABLE O NON STOCKABLE

NOTES



SHOULDER MILLING

- Shoulder milling is a machining process in which the cutter is positioned at an angle relative to the workpiece, rather than perpendicular to it.
- A 90-degree shoulder is the most common angle, but other angles can be used depending on the application.
- Our Popular Shoulder milling insert XDMT (2 Corner), LNKX (4 Corner), WNMX (6 Corner), SNMU (8 Corners)

SHOULDER MILLING INDEX

Shoulder Milling	**309-326**
Grade Information	312-313
Recommended Cutting Conditions	314-315
LNKU 1206	316
LNKX 0904	317
LNKX 1205	318
LNKX 1706	319
SDMT 1204	320
SNMU 1206	321
WNMX 08	322
XNEX 08	323
XDMT SERIES (11 & 17)	324-326

GRADE INFORMATION



P10-P25 | M10-M20 |K05-K15

PVD coated grade, suitable for cast iron & processing whenever it is required high toughness and excellent resistance. Used with coolant in medium cutting speed, this quality ensures a remarkable insert life.



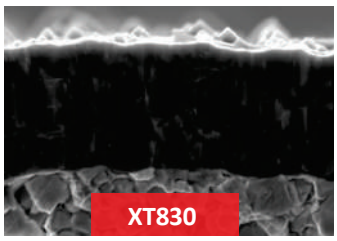
P05-P25 | K05-K30

Uses heat-resistance PVD Al203 coating which has best hot hardness compared to previous PVD coatings, has better wear resistance. The smooth rake face and sharp cutting edge due to advanced technology with PVD coating, to ensure the workpiece without burr, also reduce the built-up edge. Suitable for Steels & Cast Iron



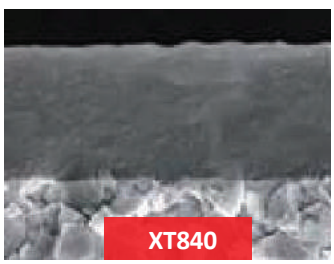
M10-M35 | P10-P35 | S05-515

Composition: Co 10.0% other 1.5%; rest TC | Grain size: coarse Coating: PVD TIAITAN Particularly suitable for the machining of high-alloy steels, Stainless Steels and Superalloys (austenitic).



P05-P30 M05-M20 | K05-K20 | 505-515 |H05-H10

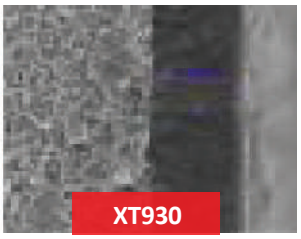
PVD coating with optimal thermal resistance & added strength. Tough carbide substrate designed for demanding application. Suitable for all materials from steels to superalloys



P10-P30 | K10-K25 | M10-M25

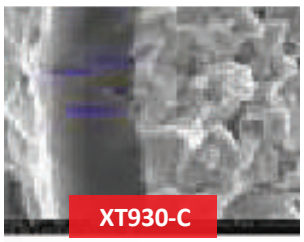
Composition: Co 10.5 %; mixed carbides 2.0 %; WC balance | Grain size: 1-2 µm | Hardness: HV30 1400 Coating specification: PVD TiAlTaN First choice for dry machining of steels and CI at high cutting speeds

GRADE INFORMATION



M10-M35 | P10-P35 | S05-S15

Composition: Co 10.0 %; other 1.5 %; rest TC | Grain size: coarse |Coating: PVD TiAlTaN
Particularly suitable for the machining of high-alloy steels, Stainless Steels and Superalloys (austenitic).



P15-P35 | M15-M35 | H05-H15

Ultra find grade with Nano coating for high heat resistance and toughness.
Special AlTiMeN coating gives it a bronze shade and higher temperature resistance!
The first choice for general-purpose machining of stainless steel. It can be used for supplementary machining of soft steels.



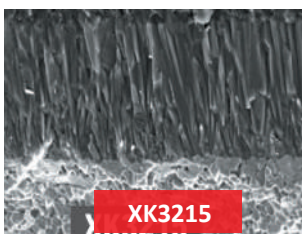
P05-P30 | M05-M20 |K05-K30

Composition: Co 10.0%; other 1.5%; rest TC | Grain size: coarse Coating: PVD TIAITN
Particularly suitable for the machining of high-alloy steels, Stainless Steels and Superal- loys (austenitic).



H10-H20 | S05-S15

- Low cobalt, ultra-fine wear-resistant and heat-resistant grain structure.
- PVD high alumina coating to improve oxidation and wear resistance.
- Suitable for high feed milling of hardened materials & superalloys



K10-K25 | P10-P20

Ultra find grade with Nano coating for high heat resistance and toughness.Special AlTiMeN coating gives it a bronze shade and higher temperature resistance! The first choice for general-purpose machining of stainless steel. It can be used for supplementary machining of soft steels.

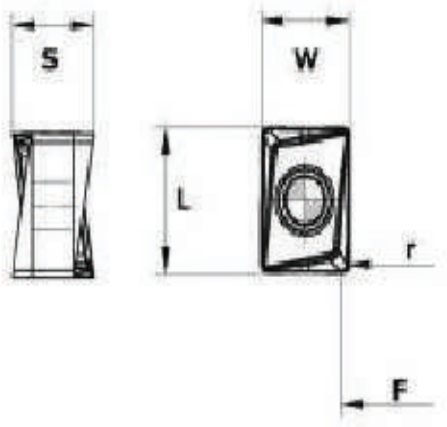
RECOMMENDED CUTTING CONDITIONS

ISO	Material Group	Relative Materials (DIN)	Hardness HB	Cutting speed (m/min)				
				XT 430	XT480	XT820	XT 830	XT840
P	Non-alloy steel	9 SMn 28, C35C50, C40E, C45E, 49 CrMo 4	125 - 250	90-250	80 -180	90 -250	100 - 250	90 -250
	Low alloy steel	13 CrMo 44, 40NiCrM022, 58 CrV 4	200 - 350	80-200	80 -180	80 -220	100 - 200	80 -220
	High alloy steel	X 40 CrMoV 5 1, X100 CrMoV 5 1, S6-5-5	200 - 325		80 -130	80 -180	80 - 130	80 -180
M	Ferritic/ martensitic Stainless steel	X6Cr13, X10CrA118, X20CrNi175	200 - 240	80-200			130 - 190	
	Austenitic Stainless steel	X5 CrNi 18 9, X5 CrNiMo 17 13 3 X6 CrNiTi 18 9	180	60-180			100 - 200	
K	Grey cast iron	GG15, GG20, GGG40, GG-35	180 - 260	90 - 200	90 -200		160 - 200	90 - 200
	Malleable castiron	GTS-35-10, GTS-35,GTS70-02, 20mN5	130 - 230	90 - 200	90 -200	90 -240	130 - 180	90 - 200
S	Fe, Ni or Co based	X12 NICrAlTi 31 20, TiAl5Sn2	200 - 350				30 - 50	
	Titanium and Ti-alloy based	TiCu2, TiAl6V4, TiAl6V4ELI					35- 75	
H	Hardended steel	C 105 W1,75 CrMoNiW 6 7	55 - 60 HRc				55 - 65	
	Chilled cast iron	G-X 260 NiCr 4 2, X15 CrNiSi 25 20	400				45 - 55	
	Cast iron	G-X 300 CrMo 15 3	55 HRc				55 - 65	

ISO	Material Group	Relative Materials (DIN)	Hardness HB	XT 930	XT 930-C	XT 960	XT 1010	XK3215
P	Non-alloy steel	9 SMn 28, C35C50, C40E, C45E, 49 CrMo 4	125 - 250		80 - 200			
	Low alloy steel	13 CrMo 44, 40NiCrM022, 58 CrV 4	200 - 350	80-220	80 -180			
	High alloy steel	X 40 CrMoV 5 1, X100 CrMoV 5 1, S6-5-5	200 - 325	80-180	60 -160			
M	Ferritic/ martensitic Stainless steel	X6Cr13, X10CrA118, X20CrNi175	200 - 240	80-220	60 -220		60 -140	
	Austenitic Stainless steel	X5 CrNi 18 9, X5 CrNiMo 17 13 3 X6 CrNiTi 18 9	180	80 -200	60 -180			
K	Grey cast iron	GG15, GG20, GGG40, GG-35	180 - 260					70-350
	Malleable castiron	GTS-35-10, GTS-35,GTS70-02, 20mN5	130 - 230					70-280
S	Fe, Ni or Co based	X12 NICrAlTi 31 20, TiAl5Sn2	200 - 350	40 -120	40 -120	50 -110	30 -90	
	Titanium and Ti-alloy based	TiCu2, TiAl6V4, TiAl6V4ELI		30 -100	30 -100	40 -85		
H	Hardended steel	C 105 W1,75 CrMoNiW 6 7	55 - 60 HRc	30 -90	30 -120		30 -120	
	Chilled cast iron	G-X 260 NiCr 4 2, X15 CrNiSi 25 20	400					50-150
	Cast iron	G-X 300 CrMo 15 3	55 HRc					50-120

LNKU1206





90 DEGREE LEAD ANGLE INSERT - 4 CUTTING EDGES
SUITABLE FOR POCKET, FACE, SLOT,ANGLED & SHOULDER MILLING
LOW POWER CUNSUMPTION, MAXIMUM CHIP REMOVAL RATE

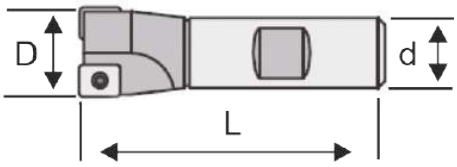
DESIGNATION	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)		XT840	XT930
	W	F	S	r	L	MIN	MAX	MIN	MAX		
LNKU120608HP	12.0	3.8	8.2	0.8	14.0	0.07	0.30	0.50	3.50	●	
LNKU120608SM	12.0	3.8	8.2	0.8	14.0	0.07	0.30	0.50	3.50		●

● STOCKABLE ○ NON STOCKABLE

END MILL TYPE

DESIGNATION	D	d	L1	L	Z	AVAILABILITY
XTEM-2525-Z2-200L-LNKU12-PRE	25	25	60	200	2	●
XTEM-3232-Z3-200L-LNKU12-PRE	32	32	60	200	3	●

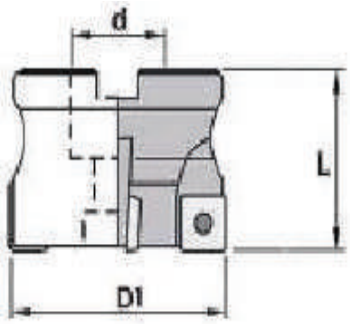
● STOCKABLE ○ NON STOCKABLE



SHELL CUTTER

DESIGNATION	D	d	H	Z	AVAILABILITY
XTSM-D40-A16-Z4-LNKU12-PRE	40	16	40	4	●
XTSM-D50-A22-Z5-LNKU12-PRE	50	22	40	5	●
XTSM-D63-A22-Z6-LNKU12-PRE	63	22	50	6	●
XTSM-D80-A27-Z7-LNKU12-PRE	80	27	50	7	●
XTSM-D100-A32-Z8-LNKU12-PRE	100	32	50	8	○
XTSM-D125-A40-Z9-LNKU12-PRE	125	40	63	9	○

● STOCKABLE ○ NON STOCKABLE

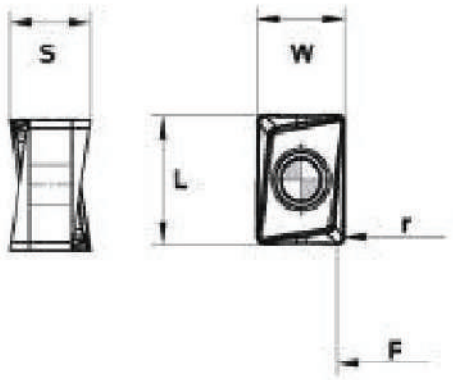


SCREW - SCREW M4 FOR LNKU12

MILLING

LNKX0904





90 DEGREE LEAD ANGLE INSERT - 4 CUTTING EDGES
HIGH RAKE ALLOWS FOR SMOOTH OPERATION
SUITABLE FOR POCKET, FACE, SLOT,ANGLED & SHOULDER MILLING

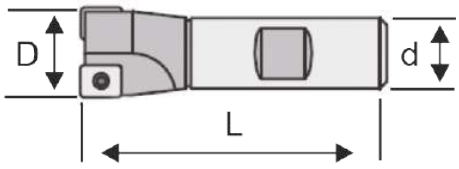
DESIGNATION	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)		XT480	XT930-C
	W	F	S	r	L	MIN	MAX	MIN	MAX		
LNKX090408	12.0	3.8	8.2	0.8	14.0	0.07	0.30	0.50	3.50	●	●

● STOCKABLE ○ NON STOCKABLE

SHELL MILL CUTTER

DESIGNATION	D	D1	D	L	AVAILABILITY
H-SASF90-1616-T2-0904-125	16	16	2	125	●
H-SASF90-2020-T3-0904-125	20	20	3	125	●
H-SASF90-2525-T4-0904-125	20	20	4	125	●

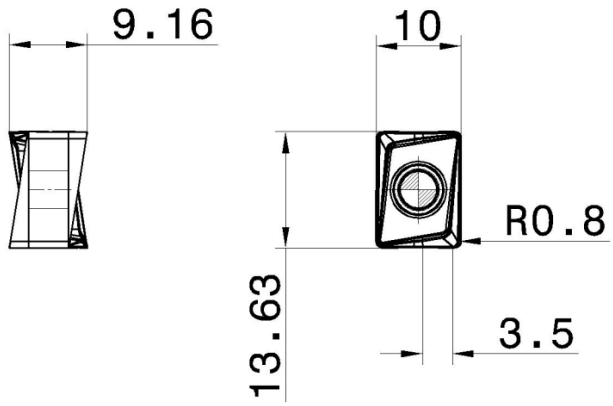
● STOCKABLE ○ NON STOCKABLE



SCREW - SCREW FOR LNKX09

LNKX1205





90 DEGREE LEAD ANGLE INSERT - 4 CUTTING EDGES
HIGH RAKE ALLOWS FOR SMOOTH OPERATION
SUITABLE FOR POCKET, FACE, SLOT,ANGLED & SHOULDER MILLING

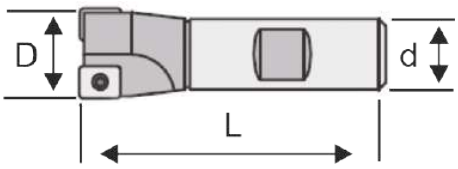
DESIGNATION	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)		XT480	XT930	XT930-C
	W	F	S	r	L	MIN	MAX	MIN	MAX			
LNKX120508	10.0	3.8	9.15	0.8	13.7	0.07	0.2	1	6	●	●	●

● STOCKABLE ○ NON STOCKABLE

END MILL TYPE

DESIGNATION	D	d	Z	L	AVAILABILITY
H-SASF90-2525-T2-1205-120	25	25	2	120	●
H-SASF90-3232-T3-1205-160	32	32	3	160	●
H-SASF90-4040-T4-1205-200	40	40	4	200	●

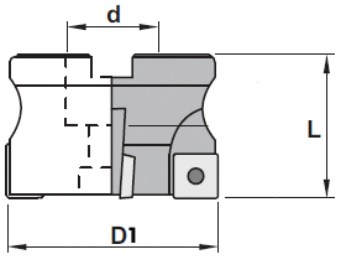
● STOCKABLE ○ NON STOCKABLE



SHELL CUTTER

DESIGNATION	D	d	H	Z	AVAILABILITY
H-SASF90-D40-04-16-1205R	40	16	40	4	●
H-SASF90-D50-05-22-1205R	50	22	40	5	●
H-SASF90-D63-06-27-1205R	63	22	50	6	●
H-SASF90-D80-07-27-1205R	80	27	50	7	●
H-SASF90-D100-08-32-1205R	100	32	50	8	○
H-SASF90-D125-09-40-1205R	125	40	63	9	○

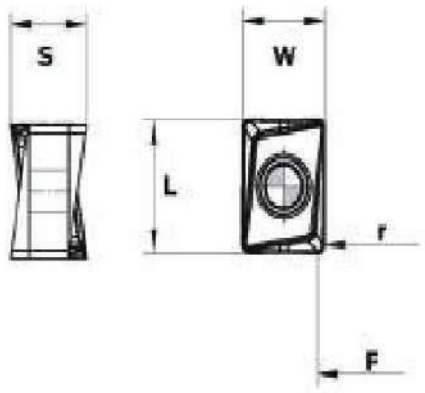
● STOCKABLE ○ NON STOCKABLE



SCREW - SCREW M4 FOR LNKU12

LNKX1706





90 DEGREE LEAD ANGLE INSERT - 4 CUTTING EDGES
HIGH RAKE ALLOWS FOR SMOOTH OPERATION
SUITABLE FOR POCKET, FACE, SLOT,ANGLED & SHOULDER MILLING

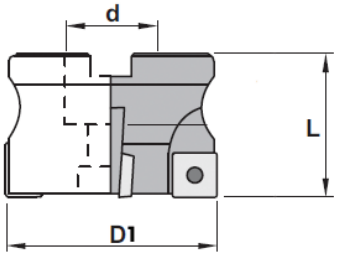
DESIGNATION	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)		XT480	XT930-C
	W	F	S	r	L	MIN	MAX	MIN	MAX		
LNKX170608	11.2	4.7	10.4	0.8	16.7	0.07	0.2	1	10	●	○

● STOCKABLE ○ NON STOCKABLE

SHELL MILL CUTTER

DESIGNATION	D	D1	L	Z	AVAILABILITY
H-SASF90-D50-04-22-1706R	50	22	40	4	●
H-SASF90-D63-05-27-1706R	63	27	50	5	●
H-SASF90-D80-07-27-1706R	80	27	50	6	○
H-SASF90-D100-08-32-1706R	100	32	50	7	○

● STOCKABLE ○ NON STOCKABLE



SCREW - SCREW FOR LNKX17

SDMT1204



90 DEGREE LEAD ANGLE INSERT - 4 CUTTING EDGES
SUITABLE FOR POCKET, FACE, SLOT,ANGLED & SHOULDER MILLING

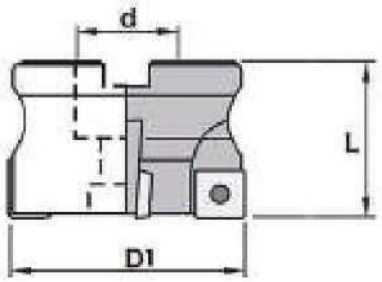
Insert Details

DESIGNATION	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)		XT820	XT830
	I	D	S	Ø	R	MIN	MAX	MIN	MAX		
SDMT1204PDER	-	12.7	4.76	15	0.4	0.07	0.29	0.5	5.0		●
SDMT120408-F57	-	12.7	4.76	15	0.8	0.07	0.29	0.5	5.0	●	

● STOCKABLE ○ NON STOCKABLE

SHELL CUTTER

DESIGNATION	D	d	H	Z	AVAILABILITY
XTSM-D50-A22-Z4-SDMT1204	50	22	40	4	●
XTSM-D63-A22-Z5-SDMT1204	63	22	50	5	●
XTSM-D80-A27-Z6-SDMT1204	80	27	50	6	●
XTSM-D100-A32-Z7-SDMT1204	100	32	50	7	○
XTSM-D125-A40-Z8-SDMT1204	125	40	50	8	○



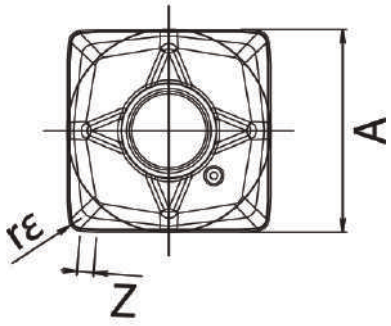
● STOCKABLE ○ NON STOCKABLE

SCREW - SCREW M4 FOR SDMT12

MILLING

SNMU1206





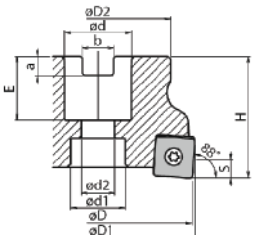
88 DEGREE MILLING INSERT - 8 CUTTING EDGES
SUITABLE FOR POCKET MILLING, FACING & SURFACING
INSERT DESIGN ENABLES LOW CUTTING FORCE TO REDUCE CHATTERING
CUTTER DIAMETER AVAILABLE FROM 50 TO 125MM

DESIGNATION	DIMENSIONS				FEED (MM/ TOOTH)		DEPTH OF CUT(MM)		XT430	XT840	XT930-C
	A	T	Z	rε	MIN	MAX	MIN	MAX			
SNMU1206EN-GM	13	5.51	1	0.8	0.08	0.24	0.5	3.5	●	●	●

● STOCKABLE ○ NON STOCKABLE

SHELL MILL CUTTER

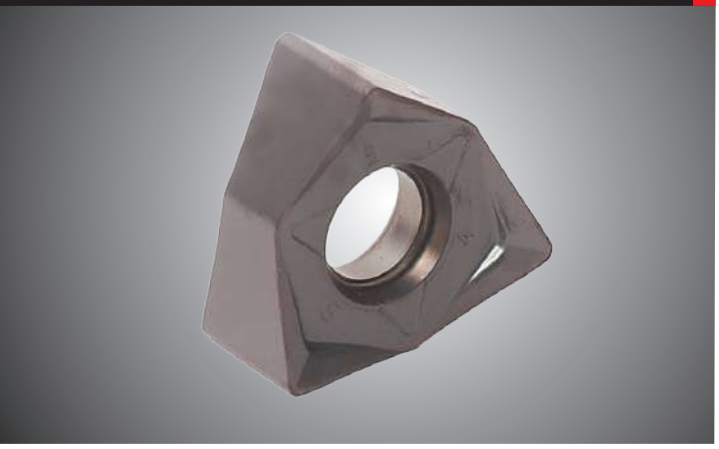
DESIGNATION	DIMENSIONS										AVAILABILITY
	ØD	ØD1	ØD2	ØD	Ød1	Ød2	H	E	a	b	
XTSM-D40-Z2-SNMU1206- 88°	40	52	48	22	17.5	11	40	21	6.3	10.4	●
XTSM-D50-Z4-SNMU1206- 88°	50	65	48	22	18	11	40	21	6.3	10.4	●
XTSM-D63-Z5-SNMU1206- 88°	63	82	70	27	20	13	50	24	7	12.4	●
XTSM-D80-Z7-SNMU1206- 88°	80	102	78	32	45	–	50	30	8	14.4	●
XTSM-D100-A32-Z7- SNMU1206-88°	100	127	89	40	55		63	33	9	16.4	●
XTSM-D125-A40-Z9- SNMU1206-88°	125	162	110	40	55		63	33	9	16.4	○



● STOCKABLE ○ NON STOCKABLE

SCREW M4 FOR SNMU / SNMX 1206

WNMX08



90 DEGREE LEAD ANGLE INSERT 6 CUTTING EDGES
SUITABLE FOR POCKET, FACE, SLOT,ANGLED & SHOULDER MILLING

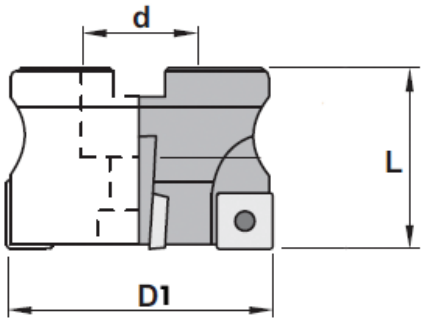
Insert Details

DESIGNATION	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)		XT125	XT430	XT820	XT840	XT930-C	XK3215
	D1	S	BS	IC	RE	MIN	MAX	MIN	MAX						
WNMX080608-GM	6.2	6.65	1.3	14.02	0.8	0.08	0.4	0.5	7	●	●	●	●	●	●

● STOCKABLE ○ NON STOCKABLE

SHELL CUTTER

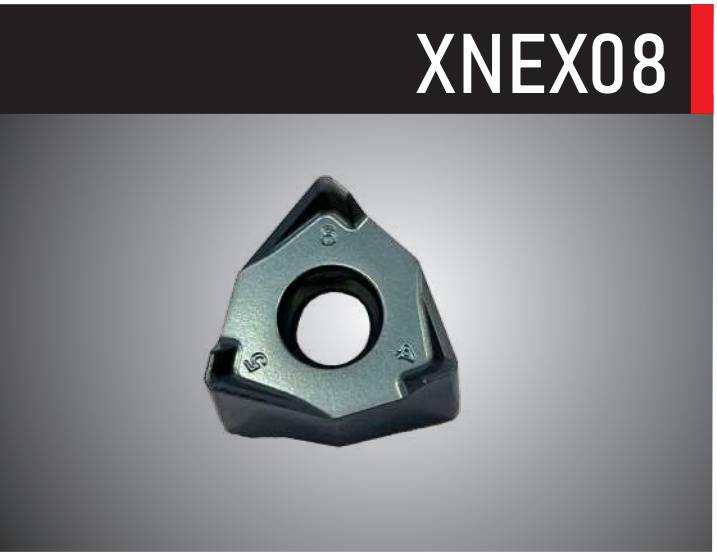
DESIGNATION	ØD	Ød	L	Z	AVAILABILITY
XTSM-D50-A22-Z4-WNMX08-PRE	50	22	40	4	●
XTSM-D63-A22-Z4-WNMX08-PRE	63	22	40	4	●
XTSM-D63-A22-Z5-WNMX08-PRE	63	22	40	5	●
XTSM-D80-A27-Z5-WNMX08-PRE	80	27	50	5	●
XTSM-D80-A27-Z7-WNMX08-PRE	80	27	50	7	●
XTSM-D100-A32-Z7-WNMX08-PRE	100	32	50	7	●
XTSM-D100-A32-Z9-WNMX08-PRE	100	32	50	9	●
XTSM-D125-A40-Z8-WNMX08-PRE	125	40	63	8	○
XTSM-D160-A40-Z10-WNMX08-PRE	160	40	63	10	○

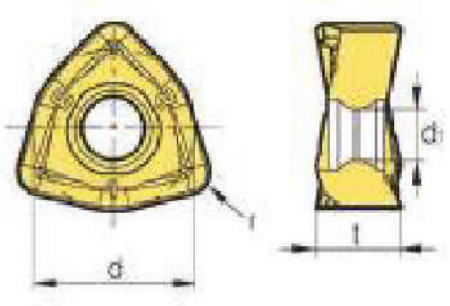


● STOCKABLE ○ NON STOCKABLE

SCREW - SCREW FOR WNMX08-M5X14

XNEX08





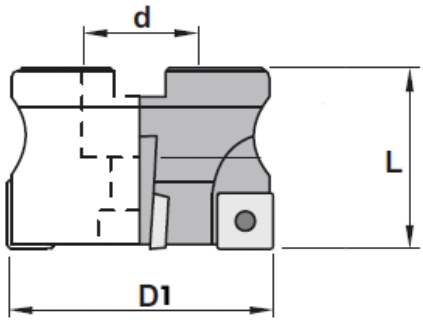
90 DEGREE LEAD ANGLE INSERT 6 CUTTING EDGES
SUITABLE FOR POCKET MILLING, COPYING & SURFACING

DESIGNATION	DIMENSIONS				FEED (MM/ TOOTH)		DEPTH OF CUT(MM)		XT430	XT820	XK3215
	d	t	d1	r	MIN	MAX	MIN	MAX			
XNEX080608	12.5	6.56	7.5	0.8	0.08	0.4	0.5	7	O	●	O

● STOCKABLE O NON STOCKABLE

SHELL MILL CUTTER

DESIGNATION	ØD	ØD	F	Z	AVAILABILITY
XTSM-D50-Z4-XNEX08-90	50	22	40	4	O
XTSM-D63-Z6-XNEX08-90	50	22	40	5	O
XTSM-D80-Z7-XNEX08-90	63	27	40	6	O
XTSM-D100-Z8-XNEX08-90	80	27	50	7	O
XTSM-D125-Z10-XNEX08-90	100	32	50	8	O



● STOCKABLE O NON STOCKABLE

SCREW - SCREW FOR XNEX08

XDMT11

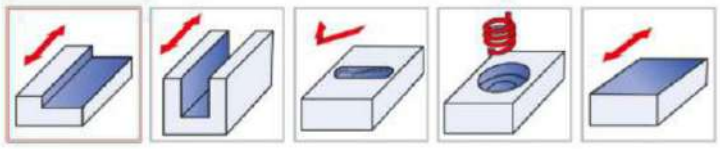


XDMT17



Applications

- Shoulder Milling, Side Milling and Helical Interpolation



- 90° End mills and Face mills with high positive two helical cutting edges of size 11 & 17 inserts
  Available in 0.8, 1.6 and 2.4 radii depending on the application
- Cutter diameter available from 16mm to 63mm

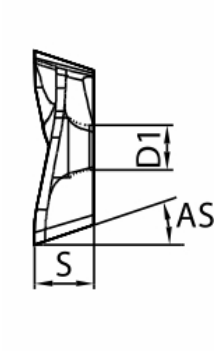
Benefits

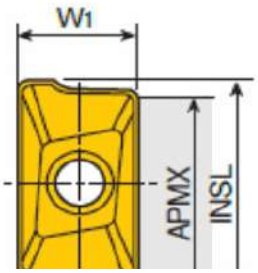
- Multiple grades for different applications
- Extremely effective on die and mould as well as production applications

Insert Details

DESIGNATION	Angle							AP(mm)	fn(mm/rev)	XT840	XT930-C	XT960
	S	D1	L	RE	AS	AN	MAX					
XDMT11T308ER-JT	0.3	0.150	0.110	0.4	0.8	18°	13°	0.5 - 6.0	0.06 - 0.25	●	●	●
XDMT11T316ER-JT	0.3	0.150	0.110	0.4	1.6	18°	13°	0.8 - 8.0	0.08 - 0.30	●	●	●

● STOCKABLE ○ NON STOCKABLE



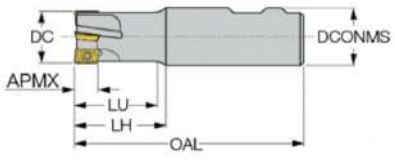


Insert Details

DESIGNATION	INSL	W1	S	BS	RE	APMX	ap (min)	ap (max)	fz(min)	fz(max)	XT840	XT930-C	XT960
XDMT1705PDER-EM	18.50	10.70	6	3	0.80	16.00	0.8	13.00	0.090	0.350	●	●	●
XDMT170516PDER-EM	18.50	10.70	6	3	1	16.00	1	13.00	0.090	0.350	●	●	●
XDMT170524PDER-EM	18.50	10.70	6	3	1.2	16.00	1.2	13.00	0.090	0.350	●	●	●

● STOCKABLE ○ NON STOCKABLE





ToolHolder Dimensions

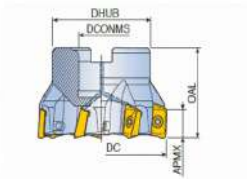
DESIGNATION	NO. OF INSERTS	DIMENSIONS					AVAILABILITY
		DC	LU	LH	OAL	APMX	
XDMT11-1616-Z2-200L	2	16	38	40	200	10	●
XDMT11-2020-Z2-200L	2	20	48	50			●
XDMT11-2020-Z3-200L	3	20					●
XDMT11-2525-Z3-200L	3	25					●
XDMT11-2525-Z4-200L	4	25					●
XDMT11-3232-Z3-300L	3	32					●
XDMT17-2525-Z2-200L	2	25				15	●
XDMT17-3232-Z3-200L	3	32					●

● STOCKABLE ○ NON STOCKABLE

ToolHolder Dimensions

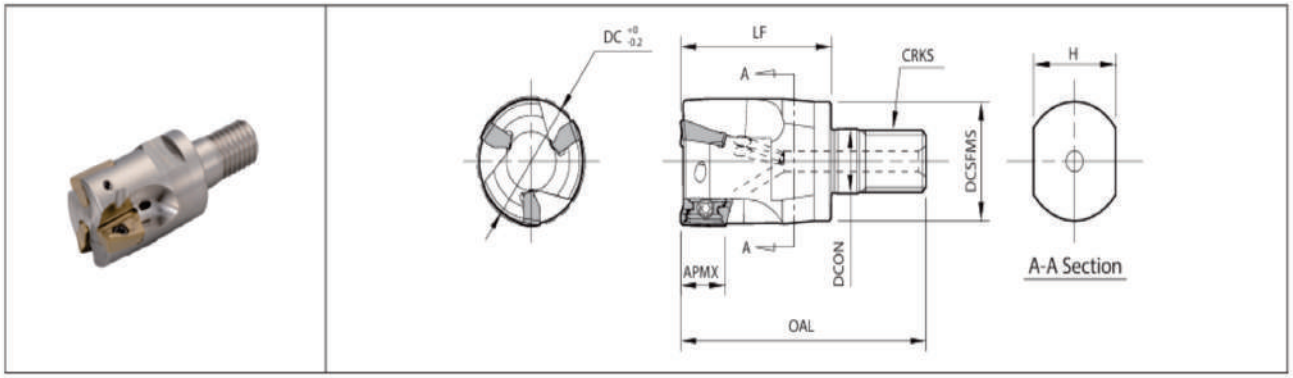
DESIGNATION	NO. OF INSERTS	DIMENSIONS					AVAILABILITY
		DC	DCONMS	DHUB	OAL	APMX	
XTSM-D50-A22-Z4-XDMT17	4	50	22	45	40	15	●
XTSM-D50-A22-Z5-XDMT17	5	50					●
XTSM-D63-A22-Z5-XDMT17	5	63		50			●
XTSM-D63-A22-Z6-XDMT17	6	63					●





Other cutter diameter available on request.

XDMT-MODULAR



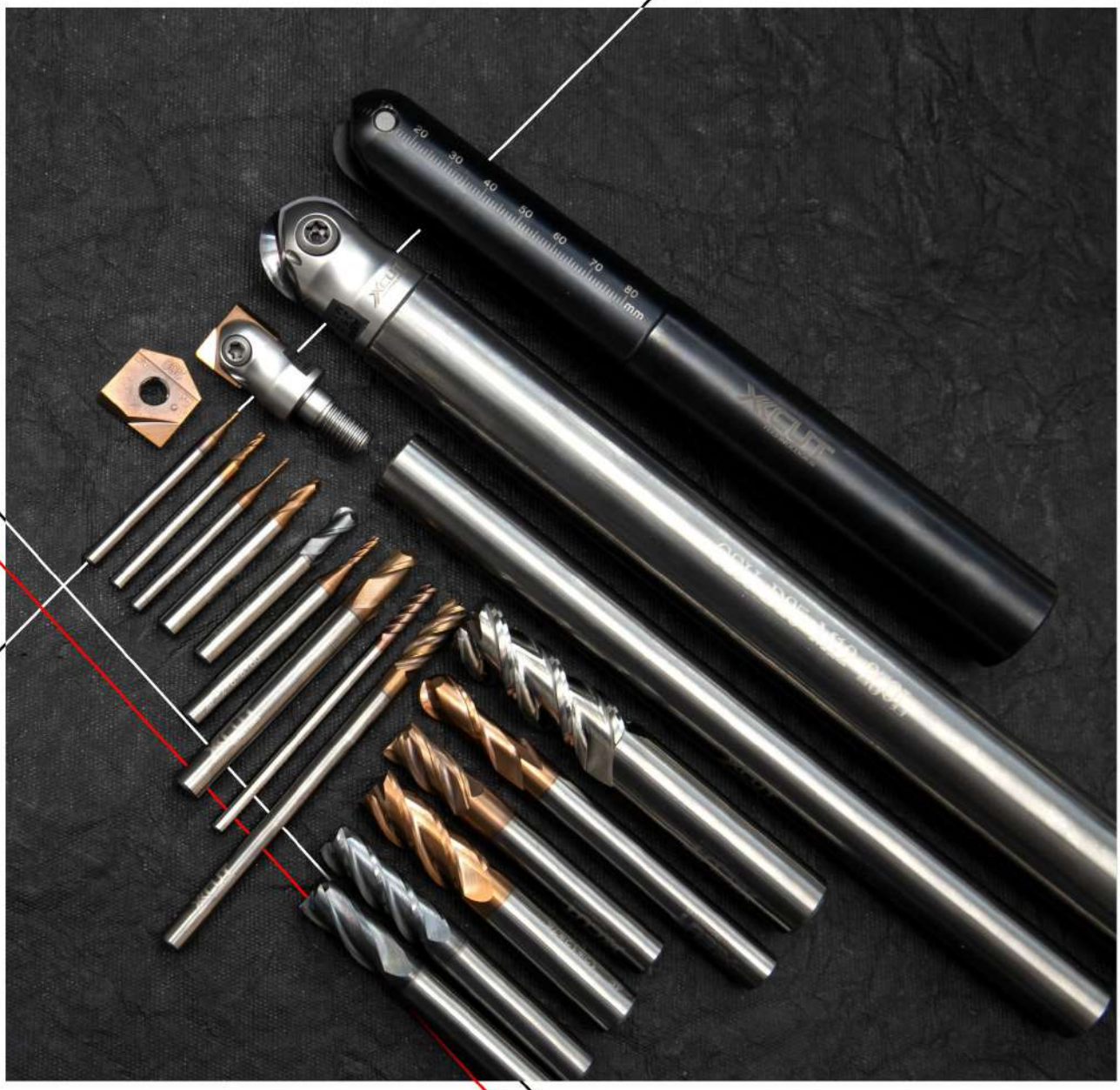
DESCRIPTION	Insert(s)	DIMENSION								AVAILABILITY
		DC	DCONMN	DCSFMS	OAL	LF	APMX	CRKS	H	
XMH-XDMT11-16-M8-2T	2	16	8.5	14.7	42	25	10	M8x1.25	12	○
XMH-XDMT11-20-M10-3T	3	20	10.5	18.7	48	30		M10x1.5	15	○
XMH-XDMT11-25-M12-4T	4	25	12.5	23	56	35		M12x1.75	19	○
XMH-XDMT11-32-M16-4T	4	32	17	30	62	40		M16x2.05	24	○

● STOCKABLE ○ NON STOCKABLE

Parameters for XDMT 11 / 17 & Spare Parts

WORKPIECE MATERIALS	RECOMMENDED INSERT GRADES (CUTTING SPEED VC: M/MIN)		
	XT960	XT930-C	Xt840
ALLOY STEEL	-	100-160-200	100-140-180
STAINLESS STEEL	100-160-200	100-160-200	-
NODULAR CAST IRON	-	100-150-200	100-150 - 200
TITANIUM ALLOYS	40-60-80	30-50-70	-

INSERTS	SCREW SIZE	KEY	AVAILABILITY
XDMT11	M2.5x6	T8	●
XDMT17	M4X9	T15	●



SOLID CARBIDE

- XCUT Solid Carbide Series Covers Semi Finishing And Finishing Application
- Available in Standard Endmill & ballnose 2 Flutes, 4 Flutes, Multi Flutes as well as in ribs,
- Suitability for Tough Materials upto 62HRC

NOTES

SOLID CARBIDE INDEX

Solid Carbide	**327-389**
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SOLID CARBIDE INDEX

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4 Flute Corner Radius Endmill	384
Cutting Paramete	385-389

DH-S SERIES

Application

1. Finishing in Die and Mould
2. General Engineering Industries

Features

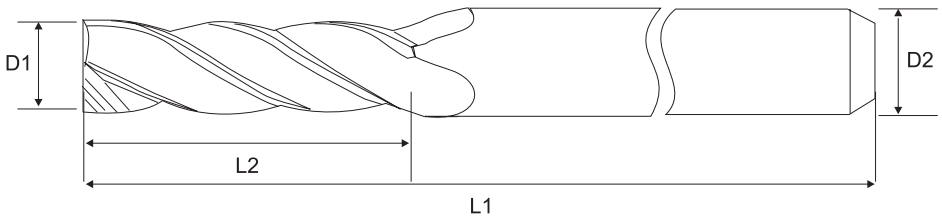
- Works on materials from 50-68 HrC
- Available in
  - -4 flute (standard and long lengths)
  - - 2 flute ballnose (standard and long lengths)
  - - 4 flute corner radius (standard and long lengths)
- Can compete with all competitors on performance

Benefits

- Works on Die and mould applications as well as stainless steels with high chromium content
- Higher helix and negative rake allows for smoother operation
- Can be even used with coolant as well for certain materials

DH-S SERIES

4 Flute Standard Endmills



ITEM DESCRIPTION	D1(DIA)	D2 (SHANK)	L2 (WL)	L1 (OAL)	AVAILABLITY
EM1N4D4DH-S	1	4	3	50	●
EM1N4F6DH-S	1	4	6	50	●
EM1.5N4D4DH-S	1.5	4	4	50	●
EM2.5N4D4DH-S	2.5	4	8	50	●
EM3N4DH-S	3	3	9	50	●
EM3N4D4DH-S	3	4	8	50	●
EM4N4DH-S	4	4	10	50	●
EM5N4DH-S	5	3	13	50	●
EM5N4D6DH-S	5	6	13	50	●
EM6N4DH-S	6	6	15	30	●
EM8N4DH-S	8	8	20	60	●
EM10N4DH-S	10	10	24	75	●
EM12N4DH-S	12	12	24	75	●
EM16N4DH-S	16	16	40	100	●

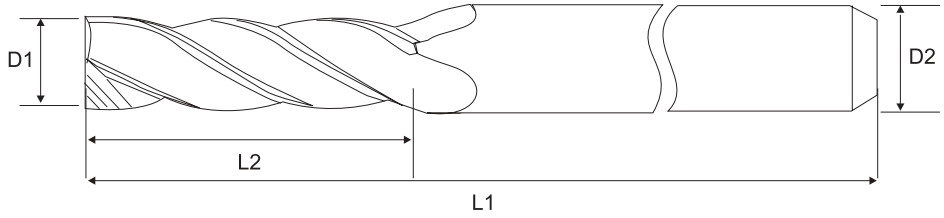


● STOCKABLE ○ NON STOCKABLE

MILLING

DH-S SERIES

4 Flute Square Long & Extra Long Endmills



ITEM DESCRIPTION	D1(DIA)	D2 (SHANK)	L2 (WL)	L1 (OAL)	AVAILABLITY
EM3L4D4DH-S	3	4	16	75	○
EM4L4DH-S	4	4	16	75	●
EM5L4D6DH-S	5	6	25	75	○
EM6L4DH-S	6	6	24	75	●
EM6LR4DH-S	6	6	24	100	●
EM6XL4DH-S	6	6	50	150	○
EM8L4DH-S	8	8	25	75	●
EM8LR4DH-S	8	8	32	100	●
EM8XL4DH-S	8	8	60	150	○
EM10LR4DH-S	10	10	40	100	●
EM10XL4DH-S	10	10	60	150	○
EM12LR4DH-S	12	12	40	100	●
EM12XL4DH-S	12	12	60	100	○
EM16XL4DH-S	16	16	60	150	○







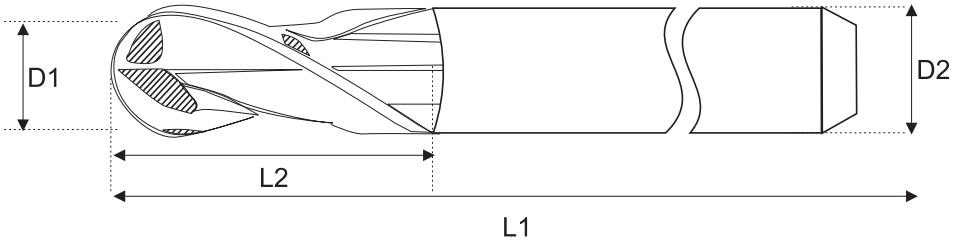






● STOCKABLE ○ NON STOCKABLE

DH-S SERIES
2 Flute Standard Ballnose



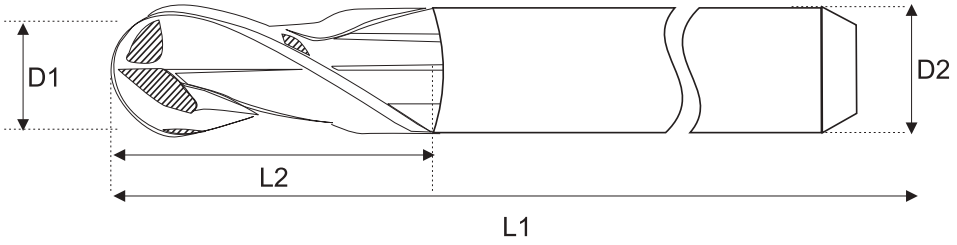
ITEM DESCRIPTION	D1(DIA)	D2 (SHANK)	L2 (WL)	L1 (OAL)	AVAILABLITY
BN0.8N2F6DH-S	R0.4	4	6	50	○
BN1N2D4DH-S	R0.5	4	2	50	●
BN1N2F6DH-S	R0.5	4	6	50	○
BN1N2F10DH-S	R0.5	4	10	50	○
BN1.5N2D4DH-S	R0.75	4	4	50	●
BN1.5N2F10DH-S	R0.75	4	10	50	○
BN1.5N2F12DH-S	R0.75	4	12	50	○
BN2N2D4DH-S	R1	4	4	50	●
BN2N2F10DH-S	R1	4	10	50	○
BN2N2F12DH-S	R1	4	12	50	○
BN2.5N2D4DH-S	R1.25	4	6	50	○
BN3N2D4DH-S	12	4	6	50	●
BN3N2F12DH-S	R1.5	4	12	50	○
BN3N2F20DH-S	R1.5	4	20	50	○
BN4N2DH-S	R2	4	8	50	●
BN4N2F20DH-S	R2	4	20	60	●
BN5N2D6DH-S	R2.5	6	10	50	●
BN6N2DH-S	R3	6	12	50	●
BN8N2DH-S	R4	8	16	60	●
BN10N2DH-S	R5	10	20	75	●
BN12N2DH-S	R6	12	25	75	●

TISI
MG
0.4 µm
Co 12%
HRC ▸60
2 flute

● STOCKABLE ○ NON STOCKABLE

MILLING

DH-S SERIES
2 Flute Long & Extra Long Ballnose



ITEM DESCRIPTION	D1(DIA)	D2 (SHANK)	L2 (WL)	L1 (OAL)	AVAILABLITY
BN3XL20D4DH-S	R1.5	4	8	100	○
BN4L2DH-S	R2	4	10	75	●
BN4XL2DH-S	R2	4	10	100	●
BN6L2H-S	R3	6	12	75	○
BN6LR2DH-S	R3	6	12	100	●
BN8L2DH-S	R4	8	16	75	○
BN8LR2DH-S	R4	8	16	100	●
BN10LR2DH-S	R5	10	20	100	●
BN12LR2DH-S	R6	12	24	100	●

● STOCKABLE ○ NON STOCKABLE





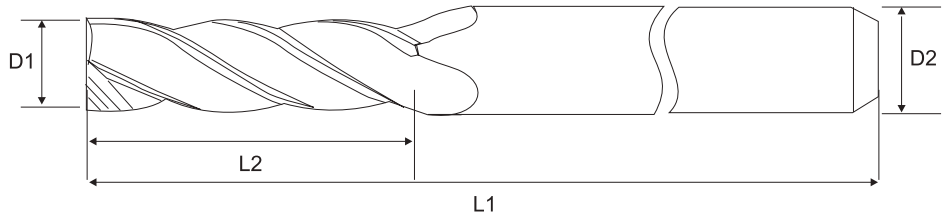








DH-S SERIES
4 Flute Corner Radius Standard Endmills



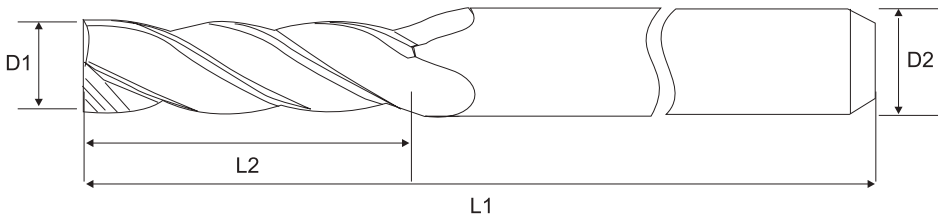
ITEM DESCRIPTION	D1(DIA)	D2 (SHANK)	L2 (WL)	L1 (OAL)	AVAILABLITY
EM3N4CR0.5D4DH-S	3R0.5	4	6	50	○
EM3N4CR1D4DH-S	381	4	6	50	○
EM4N4CR0.5DH-S	481.	4	8	50	○
EM4N4CR1DH-S	4R1	4	8	50	○
EM5N4CR0.5D6DH-S	5R0.5	6	10	50	○
EM5N4CR1D6DH-S	5R1	6	10	50	○
EM6N4CR0.5DH-S	6R0.5	6	12	50	●
EM6N4CR1DH-S	6R1	6	12	50	●
EM8N4CR0.5DH-S	SR0.5	8	16	60	●
EM8N4CR1DH-S	8R1	8	16	60	●
EM10N4CR0.5DH-S	10R0.5	10	20	75	●
EM10N4CR1DH-S	10R1	10	20	75	●
EM12N4CR0.5DH-S	12R0.5	12	24	75	●
EM12N4CR1DH-S	12R1	12	24	75	●

STOCKABLE ○ NON STOCKABLE

TISI
MG
0.4 µm
Co 12%
HRC ▸60
4 flute

MILLING

DH-S SERIES
4 Flute Corner Radius Long & Extra Long Endmills



ITEM DESCRIPTION	D1(DIA)	D2 (SHANK)	L2 (WL)	L1 (OAL)	AVAILABLITY
EM6L4CR0.5DH-S	6R0.5	6	20	75	○
EM6L4CR1DH-S	6R1	6	20	75	○
EM6LR4CR0.5DH-S	6R0.5	6	20	100	○
EM6LR4CR1DH-S	6R1	6	20	100	○
EM8L4CR0.5DH-S	8R0.5	8	20	75	○
EM8L4CR1DH-S	8R1	8	20	75	○
EM8LR4CR0.5DH-S	8R0.5	8	20	100	○
EM8LR4CR1DH-S	8R1	8	20	100	○
EM10L4CR0.5DH-S	10R0.5	10	20	100	●
EM10L4CR1DH-S	10R1	10	20	100	●
EM10XL4CR0.5DH-S	10R0.5	10	30	150	○
EM10XL4CR1DH-S	10R1	10	30	150	○
EM12L4CR0.5DH-S	12R0.5	12	24	100	●
EM12L4CR1DH-S	12R1	12	24	100	●
EM12XL4CR0.5DH-S	12R0.5	12	30	150	○
EM12XL4CR1DH-S	12R1	12	30	150	○

TISI
MG
0.4 µm
Co 12%
HRC ▸60
4 flute

● STOCKABLE ○ NON STOCKABLE

Cutting Parameter - Ballnose Standard

PROFILE MILLING	α ≤ 15°								
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
"HARDENED STEEL (55~62 HRC) AISI H13,AISI H13, AISI D2 SKH, SKS ETC"	M28	0.3	2	38.00	0.000 ~ 0.002	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 160
		0.4	2	50.00	0.000 ~ 0.002	≤0.05D(MAX0.5)	≤0.1D	40000	21 ~ 160
		0.8	2	101.00	0.002 ~ 0.004	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 320
		0.8	2	101.00	0.002 ~ 0.004	≤0.05D(MAX0.5)	≤0.1D	40000	161 ~ 320
		1.0	2	126.00	0.003 ~ 0.005	≤0.05D(MAX0.5)	≤0.1D	40000	240 ~ 400
		1.5	2	187 ~ 188	0.005 ~ 0.007	≤0.05D(MAX0.5)	≤0.1D	39790 ~ 40000	400 ~ 560
		2.0	2	187 ~ 251	0.008 ~ 0.010	≤0.05D(MAX0.5)	≤0.2D	29790 ~ 40000	480 ~ 800
		2.5	2	187 ~ 281	0.010 ~ 0.012	≤0.05D(MAX0.5)	≤0.2D	23840 ~35750	480 ~ 860
		3	2	187 ~ 281	0.012 ~ 0.015	≤0.05D(MAX0.5)	≤0.2D	19860 ~ 29790	480 ~ 890
		4	2	187 ~ 281	0.017 ~ 0.019	≤0.05D(MAX0.5)	≤0.2D	14900 ~ 22350	510 ~ 850
		5	2	187 ~ 281	0.021 ~ 0.024	≤0.05D(MAX0.5)	≤0.2D	11920 ~ 17880	500 ~ 860
		6	2	187 ~ 281	0.026 ~ 0.029	≤0.05D(MAX0.5)	≤0.2D	9930 ~ 14900	520 ~ 860
		8	2	187 ~ 281	0.033 ~ 0.036	≤0.05D(MAX0.5)	≤0.2D	7450 ~ 11170	490 ~ 800
		10	2	187 ~ 281	0.039 ~ 0.043	≤0.05D(MAX0.5)	≤0.2D	5960 ~ 8940	460 ~ 770
		12	2	187 ~ 281	0.045 ~ 0.050	≤0.05D(MAX0.5)	≤0.2D	4970 ~ 7450	450 ~ 750
		14	2	187 ~ 281	0.052 ~ 0.057	≤0.05D(MAX0.5)	≤0.2D	4260 ~ 6380	440 ~ 730
		16	2	187 ~ 281	0.058 ~ 0.064	≤0.05D(MAX0.5)	≤0.2D	3720 ~ 5590	430 ~ 720
		18	2	187 ~ 281	0.065 ~ 0.071	≤0.05D(MAX0.5)	≤0.2D	3310 ~ 4970	430 ~ 710
		20	2	187 ~ 281	0.071 ~ 0.078	≤0.05D(MAX0.5)	≤0.2D	2980 ~ 4470	420 ~ 700

PROFILE MILLING	α > 15°								
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL(55 ~ 62 HRC). AISI H13, AISI D2 SKH, SKS ETC	M28	0.3	2	38.00	0.000 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.4	2	50.00	0.000 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 160
		0.8	2	101.00	0.002 ~ 0.003	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 240
		0.8	2	101.00	0.002 ~ 0.003	≤0.05D(MAX0.5)	≤0.1D	40000	160 ^ 240
		1.0	2	126.00	0.002 ~ 0.004	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 320
		1.5	2	175 ~ 188	0.004 ~ 0.006	≤0.05D(MAX0.5)	≤0.1D	37080 ~ 40000	300 ~ 480
		2.0	2	175 ~ 251	0.006 ~ 0.008	≤0.05D(MAX0.5)	≤0.2D	27810 ~ 40000	330 ~ 640
		2.5	2	175 ~ 262	0.008 ~ 0.010	≤0.05D(MAX0.5)	≤0.2D	22250 ~ 33370	360 ~ 670
		3	2	175 ~ 262	0.010 ~ 0.012	≤0.05D(MAX0.5)	≤0.2D	18540 ~ 27810	370 ~ 670
		4	2	175 ~ 262	0.013 ~ 0.015	≤0.05D(MAX0.5)	≤0.2D	13900 ~ 20860	360 ~ 630
		5	2	175 ~ 262	0.017 ~ 0.019	≤0.05D(MAX0.5)	≤0.2D	11120 ~ 16680	380 ~ 630
		6	2	175 ~ 262	0.021 ~ 0.023	≤0.05D(MAX0.5)	≤0.2D	9270 ~ 13900	390 ~ 640
		8	2	175 ~ 262	0.026 ~ 0.029	≤0.05D(MAX0.5)	≤0.2D	6950 ~ 10430	360 ~ 600
		10	2	175 ~ 262	0.031 ~ 0.034	≤0.05D(MAX0.5)	≤0.2D	5560 ~ 8340	340 ~ 570
		12	2	175 ~ 262	0.036 ~ 0.040	≤0.05D(MAX0.5)	≤0.2D	4630 ~ 6950	330 ~ 560
		14	2	175 ~ 262	0.041 ~ 0.046	≤0.05D(MAX0.5)	≤0.2D	3970 ~ 5960	330 ~ 550
		16	2	175 ~ 262	0.047 ~ 0.051	≤0.05D(MAX0.5)	≤0.2D	3480 ~ 5210	330 ~ 530
		18	2	175 ~ 262	0.052 ~ 0.057	≤0.05D(MAX0.5)	≤0.2D	3090 ~ 4630	320 ~ 530
		20	2	175 ~ 262	0.057 ~ 0.063	≤0.05D(MAX0.5)	≤0.2D	2780 ~ 4170	320 ~ 530

Cutting Parameter - Ballnose Standard

PROFILE MILLING	α ≤ 15°								
MATERIAL	MATERIAL GROUPS	01 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
"HARDENED STEEL (55~62 HRC) AISI H13,AISI H13, AISI D2 SKH, SKS ETC"	M28	0.3	2	38.00	0.000 ~ 0.000	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.4	2	50.00	0.000 ~ 0.000	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.8	2	101.00	0.000 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.8	2	101.00	0.000 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		1.0	2	126.00	0.001 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		1.5	2	140 ~ 188	0.002 ~ 0.002	≤0.05D(MAX0.5)	≤0.1D	29790 ~ 40000	120 ~ 160
		2.0	2	140 ~ 234	0.002 ~ 0.002	≤0.05D(MAX0.5)	≤0.2D	22350 ~ 37240	90 ~ 220
		2.5	2	140 ~ 234	0.003 ~ 0.004	≤0.05D(MAX0.5)	≤0.2D	17880 ~ 29790	110 ~ 240
		3	2	140 ~ 234	0.004 ~ 0.005	≤0.05D(MAX0.5)	≤0.2D	14900 ~ 24830	120 ~ 250
		4	2	140 ~ 234	0.006 ~ 0.006	≤0.05D(MAX0.5)	≤0.2D	11170 ~ 18620	130 ~ 220
		5	2	140 ~ 234	0.007 ~ 0.008	≤0.05D(MAX0.5)	≤0.2D	8940 ~ 14900	130 ~ 240
		6	2	140 ~ 234	0.009 ~ 0.010	≤0.05D(MAX0.5)	≤0.2D	7450 ~ 12410	130 ~ 250
		8	2	140 ~ 234	0.011 ~ 0.012	≤0.05D(MAX0.5)	≤0.2D	5590 ~ 9310	120 ~ 220
		10	2	140 ~ 234	0.013 ~ 0.014	≤0.05D(MAX0.5)	≤0.2D	4470 ~ 7450	120 ~ 220
		12	2	140 ~ 234	0.015 ~ 0.017	≤0.05D(MAX0.5)	≤0.2D	3720 ~ 6210	120 ~ 210
		14	2	140 ~ 234	0.017 ~ 0.019	≤0.05D(MAX0.5)	≤0.2D	3190 ~ 5320	110 ~ 210
		16	2	140 ~ 234	0.019 ~ 0.021	≤0.05D(MAX0.5)	≤0.2D	3190 ~ 5320	110 ~ 200
		18	2	140 ~ 234	0.022 ~ 0.024	≤0.05D(MAX0.5)	≤0.2D	2480 ~ 4140	110 ~ 200
		20	2	140 ~ 234	0.024 ~ 0.026	≤0.05D(MAX0.5)	≤0.2D	2230 ~ 3720	110 ~ 190

PROFILE MILLING	α > 15°								
MATERIAL	MATERIAL GROUPS	01 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL (55 ~ 60 HRC) AISI D2	M33	0.3	2	38.00	0.000 ~ 0.000	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.4	2	50.00	0.000 ~ 0.000	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.8	2	101.00	0.000 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.8	2	101.00	0.000 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		1.0	2	126.00	0.001 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		1.5	2	131 ~ 188	0.001 ~ 0.002	≤0.05D(MAX0.5)	≤0.1D	27810 ~ 40000	60 ~ 160
		2.0	2	131 ~ 218	0.002 ~ 0.002	≤0.05D(MAX0.5)	≤0.2D	20860 ~ 34760	80 ~ 140
		2.5	2	131 ~ 218	0.002 ~ 0.003	≤0.05D(MAX0.5)	≤0.2D	16680 ~ 27810	70 ~ 170
		3	2	131 ~ 218	0.003 ~ 0.004	≤0.05D(MAX0.5)	≤0.2D	13900 ~ 23170	80 ~ 190
		4	2	131 ~ 218	0.004 ~ 0.005	≤0.05D(MAX0.5)	≤0.2D	10430 ~ 17380	80 ~ 170
		5	2	131 ~ 218	0.006 ~ 0.006	≤0.05D(MAX0.5)	≤0.2D	8340 ~ 13900	100 ~ 170
		6	2	131 ~ 218	0.007 ~ 0.008	≤0.05D(MAX0.5)	≤0.2D	6950 ~ 11590	100 ~ 190
		8	2	131 ~ 218	0.009 ~ 0.010	≤0.05D(MAX0.5)	≤0.2D	5210 ~ 8690	90 ~ 170
		10	2	131 ~ 218	0.010 ~ 0.011	≤0.05D(MAX0.5)	≤0.2D	4170 ~ 6950	80 ~ 150
		12	2	131 ~ 218	0.012 ~ 0.013	≤0.05D(MAX0.5)	≤0.2D	3480 ~ 5790	80 ~ 150
		14	2	131 ~ 219	0.014 ~ 0.015	≤0.05D(MAX0.5)	≤0.2D	2980 ~ 4970	80 ~ 150
		16	2	131 ~ 218	0.016 ~ 0.017	≤0.05D(MAX0.5)	≤0.2D	2610 ~ 4340	80 ~ 150
		18	2	131 ~ 218	0.017 ~ 0.019	≤0.05D(MAX0.5)	≤0.2D	2320 ~ 3860	80 ~ 150
		20	2	131 ~ 219	0.019 ~ 0.021	≤0.05D(MAX0.5)	≤0.2D	2090 ~ 3480	80 ~ 150

Cutting Parameter - Ballnose Long

PROFILE MILLING	α < 15°								
MATERIAL	MATERIAL GROUPS	01 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL (45 ~ 52 HRC), AISI H13, AISI D2, SUS 420 ETC	M26,27	0.3	2	38.00	0.001 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.4	2	50.00	0.000 ~ 0.002	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 160
		0.8	2	101	0.002 ~ 0.005	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 400
		0.8	2	101	0.002 ~ 0.005	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 400
		1.0	2	126	0.004 ~ 0.006	≤0.05D(MAX0.5)	≤0.1D	40000	320 ~ 480
		1.5	2	187 ~ 188	0.007 ~ 0.009	≤0.05D(MAX0.5)	≤0.1D	39730 ~ 40000	560 ~ 720
		2.0	2	187 ~ 251	0.010 ~ 0.012	≤0.05D(MAX0.5)	≤0.2D	29790 ~ 40000	600 ~ 960
		2.5	2	187 ~ 262	0.013 ~ 0.016	≤0.05D(MAX0.5)	≤0.2D	23840 ~ 33370	620 ~ 1070
		3	2	187 ~ 262	0.016 ~ 0.019	≤0.05D(MAX0.5)	≤0.2D	19860 ~ 27810	640 ~ 1060
		4	2	187 ~ 262	0.022 ~ 0.025	≤0.05D(MAX0.5)	≤0.2D	14900 ~ 20860	660 ~ 1040
		5	2	187 ~ 262	0.029 ~ 0.032	≤0.05D(MAX0.5)	≤0.2D	11920 ~ 16680	690 ~ 1070
		6	2	187 ~ 262	0.035 ~ 0.038	≤0.05D(MAX0.5)	≤0.2D	9930 ~ 13900	700 ~ 1060
		8	2	187 ~ 262	0.043 ~ 0.048	≤0.05D(MAX0.5)	≤0.2D	7450 ~ 10430	640 ~ 1000
		10	2	187 ~ 262	0.052 ~ 0.057	≤0.05D(MAX0.5)	≤0.2D	5960 ~ 8340	620 ~ 950
		12	2	187 ~ 262	0.061 ~ 0.067	≤0.05D(MAX0.5)	≤0.2D	4970 ~ 6950	610 ~ 930
		14	2	187 ~ 262	0.069 ~ 0.076	≤0.05D(MAX0.5)	≤0.2D	4260 ~ 5960	590 ~ 910
		16	2	187 ~ 262	0.078 ~ 0.085	≤0.05D(MAX0.5)	≤0.2D	3720 ~ 5210	580 ~ 890
		18	2	187 ~ 262	0.086 ~ 0.095	≤0.05D(MAX0.5)	≤0.2D	3310 ~ 4630	570 ~ 880
		20	2	187 ~ 162	0095 ~ 0.104	≤0.05D(MAX0.5)	≤0.2D	2980 ~ 4170	570 ~ 870

PROFILE MILLING	α ≥ 15°								
MATERIAL	MATERIAL GROUPS	01 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL (45 ~ 52 HRC), AISI H13, AISI D2, SUS 420 ETC	M26,27	0.3	2	38.00	0.001 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.4	2	50.00	0.000 ~ 0.002	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 160
		0.8	2	101.00	0.002 ~ 0.004	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 320
		0.8	2	101.00	0.002 ~ 0.004	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 320
		1.0	2	126.00	0.003 ~ 0.005	≤0.05D(MAX0.5)	≤0.1D	40000	240 ~ 400
		1.5	2	175 ~ 188	0.005 ~ 0.007	≤0.05D(MAX0.5)	≤0.1D	37080 ~ 40000	370 ~ 560
		2.0	2	175 ~ 245	0.008 ~ 0.010	≤0.05D(MAX0.5)	≤0.2D	27810 ~ 38930	440 ~ 780
		2.5	2	175 ~ 245	0.010 ~ 0.012	≤0.05D(MAX0.5)	≤0.2D	22250 ~ 31140	450 ~ 750
		3	2	175 ~ 245	0.013 ~ 0.015	≤0.05D(MAX0.5)	≤0.2D	18540 ~ 25950	480 ~ 780
		4	2	175 ~ 245	0.018 ~ 0.020	≤0.05D(MAX0.5)	≤0.2D	13900 ~ 19470	500 ~ 780
		5	2	175 ~ 245	0.023 ~ 0.025	≤0.05D(MAX0.5)	≤0.2D	11120 ~ 15570	510 ~ 780
		6	2	175 ~ 245	0.028 ~ 0.031	≤0.05D(MAX0.5)	≤0.2D	9270 ~ 12980	520 ~ 800
		8	2	175 ~ 245	0.035 ~ 0.038	≤0.05D(MAX0.5)	≤0.2D	6950 ~ 9730	490 ~ 740
		10	2	175 ~ 245	0.042 ~ 0.046	≤0.05D(MAX0.5)	≤0.2D	5560 ~ 7790	470 ~ 720
		12	2	175 ~ 245	0.048 ~ 0.053	≤0.05D(MAX0.5)	≤0.2D	4630 ~ 6490	440 ~ 690
		14	2	175 ~ 245	0.055 ~ 0.061	≤0.05D(MAX0.5)	≤0.2D	3970 ~ 5560	440 ~ 680
		16	2	175 ~ 245	0.062 ~ 0.068	≤0.05D(MAX0.5)	≤0.2D	3480 ~ 4870	430 ~ 660
		18	2	175 ~ 245	0.069 ~ 0.076	≤0.05D(MAX0.5)	≤0.2D	3090 ~ 4330	430 ~ 660
		20	2	175 ~ 245	0.076 ~ 0.083	≤0.05D(MAX0.5)	≤0.2D	2780 ~ 3890	420 ~ 650

Cutting Parameter - Ballnose Long

PROFILE MILLING	α < 15°								
MATERIAL	MATERIAL GROUPS	01 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL 152 63 HRC) AISI H13, AISI D2, SUS 420 ETC	M28	0.3	2	38.00	0.000 ~ 0.002	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 160
		0.4	2	50	0.000 ~ 0.002	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 160
		0.8	2	101	0.002 ~ 0.004	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 320
		0.8	2	101	0.002 ~ 0.004	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 320
		1	2	126	0.003 ~ 0.005	≤0.05D(MAX0.5)	≤0.1D	40000	240 ~ 400
		1.5	2	150 ~ 188	0.005 ~ 0.007	≤0.05D(MAX0.5)	≤0.1D	31780 ~ 40000	320 ~ 560
		2	2	150 ~ 188	0.008 ~ 0.010	≤0.05D(MAX0.5)	≤0.2D	23840 ~ 35750	380 ~ 720
		2.5	2	150 ~ 188	0.010 ~ 0.012	≤0.05D(MAX0.5)	≤0.2D	19070 ~ 28600	380 ~ 690
		3	2	150 ~ 188	0.012 ~ 0.015	≤0.05D(MAX0.5)	≤0.2D	15890 ~ 23840	380 ~ 720
		4	2	150 ~ 188	0.017 ~ 0.019	≤0.05D(MAX0.5)	≤0.2D	11920 ~ 17880	410 ~ 680
		5	2	150 ~ 188	0.021 ~ 0.024	≤0.05D(MAX0.5)	≤0.2D	9530 ~ 14300	400 ~ 690
		6	2	150 ~ 188	0.026 ~ 0.029	≤0.05D(MAX0.5)	≤0.2D	7950 ~11920	410 ~ 690
		8	2	150 ~ 188	0.033 ~ 0.036	≤0.05D(MAX0.5)	≤0.2D	5960 ~ 8940	390 ~ 640
		10	2	150 ~ 188	0.039 ~ 0.043	≤0.05D(MAX0.5)	≤0.2D	4770 ~ 7150	370 ~ 610
		12	2	150 ~ 188	0.045 ~ 0.050	≤0.05D(MAX0.5)	≤0.2D	3970 ~ 5960	360 ~ 600
		14	2	150 ~ 188	0.052 ~ 0.057	≤0.05D(MAX0.5)	≤0.2D	3410 ~ 5110	350 ~ 580
		16	2	150 ~ 188	0 058 ~ 0.064	≤0.05D(MAX0.5)	≤0.2D	2980 ~ 4470	350 ~ 570
		18	2	150 ~ 224	0.065 ~ 0.071	≤0.05D(MAX0.5)	≤0.2D	2650 ~ 3970	340 ~ 560
		20	2	150 ~ 188	0.071 ~ 0.078	≤0.05D(MAX0.5)	≤0.2D	2380 ~ 3580	340 ~ 560

PROFILE MILLING	α ≥ 15°								
MATERIAL	MATERIAL GROUPS	01 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL (52 ~ 63 HRC) AISI H13, AISI D2, SKH ETC	M28	0.3	2	38.00	0.000 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.4	2	50.00	0.000 ~ 0.002	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 160
		0.8	2	101.00	0.002 ~ 0.004	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 240
		0.8	2	101.00	0.002 ~ 0.004	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 240
		1.0	2	126.00	0.003 ~ 0.005	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 320
		1.5	2	175 ~ 188	0.005 ~ 0.007	≤0.05D(MAX0.5)	≤0.1D	29660 ~ 40000	240 ~ 480
		2.0	2	175 ~ 245	0.008 ~ 0.010	≤0.05D(MAX0.5)	≤0.2D	22250 ~ 33370	270 ~ 530
		2.5	2	175 ~ 245	0.010 ~ 0.012	≤0.05D(MAX0.5)	≤0.2D	17800 ~ 26700	280 ~ 530
		3	2	175 ~ 245	0.013 ~ 0.015	≤0.05D(MAX0.5)	≤0.2D	14830 ~ 22250	300 ~ 530
		4	2	175 ~ 245	0.018 ~ 0.020	≤0.05D(MAX0.5)	≤0.2D	11120 ~ 16680	290 ~ 500
		5	2	175 ~ 245	0.023 ~ 0.025	≤0.05D(MAX0.5)	≤0.2D	8900 ~ 13350	300 ~ 510
		6	2	175 ~ 245	0.028 ~ 0.031	≤0.05D(MAX0.5)	≤0.2D	7420 ~ 11120	310 ~ 510
		8	2	175 ~ 245	0.035 ~ 0.038	≤0.05D(MAX0.5)	≤0.2D	5560 ~ 8340	290 ~ 480
		10	2	175 ~ 245	0.042 ~ 0.046	≤0.05D(MAX0.5)	≤0.2D	4450 ~ 6670	280 ~ 450
		12	2	175 ~ 245	0.048 ~ 0.053	≤0.05D(MAX0.5)	≤0.2D	3710 ~ 5560	270 ~ 440
		14	2	175 ~ 245	0.055 ~ 0.061	≤0.05D(MAX0.5)	≤0.2D	3180 ~ 4770	260 ~ 440
		16	2	175 ~ 245	0.062 ~ 0.068	≤0.05D(MAX0.5)	≤0.2D	2780 ~ 4170	260 ~ 430
		18	2	175 ~ 245	0.069 ~ 0.076	≤0.05D(MAX0.5)	≤0.2D	2470 ~ 3710	260 ~ 420
		20	2	175 ~ 245	0.076 ~ 0.083	≤0.05D(MAX0.5)	≤0.2D	2220 ~ 3340	250 ~ 420

Cutting Parameter - Ballnose Long

PROFILE MILLING		α < 15°							
MATERIAL	MATERIAL GROUPS	01 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL (55-60 HRC) AISI D2	M33	0.3	2	38	0. 000 ~ 0.000	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.4	2	50	0.000 ~ 0.000	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.8	2	101	0 000 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.8	2	101	0.000 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		1	2	112 ~ 126	0.0001 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	35750 ~ 40030	70 ~ 80
		1.5	2	112 ~ 187	0.002 ~ 0.002	≤0.05D(MAX0.5)	≤0.1D	23840 ~ 39730	100 ~ 160
		2	2	112 ~ 187	0.002 ~ 0.003	≤0.05D(MAX0.5)	≤0.2D	17880 ~ 29790	70 ~ 180
		2.5	2	112 ~ 187	0.003 ~ 0.004	≤0.05D(MAX0.5)	≤0.2D	14300 ~ 23840	90 ~ 190
		3	2	112 ~ 187	0.004 ~ 0.005	≤0.05D(MAX0.5)	≤0.2D	11920 ~ 19860	100 ~ 200
		4	2	112 ~ 187	0.006 ~ 0.006	≤0.05D(MAX0.5)	≤0.2D	8940 ~ 14900	110 ~ 180
		5	2	112 ~ 187	0.007 ~ 0.008	≤0.05D(MAX0.5)	≤0.2D	7150 ~ 11920	100 ~ 190
		6	2	112 ~ 187	0.009 ~ 0.010	≤0.05D(MAX0.5)	≤0.2D	5960 ~ 9930	110 ~ 110
		8	2	112 ~ 187	0.011 ~ 0.012	≤0.05D(MAX0.5)	≤0.2D	4470 ~ 7450	100 ~ 180
		10	2	112 ~ 187	0.013 ~ 0.014	≤0.05D(MAX0.5)	≤0.2D	3580 ~ 5960	90 ~ 170
		12	2	112 ~ 187	0.015 ~ 0.017	≤0.05D(MAX0.5)	≤0.2D	2980 ~ 4970	90 ~ 170
		14	2	112 ~ 187	0.017 ~ 0.019	≤0.05D(MAX0.5)	≤0.2D	2550 ~ 4260	90 ~ 160
		16	2	112 ~ 187	0.019 ~ 0.021	≤0.05D(MAX0.5)	≤0.2D	2230 ~ 3720	80 ~ 160
		18	2	113 ~ 187	0.022 ~ 0.024	≤0.05D(MAX0.5)	≤0.2D	1990 ~ 3310	90 ~ 160
		20	2	112 ~ 187	0.024 ~ 0.026	≤0.05D(MAX0.5)	≤0.2D	1790 ~ 2980	90 ~ 150

PROFILE MILLING		α < 15°							
MATERIAL	MATERIAL GROUPS	01 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL (55-60 HRC) AISI D2	M33	0.3	2	38	0.000 ~ 0.000	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.4	2	50	0.000 ~ 0.000	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.8	2	101	0.000 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.8	2	101	0.000 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		1	2	105 ~ 126	0.001 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	33370 ~ 40303	70 ~ 80
		1.5	2	105 ~ 175	0.001 ~ 0.002	≤0.05D(MAX0.5)	≤0.1D	22250 ~ 37080	40 ~ 150
		2	2	105 ~ 175	0.002 ~ 0.002	≤0.05D(MAX0.5)	≤0.2D	16680 ~ 27810	70 ~ 110
		2.5	2	105 ~ 175	0.002 ~ 0.003	≤0.05D(MAX0.5)	≤0.2D	13350 ~ 22250	50 ~ 130
		3	2	105 ~ 175	0.003 ~ 0.004	≤0.05D(MAX0.5)	≤0.2D	11120 ~ 18540	70~ 150
		4	2	105 ~ 175	0.004 ~ 0.005	≤0.05D(MAX0.5)	≤0.2D	8340 ~ 13900	70~ 140
		5	2	105 ~ 175	0.006 ~ 0.006	≤0.05D(MAX0.5)	≤0.2D	6670 ~ 11120	80 ~ 130
		6	2	105 ~ 175	0.007 ~ 0.008	≤0.05D(MAX0.5)	≤0.2D	5560 ~ 9270	80 ~ 150
		8	2	105 ~ 175	0.009 ~ 0.010	≤0.05D(MAX0.5)	≤0.2D	4170 ~ 6950	80 ~ 140
		10	2	105 ~ 175	0.010 ~ 0.011	≤0.05D(MAX0.5)	≤0.2D	3340 ~ 5560	70~ 120
		12	2	105 ~ 175	0.012 ~ 0.013	≤0.05D(MAX0.5)	≤0.2D	2780 ~ 4630	70 ~ 120
		14	2	105 ~ 175	0.014 ~ 0.015	≤0.05D(MAX0.5)	≤0.2D	2380 ~ 3970	70 ~ 120
		16	2	105 ~ 175	0.016 ~ 0.017	≤0.05D(MAX0.5)	≤0.2D	2090 ~ 3480	70 ~ 120
		18	2	105 ~ 175	0.017 ~ 0.019	≤0.05D(MAX0.5)	≤0.2D	1850 ~ 3090	60 ~ 120
		20	2	105 ~ 175	0.019 ~ 0.021	≤0.05D(MAX0.5)	≤0.2D	1670 ~ 2780	60 ~ 120

Cutting Parameter - Ballnose Extralong

PROFILE MILLING		α < 15°							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL (45 ~ 52 HRC), AISI H13, AISI D2, SUS 420 ETC	M28	0.3	2	38	-0.001 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.4	2	50	0.000 ~ 0.002	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 160
		0.8	2	101	0.002 ~ 0.005	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 400
		0.8	2	101	0.002 ~ 0.005	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 400
		1	2	117 ~ 126	0.004 ~ 0.006	≤0.05D(MAX0.5)	≤0.1D	35750 ~ 40030	300 ~ 480
		1.5	2	117 ~ 164	0.007 ~ 0.009	≤0.05D(MAX0.5)	≤0.1D	23840 ~ 39730	350 ~ 630
		2	2	117 ~ 164	0.010 ~ 0.012	≤0.05D(MAX0.5)	≤0.2D	17880 ~ 29790	370 ~ 630
		2.5	2	117 ~ 164	0.013 ~ 0.016	≤0.05D(MAX0.5)	≤0.2D	14300 ~ 23840	390 ~ 670
		3	2	117 ~ 164	0.016 ~ 0.019	≤0.05D(MAX0.5)	≤0.2D	11920 ~ 19860	400 ~ 660
		4	2	117 ~ 164	0.022 ~ 0.025	≤0.05D(MAX0.5)	≤0.2D	8940 ~ 14900	410 ~ 650
		5	2	117 ~ 164	0.029 ~ 0.032	≤0.05D(MAX0.5)	≤0.2D	7150 ~ 11920	430 ~ 670
		6	2	117 ~ 164	0.035 ~ 0.038	≤0.05D(MAX0.5)	≤0.2D	5960 ~ 9930	430 ~ 660
		8	2	117 ~ 164	0.043 ~ 0.048	≤0.05D(MAX0.5)	≤0.2D	4470 ~ 7450	400 ~ 630
		10	2	117 ~ 164	0.052 ~ 0.057	≤0.05D(MAX0.5)	≤0.2D	3580 ~ 5960	390 ~ 590
		12	2	117 ~ 164	0.061 ~ 0.067	≤0.05D(MAX0.5)	≤0.2D	2980 ~ 4970	380 ~ 580
		14	2	117 ~ 164	0.069 ~ 0.076	≤0.05D(MAX0.5)	≤0.2D	2550 ~ 4260	370 ~ 570
		16	2	117 ~ 164	0.078 ~ 0.085	≤0.05D(MAX0.5)	≤0.2D	2230 ~ 3720	360 ~ 550
		18	2	117 ~ 164	0.086 ~ 0.095	≤0.05D(MAX0.5)	≤0.2D	1990 ~ 3310	360 ~ 550
		20	2	117 ~ 164	0.095 ~ 0.104	≤0.05D(MAX0.5)	≤0.2D	1790 ~ 2980	350 ~ 540

PROFILE MILLING		α < 15°							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL (45 ~ 52 HRC), AISI H13, AISI D2, SUS 420 ETC	M26,27	0.3	2	38	0001 ~ 0001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.4	2	50	0000 ~ 0.002	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 160
		0.8	2	101	0.002 ~ 0.004	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 320
		0.8	2	101	0.002 ~ 0.004	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 320
		1	2	109 ~ 126	0.003 ~ 0.005	≤0.05D(MAX0.5)	≤0.1D	34760 ~ 40000	210 ~ 400
		1.5	2	109 ~ 153	0.005 ~ 0.007	≤0.05D(MAX0.5)	≤0.1D	23170 ~ 32440	230 ~ 450
		2	2	109 ~ 153	0.008 ~ 0.010	≤0.05D(MAX0.5)	≤0.2D	17380 ~ 24330	280 ~ 490
		2.5	2	109 ~ 153	0.010 ~ 0.012	≤0.05D(MAX0.5)	≤0.2D	13900 ~ 19471	280 ~ 470
		3	2	109 ~ 153	0.013 ~ 0.015	≤0.05D(MAX0.5)	≤0.2D	11590 ~ 16220	300 ~ 490
		4	2	109 ~ 153	0.018 ~ 0.020	≤0.05D(MAX0.5)	≤0.2D	8690 ~ 12170	310 ~ 490
		5	2	109 ~ 153	0.023 ~ 0.025	≤0.05D(MAX0.5)	≤0.2D	6950 ~ 9730	320 ~ 490
		6	2	109 ~ 153	0.028 ~ 0.031	≤0.05D(MAX0.5)	≤0.2D	5790 ~ 8110	320 ~ 500
		8	2	109 ~ 153	0.035 ~ 0.018	≤0.05D(MAX0.5)	≤0.2D	4340 ~ 6080	300 ~ 460
		10	2	109 ~ 153	0.042 ~ 0.046	≤0.05D(MAX0.5)	≤0.2D	3480 ~ 4870	290 ~ 450
		12	2	109 ~ 153	0.048 ~ 0.053	≤0.05D(MAX0.5)	≤0.2D	2900 ~ 4060	280 ~ 430
		14	2	109 ~ 153	0.055 ~ 0.061	≤0.05D(MAX0.5)	≤0.2D	2480 ~ 3480	270 ~ 420
		16	2	109 ~ 153	0.062 ~ 0.068	≤0.05D(MAX0.5)	≤0.2D	2170 ~ 3040	270 ~ 410
		18	2	109 ~ 153	0.069 ~ 0.076	≤0.05D(MAX0.5)	≤0.2D	1930 ~ 2700	270 ~ 410
		20	2	109 ~ 153	0.076 ~ 0.083	≤0.05D(MAX0.5)	≤0.2D	3740 ~ 2430	260 ~ 400

Cutting Parameter - Ballnose Extralong

PROFILE MILLING		α < 15°							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL (52 ~ 63 HRC) AISI H13, AISI D2, SKH ETC	M28	0.3	2	38	0.000 ~ 0.002	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 160
		0.4	2	50	0.000 ~ 0.002	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 160
		0.8	2	94 ~ 101	0.002 ~ 0.004	≤0.05D(MAX0.5)	≤0.1D	37240 ~ 40000	150 ~ 320
		0.8	2	94 ~ 101	0.002 ~ 0.004	≤0.05D(MAX0.5)	≤0.1D	37240 ~ 40000	150 ~ 320
		1	2	94 ~ 126	0.003 ~ 0.005	≤0.05D(MAX0.5)	≤0.1D	29790 ~ 40000	180~ 400
		1.5	2	94 ~ 140	0.005 ~ 0.007	≤0.05D(MAX0.5)	≤0.1D	19860 ~ 29790	200 ~ 420
		2	2	94 ~ 140	0.008 ~ 0.010	≤0.05D(MAX0.5)	≤0.2D	14903 ~ 22350	240 ~ 450
		2.5	2	94 ~ 140	0.010 ~ 0.012	≤0.05D(MAX0.5)	≤0.2D	11920 ~ 17880	240 ~ 430
		3	2	94 ~ 140	0.012 ~ 0.015	≤0.05D(MAX0.5)	≤0.2D	9930 ~ 14900	240 ~ 450
		4	2	94 ~ 140	0.017 ~ 0.019	≤0.05D(MAX0.5)	≤0.2D	7450 ~ 11170	250 ~ 420
		5	2	94 ~ 140	0.021 ~ 0.024	≤0.05D(MAX0.5)	≤0.2D	5960 ~ 8940	250 ~ 430
		6	2	94 ~ 140	0.026 ~ 0.029	≤0.05D(MAX0.5)	≤0.2D	4970 ~ 7450	260 ~ 430
		8	2	94 ~ 140	0.033 ~ 0.036	≤0.05D(MAX0.5)	≤0.2D	3720 ~ 5590	250 ~ 400
		10	2	94 ~ 140	0.039 ~ 0.043	≤0.05D(MAX0.5)	≤0.2D	2980 ~ 4470	230 ~ 380
		12	2	94 ~ 140	0.045 ~ 0.050	≤0.05D(MAX0.5)	≤0.2D	2480 ~ 3720	220 ~ 370
		14	2	94 ~ 140	0.052 ~ 0.057	≤0.05D(MAX0.5)	≤0.2D	2130 ~ 3190	220 ~ 360
		16	2	94 ~ 140	0.068 ~ 0.064	≤0.05D(MAX0.5)	≤0.2D	1860 ~ 2790	220 ~ 360
		18	2	94 ~ 140	0.065 ~ 0.071	≤0.05D(MAX0.5)	≤0.2D	1660 ~ 2480	220 ~ 350
		20	2	94 ~ 140	0.071 ~ 0.078	≤0.05D(MAX0.5)	≤0.2D	1490 ~ 2230	210 ~ 350

Cutting Parameter - Ballnose Extralong

PROFILE MILLING		α < 15°							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL (55-60 HRC) AISI D2	M33	0.3	2	38	0.000 ~ 0.000	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.4	2	50	0.000 ~ 0.000	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.8	2	70 ~ 101	0.000 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	27930 ~ 40000	20 ~ 80
		0.8	2	70 ~ 101	0.000 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	27930 ~ 40000	20 ~ 80
		1	2	70 ~ 117	0.001 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	22350 ~ 37240	40 ~ 70
		1.5	2	70 ~ 117	0.002 ~ 0.002	≤0.05D(MAX0.5)	≤0.1D	14900 ~ 24830	60 ~ 100
		2	2	70 ~ 117	0.002 ~ 0.003	≤0.05D(MAX0.5)	≤0.2D	11170 ~ 18620	40 ~ 110
		2.5	2	70 ~ 117	0.003 ~ 0.004	≤0.05D(MAX0.5)	≤0.2D	8940 ~ 14900	50 ~ 120
		3	2	70 ~ 117	0.004 ~ 0.005	≤0.05D(MAX0.5)	≤0.2D	7450 ~ 12410	60 ~ 120
		4	2	70 ~ 117	0.006 ~ 0.006	≤0.05D(MAX0.5)	≤0.2D	5590 ~ 9310	70 ~ 110
		5	2	70 ~ 117	0.007 ~ 0.008	≤0.05D(MAX0.5)	≤0.2D	4470 ~ 7450	60 ~ 120
		6	2	70 ~ 117	0.009 ~ 0.010	≤0.05D(MAX0.5)	≤0.2D	3720 ~ 6210	70 ~ 120
		8	2	70 ~ 117	0.011 ~ 0.012	≤0.05D(MAX0.5)	≤0.2D	2790 ~ 4660	60 ~ 110
		10	2	70 ~ 117	0.013 ~ 0.014	≤0.05D(MAX0.5)	≤0.2D	2230 ~ 3720	60 ~ 100
		12	2	70 ~ 117	0.015 ~ 0.017	≤0.05D(MAX0.5)	≤0.2D	1860~ 3100	60 ~ 110
		14	2	70 ~ 117	0.017 ~ 0.019	≤0.05D(MAX0.5)	≤0.2D	1600 ~ 2660	50 ~ 100
		16	2	70 ~ 117	0.019 ~ 0.021	≤0.05D(MAX0.5)	≤0.2D	1400 ~ 2330	50 ~ 100
		18	2	70 ~ 117	0.022 ~ 0.024	≤0.05D(MAX0.5)	≤0.2D	1240 ~ 2070	50 ~ 100
		20	2	70 ~ 117	0.024 ~ 0.026	≤0.05D(MAX0.5)	≤0.2D	1120 ~ 1860	50 ~ 100

PROFILE MILLING		α < 15°							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL (55-60 HRC) AISI D2	M33	0.3	2	38	0.000 ~ 0.000	≤0.5D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.4	2	50	0.000 ~ 0.000	≤0.5D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.8	2	66 ~ 101	0.000 ~ 0.001	≤0.5D(MAX0.5)	≤0.1D	26070 ~ 40000	20 ~ 80
		0.8	2	66 ~ 101	0.000 ~ 0.001	≤0.5D(MAX0.5)	≤0.1D	26070 ~ 40000	20 ~ 80
		1	2	66 ~ 109	0.001 ~ 0.001	≤0.5D(MAX0.5)	≤0.1D	20860 ~ 34760	40 ~ 70
		1.5	2	66 ~ 109	0.001 ~ 0.002	≤0.5D(MAX0.5)	≤0.1D	13900 ~ 23170	30 ~ 90
		2	2	66 ~ 109	0.002 ~ 0.002	≤0.5D(MAX0.5)	≤0.2D	10430 ~ 17380	40 ~ 70
		2.5	2	66 ~ 109	0.002 ~ 0.003	≤0.5D(MAX0.5)	≤0.2D	8340 ~ 13900	30 ~ 80
		3	2	66 ~ 109	0.003 ~ 0.004	≤0.5D(MAX0.5)	≤0.2D	69500 ~ 11590	40 ~ 90
		4	2	65 ~ 109	0.004 ~ 0.005	≤0.5D(MAX0.5)	≤0.2D	5210 ~ 8690	40 ~ 90
		5	2	66 ~ 109	0.006 ~ 0.006	≤0.5D(MAX0.5)	≤0.2D	4170 ~ 6950	50 ~ 80
		6	2	66 ~ 109	0.007 ~ 0.008	≤0.5D(MAX0.5)	≤0.2D	3480 ~ 5790	50 ~ 90
		8	2	66 ~ 109	0.009 ~ 0.010	≤0.5D(MAX0.5)	≤0.2D	2610 ~ 4340	50 ~ 90
		10	2	66 ~ 109	0.010 ~ 0.011	≤0.5D(MAX0.5)	≤0.2D	2090 ~ 3480	40 ~ 80
		12	2	66 ~ 109	0.012 ~ 0.013	≤0.5D(MAX0.5)	≤0.2D	1740 ~ 2900	40 ~ 80
		14	2	66 ~ 109	0.014 ~ 0.015	≤0.5D(MAX0.5)	≤0.2D	1490 ~ 2480	40 ~ 70
		16	2	65 ~ 109	0.016 ~ 0.017	≤0.5D(MAX0.5)	≤0.2D	1300 ~ 2170	40 ~ 70
		18	2	66 ~ 109	0.017 ~ 0.019	≤0.5D(MAX0.5)	≤0.2D	1160 ~1930	40 ~ 70
		20	2	65 ~ 109	0.019 ~ 0.021	≤0.5D(MAX0.5)	≤0.2D	1040 ~ 1740	40 ~ 70

Cutting Parameter - Ballnose Long

PROFILE MILLING		α < 15°							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL(45 ~ 52 HRC) AISI H13, AISI D2, SUS 420 ETC	M26,27	0.3	4	38	-0.001 ~ 0.001	50.05EHMAX0.5)	≤0.1D	40000	20 ~ 160
		0.4	4	50	0.000 ~ 0.001	50.05D(MAX0.5)	≤0.1D	40000	20 ~ 160
		0.8	4	101	0.002 ~ 0.003	50.05EHMAX0.5)	≤0.1D	40000	320 ~ 480
		0.8	4	101	0.002 ~ 0.003	50.05D(MAX0.5)	≤0.1D	40000	320 ~ 480
		1	4	126	0.003 ~ 0.004	50.051NMAX0.5)	≤0.1D	40000	480 ~ 640
		1.5	4	187 ~ 188	0.005 ~ 0.007	50.051XMAX0.5)	≤0.1D	39730 ~ 40000	790 ~ 1120
		2	4	187 ~ 251	0.007 ~ 0.009	50.05EHMAX0.5)	≤0.2D	29790 ~ 40000	830 ~ 1440
		2.5	4	187 ~ 262	0.010 ~ 0.012	50.05D(MAX0.5)	≤0.2D	23840 ~ 33370	950 ~ 1600
		3	4	187 ~ 262	0.012 ~ 0.014	50.05EHMAX0.5)	≤0.2D	19860 ~ 27810	950 ~ 1560
		4	4	187 ~ 262	0.017 ~ 0.019	50.05ERMAX0.5)	≤0.2D	14900 ~ 20860	1010 ~ 1590
		5	4	187 ~ 262	0.021 ~ 0.024	50.05C4MAX0.5)	≤0.2D	11920 ~ 16680	1000 ~ 1600
		6	4	187 ~ 262	0.026 ~ 0.029	50.0501MAX0.5)	≤0.2D	9930 ~ 13900	1030 ~ 1610
		8	4	187 ~ 262	0.033 ~ 0.036	50.051)(MAX0.5)	≤0.2D	7450 ~ 10430	980 ~ 1500
		10	4	187 ~ 262	0.039 ~ 0.043	50.0501MAX0.5)	≤0.2D	5960' 8340	930 ~ 1430
		12	4	187 ~ 262	0.045 ~ 0.050	50.051)(MAX0.5)	≤0.2D	4970 ~ 6950	890 ~ 1390
		14	4	187 ~ 262	0.052 ~ 0.057	50.0501MAX0.5)	≤0.2D	4260 ~ 5960	890 ~ 1360
		16	4	187 ~ 262	0.058 ~ 0.064	50.05D(MAX0.5)	≤0.2D	3720 ~ 5210	860 ~ 1330
		18	4	187 ~ 262	0.065 ~ 0.071	50.0501MAX0.5)	≤0.2D	3310 ~ 4630	860 ~ 1310
		20	4	187 ~ 262	0.071 ~ 0.078	50.051)(MAX0.5)	≤0.2D	2980 ~ 4170	850 ~ 1300

PROFILE MILLING		α < 15°							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL(45 ~ 52 RC) AISI H13, AISI D2, SUS 420 ETC	M26,27	0.3	4	38	0.000 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 160
		0.4	4	50	0.000 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 160
		0.8	4	101	0.001 ~ 0.003	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 480
		0.8	4	101	0.001 ~ 0.003	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 480
		1	4	126	0.002 ~ 0.003	≤0.05D(MAX0.5)	≤0.1D	40000	320 ~ 480
		1.5	4	175 ~ 188	0.004 ~ 0.005	≤0.05D(MAX0.5)	≤0.1D	37080 ~ 40000	590 ~ 800
		2	4	175 ~ 245	0.006 ~ 0.007	≤0.05D(MAX0.5)	≤0.2D	27810 ~ 38930	670 ~ 1090
		2.5	4	175 ~ 245	0.008 ~ 0.009	≤0.05D(MAX0.5)	≤0.2D	22250 ~ 31140	710 ~ 1120
		3	4	175 ~ 245	0.010 ~ 0.011	≤0.05D(MAX0.5)	≤0.2D	18540 ~ 25950	740 ~ 1140
		4	4	175 ~ 245	0.013 ~ 0.015	≤0.05D(MAX0.5)	≤0.2D	13900 ~ 19470	720 ~ 1170
		S	4	175 ~ 245	0.017 ~ 0.019	≤0.05D(MAX0.5)	≤0.2D	1112015570	760 ~ 1180
		6	4	175 ~ 245	0.021 ~ 0.023	≤0.05D(MAX0.5)	≤0.2D	9270 ~ 12980	780 ~ 1190
		8	4	175 ~ 245	0.026 ~ 0.029	≤0.05D(MAX0.5)	≤0.2D	6950 ~ 9730	720 ~ 1130
		10	4	175 ~ 245	0.031 ~ 0.034	≤0.05D(MAX0.5)	≤0.2D	5560 ~ 7790	690 ~ 1060
		12	4	175 ~ 245	0.036 ~ 0.040	≤0.05D(MAX0.5)	≤0.2D	4630" 6490	670 ~ 1040
		14	4	175 ~ 245	0.041 ~ 0.046	≤0.05D(MAX0.5)	≤0.2D	3970 ~ 5560	650 ~ 1020
		16	4	175 ~ 245	0.047 ~ 0.051	≤0.05D(MAX0.5)	≤0.2D	3480 ~ 4870	650 ~ 990
		18	4	175 ~ 245	0.052 ~ 0.057	≤0.05D(MAX0.5)	≤0.2D	3090 ~ 4330	640 ~ 990
		20	4	175 ~ 244	0.057 ~ 0.063	≤0.05D(MAX0.5)	≤0.2D	2780' 3890	630 ~ 980

Cutting Parameter - Ballnose Long

PROFILE MILLING		α < 15°							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL(52 ~ 63 HRC) AISI H13, AISI D2, SKH ETC	M28	0.3	4	38	0.000 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 160
		0.4	4	50	0.000 ~ 0.002	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 320
		0.8	4	101	0.001 ~ 0.003	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 480
		0.8	4	101	0.001 ~ 0.003	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 480
		1	4	126	0.002 ~ 0.004	≤0.05D(MAX0.5)	≤0.1D	40000	320 ~ 640
		1.5	4	150 ~ 188	0.004 ~ 0.006	≤0.05D(MAX0.5)	≤0.1D	31780 ~ 40000	510 ~ 960
		2	4	150 ~ 225	0.006 ~ 0.007	≤0.05D(MAX0.5)	≤0.2D	23840 ~ 35750	570 ~ 1000
		2.5	4	150 ~ 225	0.007 ~ 0.009	≤0.05D(MAX0.5)	≤0.2D	19070 ~ 28600	530 ~ 1030
		3	4	150 ~ 225	0.009 ~ 0.011	≤0.05D(MAX0.5)	≤0.2D	15890 ~ 23840	570 ~ 1050
		4	4	150 ~ 225	0.013 ~ 0.014	≤0.05D(MAX0.5)	≤0.2D	11920 ~ 17880	620 ~ 1000
		5	4	150 ~ 225	0.016 ~ 0.018	≤0.05D(MAX0.5)	≤0.2D	9530 ~ 14300	610 ~ 1030
		6	4	150 ~ 225	0.020 ~ 0.022	≤0.05D(MAX0.5)	≤0.2D	7950 ~ 11920	640 ~ 1050
		8	4	150 ~ 225	0.024 ~ 0.027	≤0.05D(MAX0.5)	≤0.2D	5960 ~ 8940	570 ~ 970
		10	4	150 ~ 225	0.029 ~ 0.032	≤0.05D(MAX0.5)	≤0.2D	4770 ~ 7150	550 ~ 920
		12	4	150 ~ 225	0.034 ~ 0.037	≤0.05D(MAX0.5)	≤0.2D	3970 ~ 5960	540 ~ 880
		14	4	150 ~ 225	0.039 ~ 0.043	≤0.05D(MAX0.5)	≤0.2D	3410 ~ 5110	530 ~ 880
		16	4	150 ~ 225	0.044 ~ 0.048	≤0.05D(MAX0.5)	≤0.2D	2980 ~ 4470	520 ~ 860
		18	4	150 ~ 224	0.048 ~ 0.053	≤0.05D(MAX0.5)	≤0.2D	2650 ~ 3970	510 ~ 840
		20	4	150 ~ 225	0.053 ~ 0.059	≤0.05D(MAX0.5)	≤0.2D	2380 ~ 3580	500 ~ 840

PROFILE MILLING		α < 15°							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL (52' 63 HRC AISI H13, AISI D2, SKH ETC	M28	0.3	4	38	0.000 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 160
		0.4	4	50	0.000 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 160
		0.8	4	101	0.001 ~ 0.002	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 320
		0.8	4	101	0.001 ~ 0.002	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 320
		1	4	126	0.002 ~ 0.003	≤0.05D(MAX0.5)	≤0.1D	40000	320 ~ 480
		1.5	4	140 ~ 188	0.003 ~ 0.004	≤0.05D(MAX0.5)	≤0.1D	29660 ~ 40000	360 ~ 640
		2	4	140 ~ 210	0.005 ~ 0.006	≤0.05D(MAX0.5)	≤0.2D	22250 ~ 33370	450 ~ 800
		2.5	4	140 ~ 210	0.006 ~ 0.007	≤0.05D(MAX0.5)	≤0.2D	17800 ~ 26700	430 ~ 750
		3	4	140 ~ 210	0.007 ~ 0.009	≤0.05D(MAX0.5)	≤0.2D	14830 ~ 22250	420 ~ 800
		4	4	140 ~ 210	0.010 ~ 0.012	≤0.05D(MAX0.5)	≤0.2D	11120 ~ 16680	440 ~ 800
		5	4	140 ~ 210	0.013 ~ 0.014	≤0.05D(MAX0.5)	≤0.2D	8900 ~ 13350	460 ~ 750
		6	4	140 ~ 210	0.016 ~ 0.017	≤0.05D(MAX0.5)	≤0.2D	7420 ~ 11120	470 ~ 760
		8	4	140 ~ 210	0.020 ~ 0.021	≤0.05D(MAX0.5)	≤0.2D	5560 ~ 8340	440 ~ 700
		10	4	140 ~ 210	0.023 0.026	≤0.05D(MAX0.5)	≤0.2D	4450 ~ 6670	410 ~ 690
		12	4	140 ~ 210	0.027 ~ 0.030	≤0.05D(MAX0.5)	≤0.2D	3710 ~ 5560	400 ~ 670
		14	4	140 ~ 210	0.031 ~ 0.034	≤0.05D(MAX0.5)	≤0.2D	3180 ~ 4770	390 ~ 650
		16	4	140 ~ 210	0.035 ~ 0.038	≤0.05D(MAX0.5)	≤0.2D	2780 ~ 4170	390 ~ 630
		18	4	140 ~ 210	0.039 ~ 0.043	≤0.05D(MAX0.5)	≤0.2D	2470 ~ 3710	390 ~ 640
		20	2	139 ~ 210	0.043 ~ 0.047	≤0.05D(MAX0.5)	≤0.2D	2220 ~ 3340	380 ~ 630

Cutting Parameter - Ballnose Long

PROFILE MILLING		α < 15°							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL (55~60HRC) AISI D2	M33	0.3	4	38	0.000 ~ 0.000	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.4	4	50	0.000 ~ 0.000	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 80
		0.8	4	101	0.000 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 160
		0.8	4	101	0.000 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	40000	20 ~ 160
		1	4	112 ~ 126	0.001 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	35750 ~ 40000	140 ~ 160
		1.5	4	112 ~ 187	0.001 ~ 0.002	≤0.05D(MAX0.5)	≤0.1D	23840 ~ 39730	100 ~ 320
		2	4	112 ~ 187	0.002 ~ 0.002	≤0.05D(MAX0.5)	≤0.2D	17880 ~ 29790	140 ~ 240
		2.5	4	112~ 187	0.002 ~ 0.003	≤0.05D(MAX0.5)	≤0.2D	14300 ~ 23840	110 ~ 290
		3	4	112 ~ 187	0.003 ~ 0.004	≤0.05D(MAX0.5)	≤0.2D	11920~ 19860	140 ~ 320
		4	4	112~ 187	0.004 ~ 0.005	≤0.05D(MAX0.5)	≤0.2D	8940~ 14900	140 ~ 300
		5	4	112~ 187	0.005 ~ 0.006	≤0.05D(MAX0.5)	≤0.2D	7150 ~ 11920	140 ~ 290
		6	4	112 ~187	0.007 ~0.007	≤0.05D(MAX0.5)	≤0.2D	5960 ~9930	170 ~ 280
		8	4	112~ 187	0.008 ~ 0.009	≤0.05D(MAX0.5)	≤0.2D	4470~ 7450	140 ~ 270
		10	4	112 ~ 187	0.010 ~ 0.011	≤0.05D(MAX0.5)	≤0.2D	3580 ~ 5960	140 ~ 260
		12	4	112~ 187	0.011 ~ 0.012	≤0.05D(MAX0.5)	≤0.2D	2980~ 4970	130 ~ 240
		14	4	112~ 187	0.013 ~ 0.014	≤0.05D(MAX0.5)	≤0.2D	2550~ 4260	130 ~ 240
		16	4	112~ 187	0.015 ~ 0.016	≤0.05D(MAX0.5)	≤0.2D	2230~ 3720	130 ~ 240
		18	4	113 ~ 187	0.016 ~ 0.018	≤0.05D(MAX0.5)	≤0.2D	1990 ~3310	130 ~ 240
		20	4	112 ~ 187	0.018 ~ 0.020	≤0.05D(MAX0.5)	≤0.2D	1790 ~ 2980	130 ~ 240

PROFILE MILLING		α < 15°							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL (55~60HRC) AISI D2	M33	0.3	4	38	0.000 ~ 0.000	≤0.05D(MAX0.5	≤0.1D	40000	20 ~ 80
		0.4	4	50	0.000 ~ 0.000	≤0.05D(MAX0.5	≤0.1D	40000	20 ~ 80
		0.8	4	101	0.000 ~ 0.001	≤0.05D(MAX0.5	≤0.1D	40000	20 ~ 160
		0.8	4	101	0.000 ~ 0.001	≤0.05D(MAX0.5	≤0.1D	40000	20 ~ 160
		1	4	105 ~ 126	0.000 ~ 0.001	≤0.05D(MAX0.5	≤0.1D	33370 ~ 40000	20 ~ 160
		1.5	4	105 ~ 175	0.001 ~ 0.001	≤0.05D(MAX0.5	≤0.1D	22250 ~ 37080	90 ~ 150
		2	4	105 ~ 175	0.001 ~ 0.002	≤0.05D(MAX0.5	≤0.2D	16680 ~ 27810	70 ~ 220
		2.5	4	105 ~ 175	0.002 ~ 0.002	≤0.05D(MAX0.5	≤0.2D	13350 ~ 22250	110 ~ 180
		3	4	105 ~ 175	0.002 ~ 0.003	≤0.05D(MAX0.5	≤0.2D	11120 ~ 18540	90 ~ 220
		4	4	105 ~ 175	0.003 ~ 0.004	≤0.05D(MAX0.5	≤0.2D	8340 ~ 13900	100 ~ 220
		5	4	105 ~ 175	0.004 ~ 0.005	≤0.05D(MAX0.5	≤0.2D	6670 ~ 11120	110 ~ 220
		6	4	105~175	0.005 ~ 0.006	≤0.05D(MAX0.5	≤0.2D	5560 ~ 9270	110 ~ 220
		8	4	105 ~ 175	0.007 ~ 0.007	≤0.05D(MAX0.5	≤0.2D	4170 ~ 6950	120 ~ 190
		10	4	105 ~ 175	0.008 ~ 0.009	≤0.05D(MAX0.5	≤0.2D	3340 ~ 5560	110 ~ 200
		12	4	105 ~ 175	0.009 ~ 0.010	≤0.05D(MAX0.5	≤0.2D	2780 ~ 4630	100 ~ 190
		14	4	105~175	0.010 ~ 0.011	≤0.05D(MAX0.5	≤0.2D	2380 ~ 3970	100 ~ 170
		16	4	105 ~ 175	0.012 ~ 0.013	≤0.05D(MAX0.5	≤0.2D	2090 ~ 3480	100 ~ 180
		18	4	105 ~ 175	0.013 ~ 0.014	≤0.05D(MAX0.5	≤0.2D	1850 ~ 3090	100 ~ 170
		20	4	105 ~ 175	0.014 ~ 0.016	≤0.05D(MAX0.5	≤0.2D	1670 ~ 2780	90 ~ 180

Cutting Parameter - Square Endmill Standard

SIDE MILLING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDEDNED STEEL (45~52HRC) AISI H13	M26	1	4	50 ~ 70	0.005 ~ 0.007	≤ 1.0 D	≤ 0.3 D	15920 ~ 22280	320 ~ 620
		1	4	50 ~ 70	0.008 ~ 0.011	≤ 1.0 D	≤ 0.3 D	10610 ~ 14850	340 ~ 650
		2	4	50 ~ 70	0.012 ~ 0.01S	≤ 1.0 D	≤ 0.3 D	7960 ~ 11140	380 ~ 670
		2.5	4	50 ~ 70	0.016 ~ 0.019	≤ 1.0 D	≤ 0.3 D	6370 ~ 8910	410 ~ 680
		3	4	50 ~ 70	0.020 ~ 0.023	≤ 1.0 D	≤ 0.5 D (MAX0.5)	5310 ~ 7430	420 ~ 680
		4	4	50 ~ 70	0.028 ~ 0.031	≤ 1.0 D	≤ 0.5 D (MAX0.5)	3980 ~ 5570	450 ~ 690
		5	4	50 ~ 70	0.035 ~ 0.039	≤ 1.0 D	≤ 0.5 D (MAX0.5)	3180 ~ 4460	450 ~ 700
		6	4	50 ~ 70	0.043 ~ 0.048	≤ 1.0 D	≤ 0.5 D (MAX0.5)	2650 ~ 3710	460 ~ 710
		8	4	50 ~ 70	0.054 ~ 0.059	≤ 1.0 D	≤ 0.5 D (MAX0.5)	1990 ~ 2790	430 ~ 660
		10	4	50 ~ 70	0.064 ~ 0.071	≤ 1.0 D	≤ 0.5 D (MAX0.5)	1590 ~ 2230	410 ~ 630
		12	4	50 ~ 70	0.075 ~ 0.083	≤ 1.0 D	≤ 0.5 D (MAX0.5)	1330 ~ 1860	400 ~ 620
		14	4	50 ~ 70	0.086 ~ 0.094	≤ 1.0 D	≤ 0.5 D (MAX0.5)	1140 ~ 1590	390 ~ 600
		16	4	50 ~ 70	0.096 ~ 0.106	≤ 1.0 D	≤ 0.5 D (MAX0.5)	990 ~ 1390	380 ~ 590
		18	4	50 ~ 70	0.107 ~ 0.118	≤ 1.0 D	≤ 0.5 D (MAX0.5)	880 ~ 1240	380 ~ 590
		20	4	50 ~ 70	0.117 ~ 0.129	≤ 1.0 D	≤ 0.5 D (MAX0.5)	800 ~ 1110	370 ~ 570
		22	4	50 ~ 70	0.128 ~ 0.141	≤ 1.0 D	≤ 0.5 D (MAX0.5)	720 ~ 1010	370 ~ 570
		25	4	50 ~ 70	0.144 ~ 0.158	≤ 1.0 D	≤ 0.5 D (MAX0.5)	640 ~ 890	370 ~ 560
		18	4	50 ~ 70	0.039 ~ 0.043	≤ 1.0 D	≤ 0.5 D (MAX0.5)	2470 ~ 3710	370 ~ 570
		20	4	50 ~ 70	0.128 ~ 0.141	≤ 1.0 D	≤ 0.5 D (MAX0.5)	370 ~ 570	370 ~ 570
		25	4	50 ~ 70	0.144 ~ 0.158	≤ 1.0 D	≤ 0.5 D (MAX0.5)	640 ~ 890	370 ~ 560

SIDE MILLING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDEDNED STEEL (52~63H RC) AISI D2	M27,28	1	4	40 ~ 60	0.004 ~ 0.006	≤1.0 D	≤ 0.3 D	12730 ~ 19100	200 ~ 460
		1.5	4	40 ~ 60	0.006 ~ 0.009	≤1.0 D	≤ 0.3 D	8490 ~ 12730	200 ~ 460
		2	4	40 ~ 60	0.009 ~ 0.012	≤1.0 D	≤ 0.3 D	6370 ~ 9550	230 ~ 460
		2.5	4	40 ~ 60	0.012 ~ 0.015	≤1.0 D	≤ 0.3 D	5090 ~ 7640	240 ~ 460
		3	4	40 ~ 60	0.015 ~ 0.018	≤1.0 D	≤ 0.5 D (MAX0.5)	4240 ~ 6370	250 ~ 460
		4	4	40 ~ 60	0.021 ~ 0.024	≤1.0 D	≤ 0.5 D (MAX0.5)	3180 ~ 4770	270 ~ 460
		5	4	40 ~ 60	0.027 ~ 0.030	≤1.0 D	≤ 0.5 D (MAX0.5)	2550 ~ 3820	280 ~ 460
		6	4	40 ~ 60	0.032 ~ 0.036	≤1.0 D	≤ 0.5 D (MAX0.5)	2120 ~ 3180	270 ~ 460
		8	4	40 ~ 60	0.040 ~ 0.044	≤1.0 D	≤ 0.5 D (MAX0.5)	1590 ~ 2390	250 ~ 420
		10	4	40 ~ 60	0.048 ~ 0.053	≤1.0 D	≤ 0.5 D (MAX0.5)	1270 ~ 1910	240 ~ 400
		12	4	40 ~ 60	0.056 ~ 0.062	≤1.0 D	≤ 0.5 D (MAX0.5)	1060 ~ 1590	240 ~ 390
		14	4	40 ~ 60	0.064 ~ 0.071	≤1.0 D	≤ 0.5 D (MAX0.5)	910 ~ 1360	230 ~ 390
		16	4	40 ~ 60	0.072 ~ 0.079	≤1.0 D	≤ 0.5 D (MAX0.5)	800 ~ 1190	230 ~ 380
		18	4	40 ~ 60	0.080 ~ 0.088	≤1.0 D	≤ 0.5 D (MAX0.5)	710 ~ 1060	230 ~ 370
		20	4	40 ~ 60	0.088 ~ 0.097	≤1.0 D	≤ 0.5 D (MAX0.5)	640 ~ 950	230~ 370
		22	4	40 ~ 60	0.096 ~ 0.106	≤1.0 D	≤ 0.5 D (MAX0.5)	580 ~ 870	220 ~ 370
		25	4	40 ~ 60	0.108 ~ 0.119	≤1.0 D	≤ 0.5 D (MAX0.5)	510 ~ 760	220 ~ 360

Cutting Parameter - Square Endmill Standard

SIDE MILLING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
MILLING MATERIAL GROUPS M33	M33	1	4	30 ~ 50	0.001 ~ 0.002	≤ 1.0 D	≤ 0.3 D	9550 ~ 15920	40 ~ 130
		2.	4	30 ~ 50	0.002 ~ 0.003	≤ 1.0 D	≤ 0.3 D	6370 ~ 10610	50 ~ 130
		2	4	30 ~ 50	0.003 ~ 0.004	≤ 1.0 D	≤ 0.3 D	4770 ~ 7960	60 ~ 130
		3.	4	30 ~ 50	0.004 ~ 0.005	≤ 1.0 D	≤ 0.3 D	3820 ~ 6370	60 ~ 130
		3	4	30 ~ 50	0.005 ~ 0.006	≤ 1.0 D	≤ 0.5 D(MAX0.5)	3180 ~ 5310	60 ~ 130
		4	4	30 ~ 50	0.007 ~ 0.008	≤ 1.0 D	≤ 0.5 D(MAX0.5)	2390 ~ 3980	70 ~ 130
		S	4	30 ~ 50	0.009 ~ 0.010	≤ 1.0 D	≤ 0.5 D(MAX0.5)	1910 ~ 3180	70 ~ 130
		6	4	30 ~ 50	0.011 ~ 0.012	≤ 1.0 D	≤ 0.5 D(MAX0.5)	1590 ~ 2650	70 ~ 130
		8	4	30 ~ 50	0.013 ~ 0.015	≤ 1.0 D	≤ 0.5 D(MAX0.5)	1190 ~ 1990	60 ~ 120
		10	4	30 ~ 50	0.016 ~ 0.018	≤ 1.0 D	≤ 0.5 D(MAX0.5)	950 ~ 1590	60 ~ 110
		12	4	30 ~ 50	0.019 ~ 0.021	≤ 1.0 D	≤ 0.5 D(MAX0.5)	800 ~ 1330	60 ~ 110
		14	4	30 ~ 50	0.021 ~ 0.024	≤ 1.0 D	≤ 0.5 D(MAX0.5)	680 ~ 1140	60 ~ 110
		16	4	30 ~ 50	0.024 ~ 0.026	≤ 1.0 D	≤ 0.5 D(MAX0.5)	600 ~ 990	60 ~ 100
		18	4	30 ~ 50	0.027 ~ 0.029	≤ 1.0 D	≤ 0.5 D(MAX0.5)	530 ~ 880	60 ~ 100
		20	4	30 ~ 50	0.029 ~ 0.032	≤ 1.0 D	≤ 0.5 D(MAX0.5)	480 ~ 800	60 ~ 100
		22	4	30 ~ 50	0.032 ~ 0.035	≤ 1.0 D	≤ 0.5 D(MAX0.5)	430 ~ 720	60 ~ 100
		25	4	30 ~ 50	0.036 ~ 0.040	≤ 1.0 D	≤ 0.5 D(MAX0.5)	380 ~ 640	50 ~ 100

SIDE MILLING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDEDNED STEEL (45~52HRC) AISI H13	M26	1	4	50 ~ 70	0.004 ~ 0.006	≤ 0.05 D	1.0 D	15920 ~ 22280	250 ~ 530
		1.5	4	50 ~ 70	0.007 ~ 0.009	≤ 0.05 D	1.0 D	10610 ~ 14850	300 ~ 530
		2	4	50 ~ 70	0.010 ~ 0.012	≤ 0.05 D	1.0 D	7960 ~ 11140	320 ~ 530
		2.5	4	50 ~ 70	0.013 ~ 0.015	≤ 0.05 D	1.0 D	6370 ~ 8910	330 ~ 530
		3	4	50 ~ 70	0.016 ~ 0.019	≤ 0.05 D	1.0 D	5310 ~ 7430	340 ~ 560
		4	4	50 ~ 70	0.022 ~ 0.025	≤ 0.05 D	1.0 D	3980 ~ 5570	350 ~ 560
		5	4	50 ~ 70	0.028 ~ 0.032	≤ 0.05 D	1.0 D	3180 ~ 4460	360 ~ 570
		6	4	50 ~ 70	0.035 ~ 0.038	≤ 0.05 D	1.0 D	2650 ~ 3710	370 ~ 560
		8	4	50 ~ 70	0.043 ~ 0.047	≤ 0.05 D	1.0 D	1990 ~ 2790	340 ~ 520
		10	4	50 ~ 70	0.052 ~ 0.057	≤ 0.05 D	1.0 D	1590 ~ 2230	330 ~ 510
		12	4	50 ~ 70	0.060 ~ 0.066	≤ 0.05 D	1.0 D	1330 ~ 1860	320 ~ 490
		14	4	50 ~ 70	0.069 ~ 0.075	≤ 0.05 D	1.0 D	1140 ~ 1590	310 ~ 480
		16	4	50 ~ 70	0.077 ~ 0.085	≤ 0.05 D	1.0 D	990 ~ 1390	300 ~ 470
		18	4	50 ~ 70	0.085 ~ 0.094	≤ 0.05 D	1.0 D	880 ~ 1240	300 ~ 470
		20	4	50 ~ 70	0.094 ~ 0.103	≤ 0.05 D	1.0 D	800 ~ 1110	300 ~ 460
		22	4	50 ~ 70	0.102 ~ 0.113	≤ 0.05 D	1.0 D	720 ~ 1010	290 ~ 460
		25	4	50 ~ 70	0.115 ~ 0.127	≤ 0.05 D	1.0 D	640 ~ 890	290 ~ 450

Cutting Parameter - Square Endmill Standard

PROFILE MILLING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDEDNED STEEL (52~63HRC) AISI D2	'M27,28	1	4	40 ~ 60	0.003 ~ 0.005	≤ 0.05 D	1.0 D	12730 ~ 19100	150 ~380
		1.5	4	40 ~ 60	0.005 ~ 0.007	≤ 0.05 D	1.0 D	8490 ~ 12730	170 ~ 360
		2	4	40 ~ 60	0.007 ~ 0.010	≤ 0.05 D	1.0 D	6370 ~ 9550	180 ~ 380
		2.5	4	40 ~ 60	0.010 ~ 0.012	≤ 0.05 D	1.0 D	5090 ~ 7640	200 ~ 370
		3	4	40 ~ 60	0.012 ~ 0.014	≤ 0.05 D	1.0 D	4240 ~ 6370	200 ~ 360
		4	4	40 ~ 60	0.017 ~ 0.019	≤ 0.05 D	1.0 D	3180 ~ 4770	220 ~ 360
		5	4	40 ~ 60	0.021 ~ 0.024	≤ 0.05 D	1.0 D	2550 ~ 3820	210 ~ 370
		6	4	40 ~ 60	0.026 ~ 0.029	≤ 0.05 D	1.0 D	2120 ~ 3180	220 ~ 370
		8	4	40 ~ 60	0.032 ~ 0.036	≤ 0.05 D	1.0 D	1590 ~ 2390	200 ~ 340
		10	4	40 ~ 60	0.039 ~ 0.043	≤ 0.05 D	1.0 D	1270 ~ 1910	200 ~ 330
		12	4	40 ~ 60	0.045 ~ 0.050	≤ 0.05 D	1.0 D	1060 ~ 1590	190 ~ 320
		14	4	40 ~ 60	0.051 ~ 0.057	≤ 0.05 D	1.0 D	910 ~ 1360	190 ~ 310
		16	4	40 ~ 60	0.058 ~ 0.064	≤ 0.05 D	1.0 D	800 ~ 1190	190 ~ 300
		18	4	40 ~ 60	0.064 ~ 0.071	≤ 0.05 D	1.0 D	710 ~ 1060	180 ~ 300
		20	4	40 ~ 60	0.070 ~ 0.078	≤ 0.05 D	1.0 D	640 ~ 950	180 ~ 300
		22	4	40 ~ 60	0.077 ~ 0.085	≤ 0.05 D	1.0 D	580 ~ 870	180 ~ 300
		25	4	40 ~ 60	0.086 ~ 0.095	≤ 0.05 D	1.0 D	510 ~ 760	180 ~ 290

SIDE MILLING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDEDNED STEEL (55~60 HRC) AISI D2	M33	1	4	30 ~ 50	0.001 ~ 0.001	≤ 0.05 D	1.0 D	9550 ~ 15920	40 ~ 60
		1.5	4	30 ~ 50	0.002 ~ 0.002	≤ 0.05 D	1.0 D	6370 ~ 10610	50 ~ 80
		2	4	30 ~ 50	0.002 ~ 0.003	≤ 0.05 D	1.0 D	4770 ~ 7960	40 ~ 100
		2.5	4	30 ~ 50	0.003 ~ 0.004	≤ 0.05 D	1.0 D	3820 ~ 6370	50 ~ 100
		3	4	30 ~ 50	0.004 ~ 0.005	≤ 0.05 D	1.0 D	3180 ~ 5310	50 ~ 110
		4	4	30 ~ 50	0.005 ~ 0.006	≤ 0.05 D	1.0 D	2390 ~ 3980	50 ~ 100
		5	4	30 ~ 50	0.007 ~ 0.008	≤ 0.05 D	1.0 D	1910 ~ 3180	50 ~ 100
		6	4	30 ~ 50	0.009 ~ 0.010	≤ 0.05 D	1.0 D	1590 ~ 2650	60 ~ 110
		8	4	30 ~ 50	0.011 ~ 0.012	≤ 0.05 D	1.0 D	1190 ~ 1990	50 ~ 100
		10	4	30 ~ 50	0.013 ~ 0.014	≤ 0.05 D	1.0 D	950 ~ 1590	50 ~ 90
		12	4	30 ~ 50	0.015 ~ 0.017	≤ 0.05 D	1.0 D	800 ~ 1330	50 ~ 90
		14	4	30 ~ 50	0.017 ~ 0.019	≤ 0.05 D	1.0 D	680 ~ 1140	50 ~ 90
		16	4	30 ~ 50	0.019 ~ 0.021	≤ 0.05 D	1.0 D	600 ~ 990	50 ~ 80
		18	4	30 ~ 50	0.021 ~ 0.024	≤ 0.05 D	1.0 D	530 ~ 880	40 ~ 80
		20	4	30 ~ 50	0.023 ~ 0.026	≤ 0.05 D	1.0 D	480 ~ 800	40 ~ 80
		22	4	30 ~ 50	0.026 ~ 0.028	≤ 0.05 D	1.0 D	430 ~ 720	40 ~ 80
		25	4	30 ~ 50	0.029 ~ 0.032	≤ 0.05 D	1.0 D	380 ~ 640	40 ~ 80

Cutting Parameter - Square Endmill Long

SIDE MILLING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDEDNED STEEL (45~52HRC) AISI H13	M26	1	4	40 ~ 56	0.005 ~ 0.007	≤ 1.0 D	≤ 0.3 D	12730 ~ 17830	250 ~ 500
		1.5	4	40 ~ 56	0.008 ~ 0.011	≤ 1.0 D	≤ 0.3 D	8490 ~ 11880	270 ~ 520
		2	4	40 ~ 56	0.012 ~ 0.015	≤ 1.0 D	≤ 0.3 D	6370 ~ 8910	310 ~ 530
		2.5	4	40 ~ 56	0.016 ~ 0.019	≤ 1.0 D	≤ 0.3 D	5090 ~ 7130	330 ~ 540
		3	4	40 ~ 56	0.020 ~ 0.023	≤ 1.0 D	≤ 0.5 D (MAX0.5)	4240 ~ 5940	340 ~ 550
		4	4	40 ~ 56	0.028 ~ 0.031	≤ 1.0 D	≤ 0.5 D (MAX0.5)	3180 ~ 4460	360 ~ 550
		5	4	40 ~ 56	0.035 ~ 0.039	≤ 1.0 D	≤ 0.5 D (MAX0.5)	2550 ~ 3570	360 ~ 560
		6	4	40 ~ 56	0.043 ~ 0.048	≤ 1.0 D	≤ 0.5 D (MAX0.5)	2120 ~ 2970	360 ~ 570
		8	4	40 ~ 56	0.054 ~ 0.059	≤ 1.0 D	≤ 0.5 D (MAX0.5)	1590 ~ 2230	340 ~ 530
		10	4	40 ~ 56	0.064 ~ 0.071	≤ 1.0 D	≤ 0.5 D (MAX0.5)	1270 ~ 1780	330 ~ 510
		12	4	40 ~ 56	0.075 ~ 0.083	≤ 1.0 D	≤ 0.5 D (MAX0.5)	1060 ~ 1490	320 ~ 490
		14	4	40 ~ 56	0.086 ~ 0.094	≤ 1.0 D	≤ 0.5 D (MAX0.5)	910 ~ 1270	310 ~ 480
		16	4	40 ~ 56	0.096 ~ 0.106	≤ 1.0 D	≤ 0.5 D (MAX0.5)	800 ~ 1110	310 ~ 470
		18	4	40 ~ 56	0.107 ~ 0.118	≤ 1.0 D	≤ 0.5 D (MAX0.5)	710 ~ 990	300 ~ 470
		20	4	40 ~ 56	0.117 ~ 0.129	≤ 1.0 D	≤ 0.5 D (MAX0.5)	640 ~ 890	300 ~ 460
		22	4	40 ~ 56	0.128 ~ 0.141	≤ 1.0 D	≤ 0.5 D (MAX0.5)	580 ~ 810	300 ~ 460
		25	4	40 ~ 56	0.144 ~ 0.158	≤ 1.0 D	≤ 0.5 D (MAX0.5)	510 ~ 710	290 ~ 450

SIDE MILLING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDEDNED STEEL (52~63HRC) AISI D2	M27,28	1	4	32 ~ 48	0.004 ~ 0.006	≤ 1.0 D	≤ 0.3 D	10190 ~ 15280	160 ~ 370
		1.5	4	32 ~ 48	0.006 ~ 0.009	≤ 1.0 D	≤ 0.3 D	6790 ~ 10190	160 ~ 370
		2	4	32 ~ 48	0.009 ~ 0.012	≤ 1.0 D	≤ 0.3 D	5090 ~ 7640	180 ~ 370
		2.5	4	32 ~ 48	0.012 ~ 0.015	≤ 1.0 D	≤ 0.3 D	4070 ~ 6110	200 ~ 370
		3	4	32 ~ 48	0.015 ~ 0.018	≤ 1.0 D	≤ 0.5 D (MAX0.5)	3400 ~ 5090	200 ~ 370
		4	4	32 ~ 48	0.021 ~ 0.024	≤ 1.0 D	≤ 0.5 D (MAX0.5)	2550 ~ 3820	210 ~ 370
		5	4	32 ~ 48	0.027 ~ 0.030	≤ 1.0 D	≤ 0.5 D (MAX0.5)	2040 ~ 3060	220 ~ 370
		6	4	32 ~ 48	0.032 ~ 0.036	≤ 1.0 D	≤ 0.5 D (MAX0.5)	1700 ~ 2550	220 ~ 370
		8	4	32 ~ 48	0.040 ~ 0.044	≤ 1.0 D	≤ 0.5 D (MAX0.5)	1270 ~ 1910	200 ~ 340
		10	4	32 ~ 48	0.048 ~ 0.053	≤ 1.0 D	≤ 0.5 D (MAX0.5)	1020 ~ 1530	200 ~ 320
		12	4	32 ~ 48	0.056 ~ 0.062	≤ 1.0 D	≤ 0.5 D (MAX0.5)	850 ~ 1270	190 ~ 310
		14	4	32 ~ 48	0.064 ~ 0.071	≤ 1.0 D	≤ 0.5 D (MAX0.5)	730 ~ 1090	190 ~ 310
		16	4	32 ~ 48	0.072 ~ 0.079	≤ 1.0 D	≤ 0.5 D (MAX0.5)	640 ~ 950	180 ~ 300
		18	4	32 ~ 48	0.080 ~ 0.088	≤ 1.0 D	≤ 0.5 D (MAX0.5)	570 ~ 850	180 ~ 300
		20	4	32 ~ 48	0.088 ~ 0.097	≤ 1.0 D	≤ 0.5 D (MAX0.5)	510 ~ 760	180 ~ 290
		22	4	32 ~ 48	0.096 ~ 0.106	≤ 1.0 D	≤ 0.5 D (MAX0.5)	460 ~ 690	180 ~ 290
		25	4	32 ~ 48	0.108 ~ 0.119	≤ 1.0 D	≤ 0.5 D (MAX0.5)	410 ~ 610	180 ~ 290

Cutting Parameter - Square Endmill Long

SIDE MILLING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDEDNED STEEL (65-68 H RC) AISI D2	'M27,28	1	4	24 ~ 40	0.001 ~ 0.002	≤1.0 D	≤ 0.3 D	7640 ~ 12730	30 ~ 100
		2.	4	24 ~ 40	0.002 ~ 0.003	≤1.0 D	≤ 0.3 D	5090 ~ 8490	40 ~ 100
		2	4	24 ~ 40	0.003 ~ 0.004	≤1.0 D	≤ 0.3 D	3820 ~ 6370	50 ~ 100
		3.	4	24 ~ 40	0.004 ~ 0.005	≤1.0 D	≤ 0.3 D	3060 ~ 5090	50 ~ 100
		3	4	24 ~ 40	0.005 ~ 0.006	≤1.0 D	≤0.5D(MAX0.5)	2550 ~ 4240	50 ~ 100
		4	4	24 ~ 40	0.007 ~ 0.008	≤1.0 D	≤0.5D(MAX0.5)	1910 ~ 3180	50 ~ 100
		5	4	24 ~ 40	0.009 ~ 0.010	≤1.0 D	≤0.5D(MAX0.5)	1530 ~ 2550	60 ~ 100
		6	4	24 ~ 40	0.011 ~ 0.012	≤1.0 D	≤0.5D(MAX0.5)	1270 ~ 2120	60 ~ 100
		8	4	24 ~ 40	0.013 ~ 0.015	≤1.0 D	≤0.5D(MAX0.5)	950 ~ 1590	50 ~ 100
		10	4	24 ~ 40	0.016 ~ 0.018	≤1.0 D	≤0.5D(MAX0.5)	760 ~ 1270	50 ~ 90
		12	4	24 ~ 40	0.019 ~ 0.021	≤1.0 D	≤0.5D(MAX0.5)	640 ~ 1060	50 ~ 90
		14	4	24 ~ 40	0.021 ~ 0.024	≤1.0 D	≤0.5D(MAX0.5)	550 ~ 910	50 ~ 90
		16	4	24 ~ 40	0.024 ~ 0.026	≤1.0 D	≤0.5D(MAX0.5)	480 ~ 800	50 ~ 80
		18	4	24 ~ 40	0.027 ~ 0.029	≤1.0 D	≤0.5D(MAX0.5)	420 ~ 710	50 ~ 80
		20	4	24 ~ 40	0.029 ~ 0.032	≤1.0 D	≤0.5D(MAX0.5)	380 ~ 640	40 ~ 80
		22	4	24 ~ 40	0.032 ~ 0.035	≤1.0 D	≤0.5D(MAX0.5)	350 ~ 580	40 ~ 80
		25	4	24 ~ 40	0.036 ~ 0.040	≤1.0 D	≤0.5D(MAX0.5)	310 ~ 510	40 ~ 80

SIDE MILLING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDEDNED STEEL (55~60HRC) AISI H13	M26	1	4	40 ~ 56	0.004 ~ 0.006	≤0.05 D	1.0 D	12730 ~ 17830	200 ~ 430
		1.5	4	40 ~ 56	0.007 ~ 0.009	≤0.05 D	1.0 D	8490 ~ 11880	240 ~ 430
		2	4	40 ~ 56	0.010 ~ 0.012	≤0.05 D	1.0 D	6370 ~ 8910	250 ~ 430
		2.5	4	40 ~ 56	0.013 ~ 0.015	≤0.05 D	1.0 D	5090 ~ 7130	260 ~ 430
		3	4	40 ~ 56	0.016 ~ 0.019	≤0.05 D	1.0 D	4240 ~ 5940	270 ~ 450
		4	4	40 ~ 56	0.022 ~ 0.025	≤0.05 D	1.0 D	3180 ~ 4460	280 ~ 450
		S	4	40 ~ 56	0.028 ~ 0.032	≤0.05 D	1.0 D	2550 ~ 3570	290 ~ 460
		6	4	40 ~ 56	0.035 ~ 0.038	≤0.05 D	1.0 D	2120 ~ 2970	300 ~ 450
		8	4	40 ~ 56	0.043 ~ 0.047	≤0.05 D	1.0 D	1590 ~ 2230	270 ~ 420
		10	4	40 ~ 56	0.052 ~ 0.057	≤0.05 D	1.0 D	1270 ~ 1780	260 ~ 410
		12	4	40 ~ 56	0.060 ~ 0.066	≤0.05 D	1.0 D	1060 ~ 1490	250 ~ 390
		14	4	40 ~ 56	0.069 ~ 0.075	≤0.05 D	1.0 D	910 ~ 1270	250 ~ 380
		16	4	40 ~ 56	0.077 ~ 0.085	≤0.05 D	1.0 D	800 ~ 1110	250 ~ 380
		18	4	40 ~ 56	0.085 ~ 0.094	≤0.05 D	1.0 D	710 ~ 990	240 ~ 370
		20	4	40 ~ 56	0.094 ~ 0.103	≤0.05 D	1.0 D	640 ~ 890	240 ~ 370
		22	4	40 ~ 56	0.102 ~ 0.113	≤0.05 D	1.0 D	580 ~ 810	240 ~ 370
		25	4	40 ~ 56	0.115 ~ 0.127	≤0.05 D	1.0 D	510 ~ 710	230 ~ 360

Cutting Parameter - Square Endmill Long

SIDE MILLING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDEDNED STEEL (52~63HRC) AISI D2	M27,28	1	4	32 ~ 48	0.003 ~ 0.005	≤0.05 D	1.0 D	10190 ~ 15280	120 ~ 310
		1.5	4	32 ~ 48	0.005 ~ 0.007	≤0.05 D	1.0 D	6790 ~ 10190	140 ~ 290
		2	4	32 ~ 48	0.007 ~ 0.010	≤0.05 D	1.0 D	5090 ~ 7640	140 ~ 310
		2.5	4	32 ~ 48	0.010 ~ 0.012	≤0.05 D	1.0 D	4070 ~ 6110	160 ~ 290
		3	4	32 ~ 48	0.012 ~ 0.014	≤0.05 D	1.0 D	3400 ~ 5090	160 ~ 290
		4	4	32 ~ 48	0.017 ~ 0.019	≤0.05 D	1.0 D	2550 ~ 3820	170 ~ 290
		5	4	32 ~ 48	0.021 ~ 0.024	≤0.05 D	1.0 D	2040 ~ 3060	170 ~ 290
		6	4	32 ~ 48	0.026 ~ 0.029	≤0.05 D	1.0 D	1700 ~ 2550	180 ~ 300
		8	4	32 ~ 48	0.032 ~ 0.036	≤0.05 D	1.0 D	1270 ~ 1910	160 ~ 280
		10	4	32 ~ 48	0.039 ~ 0.043	≤0.05 D	1.0 D	1020 ~ 1530	160 ~ 260
		12	4	32 ~ 48	0.045 ~ 0.050	≤0.05 D	1.0 D	850 ~ 1270	150 ~ 250
		14	4	32 ~ 48	0.051 ~ 0.057	≤0.05 D	1.0 D	730 ~ 1090	150 ~ 250
		16	4	32 ~ 48	0.058 ~ 0.064	≤0.05 D	1.0 D	640 ~ 950	150 ~ 240
		18	4	32 ~ 48	0.064 ~ 0.071	≤0.05 D	1.0 D	570 ~ 850	150 ~ 240
		20	4	32 ~ 48	0.070 ~ 0.078	≤0.05 D	1.0 D	510 ~ 760	140 ~ 240
		22	4	32 ~ 48	0.077 ~ 0.085	≤0.05 D	1.0 D	460 ~ 690	140 ~ 230
		25	4	32 ~ 48	0.086 ~ 0.095	≤0.05 D	1.0 D	410 ~ 610	140 ~ 230

SIDE MILLING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDEDNED STEEL (63~68 HRC) AISI D2	M33	1	4	24 ~ 40	0.001 ~ 0.001	≤ 0.05 D	1.0 D	7640 ~ 12730	30 ~ 50
		1.5	4	24 ~ 40	0.002 ~ 0.002	≤ 0.05 D	1.0 D	5090 ~ 8490	40 ~ 70
		2	4	24 ~ 40	0.002 ~ 0.003	≤ 0.05 D	1.0 D	3820 ~ 6370	30 ~ 80
		2.5	4	24 ~ 40	0.003 ~ 0.004	≤ 0.05 D	1.0 D	3060 ~ 5090	40 ~ 80
		3	4	24 ~ 40	0.004 ~ 0.005	≤ 0.05 D	1.0 D	2550 ~ 4240	40 ~ 80
		4	4	24 ~ 40	0.005 ~ 0.006	≤ 0.05 D	1.0 D	1910 ~ 3180	40 ~ 80
		5	4	24 ~ 40	0.007 ~ 0.008	≤ 0.05 D	1.0 D	1530 ~ 2550	40~ 80
		6	4	24 ~ 40	0.009 ~ 0.010	≤ 0.05 D	1.0 D	1270 ~ 2120	50 ~ 80
		8	4	24 ~ 40	0.011 ~ 0.012	≤ 0.05 D	1.0 D	950 ~ 1590	40 ~ 80
		10	4	24 ~ 40	0.013 ~ 0.014	≤ 0.05 D	1.0 D	760 ~1270	40 ~ 70
		12	4	24 ~ 40	0.015 ~ 0.017	≤ 0.05 D	1.0 D	640 ~ 1060	40 ~ 70
		14	4	24 ~ 40	0.017 ~ 0.019	≤ 0.05 D	1.0 D	550 ~ 910	40 ~ 70
		16	4	24 ~ 40	0.019 ~ 0.021	≤ 0.05 D	1.0 D	480 ~ 800	40 ~ 70
		18	4	24 ~ 40	0.021 ~ 0.024	≤ 0.05 D	1.0 D	420 ~ 710	40 ~ 70
		20	4	24 ~ 40	0.023 ~ 0.026	≤ 0.05 D	1.0 D	380 ~ 640	30 ~ 70
		22	4	24 ~ 40	0.026 ~ 0.028	≤ 0.05 D	1.0 D	350 ~ 580	40 ~ 60
		25	4	24 ~ 40	0.029 ~ 0.032	≤ 0.05 D	1.0 D	310 ~ 510	40 ~ 70

Cutting Parameter - Square Endmill Extra Long

SIDE MILLING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDEDNED STEEL (45~52HRC) AISI H13	M 26	1	4	25 ~ 35	0.005 ~ 0.007	≤ 1.0 D	≤ 0.3 D	7960 ~ 11140	160 ~ 310
		1.5	4	25 ~ 35	0.008 ~ 0.011	≤ 1.0 D	≤ 0.3 D	5310 ~ 7430	170 ~ 330
		2	4	25 ~ 35	0.012 ~ 0.015	≤ 1.0 D	≤ 0.3 D	3980 ~ 5570	190 ~ 330
		2.5	4	25 ~ 35	0.016 ~ 0.019	≤ 1.0 D	≤ 0.3 D	3180 ~ 4460	200 ~ 340
		3	4	25 ~ 35	0.020 ~ 0.023	≤ 1.0 D	≤ 0.5 D (MAX0.5)	2650 ~ 3710	210 ~ 340
		4	4	25 ~ 35	0.028 ~ 0.031	≤ 1.0 D	≤ 0.5 D (MAX0.5)	1990 ~ 2790	220 ~ 350
		5	4	25 ~ 35	0.035 ~ 0.039	≤ 1.0 D	≤ 0.5 D (MAX0.5)	1590 ~ 2230	220 ~ 350
		6	4	25 ~ 35	0.043 ~ 0.048	≤ 1.0 D	≤ 0.5 D (MAX0.5)	1330 ~ 1860	230 ~ 360
		8	4	25 ~ 35	0.054 ~ 0.059	≤ 1.0 D	≤ 0.5 D (MAX0.5)	990 ~ 1390	210 ~ 330
		10	4	25 ~ 35	0.064 ~ 0.071	≤ 1.0 D	≤ 0.5 D (MAX0.5)	800 ~ 1110	200 ~ 320
		12	4	25 ~ 35	0.075 ~ 0.083	≤ 1.0 D	≤ 0.5 D (MAX0.5)	660 ~ 930	200 ~ 310
		14	4	25 ~ 35	0.086 ~ 0.094	≤ 1.0 D	≤ 0.5 D (MAX0.5)	570 ~ 800	200 ~ 300
		16	4	25 ~ 35	0.096 ~ 0.106	≤ 1.0 D	≤ 0.5 D (MAX0.5)	500 ~ 700	190 ~ 300
		18	4	25 ~ 35	0.107 ~ 0.118	≤ 1.0 D	≤ 0.5 D (MAX0.5)	440 ~ 620	190 ~ 290
		20	4	25 ~ 35	0.117 ~ 0.129	≤ 1.0 D	≤ 0.5 D (MAX0.5)	400 ~ 560	190 ~ 290
		22	4	25 ~ 35	0.128 ~ 0.141	≤ 1.0 D	≤ 0.5 D (MAX0.5)	360 ~ 510	180 ~ 290
		25	4	25 ~ 35	0.144 ~ 0.158	≤ 1.0 D	≤ 0.5 D (MAX0.5)	320 ~ 450	180 ~ 280

SIDE MILLING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDEDNED STEEL (52~63HRC) AISI H13	M27,28	1	4	20 ~ 30	0.004 ~ 0.006	≤ 1.0 D	≤ 0.3 D	6370 ~ 9550	100 ~ 230
		1.5	4	20 ~ 30	0.006 ~ 0.009	≤ 1.0 D	≤ 0.3 D	4240 ~ 6370	100 ~ 230
		2	4	20 ~ 30	0.009 ~ 0.012	≤ 1.0 D	≤ 0.3 D	3180 ~ 4770	110 ~ 230
		2.5	4	20 ~ 30	0.012 ~ 0.015	≤ 1.0 D	≤ 0.3 D	2550 ~ 3820	120 ~ 230
		3	4	20 ~ 30	0.015 ~ 0.018	≤ 1.0 D	≤ 0.5 D (MAX0.5)	2120 ~ 3180	130 ~ 230
		4	4	20 ~ 30	0.021 ~ 0.024	≤ 1.0 D	≤ 0.5 D (MAX0.5)	1590 ~ 2390	130 ~ 230
		S	4	20 ~ 30	0.027 ~ 0.030	≤ 1.0 D	≤ 0.5 D (MAX0.5)	1270 ~ 1910	140 ~ 230
		6	4	20 ~ 30	0.032 ~ 0.036	≤ 1.0 D	≤ 0.5 D (MAX0.5)	1060 ~ 1590	140 ~ 230
		8	4	20 ~ 30	0.040 ~ 0.044	≤ 1.0 D	≤ 0.5 D (MAX0.5)	800 ~ 1190	130 ~ 210
		10	4	20 ~ 30	0.048 ~ 0.053	≤ 1.0 D	≤ 0.5 D (MAX0.5)	640 ~ 950	120 ~ 200
		12	4	20 ~ 30	0.056 ~ 0.062	≤ 1.0 D	≤ 0.5 D (MAX0.5)	530 ~ 800	120 ~ 200
		14	4	20 ~ 30	0.064 ~ 0.071	≤ 1.0 D	≤ 0.5 D (MAX0.5)	450 ~ 680	120 ~ 200
		16	4	20 ~ 30	0.072 ~ 0.079	≤ 1.0 D	≤ 0.5 D (MAX0.5)	400 ~ 600	120 ~ 190
		18	4	20 ~ 30	0.080 ~ 0.088	≤ 1.0 D	≤ 0.5 D (MAX0.5)	350 ~ 530	110 ~ 190
		20	4	20 ~ 30	0.088 ~ 0.097	≤ 1.0 D	≤ 0.5 D (MAX0.5)	320 ~ 480	110 ~ 190
		22	4	20 ~ 30	0.096 ~ 0.106	≤ 1.0 D	≤ 0.5 D (MAX0.5)	290 ~ 430	110 ~ 180
		25	4	20 ~ 30	0.108 ~ 0.119	≤ 1.0 D	≤ 0.5 D (MAX0.5)	250 ~ 380	110 ~ 180

Cutting Parameter - Square Endmill Extra Long

SIDE MILLING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDEDNED STEEL (55~60HRC) AISI H13	M33	1	4	15 ~ 25	0.001 ~ 0.002	≤1.0 D	≤0.3 D	4770 ~ 7960	20 ~ 60
		1.5	4	15 ~ 25	0.002 ~ 0.003	≤1.0 D	≤0.3 D	3180 ~ 5310	30 ~ 60
		2	4	15 ~ 25	0.003 ~ 0.004	≤1.0 D	≤0.3 D	2390 ~ 3980	30 ~ 60
		25	4	15 ~ 25	0.004 ~ 0.005	≤1.0 D	≤0.3 D	1910 ~ 3180	30 ~ 60
		3	4	15 ~ 25	0.005 ~ 0.006	≤1.0 D	≤0.5 D (MAX0.5)	1590 ~ 2650	30 ~ 60
		4	4	15 ~ 25	0.007 ~ 0.008	≤1.0 D	≤0.5 D (MAX0.5)	1190 ~ 1990	30 ~ 60
		5	4	15 ~ 25	0.009 ~ 0.010	≤1.0 D	≤0.5 D (MAX0.5)	950 ~ 1590	30 ~ 60
		6	4	15 ~ 25	0.011 ~ 0.012	≤1.0 D	≤0.5 D (MAX0.5)	800 ~ 1330	40 ~ 60
		a	4	15 ~ 25	0.013 ~ 0.015	≤1.0 D	≤0.5 D (MAX0.5)	600 ~ 990	30 ~ 60
		10	4	15 ~ 25	0.016 ~ 0.018	≤1.0 D	≤0.5 D (MAX0.5)	480 ~ 800	30 ~ 60
		12	4	15 ~ 25	0.019 ~ 0.021	≤1.0 D	≤0.5 D (MAX0.5)	400 ~ 660	30 ~ 60
		14	4	15 ~ 25	0.021 ~ 0.024	≤1.0 D	≤0.5 D (MAX0.5)	340 ~ 570	30 ~ 50
		16	4	15 ~ 25	0.024 ~ 0.026	≤1.0 D	≤0.5 D (MAX0.5)	300 ~ 500	30 ~ 50
		18	4	15 ~ 25	0.027 ~ 0.029	≤1.0 D	≤0.5 D (MAX0.5)	270 ~ 440	30 ~ 50
		20	4	15 ~ 25	0.029 ~ 0.032	≤1.0 D	≤0.5 D (MAX0.5)	240 ~ 400	30 ~ 50
		22	4	15 ~ 25	0.032 ~ 0.035	≤1.0 D	≤0.5 D (MAX0.5)	220 ~ 360	30 ~ 50
		25	4	15 ~ 25	0.036 ~ 0.040	≤1.0 D	≤0.5 D (MAX0.5)	190 ~ 320	30 ~ 50

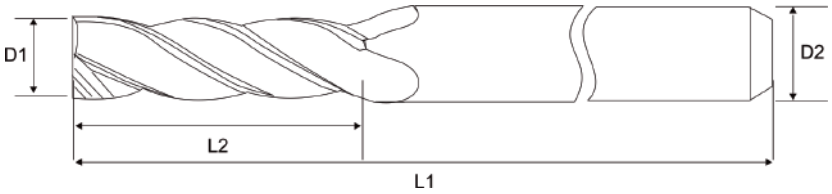
SIDE MILLING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDEDNED STEEL (45~52HRC) AISI H13	M27,28	1	4	25~ 35	0.004 ~ 0.006	≤ 0.05 D	1.0 D	7960 ~ 11140	130 ~ 270
		1.5	4	25 ~ 35	0.007 ~ 0.009	≤ 0.05 D	1.0 D	5310 ~ 7430	150 ~ 270
		2	4	25 ~ 35	0.010 ~ 0.012	≤ 0.05 D	1.0 D	3980 ~ 5570	160 ~ 270
		2.5	4	25 ~ 35	0.013 ~ 0.015	≤ 0.05 D	1.0 D	3180 ~ 4460	170 ~ 270
		3	4	25 ~ 35	0.016 ~ 0.019	≤ 0.05 D	1.0 D	2650 ~ 3710	170 ~ 280
		4	4	25~ 35	0.022 ~ 0.025	≤ 0.05 D	1.0 D	1990 ~ 2790	180 ~ 280
		5	4	25 ~ 35	0.028 ~ 0.032	≤ 0.05 D	1.0 D	1590 ~ 2230	180 ~ 290
		6	4	25 ~ 35	0.035 ~ 0.038	≤ 0.05 D	1.0 D	1330 ~ 1860	190 ~ 280
		8	4	25 ~ 35	0.043 ~ 0.047	≤ 0.05 D	1.0 D	990 ~ 1390	170 ~ 260
		10	4	25 ~ 35	0.052 ~ 0.057	≤ 0.05 D	1.0 D	800 ~ 1110	170 ~ 250
		12	4	25 ~ 35	0.060 ~ 0.066	≤ 0.05 D	1.0 D	660 ~ 930	160 ~ 250
		14	4	25 ~ 35	0.069 ~ 0.075	≤ 0.05 D	1.0 D	570 ~ 800	160 ~ 240
		16	4	25 ~ 35	0.077 ~ 0.085	≤ 0.05 D	1.0 D	500 ~ 700	150 ~ 240
		18	4	25 ~ 35	0.085 ~ 0.094	≤ 0.05 D	1.0 D	440 ~ 620	150 ~ 230
		20	4	25 ~ 35	0.094 ~ 0.103	≤ 0.05 D	1.0 D	400 ~ 560	150 ~ 230
		22	4	25 ~ 35	0.102 ~ 0.113	≤ 0.05 D	1.0 D	360 ~ 510	150 ~ 230
		25	4	25 ~ 35	0.115 ~ 0.127	≤ 0.05 D	1.0 D	320 ~ 450	150 ~ 230

Cutting Parameter - Square Endmill Extra Long

SLOTTING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDEDNED STEEL (52-63HRC) AISI D2	M27,28	1	4	20 ~ 30	0.003 ~ 0.005	≤ 0.05 D	1.0 D	6370 ~ 9550	80 ~ 190
		1.5	4	20 ~ 30	0.005 ~ 0.007	≤ 0.05 D	1.0 D	4240 ~ 6370	80 ~ 180
		2	4	20 ~ 30	0.007 ~ 0.010	≤ 0.05 D	1.0 D	3180 ~ 4770	90 ~ 190
		2.5	4	20 ~ 30	0.010 ~ 0.012	≤ 0.05 D	1.0 D	2550 ~ 3820	100 ~ 180
		3	4	20 ~ 30	0.012 ~ 0.014	≤ 0.05 D	1.0 D	2120 ~ 3180	100 ~ 180
		4	4	20 ~ 30	0.017 ~ 0.019	≤ 0.05 D	1.0 D	1590 ~ 2390	110 ~ 180
		5	4	20 ~ 30	0.021 ~ 0.024	≤ 0.05 D	1.0 D	1270 ~ 1910	110 ~ 180
		6	4	20 ~ 30	0.026 ~ 0.029	≤ 0.05 D	1.0 D	1060 ~ 1590	110 ~ 180
		8	4	20 ~ 30	0.032 ~ 0.036	≤ 0.05 D	1.0 D	800 ~ 1190	100 ~ 170
		10	4	20 ~ 30	0.039 ~ 0.043	≤ 0.05 D	1.0 D	640 ~ 950	100 ~ 160
		12	4	20 ~ 30	0.045 ~ 0.050	≤ 0.05 D	1.0 D	530 ~ 800	100 ~ 160
		14	4	20 ~ 30	0.051 ~ 0.057	≤ 0.05 D	1.0 D	450 ~ 680	90 ~ 160
		16	4	20 ~ 30	0.058 ~ 0.064	≤ 0.05 D	1.0 D	400 ~ 600	90 ~ 150
		18	4	20 ~ 30	0.064 ~ 0.071	≤ 0.05 D	1.0 D	350 ~ 530	90 ~ 150
		20	4	20 ~ 30	0.070 ~ 0.078	≤ 0.05 D	1.0 D	320 ~ 480	90 ~ 150
		22	4	20 ~ 30	0.077 ~ 0.085	≤ 0.05 D	1.0 D	290 ~ 430	90 ~ 150
		25	4	20 ~ 30	0.086 ~ 0.095	≤ 0.05 D	1.0 D	250 ~ 380	180 ~ 280

DH SERIES

4 Flute Standard Endmill



ITEM CODE	D1(DIA)	D2 (SHANK)	L2 (WL)	L1 (OAL)	AVAILABLITY
EM1N4D4DH	1	4	3	50	●
EM1.5N4D4DH	1.5	4	4	50	●
EM2N4D4DH	2	4	6	50	●
EM3N4D4DH	3	4	8	50	●
EM3N4D4H	3	3	8	50	●
EM4N4DH	4	4	10	50	●
EMSN4DH	5	5	13	50	●
EMSN4D6DH	5.	6	13	50	●
EM6N4DH	6	6	15	50	●
EM8N4DH	8	8	25	60	●
EM10N4DH	10	10	30	75	●
EM12N4DH	12	12	30	75	●
EM14N4DH	14	14	45	100	●
EM16N4DH	16	16	45	100	●
EM18N4DH	18	18	45	100	●
EM20N4DH	20	20	50	100	●

● STOCKABLE ○ NON STOCKABLE







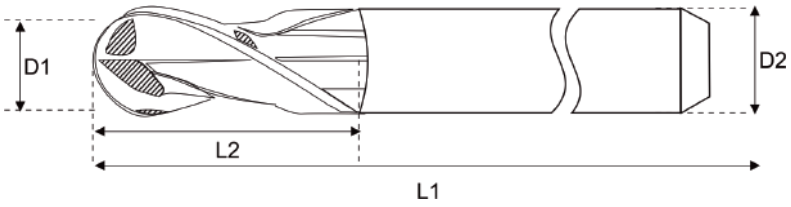






DH SERIES

2 Flute Standard Ballnose



ITEM CODE	D1(DIA)	D2 (SHANK)	L2 (WL)	L1 (OAL)	AVAILABLITY
BN1N2D4DH	1	4.	3	50	●
BN1.5N2D4DH	1.5	4	3	50	●
BN2N2D4DH	2	4	4	50	●
BN3N2DH	3	3	6	50	●
BN3N2D4DH	3	4	6	50	●
BN4N2DH	4	4	8	50	●
BN5N2DH	5	5	10	50	●
BN5N2D6DH	5.	6	10	50	●
BN6N2DH	6	6	12	50	●
BN8N2DH	8	8	16	60	●
BN10N2DH	10	10	20	75	●
BN12N2DH	12	12	25	75	●

● STOCKABLE ○ NON STOCKABLE







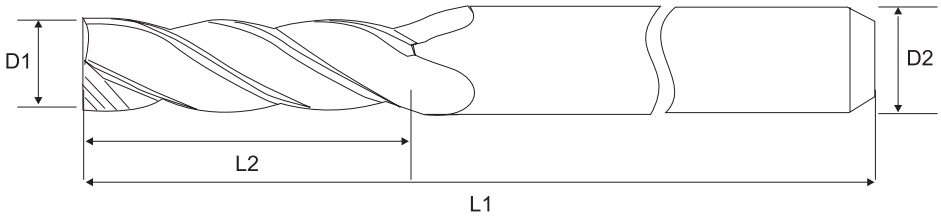






DH SERIES

4 Flute Long Endmill Series



ITEM CODE	D1(DIA)	D2 (SHANK)	L2 (WL)	L1 (OAL)	AVAILABLITY
EM3L4D4DH	3	4	15	75	●
EM4L4DH	4T	4	15	75	●
EM5L4D6DH	5	6	20	75	●
EM6L4DH	6	6	24	75	●
EM8L4DH	8	8	25	50	●
EM4XL4DH	4	4	16	100	●
EM6LR4DH	6	6	24	100	●
EM8LR4DH	8	8	32	100	●
EM10LR4DH	10	10	40	100	●
EM12LR4DH	12	12	48	100	●

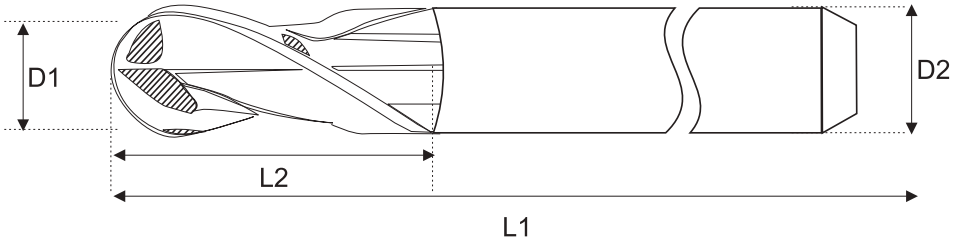
● STOCKABLE ○ NON STOCKABLE

TiSi
MG
0.8 µm
Co 10%
HRC ▸50
4flute

MILLING

DH SERIES

2 Flute Long Ballnose Series



ITEM CODE	D1(DIA)	D2 (SHANK)	L2 (WL)	L1 (OAL)	AVAILABLITY
BN3L2D4DH	3	4	8	75	●
BN3XL2D4DH	3	4	8	100	●
BN4L2DH	4	4	10	75	●
BN4XL2DH	4	4	10	100	●
BN6L2DH	6	6	12	75	●
BN6LR2DH	6	6	15	100	●
BN8L2DH	8	8	16	75	●
BN8LR2DH	8	8	20	100	●
BN10LR2DH	10	10	25	100	●
BN12LR2DH	12	12	30	100	●

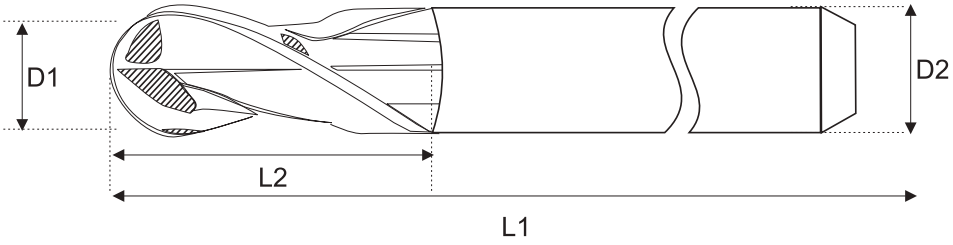
● STOCKABLE ○ NON STOCKABLE



MILLING

DH SERIES

4 Flute Ballnose Line



ITEM CODE	D1(DIA)	D2 (SHANK)	L2 (WL)	L1 (OAL)	AVAILABLITY
BN2N4D4DH	2	4	4	50	●
BN3N4DH	3	3	6	50	●
BN4N4DH	4	4	8	50	●
BN5N4DH	5	5	12	50	●
BN6N4DH	6	6	12	50	●
BN8N4DH	8	8	16	60	●
BN10N4DH	10	10	20	75	●
BN12N4DH	12	12	25	75	●

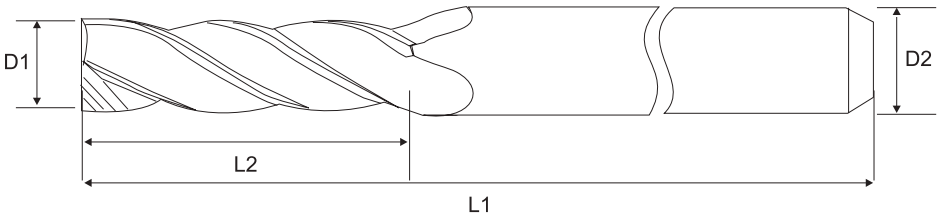
● STOCKABLE ○ NON STOCKABLE

TiSi
MG
0.8 µm
Co 10%
HRC ▸50
4 flute

MILLING

DH SERIES

4 Flute Corner Radius Endmill

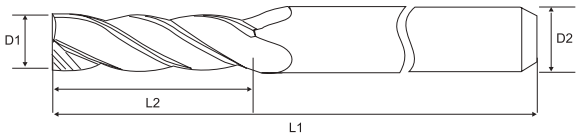


ITEM CODE	D1(DIA)	D2 (SHANK)	L2 (WL)	L1 (OAL)	AVAILABLITY
EM3N4D4CR0.5DH	3R0.5	4	6	50	●
EM3N4D4CR1DH	3R1	4	6	50	●
EM4N4CR0.5DH	4R0.5	4	8	50	●
EM4N4CR1DH	4 R1	4	8	50	●
EM5N4CR0.5DH	5R0.5	5	10	50	●
EM5N4CR1DH	5R1	5	10	50	●
EM6N4CR0.5DH	6R0.5	6	12	50	●
EM6N4CR1DH	6R1	6	12	50	●
EM8N4CR0.5DH	8R0.5	8	16	60	●
EM8N4CR1DH	8R1	8	16	60	●
EM10N4CR0.5DH	10R0.5	10	20	75	●
EM10N4CR1DH	10R1	10	20	75	●
EM12N4CR0.5DH	12R0.5	12	24	75	●
EM12N4CR1DH	12R1	12	24	75	●



● STOCKABLE ○ NON STOCKABLE

DH SERIES
Extra Long Length 4 Flute Square Endmill



ITEM CODE	D1(DIA)	D2 (SHANK)	L2 (WL)	L1 (OAL)	Z	AVAILABLITY
EM6XL4DH	6	6	40	150	4	●
EM8XL4DH	8	8	40	150	4	●
EM10XL4DH	10	10	40	150	4	●
EM12XL4DH	12	12	50	150	4	●
EM16XL4DH	16	16	60	150	4	●
EM20XL4DH	20	20	60	150	4	●

● STOCKABLE ○ NON STOCKABLE

TiSi
MG
0.8 µm
Co 10%
HRC ▸50
4flute

MILLING

DH SERIES
2 Flute Rib Endmill



ITEM NUMBER	D1(DIA)	L2 (WL)	L (OAL)	D2(SHANK)	AVAILABLITY
ME0.3F2LN2D4DH	0.3	2	50	4	○
ME0.3F4LN2D4DH	0.3	4	50	4	○
ME0.4F2LN2D4DH	0.4	2	50	4	○
ME0.4F4LN2D4DH	0.4	4	50	4	○
ME0.5F2LN2D4DH	0.5	2	50	4	●
ME0.5F4LN2D4DH	0.5	4	50	4	●
ME0.5F6LN2D4DH	0.5	6	50	4	●
ME0.5F8LN2D4DH	0.5	8	50	4	●
ME0.6F4LN2D4DH	0.6	4	50	4	○
ME0.6F6LN2D4DH	0.6	6	50	4	○
ME0.6F8LN2D4DH	0.6	8	50	4	○
ME0.8F4LN2D4DH	0.8	4	50	4	○
ME0.8F6LN2D4DH	0.8	6	50	4	○
ME0.8F8LN2D4DH	0.8	8	50	4	○
ME0.8F10LN2D4DH	0.8	10	50	4	○
ME1F6LN2D4DH	1	6	50	4	●
ME1F10LN2D4DH	1	10	50	4	●
ME1F12LN2D4DH	1	12	50	4	●
ME1F16LN2D4DH	1	16	50	4	●
ME1.5F8LN2D4DH	1.5	8	50	4	●
ME1.5F10LN2D4DH	1.5	10	50	4	●
ME1.5F12LN2D4DH	1.5	12	50	4	●
ME1.5F16LN2D4DH	1.5	16	50	4	●
ME2F8LN2D4DH	2	8	50	4	●
ME2F10LN2D4DH	2	10	50	4	●
ME2F12LN2D4DH	2	12	50	4	●
ME2F16LN2D4DH	2	16	50	4	●
ME2F20LN2D4DH	2	20	50	4	●
ME2.5F10LN2D4DH	2.5	10	50	4	○
ME2.5F16LN2D4DH	2.5	16	50	4	○
ME2.5F20LN2D4DH	2.5	20	50	4	○
ME3F12LN2D4DH	3	12	50	4	●
ME3F16LN2D4DH	3	16	50	4	●
ME3F20LN2D4DH	3	20	50	4	●
ME3F25LN2D4DH	3	25	50	4	○













PLEASE NOTE : FLUTE LENGTH OF ALL ABOVE TOOLS IS 2 X DIAMETER . FOR EG: FOR 0.5MM DIA, FLUTE LENGTH IS 1MM.

● STOCKABLE ○ NON STOCKABLE

DH SERIES

2 Flute BallNose Rib Endmill



ITEM NUMBER	D1(DIA)	L2 (WL)	L (OAL)	D2(SHANK)	AVAILABLITY
MB0.5F2LN2D4DH	0.5	2	50	4	●
MB0.5F4LN2D4DH	0.5	4	50	4	●
MB0.5F6LN2D4DH	0.5	6	50	4	●
MB0.5F8LN2D4DH	0.5	8	50	4	●
MB0.6F4LN2D4DH	0.6	4	50	4	○
MB0.6F6LN2D4DH	0.6	6	50	4	○
MB0.6F8LN2D4DH	0.6	8	50	4	○
MB0.8F4LN2D4DH	0.8	4	50	4	○
MB0.8F6LN2D4DH	0.8	6	50	4	○
MB0.8F8LN2D4DH	0.8	8	50	4	○
MB0.8F10LN2D4DH	0.8	10	50	4	○
MB1F6LN2D4DH	1	6	50	4	●
MB1F10LN2D4DH	1	10	50	4	●
MB1F12LN2D4DH	1	12	50	4	●
MB1F16LN2D4DH	1	16	50	4	●
MB1.5F8LN2D4DH	1.5	8	50	4	●
MB1.5F10LN2D4DH	1.5	10	50	4	○
MB1.5F12LN2D4DH	1.5	12	50	4	●
MB1.5F16LN2D4DH	1.5	16	50	4	●
MB2F8LN2D4DH	2	8	50	4	●
MB2F10LN2D4DH	2	10	50	4	●
MB2F12LN2D4DH	2	12	50	4	●
MB2F16LN2D4DH	2	16	50	4	●
MB2F20LN2D4DH	2	20	50	4	○
MB2.5F10LN2D4DH	2.5	10	50	4	○
MB2.5F16LN2D4DH	2.5	16	50	4	○
MB2.5F20LN2D4DH	2.5	20	50	4	○
MB3F12LN2D4DH	3	12	50	4	●
MB3F16LN2D4DH	3	16	50	4	●
MB3F20LN2D4DH	3	20	50	4	●
MB3F25LN2D4DH	3	25	50	4	○













● STOCKABLE ○ NON STOCKABLE

PLEASE NOTE : FLUTE LENGTH OF ALL ABOVE TOOLS IS 2 X DIAMETER . FOR EG: FOR 0.5MM DIA, FLUTE LENGTH IS 1MM

DH SERIES

4 Flute Rib Endmill



ITEM NUMBER	D1(DIA)	L2 (WL)	L (OAL)	D2(SHANK)	AVAILABLITY
ME1F6LN4D4DH	1	6	50	4	●
ME1F10LN4D4DH	1	10	50	4	●
ME1F12LN4D4DH	1	12	50	4	●
ME1F16LN4D4DH	1	16	50	4	●
ME1.5F8LN4D4DH	1.5	8	50	4	○
ME1.5F10LN4D4DH	1.5	10	50	4	●
ME1.5F12LN4D4DH	1.5	12	50	4	○
ME1.5F16LN4D4DH	1.5	16	50	4	●
ME2F8LN4D4DH	2	8	50	4	●
ME2F10LN4D4DH	2	10	50	4	●
ME2F12LN4D4DH	2	12	50	4	●
ME2F16LN4D4DH	2	16	50	4	●
ME2F20LN4D4DH	2	20	50	4	●
ME2.5F10LN4D4DH	2.5	10	50	4	○
ME2.5F16LN4D4DH	2.5	16	50	4	○
ME2.5F20LN4D4DH	2.5	20	50	4	○
ME3F12LN4D4DH	3	12	50	4	●
ME3F16LN4D4DH	3	16	50	4	●
ME3F20LN4D4DH	3	20	50	4	●
ME3F25LN4D4DH	3	25	50	4	○

TiSi

MG

0.8 µm

Co 10%

HRC ▸50

4 flute

● STOCKABLE ○ NON STOCKABLE

PLEASE NOTE : FLUTE LENGTH OF ALL ABOVE TOOLS IS 2 X DIAMETER . FOR EG: FOR 0.5MM DIA, FLUTE LENGTH IS 1MM.

Cutting Parameter - Miniature Square Endmill Long Neck

2 FLUTES MINIATURE ENDMILL												
DEPTH OF CUT			HARDENED STEELS - M26,M27					HARDENED STEELS -M28,M33				
C	L2	AE (MM)	AP (MM)	VC(M/MIN)	FZ (MM)	N (MIN-1)	VF (MM/MIN)	AP (MM)	VC (M/MIN)	FZ (MM)	N (MIN-1)	VF(MM/MIN)
0.2	0.5T	1.0D	0.040	25	0.002	40,000	160	0.034	25	0.001	40,000	80
0.2	1	1.0D	0.016	23	0.002	37,400	140	0.014	23	0.001	37.400	70
0.2	1.5	1.0D	0.011	22	0.002	34,800	121	0.010	22	0.001	34,800	61
0.3	1	1.0D	0.040	38	0.002	40,000	160	0.034	38	0.001	40,000	80
0.3	2	1.0D	0.020	33	0.002	34,800	121	0.017	33	0.001	34,800	61
0.3	3	1.0D	0.012	28	0.001	29,600	88	0.010	28	0.001	29,600	44
0.4	2	1.0D	0.032	47	0.003	37,400	210	0.027	47	0.003	37,301	209
0.4	3	1.0D	0.023	44	0.003	34,800	182	0.019	44	0.003	34,708	181
0.4	4	1.0D	0.016	37	0.002	29,600	131	0.014	37	0.002	29,522	131
0.4	5	1.0D	0.013	34	0.002	27,000	109	0.011	34	0.002	26,929	109
0.5	2	1.0D	0.050	62	0.004	39,099	315	0.043	57	0.004	35,916	264
0.5	4	1.0D	0.025	50	0.003	31,474	204	0.021	45	0.003	28,912	171
0.5	6	1.0D	0.017	42	0.003	26,391	143	0.014	38	0.002	24,243	120
0.5	8	1.0D	0.013	34	0.002	21,309	93	0.011	31	0.002	19,574	78
0.6	2	1.0D	0.080	68	0.005	35,916	336	0.068	60	0.004	31,831	239
0.6	4	1.0D	0.040	59	0.004	31,246	254	0.034	52	0.003	27,693	181
0.6	6	1.0D	0.024	50	0.003	26,577	184	0.020	44	0.003	23,555	131
0.6	8	1.0D	0.018	46	0.003	24,243	153	0.016	41	0.002	21,486	109
0.6	10	1.0D	0.015	37	0.002	19,574	100	0.013	33	0.002	17,348	71
0.7	2	1.0D	0.140	70	0.005	31,831	328	0.119	60	0.005	27,284	259
0.7	4	1.0D	0.056	65	0.005	29,762	286	0.048	56	0.004	25,510	226
0.7	6	1.0D	0.035	56	0.004	25,624	212	0.030	48	0.004	21,963	168
0.7	8	1.0D	0.025	52	0.004	23,555	179	0.022	44	0.003	20,190	142
0.7	10	1.0D	0.020	43	0.003	19,417	122	0.017	37	0.003	16,643	96
0.8	4	1.0D	0.064	65	0.005	26,042	278	0.054	56	0.004	22,321	198
0.8	6	1.0D	0.046	61	0.005	24,231	241	0.039	52	0.004	20,770	171
0.8	8	1.0D	0.032	52	0.004	20,610	174	0.027	44	0.003	17,666	124
0.8	10	1.0D	0.027	47	0.004	18,800	145	0.023	41	0.003	16,114	103
0.8	12	1.0D	0.021	43	0.003	16,990	119	0.018	37	0.003	14,563	84
0.9	6	1.0D	0.060	61	0.005	21,539	230	0.051	52	0.005	18,462	185
0.9	8	1.0D	0.045	56	0.005	19,930	197	0.038	48	0.004	17,083	158
0.9	10	1.0D	0.033	52	0.004	18,321	166	0.028	44	0.004	15,703	134
0.9	15	1.0D	0.023	38	0.003	13,493	90	0.019	33	0.003	11,565	72
1.0	6	1.0D	0.067	61	0.006	19,385	226	0.057	52	0.005	16,616	166
1.0	8	1.0D	0.050	56	0.005	17,937	194	0.043	48	0.004	15,374	142
1.0	10	1.0D	0.040	52	0.005	16,489	164	0.034	44	0.004	14,133	120
1.0	12	1.0D	0.033	47	0.004	15,040	136	0.028	41	0.004	12,891	100

Cutting Parameter - Miniature Square Endmill Long Neck

2 FLUTES MINIATURE ENDMILL												
DEPTH OF CUT			HARDENED STEELS - M26,M27					HARDENED STEELS -M28,M33				
C	L2	AE (MM)	AP (MM)	VC(M/MIN)	FZ (MM)	N (MIN-1)	VF (MM/MIN)	AP (MM)	VC (M/MIN)	FZ (MM)	N (MIN-1)	VF(MM/MIN)
1.0	14	1.0D	0.029	43	0.004	13592	111	0.024	37	0.003	11650	82
1.0	16	1.0D	0.025	38	0.004	12144	89	0.021	33	0.003	10409	65
1.2	6	1.0D	0.096	65	0.007	17361	250	0.082	56	0.006	14881	188
1.2	8	1.0D	0.080	61	0.007	16154	217	0.068	52	0.006	13846	163
1.2	10	1.0D	0.060	56	0.006	14947	186	0.051	48	0.005	12812	139
1.2	12	1.0D	0.048	52	0.006	13740	157	0.041	44	0.005	11777	118
1.4	6	1.0D	0.140	70	0.008	15916	264	0.119	60	0.007	13642	200
1.4	8	1.0D	0.112	65	0.007	14881	231	0.095	56	0.007	12755	175
1.4	10	1.0D	0.080	61	0.007	13846	200	0.068	52	0.006	11868	151
1.4	12	1.0D	0.070	56	0.006	12812	171	0.060	48	0.006	10981	130
1.4	14	1.0D	0.056	52	0.006	11777	145	0.048	44	0.005	10095	110
1.4	16	1.0D	0.051	52	0.006	11777	145	0.043	44	0.005	10095	110
1.5	6	1.0D	0.150	70	0.009	14855	259	0.128	60	0.008	12732	212
1.5	8	1.0D	0.120	65	0.008	13889	226	0.102	56	0.007	11904	185
1.5	10	1.0D	0.100	61	0.007	12923	196	0.085	52	0.007	11077	160
1.5	12	1.0D	0.075	56	0.007	11958	168	0.064	48	0.006	10249	137
1.5	14	1.0D	0.067	56	0.007	11958	168	0.057	48	0.006	10249	137
1.5	16	1.0D	0.060	52	0.006	10992	142	0.051	44	0.006	9422	116
1.5	18	1.0D	0.050	47	0.006	10027	118	0.043	41	0.005	8594	97
1.5	20	1.0D	0.046	47	0.006	10027	118	0.039	41	0.005	8594	97
1.6	6	1.0D	0.213	70	0.009	13926	259	0.181	60	0.008	11937	199
1.6	8	1.0D	0.128	65	0.008	13021	226	0.109	56	0.007	11161	174
1.6	10	1.0D	0.107	61	0.008	12116	196	0.091	52	0.007	10385	151
1.6	12	1.0D	0.091	61	0.008	12116	196	0.078	52	0.007	10385	151
1.6	14	1.0D	0.080	56	0.007	11210	168	0.068	48	0.006	9609	129
1.6	16	1.0D	0.064	52	0.007	10305	142	0.054	44	0.006	8833	109
1.6	18	1.0D	0.058	52	0.007	10305	142	0.049	44	0.006	8833	109
1.6	20	1.0D	0.053	47	0.006	9400	118	0.045	41	0.005	8057	91
1.8	6	1.0D	0.240	70	0.010	12379	255	0.204	60	0.009	10611	198
1.8	8	1.0D	0.180	70	0.010	12379	255	0.153	60	0.009	10611	198
1.8	10	1.0D	0.144	65	0.009	11574	223	0.122	56	0.008	9921	173
1.8	12	1.0D	0.120	61	0.009	10769	193	0.102	52	0.008	9231	150
1.8	14	1.0D	0.103	61	0.009	10769	193	0.087	52	0.008	9231	150
1.8	16	1.0D	0.090	56	0.008	9965	165	0.077	48	0.007	8541	128
1.8	18	1.0D	0.072	52	0.007	9160	140	0.061	44	0.007	7852	108
1.8	20	1.0D	0.065	52	0.007	9160	140	0.056	44	0.007	7852	108
2.0	6	1.0D	0.267	70	0.011	11141	252	0.227	60	0.010	9550	197

Cutting Parameter - Miniature Square Endmill Long Neck

2 FLUTES MINIATURE ENDMILL												
DEPTH OF CUT			HARDENED STEELS - M26,M27					HARDENED STEELS -M28,M33				
C	L2	AE (MM)	AP (MM)	VC(M/MIN)	FZ (MM)	N (MIN-1)	VF (MM/MIN)	AP (MM)	VC (M/MIN)	FZ (MM)	N (MIN-1)	VF(MM/MIN)
2.0	8	1.0D	0.200	70	0.011	11,141	252	0.170	60	0.010	9,550	197
2.0	10	1.0D	0.160	65	0.010	10,416	220	0.136	56	0.009	8,929	172
2.0	12	1.0D	0.133	61	0.010	9,692	190	0.113	52	0.009	8,308	149
2.0	14	1.0D	0.114	61	0.010	9,692	190	0.097	52	0.009	8,308	149
2.0	16	1.0D	0.100	56	0.009	8,968	163	0.085	48	0.008	7,687	128
2.0	18	1.0D	0.089	56	0.009	8,968	163	0.076	48	0.008	7,687	128
2.0	20	1.0D	0.080	52	0.008	8,244	138	0.068	44	0.007	7,067	108
2.0	25	1.0D	0.067	47	0.007	7,520	115	0.057	41	0.007	6,446	90
2.0	30	1.0D	0.053	43	0.007	6,796	94	0.045	37	0.006	5,825	73
2.5	8	1.0D	0.333	70	0.013	8,913	230	0.283	60	0.012	7,640	191
2.5	10	1.0D	0.250	70	0.013	8,913	230	0.213	60	0.012	7,640	191
2.5	12	1.0D	0.250	70	0.013	8,913	230	0.213	60	0.012	7,640	191
2.5	14	1.0D	0.200	65	0.012	8,333	201	0.170	56	0.011	7,143	167
2.5	16	1.0D	0.167	61	0.011	7,754	174	0.142	52	0.010	6,646	145
2.5	18	1.0D	0.143	61	0.011	7,754	174	0.121	52	0.010	6,646	145
2.5	20	1.0D	0.125	56	0.010	7,175	149	0.106	48	0.010	6,150	124
2.5	25	1.0D	0.100	52	0.009	6,595	126	0.085	44	0.009	5,653	105
2.5	30	1.0D	0.083	47	0.008	6,016	105	0.071	41	0.008	5,157	87
3.0	8	1.0D	0.600	70	0.015	7,427	221	0.510	60	0.014	6,366	185
3.0	10	1.0D	0.400	70	0.015	7,427	221	0.340	60	0.014	6,366	185
3.0	12	1.0D	0.300	70	0.015	7,427	221	0.255	60	0.014	6,366	185
3.0	14	1.0D	0.300	70	0.015	7,427	221	0.255	60	0.014	6,366	185
3.0	16	1.0D	0.240	65	0.014	6,944	193	0.204	56	0.013	5,952	162
3.0	18	1.0D	0.200	61	0.013	6,461	167	0.170	52	0.012	5,538	140
3.0	20	1.0D	0.200	61	0.013	6,461	167	0.170	52	0.012	5,538	140
3.0	25	1.0D	0.150	56	0.012	5,979	143	0.128	48	0.011	5,125	120
4.0	10	1.0D	0.800	70	0.019	5,571	217	0.680	60	0.019	4,775	182
4.0	15	1.0D	0.533	70	0.019	5,571	217	0.453	60	0.019	4,775	182
4.0	20	1.0D	0.320	65	0.018	5,208	189	0.272	56	0.017	4,464	159
4.0	25	1.0D	0.267	61	0.017	4,846	164	0.227	52	0.016	4,154	138
4.0	30	1.0D	0.229	61	0.017	4,846	164	0.194	52	0.016	4,154	138
4.0	40	1.0D	0.160	52	0.014	4,122	119	0.136	44	0.014	3,533	100

Cutting Parameter - Hard 2 Flute Ballnose

PROFILE MILLING		α < 15°							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
ALLOY STEEL, TOOL STEEL, PREHARDENED STEEL(~45HRC)AISI H13,AISI D2, NAK	M12, M13, M14, M15, M18, M22 M23, M24, M25	0.5	2	63	0.008	≤0.05D	≤0.1D	40000	640
		0.6	2	75	0.009	≤0.05D	≤0.1D	40000	699
		0.7	2	88	0.009	≤0.05D	≤0.1D	40000	758
		0.8	2	101	0.010	≤0.05D	≤0.1D	40000	817
		0.9	2	113	0.011	≤0.05D	≤0.1D	40000	877
		1	2	126	0.012	≤0.05D	≤0.1D	40000	936
		1.5	2	188	0.015	≤0.05D	≤0.2D	40000	1231
		2	2	251	0.019	≤0.05D	≤0.2D	40000	1527
		2.5	2	314	0.023	≤0.05D	≤0.2D	40000	1823
		3	2	370	0.026	≤0.05D	≤0.2D	39258	2079
		4	2	370	0.034	≤0.05D	≤0.2D	29444	1994
		5	2	370	0.041	≤0.05D	≤0.2D	23555	1944
		6	2	370	0.049	≤0.05D	≤0.2D	19629	1910
		8	2	370	0.063	≤0.05D	≤0.2D	14722	1868
		10	2	370	0.078	≤0.05D	≤0.2D	11777	1842
		12	2	370	0.093	≤0.05D	≤0.2D	9815	1826
		14	2	370	0.093	≤0.05D	≤0.2D	8412	1565
		16	2	370	0.093	≤0.05D	≤0.2D	7361	1369
		18	2	370	0.093	≤0.05D	≤0.2D	6543	1217
		20	2	370	0.093	≤0.05D	≤0.2D	5889	1095
		22	2	370	0.093	≤0.05D	≤0.2D	5353	996
		25	2	370	0.093	≤0.05D	≤0.2D	4711	876

Cutting Parameter - Hard 2 Flute Ballnose

PROFILE MILLING		α < 15°							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL (45 -50 HRC) AISI H13	M26, M32	0.5	2	63	0.006	≤0.05D	≤0.1D	40000	480
		0.6	2	75	0.007	≤0.05D	≤0.1D	40000	531
		0.7	2	88	0.007	≤0.05D	≤0.1D	40000	583
		0.8	2	101	0.008	≤0.05D	≤0.1D	40000	634
		0.9	2	113	0.009	≤0.05D	≤0.1D	40000	686
		1	2	126	0.009	≤0.05D	≤0.1D	40000	737
		1.5	2	188	0.012	≤0.05D	≤0.2D	40000	995
		2	2	250	0.016	≤0.05D	≤0.2D	39789	1246
		2.5	2	250	0.019	≤0.05D	≤0.2D	31831	1201
		3	2	250	0.022	≤0.05D	≤0.2D	26526	1172
		4	2	250	0.029	≤0.05D	≤0.2D	19894	1135
		5	2	250	0.035	≤0.05D	≤0.2D	15915	1113
		6	2	250	0.041	≤0.05D	≤0.2D	13263	1098
		8	2	250	0.054	≤0.05D	≤0.2D	9947	1079
		10	2	250	0.067	≤0.05D	≤0.2D	7958	1068
		12	2	250	0.080	≤0.05D	≤0.2D	6631	1061
		14	2	250	0.080	≤0.05D	≤0.2D	5684	909
		16	2	250	0.080	≤0.05D	≤0.2D	4974	796
		18	2	250	0.080	≤0.05D	≤0.2D	4421	707
		20	2	250	0.080	≤0.05D	≤0.2D	3979	637
		22	2	250	0.080	≤0.05D	≤0.2D	3617	579
		25	2	250	0.080	≤0.05D	≤0.2D	3183	509

Cutting Parameter - Hard
2 Flute Ballnose Long

PROFILE MILLING		α < 15°							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
ALLOY STEEL, TOOL STEEL, PRE-HARDENED STEEL (~45 HRC) AISI H13,AISI D12,NAK	M12,13,14,15,18, 22,23, 24,25	0.5	2	63	0.002 ~ 0.003	≤0.05D	≤0.1D	40000	160 ~ 240
		0.6	2	75	0.002 ~ 0.004	≤0.05D	≤0.1D	40000	160 ~ 320
		0.7	2	88	0.002 ~ 0.004	≤0.05D	≤0.1D	40000	160 ~ 320
		0.8	2	101	0.003 ~ 0.005	≤0.05D	≤0.1D	40000	240 ~ 400
		0.9	2	113	0.003 ~ 0.005	≤0.05D	≤0.1D	40000	240 ~ 400
		1	2	126	0.004 ~ 0.006	≤0.05D	≤0.1D	40000	320 ~ 480
		1.5	2	188	0.006 ~ 0.008	≤0.05D	≤0.1D	40000	480 ~ 640
		2	2	251	0.009 ~ 0.011	≤0.05D	≤0.2D	40000	720 ~ 880
		2.5	2	314	0.011 ~ 0.014	≤0.05D	≤0.2D	40000	880 ~ 1120
		3	2	377	0.014 ~ 0.016	≤0.05D	≤0.2D	40000	1120 ~ 1280
		4	2	432 ~ 503	0.019 ~ 0.021	≤0.05D	≤0.2D	34380 ~ 40000	1310 ~ 1680
		5	2	432 ~ 504	0.024 ~ 0.026	≤0.05D	≤0.2D	27500 ~ 32090	1320 ~ 1670
		6	2	432 ~ 504	0.029 ~ 0.031	≤0.05D	≤0.2D	22920 ~ 26740	1330 ~ 1660
		8	2	432 ~ 504	0.034 ~ 0.038	≤0.05D	≤0.2D	17190 ~ 20050	1170 ~ 1520
		10	2	432 ~ 504	0.040 ~ 0.044	≤0.05D	≤0.2D	13750 ~ 16040	1100 ~ 1410
		12	2	432 ~ 504	0.046 ~ 0.051	≤0.05D	≤0.2D	11460 ~ 13370	1050 ~ 1360
		14	2	432 ~ 504	0.052 ~ 0.057	≤0.05D	≤0.2D	9820 ~ 11460	1020 ~ 1310
		16	2	432 ~ 504	0.058 ~ 0.064	≤0.05D	≤0.2D	8590 ~ 10030	1000 ~ 1280
		18	2	432 ~ 504	0.064 ~ 0.070	≤0.05D	≤0.2D	7640 ~ 8910	980 ~ 1250
		20	2	432 ~ 504	0.070 ~ 0.077	≤0.05D	≤0.2D	6880 ~ 8020	960 ~ 1240
		22	2	432 ~ 504	0.076 ~ 0.083	≤0.05D	≤0.2D	6250 ~ 7290	950 ~ 1210
		25	2	432 ~ 504	0.084 ~ 0.093	≤0.05D	≤0.2D	5500 ~ 6420	920 ~ 1190

Cutting Parameter - Hard
2 Flute Ballnose Long

PROFILE MILLING		α < 15°							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
ALLOY STEEL, TOOL STEEL, PRE-HARDENED STEEL (~45 HRC) AISI H13,AISI D12,NAK	M12,13,14,15,18, 22,23, 24,25	0.5	2	63	0.001 ~ 0.003	≤0.05D	≤0.1D	40000	80 ~ 240
		0.6	2	75	0.002 ~ 0.003	≤0.05D	≤0.1D	40000	160 ~ 240
		0.7	2	88	0.002 ~ 0.004	≤0.05D	≤0.1D	40000	160 ~ 320
		0.8	2	101	0.002 ~ 0.004	≤0.05D	≤0.1D	40000	160 ~ 320
		0.9	2	113	0.003 ~ 0.004	≤0.05D	≤0.1D	40000	240 ~ 320
		1	2	126	0.003 ~ 0.005	≤0.05D	≤0.1D	40000	240 ~ 400
		1.5	2	188	0.005 ~ 0.007	≤0.05D	≤0.1D	40000	400 ~ 560
		2	2	251	0.007 ~ 0.009	≤0.05D	≤0.2D	40000	560 ~ 720
		2.5	2	314	0.009 ~ 0.011	≤0.05D	≤0.2D	40000	720 ~ 880
		3	2	377	0.011 ~ 0.013	≤0.05D	≤0.2D	40000	880 ~ 1040
		4	2	403 ~ 470	0.015 ~ 0.017	≤0.05D	≤0.2D	32090 ~ 37430	960 ~ 1270
		5	2	403 ~ 470	0.019 ~ 0.021	≤0.05D	≤0.2D	25670 ~ 29950	980 ~ 1260
		6	2	403 ~ 470	0.023 ~ 0.025	≤0.05D	≤0.2D	21390 ~ 24960	980 ~ 1250
		8	2	403 ~ 470	0.028 ~ 0.030	≤0.05D	≤0.2D	16040 ~ 18720	900 ~ 1120
		10	2	403 ~ 470	0.032 ~ 0.035	≤0.05D	≤0.2D	12830 ~ 14970	820 ~ 1050
		12	2	403 ~ 470	0.037 ~ 0.041	≤0.05D	≤0.2D	10700 ~ 12480	790 ~ 1020
		14	2	403 ~ 471	0.042 ~ 0.046	≤0.05D	≤0.2D	9170 ~ 10700	770 ~ 980
		16	2	403 ~ 470	0.046 ~ 0.051	≤0.05D	≤0.2D	8020 ~ 9360	740 ~ 950
		18	2	403 ~ 470	0.051 ~ 0.056	≤0.05D	≤0.2D	7130 ~ 8320	730 ~ 930
		20	2	403 ~ 471	0.056 ~ 0.061	≤0.05D	≤0.2D	6420 ~ 7490	720 ~ 910
		22	2	403 ~ 471	0.061 ~ 0.067	≤0.05D	≤0.2D	5830 ~ 6810	710 ~ 910
		25	2	403 ~ 470	0.068 ~ 0.074	≤0.05D	≤0.2D	5130 ~ 5990	700 ~ 890

Cutting Parameter - Hard
2 Flute Ballnose Long

PROFILE MILLING		α < 15°							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL (45~55 HRC) AISI H13	M26,32	0.5	2	63	0.002 ~ 0.003	≤0.05D	≤0.1D	40000	160 ~ 240
		0.6	2	75	0.002 ~ 0.004	≤0.05D	≤0.1D	40000	160 ~ 320
		0.7	2	88	0.002 ~ 0.004	≤0.05D	≤0.1D	40000	160 ~ 320
		0.8	2	101	0.003 ~ 0.005	≤0.05D	≤0.1D	40000	240 ~ 400
		0.9	2	113	0.003 ~ 0.005	≤0.05D	≤0.1D	40000	240 ~ 400
		1	2	126	0.004 ~ 0.006	≤0.05D	≤0.1D	40000	320 ~ 480
		1.5	2	188	0.006 ~ 0.008	≤0.05D	≤0.1D	40000	480 ~ 640
		2	2	251	0.009 ~ 0.011	≤0.05D	≤0.2D	40000	720 ~ 880
		2.5	2	314	0.011 ~ 0.014	≤0.05D	≤0.2D	40000	880 ~ 1120
		3	2	377	0.014 ~ 0.016	≤0.05D	≤0.2D	40000	1120 ~ 1280
		4	2	432 ~ 503	0.019 ~ 0.021	≤0.05D	≤0.2D	34380 ~ 40000	1310 ~ 1680
		5	2	432 ~ 504	0.024 ~ 0.026	≤0.05D	≤0.2D	27500 ~ 32090	1320 ~ 1670
		6	2	432 ~ 504	0.029 ~ 0.031	≤0.05D	≤0.2D	22920 ~ 26740	1330 ~ 1660
		8	2	432 ~ 504	0.034 ~ 0.038	≤0.05D	≤0.2D	17190 ~ 20050	1170 ~ 1520
		10	2	432 ~ 504	0.040 ~ 0.044	≤0.05D	≤0.2D	13750 ~ 16040	1100 ~ 1410
		12	2	432 ~ 504	0.046 ~ 0.051	≤0.05D	≤0.2D	11460 ~ 13370	1050 ~ 1360
		14	2	432 ~ 504	0.052 ~ 0.057	≤0.05D	≤0.2D	9820 ~ 11460	1020 ~ 1310
		16	2	432 ~ 504	0.058 ~ 0.064	≤0.05D	≤0.2D	8590 ~ 10030	1000 ~ 1280
		18	2	432 ~ 504	0.064 ~ 0.070	≤0.05D	≤0.2D	7640 ~ 8910	980 ~ 1250
		20	2	432 ~ 504	0.070 ~ 0.077	≤0.05D	≤0.2D	6880 ~ 8020	960 ~ 1240
		22	2	432 ~ 504	0.076 ~ 0.083	≤0.05D	≤0.2D	6250 ~ 7290	950 ~ 1210
		25	2	432 ~ 504	0.084 ~ 0.093	≤0.05D	≤0.2D	5500 ~ 6420	920 ~ 1190

Cutting Parameter - Hard
2 Flute Ballnose Long

PROFILE MILLING		α < 15°							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL (45~50 HRC) AISI H13	M26,32	0.5	2	63	0.000 ~ 0.002	≤0.05D	≤0.1D	40000	0 ~ 160
		0.6	2	75	0.001 ~ 0.002	≤0.05D	≤0.1D	40000	80 ~ 160
		0.7	2	88	0.001 ~ 0.003	≤0.05D	≤0.1D	40000	80 ~ 240
		0.8	2	101	0.002 ~ 0.003	≤0.05D	≤0.1D	40000	160 ~ 240
		0.9	2	113	0.002 ~ 0.004	≤0.05D	≤0.1D	40000	160 ~ 320
		1	2	126	0.003 ~ 0.004	≤0.05D	≤0.1D	40000	240 ~ 320
		1.5	2	168 ~ 188	0.005 ~ 0.007	≤0.05D	≤0.1D	35650 ~ 40000	360 ~ 560
		2	2	168 ~ 235	0.007 ~ 0.009	≤0.05D	≤0.2D	26740 ~ 37430	370 ~ 670
		2.5	2	168 ~ 235	0.009 ~ 0.011	≤0.05D	≤0.2D	21390 ~ 29950	390 ~ 660
		3	2	168 ~ 235	0.012 ~ 0.014	≤0.05D	≤0.2D	17830 ~ 24960	430 ~ 700
		4	2	168 ~ 235	0.016 ~ 0.018	≤0.05D	≤0.2D	13370 ~ 18720	430 ~ 670
		5	2	168 ~ 235	0.021 ~ 0.023	≤0.05D	≤0.2D	10700 ~ 14970	450 ~ 690
		6	2	168 ~ 235	0.025 ~ 0.028	≤0.05D	≤0.2D	8910 ~ 12480	450 ~ 700
		8	2	168 ~ 235	0.032 ~ 0.035	≤0.05D	≤0.2D	6680 ~ 9360	430 ~ 660
		10	2	168 ~ 235	0.038 ~ 0.042	≤0.05D	≤0.2D	5350 ~ 7490	410 ~ 630
		12	2	168 ~ 235	0.044 ~ 0.048	≤0.05D	≤0.2D	4460 ~ 6240	390 ~ 600
		14	2	168 ~ 235	0.050 ~ 0.055	≤0.05D	≤0.2D	3820 ~ 5350	380 ~ 590
		16	2	168 ~ 235	0.056 ~ 0.062	≤0.05D	≤0.2D	3340 ~ 4680	370 ~ 580
		18	2	168 ~ 235	0.063 ~ 0.069	≤0.05D	≤0.2D	2970 ~ 4160	370 ~ 570
		20	2	168 ~ 235	0.069 ~ 0.076	≤0.05D	≤0.2D	2670 ~ 3740	370 ~ 570
		22	2	168 ~ 235	0.075 ~ 0.083	≤0.05D	≤0.2D	2430 ~ 3400	360 ~ 560
		25	2	168 ~ 235	0.084 ~ 0.093	≤0.05D	≤0.2D	2140 ~ 2990	360 ~ 560

Cutting Parameter - Hard Endmill Extra long

4 Z SLOTTING		4 FLUTES ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
STEEL AND CAST STEEL (35 HRC ~ 45HRC)	M22 M31	1	4	35 ~ 45	0.004 ~ 0.006	≤0.1D	1.0D	11140 ~ 14320	180 ~ 340
		1.5	4	35 ~ 45	0.006 ~ 0.008	≤0.1D	1.0D	7430 ~ 9550	180 ~ 310
		2	4	35 ~ 45	0.008 ~ 0.011	≤0.2D	1.0D	5570 ~ 7160	180 ~ 320
		2.5	4	35 ~ 45	0.011 ~ 0.013	≤0.2D	1.0D	4460 ~ 5730	200 ~ 300
		3	4	35 ~ 45	0.013 ~ 0.016	≤0.2D	1.0D	3710 ~ 4770	190 ~ 310
		4	4	35 ~ 45	0.018 ~ 0.021	≤0.2D	1.0D	2790 ~ 3580	200 ~ 300
		5	4	35 ~ 45	0.023 ~ 0.025	≤0.2D	1.0D	2230 ~ 2860	210 ~ 290
		6	4	35 ~ 45	0.028 ~ 0.030	≤0.2D	1.0D	1860 ~ 2390	210 ~ 290
		8	4	35 ~ 45	0.034 ~ 0.038	≤0.2D	1.0D	1390 ~ 1790	180 ~ 250
		10	4	35 ~ 45	0.041 ~ 0.045	≤0.2D	1.0D	1110 ~ 1430	180 ~ 250
		12	4	35 ~ 45	0.048 ~ 0.053	≤0.2D	1.0D	930 ~ 1190	180 ~ 240
		14	4	35 ~ 45	0.055 ~ 0.060	≤0.2D	1.0D	800 ~ 1020	170 ~ 240
		16	4	35 ~ 45	0.062 ~ 0.068	≤0.2D	1.0D	700 ~ 900	170 ~ 240
		18	4	35 ~ 45	0.068 ~ 0.075	≤0.2D	1.0D	620 ~ 800	170 ~ 240
		20	4	35 ~ 45	0.075 ~ 0.083	≤0.2D	1.0D	560 ~ 720	170 ~ 240
		22	4	35 ~ 45	0.082 ~ 0.090	≤0.2D	1.0D	510 ~ 650	170 ~ 230
		25	4	35 ~ 45	0.092 ~ 0.101	≤0.2D	1.0D	450 ~ 570	170 ~ 230

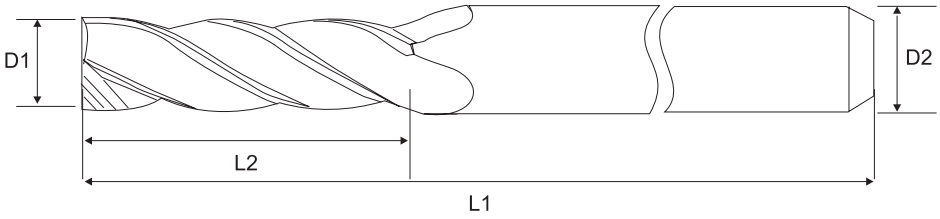
4 Z SLOTTING		4 FLUTES ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
ALLOY STEEL TOOL STEEL PRE-HARDENED STEEL (30 - 45 HRC) AISI H13 NAK	M20 M21 M24	1	4	25 ~ 35	0.002 ~ 0.005	≤0.1D	1.0D	7960 ~ 11140	60 ~ 220
		1.5	4	25 ~ 35	0.004 ~ 0.007	≤0.1D	1.0D	5310 ~ 7430	80 ~ 210
		2	4	25 ~ 35	0.006 ~ 0.009	≤0.2D	1.0D	3980 ~ 5570	100 ~ 200
		2.5	4	25 ~ 35	0.008 ~ 0.011	≤0.2D	1.0D	3180 ~ 4460	100 ~ 200
		3	4	25 ~ 35	0.010 ~ 0.013	≤0.2D	1.0D	2650 ~ 3710	110 ~ 190
		4	4	25 ~ 35	0.014 ~ 0.016	≤0.2D	1.0D	1990 ~ 2790	110 ~ 180
		5	4	25 ~ 35	0.018 ~ 0.020	≤0.2D	1.0D	1590 ~ 2230	110 ~ 180
		6	4	25 ~ 35	0.022 ~ 0.024	≤0.2D	1.0D	1330 ~ 1860	120 ~ 180
		8	4	25 ~ 35	0.027 ~ 0.030	≤0.2D	1.0D	990 ~ 1390	110 ~ 170
		10	4	25 ~ 35	0.032 ~ 0.035	≤0.2D	1.0D	800 ~ 1110	100 ~ 160
		12	4	25 ~ 35	0.038 ~ 0.041	≤0.2D	1.0D	660 ~ 930	100 ~ 150
		14	4	25 ~ 35	0.043 ~ 0.047	≤0.2D	1.0D	570 ~ 800	100 ~ 150
		16	4	25 ~ 35	0.048 ~ 0.053	≤0.2D	1.0D	500 ~ 700	100 ~ 150
		18	4	25 ~ 35	0.053 ~ 0.059	≤0.2D	1.0D	440 ~ 620	190 ~ 150
		20	4	25 ~ 35	0.059 ~ 0.065	≤0.2D	1.0D	400 ~ 560	90 ~ 150
		22	4	25 ~ 35	0.064 ~ 0.070	≤0.2D	1.0D	360 ~ 510	90 ~ 140
		25	4	25 ~ 35	0.072 ~ 0.079	≤0.2D	1.0D	320 ~ 450	90 ~ 140

Cutting Parameter - Square Endmill Standard

4 Z SLOTTING		4 FLUTES ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL (45 - 50 HRC)	M26 M32	1	4	20 ~ 30	0.001 ~ 0.001	≤0.05D	1.0D	6370 ~ 9550	30 ~ 50
		1.5	4	20 ~ 30	0.002 ~ 0.002	≤0.05D	1.0D	4240 ~ 6370	30 ~ 50
		2	4	20 ~ 30	0.002 ~ 0.003	≤0.1D	1.0D	3180 ~ 4770	30 ~ 50
		2.5	4	20 ~ 30	0.003 ~ 0.004	≤0.1D	1.0D	2550 ~ 3820	30 ~ 50
		3	4	20 ~ 30	0.004 ~ 0.005	≤0.1D	1.0D	2120 ~ 3180	30 ~ 50
		4	4	20 ~ 30	0.005 ~ 0.006	≤0.1D	1.0D	1590 ~ 2390	30 ~ 50
		5	4	20 ~ 30	0.007 ~ 0.008	≤0.1D	1.0D	1270 ~ 1910	30 ~ 50
		6	4	20 ~ 30	0.009 ~ 0.010	≤0.1D	1.0D	1060 ~ 1590	30 ~ 50
		8	4	20 ~ 30	0.011 ~ 0.012	≤0.1D	1.0D	800 ~ 1190	30 ~ 50
		10	4	20 ~ 30	0.013 ~ 0.014	≤0.1D	1.0D	640 ~ 950	30 ~ 50
		12	4	20 ~ 30	0.015 ~ 0.017	≤0.1D	1.0D	530 ~ 800	30 ~ 50
		14	4	20 ~ 30	0.017 ~ 0.019	≤0.1D	1.0D	450 ~ 680	30 ~ 50
		16	4	20 ~ 30	0.019 ~ 0.021	≤0.1D	1.0D	400 ~ 600	30 ~ 50
		18	4	20 ~ 30	0.021 ~ 0.024	≤0.1D	1.0D	350 ~ 530	30 ~ 50
		20	4	20 ~ 30	0.023 ~ 0.026	≤0.1D	1.0D	320 ~ 480	30 ~ 50
		22	4	20 ~ 30	0.026 ~ 0.028	≤0.1D	1.0D	290 ~ 430	30 ~ 50
		25	4	20 ~ 30	0.029 ~ 0.032	≤0.1D	1.0D	250 ~ 380	30 ~ 50

DM SERIES

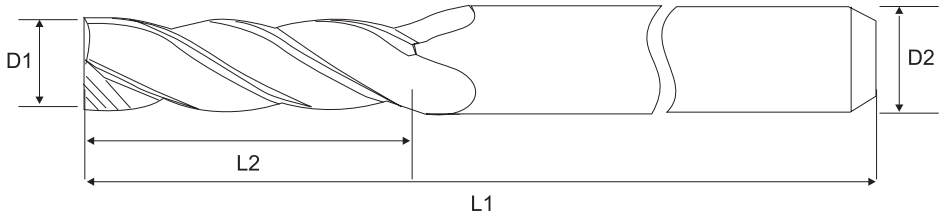
4 Flute Standard Endmill



ITEM CODE	D1(DIA)	D2 (SHANK)	L2 (WL)	L1 (OAL)	AVAILABLITY
EM1N4D4DM	1	4	4	50	●
EM1.5N4D4DM	1.5	4	4	50	●
EM2N4D4DM	2	4	4	50	●
EM2.5N4D4DM	2.5	4	8	50	●
EM3N4D4DM	3	4	8	50	●
EM3N4DM	3	3	8	50	●
EM4N4DM	4	4	10	50	●
EM5N4DM	5	5	13	50	●
EM5N4D6DM	5	6	13	50	●
EM6N4DM	8	6	15	50	●
EM8N4DM	6	8	20	60	●
EM10N4DM	10	10	25	75	●
EM12N4DM	12	12	30	75	●
EM16N4DM	16	16	40	100	○
EM20N4DM	20	20	40	100	●

DM SERIES

4 Flute Long Endmill Series

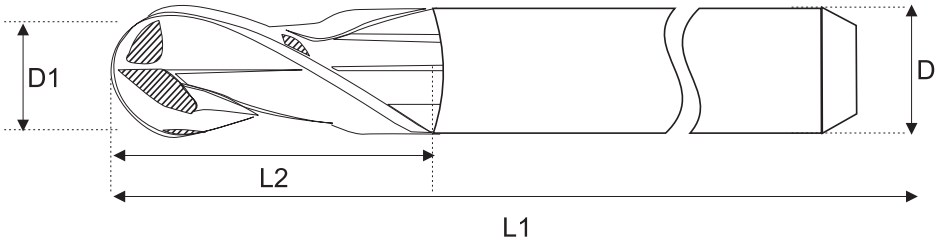


ITEM CODE	D1(DIA)	D2 (SHANK)	L2 (WL)	L1 (OAL)	AVAILABLITY
EM3L4D4DM	3	4	15	75	●
EM4L4DM	4	4	15	75	●
EM5L4D6DM	5	6	20	75	●
EM6L4DM	6	6	24	75	●
EM8L4DM	8	8	25	75	●
EM4XL4DM	4	4	16	100	●
EM6LR4DM	6	6	24	100	●
EM8LR4DM	8	8	32	100	●
EM10L4DM	10	10	40	100	●
EM12L4DM	12	12	48	100	●



DM SERIES

2 Flute Standard Ballnose Line

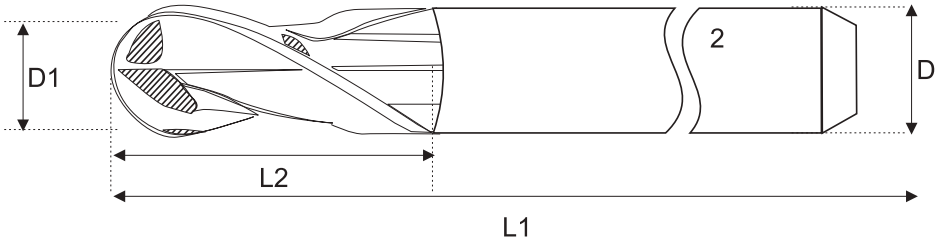


ITEM CODE	D1(DIA)	D2 (SHANK)	L2 (WL)	L1 (OAL)	AVAILABLITY
BN1N2D4DM	1	4	3	50	●
BN1.5N2D4DM	1.5	4	4	50	●
BN2N2D4DM	2	4	4	50	●
BN2.5N2D4DM	2.5	4	6	50	●
BN3N2D4DM	3	4	6	50	●
BN4N2DM	4	4	8	50	●
BN6N2DM	6	6	12	50	●
BN8N2DM	8	8	16	60	●
BN10N2DM	10	10	25	75	●
BN12N2DM	12	12	25	75	●



DM SERIES

2 Flute Long Ballnose Series



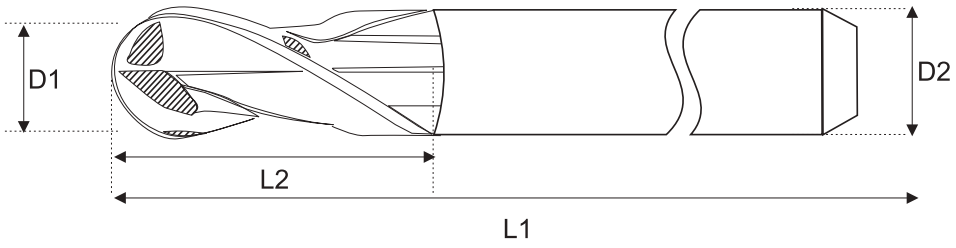
ITEM CODE	D1(DIA)	D2 (SHANK)	L2 (WL)	L1 (OAL)	AVAILABLITY
BN3L2D4DM	3	4	8	75	●
BN4L2DM	4	4	10	75	●
BN6L2DM	6	6	15	75	●
BN8L2DM	8	6	10	75	●
BN3XL2D4DM	3	8	8	100	●
BN4XL2DM	4	4	10	100	●
BN6LR2DM	6	6	15	100	●
BN8LR2DM	8	8	20	100	●
BN10LR2DM	10	10	25	100	●
BN12LR2DM	12	12	30	100	●

TiAlN
MG
0.8 µm
Co 10%
HRC ▸40
2flute

MILLING

DM SERIES

4 Flute Ballnose Line

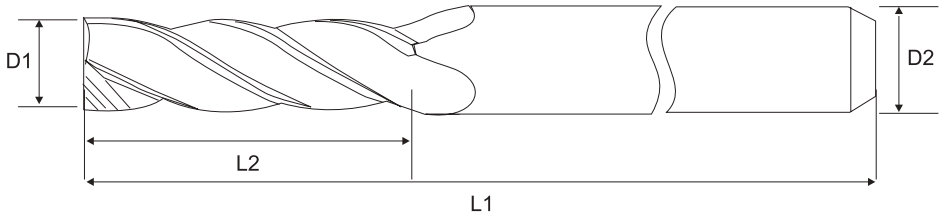


ITEM CODE	D1(DIA)	D2 (SHANK)	L2 (WL)	L1 (OAL)	AVAILABLITY
BN1N4D4DEXT	1	4	2	50	●
BN1.5N4D4DEXT	1.5	4	3	50	●
BN2N4D4DEXT	2	4	4	50	●
BN2.5N4D4DEXT	2.5	4	5	50	●
BN3N4D4DEXT	3	4	6	50	●
BN3N4DEXT	3	3	6	50	●
BN4N4DEXT	4	4	8	50	●
BN5N4DEXT	5	5	10	50	●
BN6N4DEXT	6	6	12	50	●
BN8N4DEXT	8	8	16	60	●



DM SERIES

4 Flute Corner Radius Endmill



ITEM CODE	D1(DIA)	D2 (SHANK)	L2 (WL)	L1 (OAL)	AVAILABLITY
EM3N4D4CR0.5DM	3R0.5	4	6	50	●
EM3N4D4CR1DM	3R1	4	6	50	●
EM4N4CR0.5DM	4R0.5	4	8	50	●
EM4N4CR1DM	4R1	4	8	50	●
EM6N4CR0.5DM	6R0.5	6	12	50	●
EM6N4CR1DM	6R1	6	12	50	●
EM8N4CR0.5DM	8R0.5	8	16	60	●
EM8N4CR1DM	8R1	8	16	60	●
EM10N4CR0.5DM	10R0.5	10	20	75	●
EM10N4CR1DM	10R1	10	20	75	●
EM12N4CR0.5DM	12R0.5	12	24	75	●
EM12N4CR1DM	12R1	12	24	75	●



Cutting Parameter - Square Endmill Standard

SIDE MILLING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
CARBON STEEL (~30 HRC) AISI 1049 , SCM CAST, IRON FC250	M10,11,12,13,14	1	4	126	0.005 ~ 0.007	≤1.5D	≤ 0.5 D	40000	800 ~ 1120
		1.5	4	130 ~ 170	0.008 ~ 0.010	≤1.5D	≤ 0.5 D	27590 ~ 36080	880 ~ 1440
		2	4	130 ~ 170	0.011 ~ 0.014	≤1.5D	≤ 0.5 D	20690 ~ 27060	910 ~ 1520
		2.5	4	130 ~ 170	0.014 ~ 0.017	≤1.5D	≤ 0.5 D	16550 ~ 21650	930 ~ 1470
		3	4	130 ~ 170	0.017 ~ 0.020	≤1.5D	≤ 0.5 D	13790 ~ 18040	940 ~ 1440
		4	4	130 ~ 170	0.023 ~ 0.026	≤1.5D	≤ 0.5 D	10350 ~ 13530	950 ~ 1410
		5	4	130 ~ 170	0.029 ~ 0.032	≤1.5D	≤ 0.5 D	8280 ~ 10820	960 ~ 1380
		6	4	130 ~ 170	0.035 ~ 0.038	≤1.5D	≤ 0.5 D	6900 ~ 9020	970 ~ 1370
		8	4	130 ~ 170	0.042 ~ 0.046	≤1.5D	≤ 0.5 D	5170 ~ 6760	870 ~ 1240
		10	4	130 ~ 170	0.049 ~ 0.054	≤1.5D	≤ 0.5 D	4140 ~ 5410	810 ~ 1170
		12	4	130 ~ 170	0.057 ~ 0.062	≤1.5D	≤ 0.5 D	3450 ~ 4510	790 ~ 1120
		14	4	130 ~ 170	0.064 ~ 0.070	≤1.5D	≤ 0.5 D	2960 ~ 3870	760 ~ 1080
		16	4	130 ~ 170	0.071 ~ 0.078	≤1.5D	≤ 0.5 D	2590 ~ 3380	740 ~ 1050
		18	4	130 ~ 170	0.078 ~ 0.086	≤1.5D	≤ 0.5 D	2300 ~ 3010	720 ~ 1040
		20	4	130 ~ 170	0.086 ~ 0.094	≤1.5D	≤ 0.5 D	2070 ~ 2710	710 ~ 1020

SIDE MILLING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
CARBON STEEL (~30 HRC) AISI 1049 , SCM CAST, IRON FC250	M15,18,19 23,25	1	4	120 ~ 126	0.005 ~ 0.007	≤1.5D	≤ 0.5 D	38200 ~ 40000	760 ~ 1120
		1.5	4	120 ~ 140	0.008 ~ 0.010	≤1.5D	≤ 0.5 D	25460 ~ 29710	810 ~ 1190
		2	4	120 ~ 140	0.011 ~ 0.014	≤1.5D	≤ 0.5 D	19100 ~ 22280	840 ~ 1250
		2.5	4	120 ~ 140	0.014 ~ 0.017	≤1.5D	≤ 0.5 D	15280 ~ 17830	860 ~ 1210
		3	4	120 ~ 140	0.017 ~ 0.020	≤1.5D	≤ 0.5 D	12730 ~ 14850	870 ~ 1190
		4	4	120 ~ 140	0.023 ~ 0.026	≤1.5D	≤ 0.5 D	9550 ~ 11140	880 ~ 1160
		5	4	120 ~ 140	0.029 ~ 0.032	≤1.5D	≤ 0.5 D	7640 ~ 8910	890 ~ 1140
		6	4	120 ~ 140	0.035 ~ 0.038	≤1.5D	≤ 0.5 D	6370 ~ 7430	890 ~ 1130
		8	4	120 ~ 140	0.042 ~ 0.046	≤1.5D	≤ 0.5 D	4770 ~ 5570	800 ~ 1020
		10	4	120 ~ 140	0.049 ~ 0.054	≤1.5D	≤ 0.5 D	3820 ~ 4460	750 ~ 960
		12	4	120 ~ 140	0.057 ~ 0.062	≤1.5D	≤ 0.5 D	3180 ~ 3710	730 ~ 920
		14	4	120 ~ 140	0.064 ~ 0.070	≤1.5D	≤ 0.5 D	2730 ~ 3180	700 ~ 890
		16	4	120 ~ 140	0.071 ~ 0.078	≤1.5D	≤ 0.5 D	2390 ~ 2790	680 ~ 870
		18	4	120 ~ 140	0.078 ~ 0.086	≤1.5D	≤ 0.5 D	2120 ~ 2480	660 ~ 850
		20	4	120 ~ 140	0.086 ~ 0.094	≤1.5D	≤ 0.5 D	1910 ~ 2230	660 ~ 840

Cutting Parameter - Square Endmill Standard

SLOTTING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
ALLOY STEEL TOOL STEEL PRE-HARDENED STEEL (30~45 HRC) AISI H13 NAK	M15,18,19, 23,25	1	4	60 ~ 80	0.003 ~ 0.006	≤1.5D	≤ 0.5 D	19100 ~ 25460	230 ~ 610
		1.5	4	60 ~ 80	0.006 ~ 0.008	≤1.5D	≤ 0.5 D	12730 ~ 16980	310 ~ 540
		2	4	60 ~ 80	0.008 ~ 0.011	≤1.5D	≤ 0.5 D	9550 ~ 12730	310 ~ 560
		2.5	4	60 ~ 80	0.011 ~ 0.014	≤1.5D	≤ 0.5 D	7640 ~ 10190	340 ~ 570
		3	4	60 ~ 80	0.014 ~ 0.016	≤1.5D	≤ 0.5 D	6370 ~ 8490	360 ~ 540
		4	4	60 ~ 80	0.019 ~ 0.022	≤1.5D	≤ 0.5 D	4770 ~ 6370	360 ~ 560
		5	4	60 ~ 80	0.024 ~ 0.027	≤1.5D	≤ 0.5 D	3820 ~ 5090	370 ~ 550
		6	4	60 ~ 80	0.029 ~ 0.032	≤1.5D	≤ 0.5 D	3180 ~ 4240	370 ~ 540
		8	4	60 ~ 80	0.036 ~ 0.040	≤1.5D	≤ 0.5 D	2390 ~ 3180	340 ~ 510
		10	4	60 ~ 80	0.043 ~ 0.048	≤1.5D	≤ 0.5 D	1910 ~ 2550	330 ~ 490
		12	4	60 ~ 80	0.051 ~ 0.056	≤1.5D	≤ 0.5 D	1590 ~ 2120	320 ~ 470
		14	4	60 ~ 80	0.058 ~ 0.064	≤1.5D	≤ 0.5 D	1360 ~ 1820	320 ~ 470
		16	4	60 ~ 80	0.065 ~ 0.071	≤1.5D	≤ 0.5 D	1190 ~ 1590	310 ~ 450
		18	4	60 ~ 80	0.072 ~ 0.079	≤1.5D	≤ 0.5 D	1060 ~ 1410	310 ~ 450
		20	4	60 ~ 80	0.079 ~ 0.087	≤1.5D	≤ 0.5 D	950 ~ 1270	300 ~ 440

SIDE MILLING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
TITANIUM ALLOYS HARDEDNED UP TO 35 HRC	M17	1	4	60 ~ 80	0.004 ~ 0.006	≤1.5D	≤ 0.5 D	19100 ~ 25460	310 ~ 610
		1.5	4	60 ~ 80	0.008 ~ 0.010	≤1.5D	≤ 0.5 D	12730 ~ 16980	410 ~ 680
		2	4	60 ~ 80	0.011 ~ 0.014	≤1.5D	≤ 0.5 D	9550 ~ 12730	420 ~ 710
		2.5	4	60 ~ 80	0.014 ~ 0.017	≤1.5D	≤ 0.5 D	7640 ~ 10190	430 ~ 690
		3	4	60 ~ 80	0.018 ~ 0.021	≤1.5D	≤ 0.5 D	6370 ~ 8490	460 ~ 710
		4	4	60 ~ 80	0.025 ~ 0.028	≤1.5D	≤ 0.5 D	4770 ~ 6370	480 ~ 710
		5	4	60 ~ 80	0.032 ~ 0.036	≤1.5D	≤ 0.5 D	3820 ~ 5090	490 ~ 730
		6	4	60 ~ 80	0.039 ~ 0.043	≤1.5D	≤ 0.5 D	3180 ~ 4240	500 ~ 730
		8	4	60 ~ 80	0.048 ~ 0.053	≤1.5D	≤ 0.5 D	2390 ~ 3180	460 ~ 670
		10	4	60 ~ 80	0.058 ~ 0.064	≤1.5D	≤ 0.5 D	1910 ~ 2550	440 ~ 650
		12	4	60 ~ 80	0.068 ~ 0.074	≤1.5D	≤ 0.5 D	1590 ~ 2120	430 ~ 630
		14	4	60 ~ 80	0.077 ~ 0.085	≤1.5D	≤ 0.5 D	1360 ~ 1820	420 ~ 620
		16	4	60 ~ 80	0.087 ~ 0.095	≤1.5D	≤ 0.5 D	1190 ~ 1590	410 ~ 600
		18	4	60 ~ 80	0.096 ~ 0.106	≤1.5D	≤ 0.5 D	1060 ~ 1410	410 ~ 600
		20	4	60 ~ 80	0.106 ~ 0.116	≤1.5D	≤ 0.5 D	950 ~ 1270	400 ~ 590

Cutting Parameter - Square Endmill Standard

SIDE MILLING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
NICKEL BASED ALLOYS HARDENED UP TO 35 HRC	M19,23	1	4	60 ~ 80	0.003 ~ 0.006	≤1.5D	≤ 0.5 D	19100 ~ 25460	230 ~ 610
		1.5	4	60 ~ 80	0.006 ~ 0.009	≤1.5D	≤ 0.5 D	12730 ~ 16980	310 ~ 610
		2	4	60 ~ 80	0.008 ~ 0.012	≤1.5D	≤ 0.5 D	9550 ~ 12730	310 ~ 610
		2.5	4	60 ~ 80	0.011 ~ 0.014	≤1.5D	≤ 0.5 D	7640 ~ 10190	340 ~ 570
		3	4	60 ~ 80	0.014 ~ 0.017	≤1.5D	≤ 0.5 D	6370 ~ 8490	360 ~ 580
		4	4	60 ~ 80	0.019 ~ 0.02	≤1.5D	≤ 0.5 D	4770 ~ 6370	360 ~ 560
		5	4	60 ~ 80	0.024 ~ 0.027	≤1.5D	≤ 0.5 D	3820 ~ 5090	370 ~ 550
		6	4	60 ~ 80	0.029 ~ 0.032	≤1.5D	≤ 0.5 D	3180 ~ 4240	370 ~ 540
		8	4	60 ~ 80	0.036 ~ 0.040	≤1.5D	≤ 0.5 D	2390 ~ 3180	340 ~ 510
		10	4	60 ~ 80	0.043 ~ 0.048	≤1.5D	≤ 0.5 D	1910 ~ 2550	330 ~ 490
		12	4	60 ~ 80	0.051 ~ 0.056	≤1.5D	≤ 0.5 D	1590 ~ 2120	320 ~ 470
		14	4	60 ~ 80	0.058 ~ 0.064	≤1.5D	≤ 0.5 D	1360 ~ 1820	320 ~ 470
		16	4	60 ~ 80	0.065 ~ 0.071	≤1.5D	≤ 0.5 D	1190 ~ 1590	310 ~ 450
		18	4	60 ~ 80	0.072 ~ 0.079	≤1.5D	≤ 0.5 D	1060 ~ 1410	310 ~ 450
		20	4	60 ~ 80	0.079 ~ 0.087	≤1.5D	≤ 0.5 D	950 ~ 1270	300 ~ 440

SLOTTING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
CARBON STEEL (~30 HRC) AISI 1049 , SCM CAST,IRON FC250	M10,11, 12,13,14	1	4	126	0.004 ~ 0.006	≤1.5D	≤ 0.5 D	40000	640 ~ 960
		1.5	4	130 ~ 170	0.006 ~ 0.008	≤1.5D	≤ 0.5 D	27590 ~ 36080	660 ~ 1150
		2	4	130 ~ 170	0.009 ~ 0.011	≤1.5D	≤ 0.5 D	20690 ~ 27060	740 ~ 1190
		2.5	4	130 ~ 170	0.011 ~ 0.013	≤1.5D	≤ 0.5 D	16550 ~ 21650	730 ~ 1130
		3	4	130 ~ 170	0.014 ~ 0.016	≤1.5D	≤ 0.5 D	13790 ~ 18040	770 ~ 1150
		4	4	130 ~ 170	0.018 ~ 0.021	≤1.5D	≤ 0.5 D	10350 ~ 13530	750 ~ 1140
		5	4	130 ~ 170	0.023 ~ 0.026	≤1.5D	≤ 0.5 D	8280 ~ 10820	760 ~ 1130
		6	4	130 ~ 170	0.028 ~ 0.031	≤1.5D	≤ 0.5 D	6900 ~ 9020	770 ~ 1120
		8	4	130 ~ 170	0.034 ~ 0.037	≤1.5D	≤ 0.5 D	5170 ~ 6760	700 ~ 1000
		10	4	130 ~ 170	0.040 ~ 0.044	≤1.5D	≤ 0.5 D	4140 ~ 5410	660 ~ 950
		12	4	130 ~ 170	0.045 ~ 0.050	≤1.5D	≤ 0.5 D	3450 ~ 4510	620 ~ 900
		14	4	130 ~ 170	0.051 ~ 0.056	≤1.5D	≤ 0.5 D	2960 ~ 3870	600 ~ 870
		16	4	130 ~ 170	0.057 ~ 0.063	≤1.5D	≤ 0.5 D	2590 ~ 3380	590 ~ 850
		18	4	130 ~ 170	0.063 ~ 0.069	≤1.5D	≤ 0.5 D	2300 ~ 3010	580 ~ 830
		20	4	130 ~ 170	0.068 ~ 0.075	≤1.5D	≤ 0.5 D	2070 ~ 2710	560 ~ 810

Cutting Parameter - Square Endmill Standard

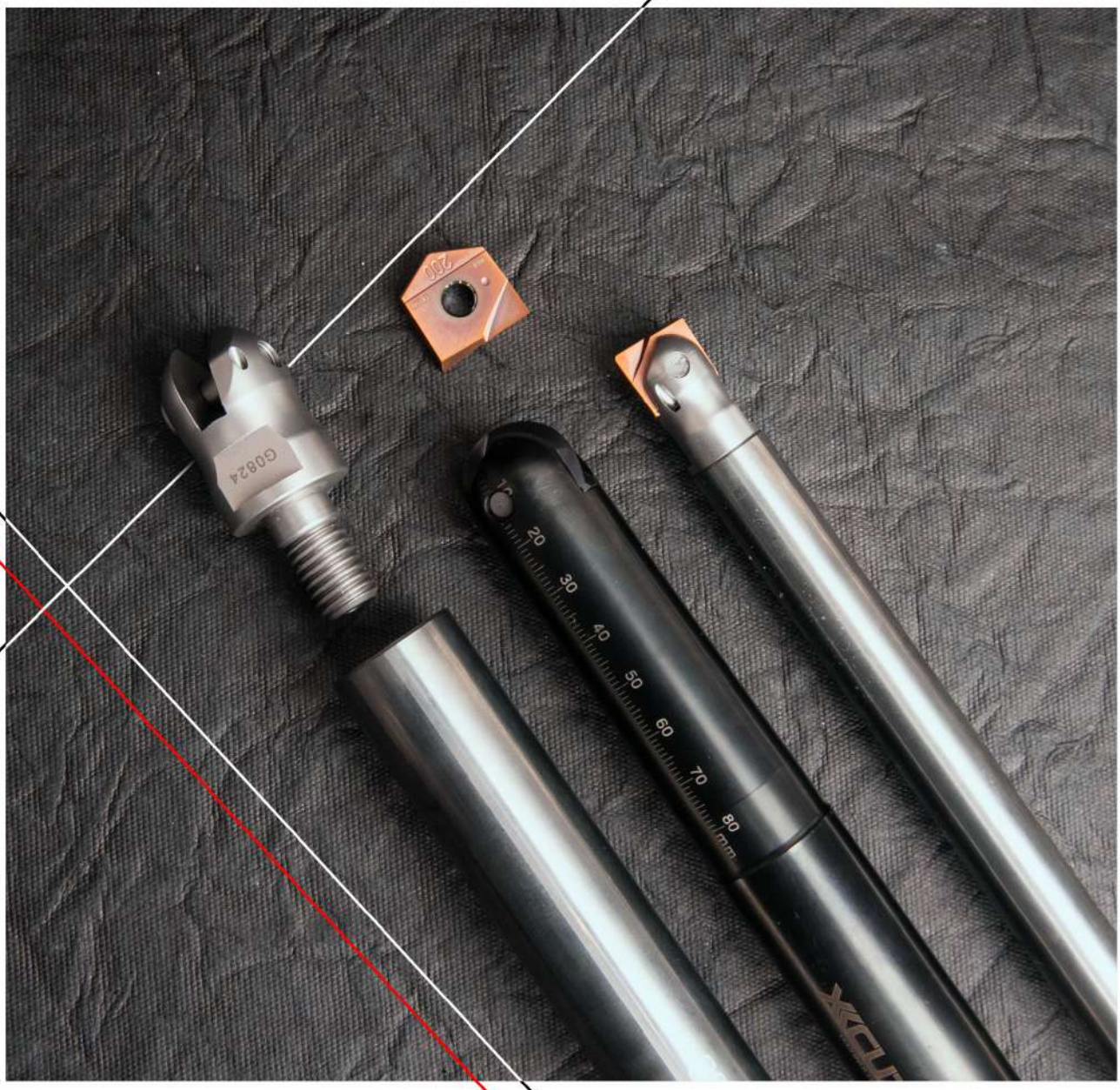
SLOTTING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
ALLOY STEEL TOOL STEEL PRE-HARDENED STEEL (30~45 HRC) AISI H13 NAK	M15,18,19, 23,25	1	4	120 ~ 126	0.004 ~ 0.006	≤1.0D	1.0 D	38200 ~ 40000	610 ~ 960
		1.5	4	120 ~ 126	0.006 ~ 0.008	≤1.0D	1.0 D	25460 ~ 29710	610 ~ 950
		2	4	120 ~ 126	0.009 ~ 0.011	≤1.0D	1.0 D	19100 ~ 22280	690 ~ 980
		2.5	4	120 ~ 126	0.011 ~ 0.013	≤1.0D	1.0 D	15280 ~ 17830	670 ~ 930
		3	4	120 ~ 126	0.014 ~ 0.016	≤1.0D	1.0 D	12730 ~ 14850	710 ~ 950
		4	4	120 ~ 126	0.018 ~ 0.021	≤1.0D	1.0 D	9550 ~ 11140	690 ~ 940
		5	4	120 ~ 126	0.023 ~ 0.026	≤1.0D	1.0 D	7640 ~ 8910	700 ~ 930
		6	4	120 ~ 126	0.028 ~ 0.031	≤1.0D	1.0 D	6370 ~ 7430	710 ~ 920
		8	4	120 ~ 126	0.034 ~ 0.037	≤1.0D	1.0 D	4770 ~ 5570	650 ~ 820
		10	4	120 ~ 126	0.040 ~ 0.044	≤1.0D	1.0 D	3820 ~ 4460	610 ~ 780
		12	4	120 ~ 126	0.045 ~ 0.050	≤1.0D	1.0 D	3180 ~ 3710	570 ~ 740
		14	4	120 ~ 126	0.051 ~ 0.056	≤1.0D	1.0 D	2730 ~ 3180	560 ~ 710
		16	4	120 ~ 126	0.057 ~ 0.063	≤1.0D	1.0 D	2390 ~ 2790	540 ~ 700
		18	4	120 ~ 126	0.063 ~ 0.069	≤1.0D	1.0 D	2120 ~ 2480	530 ~ 680
		20	4	120 ~ 126	0.068 ~ 0.075	≤1.0D	1.0 D	1910 ~ 2230	520 ~ 670

SLOTTING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
STAINLESS STEEL UP TO 35 HRC)	M16	1	4	60 ~ 80	0.003 ~ 0.005	≤1.5D	≤ 0.5 D	19100 ~ 25460	230 ~ 510
		1.5	4	60 ~ 80	0.005 ~ 0.007	≤1.5D	≤ 0.5 D	12730 ~ 16980	250 ~ 480
		2	4	60 ~ 80	0.007 ~ 0.009	≤1.5D	≤ 0.5 D	9550 ~ 12730	270 ~ 460
		2.5	4	60 ~ 80	0.009 ~ 0.011	≤1.5D	≤ 0.5 D	7640 ~ 10190	280 ~ 450
		3	4	60 ~ 80	0.011 ~ 0.013	≤1.5D	≤ 0.5 D	6370 ~ 8490	280 ~ 440
		4	4	60 ~ 80	0.015 ~ 0.017	≤1.5D	≤ 0.5 D	4770 ~ 6370	290 ~ 430
		5	4	60 ~ 80	0.019 ~ 0.021	≤1.5D	≤ 0.5 D	3820 ~ 5090	290 ~ 430
		6	4	60 ~ 80	0.023 ~ 0.026	≤1.5D	≤ 0.5 D	3180 ~ 4240	290 ~ 440
		8	4	60 ~ 80	0.029 ~ 0.032	≤1.5D	≤ 0.5 D	2390 ~ 3180	280 ~ 410
		10	4	60 ~ 80	0.035 ~ 0.038	≤1.5D	≤ 0.5 D	1910 ~ 2550	270 ~ 390
		12	4	60 ~ 80	0.041 ~ 0.045	≤1.5D	≤ 0.5 D	1590 ~ 2120	260 ~ 380
		14	4	60 ~ 80	0.046 ~ 0.051	≤1.5D	≤ 0.5 D	1360 ~ 1820	250 ~ 370
		16	4	60 ~ 80	0.052 ~ 0.057	≤1.5D	≤ 0.5 D	1190 ~ 1590	250 ~ 360
		18	4	60 ~ 80	0.058 ~ 0.063	≤1.5D	≤ 0.5 D	1060 ~ 1410	250 ~ 360
		20	4	60 ~ 80	0.063 ~ 0.070	≤1.5D	≤ 0.5 D	950 ~ 1270	240 ~ 360

Cutting Parameter - Square Endmill Standard

SLOTTING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
TITANIUM ALLOYS HARDEDNED UP TO 35 HRC	M17	1	4	60 ~ 80	≤1.0D	1.0 D	≤ 0.5 D	19100 ~ 25460	230 ~ 510
		1.5	4	60 ~ 80	≤1.0D	1.0 D	≤ 0.5 D	12730 ~ 16980	310 ~ 540
		2	4	60 ~ 80	≤1.0D	1.0 D	≤ 0.5 D	9550 ~ 12730	340 ~ 560
		2.5	4	60 ~ 80	≤1.0D	1.0 D	≤ 0.5 D	7640 ~ 10190	370 ~ 570
		3	4	60 ~ 80	≤1.0D	1.0 D	≤ 0.5 D	6370 ~ 8490	360 ~ 580
		4	4	60 ~ 80	≤1.0D	1.0 D	≤ 0.5 D	4770 ~ 6370	380 ~ 590
		5	4	60 ~ 80	≤1.0D	1.0 D	≤ 0.5 D	3820 ~ 5090	400 ~ 570
		6	4	60 ~ 80	≤1.0D	1.0 D	≤ 0.5 D	3180 ~ 4240	390 ~ 580
		8	4	60 ~ 80	≤1.0D	1.0 D	≤ 0.5 D	2390 ~ 3180	370 ~ 550
		10	4	60 ~ 80	≤1.0D	1.0 D	≤ 0.5 D	1910 ~ 2550	350 ~ 520
		12	4	60 ~ 80	≤1.0D	1.0 D	≤ 0.5 D	1590 ~ 2120	340 ~ 500
		14	4	60 ~ 80	≤1.0D	1.0 D	≤ 0.5 D	1360 ~ 1820	340 ~ 500
		16	4	60 ~ 80	≤1.0D	1.0 D	≤ 0.5 D	1190 ~ 1590	330 ~ 480
		18	4	60 ~ 80	≤1.0D	1.0 D	≤ 0.5 D	1060 ~ 1410	330 ~ 480
		20	4	60 ~ 80	≤1.0D	1.0 D	≤ 0.5 D	950 ~ 1270	320 ~ 470

NOTES

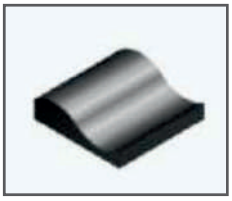


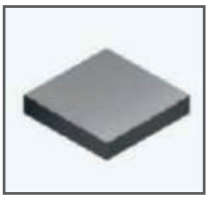
X-FIN LINE

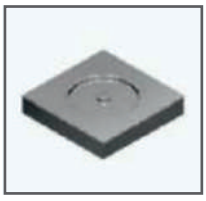
- Used for finishing in mainly die-mould industry as suitable for 3-D finishing
- Excellent surface finish and stable machining due to secure clamping and minimum run-out
- Have the full range with steel bodies, modular heads and carbide shanks!

X-FIN LINE overview

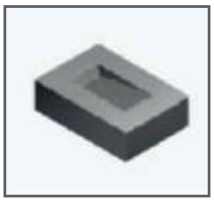
Applications

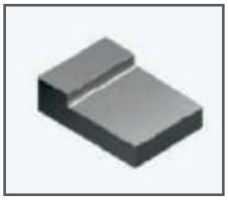

Profiling


Face Milling


Helical Milling


Slot Milling


Ramping


Shoulder Milling

Features

Excellent tool life when machining hard materials by applying ultra-fine grade &coating

- High accuracy of R shape (Ball shape: +/-0.01/ Comer R shape: +/-0.015)
- Possible to apply a wide range of processing areas with various shapes
- Securing excellent performance and quality in mold and parts processing

Grade Features

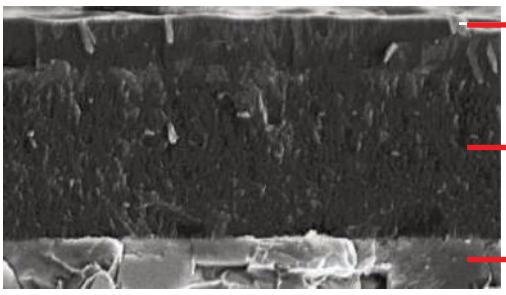
- Excellent abrasion resistance and chipping resistance by using high-characteristic base material applied with ultra-fine WC powder.
- Application of high-harness exclusive PVD coating technology with excellent high temperature properties.

DH-S:

Grade applicable to high-speed and continuous machining of soft pre-hardened steels and stainless steels(mould, press) up to HRC52

DH-P:

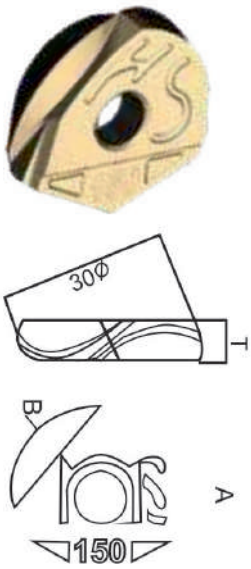
Grade applicable to high speed and continuous machining of high-hardness heat-treated steel (mould, press)of HRC52 and higher. High-hardness exclusive insert coating to prevent tool defects and improve tool life



XHBI Series (Ball End MILL Insert)

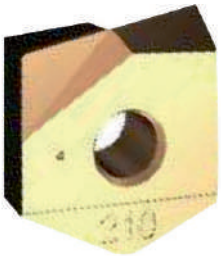
Description	Dimensions (mm)				Dh-S	Dh-P
	R	ODc	A	T		
XHBI-100	5.0/5.5	10.0/11.0	12.2/12.0	27	●	●
XHBI-120	6.0/6.5	12.0/13.0	14.6	32	●	●
XHBI-160	8.0/8.5	16.0/17	16.6/17.1	4.2	●	●
XHBI-160	10.0/10.5	20.0/21.0	20.3/20.8	5.2	●	●
XHBI-250-	12.5	25.0	24.1	6.2	●	●
XHBI-300-	15.0	30.0	29.2	7.2	○	○
XHBI-320-	16.0	32.0	30.2	7.2	○	○

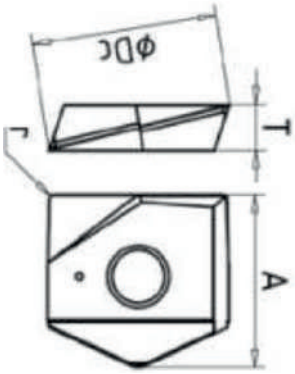
● STOCKABLE ○ NON STOCKABLE



XHBR Series (Corner Radius End) Mill Insert)

Description	Dimensions (mm)				DH-S	DH-P
	R	ODc	A	T		
XHBR-100-R0.5	0.50	10	12	2.7	○	○
XHBR-100-R1.0	1.00	10	12	2.7	○	●
XHBR-120-R0.5	0.50	12	14.6	3.2	○	●
XHBR-120-R1.0	1.00	12	14.6	3.2	○	●
XHBR-160-R0.5	0.50	16	16.6	4.2	○	●
XHBR-160-R1.0	1.00	16	16.6	4.2	○	●
XHBR-200-R0.5	0.50	20	19.8	5.2	○	●
XHBR-200-R1.0	1.00	20	19.8	5.2	○	●
XHBR-210-R0.5	0.50	21	19.8	5.2	○	○
XHBR-210-R1.0	1.00	21	19.8	5.2	○	○
XHBR-250-R0.5	0.50	25	22.55	6.1	○	●
XHBR-250-R1.0	1.00	25	22.55	6.1	○	●
XHBR-250-R2.0	2.00	25	22.55	6.1	○	○
XHBR-300-R0.5	0.50	30	27.2	7.2	○	○
XHBR-300-R1.0	1.00	30	27.2	7.2	○	○





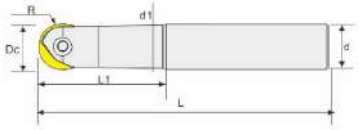
● STOCKABLE ○ NON STOCKABLE

MILLING

ABPF Types Ball/R Finishing End Mills-Steel Bodies





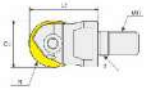


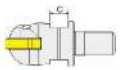
Item code	Teeth	Dimension					Corresponding Insert	Accessories		Stock
		Dc	d1	d	L1	L		Locking Screw	Wrench	
ABPF R4 C08 120L	1	08	7.5	10	25	120	XHBI-080	SCREW-XHBI-080-FSW-3008H	TF08	○
ABPF-R5-C10-120L	1	10	9.5	10	25	120	XHBI-100	SCREW-XHBI-100-FSW-3508H	TF08	●
ABPF-R6-C12-120L	1	12	11.5	12	30	120	XHBI-120	SCREW-XHBI-120-FSW-5010H	TF15	●
ABPF-R8-C16-160L	1	16	15.5	16	49	160	XHBI-160	SCREW-XHBI-160-FSW-5013H	TF20	●
ABPF-R8-C16-200L	1	16	15.5	16	70	200	XHBI-160	SCREW-XHBI-160-FSW-5013H	TF20	●
ABPF-R10-C20-160L	1	20	19	20	59	160	XHBI-200	SCREW-XHBI-200-FSW-6017H	TF25	●
ABPF-R10-C20-200L	1	20	19	20	80	200	XHBI-200	SCREW-XHBI-200-FSW-6017H	TF25	●
ABPF-R12.5-C25-160L	1	25	24	25	68	160	XHBI-250	SCREW-XHBI-250-FSW-6022H	TF30	●
ABPF-R12.5-C25-200L	1	25	24	25	88	200	XHBI-250	SCREW-XHBI-250-FSW-6022H	TF30	●
ABPF-R15-C32-160L	1	30	29	32	78	160	XHBI-300	SCREW-XHBI-300-FSW-8025H	TF30	○
ABPF-R15-C32-200L	17	30	29	32	98	200	XHBI-300	SCREW-XHBI-300-FSW-8025H	TF30	○

Modular Mill types ABPF



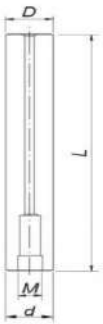






Item code	Teeth	Dimension						Corresponding Insert	Accessories		Stock
		R	Dc	Lf	MC	D	d		Locking Screw	Wrench	
ABPF-080-M05	1	4	8	18	M05	6	5.5	XHBI-080	SCREW-XHBI-080-FSW-3008H	TF08	○
ABPF-100-M06	1	5	10	18	M06	6	6.5	XHBI-100	SCREW-XHBI-100-FSW-3508H	TF08	●
ABPF-120-M06	1	6	12	20	M06	6	6.5	XHBI-120	SCREW-XHBI-120-FSW-5010H	TF15	●
ABPF-160-M08	1	8	16	23	M08	8	8.5	XHBI-160	SCREW-XHBI-160-FSW-5013H	TF20	●
ABPF-200-M10	1	10	20	30	M10	8	10.5	XHBI-200	SCREW-XHBI-200-FSW-6017H	TF25	●
ABPF-250-M12	1	12.5	25	34	M12	10	12.5	XHBI-250	SCREW-XHBI-250-FSW-6022H	TF30	●
ABPF-300-M16	1	15	30	41	M16	12	17	XHBI-300	SCREW-XHBI-300-FSW-8025H	TF30	○

Modular Carbide Straight Shanks





Description	Shank Dia. (D)	Length (L)	Locating Thread	Nose Dia(d)	Availability
CSH-D10-M5-100L	10	100	M5	10	○
CSH-D10-M5-150L	10	150	M5	10	●
CSH-D12-M6-150L	12	150	M6	12	○
CSH-D12-M6-200L	12	200	M6	12	●
CSH-D16-M8-150L	16	150	M8	16	○
CSH-D16-M8-200L	16	200	M8	16	●
CSH-D16-M8-250L	16	250	M8	16	●
CSH-D20-M10-150L	20	150	M10	20	○
CSH-D20-M10-200L	20	200	M10	20	●
CSH-D20-M10-250L	20	250	M10	20	●
CSH-D25-M12-150L	25	150	M12	25	○
CSH-D25-M12-200L	25	200	M12	25	●
CSH-D25-M12-250L	25	250	M12	25	●
CSH-D25-M12-300L	25	300	M12	25	○

● STOCKABLE ○ NON STOCKABLE

Cutting Parameters

	Hardness	Cutting conditions	5R		6R		8R		10R		12.5R		15R	
H	uptoHRC 55(DH-S)	vc (m/min)	100-210	260	100-210	290	100-150	350	100-150	400.00	100-150	450.00	100-150	500
		fz (mm/t)	0.10-0.20	0.2	0.10-0.20	0.2	0.12-0.24	0.30	0.12-0.24	0.4	0.12-0.24	0.5	0.12-0.24	0.6
		ap (mm)	0.15-0.25	0.1	0.20-0.30	0.1	0.60-0.80	0.10	0.70-1.00	0.1	0.90-1.25	0.1	1.10-1.60	0.1
		yes (mm)	0.80-1.00	0.25	0.90-1.20	0.3	1.10-1.60	0.30	1.50-2.00	0.4	1.80-2.50	0.5	2.40-3.20	0.6
	HRC55-68(DH-S)	vc (m/min)	80-170	200	80-160	230	80-200	280.00	80-120	320	80-120	360	80-120	400
		fz (mm/t)	0.10-0.20	0.2	0.10-0.20	0.2	0.12-0.24	0.30	0.12-0.24	0.4	0.12-0.24	0.5	0.12-0.24	0.6
		ap (mm)	0.15-0.25	0.1	0.20-0.30	0.1	0.60-0.80	0.10	0.70-1.00	0.1	0.90-1.25	0.1	1.10-1.60	0.1
		yes (mm)	0.80-1.00	0.25	0.90-1.20	0.3	1.10-1.60	0.30	1.50-2.00	0.4	1.80-2.50	0.5	2.40-3.20	0.6

Notes :

If the overhang length is more than 3 times the diameter, adjust the speed and feed conditions downward as shown in the table on the right.

Overhang	VC mm/min	fz (mm/n)
0-3D	100%	100%
3D-5D	70%	70%
3D-5D	60%	60%
8D-10D	50%	50%

Order Of Fastening

- Clean the fastening space (using air blow, etc.)
- Insert the screw after inserting it into the holder with the number side of the insert facing forward
- Use a torque wrench to tighten the screw with the torque specified on the right.
  Do not press the insert while tightening.
- Complete insert fastening

Fasten In Order To Ensure Accuracy

Ball Type	Corner R type	Tightening torque (NM)
XHBI-100-XX	XHBR-100-XX	1.8
XHBI-120-XX	XHBR-120-XX	3.7
XHBI-160-XX	XHBR-160-XX	3.7
XHBI-200-XX	XHBR-200-XX	3.8
XHBI-250-XX	XHBR-250-XX	5.2
XHBI-300-XX	XHBR-300-XX	5.7



TOOL HOLDING SYSTEM

- Used for finishing in mainly die-mould industry as suitable for 3-D finishing
- Excellent surface finish and stable machining due to secure clamping and minimum run-out
- Have the full range with steel bodies, modular heads and carbide shanks!

NOTES

TOOL HOLDING SYSTEM
INDEX

Tool Holding	401-418
ER Collets/Collet Chucks	401-411
Face Mill Holders/Shell Mill Holders	412-414
Side Lock Holders/ End Mill Holders	415-418

ER-COLLETS
TECHNICAL INFORMATION:

COLLET RUN-OUT TOLERANCES

TABLE - A SPECIFIES COLLET RUN-OUT TOLERANCESRUN

These tolerances are checked as is shown in Figure 4

by the introduction of a test mandrel into the collet.

The diameter of the test mandrel is the nominal diameter of the collet..

For the test mandrel, the following specifications apply:

a) diameter tolerance: hó:

b) cylindricity: 0.002 mm:

c) parallelism: 0,002 mm:

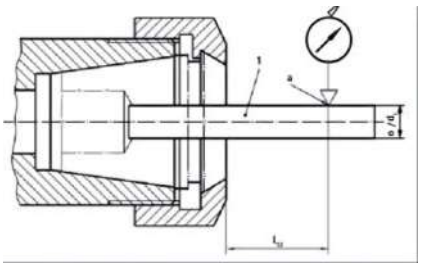
d) roundness: 0.002 mm:

e) surface without longitudinal marks:

f) maximum surface roughness Rz 4 µm:

g) surface hardness: (583) HRC.

FIGURE A



KEY
1. Test Mandrel
2. Test Point

Table-A-Collet run-out tolerance values as per ISO15488/DIN6499 standard

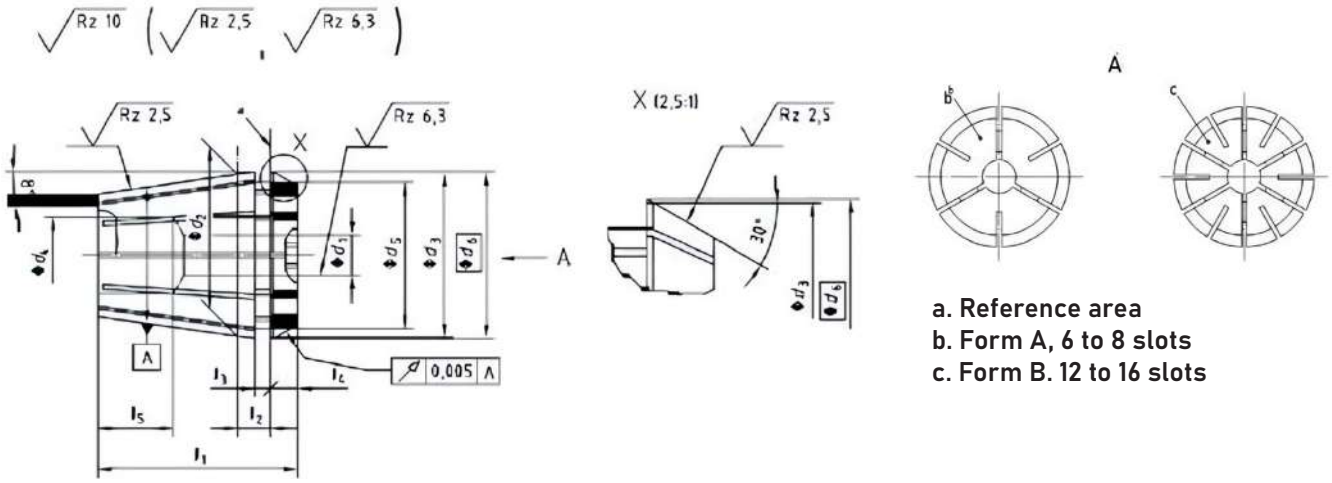
d1 H7 Nominal diameter		112	Run-out tolerance a		
ABOVE	to (included		Standard	HP	UP
1(included)	1.6	6	0.015	0.01	0.005
1.6	3	10			
3	6	16			
6	10	25			
10	18	40	0.020	0.015	0.01
18	26	50			

Dimensions in millimetres

COLLETS (FIGURE & DIMENSION)

FIGURE A

Table-A-Collet run-out tolerance values as per ISO15488/DIN6499 standard



a. Reference area
b. Form A, 6 to 8 slots
c. Form B. 12 to 16 slots

Nominal Size	d_1 H7 From A [a] | From B [β] Nominal Diameter				d_2	d_3 0 / 0.2 From		d_4 From		d_5	d_6		l_1	l_2		l_3		l_5 min
	from (incl)	upto (incl)	from (incl)	upto (incl)		A	B	A	B		A	B		A	B	A	B	
11	1	<3	1	2.5	11	11.3	11.5	5	5	9.5	11.6	11.7	18	2	3.8	2	2	9
	3	6	3	7				-	-									-
16	1	<5	1	4	16	16.74	17	7	7.5	13.8	17.1	17.25	27.5	2.3	6.26	2.3	2.7	9
	5	10	5	10				-	-									-
20	1	<7	1	6	20	20.74	21	9	10	17.4	21.1	21.3	31.5	2.4	6.36	2.4	2.8	12
	7	13	7	13				-	-									-
25	1	<8	2	7	25	25.75	26	10	12	22	26.1	26.3	34	2.5	6.66	2.5	3.1	13
	8	16	8	16				-	-									-
32	2	8	3	7	32	32.75	33	12	15	29.2	33.1	33.55	40	2.7	7.16	2.7	3.6	15
	8	20	8	20				-	-									-
40	3	<9	4	8	40	40.75	41	14	20	36.2	41.1	41.4	46	3.5	7.66	3.5	4.1	18
	9	26	9	26				-	-									-

a. From Clamping rang h10
b. Clamping range -α, 5
Nominal size 16 to 40, Clamping range [0] or upon agreement [0 -0.5]

Dimension in Millimetres

ER-COLLETS
HOLDER (FIGURE & DIMENSION)

FIGURE C

Tolerances in millimetres, surface roughness in micrometres

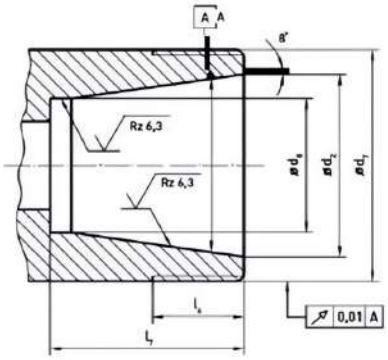


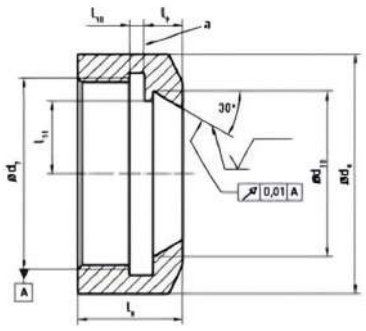
TABLE C

Nominal Size	11	16	20	25	32	40
d, ±0,05	11	16	20	25	32	40
d, 6g	M14 x 0,75	M22 x 1,5	M25 x 1,5	M32 x 1,5	M40 x 1,5	M50 x 1,5
d +0,50	7,5	10,5	13,5	18	23,5	30,5
1 min.	10	13	13,5	14	16	17
L, min.	17	22	26,5	29	34	38
(Form A or B)						

NUT (FIGURE & DIMENSION)

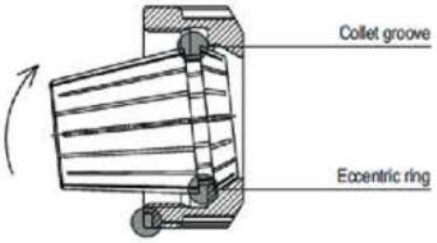
See below Figure and Table

Tolerances in millimetres, surface roughness in micrometres



Nominal Size	$d_2$6H	d_9	d_{10}	l_8	l_9	l_{10}0-0,2	l_{11}max.
11	M14 x 0,75	19	12,1	11,3	3,1	1	5
16	M22 x 1,5	32	17,71	17,5	4,7	1,1	7,2
20	M25 x 1,5	35	21,76	19	5,5	1,2	9,2
25	M32 x 1,5	45	26,64	20	5,7	1,3	11,5
32	M40 x 1,5	53	33,57	22,5	6,2	1,6	14,9
40	M50 x 1,5	60	41,86	25,5	34	2,1	18,5

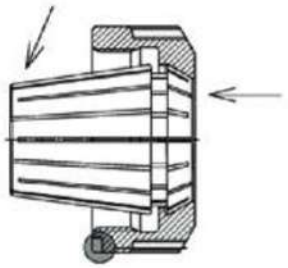
ER-COLLETS
MOUNTING-INSTRUCTIONS
DIN6499/ISO15488



Collets Type ER

Assembling Instructions

Insert groove of collet into eccentric ring of the clamping nut at the mark on the bottom of the nut. Push collet in the direction of the arrow until it clicks in place. Screw nut with collet onto toolholder. We recommend to tighten the nut with a torque wrench



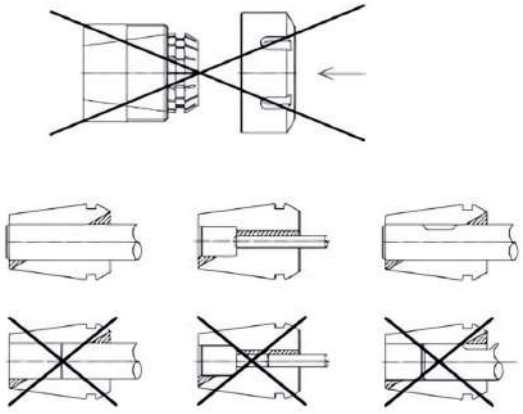
Disassembly Instructions

After the nut is unscrewed from the toolholder, press on the face of the collet while simultaneously pushing sideways on the back of the collet opposite the mark until it disengages from the clamping nut.

Improper assembly can permanently damage the concentricity of the collet and may result in the destruction of the clamping nut.

Only mount clamping nuts with correctly assembled collets!

Never clamp oversized tool shanks! E.g. never use a Ø 12-11 mm collet to clamp a Ø 12.2 mm shank. Rather use the next bigger collet (here Ø 12.5-11.5 mm or 13-12 mm collet). Insert tool to the full length of the collet for best results if possible. However never insert the tool less than 2/3 of the collet bore length. Improper tool insertion can permanently deform the collet and will result in poor runout



MILLING

ER-COLLETS

ACCURACY







STANDARD
PRECISION COLLETS

-below 15 micron

-0.00059”

HIGH
PRECISION COLLETS

-below 10 micron

-0.00039”

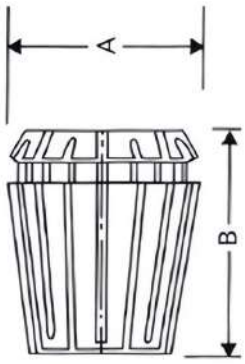
ULTRA
PRECISION COLLETS

-below 5 micron

-0.00019”

**Super Polished collets are available

DIMENSIONS



COLLET SERIES	REFERENCE#	A	B
ER 8	4004E	8.5mm 1.335 in)	13.5mm (.531 in)
ER 11	4008E	11.5mm (.453 in)	18mm 1.709 inl
ER 16	426E	17mm [.669 in)	27.5mm (1.063 in)
ER 20	428E	21mm 1.827 inl	31.5mm (1.220 in)
ER 25	430E	26mm (1.024 in)	34mm (1.378 inl
ER 32	470E	33mm (1.299 in)	40mm 1.575 in)
ER 40	472E	41mm (1.614 in)	46mm (1.811 in)
ER 50	477E	52mm (2.047 in)	60mm [2.362 in)

FEATURES

1. Precision Collets are as per ISO-15488/DIN 6499 standard
2. Precision Collets are as per ISO-15488/DIN 6499 standard
3. Crafted from high quality European Spring steel
4. METRIC & INCH sizes
5. 16 slot construction for rigid clamping and extra concentricity
5. 16 slot construction for rigid clamping and extra concentricity
6. Collets improve tool life, part finish and reduces spindle wear
7. Can be used for drilling, milling, tapping and reaming
8 Hardness: 44-48 HRC
9. All edges are not only deburred but rounded for repeatability

ER-COLLETS MOUNTING-INSTRUCTIONS

INCH SIZE	MM Size	Dec. MM	ER8 4004E	ER11 4008E	ER16 426E	ER20 428E	ER25 430E	ER32 470E	ER40 472E	ER50 477E
1/32		0.79	ER8-1/32	ER11-1/32	ER16-1/32					
	1.0	1.00	ER8-1.0mm	ER11-1.0mm	ER16-1.0mm					
3/64		1.19	ERB-3/64	ER11-3/64	ER16-3/64					
	1.5	1.50	ER8-1.5mm	ER11-1.5mm	ER16-1.5mm					
5/64		1.98	ER8-5/64	ER11-5/64	ER16-5/64					
	2.0	2.00	ER8-2.0mm	ER11-2.0mm	ER16-2.0mm	ER20-2.0mm	ER25-2.0mm			
3/32		2.38	ER8-3/32	ER11-3/32	ER16-3/32	ER20-3/32	ER25-3/32			
	2.5	2.50	ER8-2.5mm	ER11-2.5mm	ER16-2.5mm	ER20-2.5mm	ER25-2.5mm			
7/64		2.78	ER8-7/64	ER11-7/64	ER16-7/64	ER20-7/64	ER25-7/64			
	3.0	3.00	ER8-3.0mm	ER11-3.0mm	ER16-3.0mm	ER20-3.0mm	ER25-3.0mm	ER32-3.0mm	ER40-3.0mm	
1/8		3.18	ER8-1/8	ER11-1/8	ER16-1/8	ER20-1/8	ER25-1/8	ER32-1/8	ER40-1/8	
	3.5	3.50	ER8-3.5mm	ER11-3.5mm	ER16-3.5mm	ER20-3.5mm	ER25-3.5mm	ER32-3.5mm	ER40-3.5mm	
9/64		3.57	ERB-9/64	ER11-9/64	ER16-9/64	ER20-9/64	ER25-9/64	ER32-9/64	ER40-9/64	
5/32		3.97	ER8-5/32	ER11-5/32	ER16-5/32	ER20-5/32	ER25-5/32	ER32-5/32	ER40-5/32	
	4.0	4.00	ER8-4.0mm	ER11-4.0mm	ER16-4.0mm	ER20-4.0mm	ER25-4.0mm	ER32-4.0mm	ER40-4.0mm	
11/64		4.37	ER8-11/64	ER11-11/64	ER16-11/64	ER20-11/64	ER25-11/64	ER32-11/64	ER40-11/64	
	4.5	4.50	ER8-4.5mm	ER11-4.5mm	ER16-4.5mm	ER20-4.5mm	ER25-4.5mm	ER32-4.5mm	ER40-4.5mm	
3/16		4.76	ER8-3/16	ER11-3/16	ER16-3/16	ER20-3/16	ER25-3/16	ER32-3/16	ER40-3/16	
	5.0	5.00	ER8-5.0mm	ER11-5.0mm	ER16-5.0mm	ER20-5.0mm	ER25-5.0mm	ER32-5.0mm	ER40-5.0mm	
13/64		5.16		ER11-13/64	ER16-13/64	ER20-13/64	ER25-13/64	ER32-13/64	ER40-13/64	
	5.5	5.50		ER11-5.5mm	ER16-5.5mm	ER20-5.5mm	ER25-5.5mm	ER32-5.5mm	ER40-5.5mm	
7/32		5.56		ER11-7/32	ER16-7/32	ER20-7/32	ER25-7/32	ER32-7/32	ER40-7/32	
15/64		5.95		ER11-7/32	ER16-15/64	ER20-15/64	ER25-15/64	ER32-15/64	ER40-15/64	
	6,0	6,00		ER11-15/64	ER16-6.0mm	ER20-6.0mm	ER25-6.0mm	ER32-6.0mm	ER40-6.0mm	
1/4		6.35		ER11-40mm	ER16-1/4	ER20-1/4	ER25-1/4	ER32-1/4	ER40-1/4	
	6.5	6.50		ER11-1/4	ER14-4.5mm	ER20-6.5mm	ER25-6.5mm	ER32-6.5mm	ER40-6.5mm	
17/64		6.75		ER11-6.5mm	ER16-17/64	ER20-17/64	ER25-17/64	ER32-17/64	ER40-17/64	
	7.0	7.00		ER11-17/64	ER16-70mm	ER210-7.0mm	ER25-7.0mm	ER32-7.num	ER40-7.0mm	
9/32		7.14		ER11-7.0mm	ER16-9/32	ER20-9/32	ER25-9/32	ER32-9/32	ER40-9/32	
	7.5	7.50			ER14-7.5mm	ER20-7.5mm	ER25-7.5mm	ER32-7.5mm	ER40-7.5mm	
19/64		7.54			ER16-19/64	ER20-19/64	ER25-19/64	ER32-19/64	ER40-19/64	
5/16		7.94			ER16-5/16	ER20-5/16	ER25-5/16	ER32-5/16	ER40-5/16	
	8.0	8.00			ER16-8.0mm	ER20-8.0mm	ER25-8.0mm	ER32-8.0mm	ER40-8.0mm	
21/64		8.33			ER16-21/64	ER20-21/64	ER25-21/64	ER32-21/64	ER40-21/64	
	8.5	8.50			ER14-8.5mm	ER28-8.5mm	ER25-8.5mm	ER32-11.5mm	ER40-8.5mm	
11/32		8.73			ER16-11/32	ER20-11/22	ER25-11/32	ER22-11/32	ER40-11/32	
	9.0	9,00			ER16-9.0mm	ER20-9.0mm	ER25-9.0mm	ER32-9.0mm	ER40-9.0mm	
23/64		9.13			ER16-23/64	ER20-23/64	ER25-23/64	ER32-23/64	ER40-23/64	
	9.5	9.50			ER14-9.5mm	ER20-9.5mm	ER25-9.5mm	ER32-9.5mm	ER40-9.5mm	
3/0		9.53			ER16-3/8	ER20-3/8	ER25-3/8	ER32-370	ER40-3/8	

ER-COLLETS

INCH SIZE	MM Size	Dec. MM	ER8 4004E	ER11 4008E	ER16 426E	ER20 428E	ER25 430E	ER32 470E	ER40 472E	ER50 477E
25/64		9.92			ER16-25/64	ER20-25/44	ER25-25/64	ER32-25/64	ER40-25/64	
	10.0	10.00			ER14-10mm	ER29-100mm	ER25-10.0mm	ER32-100mm	ER40-10	
13/32		10.32				ER20-13/32	ER25-5-13/32	ER32-2-13/32	ER40-0-13/32	
	10.5	10.50				ER20-10.5mm	ER25-10.5mm	ER32-100mm	ER40-10.5mm	
27/64		10.72				ER20-27/64	ER25-27/64	ER32-27/64	ER40-27/64	
	11.0	11.00				ER20-11.0mm	ER25-11,0mm	ER32-110mm	ER60-11.0mm	
7/16		11.11				ER20-7/14	ER25-7/16	ER22-7/16	ER40-7/14	
	11.5	11.50				ER20-11.5mm	ER25-11.5mm	ER22-115mm	ER60-11.5mm	
29/64		11.51				ER20-29/44	ER25-29/64	ER22-29/64	ER40-29/64	
15/32		11.91				ER29-15/32	ER25-15/32	ER32-15/32	ER40-15/32	
	12.0	12.00				ER20-12.0mm	ER25-12.0mm	ER32-12.0mm	ER40-12.0mm	ER50-12.0mm
31/64		12.30				ER20-31/46	ER25-31/64	ER22-31/64	ER40-31/64	ERS0-31/8A
	12.5	12.50				ER20-12.5mm	ER25-12.5mm	ER22-12.3mm	ER40-12.5mm	ER50-12.5mm
1/2		12.70				ER20-1/2	ER25-1/2	ER30-1/2	ER40-1/2	ER50-1/2
	13.0	13.00				ER20-13.0mm	ER25-13.0mm	ER22-13.0mm	ER40-13.0mm	ER50-13.00mm
33/64		13.10				ER20-0/16	ER25-33/64	ER22-33/4	ER60-33/44	ER50-33/44
17/32		13,49				ER20-8.0mm	ER25-17/32	ER32-17/32	ER40-17/32	ER50-17/32
	13.5	13.50				ER20-21/64	ER25-13.5mm	ER32-135mm	ER40-13.5mm	ER50-135mm
35/64		13.89				ER20-8.5mm	ER25-35/64	ER32-35/64	ER40-35/64	ER50-35/44
	14.0	14.00				ER20-11/12	ER25-14.0mm	ER22-140mm	ER40-14.0mm	ER50-14mm
9/16		14.29				ER20-70mm	ER25-9/16	ER32-9/16	ER40-9/14	ERS0-1/16
	14.5	14,50				ER20-23/64	ER25-14.5mm	ER32-14.5mm	ER40-14.5mm	ER50-145mm
37/64		16.60				ERZ0-9.5mm	ER25-37/64	ER22-37/64	ER40-37/64	ER50-37/44
	15.0	15.00				ER20-9/8	ER25-15.0mm	ER22-150mm	ER60-15.0mm	ER50-15.0mm
19/32		15,08					ER25-19/32	ER32-19/32	ER40-19/32	ERS0-19/32
39/64		15.48					ER25-39/64	ER32-39/64	ER40-39/64	ER30-39/64
	15.5	15.50					ER25-15.5mm	ER32-15.5mm	ER40-15.5mm	ERS0-15.5mm
5/8		15.88					ER25-5/8	ER32-5/8	ER60-5/8	ER50-5/6
	16.0	16.00					ER25-16.0mm	ER32-160mm	ER40-16.0mm	ER50-16.0mm
61/64		16.27						ER32-41/64	ER40-41/64	ER50-41/64
	16.5	16.50						ER32-165mm	ER60-16.5mm	ER50-14.5mm
21/32		16.67						ER32-21/12	ER40-21/22	ER50-21/20
	17.0	17.00						ER32-170mm	ER40-17.0mm	ER50-170mm
43/64		17.07						ER22-43/64	ER40-43/64	ES1-43/44
11/16		17.46						ER32-11/16	ER40-11/16	ERS0-11/14
	17.5	17.50						ER32-17.5mm	ER40-17.35mm	ER50-17.5mm
45/64		17.86						ER32-45/64	ER40-45/64	ER50-45/64
	18.0	18,00						ER32-18mm	ER40-180mm	ER50-180mm
23/32		18.26						ER32-23/37	ER40-23/22	ER50-23/32

ER-COLLETS

INCH SIZE	MM Size	Dec. MM	ER8 4004E	ER11 4008E	ER16 426E	ER20 428E	ER25 430E	ER32 470E	ER40 472E	ER50 477E
3/4	19.0	19.00						ER32-19.0mm	ER40-19.0mm	ER50-19.0mm
49/64		19.05						ER32-3/4	ER40-3/4	ER50-3/4
	19.5	19.45						ER32-49/64	ER40-49/64	ER50-49/64
25/32		19.50						ER32-17.5mm	ER40-19.5mm	ER50-19.5mm
	20.0	19.84						ER32-25/32	ER40-25/32	ER50-25/32
51/64		20.00						ER32-20.0mm	ER40-20.0mm	ER50-20.0mm
	20.5	20.24						ER32-51/64	ER40-51/64	ER50-51/64
13/16		20.50						ER32-20.5mm	ER40-20.5mm	ER50-20.5mm
	21.0	20.64						ER32-13/16	ER40-13/16	ER50-13/16
53/64		21.00							ER40-21mm	ER50-21mm
27/32		21.03							ER60-53/64	ER50-53/64
	21.5	21.43							ER40-27/32	ER50-27/32
55/64		21.50							ER40-21.5mm	ER50-21.5mm
	22.0	21.83							ER40-55/64	ER50-55/64
7/8		22.00							R40-22.0mm	ER50-22.0mm
	22.5	22.23							ER40-7/8	ER50-7/8
57/64		22.50							ER40-22.5mm	ER50-22.5mm
	23.0	22.62							ER40-57/64	ER50-57/64
29/32		23.00							ER40-23.0mm	ER50-23.0mm
59/64		23.02							ER40-29/32	ER50-29/32
	23.5	23.42							ER40-59/64	ER50-59/64
15/16		23.50							ER40-23.5mm	ER50-23.5mm
	24.0	23.81							ER40-15/16	ER50-15/16
61/64		24.00							ER40-24.0mm	ER50-24.0mm
	24.5	24.21							ER40-61/64	ER50-61/64
31/32		24.50							ER40-25.0mm	ER50-25.0mm
		24.61							ER40-63/64	ER50-63/64
63/64	25.00	25.00							ER40-1	ER50-1
		25.40							ER40-25.5mm	ER50-25.5mm
	26.0	26.00							ER40-26.0mm	ER50-26.0mm
	27.00	27.00								ER50-27.0mm
	28.00	28.00								ER50-28.0mm
	29.00	29.00								ER50-29.0mm
	30.00	30.00								ER50-30.0mm
	31.00	31.00								ER50-31.0mm
	32.00	32.00								ER50-32.0mm
	33.00	33.00								ER50-33.0mm
	34.00	34.00								ER50-34.0mm

ER-COLLETS CHUCKS



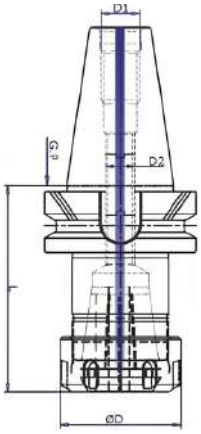
FEATURES

1. Accuracy: 5 Micron or 0.0002" TIR or better
2. AT3 Class Taper Accuracy
3. Through-tool coolant feature is standard
4. H5 bore tolerance for optimum surface contact with cutting tool
5. ER Collet Nuts are Power Coated for increased clamping force due to reduced friction
6. High precision pilot holes
7. Hardness: HRC 56-58
8. Carbon depth: 0.8mm +-0.2mm
9. Surface Roughness: Ra<0.005mm
10. Crafted from case hardened alloy steel
11. Balanced G6.3 @15000RPM
12. Balanced G2.5 (@25000 RPM

BT TAPER - MAS-403

IPART NUMBER	TAPER	NUT DIA L	GRADE DIA L	COLLET TYPE	COLLET CLAMPING RANGE	D1	AVAILABILITY
BT30-ER16-70-D(BAL)	BT-30	29	70	ER16	0.5-10	M12	●
BT30-ER20-70-D(BAL)	BT-30	35	70	ER20	1.0-12	M12	●
8130-ER25-70-D(BAL)	BT-30	42	70	ER25	1.0-16	M12	●
BT30-ER32-70-D(BAL)	BT-30	50	70	ER32	2.0-20	M12	●
BT30-ER32-100-D(BAL)	BT-30	50	100	ER32	2.0-20	M12	●
BT30-ER40-80-D(BAL)	BT-30	63	80	ER40	2.0-26	M12	●
BT40-ER16-70-D(BAL)	20.5	32	70	ER16	0.5-10	M16	●
BT40-ER16-100-D(BAL)	BT-40	32	100	ER16	0.5-10	M16	●
BT40-ER20-70-D(BAL)	BT-40	35	70	ER20	1.0-12	M16	●
BT40-ER20-100-D(BAL)	BT-40	35	100	ER20	1.0-12	M16	●
BT40-ER20-150-D(BAL)	BT-40	35	15	EA20	1.0-12	M16	●
BT40-ER25-70-D(BAL)	BT-40	42	70	ER25	1.0-16	M16	●
BT40-ER25-100-D(BAL)	BT-40	42	100	ER25	1.0-16	M16	●
BT40-ER25-150-D(BAL)	BT-40	42	150	ER25	1.0-16	414	●
BT40-ER32-70-D(BAL)	BT-40	50	70	ER32	2.0-20	M16	●
BT40-ER32-100-D(BAL)	BT-40	50	100	ER32	20-20	M16	●
BT40-ER32-150-D(BAL)	BT-40	50	150	ER32	2.0-20	M16	●
BT40-ER32-200-D(BAL)	BT-40	50	200	ER32	2.0-20	M16	●
BT40-ER40-80-D(BAL)	BT-40	63	80	ER40	2.0-26	M16	●
BT40-ER40-100-D(BAL)	BT-40	63	100	ER40	2.0-26	M16	●
BT40-ER40-150-D(BAL)	BT-40	63	150	ER40	2.0-26	M16	●
BT50-ER16-70-D(BAL)	BT-50	28	70	ER16	0.5-10	M24	●
BT50-ER20-70-D(BAL)	BT-50	35	70	ER20	1.0-12	M24	●
BT50-ER20-100-D(BAL)	BT-50	35	100	ER20	1.0-12	M24	●
BT50-ER25-70-D(BAL)	BT-50	42	70	ER25	1.0-16	M24	●
BT50-ER25-100-D(BAL)	BT-50	42	100	ER25	1.0-16	M24	●
BT50-ER32-70-D(BAL)	BT-50	50	70	ER32	2.0-20	M24	●
BT50-ER32-100-D(BAL)	BT-50	50	100	ER32	2.0-20	M24	●
8T50-ER32-150-D(BAL)	BT-50	50	150	ER32	2.0-20	M24	●
BT50-ER32-200-D(BAL)	BT-50	50	200	ER32	2.0-20	M24	●
BT50-ER40-80-D(BAL)	BT-50	63	80	ER40	2.0-26	M24	●
BT50-ER40-100-D(BAL)	BT-50	63	100	ER40	2.0-26	M24	●
BT50-ER40-150-D(BAL)	BT-50	63	150	ER40	2.0-26	M24	
BT50-ER40-200-D(BAL)	BT-50	63	200	ER40	2.0-26	M24	



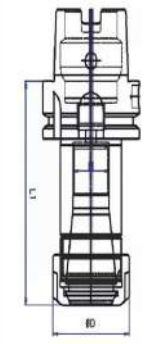


MILLING

ER-COLLETS
HSK-A DIN69893-1

ITEM NUMBER	SUITABLE FOR COLLECT	CLAMPING CAPACITY	L1	M	NUT DIA D	NUT TYPE	AVAILABILITY
HSK-A50 ER16 060-D(BAL)	ER16	0.5-10	60	M10x1P	28	UM/ER16	O
HSK-A50 ER16 100-D(BAL)	ER16	0.5-10	100	M10x1P	34	UM/ER16	O
HSK-A50 ER20 100-D(BAL)	ER20	1.0-13	100	M10x1P	34	UM/ER20	O
HSK-A50 ER25.080-D(BAL)	ER25	1.0-36	80	M18x1P	42	UM/ER25	O
HSK-A50 ER25 100-D(BAL)	ER25	1.0-16	100	M18x1P	42	UM/ER25	O
HSK-A50 ER32.000-D(BAL)	ER32	2.0-20	80	M22x1.5P	50	UM/ER32	O
HSK-A50 ER32 100-D(BAL)	ER32	2.0-20	100	M22x1.5P	50	UM/ER32	O
HSK-A50 ER40 080-D(BAL)	ER40	3.0-26	80	M30X1.5P	63	UM/ER40	O
HSK-A63ER16 100-D(BAL)	ER16	0.5-10	100	M10x1P	28	UM/ER16	O
HSK-A63 ER36 160-D(BAL)	ER16	0.5-10	160	M10x1P	28	UM/ER16	O
HSK-A63 ER20 100-D(BAL)	ER20	1.0-13	160	M10x1P	34	UM/ER20	O
HSK-A63 ER20 160-D(BAL)	ER20	1.0-13	160	M10x1P	34	UM/ER20	O
HSK-A63 ER25 100-D(BAL)	ER25	1.0-16	100	M18x1P	42	UM/ER20	O
HSK-A63 ER25 160-D(BAL)	ER25	1.0-16	160	M18x1P	42	UM/ER25	O
HSK-A63 ER32 100-D(BAL)	ER32	2.0-20	100	M22x1.5P	50	UM/ER32	O
HSK-A63 ER32 160-D(BAL)	ER32	2.020	160	M22x1.5P	50	UM/ER32	O
HSK-A63 ER40 120-D(BAL)	ER40	3.0-26	120	M30X1.5P	63	UM/ER40	O
HSK-A53 ER40 160-D(BAL)	ER40	3.0-26	160	M30X1.5P	63	UM/ER40	O
HSK-A100 ER25 100-D(BAL)	ER25	1.0-16	100	M18X1P	42	UM/ER25	O
HSK-A100 ER25 160-D(BAL)	ER25	1.0-16	160	M18X1P	42	UM/ER25	O
HSK-A100 ER32 100-D(BAL)	ER32	20-20	100	M22X1.5P	50	UM/ER32	O
HSK-A100 ER32 160-D(BAL)	ER32	20-20	160	M22X1.5P	50	UM/ER32	O
HSK-A100 ER40 120-D(BAL)	ER40	3.0-26	120	M30X1.5P	63	UM/ER40	O
HSK-A100 ER40 160-D(BAL)	ER40	3.0-26	160	M30X1.5P	63	UM/ER40	O





FACE-MILL HOLDERS/ SHELL-MILL HOLDERS



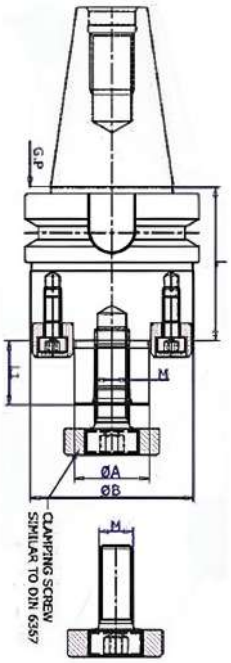
FEATURES

1. Balanced to 15000 RPM at G6.3 & 25000 RPM at G2.5
2. AT3 Class Taper
3. High precision pilot
4. Hardness: HRC 56-58
5. Carbon depth: 0.8mm
6. Surface Roughness
7. Crafted from case hardened alloy
8. Crafted from case hardened alloy steel

BTMAS403
FACE MILL HOLDERS

BT TAPER - MAS-403 DIN6357

ITEM NUMBER	TOOL SHANK	A H6	L	L1	B	M	AVAILABILITY
BT 30 FMH 16 040-D(BAL)	BT30	16	40	17	38	M8	●
BT 30 FMH 22 040-D(BAL)	BT30	22	40	19	48	M10	●
BT 30 FMH 27 040-D(BAL)	BT30	27	40	21	58	M12	●
BT 40 FMH 16 045-D(BAL)	BT40	16	45	17	38	M8	●
BT 40 FMH 16100-D(BAL)	BT40	16	100	17	38	M8	●
BT 40 FMH 16120-D(BAL)	BT40	16	120	17	38	M8	●
BT 40 FMH 16160-D(BAL)	BT40	16	160	17	38	M8	●
BT 40 FMH 22 045-D(BAL)	BT40	22	45	19	48	M10	●
BT 40 FMH 22100-D(BAL)	BT40	22	100	19	48	M10	●
BT 40 FMH 22150-D(BAL)	BT40	22	150	19	48	M10	●
BT 40 FMH 22 200-D(BAL)	BT40	22	200	19	48	M10	●
BT 40 FMH 22 250-D(BAL)	BT40	22	250	19	48	M10	●
BT 40 FMH 27 045-D(BAL)	BT40	27	45	21	58	M12	●
BT 40 FMH 27100-D(BAL)	BT40	27	100	21	58	M12	●
BT 40 FMH 27120-D(BAL)	BT40	27	120	21	58	M12	●
BT 40 FMH 27160-D(BAL)	BT40	27	160	21	58	M12	●
BT 40 FMH 32 050-D(BAL)	BT40	32	50	24	78	M16	●
BT 40 FMH 32100-D(BAL)	BT40	32	100	24	78	M16	●
BT 40 FMH 32120-D(BAL)	BT40	32	120	24	78	M16	●
BT 40 FMH 32160-D(BAL)	BT40	32	160	24	78	M16	●
BT 50 FMH 16 055-D(BAL)	BT50	16	55	17	38	M8	●
BT 50 FMH 16100-D(BAL)	BT50	16	100	17	38	M8	●
BT 50 FMH 16150-D(BAL)	BT50	16	150	17	38	M8	●
BT 50 FMH 22 055-D(BAL)	BT50	22	55	19	48	M10	●
BT 50 FMH 22 100-D(BAL)	BT50	22	100	19	48	M10	●
BT 50 FMH 22150-D(BAL)	BT50	22	150	19	48	M10	●
BT 50 FMH 22 200-D(BAL)	BT50	22	200	19	48	M10	●
BT 50 FMH 22 250-D(BAL)	BT50	22	250	19	48	M10	●
BT 50 FMH 22 300-D(BAL)	BT50	22	300	19	48	M10	●
BT 50 FMH 27 055-D(BAL)	BT50	27	55	21	58	M12	●
BT 50 FMH 27100-D(BAL)	BT50	27	100	21	58	M12	●
BT 50 FMH 27150-D(BAL)	BT50	27	150	21	58	M12	●
BT 50 FMH 32 060-D(BAL)	BT50	32	60	24	78	M16	●
BT 50 FMH 32100-D(BAL)	BT50	32	100	24	78	M16	●
BT 50 FMH 32 150-D(BAL)	BT50	32	150	24	78	M16	●



HSK-A DIN69893-1 FACE-MILLHOLDERS

HSK-A DIN69893-1

ITEM NUMBER	D1	L1	D	L2	AVAILABILITY
HSK-A50 FMH16 045-D(BAL)	16	45	38	17	O
HSK-A50FMH22 055-D(BAL)	22	55	48	19	O
HSK-A50 FMH27 055-D(BAL)	27	55	58	21	O
HSK-A50 FMH32 060-D(BAL)	32	60	78	24	O
HSK-A63 FMH16 045-D(BAL)	16	45	38	17	O
HSK-A63 FMH16 100-D(BAL)	16	100	38	17	O
HSK-A63FMH16 160-D(BAL)	16	160	38	17	O
HSK-A63 FMH22 050-D(BAL)	22	50	48	19	O
HSK-A63 FMH22 100-D(BAL)	22	100	48	19	O
HSK-A63 FMH22 160-D(BAL)	22	160	48	19	O
HSK-A63 FMH27 055-D(BAL)	27	55	58	21	O
HSK-A63 FMH27100-D(BAL)	27	100	58	21	O
HSK-A63 FMH27160-D(BAL)	27	160	58	21	O
HSK-A63FMH32 060-D(BAL)	32	60	78	24	O
HSK-A63FMH32100-D(BAL)	32	100	78	24	O
HSK-A63 FMH32 160-D(BAL)	32	160	78	24	O
HSK-A63 FMH40 065-D(BAL)	40	65	88	27	O
HSK-A63FMH40 100-D(BAL)	40	100	88	27	O
HSK-A63 FMH40 160-D(BAL)	40	160	88	27	O
HSK-A100 FMH16 055-D(BAL)	16	55	38	17	O
HSK-A100 FMH22 055-D(BAL)	22	55	48	19	O
HSK-A100 FMH27 055-D(BAL)	27	55	58	21	O
HSK-A100 FMH32 060-D(BAL)	32	60	78	24	O
HSK-A100 FMH40 065-D(BAL)	40	65	88	27	O

D	SCREW	TENON	ALLEN CAP SCREW
16	SCR16 XM8	8	M4
22	SCR22 XM10	10	MS
27	SCR27 XM12	12	MS
32	SCR32 XM16	14	M6
40	SCR40 XM20	16	M6

SIDE-LOCK HOLDER/ END MILL HOLDERS

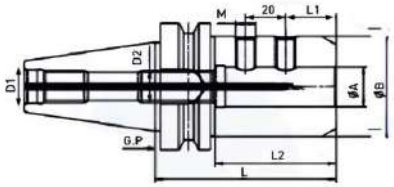


FEATURES

1. Balanced to 15000 RPM at G6.3 & 25000 RPM at G2.5
2. AT3 Class Taper Accuracy
3. H5 bore tolerance for optimum contact with cutting tool
4. High precision pilot holes
5. Hardness: HRC 56-58
6. 1Carbon depth: 0.8mm +-0.2mm
7. Surface Roughness: Ra<0.005mm
8. Crafted from case hardened alloy steel

BT TAPER-MAS-403-DI
SIDE LOCK HOLDER/ENDMILL HOLDERS





ITEM NUMBER	TOOL SHANK	A H6	L	B	L1	L2	01	02	M	AVAILABILITY
BT 30 SLA06 065-D(BAL)	BT30	6	65	20	15	35	M12	M5	M6	●
BT 30 SLA08 065-D(BAL)	BT30	8	65	24	15	40	M12	M6	M8	●
BT 30 SLA10 045-D(BAL)	BT30	10	65	30	16	44	M12	M8	M10	●
BT 30 SLA12065-D(BAL)	BT30	12	65	35	20	44	M12	M10	M10	●
BT 30 SLA16 065-D(BAL)	BT30	16	65	40	23	52	M12	M12	M10	●
BT 30 SLA20 090-D(BAL)	BT30	20	90	50	25	70	M12	M12	M10	●
BT 30 SLA25 090-D(BAL)	BT30	25	90	50	25	70	M12	M12	M10	●
BT 40 SLAD6 065-D(BAL)	BT40	6	65	20	15	35	M16	M5	M6	●
BT 40 SLA08 065-D(BAL)	BT 40	8	65	24	15	40	M16	M6	M8	●
BT 40 SLA10 065-D(BAL)	BT 40	10	65	30	16	44	M16	M8	M10	●
BT 40 SLA12065-D(BAL)	BT40	12	65	35	20	44	M16	M10	M10	●
BT 40 SLA16 065-D(BAL)	BT 40	16	65	40	23	52	M16	M12	M10	●
BT 40 SLA20 090-D(BAL)	BT40	20	90	50	25	70	M16	M12	M10	●
BT 40 5LA25 090-D(BAL)	BT 40	25	90	50	25	70	M16	M12	M10	●
BT 40 SLA32 090 -D(BAL)	BT40	32	90	60	30	70	M16	M12	M10	●
BT 40 SLA40 090-D(BAL)	BT40	40	90	60	30	70	M16	M12	M10	●
BT 50 SLA06-075-D(BAL)	BT50	6	75	20	15	35	M24	M12	M6	●
BT 50 SLA08 075-D(BAL)	BT50	8	75	24	15	40	M24	M5	M8	●
BT 50 SLA10 075-D(BAL)	BT50	10	75	30	16	44	M 24	M6	M10	●
BT 50 SLA20 105-D(BAL)	BT50	12	75	35	20	44	M24	M8	M10	●
BT 50 SLA25 105-D(BAL)	BT50	16	75	40	23	52	M24	M10	M10	●
BT 50 5LA32 105-D(BAL)	BT50	20	105	50	25	70	M24	M12	M10	●
BT 50 SLA40 105-D(BAL)	BT50	25	105	50	25	70	M24	M12	M10	●
BT 50 SLA40 150-D(BAL)	BT50	32	105	60	30	70	M24	M12	M10	●
BT 50 SLA50 075-D(BAL)	BT50	40	105	60	30	70	M 24	M12	M10	●
BT 50 SLA50 105-D(BAL)	BT50	40	150	60	30	70	M24	M12	M10	●
BT 50 SLA50 150-D(BAL)	BT50	50	75	90	40	70	M24	M12	M12	●
BT 50 SLA50 105-D(BAL)	BT50	50	105	90	40	70	M24	M12	M12	●
BT 50 SLA50 150-D(BAL)	BT50	50	150	90	40	70	M24	M12	M12	●

HSK- ADIN69893-1
SIDE LOCK HOLDER/ENDMILL HOLDERS

ITEM NUMBER	D H5	L1	D1	M	D2	FIG	AVAILABILITY
HSK-A50 WN06 065-D(BAL)	6	65	25	M6	MS	1	O
HSK-A50 WN08 065 -D(BAL)	8	65	28	M8	M6	1	O
HSK-A50 WN10 065-D(BAL)	10	65	35	M10	MS	1	O
HSK-A 50 WN12 080-D(BAL)	12	80	42	M12	M10	1	O
HSK-A50 WN14 080-D(BAL)	14	80	44	M12	M10	1	O
HSK-A50 WN16 080-D(BAL)	16	80	48	M14	M12	1	O
HSK-A50 WN18 080-D(BAL)	18	80	50	M14	M12	1	O
HSK-A50 WN20 080-D(BAL)	20	80	52	M16	M16	1	O
HSK-A50 SLA25 100-D(BAL)	25	100	50	M10X2P	M12	1	O
HSK-A63 WN06 065-D(BAL)	6	65	25	M6	M5	1	O
HS K-A63 WN06 100-D(BAL)	6	100	25	M6	M5	1	O
HSK-A63 WN06 160-D(BAL)	6	160	25	M6	M5	1	O
HSK-A63 WN08 065-D(BAL)	8	65	28	M8	M6	1	O
HSK-A63 WNOS 100-D(BAL)	8	100	28	M8	M6	1	O
HS K-A63 WN08 160-D(BAL)	8	160	28	M10	M6	1	O
HSK-A63 WN10 065-D(BAL)	10	65	35	M10	MS	1	O
HSK-A63 WN10 100-D(BAL)	10	100	35	M10	MS	1	O
HSK-A63 WN10 160-D(BAL)	10	160	35	M12	MS	1	O
HSK-A63 WN12080-D(BAL)	12	80	42	M12	M10	1	O
HSK-A63 WN12 100-D(BAL)	12	100	42	M12	M10	1	O
HSK-A63 WN12 160-D(BAL)	12	160	42	M12	M10	1	O
HSK-A63 WN14 080-D(BAL)	14	80	44	M12	M10	1	O
HSK-A63 WN14 100-D(BAL)	14	100	44	M12	M10	1	O
HSK-A63 WN14 160-D(BAL)	14	160	44	M12	M10	1	O
HSK-A63 WN16 080-D(BAL)	16	80	48	M14	M12	1	O
HSK-A63 WN16 100-D(BAL)	16	100	48	M14	M12	1	O
HSK-A63 WN16 160-D(BAL)	16	160	48	M14	M12	1	O
HSK-A63 WN18 080-D(BAL)	16	80	50	M14	M12	1	O
HSK-A63 WN18100-D(BAL)	16	100	50	M14	M12	1	O



FIG-1

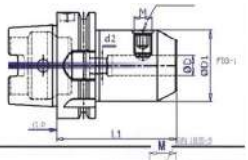
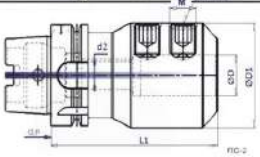


FIG-2



MILLING

HSK-ADIN69893-1
SIDE LOCK HOLDER/ENDMILL HOLDERS

ITEM NUMBER	D H5	L1	D1	M	D2	FIG	AVAILABILITY
HSK-A63 WN18 160-D(BAL)	18	160	50	M14	M12	1	O
HSK-A63 WN20 080-D(BAL)	20	80	52	M16	M16	1	O
HS K-A 63 WN20 100-D(BAL)	20	100	52	M16	M16	1	O
HS K-A 63 WN20 160-D(BAL)	20	160	52	M16	M16	2	O
HSK-A63 WN25110-D(BAL)	25	110	65	M18X2P	M20	2	O
HSK-A63WN32110-D(BAL)	32	110	72	M18X2P	M20	2	O
HSK-A63WN40125-D(BAL)	40	125	80	M20X2P	M20	1	O
HSK-A100WN06 080-D(BAL)	6	80	25	M6	MS	1	O
HSK-A100WN06 160-D(BAL)	6	160	25	M6	MS	1	O
HSK-A100WN08 080-D(BAL)	8	80	28	M8	M6	1	O
HSK-A100WN08160-D(BAL)	8	160	28	M8	M6	1	O
HSK-A100WN10 080-D(BAL)	10	60	35	M10	M8	1	O
HSK-A100WN10 160-D(BAL)	10	180	35	M10	M8	1	O
HSK-A100WN12 100-D(BAL)	12	160	42	M12	M10	1	O
HSK-A100WN12 160 -D(BAL)	12	80	42	M12	M10	1	O
HSK-A100WN14 100-D(BAL)	14	160	44	M12	M10	1	O
HSK-A100WN14160-D(BAL)	14	100	44	M12	M10	1	O
HSK-A100WN16100-D(BAL)	16	160	48	M14	M12	1	O
HSK-A100WN16 160-D(BAL)	16	100	48	M14	M12	1	O
HSK-A100WN18100-D(BAL)	18	160	50	M14	M12	1	O
HSK-A100WN18160-D(BAL)	18	100	50	M14	M12	1	O
HSK-A100WN20 100-D(BAL)	20	160	50	M16	M16	1	O
HSK-A100WN20 160-D(BAL)	20	100	52	M16	M16	1	O
HSK-A100WN25100-D(BAL)	25	160	52	M18X2P	M20	1	O
HSK-A100WN25160-D(BAL)	25	160	65	M18X2P	M20	2	O
HSK-A100WN32120-D(BAL)	32	120	72	M20X2P	M20	2	O
HSK-A100WN32160-D(BAL)	32	160	72	M20X2P	M20	2	O
HSK-A100WN40120-D(BAL)	40	120	80	M20X2P	M20	2	O
HSK-A100WN50 130-D(BAL)	50	130	100	M24X2P	M20	2	O

NOTES

Threading & Tiny Tool Enquiry Sheet

Company :

Contact Person :

Contact :

E-mail :

Tool Details :

Diagram :

Applications :

Simple Speacial - Endmills

Enquiry Date :_____

Sales Engineer :_____

Distributor : _____

End Customers : _____

City State _____

Work pieces Material : _____

Matl hardness ; _____

Machine : _____

Sr .No	End mill Description	Application	End mili Diametor in mm,D1	Relief Dia in mm, 02	Shank Dia in mm, D	Flute Length in mm, L1	Length in mm, L2	OALin mm, L	No. of Flutes,Z

Corner Radius in mm	Qty Required in Nos	Additional info if any	XCUT Code	MOQ IN NOS	Remarks

Note : Sales team to fill
Customs tooling team to share

SC ENDMILLS	
Category	MOQ as per quideLines
If Cutting parameters ≤ 6 mm	10 No's
If Cutting parameters > 6-16 mm	5 Nos
If Cutting parameters >16 mm	3 No's

PCD/CBN Tool Selection Enquiry Sheet

Company : _____

Contact Person : _____ Phone : _____

Email : _____

Machine Information

Make : _____ Model :_____

Application Information

OD Turning	ID Turining	Grooving	Face Milling	Shoulder wall milling	Others

Material Information

Material Specification		Hardness	
Material ISO Code		Hardening Process	

Application Criteria

Allowed Tolorence		Finish required in Ra		Cycle Time	

Types of Cutting

Continues Cut	Light Interrupted Cut	Medium Interrupted Cut	Heavy Interrupted Cut



Existing Tool Information

Manufacturer :			Std(Catalog Item)		Special Tool	
Insert Spec :			Chip Breaker		Grade	
Cutting Speed		Depth of Cut	Length of Cut	Tool Life		
Criteria for Tool Change		COST CUTTING		Production Qty/ month		

Our Tool Recommendation :

Obseravtion noted while making survey

Test Data Report

XCUT TECHNOLOGIES						
Test Data Report						DATE
Distributor		Workpiece Sketch & Operation				
Industry						
Workpiece Name						
Matarial & Hardness						
DIAMETERS OF WORK						
Machine Type						
Tool	Description	TEAGUTEC		XCUT		Remarks
	Insert(Grade)					
	Tool Holder					
Cutting Condition	Cutting Speed : Vc (m/min)					
	RPM(Min^{-1})					
	Feed Rate : f (mm/rev)					
	Cutting Depth: ap (mm)					
	Coolant					
Test data		ToolLife		Tool life		
		Pc	min	Pc	min	
	1st Edge					
	2nd Edge					
	3rd Edge					
	4thEdge					
	5thEdge					
	6thEdge					
	7thEdge					
	8th Edge					
	Average					
	Results					

No	Facts	TEAGUTEC	XCUT
1	Tool Life / Edge (Average)		
2	Number of Edge		
3	Insert Price (NRI)		
4	Number of Production per month		
5	Total Tool Life / Insert		
6	Cost per Component (INR)		
7	Cost Saved / Comp (INR)		
8	Cost per Month (INR)		
9	Cost saved per Month (INR)		
10	Cost per Year (INR)		
11	Cost saved per Year (INR)		
12	Tool Cost Reduction %		

Cost Reduction By XCUT

CPC reduction	Total Cost reduction

Pls input data to while column only

Light blue column will automatcally, do not input data

Safety Notes for Cutting Tools

. Introduction

The purpose of the below guidelines are to familiarize all end users with the contents of cutting tools. Before using and handling any cutting tool products and cutting tool materials be sure to read this safety note so that they are used correctly.

. Basic Information for Cutting Tool Materials

1. Technical Terms

Cutting Tool Material: Terminology for cutting tool materials, such as Cemented Carbide, Coated Carbide, Cermet, Coated Cermet, Ceramics, CBN and PCD

Carbide Material :Cemented Carbide with WC (Tungsten Carbide) as the main component

2 Physical Properties

Appearance: Depends on materials. (e.g. Gray, Black, Gold, etc.)

Smell : None

Hardness : Carbide / Cermet 5 ~ 30GPaHV, Ceramic 10 ~ 40GPaHV
CBN 20 ~ 50GPaHV, PCD 80 ~ 120GPaHV

Sp. Gr. : Carbide 9 ~ 16, Cermet 5 ~ 9, Ceramic 2 ~ 7, CBN / PCD 3 ~ 5

3 Composition

Carbide, Nitride, Carbon-nitride and Oxide with W, Ti, Al, Si, Ta, B, etc. and additionally, metals such as Co, Ni, Cr, Mo are included in some cutting materials.

. Notes for Handling Cutting Tool Materials

- These cutting tool materials are very hard,but also brittle. Therefore, they may brake by shock or excessive clamp force.
- Carbide base material, in particular, can be very heavy. Handle with care when transferring and storing large size products or large quantities as heavy load.
- Carbide base material has a different rate of thermal expansion to that of normal metals. When brazing the cutting tool material, use the proper temperature to prevent the tool from breaking.

. Notes for Cutting Tools

- The cutting edge is very sharp; wear gloves when handling or installing tools to prevent injury.
- When cutting, cutting tools may brake due to shock, excessive tool wear or improper conditions. It is essential to wear protective clothing such as safe guards, safety eyeglasses, and gloves to prevent injury.
- Depending on workpiece material and cutting conditions, sparks or fire may occur. Use protective material such as safe guards, safety eyeglasses and gloves.
- When cutting, flying chips or metal pieces may be dangerous. Use protective materials such as safe guards and safety eyeglasses to prevent injury.

CAUTION

Safety Notes for Cutting Tools

Precaution for using cutting tools

Target Products	Precariousness	Countermeasures
General Cutting Tools	0 Direct touch to a sharp cutting edge may cause injury.	* When you set up tools to the machine or take tools out of the case, please wear protective gloves.
	0 Misuse or inappropriate working conditions may cause tool breakage or dispersion of broken pieces.	* Please use safety items, such as safety glasses and protective gloves. * Please use in the range of our recommended cutting condition. See our catalog or instruction manuals.
	0 Excessive impact or heavy wear will increase cutting resistance and may cause tool breakage and dispersion of broken pieces.	* Please use safety items, such as safety glasses and protective gloves. * Early exchanging tools is prefereable.
	0 Dispersion of heated or prolonged chips may cause injury or burn.	* Please use safety items, such as safety glasses and protective gloves. * For chips removal, please stop the machine beforehand and use safety items, such as safety glasses and protective gloves.
	0 Tools and materials reach high temperatures during cutting operation. Direct touch to the tools and materials shortly after cutting may cause burn.	* Please prepare safety items, such as safety glasses and protective gloves.
	0 Sparks, generation of heat or chips in high temperature during operation may cause fire.	* Please do not operate around Hazardous zone, in which there is some possibility of fire or explosion. * In case of using oil-coolant, please make sure there is sufficient fire-protection equipment.
	0 Lack of dynamic balance during high-speed revolutions leads to vibrations which can make the tool break.	* Please use safety items, such as safety glasses and protective gloves. * Please conduct test-operation before cutting, and confirm that there is no vibration or unusual sound.
	0 Direct touch to burrs which were generated on the rough surface of the workpiece may cause injury.	* Do not touch workpiece with bare hand.
Indexable Cutting Tools	0 If the inserts or other tool parts are not installed properly, they can fall down or break which may cause injuries.	* Please clean up insert pockets or clamping parts before setting insert. * Please set up inserts with supplied wrench only, and confirm that the inserts or parts are clamped completely. Never use inserts or parts other than those prescribed.
	0 If inserts are clamped too tightly by supplementary tools like pipe etc, inserts or body may brake.	* Do not use aids such as pipes. Please set up using supplied wrench only.
	0 When tools are used in high-speed revolution, inserts or parts may burst out of the body due to centrifugal force. When handling, please pay special attention to safety.	* Please use in the range of our recommended cutting conditions. See our catalog or instruction manuals.
Milling Cutters and other Milling Tools	0 Since milling cutters have sharp edges, direct contact with bare hands may cause injury.	* Please use safety items, such as safety glasses and protective gloves.
	0 If a cutter lacks balance, the tool can start to vibrate. The dispersion of broken pieces can cause injuries.	* Please use in the range of our recommended cutting condition. * Accuracy and balance of machine spindle should be checked and adjusted regularly to prevent wear of the bearings due to eccentric rotation.
Drilling	0 When drilling a through-bore, it is possible that a disc is created during the drilling procedure that can fly out of the workpiece at a high speed. This is very dangerous since the disc has sharp edges.	* Please use safety items, such as safety glasses and protective gloves. Also attach a cover on a chuck part.
Brazed Tools	0 Dispersion or falling down of broken inserts may cause injury.	* Please check that the cutting inserts are brazed firmly before use. * Please do not use brazed tools in the condition that requires high cutting temperature.
Others	0 If brazing is carried out many times, the strength of carbide insert is deteriorated and can break easily during cutting.	* Please do not use tools that have been brazed several times. The quality of the tool deteriorates.
	0 The tools can only be used for the appropriate application. It may damage tools and machines.	* Please follow our recommended usage for the tools.

MATERIAL INFORMATION

P Steel
M Stainless Steel
K Cast iron
N Non Ferrous
S High-Temp Alloys
H Hardend materials

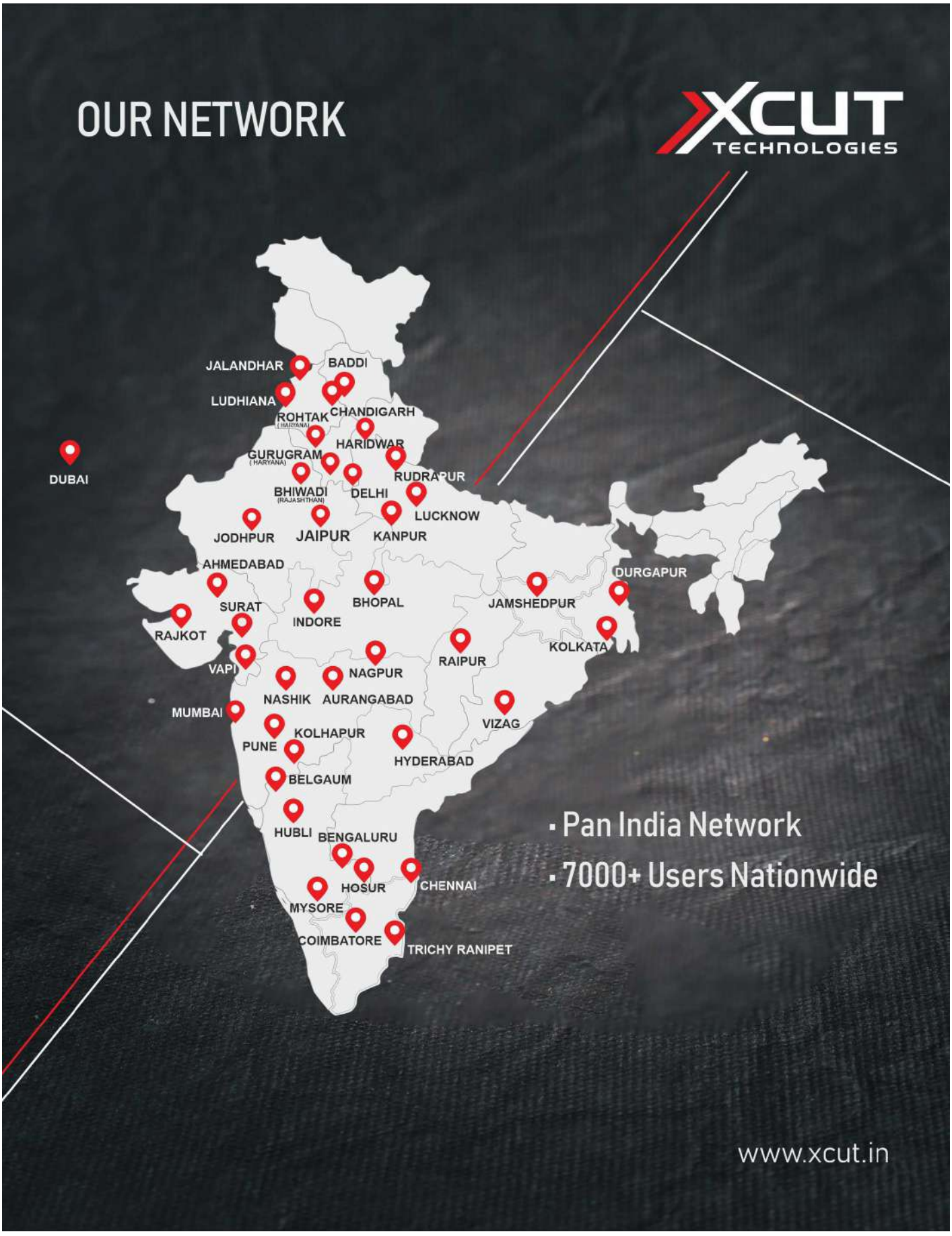
Material Group	Description	Content	Tensile Strength RM (MPa)*	Tensile Strength RM (MPa)*	Hardness (HRC)*	Material Number
P0	Low-Carbon Steels, Long Chipping	C<0,25	<530	<125	-	-
P1	Low-Carbon Steels, Short Chipping, Free Machining	C<0,25%	<530	<125	-	C15, CK22, ST37-2, S235JR,9SMnPb28, GS38
P2	P2 Medium-and High-Carbon Steels	C>0,25%	>530	<220	<25	C15, CK22, ST37-2, S235JR,9SMnPb28, GS38
P3	Alloy Steels and Tool Steels	C>0,25%	600-850	<330	<35	16MnCr5, Ck45, 21CrMoV5-7, 38SM128
P4	Alloy Steels and Tool Steels	C>0,25	850-1400	340-450	35-48	100Cr6, 30CrNiMo8, 42CrMo4, C70W2, S6525, X120Mn12
P5	P5 Ferritic, Martensitic, and PH Stainless Steels	-	600-900	<330	<35	100Cr6, 30CrNiMo8, 42CrMo4, C70W2, S6525, X120Mn12
P6	High-Strength Ferritic, Martensitic, and PH Stainless Steels	-	900-1350	350-450	35-48	X102CrMo17, G-X1200:29
M1	Austenitic Stainless Steel	-	<600	130-200	-	X5CrNi 18 10, X2CrNiMo 17 13 2, G-X25C/NISI18 9, X15CrNISI 20 12
M2	High-Strength Austenitic Stainless and Cast Stainless Steels	-	600-800	150-230	<25	X2CrNiMo 13 4, X5NiCr 32 21, X5CrNiNb 18 10, G-X15CrNi 25-20
M3	Duplex Stainless Steel	-	<800	135-275	<30	XBCrNiMo27 5, X2CrNiMoN22 5 3, X20C/NISI25 4, G-X40CrNiSi27 4
K1	Grey Cast Iron	-	125-500	120-290	<32	GG15, GG25, G630, GG40, GTW40
K2	Low-and Medium-Strength Ductile Irons (Nodular Irons) and Compacted Graphite Irons (CGI				<28	
K3	High-Strength Ductile Irons and Austempered Ductile Iron (ADI)				<43	
N1	Wrought Aluminium	-	<600	130-260	-	AlMg1, Al99.5, AlCuMg1, AlCuBiPb, AlMgSi1, ALMgSPb
N2	Low-Silicon Aluminium Alloys and Magnesium Alloys	Si <12,2%	-	-	-	GAlSlCu4, GDAlS 10Mg
N3	High-Silicon Aluminium Albys and Magnesium Alloys	Si>12,2%	-	-	-	G-ALSI12, G-ASI1704, G-AlSi21 CaNiMg
N4	Copper-, Brass-, Zinc-Based on Machinability Index Range of 70-100	-	-	-	-	CaZn40, Ms60, G-CuSn5ZnPb, CuZn37, CuSi3Mn
N5	Nylon, Plastics, Rubbers, Phenolics, Resins, Fibreglass	-	-	-	-	Lexan, Hostalen", Polystyrol, Makrolon
N6	Carbon, Graphite Composites, CFRP	-	-	-	-	CFK, GFK
N7	Metal Matrix Composites (MMC)	-	-	-	-	-
S1	Iron-Based, Heat-Resistant Alloys	-	500-1200	25-48	25-48	X1NiCrMoGu32 287, X12NICS36 16, XSNICIAITI31 20, X40CoCrNi20 20
S2	Coball-Based, Heat-Resistant Alloys	-	1000-1450	25-48	25-48	Haynes 188, Stellite 6,21,31
S3	Nickel-Based, Heat-Resistant Alloys	-	600-1700	<48	<48	INCONEL 690, INCONEL 625, Hastelloy, NIMONIC® 75
S4	Titanium and Titanium Alloys	-	900-1600	33-48	33-48	Ti1, TiAl5Sn2, TIAI6V4, TIA14Mo4Sn2
H1	Hardened Materials	-	-	-	44-48	GX260NCr42, GX330NIC:42, GX300C/NS952, GX300CrMo153, Hardox 400
H2		-	-	-	48-45	-
H3		-	-	-	56-60	-
H4		-	-	-	>60	-

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