www.xcut.in

XCUT®
TECHNOLOGIES

Master Catalogue
2023

XCUT TECHNOLOGIES

XCUT is the amalgamation of 45 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.

XCUT's goal is to be positioned in the Cutting Tool Industry as a Brand that Offers Exceptional Value with high Quality Products & Right Pricing Policies having a Strong PAN India & Middle East Sales Network !!

XCUT caters to more than 5000+ customers across India & Middle East having more than 25000 stock able items. Assuring of prompt deliveries & support with wide network & branches across India.

All tools of XCUT are produced in accordance with ISO standards and thereby all the industry standards are fulfilled. Furthermore, they are always in development enabling us to meet our customer´s contemporary needs.

XCUT guarantees you excellent quality and very high durability. Among our customers, there are well-known companies from various industries.

We look forward to an opportunity to convince you of our competence, too!

TERMS & CONDITIONS

1. NO LIABILITY CAN BE ACCEPTED FOR PRINTING ERRORS OR TECHNICAL CHANGES OF ANY KIND.
2. OUR CONDITIONS OF SALES & TERMS OF PAYMENT APPLY ON AVAILABLE REQUEST.
3. REFER GUIDE LINE TO ICONS.
4. ALL SPECIFICATIONS IN THIS CATALOGUE ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.
5. DIMENSIONS & LENGTH OF TOOLS MAY VARY FROM INDICATION IN CATALOGUE.
6. FOR PRODUCTS/SIZE OTHER THAN THOSE MENTIONED IN THE CATALOGUE, PLEASE FILL IN THE ENQUIRY SHEET AT THE END OF THIS CATALOGUE.
7. STANDARD STOCK_____ •

INDEX

Notes

XCUT®
TECHNOLOGIES

TURNING

www.xcut.in

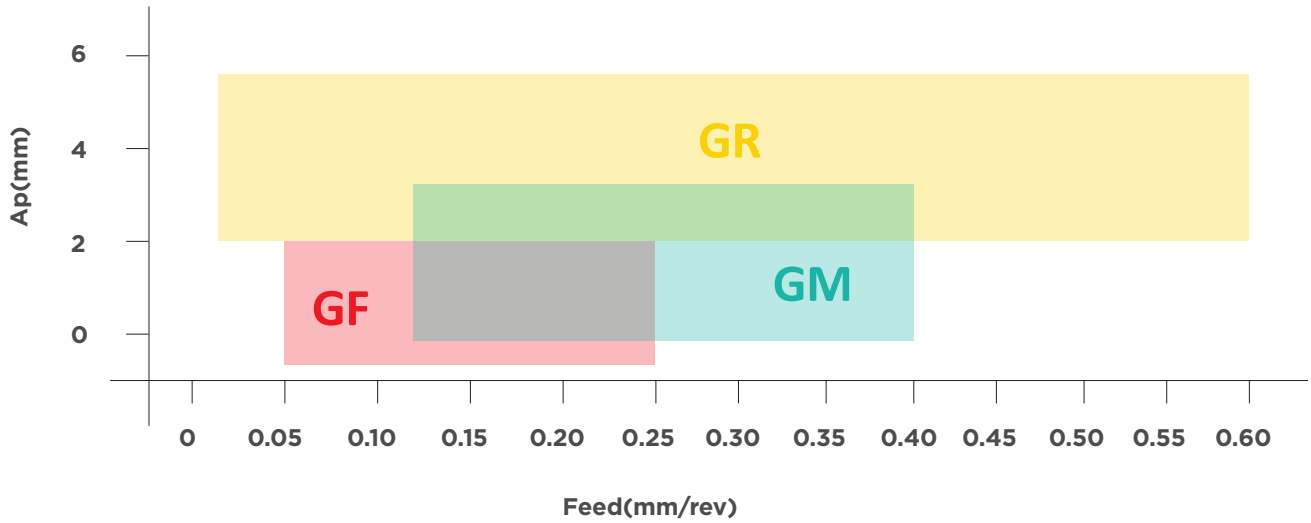
INDEX

GRADE CHART

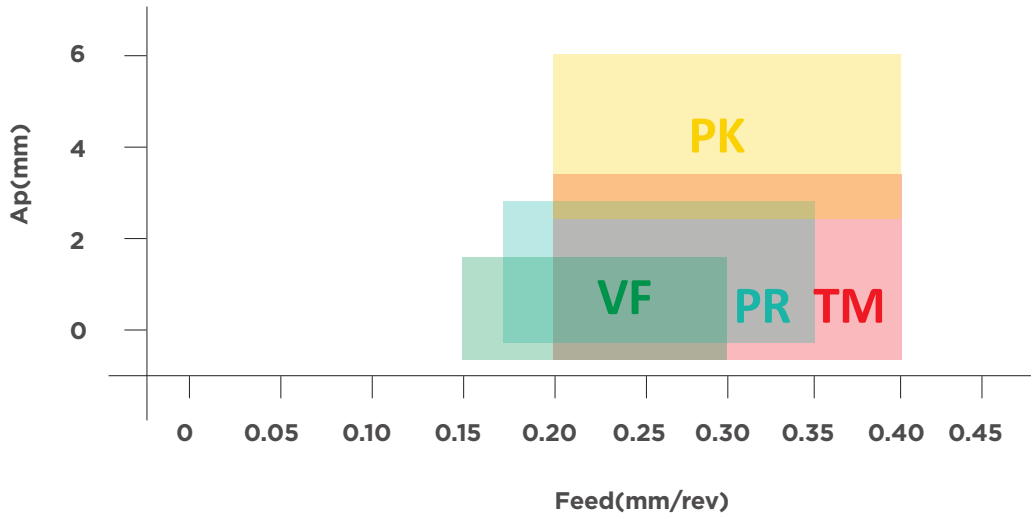
MATERIAL	C.V.D						PVD				
P05	XP7015			XK3215							
P10		XP7020				XP7025	XT225	XT110	XT125	XT810	
P15			XP7125		XP7030						XT380
P20				XP7235							
P25											
P30											
P35											
P40											
M05			XP7125				XT225	XT110	XT125	XT810	
M10											
M15											XT380
M20											
M25											
M30											
M35											
M40											
K05		XK3215				XK3220		XT110	XT125	XT810	
K10	XK3115			XK3120							
K15											
K20											
K25											
K30											
S05							XT225			XT810	
S10											XT380
S15											
S20											
S25											
S30											
H05							XT225			XT810	XT380
H10											
H15											
H20											
H25											

CHIPBREAKER CHART

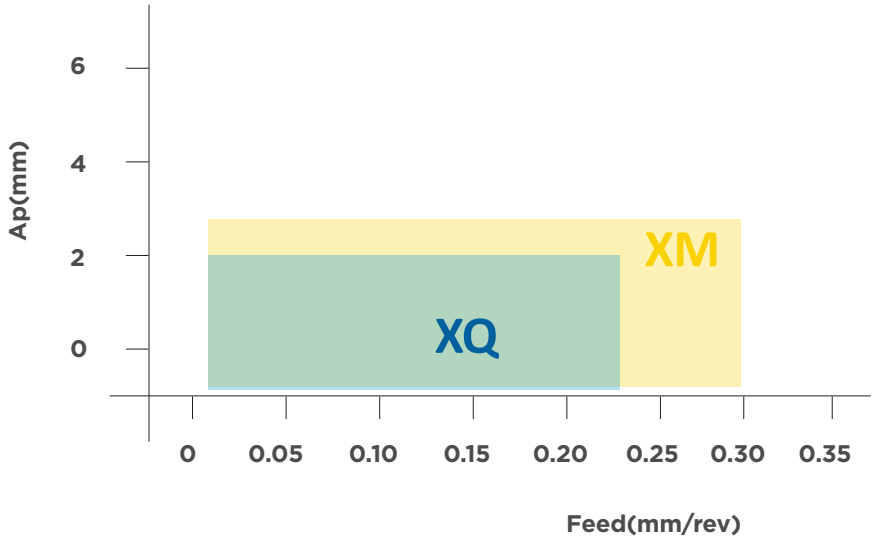
XP7125/XP7235



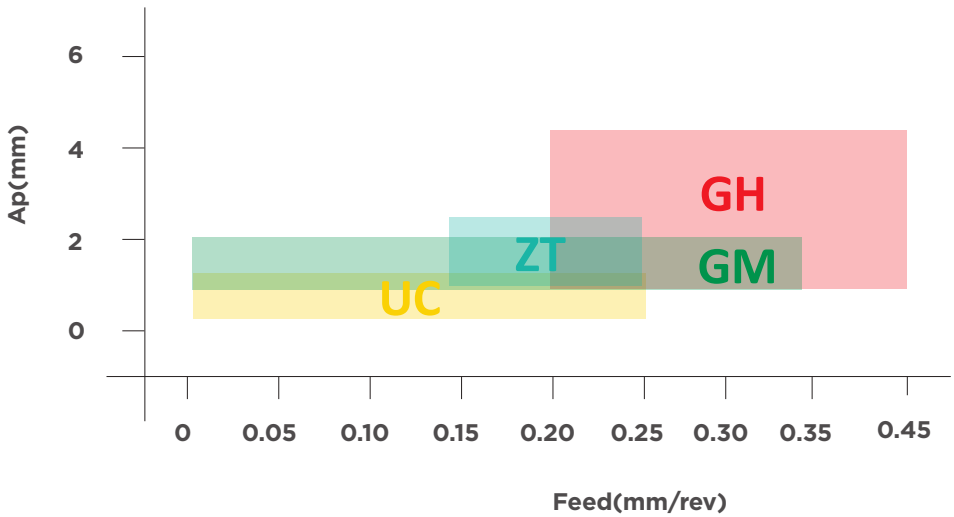
XP7015/XP7020/XP7030



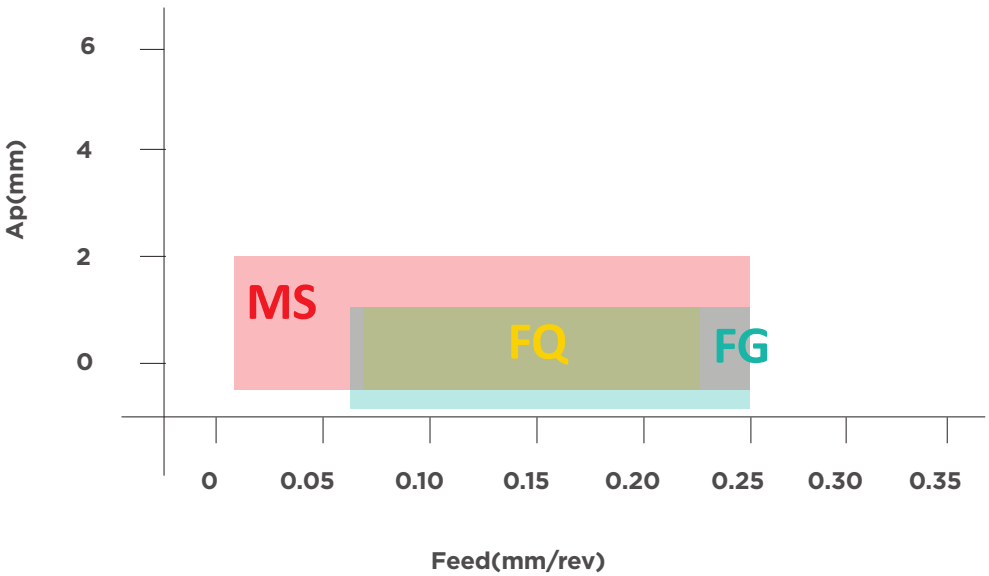
XP7015/XP7020/XP7030



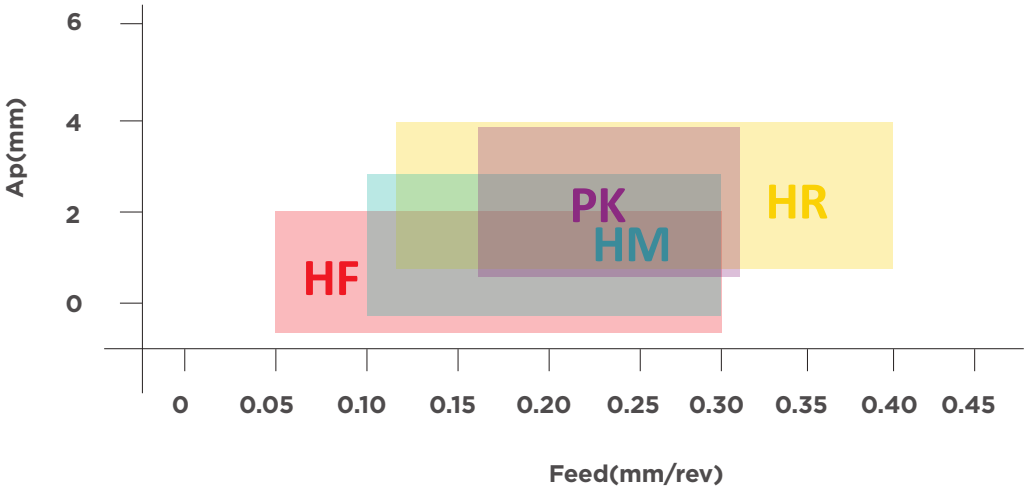
XK3115/XK3215/XK3120/XK3220



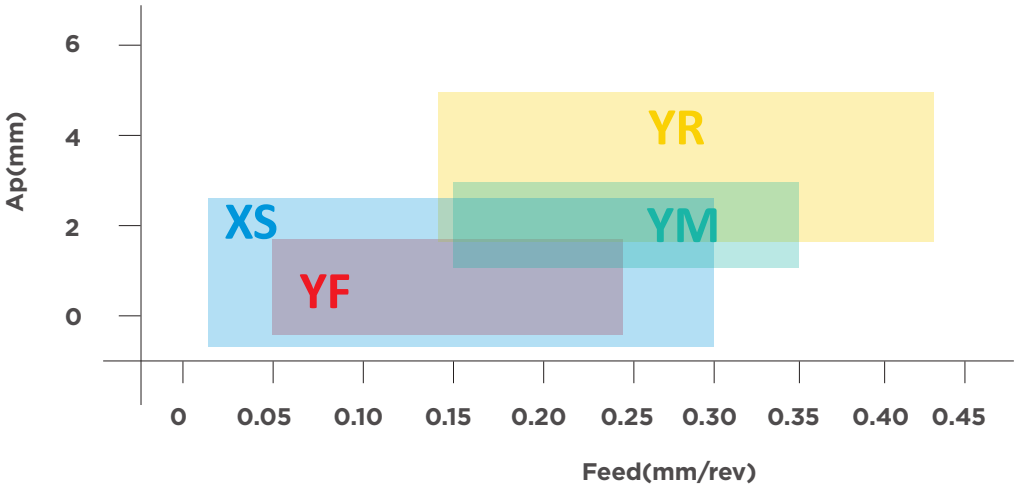
Cermet



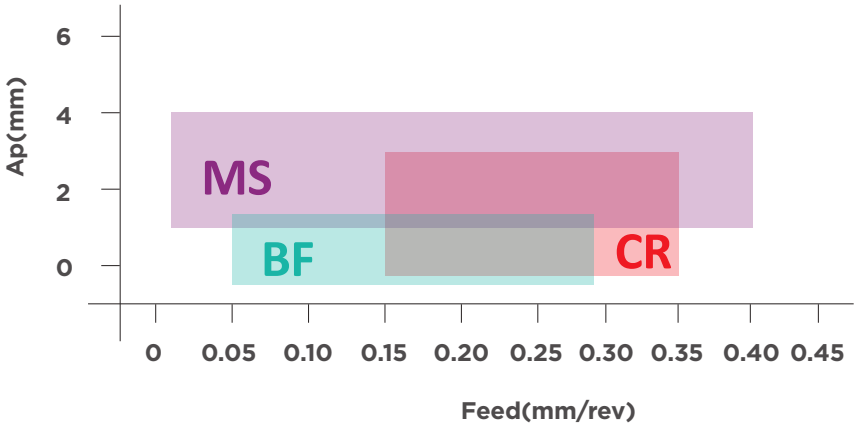
Positive inserts-XT125/XT225/XP7125/XP7020



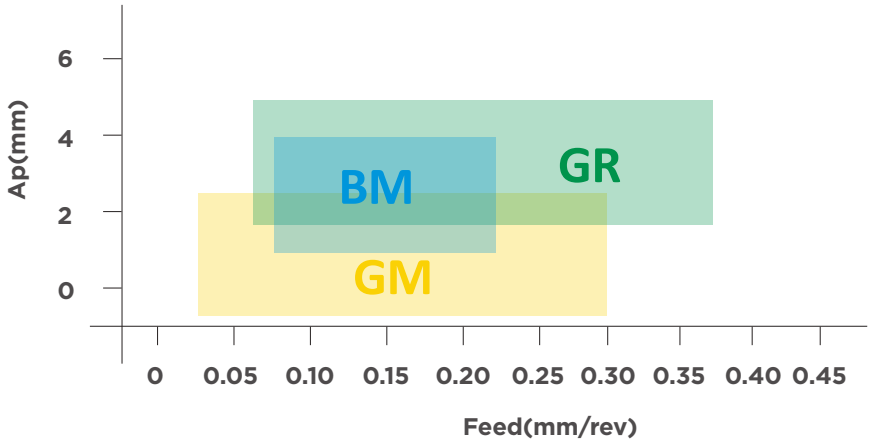
PVD-XT810-XT110



PVD-XT125/XT225/XT930-C



PVD-XT125/XT225/XT930-C



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	±0.005	±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	
N*		±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

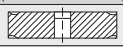
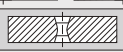
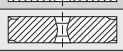
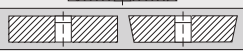
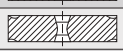
ISO
(METRIC)

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.

Turning Indexable Insert Identification System

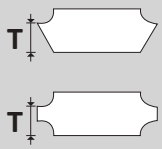
Symbol (class)	Hole	Hole Shape	Insert Chipbreaker	Shape
N	No	-	NO	
R			One Sides	
F			Two Sides	
A	Yes	White Hole	No	
M			One Sides	
G			Two Sides	
W		With Hole and One Countersink 40°~60°	No	
T			One Sides	
Q		With Hole and Two Countersink 40°~60°	No	
U			Two Sides	
B		With Hole and One Countersink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

(4) Hole/ Chipbreaker Symbol

12 (5)

04 (6)

(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



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

08 (7)

(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 MO (metric)

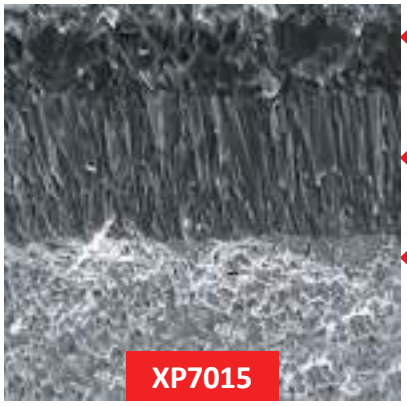
GM (8)

(8) Manufacture's Option
Hans Symbol Chipbreaker Symbol, etc.

XP7015

CVD Coated Golden Grade for Steel Applications

Special substrate with TiC(N) CVD coating for cutting with higher speeds for stable maching conditions.



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. Helps the insert in resisting damage.

Special carbide grade developed to sustain wear resistance. Helps the insert to perform at high speeds and feeds in unstable conditions.

XP7015

INSERT TABLE

GRADE		APPLICABLE CHIPBREAKERS
XP7015		
CNMG	120404	TM
	120408	TM
	120412	TM
TNMG	160404	TM
	160408	TM
	160412	TM
WNMG	080408	TM
	080412	TM
DNMG	150608	TM
	150612	TM
VNMG	160404	TM
	160408	TM

STOCKABLE NON STOCKABLE

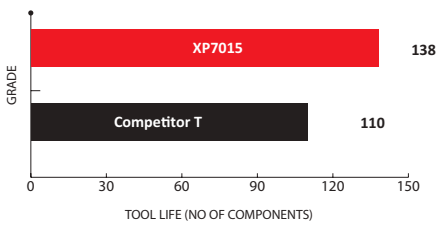
MATERIAL	TYPE	CUTTING SPEED
STEEL	NON ALLOY STEELS	180-340
	LOW ALLOY STEELS	120-300
	HIGH ALLOY STEELS	80-240

* Additional Sizes & Chipbreakers Available on Request

PERFORMANCE COMPARISON

Performance of TNMG160408TM-XP7015

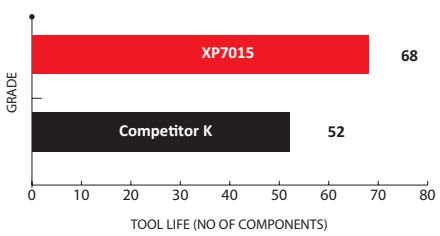
Material: 548-C
Vc= 240m/min
Feed= 0.22mm/rev
Ap=0.8mm



Competitor T XP7015

Performance of TNMG160408TM-XP7015

Material: EN19
Vc= 190m/min
Feed= 0.15mm/rev
Ap=1.5mm



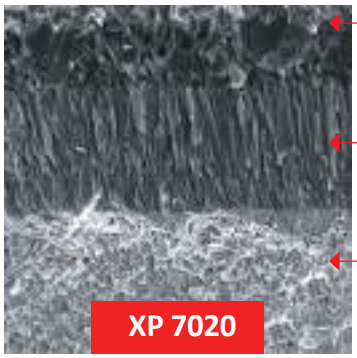
Competitor K XP7015

XP7020

CVD Coated Black & Golden Grade for Steel Applications

Extremely strong on Forged & Automotive Steel in Roughing & Semi Finishing Applications.

XP7020



XP 7020

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.

Carbide with special grain structure improves the red hardness & strengthens the high temperature resistant performance of insert.

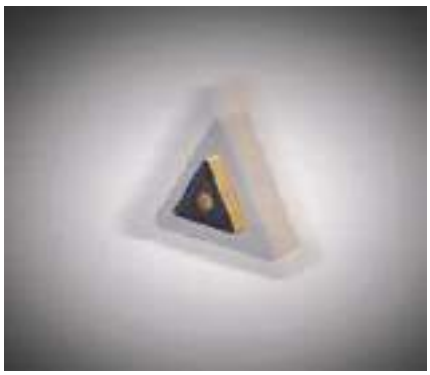
XP7020

INSERT TABLE

GRADE		APPLICABLE CHIPBREAKERS
XP7020		
CCMT	060204	PK
	060208	PK
	09T304	PK
	09T308	PK
CNMG	120404	PK, PR
	120408	PK, PR
	120412	PK, PR, TM
DCMT	070204	PK
	11T304	PK
	11T308	PK
DNMG	110404	PK
	110408	PK
	150604	PR, PK
	150608	PR, PK
	150612	PR, PK
SCMT	09T304	PK
	09T308	PK
SNMG	120408	PK
	120412	PK
TCMT	110204	PK
	110208	PK
	16T304	PK
	16T308	PK
TNMG	160404	PK, PR, TM
	160408	PK, PR, TM
	160412	PK, PR, TM
VBMT	160404	PK
	160408	PK
VNMG	160404	PK, VF
	160408	PK, VF
WNMG	060408	GM
	080404	PK, PR
	080408	PK, PR
	080412	PK, PR

■ Stockable ■ Non Stockable

* Additional Sizes & Chipbreakers available on Request
* Additional Harder and Tougher Grades available on Request



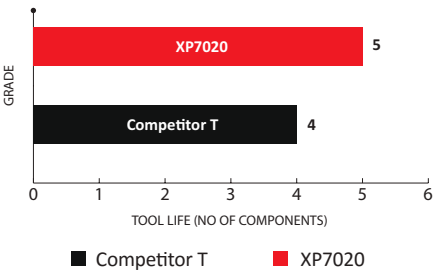
PARAMETER

Material	Type	Cutting Speed
STEEL	NON ALLOY STEELS	180-340
	LOW ALLOY STEELS	120-240
	HIGH ALLOY STEELS	80-180

PERFORMANCE COMPARISON

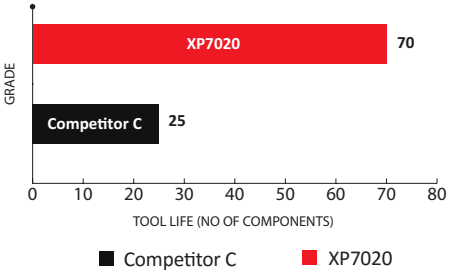
Performance of WNMG080412PR-XP7020

Material: EN31
Vc= 300m/min
Feed= 0.3mm/rev
Ap= 2mm



Performance of TNMG160412PK-XP7020

Material: 20MnCr5
Vc= 280m/min
Feed=0.2-0.3mm/rev
Ap= 1.5mm

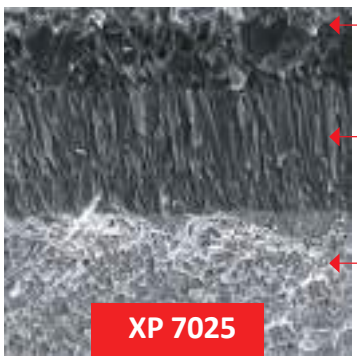


XP7025

CVD Coated Golden Grade for Steel Applications

Extremely strong for general Steel in Roughing & Semi Finishing Applications.

XP7025



XP 7025

- TiCN layer with anitwear 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.
- Carbide with special crystal structure improves the red hardness of the matrix & strengthened the high temperature resistant performance of insert.

XP7025

INSERT TABLE

GRADE		APPLICABLE CHIPBREAKERS
XP7025		
CCMT	060204	HF
	060208	HM
	09T304	HF
	09T308	HM
CNMG	120408	GM, GR, TM
	120412	GM, TM
DNMG	150608	GM
	150612	GM
SNMG	120408	GM
	120412	GM
	120416	ZR
TCMT	110204	HF, HM
	110208	HM
	16T304	HF
	16T308	HM
TNMG	160404	GF, GM
	160408	GM, TM
	160412	GM, GR, TM
VNMG	160404	GM
	160408	GM, TM
	160412	GM, TM
WNMG	060408	GM
	080404	GM
	080408	GR, TM
	080412	GR, TM

STOCKABLE NON STOCKABLE

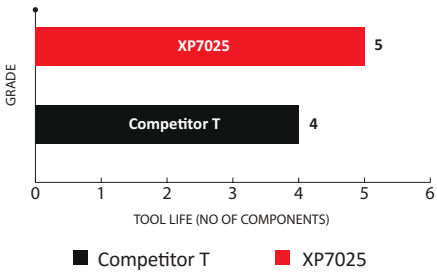
PARAMETER

Material	Type	Cutting Speed
STEEL	NON ALLOY STEELS	180-340
	LOW ALLOY STEELS	120-240
	HIGH ALLOY STEELS	80-180

PERFORMANCE COMPARISON

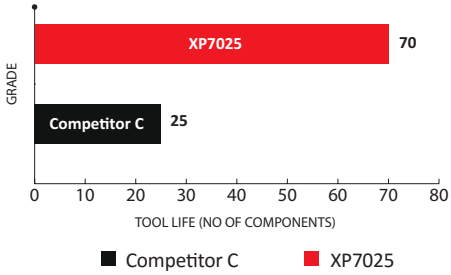
Performance of WNMG080412GR-XP7025

Material: EN31
Vc= 300m/min
Feed= 0.3mm/rev
Ap= 2mm



Performance of TNMG160412GM-XP7025

Material: 20MnCr5
Vc= 280m/min
Feed=0.2-0.3mm/rev
Ap= 1.5mm

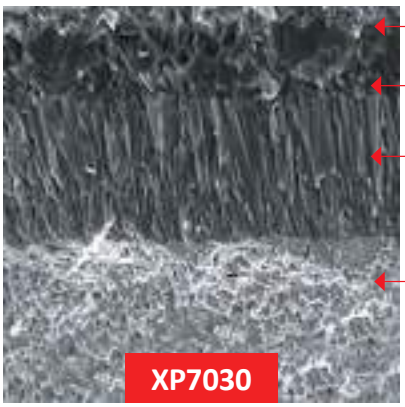


* Additional Sizes & Chipbreakers available on Request
* Additional Harder and Tougher Grades available on Request

XP7030

CVD Coated Grade for Automotive Steel & Gear Applications.

Our most popular grade for Automotive component machining. Extremely powerful performance on Alloy Steels.



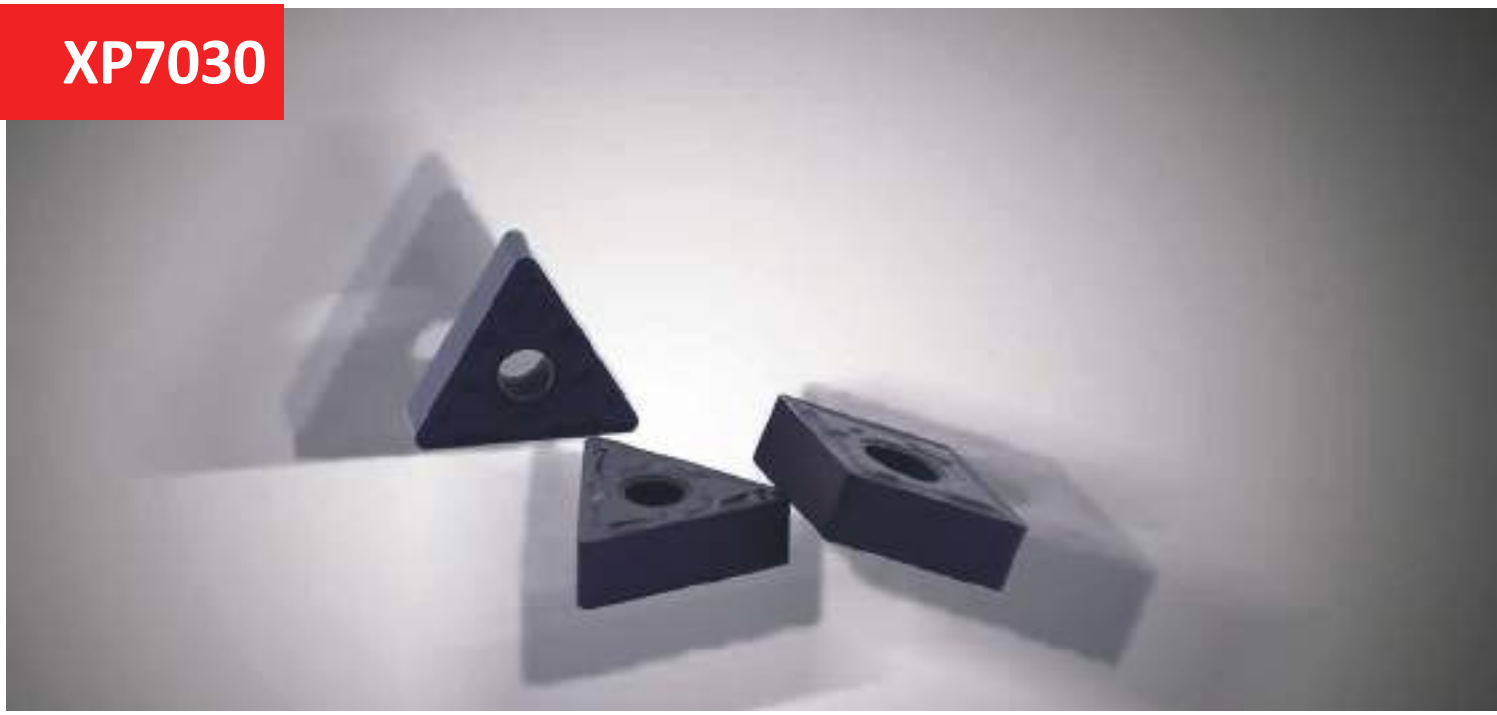
Special structure of Al_2O_3 settled layer has the best thermal barrier performance, high speed dry cutting, ensure resistance to plastic deformation.

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.

Carbide with special crystalline structure improves the temperature resistant performance of insert.

XP7030



INSERT TABLE

GRADE		APPLICABLE CHIPBREAKERS
XP7030		
CNMG	120404	XQ, XM
	120408	XQ, XM
	120412	XM
	160608	XM
	160612	XM
	160616	XM
	190612	XM
	190616	XM
DNMG	150408	XM
	150412	XM
	150604	XM
	150608	XM
	150612	XM
SNMG	120408	XM
	120412	XM
	190612	XM
TNMG	160404	XQ, XM
	160408	XQ, XM
	160412	XM
VBMT	160404	XQ
	160408	XQ
VNMG	160404	VF, XQ
	160408	VF, XQ
WNMG	060404	XM
	060408	XM
	080404	XM
	080408	XM, XQ
	080412	XM, XQ

STOCKABLE NON STOCKABLE

* Additional Sizes & CB's Available On Request

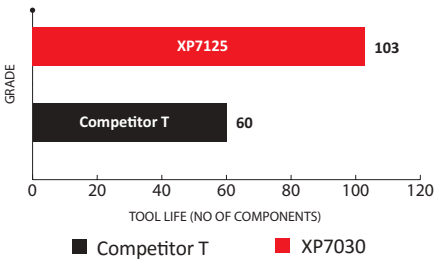
PARAMETER

Material	Type	Cutting Speed
STEEL	NON ALLOY STEELS	180-340
	LOW ALLOY STEELS	120-240
	HIGH ALLOY STEELS	80-180

PERFORMANCE COMPARISON

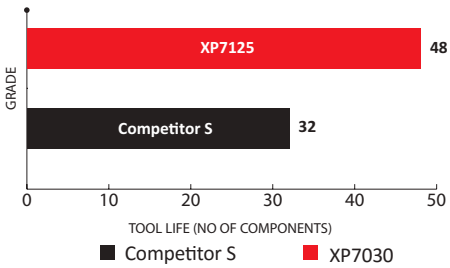
Performance of TNMG160408XM-XP7030

Material: Forged Steel
Vc=280m/min
Feed=0.2mm/rev
Ap=1mm



Performance of CNMG120408XM-XP7030

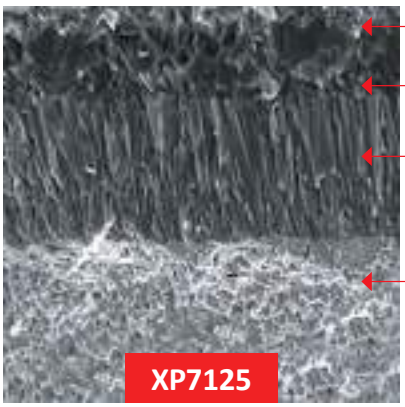
Material: MS
Vc=290m/min
Feed=0.26mm/rev
Ap=0.7mm



XP7125

CVD Coated Grade for Steel & Ductile CI Applications.

Our Flagship Grade.
Black Coloured Double Coated Grade with additional Wear Resistance.
Can be Used for all applications of Steels as well as Ductile Cast Iron.



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

TiCN layer with ant i wear material abrassion performance lead to the best wear resistance of the face of clearance angle.

Using gradient sintering technology, we increase the impact & wear resistance of insert, so as to improve the ability to resist damage of the insert.

Carbide with special structure improves the hardness & strengthened the high temperature resistance performance of insert.

XP7125

INSERT TABLE

GRADE		APPLICABLE CHIPBREAKERS
XP7125		
CCMT	060204	HF, HM
	060208	HM
	09T302	HM
	09T304	HF, HM
	09T308	HM
	120404	HM
	120408	HM, HR
CNMG	120404	GF, GM
	120408	CR, GF, GM
	120412	GM, GR
	120416	GM
	160608	GM
	160612	GM
	190608	GM
	190612	GR
	190616	GR
DCMT	110404	GM
	110408	GM
	110412	GM
DNMG	150408	GF
	150412	GM
	150604	GF, GM
	150608	GF, GM
	150612	GM, GR
RCMX	200600	MO
	250700	MO
SCMT	09T308	HM
SNMG	120408	GM
	120412	GM, GR
	150612	GR
	190612	GM, GR
	190616	GM
SNMM	190612	GR
	250924	GR

STOCKABLE NON STOCKABLE

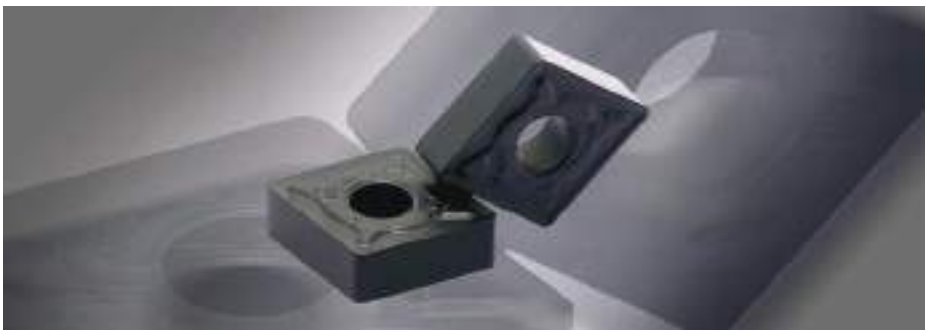
INSERT TABLE

GRADE		APPLICABLE CHIPBREAKERS
XP7125		
TCMT	090204	HF, HM
	090208	HM
	110204	HF
	110208	HM
	16T304	HM
	16T308	HM
	16T312	HM
TNMG	160404	GF, GM
	160408	GF, GM, GR
	160412	GM, GR
	220404	GM
	220408	GM
	220412	GM
	220416	GR
VBMT	160404	CR
	160408	HR

GRADE		APPLICABLE CHIPBREAKERS
XP7125		
VNMG	160404	GF, GM
	160408	GF, GM
	160412	GM
WNMG	060404	GM, AR
	060408	GM
	080404	GM, GS
	080408	GM, CT
	080412	GM, GR
	080416	GM

PARAMETER

MATERIAL	GRADE	RECOMMENDED CUTTING SPEED (M/MIN)
STEEL	XP7125	150 - 280
STAINLESS STEEL	XP7125	100 - 200
DUCTILE CAST IRON	XP7125	150 - 300

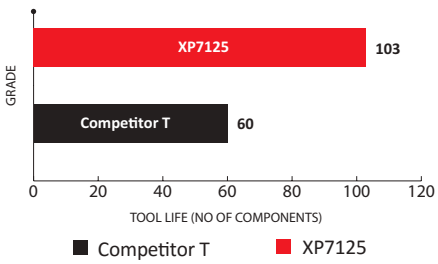


* Additional Sizes & CB's Available On Request
* Harder and tougher grades on request

PERFORMANCE COMPARISON

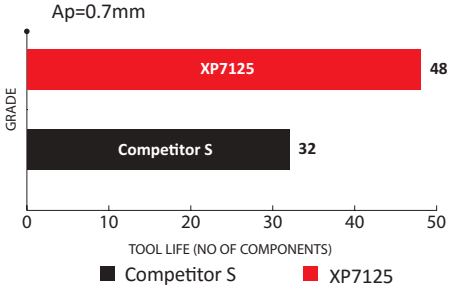
Performance of TNMG160408GM-XP7125

Material: Forged Steel
Vc=280m/min
Feed=0.2mm/rev
Ap=1mm



Performance of CNMG120408GM-XP7125

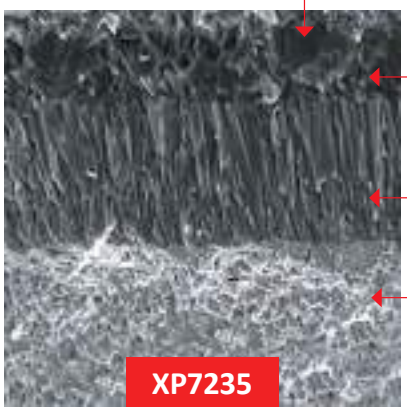
Material: MS
Vc=290m/min
Feed=0.26mm/rev
Ap=0.7mm



XP7235

CVD Coated Black & Golden Grade for Steel Applications

Double coated Black & Golden grade ideally suited for medium to heavy interruption roughing applications in less than ideal machining conditions.



Special structure of Al_2O_3 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.

Carbide with special crystal improves the red hardness & strengthened the high temperature resistance performance of insert.

XP7235

INSERT TABLE

GRADE		APPLICABLE CHIPBREAKERS
XP7235		
CNMG	120408	GM ,GR
	120412	GR
	120416	GM
	160608	GM
	160612	GM, GR
	190612	GR
	190616	GR
DNMG	150608	GF, GM
	150612	GM,GR
	150616	GR
SNMG	120408	GR
	120412	GR
	120416	GM
	190612	GR
	190616	GR
	190624	GR
	250724	GR
SNMM	190624	GR
	250724	GR
TNMG	160404	GM
	160408	GM
	160412	GM, GR
	330924	GR
VNMG	160408	GM
WNMG	080408	GM
	080412	GR

STOCKABLE NON STOCKABLE

* Additional Sizes & Chipbreakers Available on Request

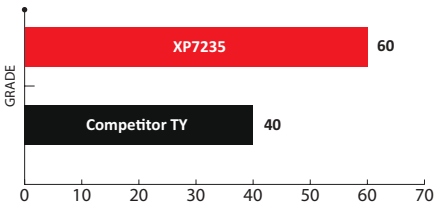
PARAMETER

Material	Type	Cutting Speed
STEEL	NON ALLOY STEELS	180-340
	LOW ALLOY STEELS	120-240
	HIGH ALLOY STEELS	80-180

PERFORMANCE COMPARISON

Performance of CNMG120412GR-XP7235

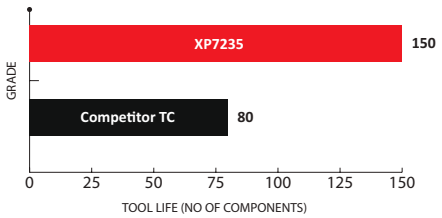
Material: Forged Steel (250 BHN)
Vc= 240m/min
Feed= 0.3mm/rev
Ap=1.0mm



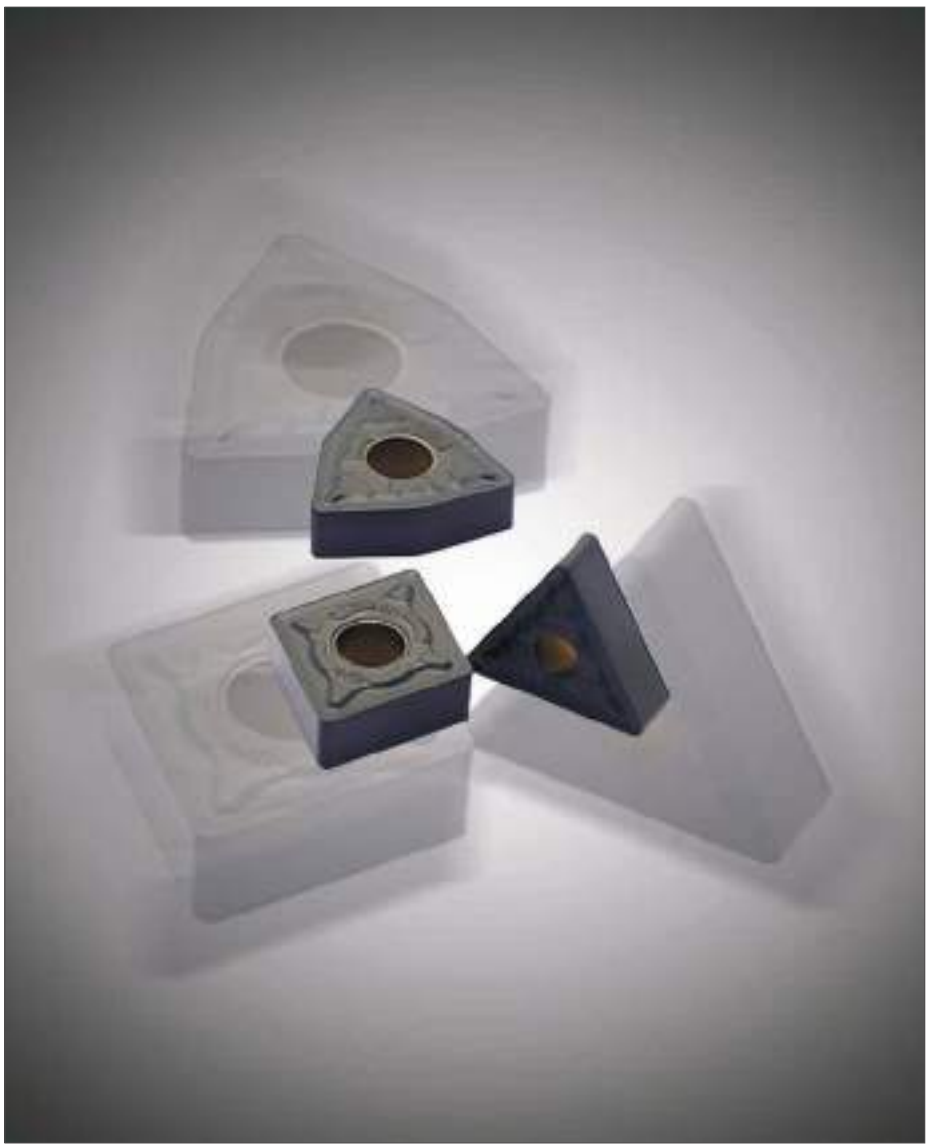
Competitor TY XP7235

Performance of DNMG150608GM-XP7235

Material: Forging Steel (280BHN)
Vc= 250m/min
Feed=0.35mm/rev
Ap=1.5mm



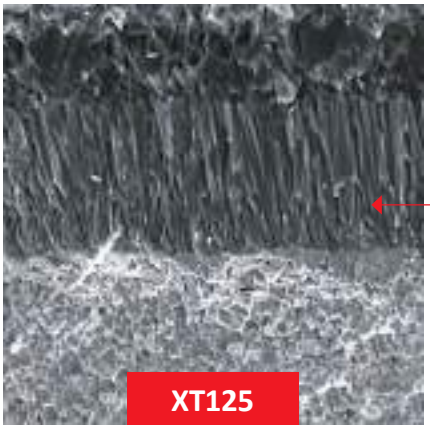
Competitor TC XP7235



XT125

PVD Coated Golden Grade.

High performance grade with tough substrate ideal for semi-finishing & finishing for steel & stainless Steel Applications.



2-4 µ ALCrN+AlCrSiN PVD Coated, Combinating with ultra 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.

XT125

GRADE		APPLICABLE CHIPBREAKERS
XT125		
CCMT	060204	HF, HM
	060208	HM
	09T302	HM
	09T304	HM
	09T308	HM
CNMG	120404	BF, CR
	120408	BF, BM, CR, GM, GR
	120412	BM, GM, GR
	160608	GR
	160612	GM
	160616	GM, GR
	190608	GM
	190612	GR
	190616	GR
DCMT	070202	HF
	070204	HF
	070208	HM
	11T302	HM
	11T304	HF
	11T308	HM
DNMG	110404	BM
	110408	BM
	150604	CR
	150608	CR
SCMT	09T304	HM
	09T308	HM
SNMG	120408	BF, BM
	120412	BM
	190612	GR
	190616	GR
TCMT	090204	HF, HM
	090208	HM
	110204	HF
	110208	HM
	16T304	HF, HM
	16T308	HM
TNMG	160404	BF, CR
	160408	BF, BM, CR, GM, GR
	160412	BM, CR, GR
TPMT	110304	HM
	110308	HM
VBMT	160402	HR
	160408	HR
	160412	HR
VNMG	160404	GM
	160408	GM

INSERT TABLE

GRADE		APPLICABLE CHIP-BREAKERS
XT125		
WNMG	060404	AR
	060408	GM
	060412	AR
	080404	CR
	080408	BM, CR
	080412	BM, CR, GM, GR

STOCKABLE NON STOCKABLE

* Additional Sizes & Chipbreakers available on Request

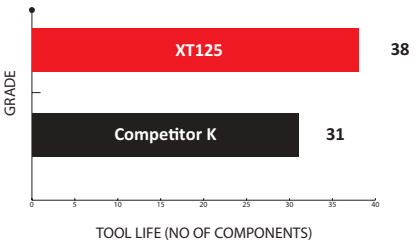
PARAMETER

MATERIAL	GRADE	RECOMMENDED CUTTING SPEED (m/min)
STEEL	XT125	90-200
STAINLESS STEEL	XT125	90-200
SUPERALLOYS	XT125	30-70

PERFORMANCE COMPARISON

Performance of WNMG080412BM-XT125

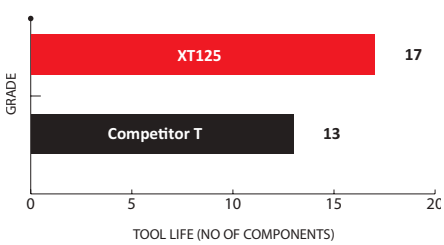
Material: SUS304
Vc= 210m/min
Feed=0.22-0.25mm/rev
Ap= 0.8-1mm



Competitor K XT125

Performance of TNMG160408CR-XT125

Material: SS316
Vc= 120m/min
Feed=0.15-0.18mm/rev
Ap= 0.1-1.2mm

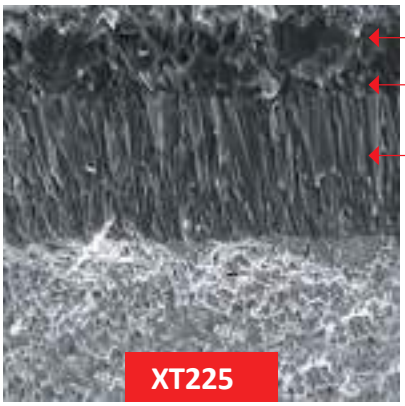


Competitor T XT125

XT225

CVD Coated Grade for Steel & Ductile CI Applications.

Improved version of XT125.
New, reliable and tough grade for tough steels, stainless steels & difficult-to-cut materials. Strong geometries like GM/GR reduce sudden fracture from interrupted machining.
Allows for stable operation and longer tool life.



2-4 µ ALCrN+AlCrSIN PVD Coated, Combinating with ultra fine 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.

XT225

INSERT TABLE

GRADE		APPLICABLE CHIPBREAKERS
XT225		
CCMT	060204	HF
	060208	HM
	09T304	HM
	09T308	HM
CNMG	120404	CR
	120408	CR, GM
	120412	BM, GR
DCMT	070204	HM
	070208	HM
	11T304	HM
	11T308	HM
DNMG	150604	CR
	150608	CR
TNMG	160404	CR
	160408	CR, GM, GR
	160412	CR
VNMG	160404	GM
	160408	GM
	060408	GM
	080408	CR
	080412	CR, GM

Stockable Non Stockable

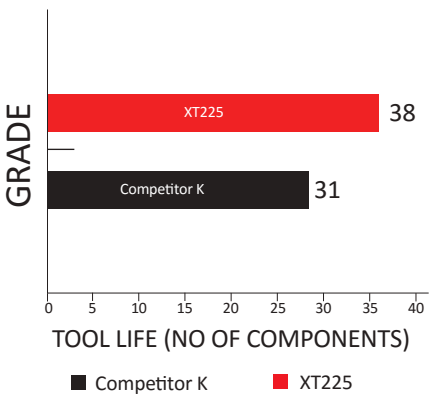
PARAMETER

MATERIAL	GRADE	RECOMMENDED CUTTING SPEED (M/MIN)
STEEL	XT225	90 - 200
STAINLESS STEEL	XT225	90 - 200
SUPPER ALLOYS	XT225	30 - 90

PERFORMANCE COMPARISON

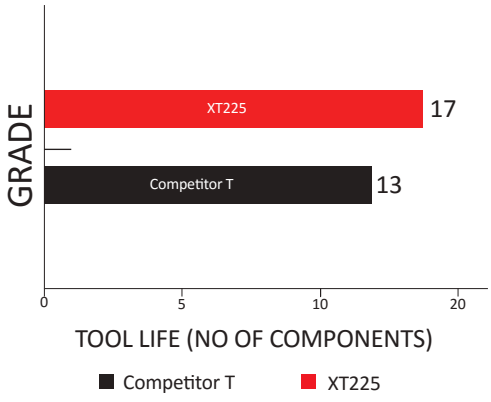
Performance of WNMG080412BM-XT225

Material: INCONEL718
Vc=130m/min
Feed=0.22-0.25mm/rev
Ap=0.8-1mm



Performance of TNMG160408CR-XT225

Material:SS316
Vc=120-180m/min
Feed=0.15-0.18mm/rev
Ap=1-1.2mm

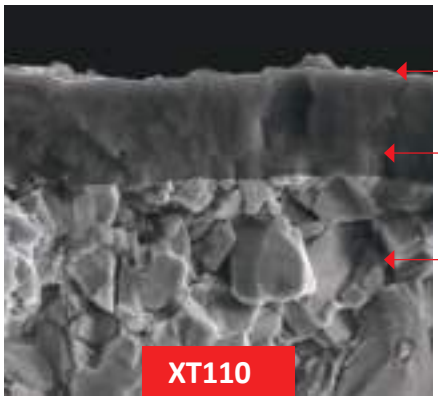


* Additional Sizes & CB's Available On Request

XT110

PVD Coated Grade for all materials.

Universal economical grade. extremely efficient in covering multi - materials including steel, stainless steels & cast iron.



- 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

XT110

INSERT TABLE

GRADE		APPLICABLE CHIPBREAKERS
XT110		
CCMT	060204	XS
	09T304	XS
	09T308	XS
	120408	XS
DCMT	070204	XS
	11T304	XS
	11T308	XS
SCMT	09T304	XS
	09T308	XS
TCMT	110204	XS
	110208	XS
	16T304	XS
	16T308	XS
VBMT	160404	XS
	160408	XS
CNMG	120404	XS
	120408	XS
TNMG	160404	XS
	160408	XS
	160412	MM

STOCKABLE NON STOCKABLE

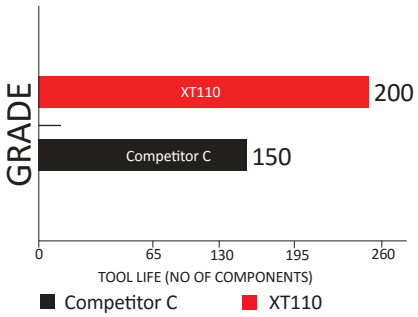
PARAMETER

MATERIAL	TYPE	CUTTING SPEED
STEEL	NON ALLOY STEELS	120-300
	LOW ALLOY STEELS	120-240
	HIGH ALLOY STEELS	80-180
STAINLESS STEEL	FERRITIC/ MARTENSITIC	80-200
	AUSTENITIC	70-220
CAST IRON	GREY CAST IRON	30-130
	MALLEABLE CAST IRON	30-140

PERFORMANCE COMPARISON

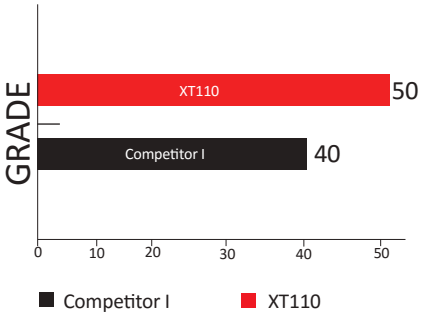
Performance of CCMT060204XS-XT110

Material: 20MnCr5
Vc= 130m/min
Feed= 0.20mm/rev
Ap= 1mm



Performance of VBMT160408XS-XT110

Material: MS
Vc= 120m/min
Feed= 0.2mm/rev
Ap= 1.5mm
Hardness= 40HrC



XT380

PVD Coated Black Grade Suitable for Stainless Steel & Exotic Materials.

Extremly tough substrate with ultra thick coating for rough machining & semi-finishing of super alloys & tough materials.

Uses ultra-fine particle substrates combine with Al_2O_3 coating, leads the reliable crafts.

Uses heat-resistance PVD Al_2O_3 coating has best hot hardness, compare with before PVD coating, 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.

XT380

INSERT TABLE

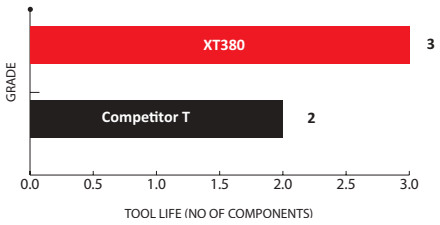
GRADE		APPLICABLE CHIPBREAKERS
XT380		
CCMT	09T308	BF
	120408	BF
CNMG	120404	BF
	120408	BF
	120412	BF
DNMG	150404	BF
	150604	BF
	150608	BF
TNMG	160404	BF
	160408	BF
	160412	BF
VNMG	160404	BF
	160408	BF

STOCKABLE NON STOCKABLE

PERFORMANCE COMPARISON

Performance of CNMG120412BF-XT380

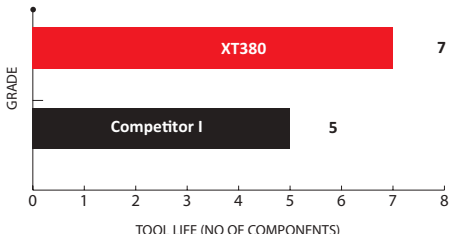
Material: SS316
Vc= 140m/min
Feed= 0.2mm/rev
Ap= 1.6mm
No of passes= 33



Competitor T XT380

Performance of CNMG120412BF-XT380

Material: Steel 45 HrC
Vc= 70m/min
Feed= 0.2mm/rev
Ap= 1.5mm



Competitor I XT380

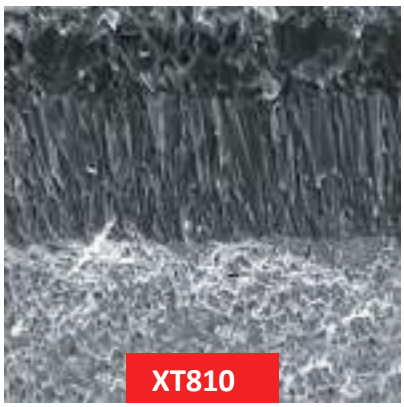
PARAMETER

MATERIAL	GRADE	RECOMMENDED CUTTING SPEED (M/MIN)
STEEL	XT380	100-280
STAINLESS STEEL	FERRITIC/ MARTENSITIC	160-240
	AUSTENITIC	160-220
HARDENED MATERIALS	HARDENED STEELS	20-90
	WHITE CAST IRON	30-50
	CHILLED CAST IRON	40-60
SUPERAL-LOYS	Fe, Ni, Co BASED	30-80
	Ti BASED	50-140

XT810

PVD Coated Grade for all materials.

Universal grade extremely efficient in covering multi - materials including steel, stainless steels, cast irons & superalloys.



Special coating designed to be able to cater all materials under different machining environments.

Excellent cutting performance under harsh machining condition.

Substrate and PVD coating designed to balance edge strength & wear resistance.

XT810

INSERT TABLE

GRADE		APPLICABLE CHIPBREAKERS
XT810		
CCMT	060204	YF
	060208	YM
	09T304	YF
	09T308	YM
	120408	YM
CNMG	120404	YF
	120408	YM
	120412	YR
DCMT	070204	YF
	11T304	YF
	11T308	YM
DNMG	150408	YM
	150604	YF
	150608	YM
	150612	YR
SCMT	09T304	YF
	09T308	YM
SNMG	120404	YF
	120408	YL,YM
	120412	YR
TCMT	110204	YF
	16T304	YF
	16T308	YM
TNMG	160404	YF
	160408	YM
	160412	YR
	220408	YM
	220412	YR
TNUX	160404	L,R
	160408	L,R
VBMT	160404	YF
	160408	YM
VCMT	160404	YF
	160408	YM
VNMG	160404	YF
	160408	YM
WNMG	060404	YF
	060408	YM
	080404	YF
	080408	YM
	080412	YR
RCMT	10T3	MO
	1204	MO

STOCKABLE NON STOCKABLE

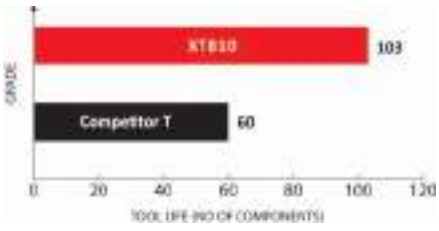
PARAMETER

MATERIAL	TYPE	CUTTING SPEED
STEEL	NON ALLOY STEELS	180-340
	LOW ALLOY STEELS	120-240
	HIGH ALLOY STEELS	80-180
STAINLESS STEEL	FERRITIC/ MARTENSITIC	160-240
	AUSTENITIC	160-220
CAST IRON	GREY CAST IRON	30-130
	MALLEABLE CAST IRON	30-140
SUPERALLOYS	Fe, Ni,Co BASED	30-80
	Ti BASED	50-140
HARDENED MATERIALS	HARDENED STEELS	20-90
	WHITE CAST IRON	30-50
	CHILLED CAST IRON	40-60

PERFORMANCE COMPARISON

Performance of TNMG160412YR-XT810

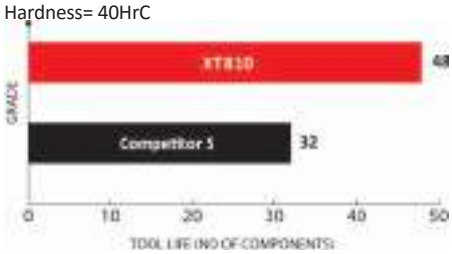
Material: 20MnCr5
Vc= 350m/min
Feed= 0.28mm/rev
Ap= 2mm



Competitor T XT810

Performance of WNMG060408YM-XT810

Material: MS & SUSS304
Vc= 180m/min
Feed= 0.2mm/rev
Ap= 1.5mm
Hardness= 40HrC



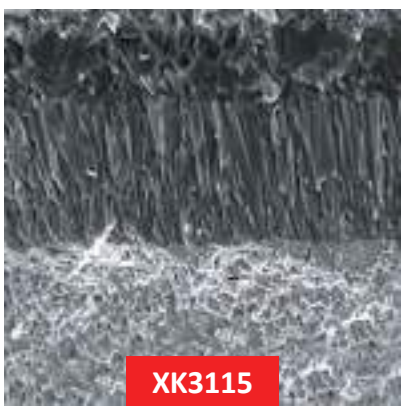
Competitor S XT810

XK3115

CVD Coated Black Grade for Cast Iron.

Special coated grade suitable for high speed cutting of Gray & Ductile cast iron .

XK3115



XK3115

High wear-resistance substrates, perfect combinations with MTTi(CN), thick Al_2O_3 coating, Initial grades for ductile cast iron, forged cast iron, highly cutting speed allowance.

XK3115

INSERT TABLE

GRADE XK3115		APPLICABLE CHIPBREAKERS
CCMT	060204	HM
	060208	HM
	09T304	HF
	09T308	HM
	120408	HM
CNMG	120408	GM, AR
	120412	GM, AR
DCMT	11T304	HF
	11T308	HM
TNMG	160404	GM
	160408	GM
	160412	GM, AR
SCMT	09T308	HM
WNMG	060408	GM
	080404	-
	080408	AR, ZR
	080412	ZR
CNMA	120404	
	120408	
	120412	
TNMA	160404	
	160408	
	160412	
WNMA	080404	
	080408	
	080412	
SNMA	120408	
	120412	
CNMG	120404	
DNMG	150608	

STOCKABLE NON STOCKABLE

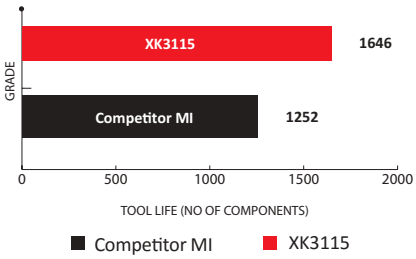
PARAMETER

Material	Type	Cutting Speed
GRAY CAST IRON	XK3115	75 - 255

PERFORMANCE COMPARISON

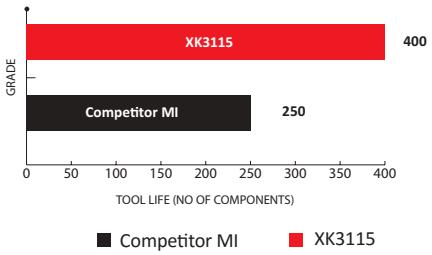
Performance of TNMG160408GM-XK3115

Material: GCI
Vc= 180m/min
Feed= 0.2mm/rev
Ap= 2mm



Performance of SNMA120412-XK3115

Material: GCI
Vc= 300m/min
Feed= 0.12mm/rev
Ap= 2.5mm

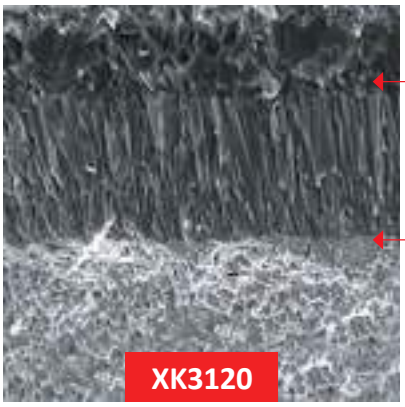


* Additional sizes & chipbreakers available on request.

XK3120

CVD coated grade for Cast Iron.

Special grade for high speed machining of both Gray & Ductile Cast Iron. Special substrate and trong coating enables high performance against any competitor.



Special Substrate designed for the perfect combination of Wear & Impact resistance.

This special material combined with Al_2O_3 and TiCN coating enables high performance at high speed against any competitor.

XK3120

INSERT TABLE

GRADE		APPLICABLE CHIPBREAKERS
XK3120		
CCMT	09T304	
	09T308	
CNMA	120408	
	120412	
CNMG	120404	-
	120408	ZT
	120412	ZT
SNMA	120408	-
	120412	-
	120416	-
SNMG	120404	-
	120408	-
	120412	-

GRADE		APPLICABLE CHIPBREAKERS
XK3120		
TCMT	16T308	
TNMA	160404	
	160408	
	160412	
TNMG	160404	
	160408	AR/ZT
	160412	
VNMG	160404	
	160408	
WNMA	080408	
	080412	
WNMG	080404	GM
	080408	
	080412	

STOCKABLE NON STOCKABLE

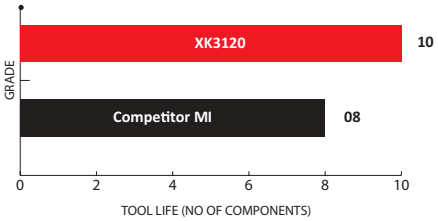
* Additional sizes & chipbreakers available on request.

PARAMETER

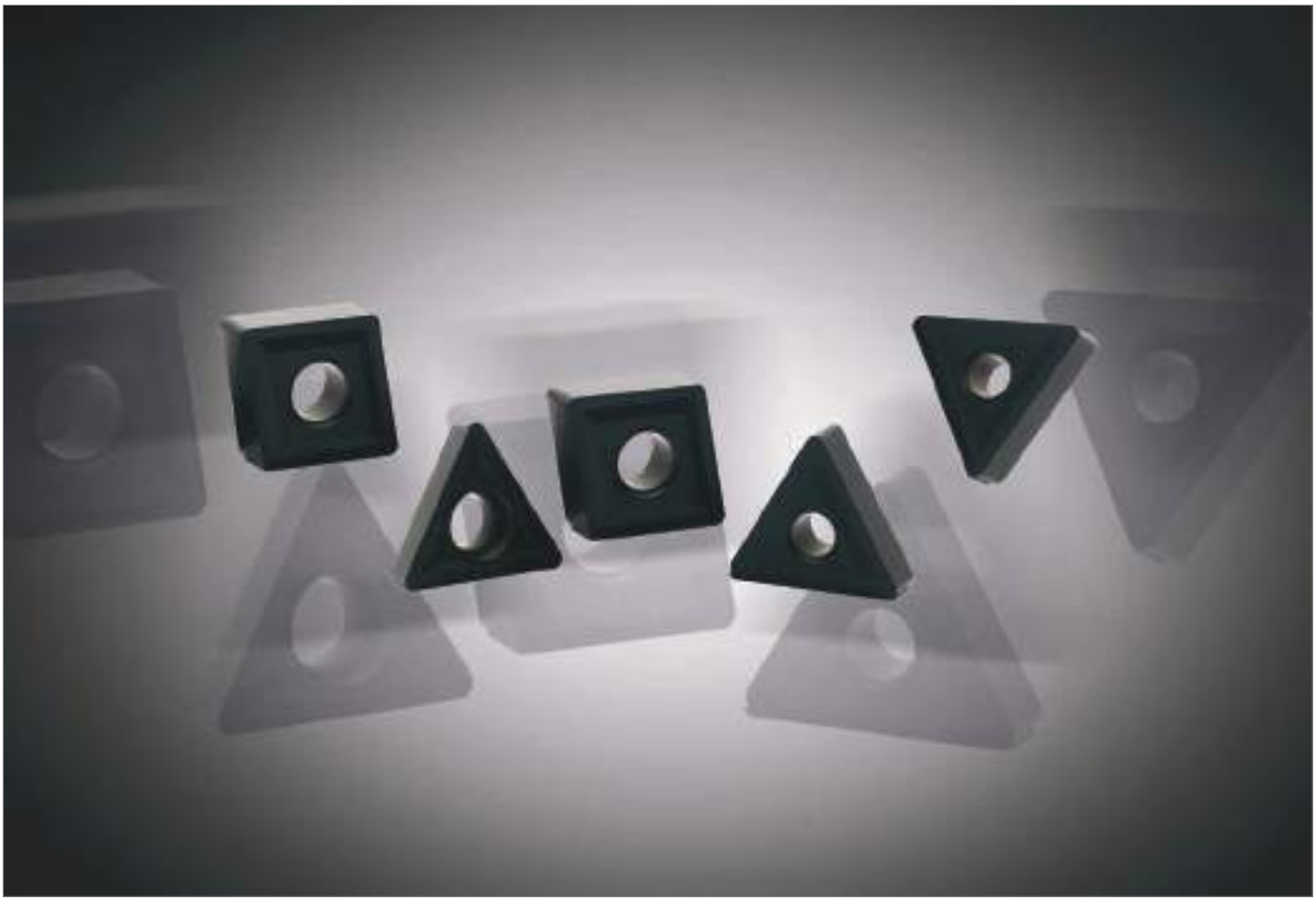
MATERIAL	TYPE	CUTTING SPEED(M/MIN)
GRAY CAST IRON	XK3120	100-350
NODULAR CAST IRON	XK3120	90-270

PERFORMANCE COMPARISON

Performance of WNMG080412-XK3120
Material: Nodular Cast iron
Vc= 295m/min
Feed= 0.45
Ap= 4mm

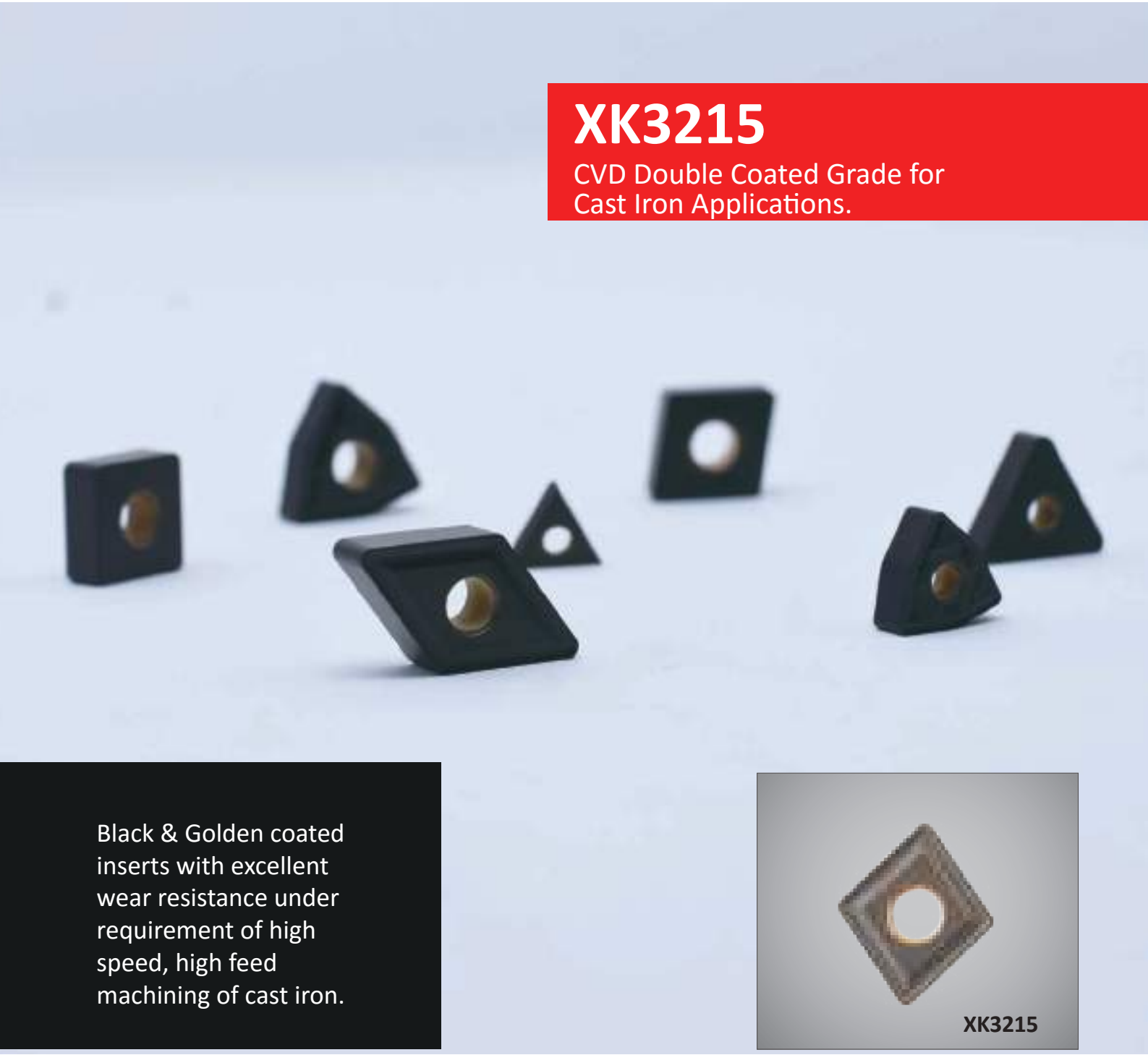


Competitor MI XK3120

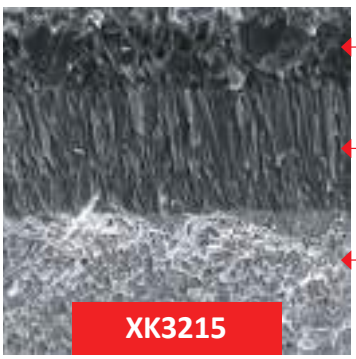


XK3215

CVD Double Coated Grade for Cast Iron Applications.



Black & Golden coated inserts with excellent wear resistance under requirement of high speed, high feed machining of cast iron.



- Thick Al_2O_3 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.

XK3215

INSERT TABLE

GRADE		APPLICABLE CHIPBREAKERS
XK3215		
CNMG	120404	AR
	120408	GM, AR
	120412	AR
	120416	AR
DNMG	150608	GM
	150612	AR
TNMG	160404	GM
	160408	GM
	160412	GM, AR, GR
VNMG	160408	GM
WNMG	060408	GM
	080404	GM
	080408	GM
	080412	GR, ZR
CNMA	120408	
	120412	
TNMA	160404	
	160408	
	160412	
WNMA	080408	
	080412	

STOCKABLE NON STOCKABLE

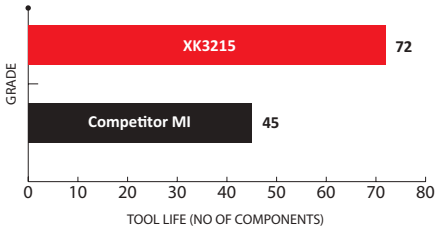
PARAMETER

Material	Type	Cutting Speed
GRAY CAST IRON	XK3215	90 - 360
SG IRON	XK3215	100 - 350

PERFORMANCE COMPARISON

Performance of VNMG160408GM-XK3215

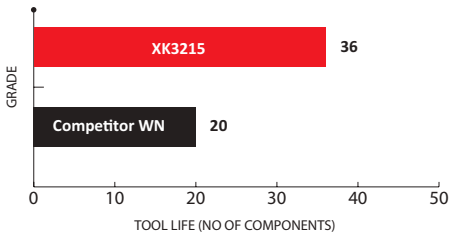
Material: C.I.(200 BHN)
Vc= 250m/min
Feed= 0.3mm/rev
Ap= 0.5-0.8mm



Competitor MI XK3215

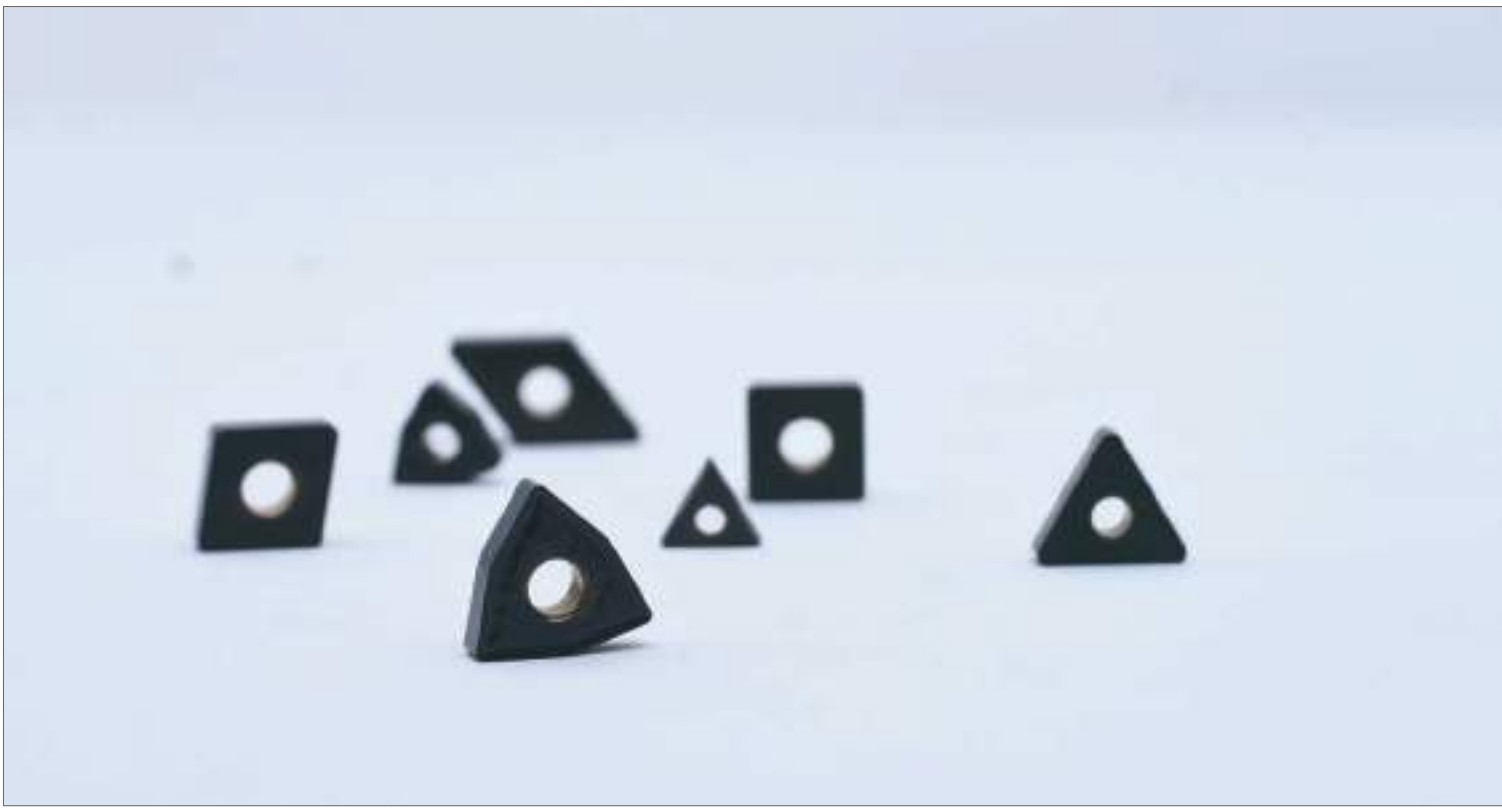
Performance of CNMG120412AR-XK3215

Material: Grey Cast Iron
Vc= 270m/min
Feed= 0.27mm/rev
Ap= 1.5mm



Competitor WN XK3215

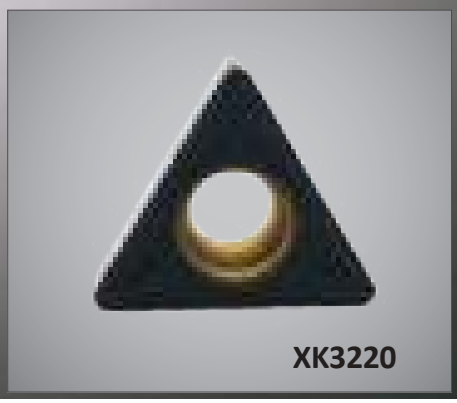
* Additional Sizes & Chipbreakers available on request

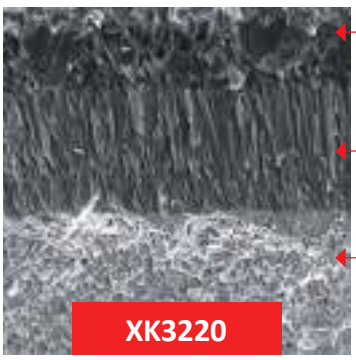


XK3220

CVD Double Coated Grade for Cast Iron Applications.

Black & Golden coated inserts with excellent wear resistance under requirement of high speed, high feed machining of cast iron.





Thick Al_2O_3 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.

XK3220

INSERT TABLE

GRADE		APPLICABLE CHIPBREAKERS
XK3220		
CNMG	120404	UC
	120408	UC,GH
	120412	GH
TCMT	16T308	GH
TNMG	160404	GH
	160408	
	160412	
WNMG	080404	UC
	080408	UC,GH
	080412	GH
CNMA	120404	UC
	120408	UC,GH
	120412	GH
TNMA	160404	
	160408	
	160412	
WNMA	080404	
	080408	
	080412	
SNMA	120408	
	120412	

STOCKABLE NON STOCKABLE

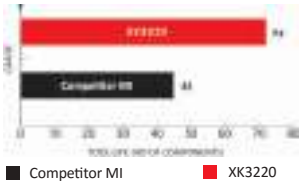
* Additional sizes & chipbreakers available on request

PARAMETER

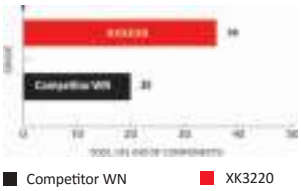
Material	Type	Cutting Speed
GRAY CAST IRON	XK3220	90 - 360
SG IRON	XK3220	100 - 350

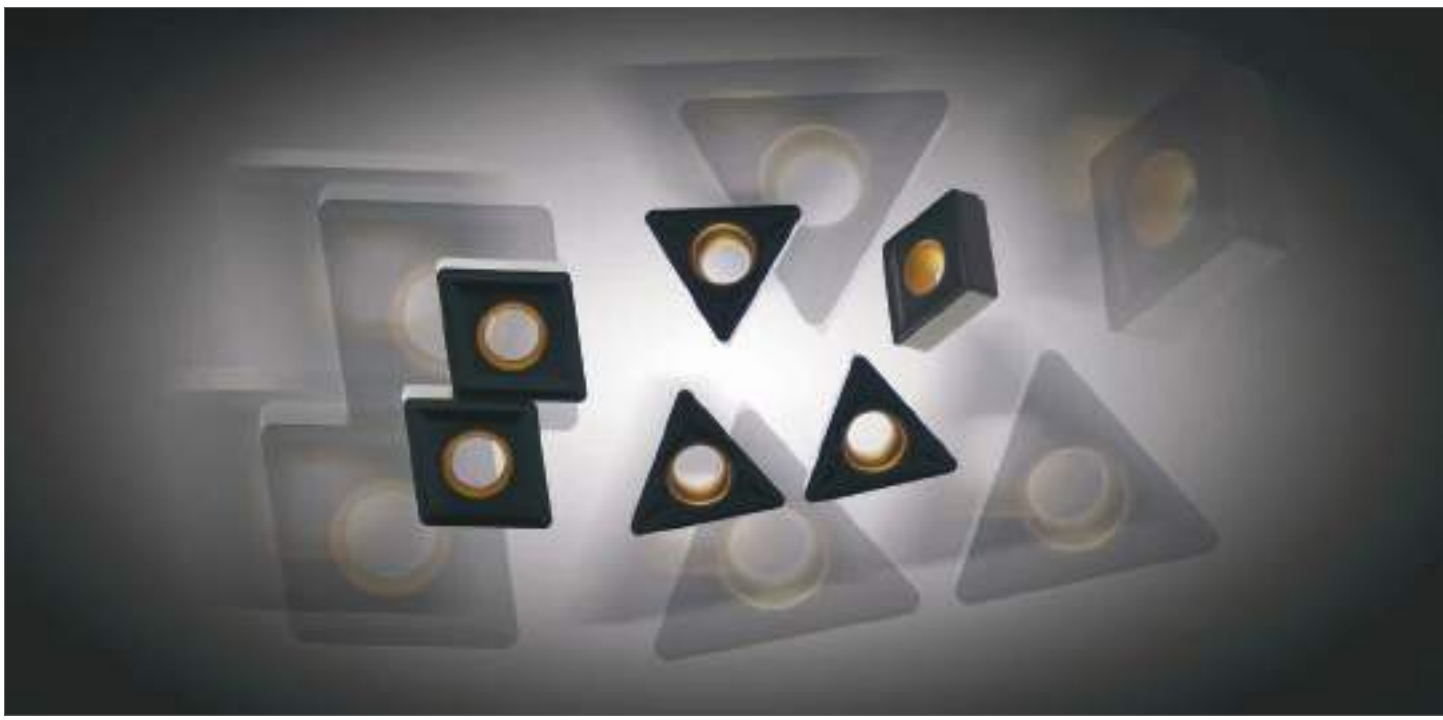
PERFORMANCE COMPARISON

Performance of
VNMG160408GM-XK3220
Material: C.I.(200 BHN)
Vc= 250m/min
Feed= 0.3mm/rev
Ap= 0.5-0.8mm



Performance of
CNMG120412AR-XK3220
Material: Grey Cast Iron
Vc= 270m/min
Feed= 0.27mm/rev
Ap= 1.5mm

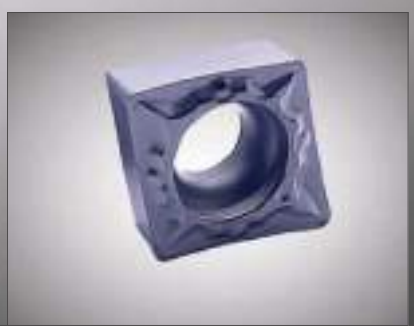


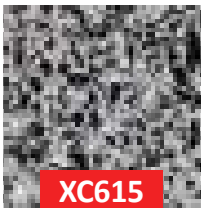


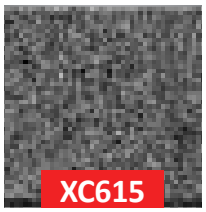
XC615

Grade for Uncoated Cermets.

High performance Cermet grade; especially suitable for high cutting speed, low feed finishing of most materials like Steel, Cast iron and a variety of materials.







Ti(C,N) based cermet is a new and potential material which not only has toughness, high thermal conductivity and good heat stability of metal, but also has high hardness, high red hardness and corrosion resistance of ceramic properties of cermet make it promising in special cutting tools, wear parts amd corrosion-resistance parts.

XC615

INSERT TABLE

GRADE		APPLICABLE CHIPBREAKERS
XC615		
CCGT	060202	LS/RS
	060204	LS/RS
	09T30	LS/RS
	09T304	LS/RS
CCMT	060202	FG, FQ, MS
	060204	FG, FQ
	09T302	FQ
	09T304	FG, FQ
	09T308	FG
CNMG	120404	MS
	120408	MS
DCGT	11T304	RS
DCMT	070202	FQ
	070204	FQ, MS
	11T302	FQ
	11T304	FG
	11T308	FG
SNGG	090304	-
	120404	-
SNMG	120408	FQ
TBGT	060104	-
TCGT	110204	LS, RS
TCMT	090204	FQ
	110202	FQ
	110204	FG, FQ
	110208	FQ
	16T304	FG, FQ
TNGG	160402	LS, RS
	160404	LS, RS
	160408	LS, RS
TNMG	160404	FQ, MS
	160408	MS

STOCKABLE NON STOCKABLE

INSERT TABLE

GRADE		APPLICABLE CHIPBREAKERS
XC615		
TPGH	080202L	-
	080204L	-
	090202L	-
	090202R	LS/RS
	090204L	LS/RS
	110302	LS/RS
	110304	LS/RS
TPMT	110304	FQ
VBMT	110304	FQ
	160404	FQ
VNMG	160404	MT
	160408	MA
WNMG	080404	MS
	080408	MS

* Additional sizes & CB's available on request.

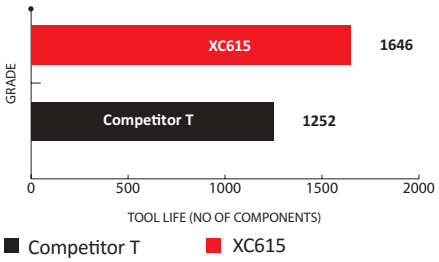
PARAMETER

MATERIAL	GRADE	RECOMMENDED CUTTING SPEED (m/min)
STEEL	NON ALLOY STEELS	180-340
	LOW ALLOY STEELS	120-240
	HIGH ALLOY STEELS	80-180
STAINLESS STEEL	FERRITIC/ MARTENSITIC	160-240
	AUSTENITIC	160-220
CAST IRON	GREY CAST IRON	30-130
	MALLEABLE CAST IRON	30-140

PERFORMANCE COMPARISON

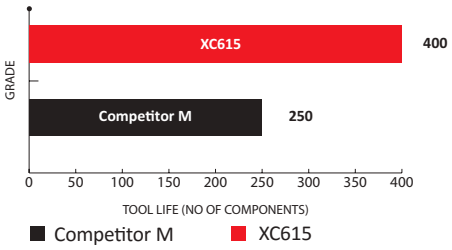
Performance of CCMT09T304FG-XC615

Material: S45C
Vc= 220m/min
Feed=0.14mm/rev
Ap= 0.4mm



Performance of TNMG160408MS-XC615

Material: MS
Vc=220m/min
Feed= 0.2mm/rev
Ap= 0.3mm

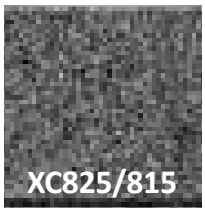


XC815/825

Grade For Coated Cermets.

High performance cermet grade, especially suitable for high cutting speed, low feed finishing of most materials like steel, cast iron and a variety of materials.

XC815/825


XC825/815

Ti(C,N) based cermet is a new and potential material which has toughness, high thermal conductivity and good heat stability of metal, making it promising in special cutting tools, wear parts amd corrosion-resistance parts.
Special Ti(C,N) and TiAlN coating in XC825 and XC 815 respectively helps to improve tool life and incries parameters.

XC815/825

INSERT TABLE

GRADE		APPLICABLE CHIPBREAKERS
XC815/825		
CCMT	060202	FG, FQ, MS
	060204	FG, FQ
	09T302	FQ
	09T304	FGFQ
	09T308	FG, FQ
CNMG	120404	MS
	120408	MS
DCMT	070202	FQ
	070204	FQ, MS
	11T302	FQ
	11T304	FG, PS
	11T308	FG
TCMT	110204	FG/FQ
	110208	FQ
	16T304	FG, FQ
TNMG	160404	FQ, MS
	160408	MS
VBMT	110304	FQ
	160404	FQ
	160408	FQ
VNMG	160404	MT
	160408	MA
WNMG	080404	MS
	080408	MS

STOCKABLE NON STOCKABLE

PARAMETER

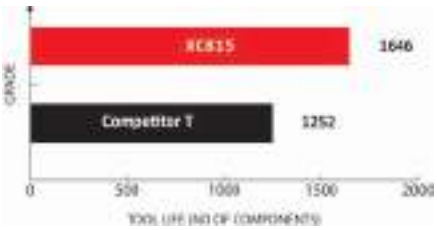
MATERIAL	GRADE	RECOMMENDED CUTTING SPEED (m/min)
STEEL	NON ALLOY STEELS	180-340
	LOW ALLOY STEELS	120-240
	HIGH ALLOY STEELS	80-180
STAINLESS STEEL	FERRITIC/ MARTENSITIC	160-240
	AUSTENITIC	160-220
CAST IRON	GREY CAST IRON	30-130
	MALLEABLE CAST IRON	30-140

* Additional sizes & CB's available on request.

PERFORMANCE COMPARISON

Performance of CCMT09T304FG-XC815

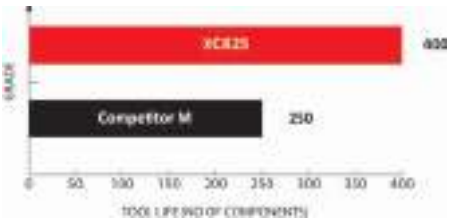
Material: S45C
Vc= 220m/min
Feed=0.14mm/rev
Ap= 0.4mm



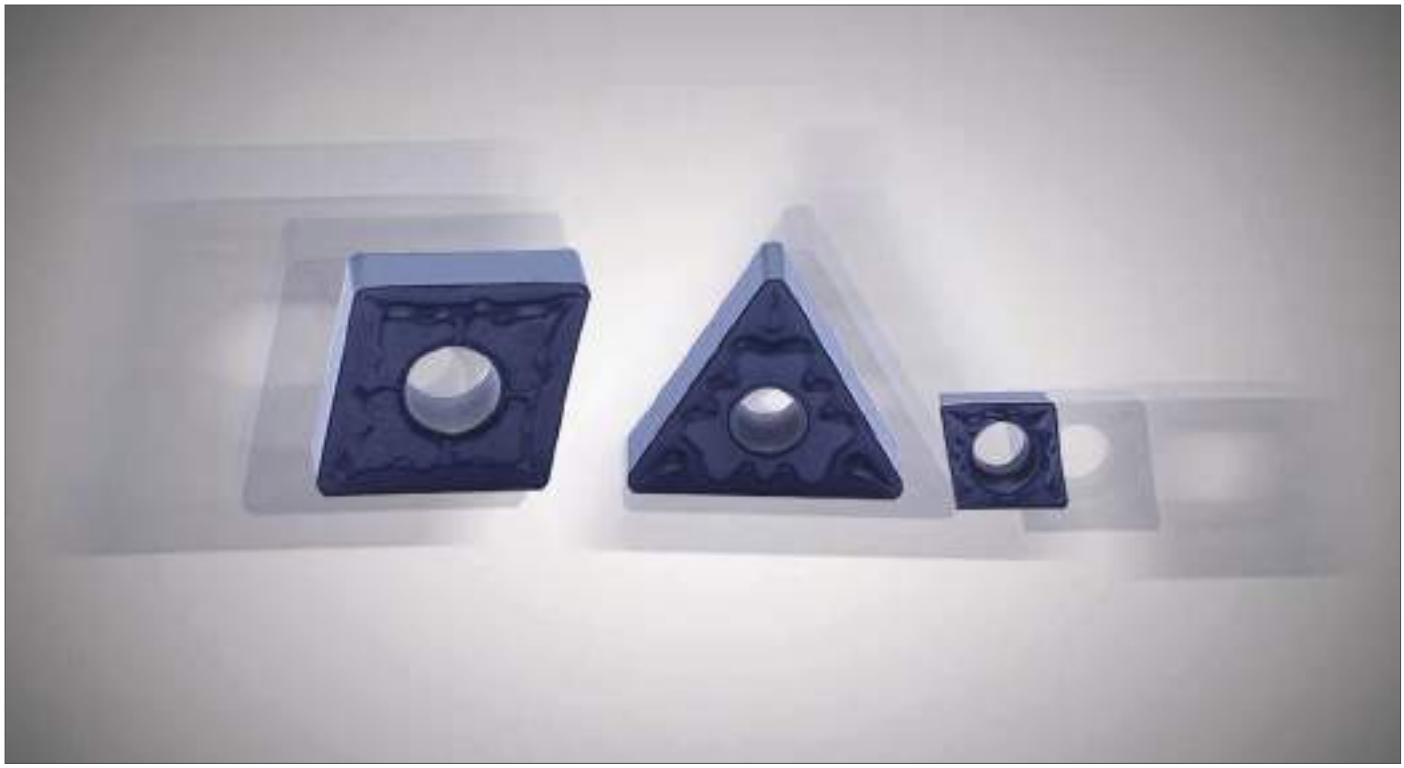
Competitor T XC815

Performance of TNMG160408MS-XC825

Material: MS
Vc=220m/min
Feed= 0.2mm/rev
Ap= 0.3mm



Competitor M XC825



XA320

Carbide Grade for Aluminium Machining.

Superior carbide substrate for high performance. Uncoated carbide positive and negative inserts capable of fighting any competitor in the market.

XA320

INSERT TABLE

GRADE	XA320
CCGT	060202
	060204
	060208
	09T302
	09T304
	09T308
	120404
	120408
CNMG	120404
	120408
DCGT	070202
	070204
	070208
	11T304
	11T308
DNMG	150604
TCGT	090204
	110204
	110208
	16T304
	16T308
TNMG	160402
	160404
	160408

GRADE	XA320
VCGT	110302
	110304
	160402
	160404
	160408
WNMG	080408

STOCKABLE NON STOCKABLE

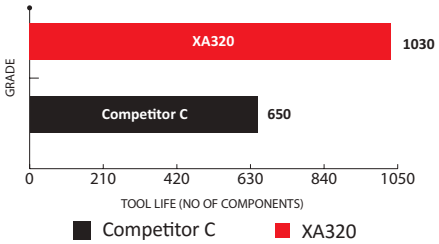
PARAMETER

MATERIAL	GRADE	RECOMMENDED CUTTING SPEED (m/min)
ALUMINIUM	XA320	100 - 250

PERFORMANCE COMPARISON

Performance of TNMG160404-XA320

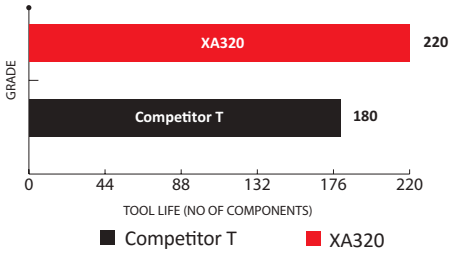
Material: Aluminium
Vc= 240m/min
Feed=0.3mm/rev
Ap= 0.3mm



Competitor C XA320

Performance of VCGT160404-XA320

Material: Aluminium
Vc= 190m/min
Feed=0.12mm/rev
Ap= 1.5mm



Competitor T XA320

P C D

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

INSERT TABLE

DESIGNATION	GRADE	D	L	T	ID	R
CCGT060204	XPD300	6.35	6.4	2.38	2.8	0.4
CCGT09T302	XPD300	9.525	9.7	3.97	4.4	0.2
CCGT09T304	XPD300	9.525	9.7	3.97	4.4	0.4
CCGT09T308	XPD300	9.525	9.7	3.97	4.4	0.8
CCGT120402	XPD300	12.7	12.9	4.76	5.5	0.2
CCGT120404	XPD300	12.7	12.9	4.76	5.5	0.1
CCGT120408	XPD300	12.7	12.9	4.76	5.5	0.8
CNMG120402	XPD300	12.7	12.9	4.76	5.5	0.2
CNMG120404	XPD300	12.7	12.9	4.76	5.5	0.1
CNMG120408	XPD300	12.7	12.9	4.76	5.5	0.8
DCGT070202	XPD300	6.35	7.7	2.38	2.5	0.2
DCGT070204	XPD300	6.35	7.7	2.38	2.5	0.4
DCGT11T302	XPD300	9.525	11.6	3.97	4.4	0.2
DCGT11T304	XPD300	9.525	11.6	3.97	4.4	0.4
DCGT11T308	XPD300	9.525	11.6	3.97	4.4	0.8
SCGT09T302	XPD300	9.525	9.525	3.97	4.4	0.2
SCGT09T304	XPD300	9.525	9.525	3.97	4.4	0.4
TCGT110202M2.5	XPD300	6.35	11	2.38	2.8	0.2
TCGT110204M2.5	XPD300	6.35	11	2.38	2.8	0.4
TCGT16T302	XPD300	9.525	16.5	3.97	4.4	0.2
TCGT16T304	XPD300	9.525	16.5	3.97	4.4	0.4
TCGT16T308	XPD300	9.525	16.5	3.97	4.4	0.8
TNMG160402	XPD300	9.525	16.5	4.76	4.4	0.2
TNMG160404	XPD300	9.525	16.5	4.76	4.4	0.4
TNMG160408	XPD300	9.525	16.5	4.76	4.4	0.8
VBGT110302	XPD300	6.35	11.1	3.18	2.8	0.2
VBGT110304	XPD300	6.35	11.1	3.18	2.8	0.4
VBGT160402	XPD300	9.525	16.6	4.76	4.4	0.2
VBGT160404	XPD300	9.525	16.6	4.76	4.4	0.4
VCGT110302	XPD300	6.35	11.1	3.18	2.8	0.2
VCGT110304	XPD300	6.35	11.1	3.18	2.8	0.4
VCGT160402	XPD300	9.525	16.6	4.76	4.4	0.1
VCGT160404	XPD300	9.525	16.6	4.76	4.4	0.4
VCGT160412	XPD300	9.525	16.6	4.76	4.4	1.2
VNMG160402	XPD300	9.525	16.6	4.76	4.4	0.2
VNMG160404	XPD300	9.525	16.6	4.76	4.4	0.4
WBGT060102	XPD300	9.525	6.5	1.59	4.4	0.2
WBGT060104	XPD300	9.525	6.5	1.59	4.4	0.4

■ Stockable ■ Non Stockable

* Additional Sizes Available on Request.

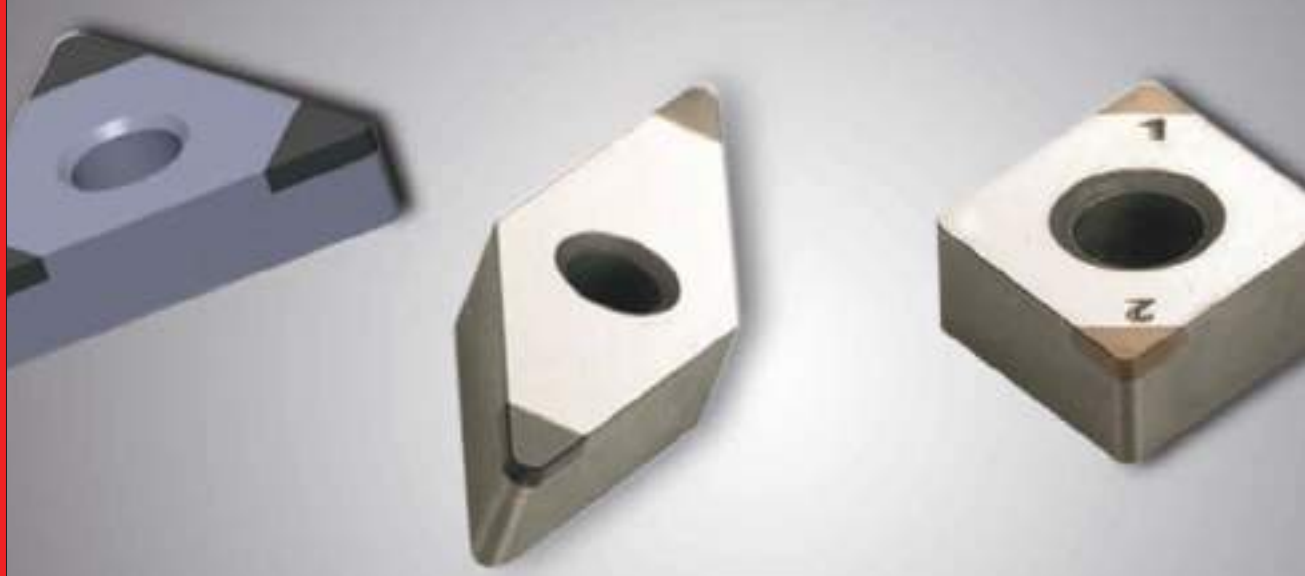
PARAMETER

	VC (M/MIN)	FEED (MM/REV)	AP (MM)
ALUMINIUM ALLOYS			
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
METAL 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

C B N

BRAZED CBN

Solution for Hard Part Machining.

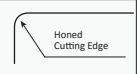
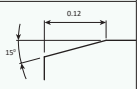
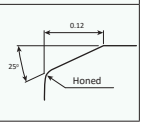


World Class Quality of Brazed CBN inserts capable of Outperforming any Competitor in the Market. All Kinds of Special Inserts & Geometries Available on Request.

BRAZED CBN

Sr. No.	GRADE	MACHINING MODE	WORKPIECE & APPLICATION
1.	XBN7540	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

How To Identify Edge Preparation

EDGEPREP				
Symbol	Cutting Edge Spec.	Example		Shape
E	Honed Cutting Edge	E008	R0.08mm Honed	
T	Chamfered Cutting Edge	T01215	0.12mm x 15^0 Chamfered Cutting Edge	
S	Chamfered Cutting Edge + Honed Cutting Edge	S01225	0.12mm x 25^0 Chamfered + Honed Cutting Edge	

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
E	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.
T	CHAMFER		Chamfer helps to improve impact resistance of the cutting edge. compared to S cutting edge, it helps to improve surface quality and dimensionslal 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.

Cutting Parameters and Coating Details

Grade	Material	Application Condition	Cutting Speed(m/min)
XBK715	HARDENED STEEL	CONTINUOUS	80-200
XBK7540	HARDENED STEEL	CONTINUOUS	80-220
XBK7550	HARDENED STEEL	CONTINUOUS	80-180
XBK7550	HARDENED STEEL	MEDIUM INTERRUPTION	50-120
XBK7560	HARDENED STEEL	HEAVY INTERRUPTION	50-150
XBK3015	CAST IRON	CONTINUOUS	50-350
XBK3520	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

INSERT TABLE

DESIGNATION	POPULAR CHAMFERS	XBK7540	XBK7550	XBK7560	XBK715	XBK3520	XBK3015
CNGA120404-2S	S01020 S01225 S01525 S02025 S04030	•	•		•		
CNGA120408-2S		•	•	•	•	•	
CNGA120408-4S			•			•	
CNGA120412-2S			•	•			•
DNGA150404-2S		•	•				
DNGA150408-2S		•	•	•		•	
TNGA160404-3S		•	•		•	•	•
TNGA160408-3S		•	•	•	•		
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		•	•	•	•		•

* 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 IndustriesLike Mining , Pumps, Construction Etc, better for Continuous applications
2.	XBN3600-XBN3200	Solid CBN	Premium Grade Suitable For Heavy Roughing To Semi-FinishingOf 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 IndustriesLike Mining , Pumps, Impellers Etc., better suited for Interrupted applications
4.	XBN3000	Solid CBN	Suitable For Heavy Roughing To Semi-Finishing Of Cast Iron InIndustries Like Brake Drum, Brake Disc, Liners Etc.

SOLID CBN

INSERT TABLE

DESIGNATION	POPULAR CHAMFERS	XBN3600	XBN3200	XBN3000	XBN7500	XBN7000
CNGN120408	S01020 S02020 T02020 T02025	•		•		
CNGN120412		•		•		
CNGN120416				•		
CNGN120708				•		
CNGN120712		•		•		
CNGN120716				•		
SNGN090408		•		•		
SNGN090412						
SNGN120408				•		
SNGN120412		•		•		
TNGN160408		•		•		
TNGN160412		•		•		
SNGN090408	FBF		•	•		
SCGN090408	FBW		•	•		
RNGN060300	S02020				•	•
RNGN090300	S05020				•	•
RNGN120400	S10030				•	•
RNGN120700	S20020				•	•

- 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

GRADE	MATERIAL	CUTTING SPEED (m/min)
XBN7500	Alloy steel	80-200
	Hi-Chrome Steel	50-150
XBN7000	Tempered Steel	80-250
	Hi-Chrome Steel	50-160
XBN3600-XBN3200	Cast Iron	80-800
XBN3000	Cast Iron	100-700

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 !!!

APPLICATION OF DELTA CBN INSERT

XCUT GRADE	MACHINING MODEL	FEATURE	MACHINED MATERIAL	APPLICATION
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

INSERT TABLE

INSERT	CHAMFER	XBK7000	XBK3000	NO OF CORNERS
CNGA120404	S01020	CNGA120404-4E-XBK7000	CNGA120404-4E-XBK3000	4
CNGA120408	S01020	CNGA120408-4E-C-XBK7000	CNGA120408-4E-C-XBK3000	4
CNGA120408	S02020	CNGA120408-4E-XBK7000	CNGA120408-4E-XBK3000	4
CNGA120412	S02020	CNGA120412-4E-XBK7000	CNGA120412-4E-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

GRADE	MATERIAL	RECOMMENDED CUTTING SPEED (m/min)
XBK7000	HARDENED STEEL	60 - 300
XBK3000	GREY CAST IRON	60-600
XBK3000	MANGANESE STEEL	60-300

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
E	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.
T	CHAMFER		Chamfer helps to improve impact resistance of the cutting edge. compared to S cutting edge, it helps to improve surface quality and dimensionslal 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.

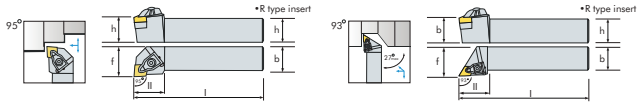
TURNING HOLDERS & BORING BARS

Tool Holders for General Purpose Machining.

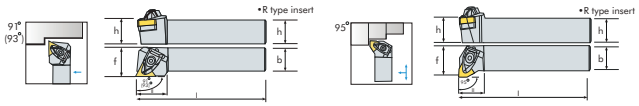
Best quality screw type and double clamp turning holders & boring bars , which apart from being economically priced and readily available, will increase your tool life as well.

A - Type Holders

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



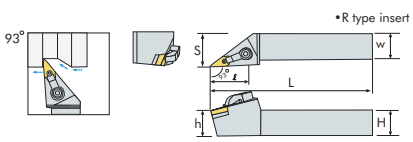
ACLNR/L ADJNR/L



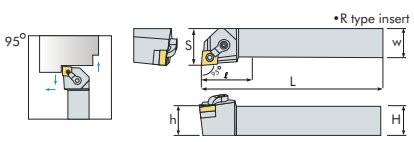
ATJNR/L2 AWLNR/L

M - Type Holders

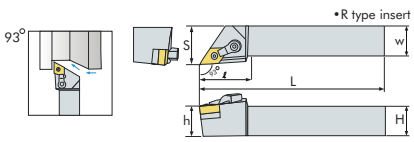
Designation	H	W	L	ℓ	H	S	Inserts	Shim	Pin	Clamp	Clamp Screw	Wrench
X-MCLNR/L2020-K12	20	20	125	32	20	25	CNMG12	MC1204	CTM617	HL1814	ML0625	L2.5 / L3.0
X-MCLNR/L2525-M12	25	25	150	32	25	32	CNMG12	MC1204	CTM617	HL1814	ML0625	L2.5 / L3.0
X-MCLNR/L2525-M16	25	25	150	32	25	32	CNMG16	MC1604	CTM822	HL2217	ML0830	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	MT1603	CTM513	HL1814	ML0625	L2.5 / L3.0
X-MTJNR/L2525-M16	25	25	150	28	25	32	TNMG16	MT1603	CTM513	HL1814	ML0625	L2.5 / L3.0
X-MVJNR/L2525-M16	25	25	150	42	25	32	VNMG16	MV1603	CTM513	HL2414	ML0625	L2.5 / L3.0
X-MWLNR/L2020-K06	20	20	125	27	20	25	WNMG06	MW0603	CTM513	HL1814	ML0625	L2.5 / L3.0
X-MWLNR/L2020-K08	20	20	125	27	20	25	WNMG08	MW0804	CTM617	HL1814	ML0625	L2.5 / L3.0
X-MWLNRL2525-M06	25	25	150	27	25	32	WNMG06	MW0603	CTM513	HL1814	ML0625	L2.5 / L3.0
X-MWLNR/L2525-M08	25	25	150	27	25	32	WNMG08	MW0804	CTM617	HL1814	ML0625	L2.5 / L3.0



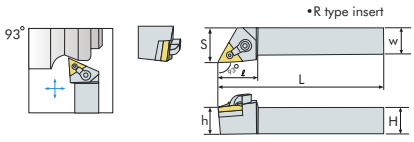
MVJNR/L



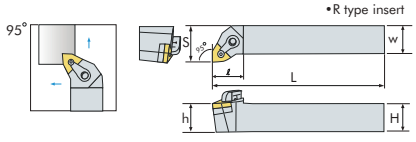
MCLNR/L



MDJNR/L



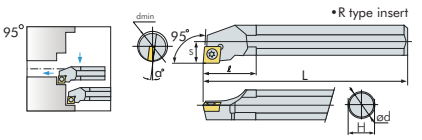
MTJNR/L



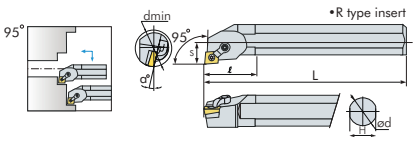
MWLNR/L

S - Type Boring Bars

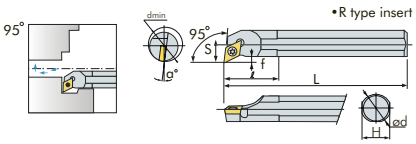
Designation	D MIN	Ø D	S	L	ℓ	H	F	α°	INSERTS
X-S08K-SCLCR/L06	9	8	5.5	125	18	7	-	13°	CCMT06
X-S10K-SCLCR/L06	11	10	7	125	22	9	-	12°	CCMT06
X-S12M-SCLCR/L06	13	12	8	150	25	11	-	10°	CCMT06
X-S16Q-SCLCR/L09	17	16	11	180	34	15	-	10°	CCMT09
X-S20Q-SCLCR/L09	21	20	13	180	38	18	-	8°	CCMT09
X-S20Q-MCLNR/L12	23	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-S12M-STUCR/L11	13	12	7	150	27	11	-	10°	TCMT11
X-S16Q-STUCR/L11	17	16	9	180	32	15	-	8°	TCMT11
X-S20Q-STUCR/L11	21	20	11	180	37	18	-	6°	TCMT11
X-S25R-STUCR/L16	26	25	14	200	45	23	-	6°	TCMT16
X-S25R-MTJNR/L16	30	25	17	200	45	23	-	12°	TNMG16
X-S32S-MTJNR/L16	38	32	22	250	54	30	-	17°	TNMG16
X-S20R-SVUBR/L16	29	20	19	200	45	18	8.5	8°	VBMT16
X-S25R-SVUBR/L16	32	25	20	200	50	23	7	6°	VBMT16
X-S32R-SVUBR/L16	38	32	22	250	50	30	5.5	6°	VBMT16



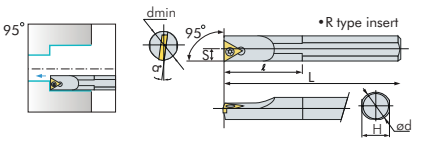
SCLCR/L



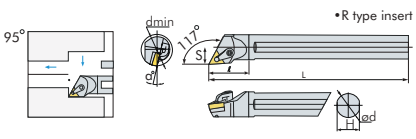
MCLNR/L



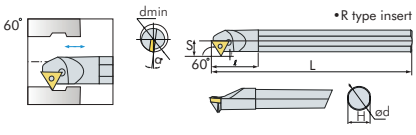
SDUCR/L



STUCR/L



MTJNR/L



MTJNR/L

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	-	-	-	-	M2.5x5	-	T-8
X-S10K-SCLCR/L06	-	-	-	-	M2.5x5	-	T-8
X-S12M-SCLCR/L06	-	-	-	-	M2.5x6	-	T-8
X-S16Q-SCLCR/L09	-	-	-	-	M3.5x9	-	T-15
X-S20Q-SCLCR/L09	-	-	-	-	M3.5x9	-	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	-	-	-	-	M3.5x9	-	T-15
X-S25R-SDUCR/L11	-	-	-	-	M3.5x9	-	T-15
X-S10K-STUCR/L11	-	-	-	-	M2.5x6	-	T-8
X-S12M-STUCR/L11	-	-	-	-	M2.5x6	-	T-8
X-S16Q-STUCR/L11	-	-	-	-	M2.5x6	-	T-8
X-S20Q-STUCR/L11	-	-	-	-	M2.5x8	-	T-8
X-S25R-STUCR/L16	-	-	-	-	M2.5x8	-	T-8
X-S25R-MTJNR/L16	-	CTM510	HL1814	ML0625	-	-	L2.5 / L3.0
X-S32S-MTJNR/L16	-	CTM513	HL1814	ML0625	-	-	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 Spares 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

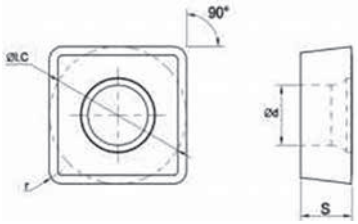
XCUT®
TECHNOLOGIES

DRILLING

www.x-cut.in

Insert Designation

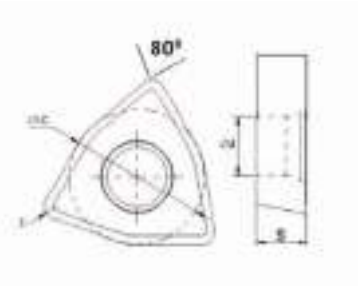
SPMG



4 Corner Drilling insert
Same insert for centre and periphery.

Description	L	S	r	d	FEED(mm/tooth)		XT830	XT430	XT840	XT110	SM-XT930-C
					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	0.2	●			●	●

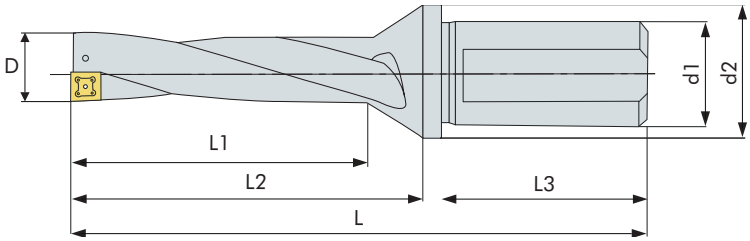
WCMX



3 Corner Drilling insert
Same insert for centre and periphery.

Description	L	s	d	r	iC	FEED(mm/tooth)		XT830	XT110
						MIN	MAX		
WCMX030208	3.4	2.38	2.8	0.8	5.56	0.04	0.09		●
WCMX040208	4.3	2.38	3.1	0.8	6.35	0.04	0.11	●	●
WCMX050308	5.4	3.18	3.2	0.8	7.94	0.04	0.11	●	●
WCMX06T308	6.5	3.97	3.7	0.8	9.525	0.06	0.13	●	●
WCMX080412	8.7	4.76	4.3	1.2	12.7	0.08	0.18	●	●

U-Drill Designation



L/D 2 SERIES

Description	D	L	L1	L2	L3	d1	d2	Insert	Screw	Wrench	Stock
H-MDR2130-20T2-05	13	101	31	46	50	20	25	SPMG05	M2.0*5	T-6	o
H-MDR2135-20T2-05	13.5	102	32	47							o
H-MDR2140-20T2-05	14	103	33	48							●
H-MDR2145-20T2-05	14.5	104	34	49							●
H-MDR2150-20T2-05	15	112	35	50							●
H-MDR2155-25T2-06	15.5	113	36	50	56	25	32	SPMG06	M2.2*5	T-7	●
H-MDR2160-25T2-06	16	114	37	51							●
H-MDR2165-25T2-06	16.5	115	38	52							●
H-MDR2170-25T2-06	17	116	39	53							●
H-MDR2175-25T2-06	17.5	117	40	54							●
H-MDR2180-25T2-06	18	118	41	55							●
H-MDR2185-25T2-06	18.5	119	42	56							●
H-MDR2190-25T2-06	19	120	43	57							●
H-MDR2195-25T2-06	19.5	121	44	58							●
H-MDR2200-25T2-06	20	122	45	59							●
H-MDR2205-25T2-06	20.5	123	46	60							o
H-MDR2210-25T2-06	21	124	47	61							o
H-MDR2215-25T2-06	21.5	125	48	62							o

● STOCKABLE o NONSTOCKABLE

Description	D	L	L1	L2	L3	d1	d2	Insert	Screw	Wrench	Stock
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
H-MDR2280-32T2-09	28	146	61	79	60	32	44	SPMG09	M3.5*9	T-15	o
H-MDR2285-32T2-09	28.5	147	62	80							o
H-MDR2290-32T2-09	29	148	63	81							o
H-MDR2295-32T2-09	29.5	149	64	82							o
H-MDR2300-32T2-09	30	150	65	83							o
H-MDR2305-32T2-09	30.5	151	66	84							o
H-MDR2310-32T2-09	31	152	67	85							o
H-MDR2315-32T2-09	31.5	153	68	86							o
H-MDR2320-32T2-09	32	154	69	87							o
H-MDR2325-32T2-09	32.5	155	70	88							o
H-MDR2330-32T2-09	33	156	71	89							o
H-MDR2335-32T2-09	33.5	157	72	90							o
H-MDR2340-32T2-11	34	158	73	91	60	32	44	SPMG11	M4.0*10	T-15	o
H-MDR2350-32T2-11	35	159	74	92							o
H-MDR2360-32T2-11	36	160	75	93							o
H-MDR2370-32T2-11	37	161	76	94							o
H-MDR2380-32T2-11	38	162	77	95							o
H-MDR2390-32T2-11	39	163	78	96							o
H-MDR2400-32T2-11	40	164	79	97							o
H-MDR2410-32T2-11	41	165	80	98							o

● STOCKABLE o NONSTOCKABLE

Description	D	L	L1	L2	L3	d1	d2	Insert	Screw	Wrench	Stock
H-MDR2420-40T2-14	42	166	81	99	70	40	54	SPMG14	M5.0*11	T-20	o
H-MDR2430-40T2-14	43	167	82	100							o
H-MDR2440-40T2-14	44	168	83	101							o
H-MDR2450-40T2-14	45	169	84	102							o
H-MDR2460-40T2-14	46	170	85	103							o
H-MDR2470-40T2-14	47	171	86	101							o
H-MDR2480-40T2-14	48	172	87	102							o
H-MDR2490-40T2-14	49	173	88	103							o
H-MDR2500-40T2-14	50	174	89	104							o

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							●

● STOCKABLE o NONSTOCKABLE

Description	D	L	L1	L2	L3	d1	d2	Insert	Screw	Wrench	Stock
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							●
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							o
H-MDR3370-32T2-11	37	201	116	134							o
H-MDR3380-32T2-11	38	204	119	137							o
H-MDR3390-32T2-11	39	207	122	140							o
H-MDR3400-32T2-11	40	210	125	143							o
H-MDR3410-32T2-11	41	218	128	143							o

● STOCKABLE o NONSTOCKABLE

Description	D	L	L1	L2	L3	d1	d2	Insert	Screw	Wrench	Stock
H-MDR3420-40T2-14	42	221	131	146	70	40	54	SPMG14	M5.0*11	T-20	o
H-MDR3430-40T2-14	43	224	134	149							o
H-MDR3440-40T2-14	44	227	137	152							o
H-MDR3450-40T2-14	45	230	140	155							o
H-MDR3460-40T2-14	46	233	143	158							o
H-MDR3470-40T2-14	47	236	146	161							o
H-MDR3480-40T2-14	48	239	149	164							o
H-MDR3490-40T2-14	49	242	152	167							o
H-MDR3500-40T2-14	50	245	155	170							o

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	o
H-MDR4135-20T2-05	13.5	129	59	74							o
H-MDR4140-20T2-05	14	131	61	76							o
H-MDR4145-20T2-05	14.5	133	63	78							o
H-MDR4150-20T2-05	15	142	65	80							o
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							●

● STOCKABLE o NONSTOCKABLE

Description	D	L	L1	L2	L3	d1	d2	Insert	Screw	Wrench	Stock
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							●
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

● STOCKABLE o NONSTOCKABLE

Description	D	L	L1	L2	L3	d1	d2	Insert	Screw	Wrench	Stock
H-MDR4420-40T2-14	42	242	157	175	70	40	54	SPMG14	M5.0*11	T-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 o NONSTOCKABLE

Notes

XCUT®
TECHNOLOGIES

GROOVING

www.x-cut.in

INDEX

Chipbreaker Overview

Chipbreaker Overview

P – Medium cutting chipbreaker

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

Parting Grooving

GT – Grooving and Turning

- For grooving and turning
- Suitable for all steel and stainless steel materials
- 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

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

XTGP

INSERT SPECIFICATION

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

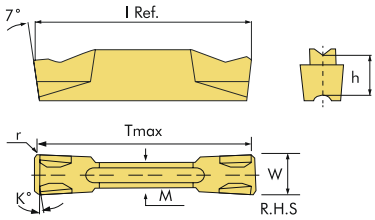
HOLDER SPECIFICATION

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-02TL3	EXTERNAL-LEFT HAND	20	125	13	XTGP20 ...	●
XTGMEL-25-K-02TL3	EXTERNAL-LEFT HAND	25	125	13	XTGP20 ...	●
XTGMEL-25-K-02T20	EXTERNAL-LEFT HAND	25	125	20	XTGP20 ...	●
XTGMEL-20-K-03TL3	EXTERNAL-LEFT HAND	20	125	13	XTGP30 ...	●
XTGMEL-20-K-03T25	EXTERNAL-LEFT HAND	20	125	25	XTGP30 ...	O
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 ...	O
XTGMEL-20-K-04T25	EXTERNAL-LEFT HAND	20	125	25	XTGP40 ...	O
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 ...	O
XTGMER-16-J-02TL3	EXTERNAL-LEFT HAND	16	150	13	XTGP20 ...	O
XTGMER-20-K-02T13	EXTERNAL-RIGHT HAND	20	110	13	XTGP20 ...	●
XTGMER-25-K-02TL3	EXTERNAL-RIGHT HAND	25	125	13	XTGP20 ...	●
XTGMER-25-K-02T20	EXTERNAL-RIGHT HAND	25	125	20	XTGP20 ...	O
XTGMER-20-K-03TL3	EXTERNAL-RIGHT HAND	20	125	25	XTGP30 ...	●
XTGMER-20-K-03T25	EXTERNAL-RIGHT HAND	25	125	13	XTGP30 ...	O
XTGMER-25-K-03TL3	EXTERNAL-RIGHT HAND	25	125	25	XTGP30 ...	●
XTGMER-25-K-03T25	EXTERNAL-RIGHT HAND	25	125	15	XTGP30 ...	●
XTGMER-20-K-04TL5	EXTERNAL-RIGHT HAND	20	125	25	XTGP40 ...	O
XTGMER-20-K-04T25	EXTERNAL-RIGHT HAND	20	125	15	XTGP40 ...	O
XTGMER-25-K-04TL5	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	XTGP60 ...	●
XTGMER-32-M-06T32	EXTERNAL-RIGHT HAND	32	150	32	XTGP60 ...	O

● STOCKABLE O NONSTOCKABLE

XGM-MGMN

DESIGNATION		b	r	l	d	t	XT310	XT125	XP7125	XT930-C
MGMN150-G	-	1.5	0.15	16	1.2	3.5	●			
MGMN200-T	XGM02002-N	2.0	0.2	16	1.6	3.5	●	●	●	●
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	●	●	●	●
	XGM2010-R	2.0	1	16	1.55	3.5	○			●
	XGM3015-R	3.0	1.5	21	2.35	4.8	○			●
	XGM4020-R	4.0	2	21	3.3	4.8	○			●
	XGM5025-R	5.0	2.5	26	4.1	5.8	○			



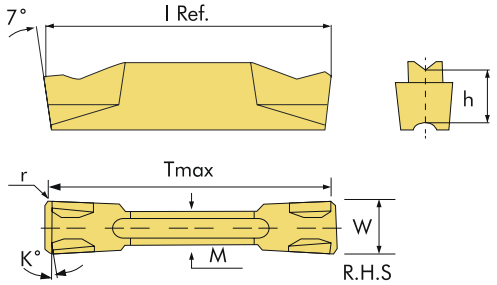
● STOCKABLE ○ NON STOCKABLE

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 ○ NONSTOCKABLE

XGDB-XGJ-XDT



"XGDB"

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

Designation	W±0.05	r	M	l	K	h	XT310
XGDB02	2.0	0.20	1.7	20	0-15	4.7	●
XGDB03	3.0	0.20	2.4	20	0-15	4.7	●
XGDB04	4.0	0.30	3.0	20	0-15	4.7	●

"XGJ"

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

Designation	W±0.05	r	M	l	K	h	XT310
XGJ02	2.0	0.20	1.7	20	0-15	4.7	●
XGJ03	3.0	0.20	2.4	20	0-15	4.7	●
XGJ04	4.0	0.30	3.0	20	0-15	4.7	●

"XDT"

Double ended inserts for turning and grooving with "T" type chip breaker

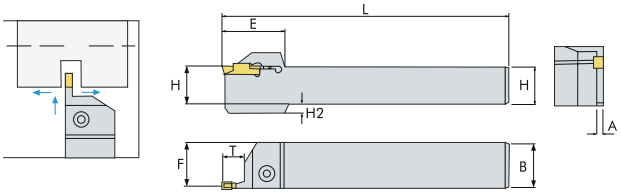
Designation	W±0.05	r	M	l	K	h	XT310
XDT02	2.0	0.20	1.7	20	0-15	4.7	●
XDT03	3.0	0.20	2.4	20	0-15	4.7	●
XDT04	4.0	0.30	3.0	20	0-15	4.7	●

● STOCKABLE o NONSTOCKABLE

TTER / L

Designation	H	B	L	F	E	A	Tmax	Inserts	Screw	Wrench	AVAILABILITY
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 2020-2T12	20	20	125	19.1	32		12.0				●
TTER/L 2525-2T12	25	25	150	24.1							●
TTER/L 2020-2T17	20	20	125	19.1	37		17.0				●
TTER/L 2525-2T17	25	25	150	24.1							●
TTER/L 2020-3T09	20	20	125	18.8	32	2.4	9.0	XGDB03 / XGJ03			●
TTER/L 2525-3T09	25	25	150	23.8							●
TTER/L 2020-3T12	20	20	125	18.8			12.0				●
TTER/L 2525-3T12	25	25	150	23.8							●
TTER/L 2020-3T20	20	20	125	18.8	38.5		20.0				●
TTER/L 2525-3T20	25	25	150	23.8							●
TTER/L 2020-4T10	20	20	125	18.8	32	3.0	10	XGDB04 / XGJ04	M6x16N	L-W5	●
TTER/L 2525-4T10	25	25	150	23.8							●
TTER/L 2020-4	20	20	125	18.8	33		15.0				●
TTER/L 2525-4	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 o NONSTOCKABLE



Notes

Notes

XCUT®
TECHNOLOGIES

THREADING

www.x-cut.in

INDEX

TERMS & CONDITIONS

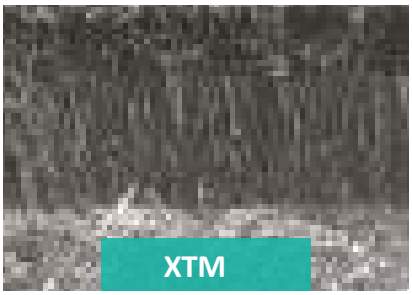
1. NO LIABILITY CAN BE ACCEPTED FOR PRINTING ERRORS OR TECHNICAL CHANGES OF ANY KIND.
2. OUR CONDITIONS OF SALES & TERMS OF PAYMENT APPLY ON AVAILABLE REQUEST.
3. LEAD TIME FOR ALL TOOLS IS 4-6 WEEKS.
4. ALL SPECIFICATIONS IN THIS CATALOGUE ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.
5. DIMENSIONS & LENGTH OF TOOLS MAY VARY FROM INDICATION IN CATALOGUE.
6. FOR PRODUCTS/SIZE OTHER THAN THOSE MENTIONED IN THE CATALOGUE, PLEASE FILL IN THE ENQUIRY SHEET AT THE END OF THIS CATALOGUE.

Notes

THREAD TURNING INSERTS- MOULDED

GRADE INFORMATION

- SPECIAL TiAIN Coating With added toughness
- Universal grade which workon all materials and allaplications
- Wide Variety of threads including ISO, UN, W, NPT, BSPT and partical Profiles



- 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 applcations

Thread Turning

PRODUCT DESIGNATION

EXAMPLE: 16ER12UN

16	E	R	12	UN		XTM

L (mm) I.C.

06 or	0	5/32"
08 or	1	3/16
11 or	2	1/4"
16 or	3	3/8"
22 or	4	1/2"
22 or	4N	1/2"N
27 or	5	5/8"
27 or	5N	5/8"N

E = *External*

I = *Internal*

R= *Right Hand*

L= *Left Hand*

Pitch

in mm:

0.35 - 10

Threads per Inch

72-2

M =

Tooth

Carbide Grade:

XTM
XTB

Full Profile:

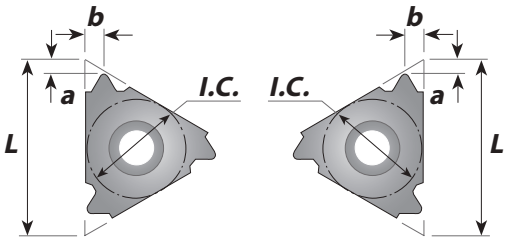
ISO
UN
WHIT
NPT
BSPT

Partial Profile:

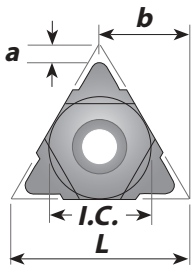
A60	A55
U60	U55
G60	G55
AG60	AG55
N60	N55
Q60	Q55

PARTIAL PROFILE 60 °

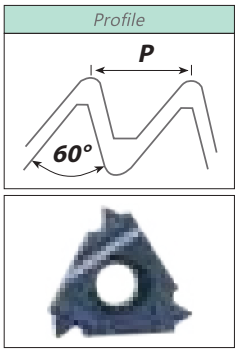
EX-RH IN-LH **IN-RH EX-LH**



N TYP



Profile

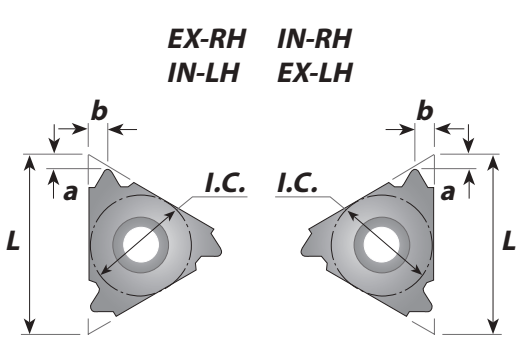


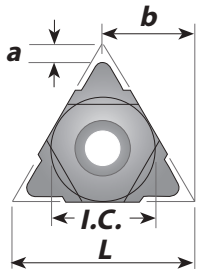
(Item Number)	(Pitch)		(Length)	(Dimensions in mm)	
	mm	(TPI)	L	a	b
11ERA60	0.5 - 1.5	48 - 16	11	0.8	0.9
2IRA60					
16ERAG60	0.5 - 3.0	48 - 8	16	1.2	1.7
16IRAG60					
16ERA60	0.5 - 1.5	48 - 16	16	0.8	0.9
16IRA60					
16ERG60	1.75 - 3.0	14 - 8	16	1.2	1.7
16IRG60					

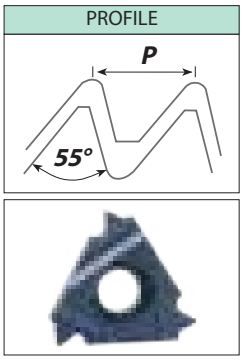
ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

EL and IL upon Request

PARTIAL PROFILE 55 ^{0}





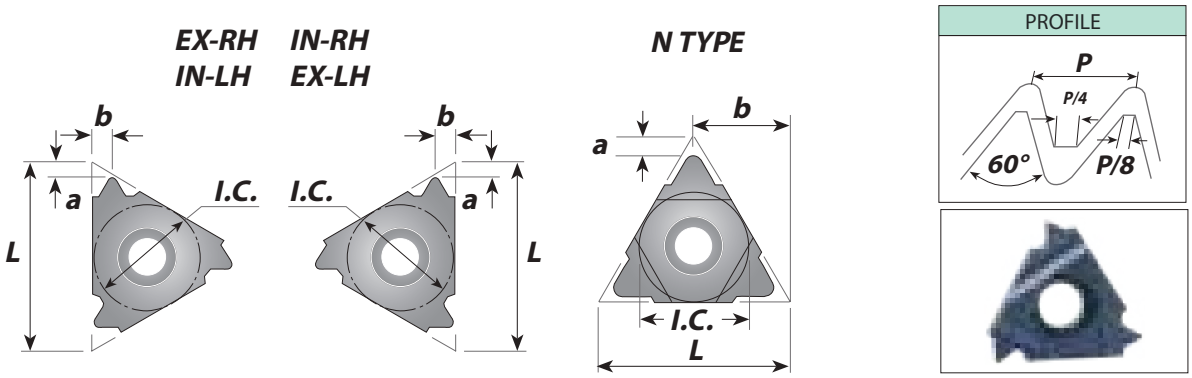


(Item Number)	(Pitch)		(Length)	(Dimensions in mm)	
	mm	(TPI)	L	a	b
11ERA55	0.5 - 1.5	48 - 16	11	0.8	0.9
11IRA55					
16ERAG55	0.5 - 3.0	48 - 8	16	1.2	1.7
16IRAG55					
16ERA55	0.5 - 1.5	48 - 16	16	0.8	0.9
16IRA55					
161ERG55	1.75 - 3.0	14 - 8	16	1.2	1.7
16IRG55					

ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

EL and IL upon Request

ISO – METRIC



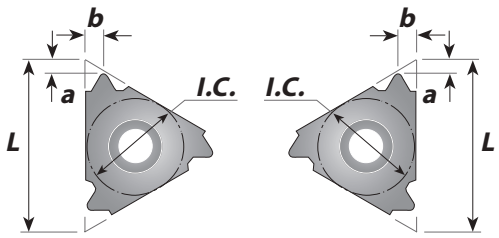
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)	
	mm	L	a	b
11ER1.0ISO	1.0	11	0.7	0.7
11IR1.0ISO			0.6	0.7
11ER1.25ISO	1.25	11	0.8	0.9
11IR1.25ISO			0.8	0.8
11ER1.5ISO	1.5	11	0.8	1.0
11IR1.5ISO				
11ER2.0ISO	2.0	11	0.8	1.1
11IR2.0ISO	2.0	11	0.8	0.9

ER = *External Right* **IR** = *Internal Right* **EL** = *External Left* **IL** = *Internal Left*

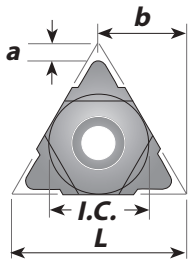
EL and IL upon Request

ISO – METRIC

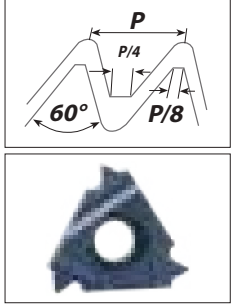
EX-RH IN-LH **IN-RH EX-LH**



N TYPE



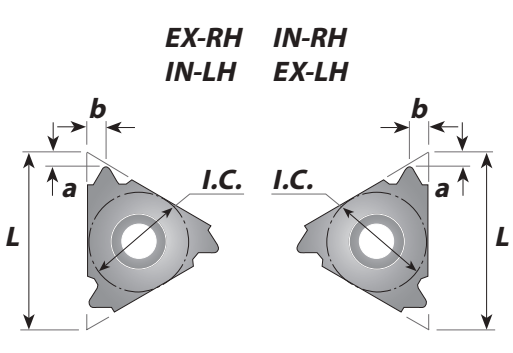
Profile

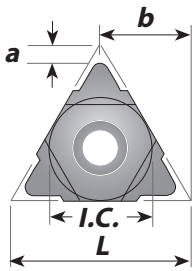


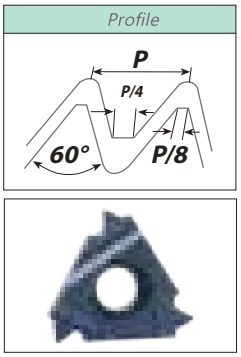
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)	
	mm	L	a	b
16ER1.0ISO	1.0	16	0.7	0.7
16IR1.0ISO			0.6	0.7
16ER1.25ISO	1.25	16	0.8	0.9
16IR1.25ISO				
16ER1.5ISO	1.5	16	0.8	1.0
16IR1.5ISO				
16ER1.75ISO	1.75	16	0.9	1.2
16IR1.75ISO				
16ER2.0ISO	2.0	16	1.0	1.3
16IR2.0ISO				
16ER2.5ISO	2.5	16	1.1	1.5
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				

ER = *External Right* **IR** = *Internal Right* **EL** = *External Left* **IL** = *Internal Left*
EL and IL upon Request

ISO–METRIC







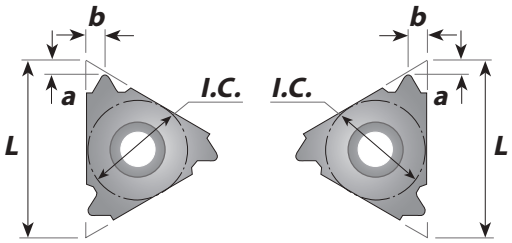
(Item Number)	(Pitch) mm	(Length) L	(Dimensions in mm) a	b
22ER3.5ISO	3.5	22	1.6	2.3
22IR3.5ISO				
22ER4.0ISO	4.0	22	1.6	2.3
22IR4.0ISO				
22ER4.5ISO	4.5	22	1.7	2.4
22IR4.5ISO			1.6	2.4
22ER5.0ISO	5.0	22	1.7	2.5
22IR5.0ISO			1.6	2.3
22IR5.5ISO	5.5	22	1.6	2.3
22ER6.0ISO*	6.0	22	1.9	2.7
22IR6.0ISO		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

ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

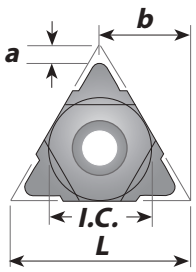
EL and IL upon Request

UN UNIFIED UNC, UNF, UNEF, UNS

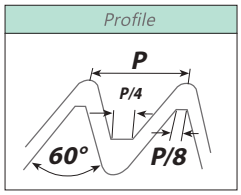
EX-RH IN-LH **IN-RH EX-LH**

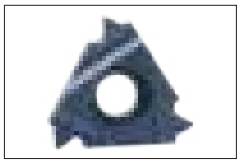


N TYPE



Profile





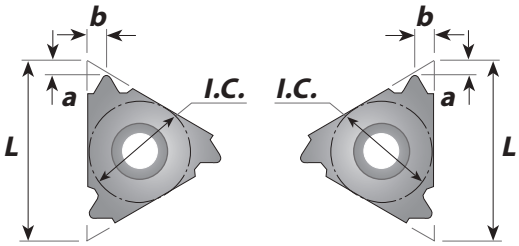
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
16ER24UN	24	16	0.7	0.8
16IR24UN				
16ER20UN	20	16	0.8	0.9
16IR20UN				
16ER18UN	18	16	0.8	1.0
16IR18UN				
16ER16UN	16	16	0.9	1.1
16IR16UN				
16ER14UN	14	16	1.0	1.2
16IR14UN			0.9	1.2
16ER12UN	12	16	1.1	1.4
16IR12UN				
16ER10UN	10	16	1.1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

ER = *External Right* **IR =** *Internal Right* **EL** *External Left* **IL =** *Internal Left*

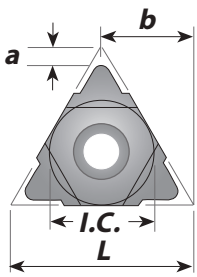
EL and IL upon Request

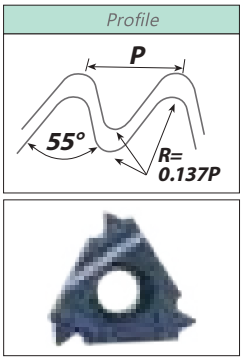
WHITWORTH 55° BSW, BSF, BSP, BSB

EX-RH IN-LH **IN-RH EX-LH**



N TYPE



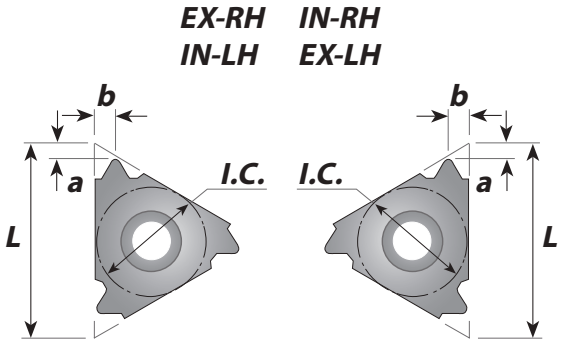


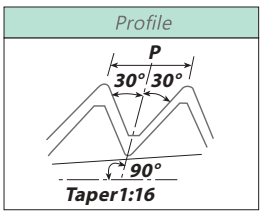
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
16ER19W	19	16	0.8	1.0
16IR19W	19	16	0.8	1.0
16ER14W	14	16	1.0	1.2
16IR14W	14	16	1.0	1.2
16ER12W	12	16	1.1	1.4
16IR12W	12	16	1.1	1.4
16ER11W	11	16	1.1	1.5
16IR11W	11	16	1.1	1.5

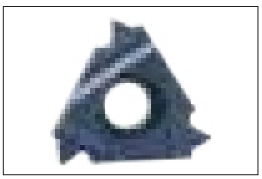
ER = *External Right* IR = *Internal Right* EL = *External Left* IL = *Internal Left*

EL and IL upon Request

NPT







(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) 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				

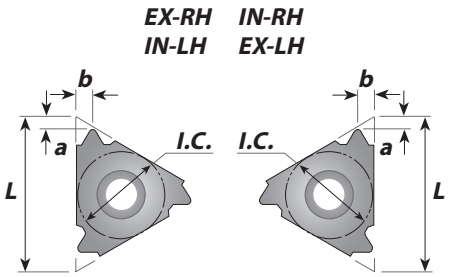
External Right
nd IL upon Request

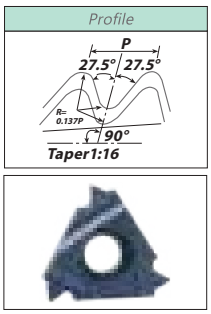
IR = *Internal Right*

EL = *External Left*

IL = *Internal Left*

BSPT





(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) 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

Thread Turning Inserts - Ground

| *PRODUCT DESIGNATION*

| *EXAMPLE:* **3ER12UN**

3	E	R		12	UN		XTG

L (mm) I.C.

06 or	0	5/32"
08 or	1	3/16
11 or	2	1/4"
16 or	3	3/8"
22 or	4	1/2"
22 or	4N	1/2"N
27 or	5	5/8"
27 or	5N	5/8"N

E = *External*

I = *Internal*

R= *Right Hand*

L= *Left Hand*

Pitch

in mm:
0.35 - 10

Threads per Inch
72-2

Full Profile:

ISO
UN
WHIT
NPTF
BSPT
ACME
STUB ACME
TRAPEZ
ROUND
UNJ
MJ
PG
AMERICAN BUTTRESS
SAGE
API

Partial Profile:

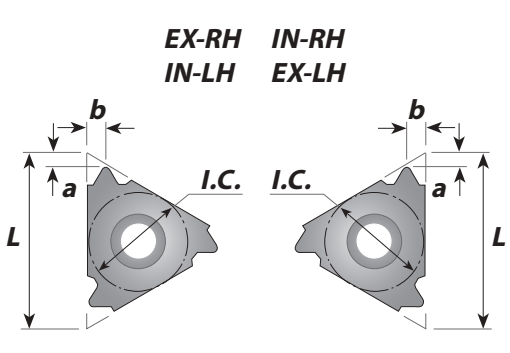
A60	A55
U60	U55
G60	G55
AG60	AG55
N60	N55
Q60	Q55

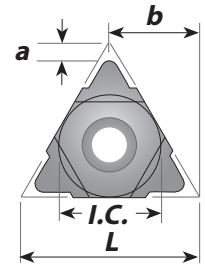
M =

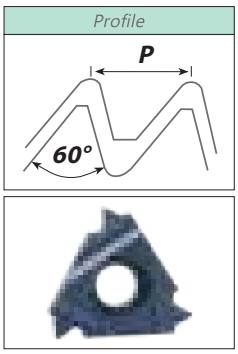
Tooth

Carbide Grade:
XTG

PARTIAL PROFILE 60°







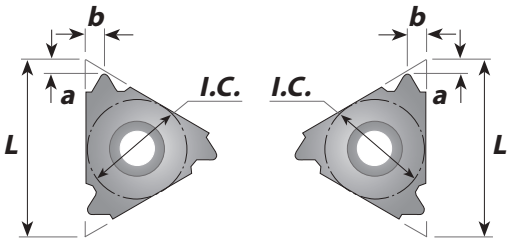
(Item Number)	(Pitch)		(Length)	(Dimensions in mm)	
	mm	(TPI)	L	a	b
0IRA60	0.5 - 1.25	48 - 20	6	0.6	0.6
1IRA60	0.5 - 1.5	48 - 16	8	0.6	0.7
2ERA60	0.5 - 1.5	48 - 16	11	0.8	0.9
2IRA60					
3ERA60	0.5 - 1.5	48 - 16	16	0.8	0.9
3IRA60					
3ERG60	1.75 - 3.0	14 - 8	16	1.2	1.7
3IRG60					

ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

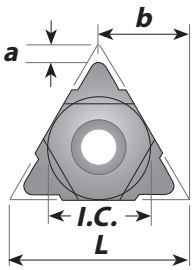
EL and IL upon Request

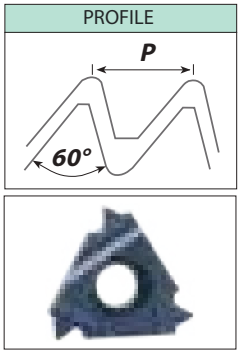
PARTIAL PROFILE 60°

EX-RH IN-RH
IN-LH EX-LH



N TYPE





(Item Number)	(Pitch)		(Length)	(Dimensions in mm)	
	mm	(TPI)	L	a	b
3ERAG60	0.5 - 3.0	48 - 8	16	1.2	1.7
3IRAG60					
4ERN60	3.5 - 5.0	7 - 5	22	1.7	2.5
4IRN60					
5ERQ60	5.5 - 6.0	4.5 - 2.75	27	2.1	3.1
5IRQ60					

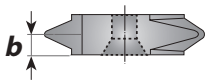
ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

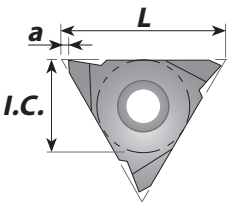
EL and IL upon Request

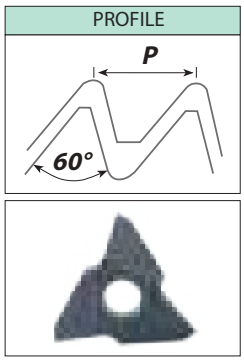
Ordering Code: 3ERAG60XTG / 16ERAG60XTG

PARTIAL PROFILE 60°

VERTICAL







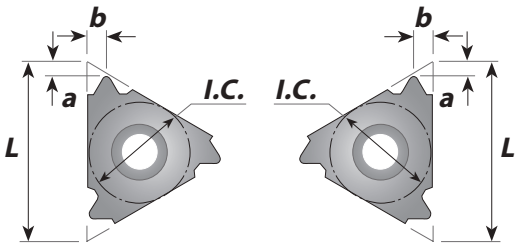
(Item Number)	(Pitch)		(Length)	(Dimensions in mm)	
	mm	(TPI)	L	a	b
3VERA60	0.5 - 1.5	48 - 16	16	1.0	0.9
3VERG60	1.75 - 3.0	14 - 8	16	1.0	1.8
3VERAG60	0.5 - 3.0	48 - 8	16	1.0	1.8

ER = *External Right* **EL** = *External Left*

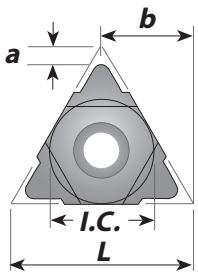
EL upon Request

PARTIAL PROFILE 55°

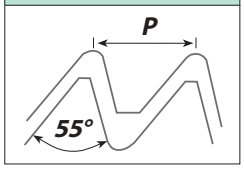
EX-RH IN-RH
IN-LH EX-LH



N TYPE



PROFILE

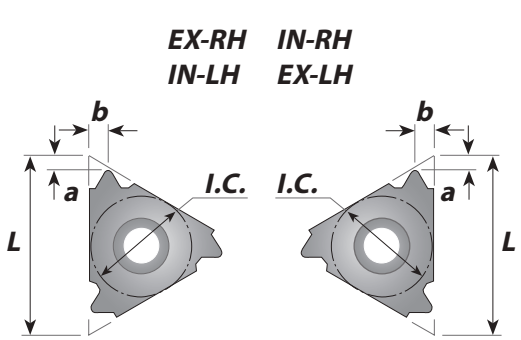


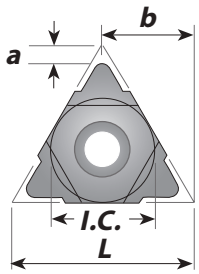
(Item Number)	(Pitch)		(Length)	(Dimensions in mm)	
	mm	(TPI)	L	a	b
0IRA55	0.5 - 1.25	48 - 20	6	0.5	0.6
1IRA55	0.5 - 1.5	48 - 16	8	0.6	0.7
2ERA55	0.5 - 1.5	48 - 16	11	0.8	0.9
2IRA55					
3ERA55	0.5 - 1.5	48 - 16	16	0.8	0.9
3IRA55					
3ERG55	1.75 - 3.0	14 - 8	16	1.2	1.7
3IRG55					

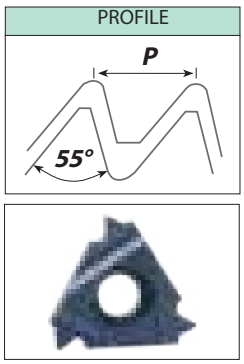
ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

EL and IL upon Request

PARTIAL PROFILE 55°







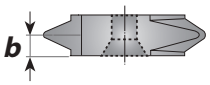
(Item Number)	(Pitch)		(Length)	(Dimensions in mm)	
	mm	(TPI)	L	a	b
3ERAG55	0.5 - 3.0	48 - 8	16	1.2	1.7
3IRAG55					
4ERN55	3.5 - 5.0	7 - 5	22	1.7	2.5
4IRN55					
5ERQ55	5.5 - 6.0	4.5 - 4	27	2.0	2.9
5IRQ55					

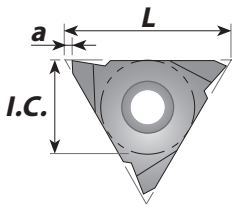
ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

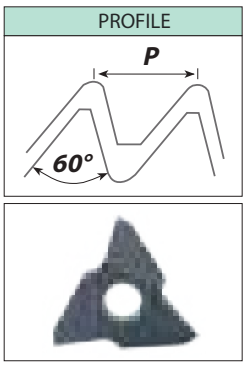
EL and IL upon Request

PARTIAL PROFILE 55 °

VERTICAL







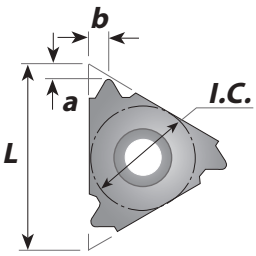
(Item Number)	(Pitch)		(Length)	(Dimensions in mm)	
	mm	(TPI)	L	a	b
3VERA55	0.5 - 1.5	48 - 16	16	1.0	0.9
3VERAG55	0.5 - 3.0	48 - 8	16	1.0	1.8
3VERG55	1.75 - 3.0	14 - 8	16	1.0	1.7

ER = *External Right* **IR** = *Internal Right* **EL** = *External Left* **IL** = *Internal Left*

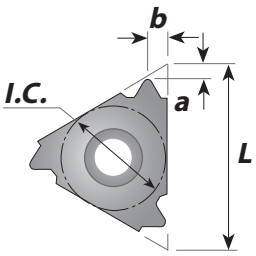
EL and IL upon Request

ISO – METRIC

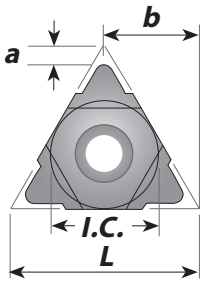
EX-RH IN-LH



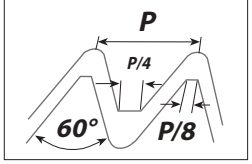
IN-RH EX-LH

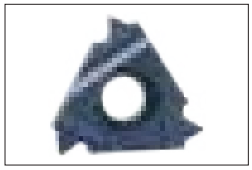


N TYPE



PROFILE



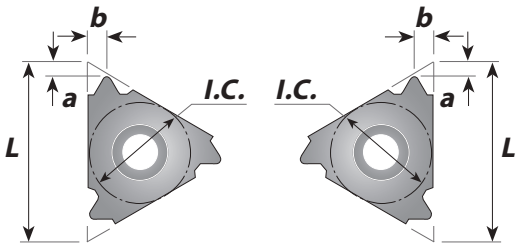


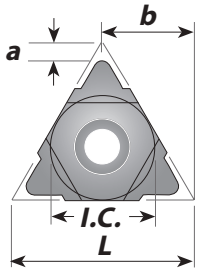
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)	
	mm	L	a	b
0IR0.5ISO	0.5	6	0.9	0.5
0IR0.75ISO	0.75	6	0.8	0.5
0IR1.0ISO	1.0	6	0.7	0.6
0IR1.25ISO	1.25	6	0.6	0.6
1IR0.5ISO	0.5	8	0.6	0.5
1IR0.75ISO	0.75	8	0.6	0.5
1IR1.0ISO	1.0	8	0.6	0.6
1IR1.25ISO	1.25	8	0.6	0.7
1IR1.5ISO	1.5	8	0.6	0.7
1IR1.75ISO	1.75	8	0.6	0.8
2ER0.35ISO	0.35	11	0.8	0.4
2IR0.35ISO			0.8	0.3

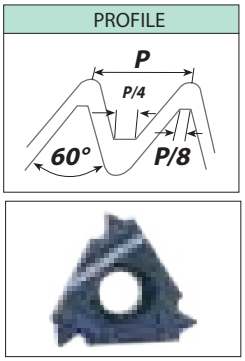
ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

EL and IL upon Request

ISO –METRIC







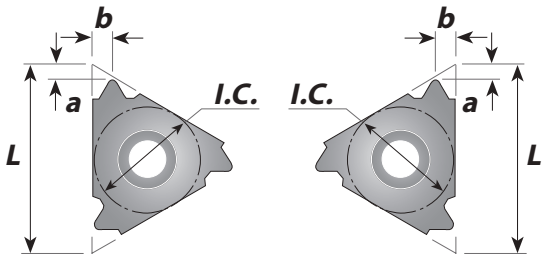
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)	
	mm	L	a	b
2ER0.4ISO	0.4	11	0.7	0.4
2IR0.4ISO			0.8	0.4
2ER0.45ISO	0.45	11	0.7	0.4
2IR0.45ISO			0.8	0.4
2ER0.5ISO	0.5	11	0.6	0.6
2IR0.5ISO				
2ER0.6ISO	0.6	11	0.6	0.6
2IR0.6ISO				
2ER0.7ISO	0.7	11	0.6	0.6
2IR0.7ISO				
2ER0.75ISO	0.75	11	0.6	0.6
2IR0.75ISO				

ER = *External Right* IR = *Internal Right* EL = *External Left* IL = *Internal Left*

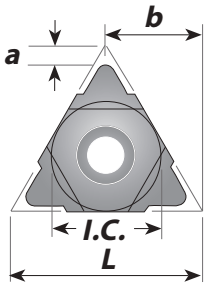
EL and IL upon Request

ISO–METRIC

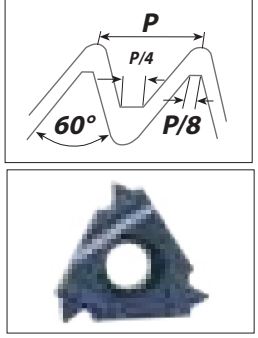
EX-RH IN-RH
IN-LH EX-LH



N TYPE



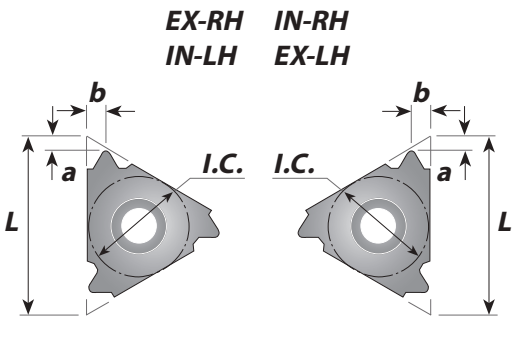
PROFILE

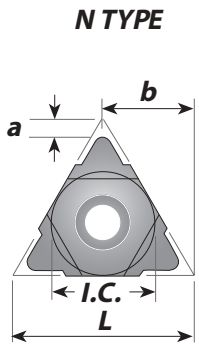


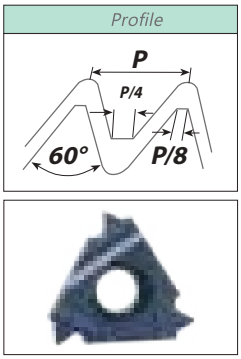
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)	
	mm	L	a	b
2ER0.8ISO	0.8	11	0.6	0.6
2IR0.8ISO				
2ER1.0ISO	1.0	11	0.7	0.7
2IR1.0ISO			0.6	0.7
2ER1.25ISO	1.25	11	0.8	0.9
2IR1.25ISO			0.8	0.8
2ER1.5ISO	1.5	11	0.8	1.0
2IR1.5ISO				
2ER1.75ISO	1.75	11	0.8	1.1
2IR1.75ISO				
2ER2.0ISO	2.0	11	0.8	1.1
2IR2.0ISO			0.8	0.9
2IR2.5ISO	2.5	11	0.8	1.2

ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

ISO – METRIC





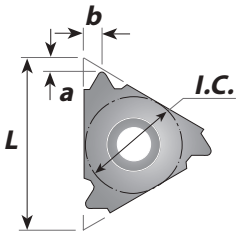


(Item Number)	(Pitch)	(Length)	(Dimensions in mm)	
	mm	L	a	b
3ER0.35ISO	0.35	16	0.8	0.4
3IR0.35ISO			0.8	0.3
3ER0.4ISO	0.4	16	0.7	0.4
3IR0.4ISO			0.8	0.4
3ER0.45ISO	0.45	16	0.7	0.4
3IR0.45ISO			0.8	0.4
3ER0.5ISO	0.5	16	0.6	0.6
3IR0.5ISO				
3ER0.6ISO	0.6	16	0.6	0.6
3IR0.6ISO				
3ER0.7ISO	0.7	16	0.6	0.6
3IR0.7ISO				
3ER0.75ISO	0.75	16	0.6	0.6
3IR0.75ISO				
3ER0.8ISO	0.8	16	0.6	0.6
3IR0.8ISO				

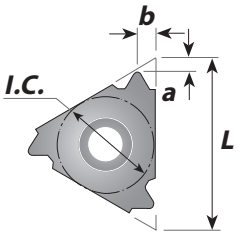
ER = *External Right* **IR** = *Internal Right* **EL** = *External Left* **IL** = *Internal Left*
EL and IL upon Request

ISO – METRIC

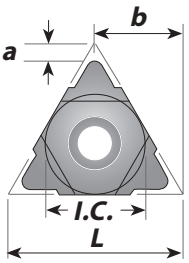
EX-RH
IN-LH



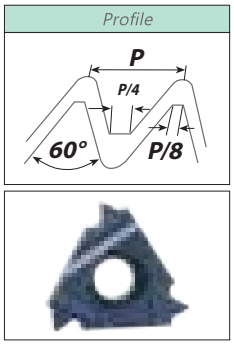
IN-RH
EX-LH



N TYPE



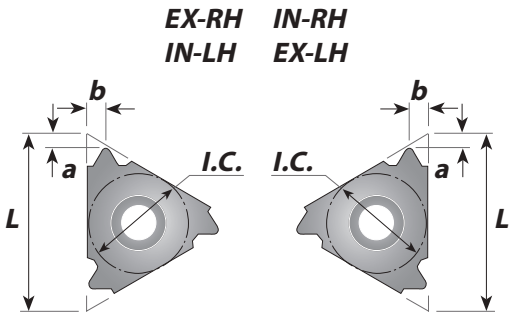
Profile

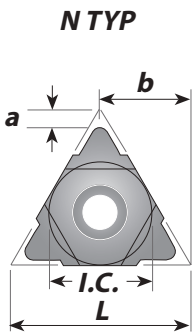


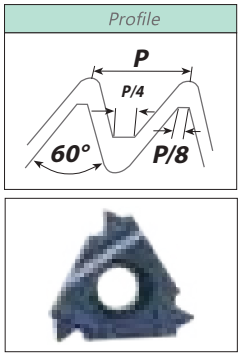
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)	
	mm	L	a	b
3ER1.0ISO	1.0	16	0.7	0.7
3IR1.0ISO			0.6	0.7
3ER1.25ISO	1.25	16	0.8	0.9
3IR1.25ISO				
3ER1.5ISO	1.5	16	0.8	1.0
3IR1.5ISO				
3ER1.75ISO	1.75	16	0.9	1.2
3IR1.75ISO				
3ER2.0ISO	2.0	16	1.0	1.3
3IR2.0ISO				
3ER2.5ISO	2.5	16	1.1	1.5
3IR2.5ISO				
3ER3.0ISO	3.0	16	1.2	1.6
3IR3.0ISO			1.1	1.5
3ER3.5ISO	3.5	16	1.2	1.7
3IR3.5ISO				

ER = *External Right* **IR** = *Internal Right* **EL** = *External Left* **IL** = *Internal Left*
EL and IL upon Request

ISO–METRIC







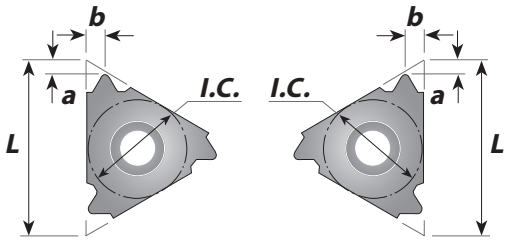
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)	
	mm	L	a	b
4ER3.5ISO	3.5	22	1.6	2.3
4IR3.5ISO				
4ER4.0ISO	4.0	22	1.6	2.3
4IR4.0ISO				
4ER4.5ISO	4.5	22	1.7	2.4
4IR4.5ISO			1.6	2.4
4ER5.0ISO	5.0	22	1.7	2.5
4IR5.0ISO			1.6	2.3
4IR5.5ISO	5.5	22	1.6	2.3
4ER6.0ISO*	6.0	22	1.9	2.7
4IR6.0ISO			1.6	2.4

ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

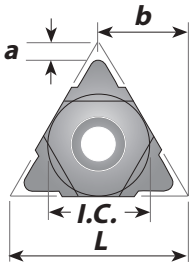
EL and IL upon Request

ISO – METRIC

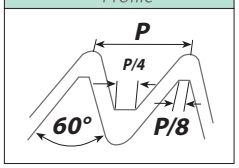
EX-RH IN-RH
IN-LH EX-LH



N TYPE



Profile

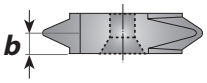


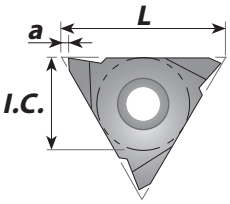
(Item Number)	(Pitch) mm	(Length) L	(Dimensions in mm) a	b
4NER5.5ISO	5.5	22N	2.3	11.0
4NIR5.5ISO			2.4	11.0
4NER6.0ISO	6.0	22N	2.6	11.0
4NIR6.0ISO			2.1	11.0
5ER5.5ISO	5.5	27	1.9	2.7
5IR5.5ISO			1.6	2.3
5ER6.0ISO	6.0	27	2.0	2.9
5IR6.0ISO			1.8	2.5

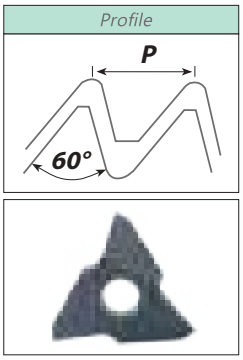
ER = *External Right* IR = *Internal Right* EL = *External Left* IL = *Internal Left*

EL and IL upon Request

ISO – METRIC
VERTICAL



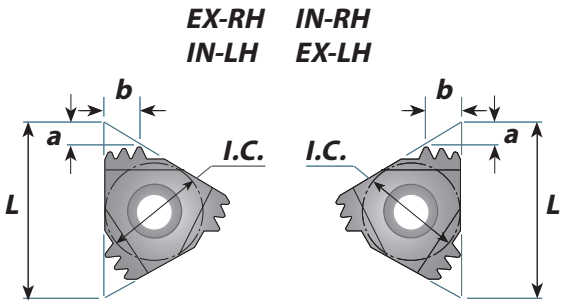


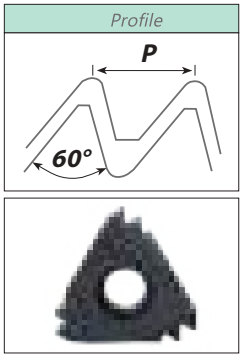


(Item Number)	(Pitch)	(Length)	(Dimensions in mm)	
	mm	L	a	b
3VER0.5ISO	0.5	16	1.0	0.6
3VER0.75ISO	0.75	16	1.0	0.6
3VER0.8ISO	0.8	16	1.0	0.6
3VER1.0ISO	1.0	16	1.0	0.7
3VER1.25ISO	1.25	16	1.0	0.9
3VER1.5ISO	1.5	16	1.0	0.9
3VER1.75ISO	1.75	16	1.0	1.2
3VER2.0ISO	2.0	16	1.0	1.3
3VER2.5ISO	2.5	16	1.0	1.5
3VER3.0ISO	3.0	16	1.0	1.7

ER = External Right IR = Internal Right EL = External Left IL = Internal Left

ISO – METRIC



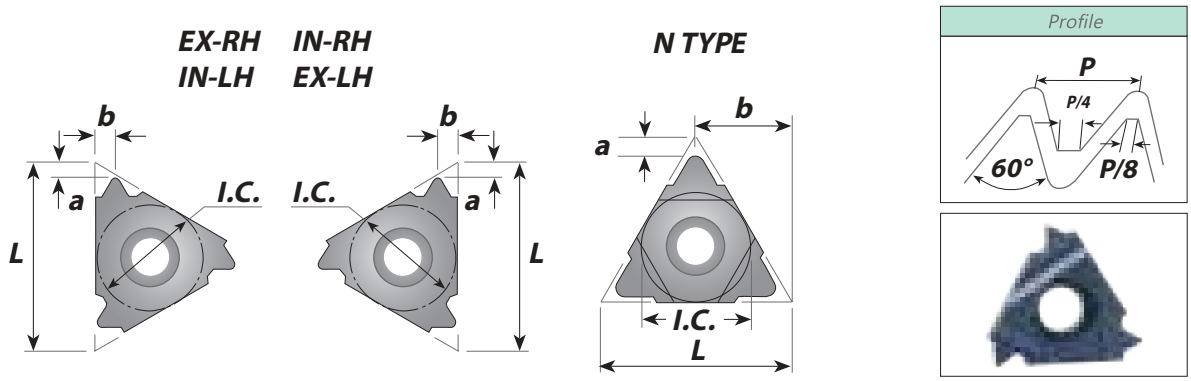


Multi-tooth

(Item Number)	(Pitch)	(Length)	(Dimensions in mm)	
	mm	L	a	b
3ER1.0ISO3M	1.0	16	1.7	2.5
3IR1.0ISO3M				
3ER1.5ISO2M	1.5	16	1.5	2.3
3IR1.5ISO2M				
4ER1.5ISO3M	1.5	22	2.3	3.7
4IR1.5ISO3M				
4ER2.0ISO2M	2.0	22	2.0	3.0
4IR2.0ISO2M				
4ER2.0ISO3M	2.0	22	3.1	5.0
4IR2.0ISO3M				
5ER3.0ISO2M	3.0	27	2.9	4.6
5IR3.0ISO2M				

ER = *External Right* IR = *Internal Right*

UN UNIFIED UNC, UNF, UNEF, UNS

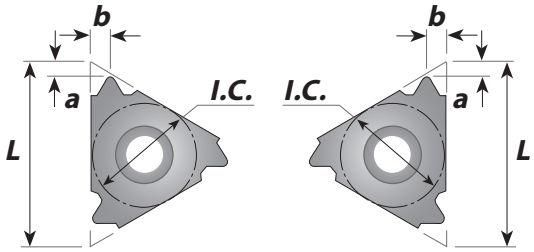


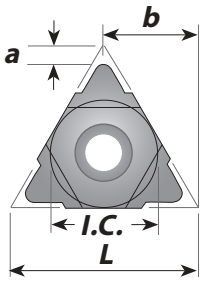
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
0IR32UN	32	6	0.8	0.5
0IR28UN	28	6	0.8	0.6
0IR24UN	24	6	0.7	0.6
0IR20UN	20	6	0.6	0.6
0IR18UN	18	6	0.6	0.7

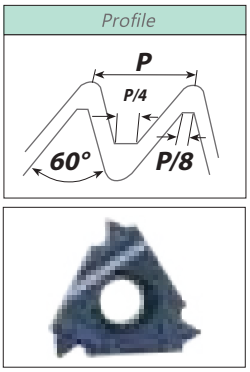
ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

EL and IL upon Request

UN UNIFIED UNC, UNF, UNEF, UNS







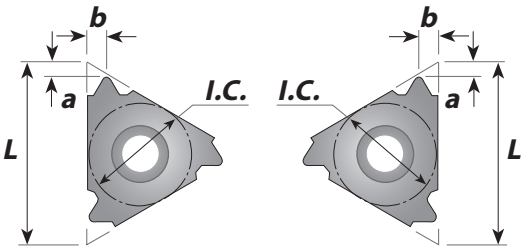
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
1IR32UN	32	8	0.6	0.5
1IR28UN	28	8	0.6	0.6
1IR24UN	24	8	0.6	0.6
1IR20UN	20	8	0.6	0.7
1IR18UN	18	8	0.6	0.7
1IR16UN	16	8	0.6	0.7
1IR14UN	14	8	0.6	0.8
1IR13UN	13	8	0.8	0.9
2ER72UN	72	11	0.8	0.4
2IR72UN			0.8	0.3
2ER64UN	64	11	0.8	0.4
2IR64UN				
2ER56UN	56	11	0.7	0.4
2IR56UN				

ER = *External Right* IR = *Internal Right* EL = *External Left* IL = *Internal Left*

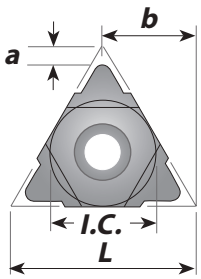
EL and IL upon Request

UN UNIFIED UNC, UNF, UNEF, UNS

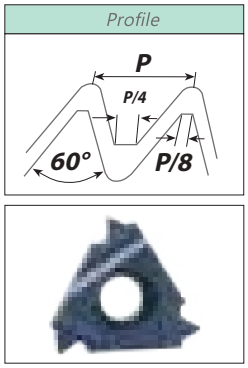
EX-RH IN-LH **IN-RH EX-LH**



N TYPE



Profile



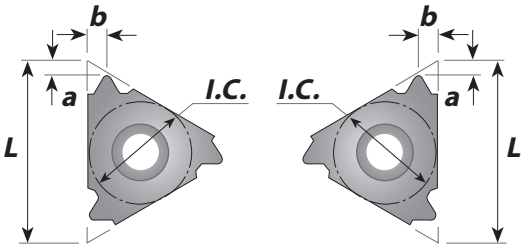
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
2ER48UN	48	11	0.6	0.6
2IR48UN				
2ER44UN	44	11	0.6	0.6
2IR44UN				
2ER40UN	40	11	0.6	0.6
2IR40UN				
2ER36UN	36	11	0.6	0.6
2IR36UN				
2ER32UN	32	11	0.6	0.6
2IR32UN				
2ER28UN	28	11	0.6	0.7
2IR28UN				
2ER27UN	27	11	0.7	0.8
2IR27UN				

ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

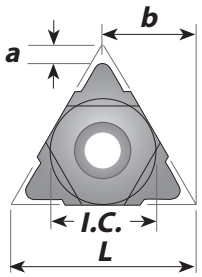
EL and IL upon Request

UN UNIFIED UNC, UNF, UNEF, UNS

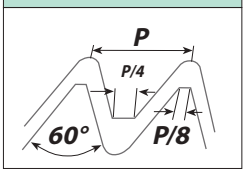
EX-RH IN-LH **IN-RH EX-LH**

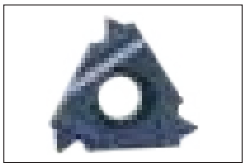


N TYPE



Profile



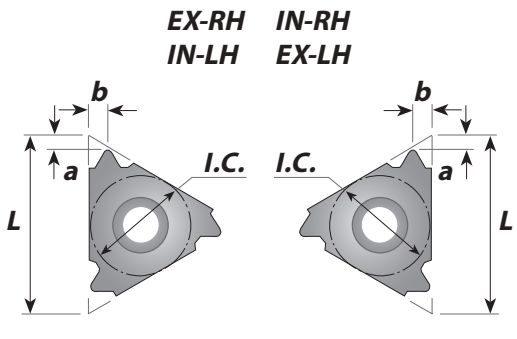


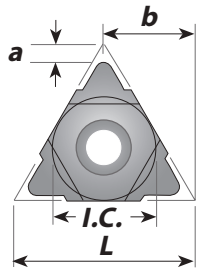
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
2ER24UN	24	11	0.7	0.8
2IR24UN				
2ER20UN	20	11	0.8	0.9
2IR20UN				
2ER18UN	18	11	0.8	1.0
2IR18UN				
2ER16UN	16	11	0.9	1.1
2IR16UN				
2ER14UN	14	11	0.9	1.1
2IR14UN				
3ER72UN	72	16	0.8	0.4
3IR72UN			0.8	0.3
3ER64UN	64	16	0.8	0.4
3IR64UN				

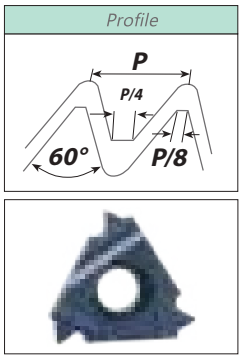
ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

EL and IL upon Request

UN UNIFIED UNC, UNF, UNEF, UNS







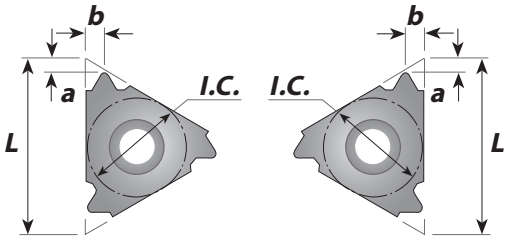
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
2ER13UN	13	11	0.8	1.0
2IR13UN				
2ER12UN	12	11	0.9	1.1
2IR12UN				
2ER11UN	11	11	0.8	1.1
2IR11UN				
3ER72UN	72	16	0.8	0.4
3IR72UN			0.8	0.3
3ER64UN	64	16	0.8	0.4
3IR64UN				
3ER56UN	56	16	0.7	0.4
3IR56UN				
3ER48UN	48	16	0.6	0.6
3IR48UN				
3ER44UN	44	16	0.6	0.6
3IR44UN				
3ER40UN	40	16	0.6	0.6
3IR40UN				

ER = *External Right* IR = *Internal Right* EL = *External Left* IL = *Internal Left*

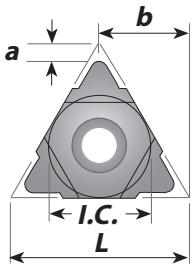
EL and IL upon Request

UN UNIFIED UNC, UNF, UNEF, UNS

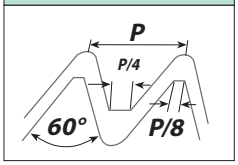
EX-RH IN-LH **IN-RH EX-LH**



N TYPE



Profile

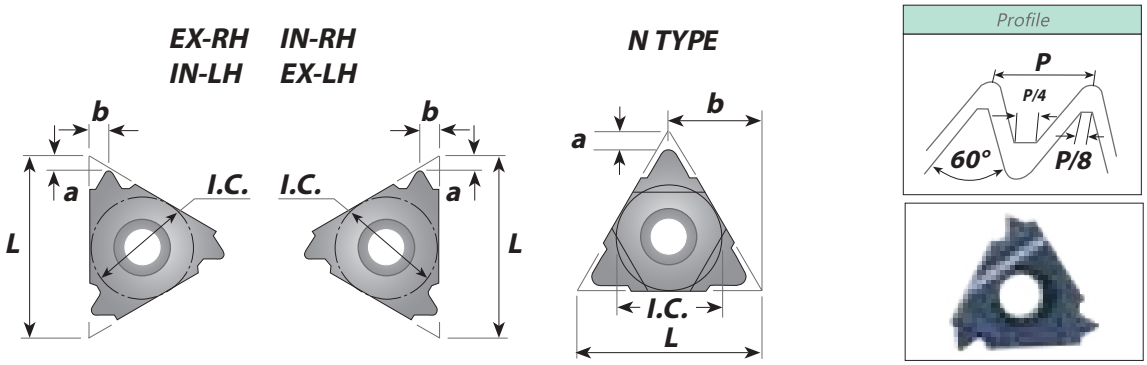


(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
3ER36UN	36	16	0.6	0.6
3IR36UN				
3ER32UN	32	16	0.6	0.6
3IR32UN				
3ER28UN	28	16	0.6	0.7
3IR28UN				
3ER27UN	27	16	0.7	0.8
3IR27UN				
3ER24UN	24	16	0.7	0.8
3IR24UN				
3ER20UN	20	16	0.8	0.9
3IR20UN				
3ER18UN	18	16	0.8	1.0
3IR18UN				
3ER16UN	16	16	0.9	1.1
3IR16UN				

ER = *External Right* **IR =** *Internal Right* **EL** *External Left* **IL =** *Internal Left*

EL and IL upon Request

UN UNIFIED UNC, UNF, UNEF, UNS



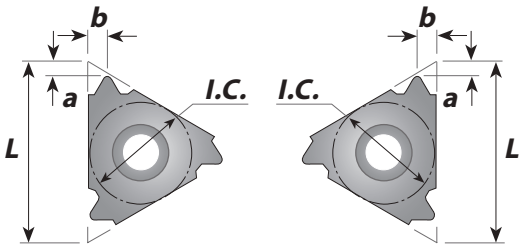
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
3ER14UN	14	16	1.0	1.2
3IR14UN			0.9	1.2
3ER13UN	13	16	1.0	1.3
3IR13UN				
3ER12UN	12	16	1.1	1.4
3IR12UN				
3ER11.5UN	11.5	16	1.1	1.5
3IR11.5UN				
3ER11UN	11	16	1.1	1.5
3IR11UN				
3ER10UN	10	16	1.1	1.5
3IR10UN				
3ER9UN	9	16	1.2	1.7
3IR9UN				
3ER8UN	8	16	1.2	1.6
3IR8UN			1.1	1.5

ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

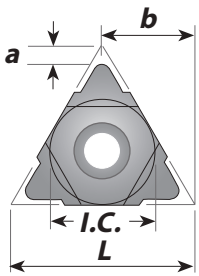
EL and IL upon Request

UN UNIFIED UNC, UNF, UNEF, UNS

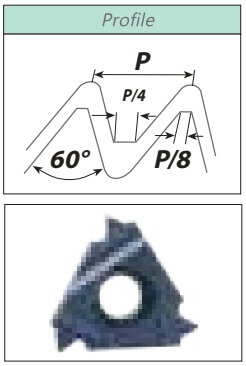
EX-RH IN-RH
IN-LH EX-LH



N TYPE



Profile

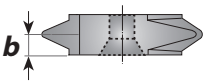


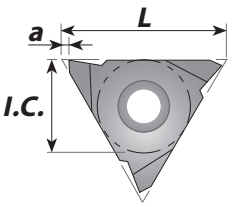
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
4ER7UN	7	22	1.6	2.3
4IR7UN				
4ER6UN	6	22	1.6	2.3
4IR6UN				
4ER5UN	5	22	1.7	2.5
4IR5UN			1.6	2.3
5ER4.5UN	4.5	27	1.9	2.7
5IR4.5UN			1.7	2.4
5ER4UN	4	27	2.5	13.7
5IR4UN			2.8	16.5

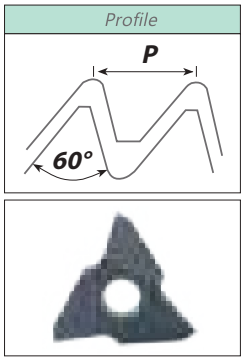
ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

EL and IL upon Request

UN UNIFIED UNC, UNF, UNEF, UNS







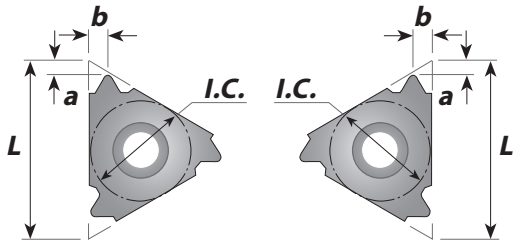
Vertical

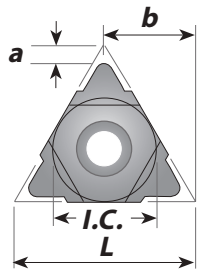
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
3VER32UN	32	16	1.0	0.6
3VER28UN	28	16	1.0	0.7
3VER24UN	24	16	1.0	0.8
3VER20UN	20	16	1.0	0.9
3VER18UN	18	16	1.0	1.0
3VER16UN	16	16	1.0	1.1
3VER14UN	14	16	1.0	1.2
3VER12UN	12	16	1.0	1.4
3VER10UN	10	16	1.0	1.5
3VER8UN	8	16	1.0	1.6

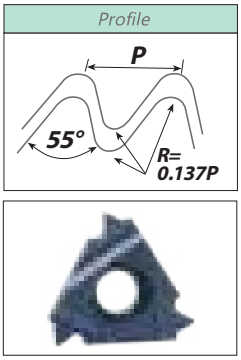
ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

EL and IL upon Request

WHITWORTH 55° BSW, BSF, BSP, BSB





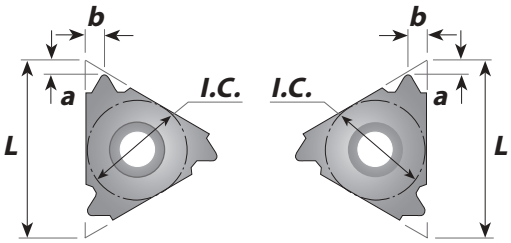


(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
0IR26W	26	6	0.7	0.6
0IR22W	22	6	0.6	0.6
0IR20W	20	6	0.6	0.7
0IR18W	18	6	0.6	0.7
1IR28W	28	8	0.6	0.6
1IR24W	24	8	0.6	0.6
1IR20W	20	8	0.6	0.7
1IR19W	19	8	0.6	0.7
1IR18W	18	8	0.6	0.7
1IR16W	16	8	0.6	0.7

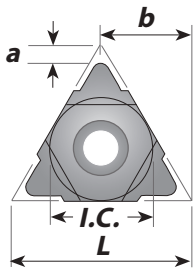
IR = *Internal Right* IL = *Internal Left*

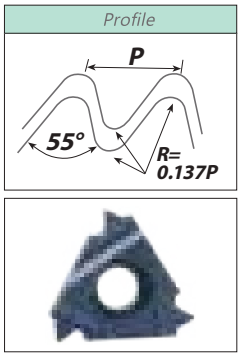
WHITWORTH 55° BSW, BSF, BSP, BSB

EX-RH IN-LH IN-RH EX-LH



N TYP

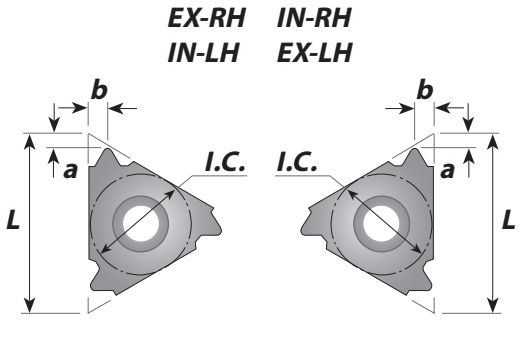




(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
2ER72W	72	11	0.7	0.4
2IR72W				
2ER60W	60	11	0.7	0.4
2IR60W				
2ER56W	56	11	0.7	0.4
2IR56W				
2ER48W	48	11	0.6	0.6
2IR48W				
2ER40W	40	11	0.6	0.6
2IR40W				
2ER36W	36	11	0.6	0.6
2IR36W				
2ER32W	32	11	0.6	0.6
2IR32W				
2ER28W	28	11	0.6	0.7
2IR28W				

ER = *External Right* IR = *Internal Right* EL = *External Left* IL = *Internal Left*

WHITWORTH 55° BSW, BSF, BSP, BSB

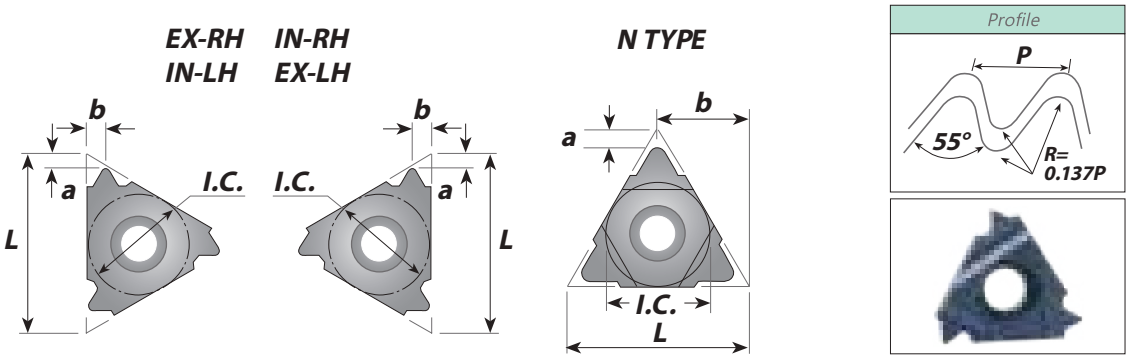


(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
2ER26W	26	11	0.7	0.7
2IR26W				
2ER24W	24	11	0.7	0.8
2IR24W				
2ER22W	22	11	0.8	0.9
2IR22W				
2ER20W	20	11	0.8	0.9
2IR20W				
2ER19W	19	11	0.8	1.0
2IR19W				
2ER18W	18	11	0.8	1.0
2IR18W				
2ER16W	16	11	0.9	1.1
2IR16W				

ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

EL and IL upon Request

WHITWORTH 55° BSW, BSF, BSP, BSB

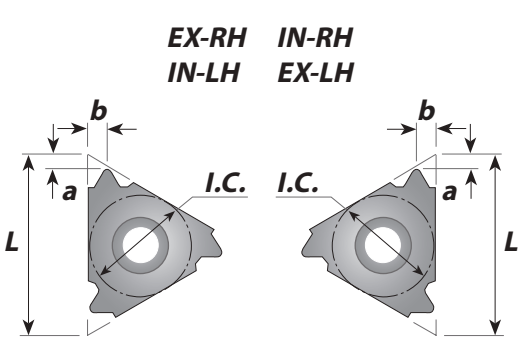


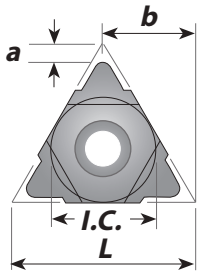
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
2ER14W	14	11	0.9	1.1
2IR14W				
2IR12W	12	11	1.0	1.1
2IR11W	11	11	0.9	1.2
3ER72W	72	16	0.7	0.4
3IR72W				
3ER60W	60	16	0.7	0.4
3IR60W				
3ER56W	56	16	0.7	0.4
3IR56W				
3ER48W	48	16	0.6	0.6
3IR48W				
3ER40W	40	16	0.6	0.6
3IR40W				

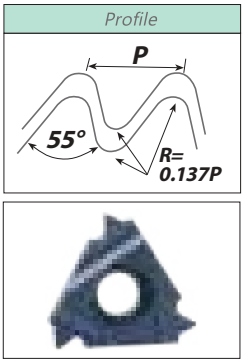
ER *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

EL and IL upon Request

WHITWORTH 55° BSW, BSF, BSP, BSB







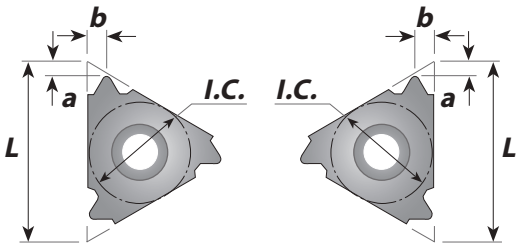
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
3ER36W	36	16	0.6	0.6
3IR36W				
3ER32W	32	16	0.6	0.6
3IR32W				
3ER28W	28	16	0.6	0.7
3IR28W				
3ER26W	26	16	0.7	0.7
3IR26W				
3ER24W	24	16	0.7	0.8
3IR24W				
3ER22W	22	16	0.8	0.9
3IR22W				
3ER20W	20	16	0.8	0.9
3IR20W				

ER = *External Right* **IR** = *Internal Right* **EL** = *External Left* **IL** = *Internal Left*

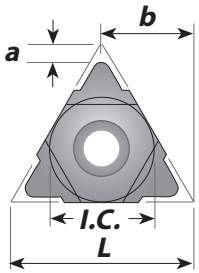
EL and IL upon Request

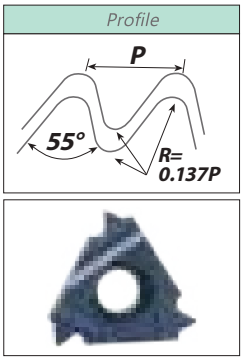
WHITWORTH 55° BSW, BSF, BSP, BSB

EX-RH IN-RH
IN-LH EX-LH



N TYPE



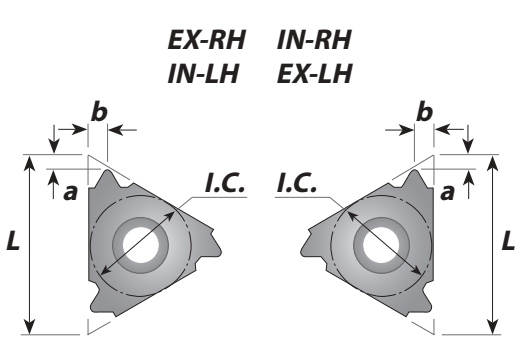


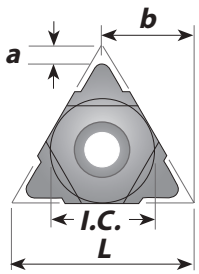
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
3ER19W	19	16	0.8	1.0
3IR19W				
3ER18W	18	16	0.8	1.0
3IR18W				
3ER16W	16	16	0.9	1.1
3IR16W				
3ER14W	14	16	1.0	1.2
3IR14W				
3ER12W	12	16	1.1	1.4
3IR12W				
3ER11W	11	16	1.1	1.5
3IR11W				
3ER10W	10	16	1.1	1.5
3IR10W				
3ER9W	9	16	1.2	1.7
3IR9W				

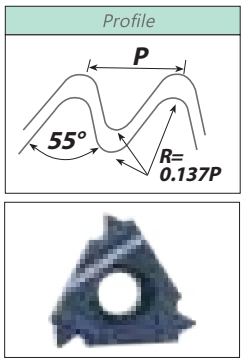
ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

EL and IL upon Request

WHITWORTH 55° BSW, BSF, BSP, BSB





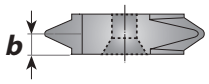


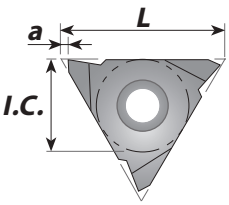
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
3ER8W	8	16	1.2	1.5
3IR8W				
4ER7W	7	22	1.6	2.3
4IR7W				
4ER6W	6	22	1.6	2.3
4IR6W				
4ER5W	5	22	1.7	2.4
4IR5W				
5ER4.5W	4.5	27	1.8	2.6
5IR4.5W				
5ER4W	4	27	2.0	2.9
5IR4W				

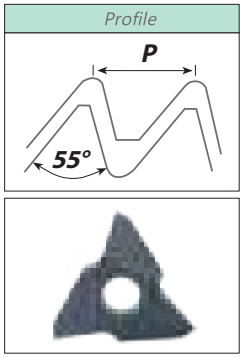
ER = *External Right* IR = *Internal Right* EL *External Left* IL = *Internal Left*

EL and IL upon Request

55° BSW, BSF, BSP, BSB
VERTICAL





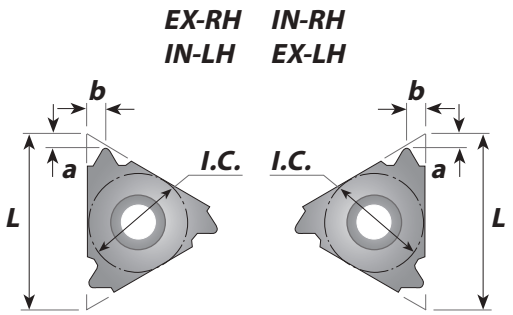


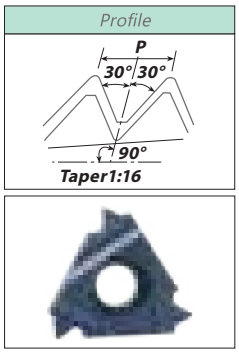
Vertical

(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
3VER20W	20	16	1.0	0.9
3VER19W	19	16	1.0	0.9
3VER18W	18	16	1.0	1.0
3VER16W	16	16	1.0	1.0
3VER14W	14	16	1.0	1.2
3VER12W	12	16	1.0	1.4
3VER11W	11	16	1.0	1.5

ER = *External Right* **EL =** *External Left*

NPT



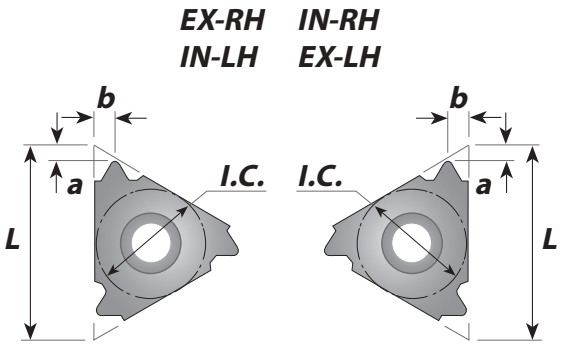


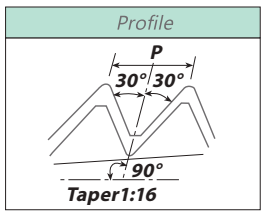
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
0IR27NPT	27	6	0.6	0.6
1IR27NPT	27	8	0.6	0.6
1IR18NPT	18	8	0.6	0.6
2ER27NPT	27	11	0.7	0.8
2IR27NPT				
2ER18NPT	18	11	0.8	1.0
2IR18NPT				
2ER14NPT	14	11	0.8	1.0
2IR14NPT				
3ER27NPT	27	16	0.7	0.8
3IR27NPT				

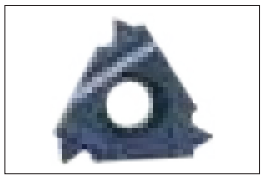
ER = *External Right* **IR** = *Internal Right* **EL** = *External Left* **IL** = *Internal Left*

EL and IL upon Request

NPT



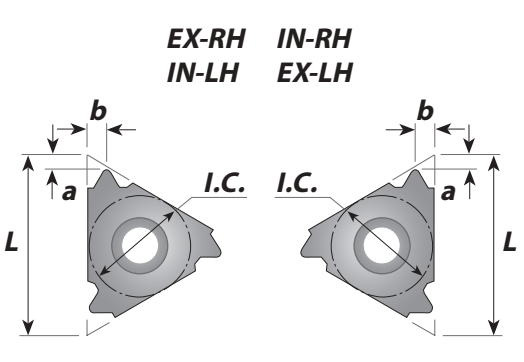


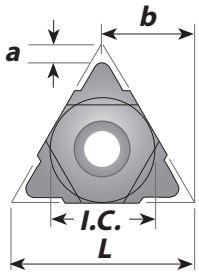


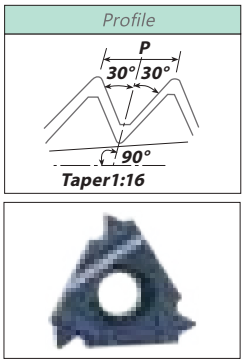
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
3ER18NPT	18	16	0.8	1.0
3IR18NPT				
3ER14NPT	14	16	0.9	1.2
3IR14NPT				
3ER11.5NPT	11.5	16	1.1	1.5
3IR11.5NPT				
3ER8NPT	8	16	1.3	1.8
3IR8NPT				

ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*
EL and IL upon Request

NPTF DRYSEAL





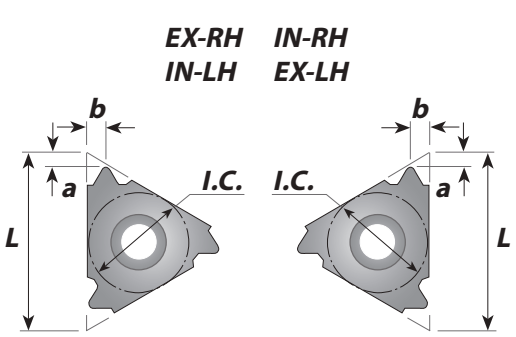


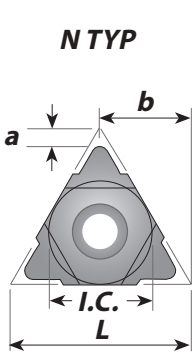
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
0IR27NPTF	27	6	0.7	0.6
1IR27NPTF	27	8	0.6	0.6
1IR18NPTF	18	8	0.6	0.6
2ER27NPTF	27	11	0.7	0.7
2IR27NPTF				
2ER18NPTF	18	11	0.8	1.0
2IR18NPTF				
2ER14NPTF	14	11	0.8	1.0
2IR14NPTF				
2ER14NPTF	14	11	0.8	1.0
2IR14NPFT				
3ER27NPTF	18	16	0.8	1.0
3IR27NPTF				
3ER18NPTF	14	16	0.9	1.2
3IR18NPTF				

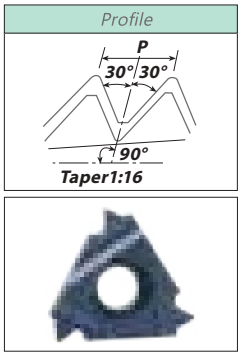
ER = *External Right* IR = *Internal Right* EL *External Left* IL = *Internal Left*

EL and IL upon Request

NPTF DRYSEAL





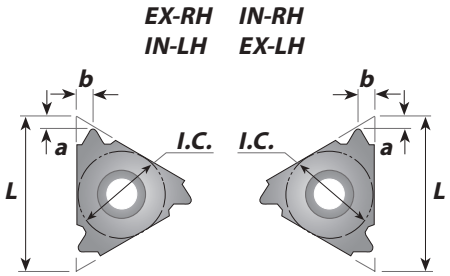


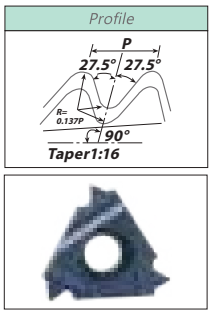
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
3ER14NPTF	14	16	0.9	1.2
3IR14NPTF				
3ER11.5NPTF	11.5	16	1.1	1.5
3IR11.5NPTF				
3ER8NPTF	8	16	1.3	1.8
3IR8NPTF				

ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

EL and IL upon Request

BSPT

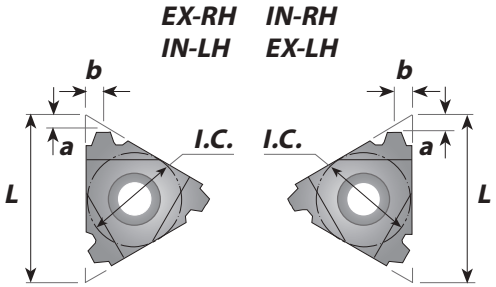


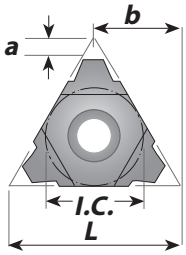


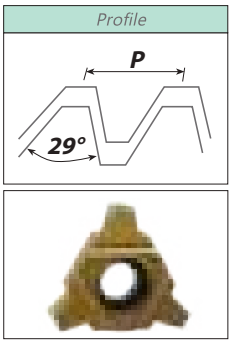
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
0IR28BSPT	28	6	0.7	0.6
1IR28BSPT	28	8	0.6	0.6
1IR19BSPT	19	8	0.6	0.6
2IR28BSPT	28	11	0.6	0.6
2IR19BSPT	19	11	0.8	0.9
2IR14BSPT	14	11	0.9	1.0
2IR11BSPT*	11	11	0.9	1.2
3ER28BSPT 3IR28BSPT	28	16	0.6	0.6
3ER19BSPT 3IR19BSPT	19	16	0.8	0.9
3ER14BSPT 3IR14BSPT	14	16	1.0	1.2
3ER11BSPT 3IR11BSPT	11	16	1.1	1.5

ER = *External Right* **IR** = *Internal Right* **EL** = *External Left* **IL** = *Internal Left*

ACME





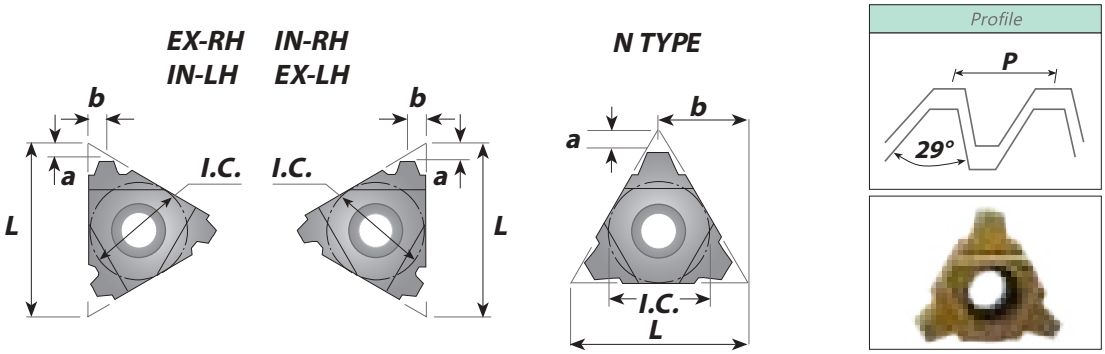


(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
2ER16ACME	16	11	0.9	1.0
2IR16ACME				
3ER16ACME	16	16	0.9	1.0
3IR16ACME				
3ER14ACME	14	16	1.0	1.2
3IR14ACME				
3ER12ACME	12	16	1.1	1.2
3IR12ACME				
3ER10ACME	10	16	1.3	1.3
3IR10ACME				
3ER8ACME	8	16	1.5	1.5
3IR8ACME				

ER = *External Right* IR = *Internal Right* EL = *External Left* IL = *Internal Left*

EL and IL upon Request

ACME



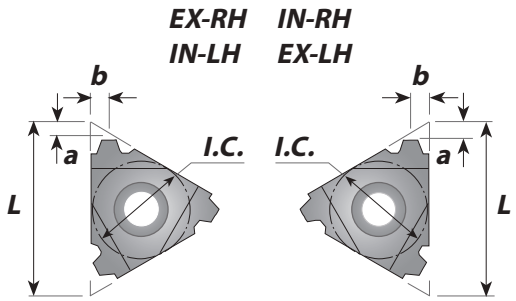
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
3ER6ACME*	6	16	1.7	1.8
3IR6ACME*				
4ER6ACME	6	22	1.8	2.1
4IR6ACME				
4ER5ACME	5	22	2.0	2.3
4IR5ACME				
4ER4ACME*	4	22	2.1	2.2
4IR4ACME*				
5ER4ACME	4	27	2.3	2.7
5IR4ACME				

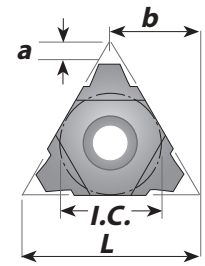
ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

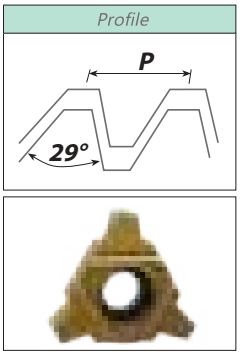
EL and IL upon Request

*(2) Special holder is required or standard holder can be modified by customer or to be used with holders: (IR12-3B, IL12-3B, IR14-3B, IL14-3B)

STUB ACME







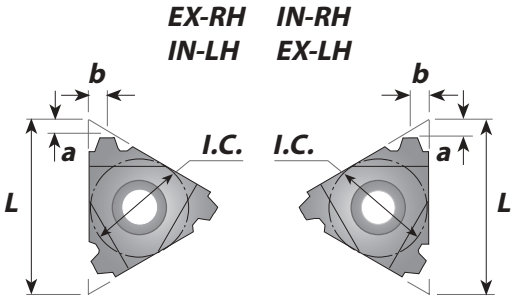
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
3IR16STACME*	16	8	0.6	0.6
2ER16STACME	16	11	1.0	1.0
3ER16STACME	16	16	1.0	1.0
3IR16STACME				
3ER14STACME	14	16	1.1	1.1
3IR14STACME				
3ER12STACME	12	16	1.2	1.2
3IR12STACME				
3ER10STACME	10	16	1.3	1.3
3IR10STACME				
3ER8STACME	8	16	1.5	1.5
3IR8STACME				

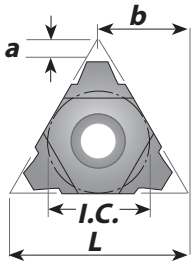
ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

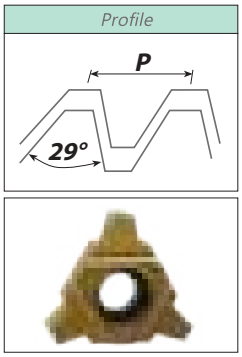
EL and IL upon Request

(2) Special holder is required or standard holder can be modified by customer or to be used with holders: (IR12-3B, IL12-3B, IR14-3B, IL14-3B)

STUB ACME





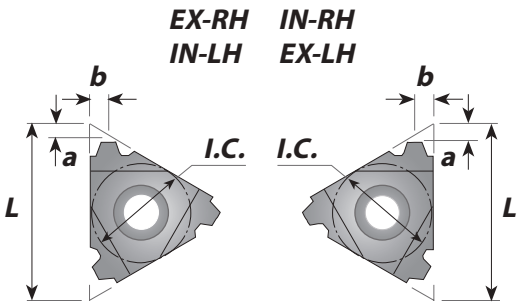


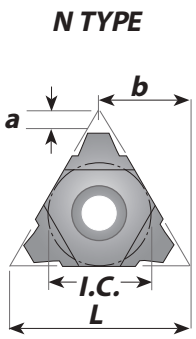
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
3ER6STACME	6	16	1.8	1.8
3IR6STACME				
4ER5STACME	5	22	2.0	2.3
4IR5STACME				
4ER4STACME	4	22	2.3	2.4
4IR4STACME				
5ER4STACME	4	27	2.3	2.4
5IR4STACME				
5ER3STACME	3	27	3.3	11.0
5IR3STACME				

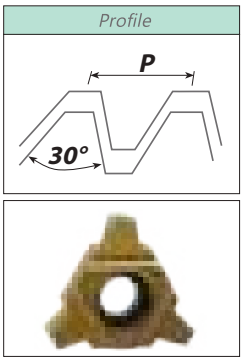
ER = *External Right* **IR** = *Internal Right* **EL** = *External Left* **IL** = *Internal Left*

EL and IL upon Request

TRAPEZ DIN 103







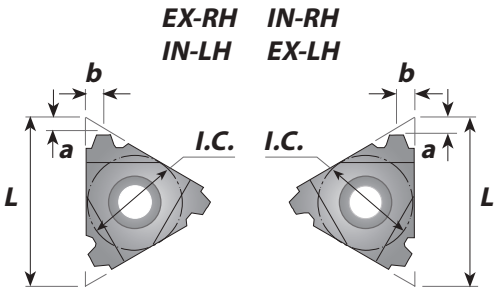
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
1IR1.5TR*	1.5	8	0.6	0.6
3ER1.5TR	1.5	16	1.0	1.1
3ER2TR	2.0	16	1.0	1.3
3IR2TR				
3ER3TR	3.0	16	1.3	1.5
3IR3TR				
(1) 3ER4TR	4.0	16	1.3	1.5
(2) 3IR4TR				
4ER4TR	4.0	22	1.8	1.9
4IR4TR				
4ER5TR	5.0	22	2.0	2.4
4IR5TR				

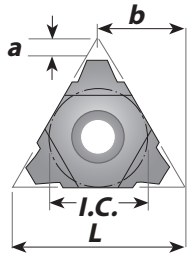
ER = *External Right* **IR** = *Internal Right* **EL** = *External Left* **IL** = *Internal Left*

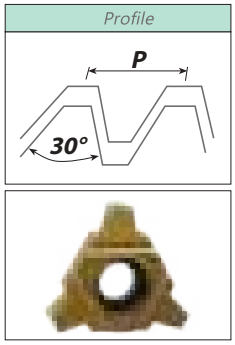
EL and IL upon Request
One cutting edge

(2) Special holder is required or standard holder can be modified by customer or to be used with holders: (IR12-3B, IL12-3B, IR14-3B, IL14-3B)

TRAPEZ DIN 103







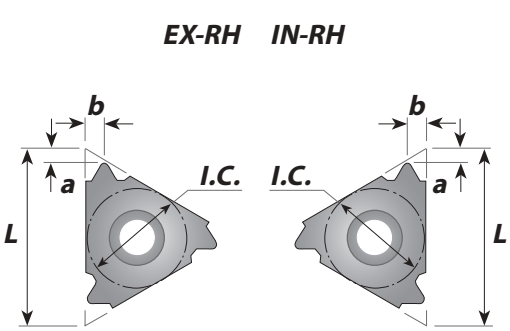
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
(1) 4ER6TR	6.0	22	2.0	2.4
(1) 4IR6TR				
4NER6TR	6.0	22N	2.0	11.0
4NIR6TR				
4NER7TR	7.0	22N	2.3	11.0
4NIR7TR				
(3) 4NIR7TR40	7.0	22N	2.6	11.0
4NER8TR	8.0	22N	2.5	11.0
4NIR8TR				
5ER6TR	6.0	27	2.3	2.7
5IR6TR				
5ER7TR	7.0	27	2.2	2.6
5IR7TR				
5NER8TR	8.0	27N	2.5	13.7
5NIR8TR				
5NER9TR	9.0	27N	3.0	13.7
5NIR9TR				
5NER10TR*	10.0	27N	3.9	16.9

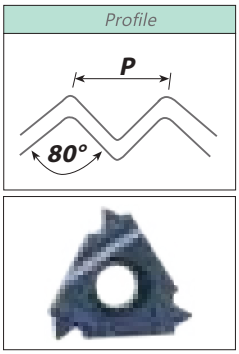
ER = *External Right* IR = *Internal Right* EL = *External Left* IL = *Internal Left*

EL and IL upon Request
One cutting edge

*(2) Special holder is required or standard holder can be modified by customer or to be used with holders: (IR12-3B, IL12-3B, IR14-3B, IL14-3B)

PG DIN 40430



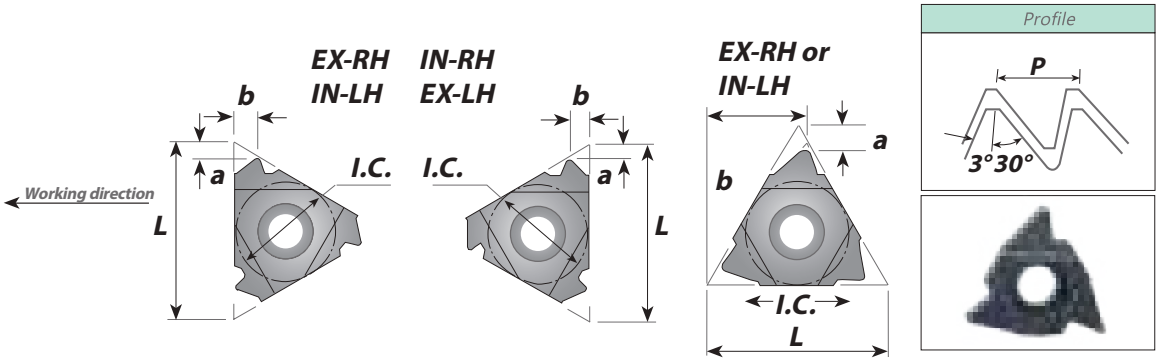


(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
1IR20PG (PG 7)	20	8	0.6	0.7
2IR18PG (PG 9)	18	11	0.8	0.9
3ER20PG (PG 7)	20	16	0.7	0.8
3ER18PG (PG 9, 11, 13.5, 16)	18	16	0.8	0.9
3IR18PG (PG 11, 13.5, 16)				
3ER16PG (PG 21, 29, 36, 42, 48)	16	16	0.8	1.0
3IR16PG (PG 21, 29, 36, 42, 48)				

ER = *External Right* IR = *Internal Right* EL = *External Left* IL = *Internal Left*

EL and IL upon Request

SAGENGEWINDE DIN 513



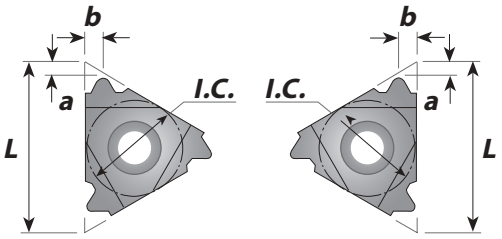
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)	
	mm	L	a	b
3ER2SAGE	2.0	16	1.1	1.6
3IR2SAGE			1.2	1.7
4ER3SAGE	3.0	22	1.5	2.4
4IR3SAGE			1.9	2.9
4ER4SAGE	4.0	22N	1.9	3.1
4IR4SAGE			2.3	3.5
4NER5SAGE	5.0*	22N	1.2	11.7
4NIR5SAGE			1.9	11.7
4NER6SAGE	6.0*	22N	1.2	11.7
4NIR6SAGE			2.1	11.9

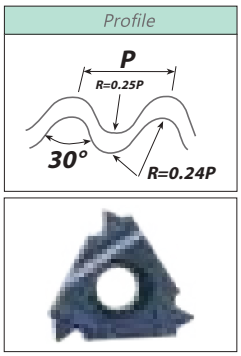
ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

EL and IL upon Request

* *Requires a special anvil:*

ROUND DIN 405



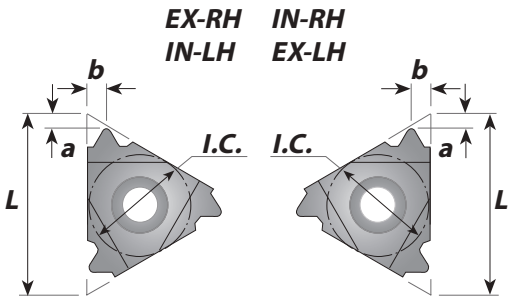


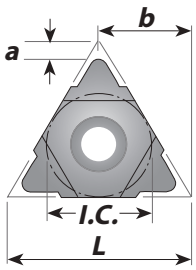
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
3ER10RD	10	16	1.1	1.2
3IR10RD			1.1	1.2
3ER8RD	8	16	1.4	1.3
3IR8RD			1.4	1.4
3ER6RD	6	16	1.5	1.7
3IR6RD			1.4	1.5
4ER6RD	6	22	1.5	1.7
4IR6RD				
4ER4RD	4	22	2.2	2.3
4IR4RD				
5ER4RD	4	27	2.2	2.3
5IR4RD				

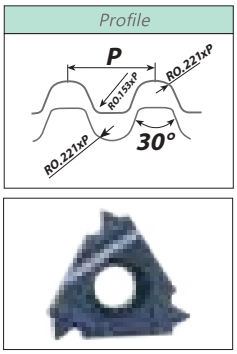
ER = *External Right* IR *Internal Right* EL = *External Left* IL = *Internal Left*

EL and IL upon Request

ROUND DIN 20400





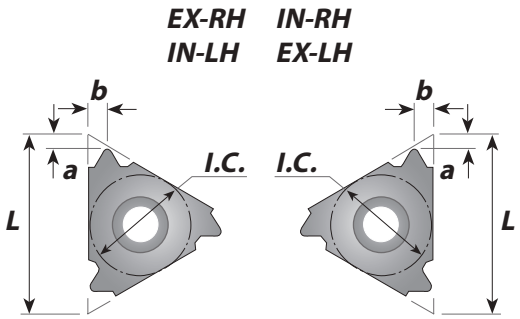


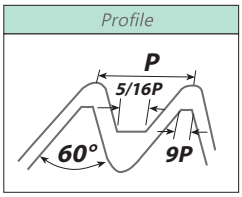
(Item Number)	(Pitch)	(Length)	(Dimensions in mm)	
	mm	L	a	b
4ER4.0RD20400	4.0	22	1.4	1.4
4IR4.0RD20400				
4ER5.0RD20400	5.0	22	1.7	1.8
4IR5.0RD20400				
4ER6.0RD20400	6.0	22	1.7	2.0
4IR6.0RD20400				

ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

EL and IL upon Request

UNJ UNJC, UNJF, UNJEF, UNJS



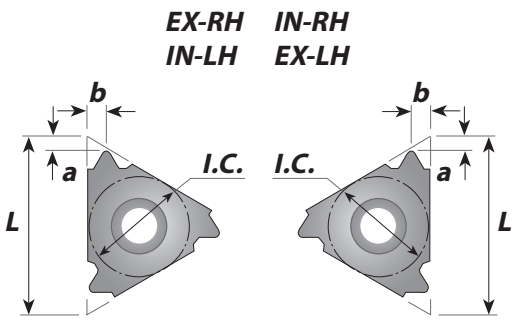


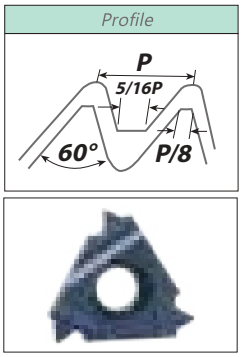
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
2ER48UNJ	48	11	0.6	0.6
2IR48UNJ				
2ER44UNJ	44	11	0.6	0.6
2IR44UNJ				
2ER40UNJ	40	11	0.6	0.6
2IR40UNJ				
2ER36UNJ	36	11	0.6	0.6
2IR36UNJ				
2ER32UNJ	32	11	0.6	0.6
2IR32UNJ				
2ER28UNJ	28	11	0.6	0.6
2IR28UNJ				
2ER24UNJ	24	11	0.7	0.8
2IR24UNJ				

ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

EL and IL upon Request

UNJ UNJC, UNJF, UNJEF, UNJS



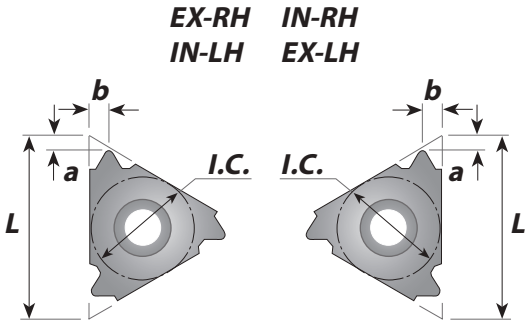


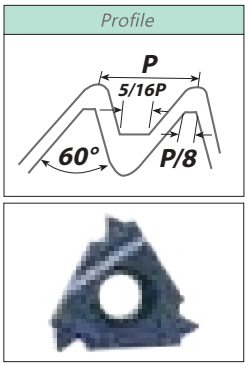
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
2ER20UNJ	20	11	0.8	0.9
2IR20UNJ				
2ER18UNJ	18	11	0.8	1.0
2IR18UNJ				
2ER16UNJ	16	11	0.8	1.0
2IR16UNJ				
2ER14UNJ	14	11	0.9	1.0
2IR14UNJ				
3ER48UNJ	48	16	0.6	0.6
3IR48UNJ				
3ER44UNJ	44	16	0.6	0.6
3IR44UNJ				
3ER40UNJ	40	16	0.6	0.6
3IR40UNJ				

ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

EL and IL upon Request

UNJ UNJC, UNJF, UNJEF, UNJS



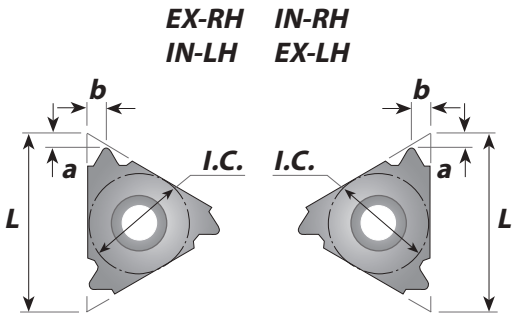


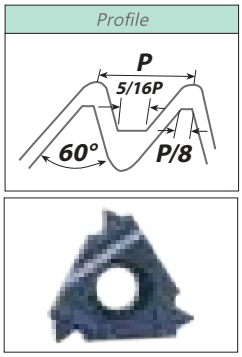
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
3ER36UNJ	36	16	0.6	0.6
3IR36UNJ				
3ER32UNJ	32	16	0.6	0.6
3IR32UNJ				
3ER28UNJ	28	16	0.6	0.6
3IR28UNJ				
3ER24UNJ	24	16	0.7	0.8
3IR24UNJ				
3ER20UNJ	20	16	0.8	0.9
3IR20UNJ				
3ER18UNJ	18	16	0.8	1.0
3IR18UNJ				
3ER16UNJ	16	16	0.8	1.0
3IR16UNJ				

ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

EL and IL upon Request

UNJ UNJC, UNJF, UNJEF, UNJS



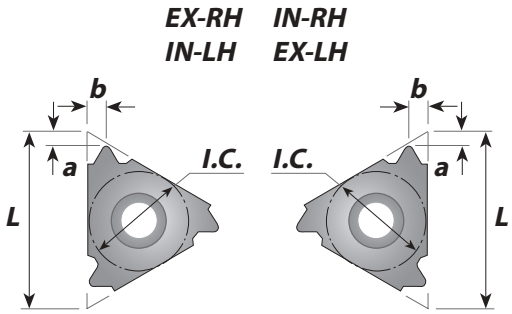


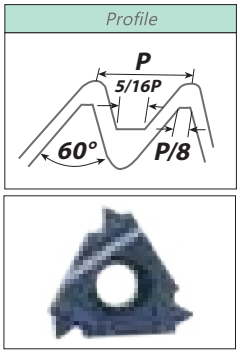
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
3ER14UNJ	14	16	1.0	1.2
3IR14UNJ				
3ER13UNJ	13	16	1.0	1.3
3IR13UNJ				
3ER12UNJ	12	16	1.1	1.4
3IR12UNJ				
3ER11UNJ	11	16	1.1	1.5
3IR11UNJ				
3ER10UNJ	10	16	1.1	1.5
3IR10UNJ				
3ER9UNJ	9	16	1.2	1.6
3IR9UNJ				
3ER8UNJ	8	16	1.2	1.6
3IR8UNJ				

ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

EL and IL upon Request

MJ ISO 5855



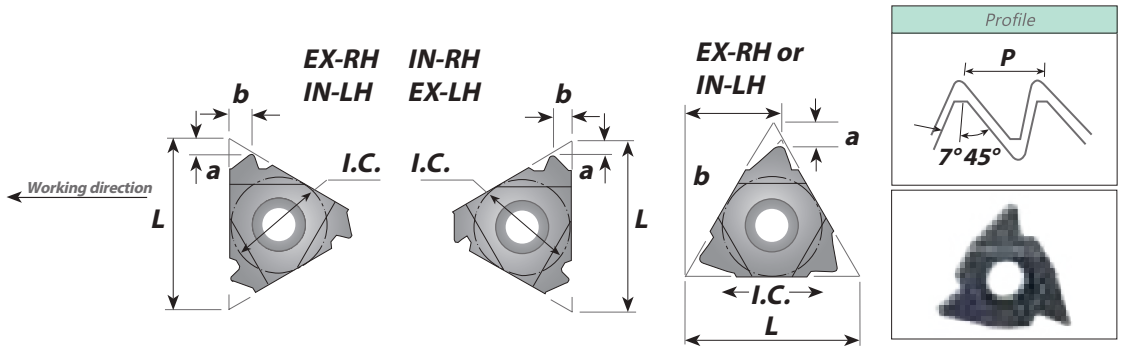


(Item Number)	(Pitch)	(Length)	(Dimensions in mm)	
	mm	L	a	b
2IR1.0MJ	1.0	11	0.7	0.8
2IR1.25MJ	1.25	11	0.8	0.9
2IR1.5MJ	1.5	11	0.8	1.0
2IR2.0MJ	2.0	11	0.9	1.0
3ER1.0MJ	1.0	16	0.7	0.8
3IR1.0MJ				
3ER1.25MJ	1.25	16	0.8	0.9
3IR1.25MJ				
3ER1.5MJ	1.5	16	0.8	2.0
3IR1.5MJ				
3ER2.0MJ	2.0	16	1.0	1.3
3IR2.0MJ				

ER = *External Right* IR = *Internal Right* EL = *External Left* IL = *Internal Left*

EL and IL upon Request

AMERICAN BUTTRESS

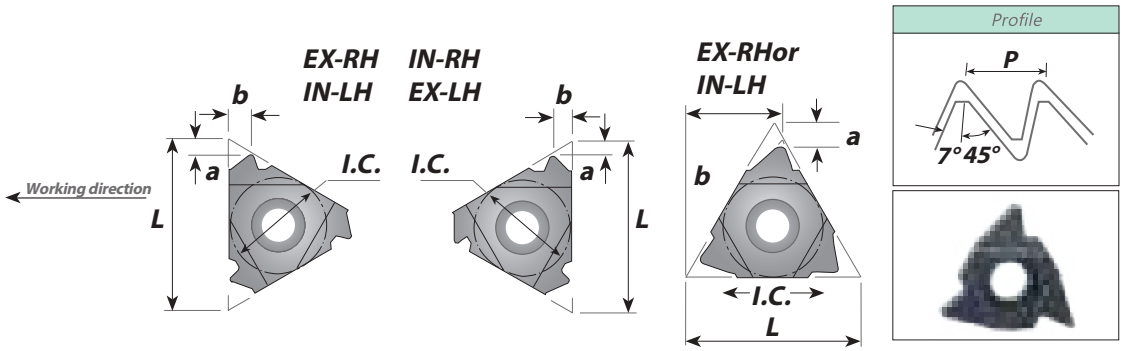


(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
2ER20ABUT	20	11	1.0	1.3
2IR20ABUT				
2ER16ABUT	16	11	1.0	1.5
2IR16ABUT				
3ER20ABUT	20	16	1.0	1.3
3IR20ABUT				
3ER16ABUT	16	16	1.0	1.5
3IR16ABUT				
3ER12ABUT	12	16	1.4	2.0
3IR12ABUT				
3ER10ABUT	10	16	1.5	2.3
3IR10ABUT				

ER = *External Right* **IR** = *Internal Right* **EL** = *External Left* **IL** = *Internal Left*

EL and IL upon Request

AMERICAN BUTTRESS

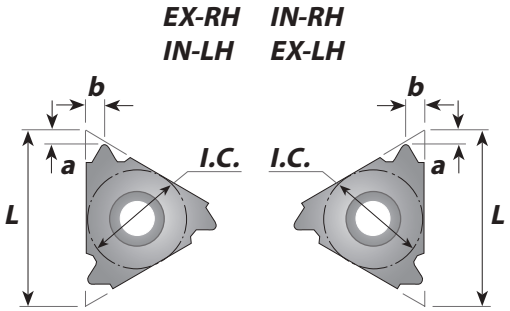


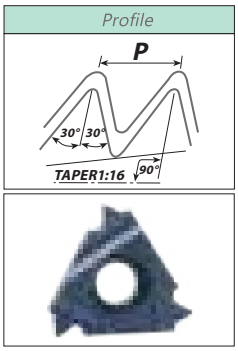
(Item Number)	(Pitch) (TPI)	(Length) L	(Dimensions in mm) a	b
4ER8ABUT	8	22	2.1	3.3
4IR8ABUT				
4ER6ABUT	6	22	2.1	3.4
4IR6ABUT				
4NER4ABUT	4	22N	2.3	11.7
4NIR4ABUT				
5NER3ABUT	3	27N	3.1	11.7
5NIR3ABUT				

ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL** *Internal Left*

EL and IL upon Request

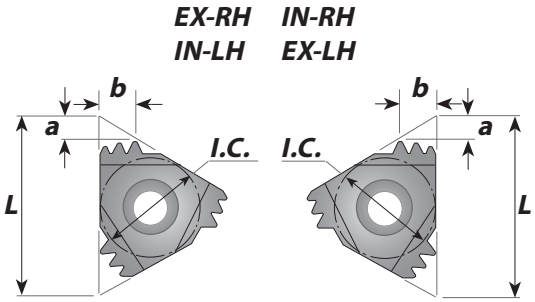
OILTHREADS API ROUND

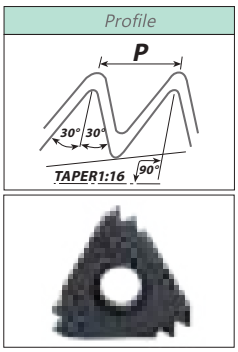




(Item Number)	(Pitch) (TPI)	(Length) L	(Taper) IPF	(Dimensions in mm) a	b
3ER10APIRD	10	16	0.75	1.5	1.4
3IR10APIRD					
3ER8APIRD	8	16	0.75	1.3	1.6
3IR8APIRD					

OILTHREADS MULTI TOOTH

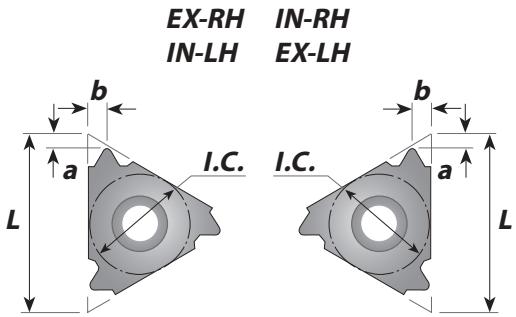


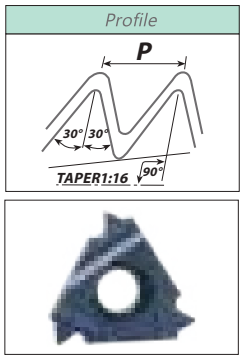


(Item Number)	(Pitch) TPI	(Length) L	(Number of Teeth)	(Dimensions in mm) a	b
(1) 4ER10APIRD2M	10	22	2	2.4	3.7
(2) 4IR10APIRD2M					
(3) 5ER10APIRD3M	10	27	3	3.8	6.2
(4) 5IR10APIRD3M					
(3) 5ER8APIRD2M	8	27	2	3.0	4.5
(4) 5IR8APIRD2M					

Anvil: (1)AE4M,(2)AI4M,(3)AE5M,(4)AI5M

OILTHREADS



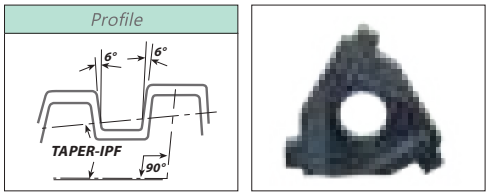


V-0.040

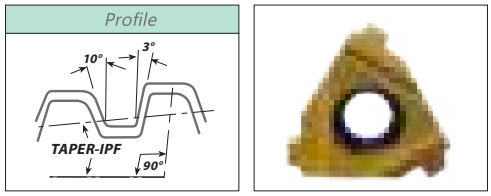
(Item Number)	(Pitch) TPI	(Length) L	(Taper) IPF	(Dimensions in mm) a	b	(Connection No. or Size)
4ER5API403 4IR5API403	5	22	3	1.8	2.5	2 3/8 -4 1/2 REG
V-0.038R						
5ER4API382 5IR4API382	4	27	2	2.1	2.8	NC23-NC50
5ER4API383 5IR4API383	4	27	3	2.1	2.8	NC56-NC77
V-0.050						
5ER4API502 5IR4API502	4	27	2	2.0	3.0	6 5/8 REG
5ER4API503 5IR4API503	4	27	3	2.0	3.0	5 1/12, 7 5/8, 5 5/8 REG
V-0.055 Macaroni Tubing (MT), American Macaroni Tubing (AMT), American Mining Macaroni Tubing (AMMT)						
4ER6API551.5	6	22	1.5	2.0	1.7	NC10,NC12, NC13,NC16
3IR6API551.5	6	16	1.5	2.0	1.7	NC10,NC12, NC13*
4IR6API551.5	6	22	1.5	2.0	1.7	NC16**

**for NC10, NC12 use holder IR16-3CB, for NC13 use holders IR20-3/IR20-3B/IR20-3CB*
***for NC16 use holder IR25-4*

OILTHREADS



Extreme-Line Casing



Extreme-Line Casing

(Item Number)	*(Pitch)* TPI	*(Length)* L	*(Taper)* IPF	*(Dimensions in mm)* a	b	*(Connection No. or Size)*
4ER6EL1.5	6	22	1.50	1.9	1.9	5-7 5/8
4IR6EL1.5						
4ER5EL1.25	5	22	1.25	2.4	2.3	8 5/8-10 3/4
4IR5EL1.25						
Buttress Casing						
4ER5BUT0.75	5	22	0.75	2.2	2.4	4 1/2-13 3/8
4IR5BUT0.75						
4ER5BUT1.0	5	22	1.00	2.3	2.4	16-20
4IR5BUT1.0						

Thread Turning ToolHolders

PRODUCT DESIGNATION

EXAMPLE: **AR20-3**

A | **R** | **20** | **–** | **3** | **B**

A = *External*
I = *Internal*

R = Rechts *Right Hand*
L = Links *Left Hand*

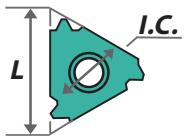
Shank Cross Section:
External toolholders square shank

20 = 20 mm x 20 mm

Internal toolholders & boring bars round shank

20 = Diam. of 20 mm

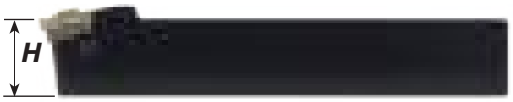
Insert Size



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

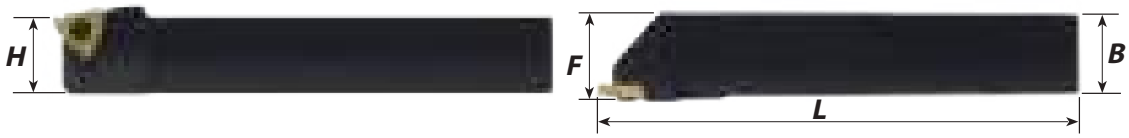


(Item Number)	B = H	(Length) L	F	(Insert Size)	Torx (Torx Key)	(Insert Screw)	(Anvil Screw)	RH (RH Anvil)	LH (LH Anvil)
*AR08-2	8	100	11	11	TX11	S2	-	-	-
*AR10-2	10	100	11	11	TX11	S2	-	-	-
*AR10-2M	10	150	11	11	TX11	S2	-	-	-
*AR12-2	12	125	12	11	TX11	S2	-	-	-
*AR12-2M	12	150	12	11	TX11	S2	-	-	-
AR12-3	12	80	16	16	TX16	S3	A3	AE3	AI3
AR16-3	16	100	16	16	TX16	S3	A3	AE3	AI3
AR20-3	20	125	20	16	TX16	S3	A3	AE3	AI3
AR25-3	25	150	25	16	TX16	S3	A3	AE3	AI3
AR32-3	32	170	32	16	TX16	S3	A3	AE3	AI3
AR25-4	25	150	25	22	TX22	S4	A4	AE4	AI4
AR32-4	32	170	32	22	TX22	S4	A4	AE4	AI4
AR40-4	40	200	40	22	TX22	S4	A4	AE4	AI4
AR25-M4N	25	150	28	22N	TX22	S4	A4	AE4N	AI4N
AR32-P4N	32	170	32	22N	TX22	S4	A4	AE4N	AI4N
AR40-R4N	40	200	40	22N	TX22	S4	A4	AE4N	AI4N
AR25-M5	25	150	32	27	TX27	S5	A5	AE5	AI5
AR32-P5	32	170	32	27	TX27	S5	A5	AE5	AI5
AR40-R5	40	200	40	27	TX27	S5	A5	AE5	AI5
AR25-M5N	25	150	32	27N	TX27	S5	A5	AE5N	AI5N
AR32-P5N	32	170	32	27N	TX27	S5	A5	AE5N	AI5N
AR40-R5N	40	200	40	27N	TX27	S5	A5	AE5N	AI5N

**Toolholders without anvil*

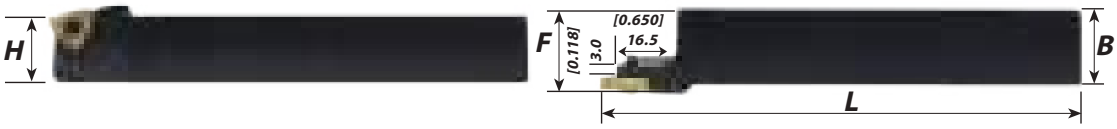
For Left Hand toolholders specify AL instead of AR

VERTICAL TOOLHOLDERS



(Item Number)	B = H	(Length) L	F	(Insert Size)	(Torx Key)	(Insert Screw)
AR20-3V	20	125	22	16	TX16	S3S
AR25-3V	25	150	27	16	TX16	S3S

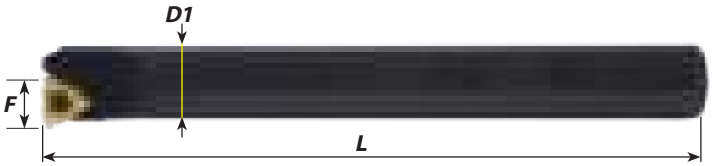
VERTICAL TOOLHOLDERS

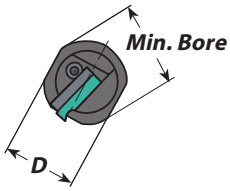


slim Throat

(Item Number)	B = H	(Length) L	F	(Insert Size)	(Torx Key)	(Insert Screw)
AR16-3VS	16	100	18	16	TX16	S3S
AR20-3VS	20	125	22	16	TX16	S3S
AR25-3VS	25	150	27	16	TX16	S3S

INTERNAL TOOLHOLDERS

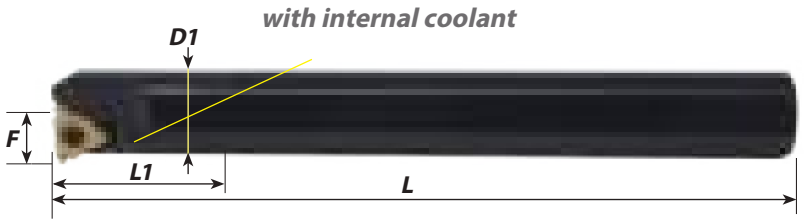


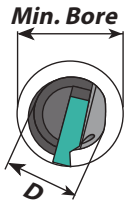


(Item Number)	D	D1	Ø	L	L1	F	(Insert Size)	(Torx Key)	(Insert Screw)	(Anvil Screw)	RH (RH Anvil)	LH (LH Anvil)
IR05-0*	12	5.1	6.0	100	12	4.3	6	TX06	S0	-	-	-
IR07-1*	16	6.6	7.8	125	18	5.3	8	TX08	S1	-	-	-
IR08-1N*	16	7.3	9.0	125	21	6.6	8N	TX08	S1	-	-	-
IR10-2*	10	10	12	100	–	7.4	11	TX11	S2	-	-	-
IR10-2D*	16	10	12	125	25	7.4	11	TX11	S2	-	-	-
IR13-2*	16	13	15	140	32	8.9	11	TX11	S2	-	-	-
IR13-3*	16	13	16	150	32	10.2	16	TX16	S3S	-	-	-
IR16-3*	20	16	19	170	40	11.7	16	TX16	S3S	-	-	-
IR20-3	20	20	24	170	-	13.7	16	TX16	S3	A3	AI3	AE3
IR25-3	25	25	29	200	-	16.2	16	TX16	S3	A3	AI3	AE3
IR32-3	32	32	36	250	-	19.7	16	TX16	S3	A3	AI3	AE3
IR40-3	40	40	44	300	-	23.7	16	TX16	S3	A3	AI3	AE3
IR50-3	50	50	54	350	-	28.7	16	TX16	S3	A3	AI3	AE3
IR20-4*	20	20	24	170	-	15.6	22	TX22	S4S	-	-	-
IR25-4	25	25	29	200	-	18.1	22	TX22	S4	A4	AI4	AE4
IR32-4	32	32	38	250	-	21.6	22	TX22	S4	A4	AI4	AE4
IR40-4	40	40	46	300	-	25.6	22	TX22	S4	A4	AI4	AE4
IR50-4	50	50	56	350	-	30.6	22	TX22	S4	A4	AI4	AE4
IR32-4N	32	32	38	250	-	24.4	22N	TX22	S4	A4	AI4N	AE4N
IR40-4N	40	40	46	300	-	28.1	22N	TX22	S4	A4	AI4N	AE4N
IR50-4N	40	40	57	350	-	30.8	22N	TX22	S4	A4	AI4N	AE4N
IR32-5	32	32	40	250	-	22.6	27	TX27	S5	A5	AI5	AE5
IR40-5	40	40	48	300	-	26.6	27	TX27	S5	A5	AI5	AE5
IR50-5	50	50	58	350	-	31.6	27	TX27	S5	A5	AI5	AE5
IR60-5	60	60	68	400	-	36.6	27	TX27	S5	A5	AI5	AE5
IR32-5N	32	32	40	250	-	25.8	27N	TX27	S5	A5	AI5N	AE5N
IR40-5N	40	40	48	300	-	29.4	27N	TX27	S5	A5	AI5N	AE5N
IR50-5N	50	50	58	350	-	34.4	27N	TX27	S5	A5	AI5N	AE5N
IR60-5N	60	60	68	400	-	39.7	27N	TX27	S5	A5	AI5N	AE5N

**Toolholders without anvil*
For Left Hand toolholders specify AL instead of AR
*Toolholders are made with a 1.5*helix angle please refer to helix angle.For other angle please refer to helix angle please refer to helix angle chart in the technical section of this cataloge.*

INTERNAL TOOLHOLDERS





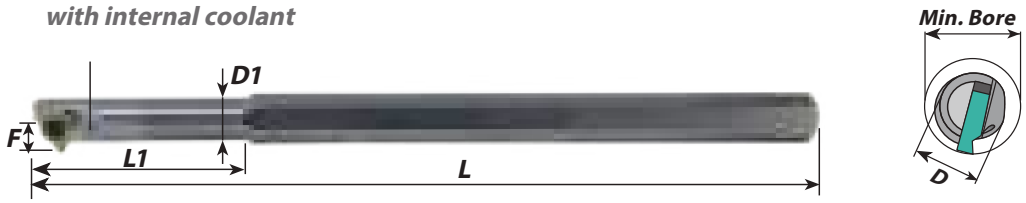
with internal coolant

(Item Number)	D	D1	Min. Ø	L	L1	F	(Insert Size)	(Torx Key)	(Insert Screw)	(Anvil Screw)	RH (RH Anvil)	LH (LH Anvil)
IR10-3B*	16	10	12	125	25	7.4	11	TX11	S2	-	-	-
IR13-3B	16	13	16	150	32	10.2	16	TX16	S3S	-	-	-
IR16-3B	20	16	19	170	40	11.7	16	TX16	S3S	-	-	-
IR20-3B	20	20	24	170	-	13.7	16	TX16	S3	A3	AI3	AE3
IR25-3B	25	25	29	200	-	16.2	16	TX16	S3	A3	AI3	AE3
IR25-4B	25	25	29	200	-	18.1	22	TX22	S4	A4	AI4	AE4

For Left Hand toolholders specify IL instead of IR

**Toolholders without anvil*
For Left Hand toolholders specify AL instead of AR
*Toolholders are made with a 1.5*helix angle please refer to helix angle.For other angle please refer to helix angle please refer to helix angle chart in the technical section of this cataloge.*

CARBIDE SHANK BORING BARS



with internal coolant

Number)	D	D1	Bohr.	L	L1	F	(Insert Size)	(Torx Key)	(Insert Screw)	(Anvil Screw)	(RH Anvil)	(LH Anvil)
IR05-0SCO	6	5.1	6.0	100	26	4.3	6	TX06	S0	-	-	-
IR07-1CB	8	6.6	7.8	125	31	5.3	8	TX08	S1	-	-	-
IR08-1NCO	8	7.3	90	125	35	6.6	8N	TX08	S1	-	-	-
IR10-2CB	10	10	12	150	-	7.4	11	TX11	S2	-	-	-
IR12-2CB	12	12	15	170	-	8.4	11	TX11	S2	-	-	-
IR16-3CB	16	16	19	200	-	11.7	16	TX16	S3S	-	-	-
IR20-3CB	20	20	24	250	-	13.7	16	TX16	S3	A3	AI3	AE3
IR25-3CB	25	25	29	250	-	16.2	16	TX16	S3	A3	AI3	AE3
IR20-4SCO	20	20	24.5	250	-	15.6	22	TX22	S4	-	-	-

For Left Hand toolholders specify IL instead of IR

BORING BARS

with 3.5˚ Helix Angle

(Item Number)	D	D1	Bohr. Ø	L	L1	F	(Insert Size)	(Torx Key)	(Insert Screw)
IR16-3CO35	20	16	19	170	40	13.7	16	TX16	S3S
IR20-4CO35	20	20	24	170	-	15.6	22	TX22	S4S

For Left Hand toolholders specify IL instead of IR

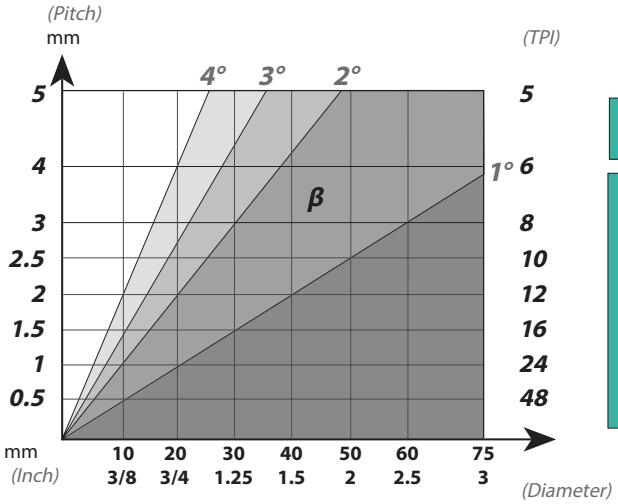
SPECIAL THREAD TURNING APPLICATIONS

(Item Number)	D	D1	L	L1	F	(Insert Size)	(Torx Key)	(Insert Screw)	(Thread)
IR09-08*	16	8.7	125	30	6.5	8	S1	TX8	1/2 - 13UNC
IR12-3B	20	11.5	140	33	10.5	16	S3	TX16	TR18x4
IR14-3B	20	12.5	140	36	21.1	16	S3	TX16	TR20x4
IR14-3NCO	20	13.5	150	40	13.2	16	S3	TX16	TR22x5
IR25-4NCO	25	-	250	-	19.5	22	S4	TX22	TR40x7

For left version please inquire

Only right hand available

(THREAD HELIX ANGLE)



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

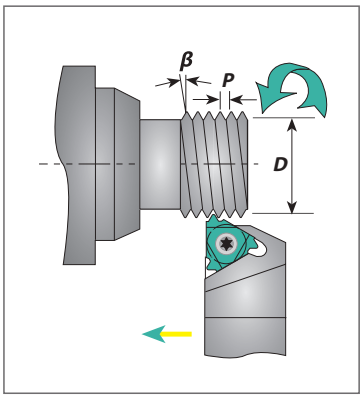
(Simplified formula)

$\beta = 20P/D$

(Example)

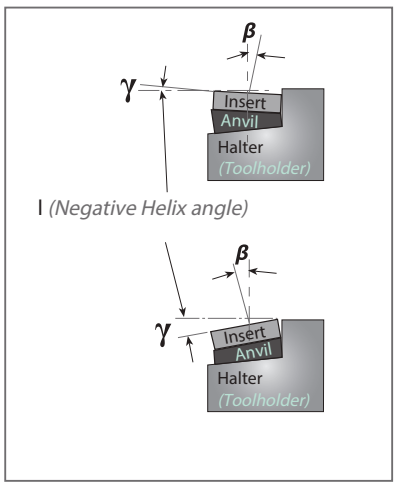
D = 30 mm (1.18")
P = 1.5 mm (16 TPI)

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



(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.)



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-RH OR IN-LH	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):

XTG (P20-P40, K20-K30):

PVD TiAlN coated sub-micrograin grade for steel, stainless steels and exotic materials at medium to high cutting speeds.

(Uncoated Grades):

upon Request :

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

(RECOMMENDED CUTTING SPEED)

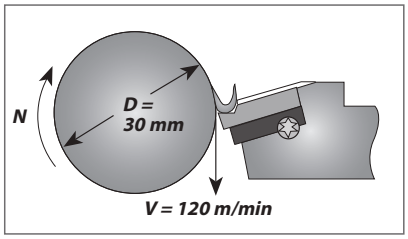
ISO Standard	Material		Condition	XTG
P	*Non-Alloy Steel and Cast Steel, Free Cutting Steel*	<0.25%C		120-180
		≥0.25%C		
		<0.55%C	*Quenched & Tempered*	
		≥0.55%C		
			Quenched & Tempered	
	Low Alloy Steel and Cast Steel (less than 5% alloying elements)		*Annealed*	80-130
			Quenched & Tempered	
	High Alloy Steel, Cast Steel and Tool Steel		*Annealed*	60-80
			Quenched & Tempered	
M	*Stainless Steel and Cast Steel*		*Martensitic*	90-130
			Martensitic	
			Austenitic	
K	*Nodular Cast Iron (GGG)*		*Pearlitic*	100-130
			Pearlitic	
	Grey Cast Iron (GG)		*Ferritic*	120-130
			Pearlitic	
	Malleable Cast Iron		*Ferritic*	100-130
			Pearlitic	
N	*Aluminum-Wrought Alloy*		*Not Hardened*	
			Precipation Hardened	
	Aluminum-Cast, Alloyed	<=12% Si	*Not Hardened*	
			Precipation Hardened	
		>12% Si	*High*	
	Copper Alloys	>1% Pb	*Free Cutting*	
			Brass	
			Electrolytic Copper	
	Copper Alloys		*Duroplastics, Fiber Plastics*	
			Hard Rubber	
S	*High Temp. Alloys, Super Alloys*	Fe based	*Annealed*	25-60
			Precipation Hardened	
		Ni or Co based	*Annealed*	
			Precipation Hardened	
			Cast	
	Titanium Alloys		*Alpha + Beta Alloys Cured*	35-45
H	*Hardened Steel*		*Hardened* 45-50 HRc	35-45
			Hardened 51-55 HRc	
			Hardened 56-62 HRc	
	Chilled Cast Iron		*Cast*	25-35
	Cast Iron		*Hardened*	15-25

(CONVERSION OF CUTTING SPEED TO ROTATIONAL SPEED)

(Conversion of a selected cutting speed to rotational speed is calculated using the following formula):

(Example):

$$N = \frac{V \times 1000}{\pi \times D} = \frac{120 \times 1000}{\pi \times D} = 1274 \text{ UPM /RPM}$$



(NUMBER OF PASSES AND DEPTH OF CUT PER PASS FOR MULTI-TOOTH INSERT)

	mm			Teeth	code	No of Passes	DOC/Pass			
		L	I.C.				1	2	3	4
ISO	1.00	16	3/8	3	3ER1.0ISO3M	2	0.38	0.25		
	1.50	16	3/8	2	3ER1.5ISO2M	3	0.42	0.30	0.20	
	1.50	22	1/2	3	4ER1.5ISO3M	2	0.55	0.37		
	2.00	22	1/2	2	4ER2.0ISO2M	3	0.57	0.40	0.28	
	2.00	22	1/2	3	4ER2.0ISO3M	2	0.76	0.49		
	3.00	27	5/8	2	5ER3.0ISO2M	4	0.59	0.51	0.42	0.32
ISO	1.00	16	3/8	3	3IR1.0ISO3M	2	0.33	0.25		
	1.50	16	3/8	2	3IR1.5ISO2M	3	0.38	0.29	0.20	
	1.50	22	1/2	3	4IR1.5ISO3M	2	0.50	0.37		
	2.00	22	1/2	2	4IR2.0ISO2M	3	0.52	0.37	0.26	
	2.00	22	1/2	3	4IR2.0ISO3M	2	0.70	0.45		
	3.00	27	5/8	2	5IR3.0ISO2M	4	0.58	0.46	0.39	0.30
UN	16	16	3/8	2	3ER16UN2M	3	0.44	0.31	0.22	
	16	22	1/2	3	4ER16UN3M	2	0.58	0.39		
	12	22	1/2	2	4ER12UN2M	3	0.59	0.42	0.30	
	12	22	1/2	3	4ER12UN3M	2	0.78	0.52		
	8	27	5/8	2	5ER8UN2M	4	0.62	0.54	0.45	0.35
UN	16	16	3/8	2	3IR16UN2M	3	0.42	0.28	0.22	
	16	22	1/2	3	4IR16UN3M	2	0.55	0.37		
	12	22	1/2	2	4IR12UN2M	3	0.53	0.38	0.31	
	12	22	1/2	3	4IR12UN3M	2	0.74	0.48		
	8	27	5/8	2	5IR8UN2M	4	0.63	0.50	0.40	0.30
Whitworth 55°	14	16	3/8	2	3ER14W2M	3	0.52	0.37	0.27	
	14	22	1/2	3	4ER14W3M	2	0.70	0.46		
	11	22	1/2	2	4ER11W2M	3	0.67	0.47	0.34	
Whitworth 55°	14	16	3/8	2	3IR14W2M	3	0.52	0.37	0.27	
	14	22	1/2	3	4IR14W3M	2	0.70	0.46		
	11	22	1/2	2	4IR11W2M	2	0.67	0.47	0.34	
	14	16	3/8	2	3ER14NPT2M	3				
NPT	11.5	22	1/2	2	4ER11.5NPT2M	4	0.54	0.47	0.37	0.30
	11.5	27	5/8	3	5ER11.5NPT3M	4	0.76	0.54	0.38	
	8	27	5/8	2	5ER8NPT2M	4	0.81	0.60	0.55	0.45
NPT	14	16	3/8	2	3IR14NPT2M	3				
	11.5	22	1/2	2	4IR11.5NPT2M	4	0.54	0.47	0.37	0.30
	11.5	27	5/8	3	5IR11.5NPT3M	4	0.76	0.54	0.38	
	8	27	5/8	2	5IR8NPT2M	4	0.81	0.60	0.55	0.45
API Rund	10	22	1/2	2	4ER10APIRD2M	3	0.60	0.50	0.31	
	10	27	5/8	3	5ER10APIRD3M	2	1.00	0.41		
	8	27	5/8	2	5ER8APIRD2M	3	0.80	0.60	0.41	
API Rund	10	22	1/2	2	4IR10APIRD2M	3	0.60	0.50	0.31	
	10	27	5/8	3	5IR10APIRD3M	2	1.00	0.41		
	8	27	5/8	2	5IR8APIRD2M	3	0.80	0.60	0.41	

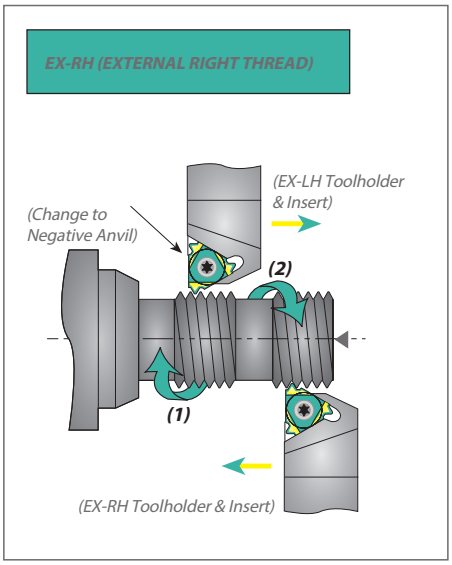
(RECOMMENDED NUMBER OF PASSES FOR THREADING INSERTS):

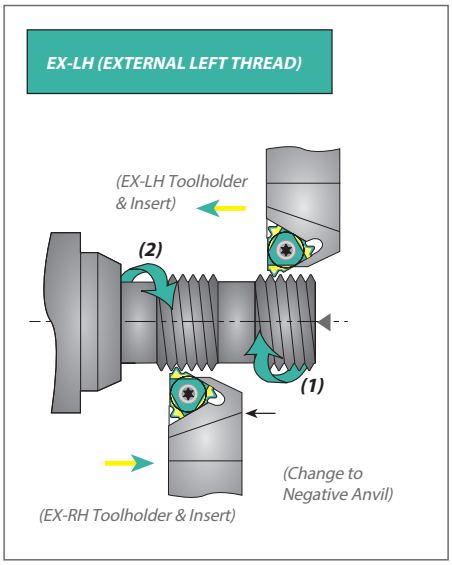
(Pitch) : mm (TPI)	0.5 48	0.8 32	1.0 24	1.25 20	1.5 16	1.75 14	2.0 12	2.5 10	3.0 8	4.0 6	6.0 4
(Number of Passes)	3-6	4-7	4-9	6-10	5-11	9-12	6-13	7-15	8-17	10-20	11-22

(Recommendations):

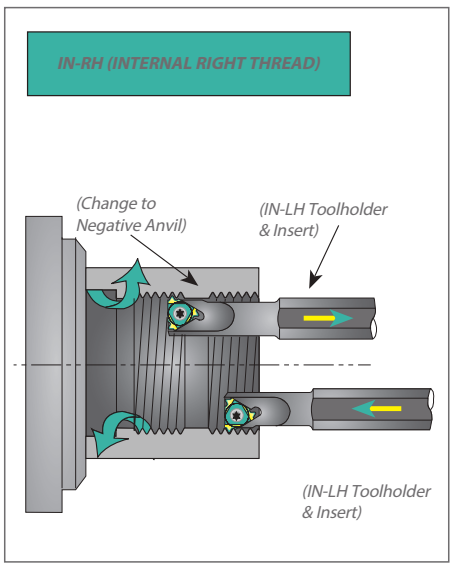
- For most standard applications, the middle of the range is a good starting point.
- For most materials, the tougher the material, the higher the number of cutting passes you should select.
- As a general rule of thumb, fewer passes are better than higher speed.

(THREAD TURNING METHODS):

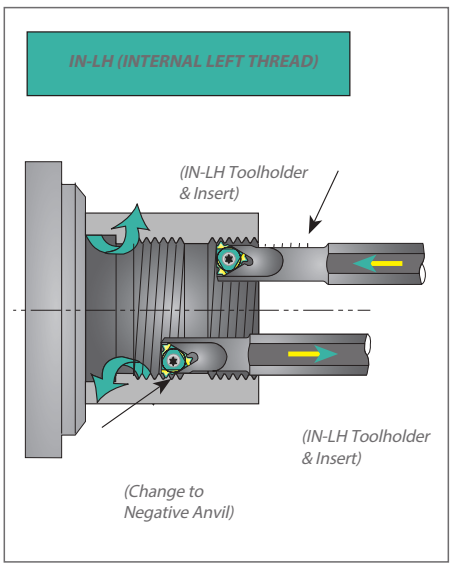




(If you want to turn an EX-LH Thread and you only have EX-Rh Insert & Toolholder)

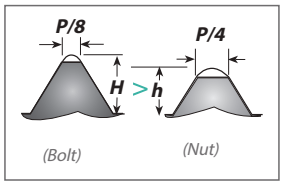


(You should use an IN-LH Insert and Toolholder, if you want to turn an IN-RH Thread but it is recommended to evacuate metal chips outside during thread turning.)

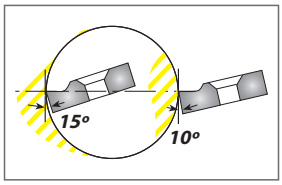


(RECOMMENDATIONS FOR THREADING INSERTS)

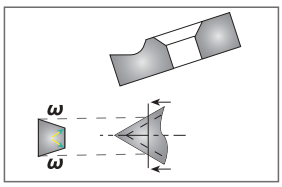
(In most thread forms internal and external threads have different depth and radii, thus tools are not interchangeable)



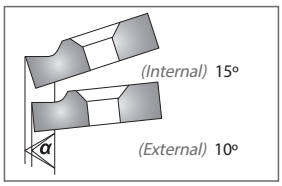
(The Insert relief angle of a standard external toolholder is 10º; for an internal toolholder it is 15º. This 5º difference is to provide additional necessary radial clearance.)



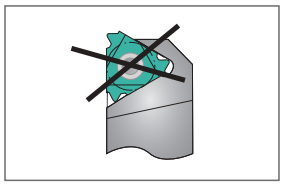
(The built-in relief angles ensure automatic insert flank angle clearance.)



(Profiles of internal & external threading inserts are precision ground to ensure accurate thread geometry when used on the matching toolholders. Using internal inserts with an external holder will result in distortion of angle and insert geometry.)

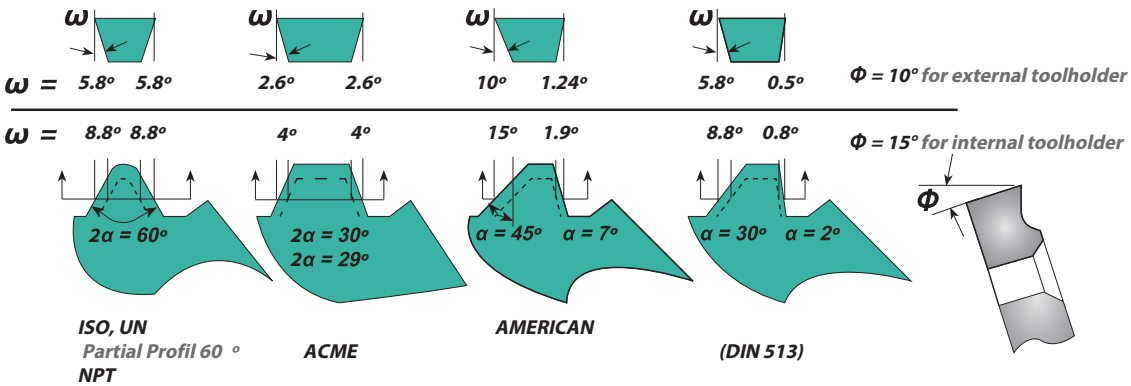


(Insert and toolholder should always match. An IN-RH insert must be used with an IN-RH toolholder. No mismatch is allowed.)



(FLANK CLEARANCE ANGLE)

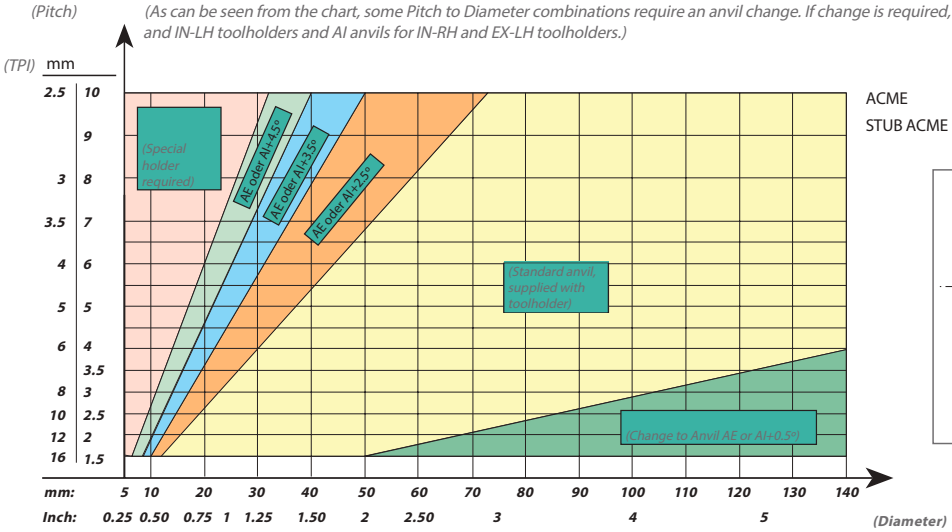
ω= α x Tan Φ)



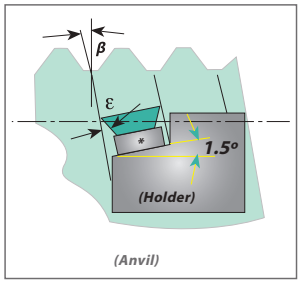
(HELIX ANGLE DIAGRAM FOR ANVIL SELECTION)

(Pitch) (As can be seen from the chart, some Pitch to Diameter combinations require an anvil change. If change is required, use AE anvi and IN-LH toolholders and AI anvils for IN-RH and EX-LH toolholders.)

Is for EX-RH

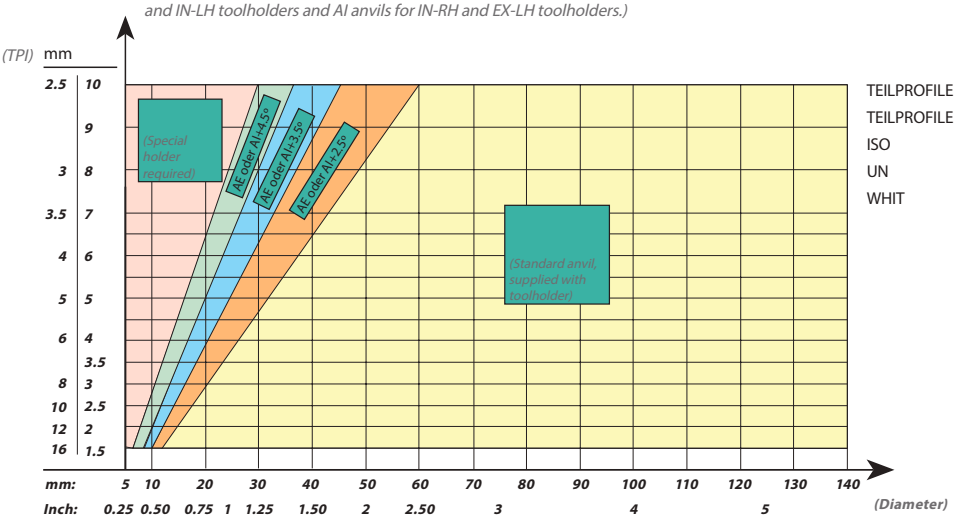


ACME (DIN 103)
STUB ACME (DIN 405)



(Pitch) (As can be seen from the chart, most applications do not require an anvil change. If change is required, use AE anvils for EX-R and IN-LH toolholders and AI anvils for IN-RH and EX-LH toolholders.)

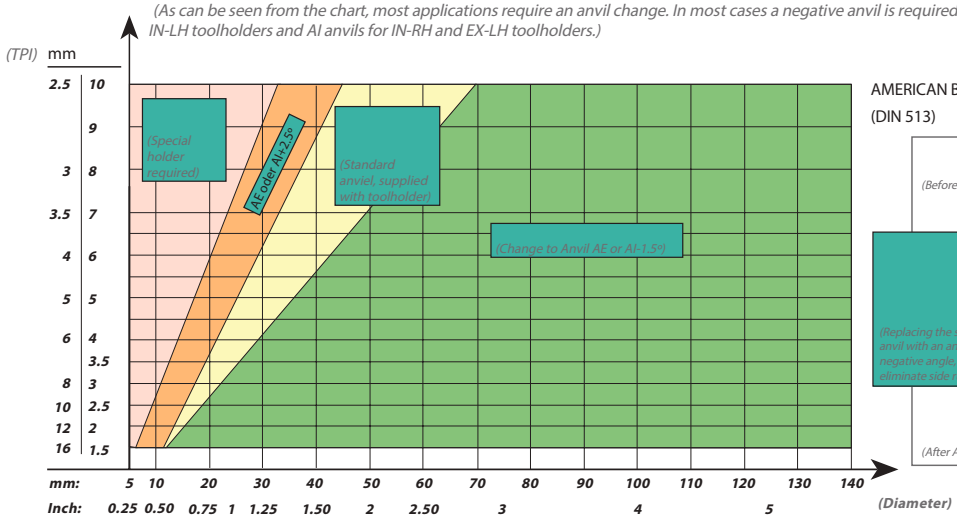
H



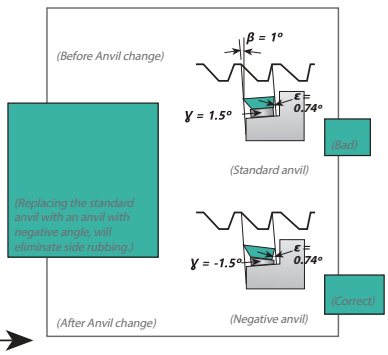
TEILPROFILE 60° *(PARTIAL PROFILE 60°)*
TEILPROFILE 55° *(PARTIAL PROFILE 55°)*
ISO
UN
WHIT

(Pitch) (As can be seen from the chart, most applications require an anvil change. In most cases a negative anvil is required. Use AE a IN-LH toolholders and AI anvils for IN-RH and EX-LH toolholders.)

Anvils for EX-RH and



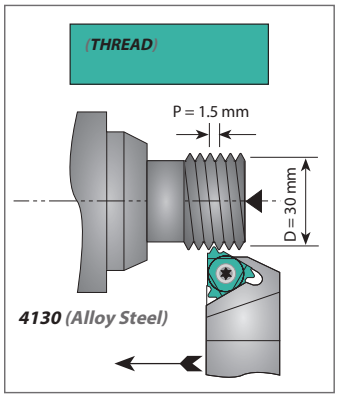
AMERICAN BUTTRESS
(DIN 513)



Step 1 : Choose Thread Turning Method
Step 2 : Choose Insert
Step 3 : Choose Toolholder
Step 4 : Choose Insert Grade
Step 5 : Choose Thread Turning Speed
Step 6 : Choose Number of Threading Passes

(In most cases the above mentioned 6 steps would be the steps needed to ensure a good thread. For asymmetric threads Buttress and Sage, an anvil with a negative pitch angle must be used.)

Step 7 : Find Thread Helix Angle
Step 8 : Choose Correct Anvil



Step 1: *Choose Thread Turning Method: EX-RH Insert & Toolholder.*

Step 2: *Choose Insert : 3ER1.5ISO.*

Step 3: *Choose Toolholder : AR20-3.*

Step 4: *Choose Insert Grade from selection : Alloy Steel is Grade XTG.*

Step 5: *Choose Thread Turning Speed from chart : 100 m/min.*

Rotational Speed calculation:

$$N = \frac{100 \times 1000}{\pi \times 30} = 1065 \text{ RPM}$$

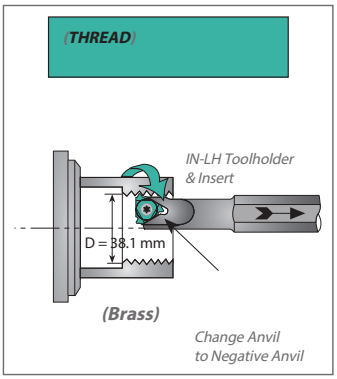
Step 6: *Choose Number of Threading passes from table : 8 passes.*

(EXAMPLE NO. 2):

Step 1: *Choose Thread Turning Method . Usually, an IN-RH Toolholder and Insert will be chosen, however, in this particular case we prefer to pull the metal chips while thread turning outward, thus we chose to work with IN-LH Insert & Toolholder*

Step 2: *Choose Insert : 3IL12UN.*

Step 3: *Choose Toolholder : IL25-3. Note: since we thread cut IN-RH thread outward with an IN-LH tool, do not forget to replace the standard anvil (supplied with the holder) with a negative anvil AE3-1.5*



Step 4: *Choose Insert Grade from selection : Brass is Grade Uncoated.*

Step 5: *Choose Thread Turning Speed from chart : choose 150 m/min.*

Rotational Speed calculation:

$$N = \frac{150 \times 1000}{\pi \times 38.1} = 1254 \text{ RPM}$$

Step 6: *Choose Number of Threading passes from table : 9 passes.*

(EXAMPLE NO. 3):

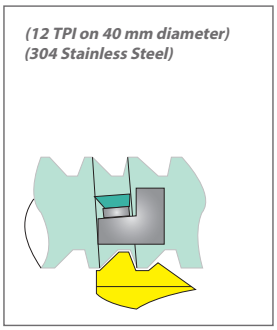
Step 1: *Choose Thread Turning Method from page 79: EX-RH Insert & Toolholder.*

Step 2: *Choose Insert from page 59: 3ER12ABUT*

Step 3: *Choose Toolholder from page 67: AR25-3.*

Step 4: *Choose Insert Grade from selection on page 76: Stainless Steel is Grade TiAlN.*

Step 5: *Choose Thread Turning Speed from chart on page 77: 120 m/min.*

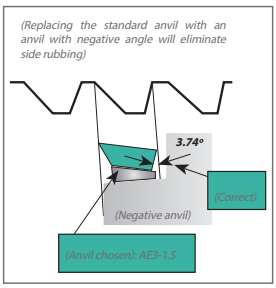


Step 6: *Rotational Speed calculation:*

$$N = \frac{120 \times 1000}{\pi \times 40} = 954 \text{ RPM}$$

Step 7: *Choose Number of Threading passes from table : 13 passes.*

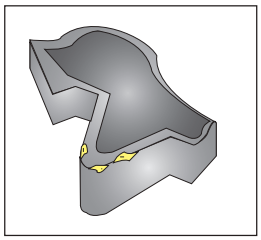
Find Thread Helix Angle: for Pitch of 12 TPI and 40 Diameter Helix Angle as shown in the chart is 1°.



Step 8: *Choose correct Anvil: As can be seen from the chart , for AMERICAN BUTTRESS Thread, for 12 TPI and 40 Diameter a negative anvil AE3-1.5 should replace the standard anvil supplied with the toolholder.*

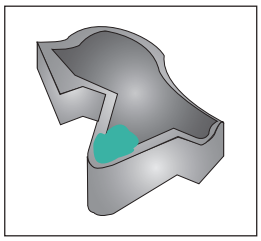
(TROUBLESHOOTING)

***(Chipping)* :**



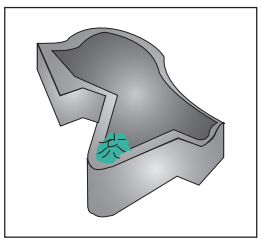
1. Use a tougher carbide grade
2. Eliminate tool overhang
3. Check if insert is correctly clamped
4. Eliminate vibration

***(Crater Wear)* :**



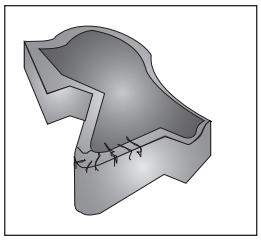
1. Reduce cutting speed
2. Apply coolant fluid
3. Use a harder carbide grade

***(Build-up Edge)* :**



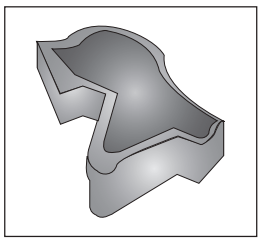
1. Increase cutting speed
2. Use a tougher carbide grade

***(Thermal Cracking)* :**



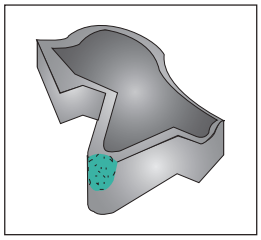
1. Reduce cutting speed
2. Apply coolant fluid
3. Use a tougher carbide grade

***(Deformation)* :**



1. Use a harder carbide grade
2. Reduce cutting speed
3. Reduce depth of cut
4. Apply coolant fluid

***(Fracture)* :**



1. Use a tougher carbide grade
2. Reduce depth of cut
3. Index insert sooner
4. Check machine and tool stability

(THREADING INSERTS STANDARDS)

(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	Class 2
SÄGENGEWINDE	DIN 513	-
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	-

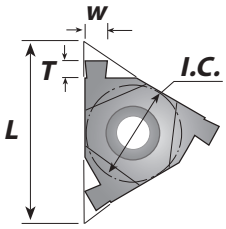
DIN: Deutsches Institut Normung
ANSI: American National Standards Institute
API: American Petroleum Institute
B.S.: British Standards
ISO: Internationale Organisation Normung

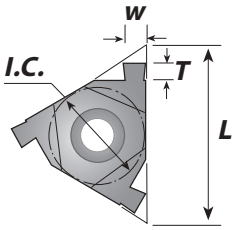
GROOVING INSERTS

External and Internal

ER/IL

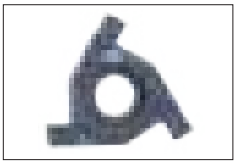
(Same insert can be used for EX.RH and for IN.LH.)





ER/IL

(Same insert can be used for IN.RH and for EX.LH.)



(Item Number)	*(Anvil)*	w ±0.02	I.C. *(Inch)*	L mm	T
3ER/IL0.50	AE3-0	0.50	3/8	16	1.4
3IR/EL0.50	AI3-0				
3ER/IL1.00	AE3-0	1.00	3/8	16	1.4
3IR/EL1.00	AI3-0				
3ER/IL1.20	AE3-0	1.20	3/8	16	1.6
3IR/EL1.20	AI3-0				
3ER/IL1.40	AE3-0	1.40	3/8	16	1.8
3IR/EL1.40	AI3-0				
3ER/IL1.70	AE3-0	1.70	3/8	16	2.0
3IR/EL1.70	AI3-0				
3ER/IL1.95	AE3-0	1.95	3/8	16	2.0
3IR/EL1.95	AI3-0				
3ER/IL2.25	AE3-0	2.25	3/8	16	2.25
3IR/EL2.25	AI3-0				

ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

Available in the following Grades

The inserts should be used with the standard threading toolholders

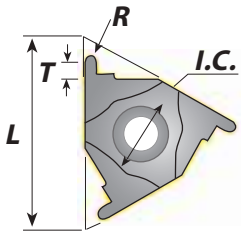
Size 3 internal holders without anvil can't be used

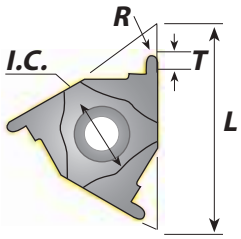
GROOVING INSERTS

External and Internal – Partial Profile

ER/IL

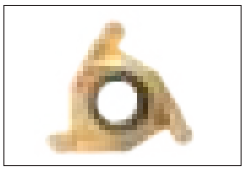
(Same insert can be used for EX.RH and for IN.LH.)





ER/IL

(Same insert can be used for IN.RH and for EX.LH.)



Radius for internal & external machining

(Item Number)	*(Anvil)*	R ±0.02	I.C. *(Inch)*	L mm	T
3ER/ILR0.50	AE3-0	0.5	3/8	16	1.4
3IR/ELR0.50	AI3-0				
3ER/ILR1.00	AE3-0	1.0	3/8	16	2.0
3IR/ELR1.00	AI3-0				
3ER/ILR1.20	AE3-0	1.2	3/8	16	2.25
3IR/ELR1.20	AI3-0				

ER = *External Right* **IR =** *Internal Right* **EL =** *External Left* **IL =** *Internal Left*

Available in the following Grades: ***XTG***

The inserts should be used with the standard threading toolholders

Size 3 internal holders without anvil can't be used

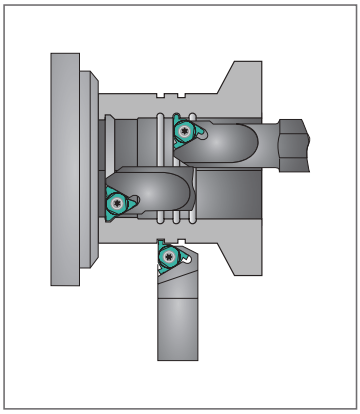
(CUTTING SPEEDS FOR GROOVING INSERTS)

(Carbide Grade): XTG

(P20-P40, K20-K30):

PVD TiAlN coated sub-micrograin grade for steels, *stainless steels and exotic materials at medium to high cutting speeds.*

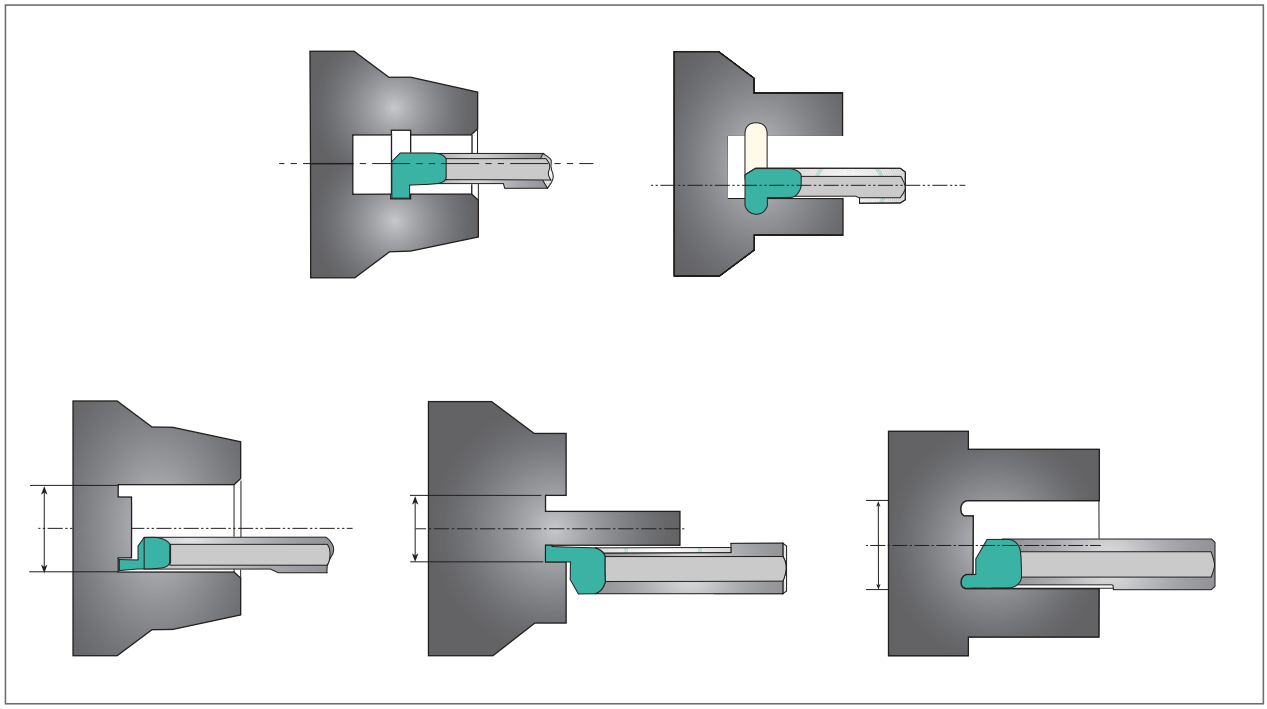
ISO Standard	*(Materials)*	*(Cutting speed)*
P	*Low & Medium Carbon Steel*	20 - 100
	High Carbon Steel	30 - 80
	Alloy Steels and Treated Steels	40 - 90
M	*Stainless Steels*	30 - 80
	Cast Steels	30 - 90
K	*Cast Iron*	30 - 90
N	*Non-Ferrous and Aluminum*	20 - 200



TINY TOOLS

(SOLID CARBIDE TOOLS FOR WORKING IN SMALL BORES)

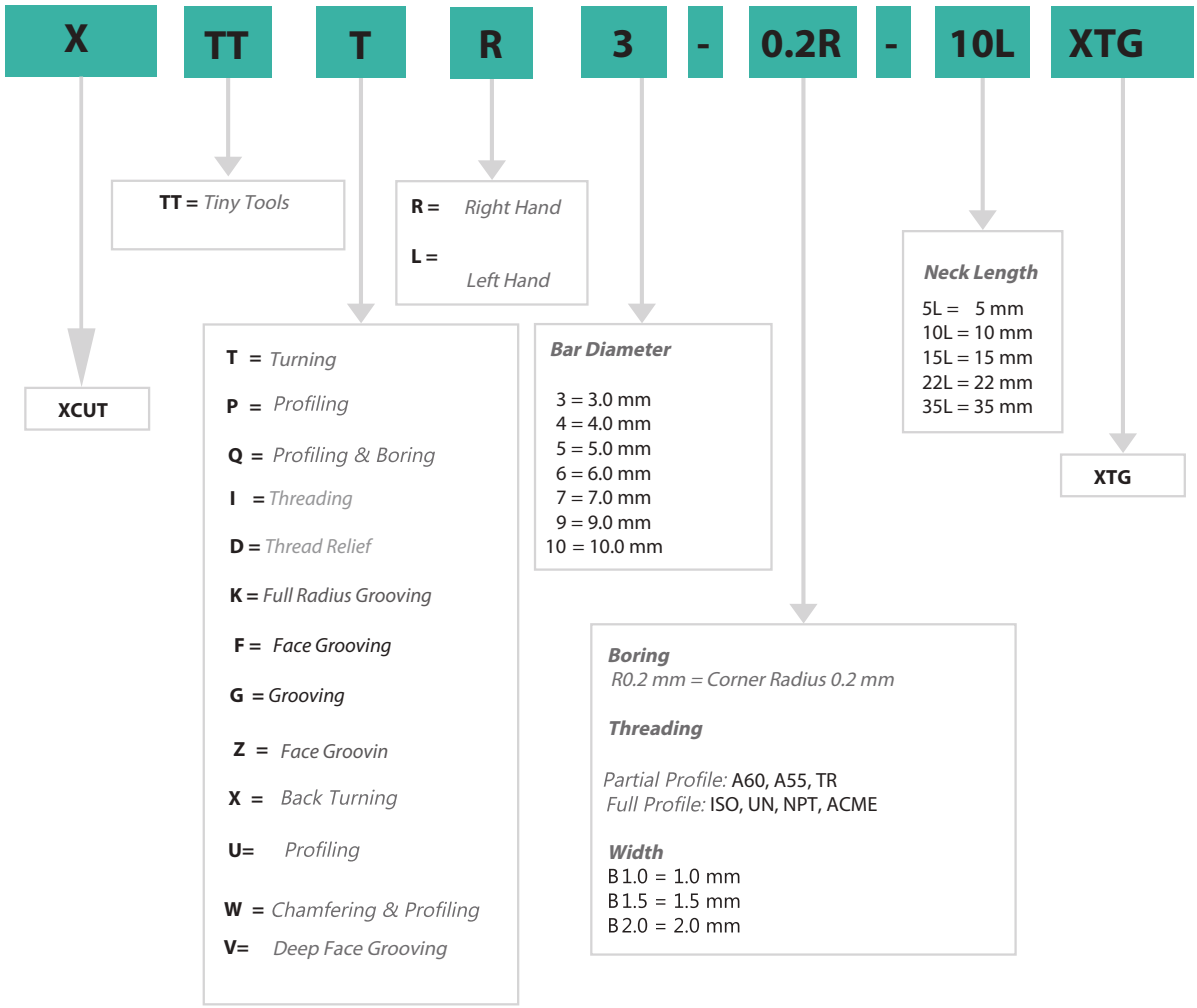
XCUT Tiny tools are designed for the high-tech, medical and small component industry. All tools have coolant channels along the shafts enabling the cooling fluid to reach the cutting edge efficiently, for easy chip evacuation and smooth cutting operations.



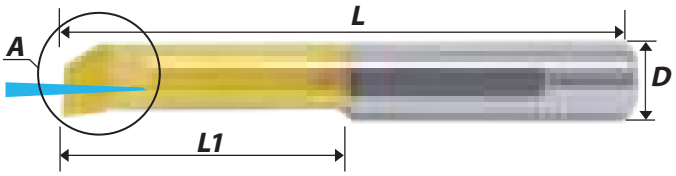
TINY TOOLS

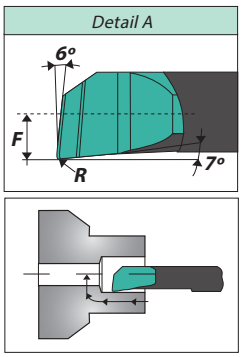
I *PRODUCT DESIGNATION*

EXAMPLE : **X - TTTR3-0.2R-10L-XTG**



TTTR BARS



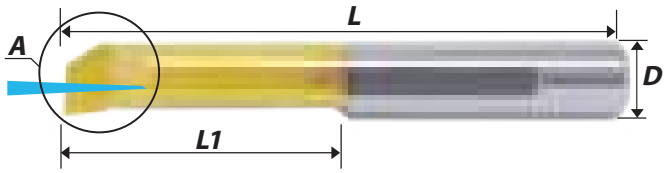


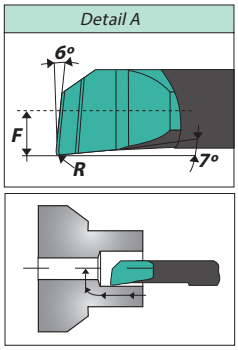
Boring bars with coolant channel

(Item Number)	D	*(Length)* in mm L	*(Length)* in mm L1	R in mm	F	*(Holder)*	*(Min. Bore Dia.)*
TTTR1-0.05R-4L*	3.0	39	4	0.05	0.5	TTH20-3	1.0
TTTR1-0.05R-6L	3.0	39	6	0.05	0.5	TTH20-3	1.0
TTTR1.5-0.1R-6L*	3.0	39	6	0.10	0.7	TTH20-3	1.5
TTTR2-0.05R-10L*	3.0	39	10	0.05	0.8	TTH20-3	2.1
TTTR2-0.15R-5L*	3.0	39	5	0.15	0.8	TTH20-3	2.1
TTTR2-0.15R-10L*	3.0	39	10	0.15	0.8	TTH20-3	2.1
TTTR3-0.05R-10L	3.0	39	10	0.05	1.3	TTH20-3	3.1
TTTR3-0.05R-15L	3.0	39	15	0.05	1.3	TTH20-3	3.1
TTTR3-0.1R-10L	3.0	39	10	0.10	1.3	TTH20-3	3.1
TTTR3-0.1R-15L	3.0	39	15	0.10	1.3	TTH20-3	3.1
TTTR3-0.2R-10L	3.0	39	10	0.20	1.3	TTH20-3	3.1
TTTR3-0.2R-15L	3.0	39	15	0.20	1.3	TTH20-3	3.1
TTTR4-0.05R-15L	4.0	51	15	0.05	1.7	TTH20-3	4.1
TTTR4-0.1R-10L	4.0	51	10	0.10	1.7	TTH20-4	4.1
TTTR4-0.1R-15L	4.0	51	15	0.10	1.7	TTH20-4	4.1
TTTR4-0.1R-22L	4.0	51	22	0.10	1.7	TTH20-4	4.1
TTTR4-0.2R-10L	4.0	51	10	0.20	1.7	TTH20-4	4.1
TTTR4-0.2R-15L	4.0	51	15	0.20	1.7	TTH20-4	4.1
TTTR4-0.2R-22L	4.0	51	22	0.20	1.7	TTH20-4	4.1
TTTR4-0.2R-30L	4.0	59	30	0.20	1.7	TTH20-4	4.1

**Left Hand Version upon Request*

TTTR BARS



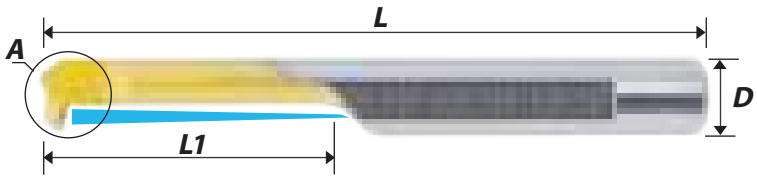


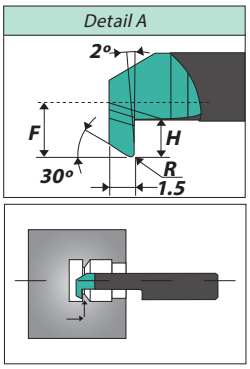
Boring bars with coolant channel

(Item Number)	D	*(Length)* in mm L	*(Length)* in mm L1	R in mm	F	*(Holder)*	*(Min. Bore Dia.)*
TTTR5-0.05R-15L	5.0	51	15	0.05	2.1	TTH20-5	5.1
TTTR5-0.1R-15L	5.0	51	15	0.10	2.1	TTH20-5	5.1
TTTR5-0.1R-22L	5.0	51	22	0.10	2.1	TTH20-5	5.1
TTTR5-0.1R-30L	5.0	76	30	0.10	2.1	TTH20-5	5.1
TTTR5-0.2R-15L	5.0	51	15	0.20	2.1	TTH20-5	5.1
TTTR5-0.2R-22L	5.0	51	22	0.20	2.1	TTH20-5	5.1
TTTR5-0.2R-30L	5.0	76	30	0.20	2.1	TTH20-5	5.1
TTTR6-0.05R-15L	6.0	51	15	0.05	2.8	TTH20-6	6.1
TTTR6-0.05R-22L	6.0	51	22	0.05	2.8	TTH20-6	6.1
TTTR6-0.1R-15L	6.0	51	15	0.10	2.8	TTH20-6	6.1
TTTR6-0.1R-22L	6.0	51	22	0.10	2.8	TTH20-6	6.1
TTTR6-0.2R-15L	6.0	51	15	0.20	2.8	TTH20-6	6.1
TTTR6-0.2R-22L	6.0	51	22	0.20	2.8	TTH20-6	6.1
TTTR6-0.2R-30L	6.0	58	30	0.20	2.8	TTH20-6	6.1
TTTR6-0.2R-35L	6.0	76	35	0.20	2.8	TTH20-6	6.1
TTTR7-0.2R-22L	7.0	62	22	0.20	3.3	TTH20-7	7.1
TTTR7-0.2R-30L	7.0	62	30	0.20	3.3	TTH20-7	7.1
TTTR8-0.2R-15L	8.0	64	15	0.20	3.8	TTH20-8	8.1
TTTR8-0.2R-22L	8.0	64	22	0.20	3.8	TTH20-8	8.1
TTTR8-0.2R-35L	8.0	76	35	0.20	3.8	TTH20-8	8.1
TTTR10-0.2R-35L	10.0	73	35	0.20	4.8	TTH20-10	10.1

**Left Hand Version upon Request*

TTXR BARS



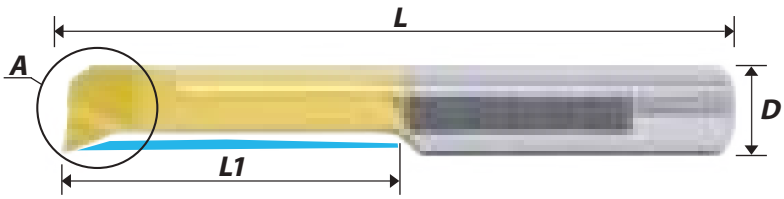


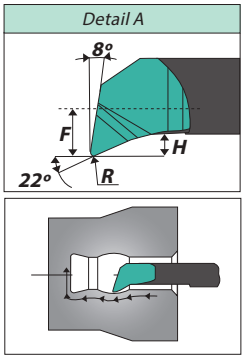
Back Turning

(Item Number)	D	(Length) in mm L	(Length) in mm L1	R in mm	F	H	(Holder)	(Min. Bore Dia.)
TTXR4-0.1R-10L	4.0	51	10	0.10	1.3	0.5	TTH20-4	3.1
TTXR4-0.15R-10L	4.0	51	10	0.15	1.6	0.8	TTH20-4	4.1
TTXR4-0.15R-15L	4.0	51	15	0.15	1.6	0.8	TTH20-4	4.1
TTXR5-0.2R-15L	5.0	51	15	0.20	2.2	1.0	TTH20-5	5.1
TTXR5-0.2R-22L	5.0	51	22	0.20	2.2	1.0	TTH20-5	5.1
TTXR6-0.2R-15L	6.0	51	15	0.20	2.8	1.8	TTH20-6	6.1
TTXR6-0.2R-22L	6.0	51	22	0.20	2.8	1.8	TTH20-6	6.1

Left Hand Version upon Request

TTPR BARS



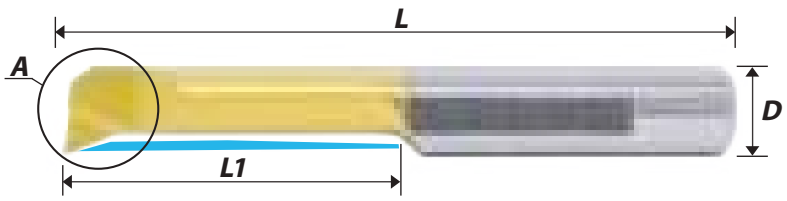


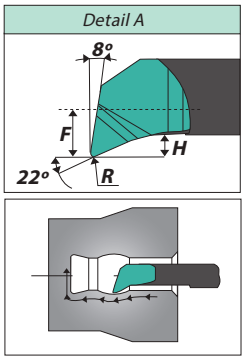
Profiling and Boring

(Item Number)	D	*(Length)* in mm L	*(Length)* in mm L1	R in mm	F	H	*(Holder)*	*(Min. Bore Dia.)*
TTPR1-0.05R-4L*	3.0	39	4	0.05	0.5	0.2	TTH20-3	1.0
TTPR1-0.05R-8L	3.0	39	8	0.05	0.5	0.2	TTH20-3	1.0
TTPR1.5-0.05R-10L	3.0	39	10	0.05	0.7	0.3	TTH20-3	1.5
TTPR1.5-0.1R-6L*	3.0	39	6	0.10	0.7	0.3	TTH20-3	1.5
TTPR1.5-0.1R-10L	3.0	39	10	0.10	0.7	0.3	TTH20-3	1.5
TTPR2-0.05R-10L*	3.0	39	10	0.05	0.8	0.5	TTH20-3	2.1
TTPR2-0.1R-10L*	3.0	39	10	0.10	0.8	0.5	TTH20-3	2.1
TTPR2-0.15R-5L*	3.0	39	5	0.15	0.8	0.5	TTH20-3	2.1
TTPR2-0.15R-10L*	3.0	39	10	0.15	0.8	0.5	TTH20-3	2.1
TTPR2-0.15R-15L	3.0	39	15	0.15	0.8	0.5	TTH20-3	2.1
TTPR3-0.05R-10L	3.0	39	10	0.05	1.3	0.7	TTH20-3	3.1
TTPR3-0.05R-15L	3.0	39	15	0.05	1.3	0.7	TTH20-3	3.1
TTPR3-0.1R-15L	3.0	39	15	0.10	1.3	0.7	TTH20-3	3.1
TTPR3-0.1R-22L	3.0	47	22	0.10	1.3	0.7	TTH20-3	3.1
TTPR3-0.2R-10L	3.0	39	10	0.20	1.3	0.7	TTH20-3	3.1
TTPR3-0.2R-15L	3.0	39	15	0.20	1.3	0.7	TTH20-3	3.1
TTPR3-0.2R-22L	3.0	47	22	0.20	1.3	0.7	TTH20-3	3.1
TTPR4-0.1R-10L	4.0	51	10	0.10	1.7	0.8	TTH20-4	4.1
TTPR4-0.1R-15L	4.0	51	15	0.10	1.7	0.8	TTH20-4	4.1
TTPR4-0.1R-22L	4.0	51	22	0.10	1.7	0.8	TTH20-4	4.1
TTPR4-0.2R-10L	4.0	51	10	0.20	1.7	0.8	TTH20-4	4.1
TTPR4-0.2R-15L	4.0	51	15	0.20	1.7	0.8	TTH20-4	4.1
TTPR4-0.2R-22L	4.0	51	22	0.20	1.7	0.8	TTH20-4	4.1

Left Hand Version upon Request

TTPR BARS



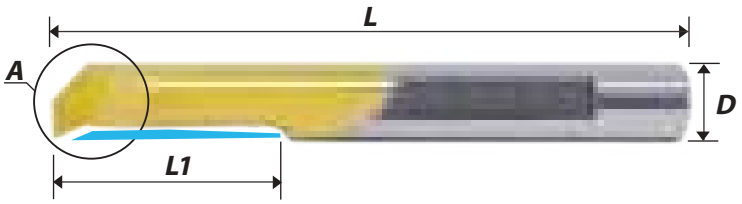


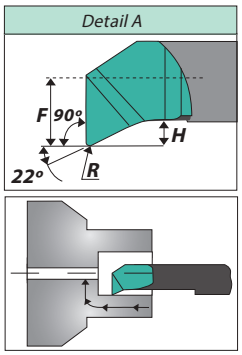
Profiling and Boring

(Item Number)	D	(Length) in mm L	(Length) in mm L1	R in mm	F	H	(Holder)	(Min. Bore Dia.)
TTPR5-0.1R-22L	5.0	51	22	0.10	2.1	1.2	TTH20-5	5.1
TTPR5-0.1R-30L	5.0	76	30	0.10	2.1	1.2	TTH20-5	5.1
TTPR5-0.2R-10L	5.0	51	10	0.20	2.1	1.2	TTH20-5	5.1
TTPR5-0.2R-15L	5.0	51	15	0.20	2.1	1.2	TTH20-5	5.1
TTPR5-0.2R-22L	5.0	51	22	0.20	2.1	1.2	TTH20-5	5.1
TTPR5-0.2R-30L	5.0	76	30	0.20	2.1	1.2	TTH20-5	5.1
TTPR6-0.2R-15L	6.0	51	15	0.20	2.8	1.4	TTH20-6	6.1
TTPR6-0.2R-22L	6.0	51	22	0.20	2.8	1.4	TTH20-6	6.1
TTPR6-0.2R-30L	6.0	76	30	0.20	2.8	1.4	TTH20-6	6.1
TTPR7-0.2R-22L	7.0	62	22	0.20	3.3	1.5	TTH20-7	7.1
TTPR7-0.2R-30L	7.0	62	30	0.20	3.3	1.5	TTH20-7	7.1
TTPR7-0.2R-35L	7.0	62	35	0.20	3.3	1.5	TTH20-7	7.1
TTPR8-0.2R-15L	8.0	64	15	0.20	3.8	1.6	TTH20-8	8.1
TTPR8-0.2R-22L	8.0	64	22	0.20	3.8	1.6	TTH20-8	8.1
TTPR8-0.2R-35L	8.0	76	35	0.20	3.8	1.6	TTH20-8	8.1
TTPR10-0.2R-35L	10.0	73	35	0.20	4.8	2.0	TTH20-10	10.1

Left Hand Version upon Request

TTUR BARS



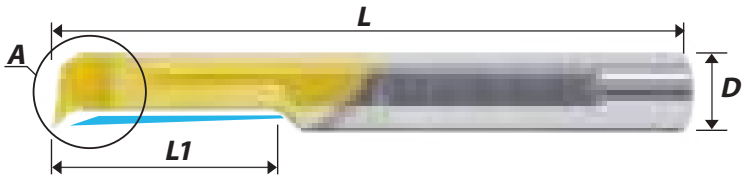


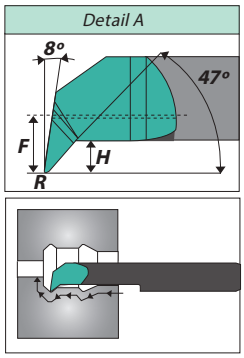
Profiling, 90° Face Cutting

(Item Number)	D	*(Length)* in mm L	*(Length)* in mm L1	R in mm	F	H	*(Holder)*	*(Min. Bore Dia.)*
TTUR3-0.05R-10L	3.0	39	10	0.05	1.3	0.4	TTH20-3	3.1
TTUR3-0.05R-15L	3.0	39	15	0.05	1.3	0.4	TTH20-3	3.1
TTUR4-0.1R-10L	4.0	51	10	0.10	1.7	0.5	TTH20-4	4.1
TTUR4-0.1R-15L	4.0	51	15	0.10	1.7	0.5	TTH20-4	4.1
TTUR5-0.15R-15L	5.0	51	15	0.15	2.1	0.7	TTH20-5	5.1
TTUR5-0.15R-22L	5.0	51	22	0.15	2.1	0.7	TTH20-5	5.1
TTUR6-0.15R-15L	6.0	51	15	0.15	2.8	0.9	TTH20-6	6.1
TTUR6-0.15R-22L	6.0	51	22	0.15	2.8	0.9	TTH20-6	6.1
TTUR8-0.2R-22L	8.0	64	22	0.20	3.8	1.1	TTH20-8	8.1

Left Hand Version upon Request

TTQR BARS



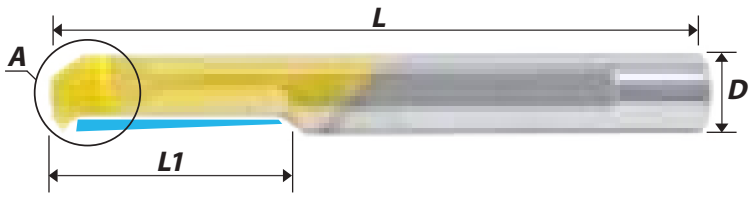


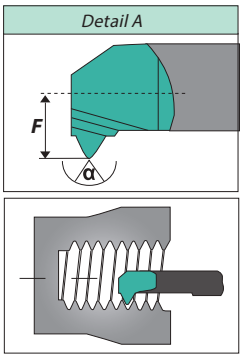
Profiling and Boring

(Item Number)	D	(Length) in mm L	(Length) in mm L1	R in mm	F	H	(Holder)	(Min. Bore Dia.)
TTQR4-0.1R-22L	4.0	22	51	0.10	1.8	0.8	TTH20-4	4.1
TTQR4-0.2R-10L	4.0	10	51	0.20	1.8	0.8	TTH20-4	4.1
TTQR4-0.2R-15L	4.0	15	51	0.20	1.8	0.8	TTH20-4	4.1
TTQR4-0.2R-22L	4.0	22	51	0.20	1.8	0.8	TTH20-4	4.1
TTQR5-0.2R-15L	5.0	15	51	0.20	2.3	1.0	TTH20-5	5.1
TTQR5-0.2R-22L	5.0	22	51	0.20	2.3	1.0	TTH20-5	5.1
TTQR6-0.2R-15L	6.0	15	51	0.20	2.8	1.4	TTH20-6	6.1
TTQR6-0.2R-22L	6.0	22	51	0.20	2.8	1.4	TTH20-6	6.1
TTQR6-0.2R-30L	6.0	30	58	0.20	2.8	1.4	TTH20-6	6.1
TTQR8-0.2R-22L	8.0	22	64	0.20	3.8	1.6	TTH20-8	8.1
TTQR8-0.2R-27L	8.0	27	64	0.20	3.8	2.0	TTH20-8	8.1

Left Hand Version upon Request

TTIR BARS



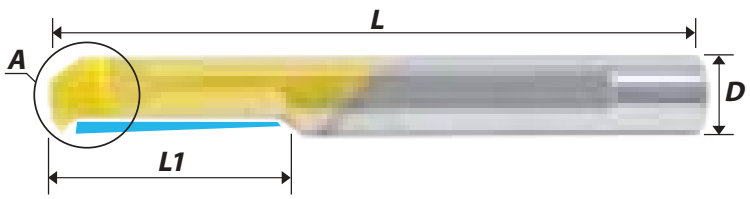


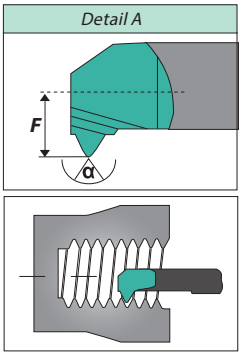
Threading, Partial Profile 55°

(Item Number)	(Pitch Range) mm	(TPI)	(Length) in mm L	(Length) in mm L1	D in mm	F	α	(Holder)	(Min.Bore Dia.)
TTIR3-A55-15L	0.5 - 1.0	48-24	39	15	3.0	1.4	55	TTH20-3	3.2
TTIR4-A55-15L	0.5 - 1.0	48-24	51	15	4.0	1.8	55	TTH20-4	4.1
TTIR5-A55-15L	0.5 - 1.25	48-20	51	15	5.0	2.3	55	TTH20-5	5.1
TTIR5-A55-22L	0.5 - 1.25	48-20	51	22	5.0	2.3	55	TTH20-5	5.1
TTIR6-A55-15L	0.5 - 1.5	48-16	51	15	6.0	2.6	55	TTH20-6	6.0
TTIR6-A55-22L	0.5 - 1.5	48-16	51	22	6.0	2.6	55	TTH20-6	6.0

Left Hand Version upon Request

TTIR BARS



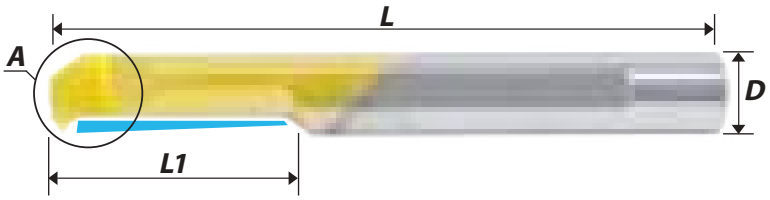


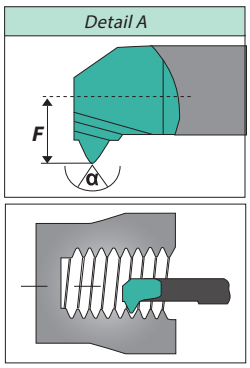
Threading, Partial Profile 60°

(Item Number)	(Pitch Range) mm	(TPI)	(Length) in mm L	(Length) in mm L1	D in mm	F	α	(Holder)	(Min.Bore Dia.)
TTIR1-A60-5L	0.25 - 0.35	100 -72	39	4.8	3.0	0.55	60	TTH20-3	1.2
TTIR1.5-A60-6L	0.35 - 0.45	72-56	39	6.3	3.0	0.65	60	TTH20-3	1.4
TTIR2-A60-8L*	0.45 - 0.7	56-32	39	8	3.0	1.0	60	TTH20-3	2.1
TTIR3-A60-15L	0.7 - 1.0	32-24	39	15	3.0	1.4	60	TTH20-3	3.2
TTIR4-A60-15L	0.8 - 1.0	32-24	51	15	4.0	1.8	60	TTH20-4	4.1
TTIR5-A60-15L	1.0 - 1.25	24-20	51	15	5.0	2.3	60	TTH20-5	5.1
TTIR5-A60-22L	1.0 - 1.25	24-20	51	22	5.0	2.3	60	TTH20-5	5.1
TTIR6-A60-15L	1.0 - 1.5	24-16	51	15	6.0	2.6	60	TTH20-6	6.0
TTIR6-A60-22L	1.0 - 1.5	24-16	51	22	6.0	2.6	60	TTH20-6	6.0
TTIR8-A60-22L	1.0 - 2.0	24-13	64	22	8.0	3.6	60	TTH20-8	8.0

Left Hand Version upon Request

TTIR BARS



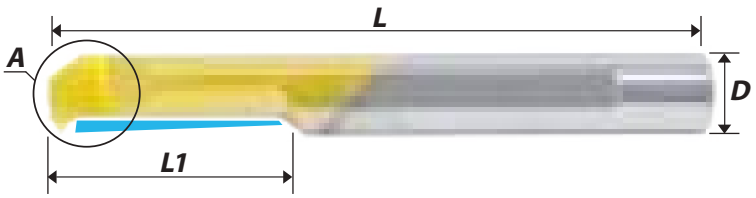


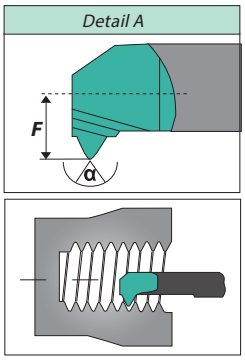
Threading, Full Profile ISO 60°

(Item Number)	*(Thread)*	*(Length)* in mm L	*(Length)* in mm L1	D in mm	F	*(Holder)*	*(Min.Bore Dia.)*
TTIR3-0.5ISO-10L	M3 x 0.5	39	10	3.0	1.0	TTH20-3	2.4
TTIR3-0.5ISO-15L	M4 x 0.5	39	15	3.0	1.4	TTH20-3	3.2
TTIR3-0.7ISO-15L	M4 x 0.7	39	15	3.0	1.4	TTH20-3	3.2
TTIR3-0.75ISO-15L	M4.5 x 0.75	39	15	3.0	1.4	TTH20-3	3.2
TTIR4-0.5ISO-15L	M5 x 0.5	51	15	4.0	1.8	TTH20-4	4.1
TTIR4-0.75ISO-15L	M5 x 0.75	51	15	4.0	1.8	TTH20-4	4.1
TTIR4-0.8ISO-15L	M5 x 0.8	51	15	4.0	1.8	TTH20-4	4.1
TTIR5-1.0ISO-15L	M6 x 1.0	51	15	5.0	2.2	TTH20-5	4.9
TTIR6-1.25ISO-22L	M8 x 1.25	51	22	6.0	2.8	TTH20-6	6.1

Left Hand Version upon Request

TTIR BARS



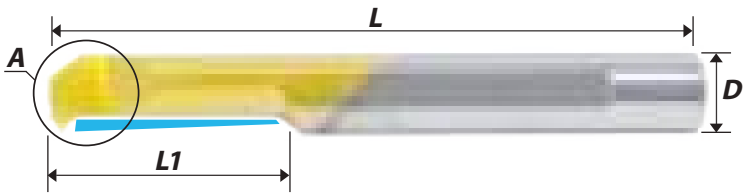


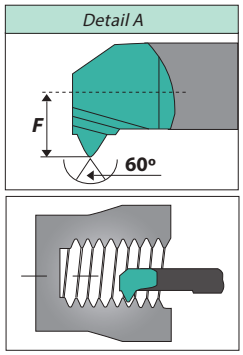
Threading, Full Profile UN 60°

(Item Number)	*(Thread)*	*(Length)* in mm L	*(Length)* in mm L1	D in mm	F	*(Holder)*	*(Min.Bore Dia.)*
TTIR3-32UN-L10	6-32UNC	39	10	3.0	1.0	TTH20-3	2.7
TTIR3-36UN-15L	8-36UNF	39	15	3.0	1.4	TTH20-3	3.2
TTIR3-32UN-15L	8-32UNC	39	15	3.0	1.4	TTH20-3	3.2
TTIR4-36UN-15L	12-36UNS	51	15	4.0	1.8	TTH20-4	4.1
TTIR4-32UN-15L	12-32UNEF	51	15	4.0	1.8	TTH20-4	4.1
TTIR5-28UN-15L	1/4-28UNF	51	15	5.0	2.2	TTH20-5	4.9
TTIR5-20UN-18L	1/4-20UNC	51	18	5.0	2.3	TTH20-5	5.0
TTIR6-24UN-18L	5/16 -24UNF	51	18	6.0	2.8	TTH20-6	6.5
TTIR6-18UN-18L	5/16 -18UNC	51	18	6.0	2.8	TTH20-6	6.2

Left Hand Version upon Request

TTIR BARS



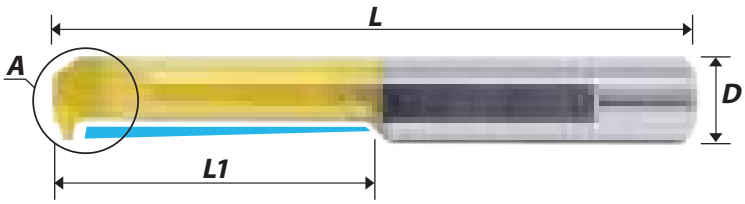


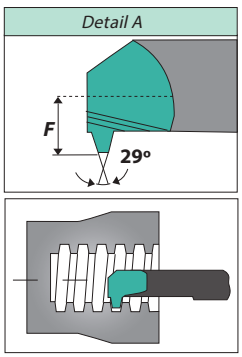
Threading, Full Profile NPT 60°

(Item Number)	(Pitch) (TPI)	(Length) in mm L	(Length) in mm L1	D in mm	F	(Thread Size)	(Holder)	(Min.Bore Dia.)
TTIR6-27NPT-15L	27	51	15	6.0	2.6	1/16x27NPT 1/8x27NPT	TTH20-6	5.9

Left Hand Version upon Request

TTIR BARS



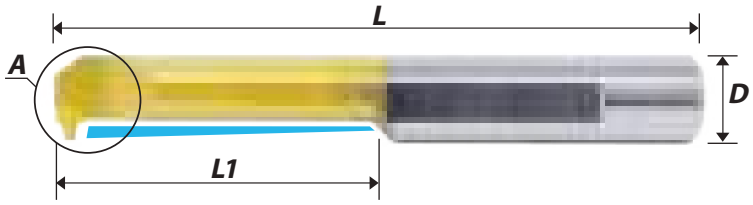


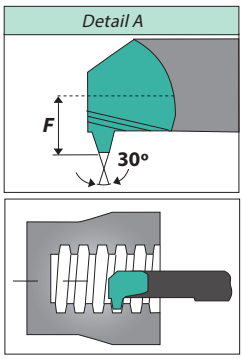
ACME

(Item Number)	(Pitch) (TPI)	(Length) in mm L	(Length) in mm L1	D in mm	F	(Thread Size)	(Holder)	(Min.Bore Dia.)
TTIR4-16ACME-15L	16	51	15	4.0	1.8	1/4 x 16	TTH20-4	4.6
TTIR6-14ACME-20L	14	51	20	6.0	2.8	5/16 x 14	TTH20-6	6.0
TTIR7-12ACME-22L	12	62	22	7.0	3.3	3/8 x 12	TTH20-7	7.2
TTIR8-10ACME-30L	10	76	30	8.0	3.8	1/2 x 10	TTH20-8	10.0
TTIR10-8ACME-35L	8	73	35	10.0	4.8	5/8 x 8	TTH20-10	12.5
TTIR10-6ACME-45L	6	105	45	10.0	4.8	3/4 x 6 7/8 x 6	TTH20-10	14.6
TTIR10-5ACME-52L	5	105	52	10.0	4.8	1 x 5	TTH20-10	20.0

Left Hand Version upon Request

TTIR BARS



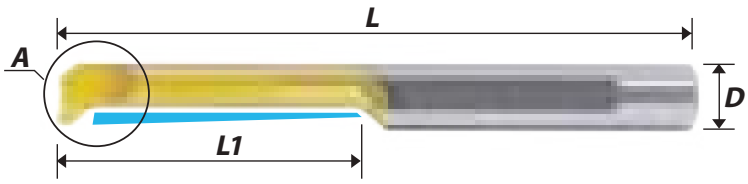


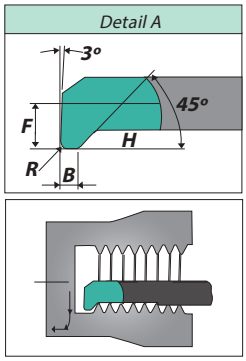
Partial Profile Trapez - DIN 103

(Item Number)	(Pitch) (TPI)	(Length) in mm L	(Length) in mm L1	D in mm	F	(Thread Size)	(Holder)	(Min.Bore Dia.)
TTIR6-1.5TR-22L	1.5	51	22	6.0	2.8	Tr 8 x 1.5 Tr 9 x 1.5 Tr 10 x 1.5	TTH20-6	6.4
TTIR7-2TR-25L	2	62	25	7.0	3.2	Tr 9 x 2 Tr 10 x 2 Tr 11 x 2 Tr 12 x 2	TTH20-7	6.9
TTIR10-2TR-35L	2	73	35	10.0	4.8	Tr 14 x 2 Tr 16 x 2 Tr 18 x 2 Tr 20 x 2	TTH20-10	11.0
TTIR7-3TR-35L	3	62	35	7.0	3.3	Tr 11 x 3 Tr 12 x 3	TTH20-7	7.5
TTIR10-3TR-35L	3	73	35	10.0	4.8	Tr 14 x 3 Tr 22 x 3 Tr 24 x 3 Tr 26 x 3 Tr 28 x 3	TTH20-10	10.5
TTIR10-4TR-45L	4	105	45	10.0	4.8	Tr 16 x 4 Tr 18 x 4 Tr 20 x 4	TTH20-10	11.5
TTIR10-5TR-55L	4	105	55	10.0	4.8	Tr 22 x 5 Tr 24 x 5 Tr 28 x 5	TTH20-10	11.0

Left Hand Version upon Request

TTDR BARS



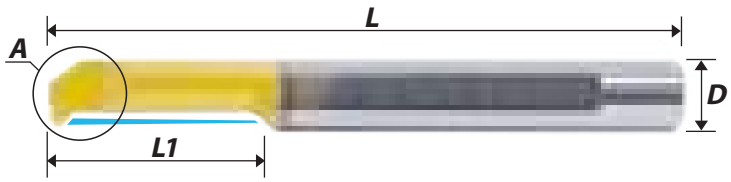


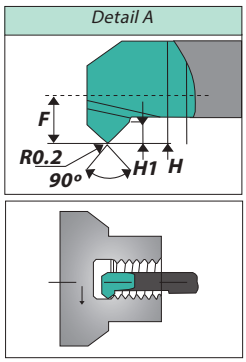
Thread Relief, Chamfering and Grooving

(Item Number)	(Length) in mm L	(Length) in mm L1	D in mm	B	R	H	F	(Holder)	(Min.Bore Dia.)
TTDR4-0.5R-18L	51	18	4.0	1.5	0.5	0.8	1.8	TTH20-4	4.1
TTDR5-0.5R-24L	51	24	5.0	1.5	0.5	1.2	2.3	TTH20-5	5.1
TTDR6-0.5R-27L	58	27	6.0	1.5	0.5	1.4	2.8	TTH20-6	6.1

Left Hand Version upon Request

TTCR BARS



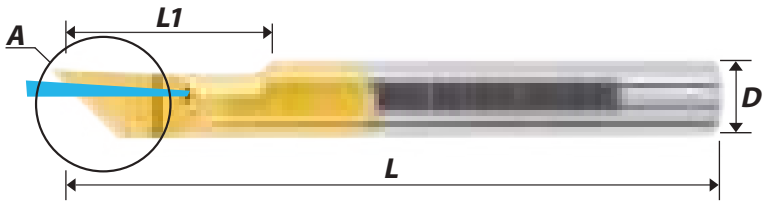


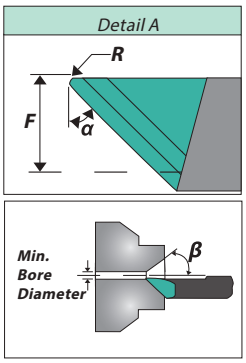
Chamfering and Boring

(Item Number)	(Length) in mm L	(Length) in mm L1	D in mm	F	H	H1	R	(Holder)	(Min.Bore Dia.)
TTCR3-0.2R-10L	39	10	3.0	1.3	0.7	0.3	0.20	TTH20-3	3.1
TTCR4-0.2R-15L	51	15	4.0	1.7	0.8	0.4	0.20	TTH20-4	4.1
TTCR5-0.2R-15L	51	15	5.0	2.1	1.2	0.7	0.20	TTH20-5	5.1
TTCR6-0.2R-15L	51	15	6.0	2.8	1.4	0.7	0.20	TTH20-6	6.1
TTCR7-0.2R-20L	62	20	7.0	3.3	1.5	0.8	0.20	TTH20-7	7.1

Left Hand Version upon Request

TTWR BARS



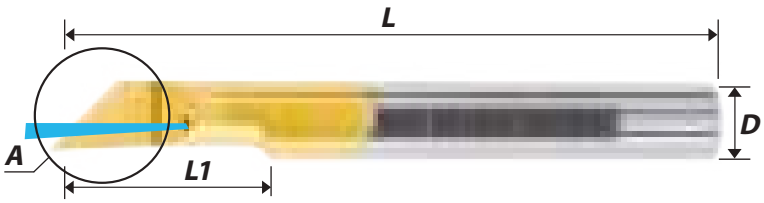


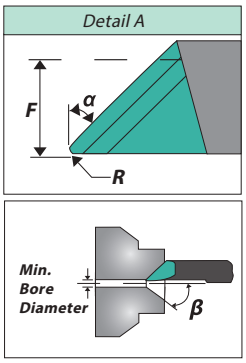
45° Chamfering and Profiling with internal coolant

(Item Number)	(Length) in mm L	(Length) in mm L1	D in mm	F	α	β	R	(Holder)	(Min.Bore Dia.)
TTWR6-0.2R-A90	51	15.0	6.0	2.3	45°	45°	0.20	TTH20-6	1.0
TTWR6-0.2R-A60	51	15.0	6.0	2.3	60°	30°	0.20	TTH20-6	1.0
TTWR6-0.4R-A90	51	22.0	6.0	2.3	45°	45°	0.40	TTH20-6	6.0
TTWR6-0.4R-A60	51	22.0	6.0	2.3	60°	30°	0.40	TTH20-6	6.0

Left Hand Version upon Request

TTWL BARS ¨



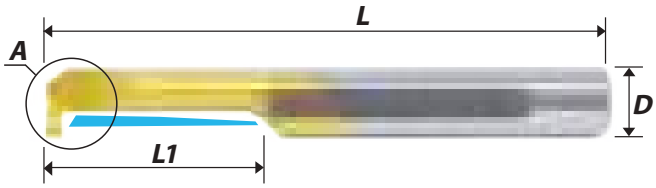


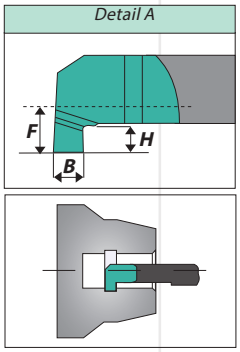
Chamfering and Profiling with internal coolant

(Item Number)	in mm L	in mm L1	D in mm	F	α	β	R	(Holder)	(Min.Bore Dia.)
TTWL6-0.2R-A90	51	15.0	6.0	2.3	45°	45°	0.20	TTH20-6	1.0
TTWL6-0.2R-A60	51	15.0	6.0	2.3	60°	30°	0.20	TTH20-6	1.0
TTWL6-0.4R-A90	51	22.0	6.0	2.3	45°	45°	0.40	TTH20-6	6.0
TTWL6-0.4R-A60	51	22.0	6.0	2.3	60°	30°	0.40	TTH20-6	6.0

Left Hand Version upon Request

TTGR BARS



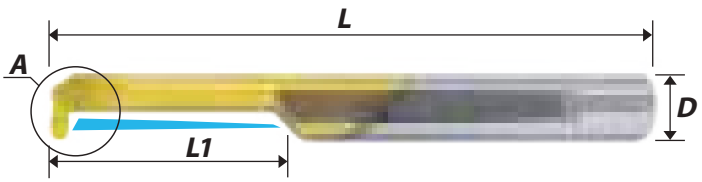


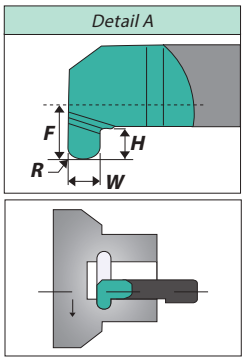
Grooving

(Item Number)	(Length) in mm L	(Length) in mm L1	D in mm	B	H	F	(Holder)	(Min.Bore Dia.)
TTGR3-0.7B-10L	39	10	3.0	0.7	0.6	1.3	TTH20-3	3.1
TTGR4-0.5B-10L	51	10	4.0	0.5	0.5	1.7	TTH20-4	4.1
TTGR4-0.7B-10L	51	10	4.0	0.7	0.6	1.7	TTH20-4	4.1
TTGR4-1.0B-10L	51	10	4.0	1.0	1.0	1.7	TTH20-4	4.1
TTGR4-1.0B-15L	51	15	4.0	1.0	1.0	1.7	TTH20-4	4.1
TTGR4-1.5B-10L	51	10	4.0	1.5	1.0	1.7	TTH20-4	4.1
TTGR5-1.0B-15L	51	15	5.0	1.0	1.2	2.3	TTH20-5	5.1
TTGR5-1.0B-22L	51	22	5.0	1.0	1.2	2.3	TTH20-5	5.1
TTGR5-1.5B-15L	51	15	5.0	1.5	1.2	2.3	TTH20-5	5.1
TTGR5-1.5B-22L	51	22	5.0	1.5	1.2	2.3	TTH20-5	5.1
TTGR5-2.0B-15L	51	15	5.0	2.0	1.2	2.3	TTH20-5	5.1
TTGR5-2.0B-22L	51	22	5.0	2.0	1.2	2.3	TTH20-5	5.1
TTGR6-1.0B-15L	51	15	6.0	1.0	1.4	2.8	TTH20-6	6.1
TTGR6-1.0B-22L	51	22	6.0	1.0	1.4	2.8	TTH20-6	6.1
TTGR6-1.5B-15L	51	15	6.0	1.5	1.4	2.8	TTH20-6	6.1
TTGR6-1.5B-22L	51	22	6.0	1.5	1.4	2.8	TTH20-6	6.1
TTGR6-2.0B-15L	51	15	6.0	2.0	1.4	2.8	TTH20-6	6.1
TTGR6-2.0B-22L	51	22	6.0	2.0	1.4	2.8	TTH20-6	6.1
TTGR6-1.0B-17L	51	17	6.0	1.0	1.8	2.8	TTH20-6	6.1
TTGR6-1.5B-17L	51	17	6.0	1.5	1.8	2.8	TTH20-6	6.1
TTGR6-2.0B-17L	51	17	6.0	2.0	1.8	2.8	TTH20-6	6.1
TTGR7-1.0B-15L	62	15	7.0	1.0	2.5	3.3	TTH20-7	7.1
TTGR7-1.0B-22L	62	22	7.0	1.0	2.5	3.3	TTH20-7	7.1
TTGR7-1.0B-30L	62	30	7.0	1.0	2.5	3.3	TTH20-7	7.1
TTGR7-1.5B-15L	62	15	7.0	1.5	2.5	3.3	TTH20-7	7.1
TTGR7-1.5B-22L	62	22	7.0	1.5	2.5	3.3	TTH20-7	7.1
TTGR7-1.5B-30L	62	30	7.0	1.5	2.5	3.3	TTH20-7	7.1
TTGR7-2.0B-15L	62	15	7.0	2.0	2.5	3.3	TTH20-7	7.1
TTGR7-2.0B-22L	62	22	7.0	2.0	2.5	3.3	TTH20-7	7.1
TTGR7-2.0B-30L	62	30	7.0	2.0	2.5	3.3	TTH20-7	7.1
TTGR8-1.0B-22L	64	22	8.0	1.0	1.7	3.8	TTH20-8	8.1
TTGR8-1.5B-22L	64	22	8.0	1.5	1.7	3.8	TTH20-8	8.1
TTGR8-2.0B-22L	64	22	8.0	2.0	2.6	3.8	TTH20-8	8.1

Left Hand Version upon Request

TTKR BARS



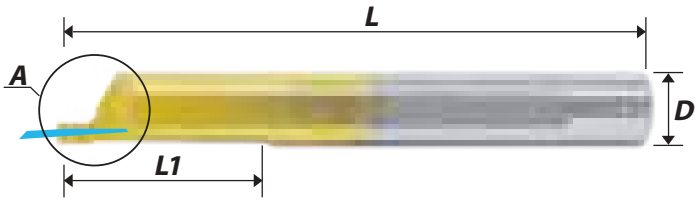


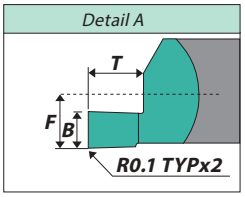
Full Radius Grooving

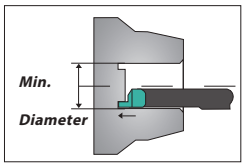
(Item Number)	*(Length)* in mm L	*(Length)* in mm L1	D in mm	F	W	H	R	*(Holder)*	*(Min.Bore Dia.)*
TTKR4-0.5R-10L	51	10	4.0	1.7	1.0	1.0	0.50	TTH20-4	4.1
TTKR4-0.75R-10L	51	10	4.0	1.7	1.5	1.0	0.75	TTH20-4	4.1
TTKR5-0.5R-15L	51	15	5.0	2.3	1.0	1.2	0.50	TTH20-5	5.1
TTKR5-0.75R-15L	51	15	5.0	2.3	1.5	1.2	0.75	TTH20-5	5.1
TTKR5-1.0R-15L	51	15	5.0	2.3	2.0	1.2	1.00	TTH20-5	5.1
TTKR6-0.5R-15L	51	15	6.0	2.8	1.0	1.6	0.50	TTH20-6	6.1
TTKR6-0.75R-15L	51	15	6.0	2.8	1.5	1.6	0.75	TTH20-6	6.1
TTKR6-1.0R-15L	51	15	6.0	2.8	2.0	1.6	1.00	TTH20-6	6.1
TTKR7-0.5R-22L	62	22	7.0	3.3	1.0	2.5	0.05	TTH20-7	7.1
TTKR7-0.75R-15L	62	22	7.0	3.3	1.5	2.5	0.75	TTH20-7	7.1
TTKR7-1.0R-22L	62	22	7.0	3.3	2.0	2.5	1.00	TTH20-7	7.1

Left Hand Version upon Request

TTFR BARS





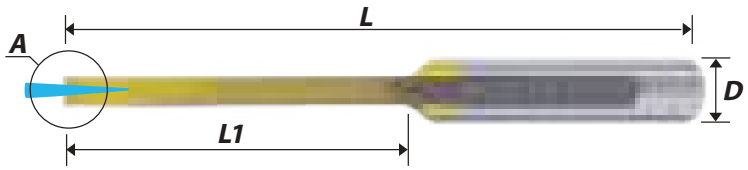


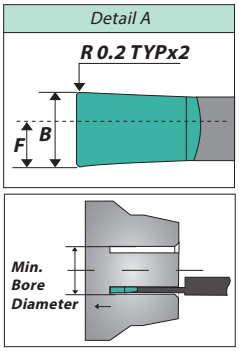
Face Grooving

(Item Number)	*(Length)* in mm L	*(Length)* in mm L1	D in mm	F	B	T	*(Holder)*	*(Min.Bore Dia.)*
TTFR4-0.75B-15L	51	15	4.0	1.95	0.75	1.2	TTH20-4	5.0
TTFR4-1.0B-15L	51	15	4.0	1.95	1.0	1.5	TTH20-4	5.0
TTFR4-1.5B-15L	51	15	4.0	1.95	1.5	2.8	TTH20-4	5.0
TTFR5-0.75B-22L	51	22	5.0	2.45	0.75	1.2	TTH20-5	6.0
TTFR5-1.0B-22L	51	22	5.0	2.45	1.0	1.5	TTH20-5	6.0
TTFR5-1.5B-22L	51	22	5.0	2.45	1.5	2.5	TTH20-5	6.0
TTFR5-2.0B-22L	51	22	5.0	2.45	2.0	3.8	TTH20-5	6.0
TTFR6-1.0B-22L	51	22	6.0	2.95	1.0	1.5	TTH20-6	8.0
TTFR6-1.5B-22L	51	22	6.0	2.95	1.5	2.5	TTH20-6	8.0
TTFR6-2.0B-22L	51	22	6.0	2.95	2.0	3.0	TTH20-6	8.0
TTFR6-2.5B-22L	51	22	6.0	2.95	2.5	4.8	TTH20-6	8.0
TTFR6-3.0B-30L	58	30	6.0	2.95	3.0	6.0	TTH20-6	8.0
TTFR8-2.5B-22L	64	22	8.0	3.95	2.5	3.5	TTH20-8	10.0

Left Hand Version upon Request

TTVR BARS



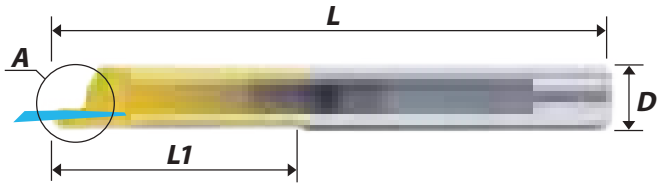


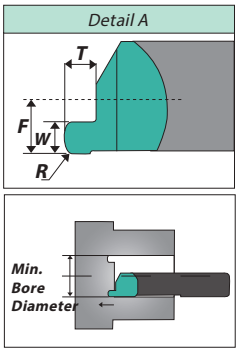
Deep Face Grooving - with 2 coolant bores

(Item Number)	(Length) in mm L	(Length) in mm L1	D in mm	F	B	(Holder)	(Min.Bore Dia.)
TTVR6-2.0B-15L	64	15	6.0	1.7	2.0	TTH20-6	12.0
TTVR6-2.0B-22L	64	22	6.0	1.7	2.0	TTH20-6	12.0
TTVR6-2.5B-22L	64	22	6.0	2.2	2.5	TTH20-6	12.0
TTVR8-3.0B-27L	64	27	8.0	2.5	3.0	TTH20-8	15.0
TTVR8-3.0B-43L	80	43	8.0	1.6	3.0	TTH20-8	15.0
TTVR8-4.0B-43L	80	43	8.0	1.6	4.0	TTH20-8	20.0

Left Hand Version upon Request

TTZR BARS





Face Grooving

(Item Number)	(Length) in mm L	(Length) in mm L1	D in mm	F	W	T	R	(Holder)	(Min.Bore Dia.)
TTZR4-0.5R-15L	51	15	4.0	1.95	1.0	1.2	0.50	TTH20-4	5.0
TTZR4-0.75R-15L	51	15	4.0	1.95	1.5	1.5	0.75	TTH20-4	5.0
TTZR5-0.5R-22L	51	22	5.0	2.45	1.0	1.2	0.50	TTH20-5	6.0
TTZR5-0.75R-22L	51	22	5.0	2.45	1.5	1.5	0.75	TTH20-5	6.0
TTZR5-1.0R-22L	51	22	5.0	2.45	2.0	2.5	1.00	TTH20-5	6.0
TTZR6-0.5R-22L	51	22	6.0	2.95	1.0	1.2	0.50	TTH20-6	8.0
TTZR6-0.75R-22L	51	22	6.0	2.95	1.5	1.5	0.75	TTH20-6	8.0
TTZR6-1.0R-22L	51	22	6.0	2.95	2.0	2.5	1.00	TTH20-6	8.0

Left Hand Version upon Request

Thread Turning

PRODUCT DESIGNATION

EXAMPLE: **SKS2-23S-5L**

SKS **2** **-** **23S** **-** **5L** **XTG**

Hexagon Keys

Min. Bore Dia.:

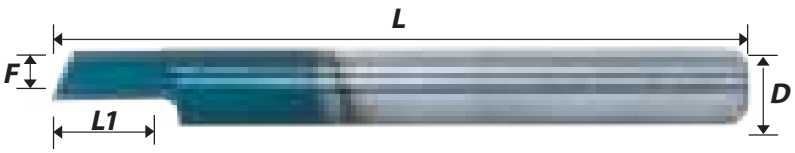
2 = 2.2 mm
3 = 2.9 mm
4 = 3.9 mm
5 = 4.9 mm

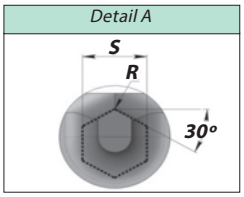
Socket Size: 23S
= 2.3 - 2.9 mm 30S
= 3.0 - 4.0 mm 40S
= 4.0 - 5.0 mm 50S
= 5.0 - 8.0 mm

Maximum Cutting depth
4L = 4.0 mm
5L = 5.5 mm
6L = 6.5 mm
9L = 9.5 mm

Coating

SKS





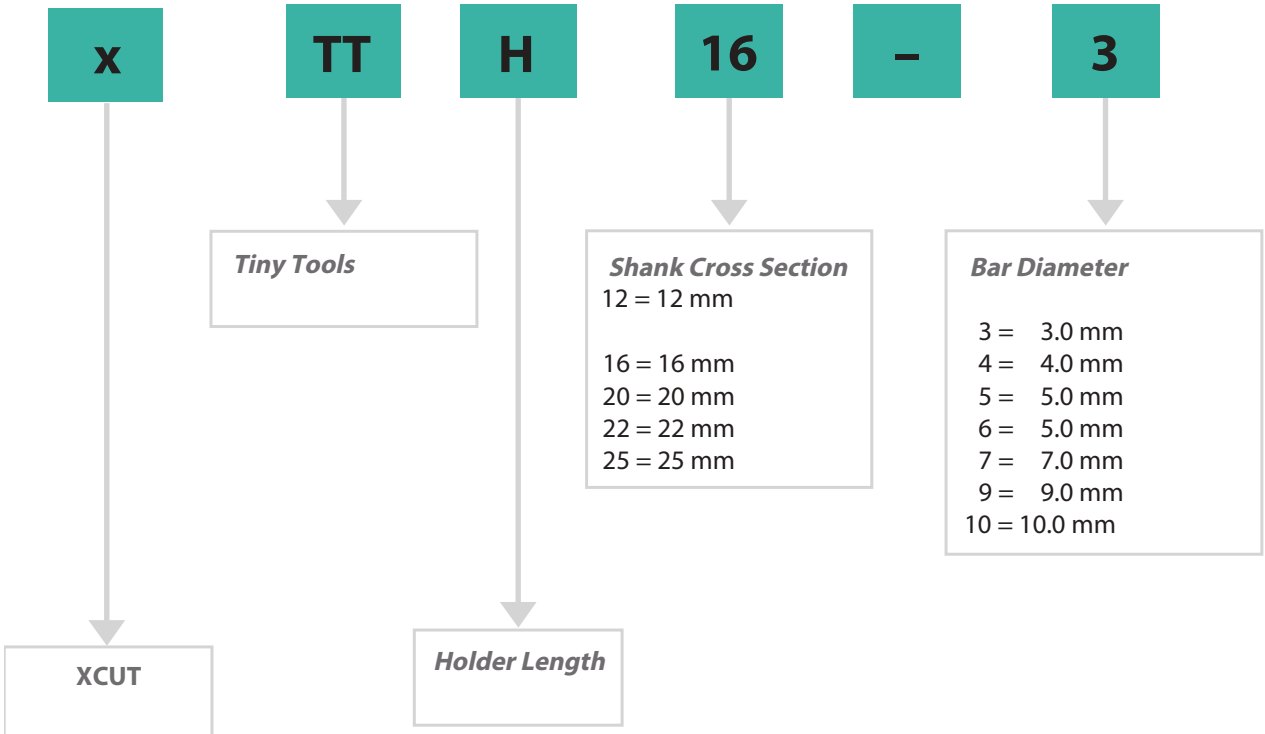
Broaching Tools for Hexagon Keys

(Item Number)	*(Length)* in mm L	*(Length)* in mm L1	D in mm	S	R	F	*(Holder)*	*(Min.Bore Dia.)*
SKS2-23S-5L	51	4.0		2.3 - 2.9	0.05	1.35	TTH...5	2.2
SKS3-30S-5L	51	5.5	5.0	3.0 - 4.0	0.05	1.35		2.9
SKS4-40S-6L	51	6.5		4.0 - 5.0	0.10	1.35		3.9
SKS5-50S-9L	62	9.5	7.0	5.0 - 8.0	0.10	1.35	TTH...7	4.9

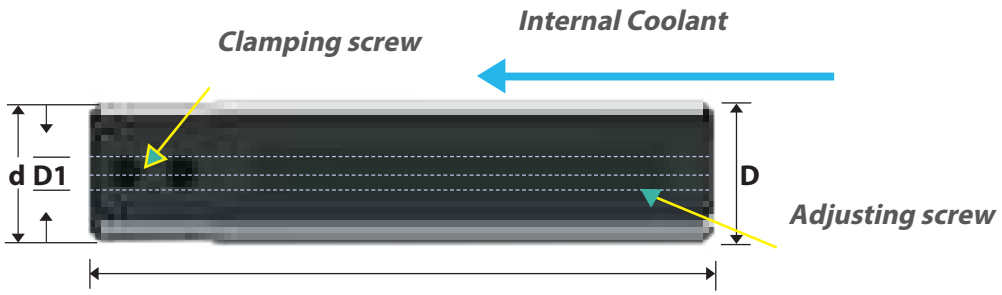
TINY TOOLS Tool Holder

| *PRODUCT DESIGNATION*

EXAMPLE: **TTH16-3**



TINY TOOLS BAR HOLDERS



(Item Number)	(Length) in mm L	D1	D	d	(Torx Key)	(Clamping Screw)	(Adjusting Screw)
TTH12-3	88	3.0	12	12	TX25	S24	S35
TTH16-3S	75	3.0	16	20	TX25	S25	S35S
TTH16-3	88	3.0	16	20	TX25	S25	S35
TTH20-3	88	3.0	20	20	TX25	S25	S35
TTH22-3	88	3.0	22	22	TX25	S25	S35
TTH12-4	88	4.0	12	12	TX25	S24	S35
TTH16-4S	75	4.0	16	20	TX25	S25	S35S
TTH16-4	88	4.0	16	20	TX25	S25	S35
TTH20-4	88	4.0	20	20	TX25	S25	S35
TTH22-4	88	4.0	22	22	TX25	S25	S35
TTH12-5	88	5.0	12	12	TX25	S24	S35
TTH16-5S	75	5.0	16	20	TX25	S25	S35S
TTH16-5	88	5.0	16	20	TX25	S25	S35
TTH20-5	88	5.0	20	20	TX25	S25	S35
TTH22-5	75	5.0	22	22	TX25	S25	S35
TTH16-6S	75	6.0	16	20	TX25	S25	S35S
TTH16-6	88	6.0	16	20	TX25	S25	S35
TTH20-6	88	6.0	20	20	TX25	S25	S35
TTH22-6	88	6.0	22	22	TX25	S25	S35
TTH16-7	88	7.0	16	20	TX25	S25	S35
TTH20-7	88	7.0	20	20	TX25	S25	S35
TTH22-7	88	7.0	22	22	TX25	S25	S35
TTH16-8	88	8.0	16	20	TX25	S25	S35
TTH20-8	88	8.0	20	20	TX25	S25	S35
TTH22-8	88	8.0	22	22	TX25	S25	S35
TTH16-10	88	10.0	16	20	TX25	S25	S35
TTH20-10	88	10.0	20	20	TX25	S25	S35
TTH22-10	88	10.0	22	22	TX25	S25	S35

(TECHNICAL SECTION)

(Carbide Grades) **: XTG** (K10 - K20)

(CUTTING SPEED FOR TINY TOOLS)

ISO	*(Material)*		*Condition)*	XTG
P	*Non-Alloy 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 (less than 5% alloying elements)		*Annealed*	25 - 50
			Quenched & Tempered	
	High Alloy Steel, Cast Steel and Tool Steel		*Annealed*	25 - 50
			Quenched & Tempered	
M	*Stainless Steel and Cast stainless Steel*		*Ferritic /Martensitic*	30 - 60
			Martensitic	
			Austenitic	
K	*Nodular Cast Iron (GGG)*		*Ferritic / Pearlitic*	30 - 80
			Pearlitic	
	Grey Cast Iron (GG)		*Ferritic*	30 - 80
			Pearlitic	
	Malleable Cast Iron		*Ferritic*	20 - 50
			Pearlitic	
N	*Aluminum-Wrought Alloy*		*Not hardened*	60 - 120
			Precipation Hardened	
	Aluminum-Cast, Alloyed	*<= 12% Si*	*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	
S	*Copper Alloys*		*Annealed*	15 - 40
			Cured	
	High Temp.	*Ni or Co based*	*Annealed*	
			Cured	
			Cast	
	Titanium Alloys		*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

(NUMBER OF PASSES)

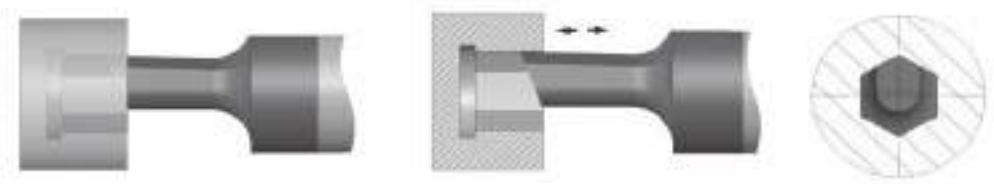
(Pitch):	mm *(TPI):*	0.5 48	0.7 36	0.8 32	1.0 24	1.25 20	1.5 16	2-5 14-5
(Number of Passes):		6-12	7-14	7-16	8-18	8-20	10-22	20-38

(SKS BROACHING TOOLS FOR HEXAGON KEYS)

(The SKS broaching system have

been developed to machine internal keyways inside blind or through holes, using CNC machines.)

(WORKING DEMO)



(To use with standard TTH Bar Holders)

- *(The holder can be located directly in the turret or the machine spindle.)*
- *(Holder with rear clamping screw for full support during operation.)*
- *(Available in XTG Grade only.)*

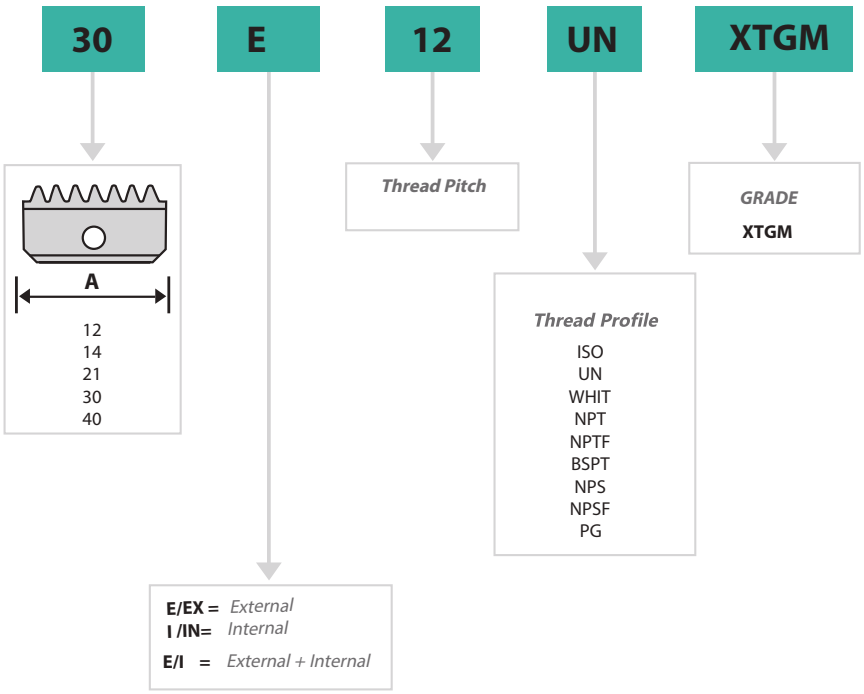
Notes

THREAD MILLING

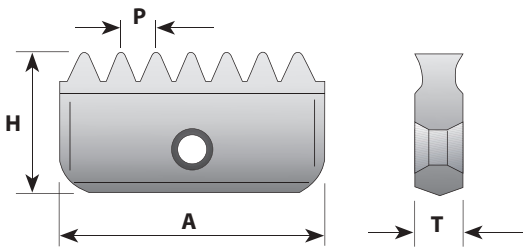
Thread Milling

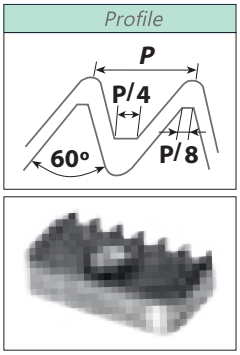
PRODUCT DESIGNATION

***EXAMPLE* : 30E12UN XTGM**



ISO

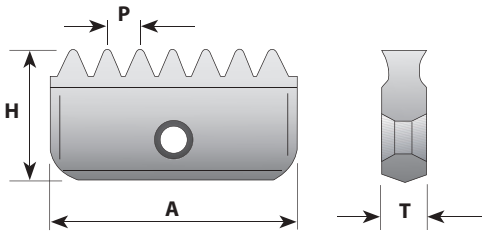


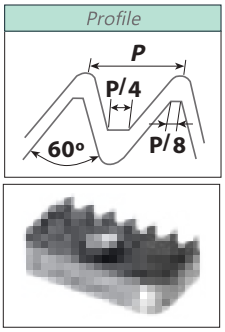


(Pitch) P	A=12 mm	A=14 mm	A=21 mm	A=30 mm	A=40 mm
0.50 EXT					
0.50 INT	*12IN0.5ISO	14IN0.5ISO			
0.75 EXT		14EX0.75ISO			
0.75 INT	*12IN0.75ISO	14IN0.75ISO			
1.00 EXT		14EX1.0ISO	21EX1.0ISO		
1.00 INT	*12IN1.0ISO	14IN1.0ISO	21IN1.0ISO		
1.25 EXT		14EX1.25ISO			
1.25 INT	*12IN1.25ISO	14IN1.25ISO			
1.50 EXT		14EX1.5ISO	21EX1.5ISO	30EX1.5ISO	40EX1.5ISO
1.50 INT	*12IN1.5ISO	14IN1.5ISO	21IN1.5ISO	30IN1.5ISO	40IN1.5ISO
1.75 EXT		14EX1.75ISO			
1.75 INT		14IN1.75ISO	21IN1.75ISO		
2.00 EXT		14EX2.0ISO	21EX2.0ISO	30EX2.0ISO	40EX2.0ISO
2.00 INT		14IN2.0ISO	21IN2.0ISO	30IN2.0ISO	40IN2.0ISO
2.50 EXT		14EX2.5ISO	21EX2.5ISO		
2.50 INT		14IN2.5ISO	21IN2.5ISO		
3.00 EXT			21EX3.0ISO	30EX3.0ISO	40EX3.0ISO
3.00 INT			21IN3.0ISO	30EX3.0ISO	40IN3.0ISO
3.50 EXT				30EX3.5ISO	
3.50 INT			21IN3.5ISO	30IN3.5ISO	40IN3.5ISO
4.00 EXT				30EX4.0ISO	40EX4.0ISO
4.00 INT				30IN4.0ISO	40IN4.0ISO
4.50 EXT					
4.50 INT				30IN4.5ISO	40IN4.5ISO
5.00 EXT					40EX5.0ISO
5.00 INT				30IN5.0ISO	40IN5.0ISO
5.50 EXT					
5.50 INT				30IN5.5ISO	40IN5.5ISO
6.00 EXT					40EX6.0ISO
6.00 INT					40IN6.0ISO
H T	6.3 2.9	7.5 3.1	12 4.7	16 5.5	20 6.3

one cutting edge

UN UNC, UNF, UNEF, UNS



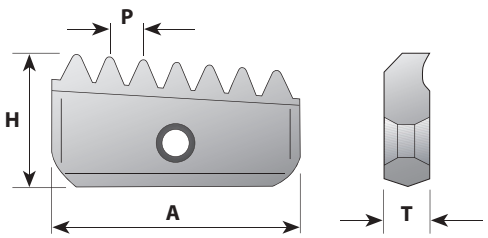


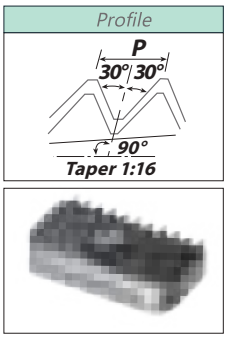
(Pitch TPI) P	A=12 mm	A=14 mm	A=21 mm	A=30 mm	A=40 mm
32 EXT		14EX32UN			
32 INT	*12IN32UN	14IN32UN			
28 EXT		14EX28UN			
28 INT	*12IN28UN	14IN28UN			
27 EXT					
27 INT		14IN27UN			
24 EXT		14EX24UN	21EX24UN		
24 INT	*12IN24UN	14IN24UN	21IN24UN		
20 EXT		14EX20UN	21EX20UN	30EX20UN	
20 INT	*12IN20UN	14IN20UN	21IN20UN	30IN20UN	
18 EXT		14EX18UN	21EX18UN	30EX18UN	
18 INT	*12IN18UN	14IN18UN	21IN18UN	30IN18UN	
16 EXT		14EX16UN	21EX16UN	30EX16UN	40EX16UN
16 INT	*12IN16UN	14IN16UN	21IN16UN	30IN16UN	40IN16UN
14 EXT		14EX14UN	21EX14UN	30EX14UN	40EX14UN
14 INT		14IN14UN	21IN14UN	30IN14UN	40IN14UN
12 EXT		14EX12UN	21EX12UN	30EX12UN	40EX12UN
12 INT		14IN12UN	21IN12UN	30IN12UN	40IN12UN
11 EXT		14EX11UN			
11 INT		14IN11UN			
10 EXT		14EX10UN	21EX10UN	30EX10UN	40EX10UN
10 INT		14IN10UN	21IN10UN	30IN10UN	40IN10UN
9 EXT					
9 INT		*14IN9UN			
8 EXT				30EX8UN	40EX8UN
8 INT			21IN8UN	30IN8UN	40IN8UN
7 EXT					
7 INT			21IN7UN		
6 EXT				30EX6UN	40EX6UN
6 INT				30IN6UN	40IN6UN
5 EXT					
5 INT				30IN5UN	
4.5 EXT					
4.5 INT					40IN4.5UN
4 EXT					
4 INT					40IN4UN
H	6.3	7.5	12	16	20
T	2.9	3.1	4.7	5.5	6.3

one cutting edge

NPT

Conical pipe thread milling inserts are one sided and may be used for both external and internal threading)



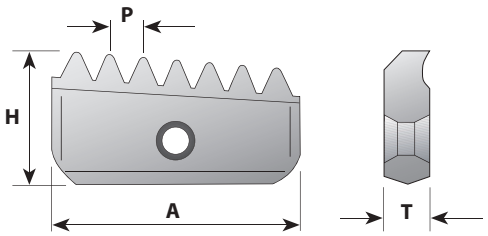


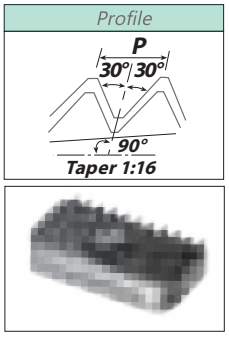
Thread milling inserts for conical pipes

(Pitch TPI) P	A=12 mm	A=14 mm	A=21 mm	A=30 mm	A=40 mm
18	IN18NPT	14EX/IN18NPT			
14		14EX/IN14NPT	21EX/IN14NPT		
11.5			21EX/IN11.5NPT	30EX/IN11.5NPT	40EX/IN11.5NPT
8				30EX/IN8NPT	40EX/IN8NPT
H	6.3	7.5	12	16	20
T	2.9	3.1	4.7	5.5	6.3

NPTF

Conical pipe are one sided and may be used for both external and internal threading)



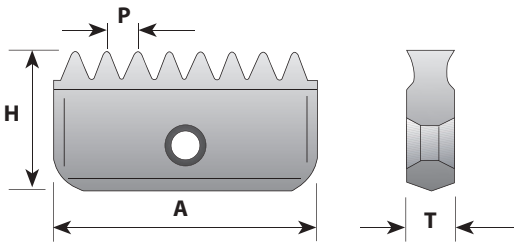


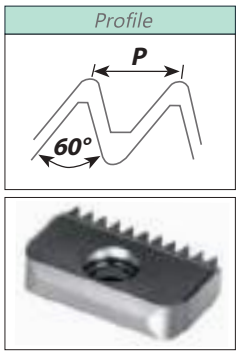
Thread milling inserts for conical pipes

(Pitch TPI) P	A=12 mm	A=14 mm	A=21 mm	A=30 mm	A=40 mm
18	12EX/IN18NPTF	14EX/IN18NPTF			
14		14EX/IN14NPTF	21EX/IN14NPTF		
11.5			21EX/IN11.5NPTF	30EX/IN11.5NPTF	40EX/IN11.5NPTF
8				30EX/IN8NPTF	40EX/IN8NPTF
H	6.3	7.5	12	16	20
T	2.9	3.1	4.7	5.5	6.3

For preparation use tapered solid carbide milling cutters see

NPS



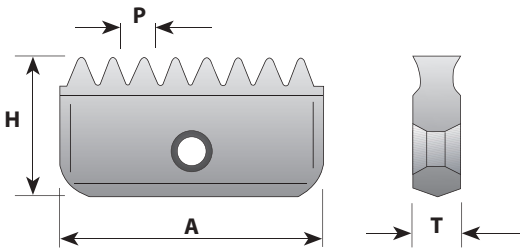


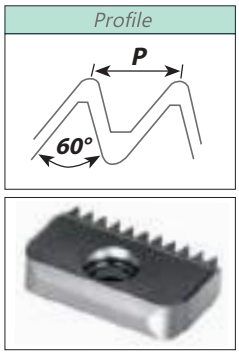
same insert for external and internal thread

(Pitch TPI) P	A=12 mm	A=14 mm	A=21 mm	A=30 mm	A=40 mm
18	*12EX/IN18NPS	14EX/IN18NPS			
14		14EX/IN14NPS	21EX/IN14NPS		
11.5			21EX/IN11.5NPS	30EX/IN11.5NPS	40EX/IN11.5NPS
8				30EX/IN8NPS	40EX/IN8NPS
H	6.3	7.5	12	16	20
T	2.9	3.1	4.7	5.5	6.3

one cutting edge

NPSF



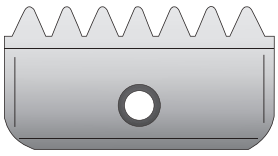


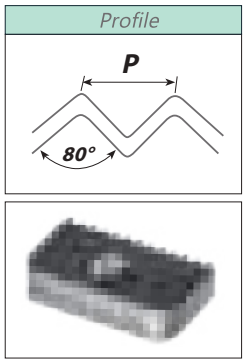
same insert for external and internal thread

(Pitch TPI) P	A=12 mm	A=14 mm	A=21 mm	A=30 mm	A=40 mm
18	*12EX/IN18NPSF	14EX/IN18NPSF			
14		14EX/IN14NPSF	21EX/IN14NPSF		
11.5			21EX/IN11.5NPSF	30EX/IN11.5NPSF	40EX/IN11.5NPSF
8				30EX/IN8NPSF	40EX/IN8NPSF
H	6.3	7.5	12	16	20
T	2.9	3.1	4.7	5.5	6.3

one cutting edge

PG DIN 40430

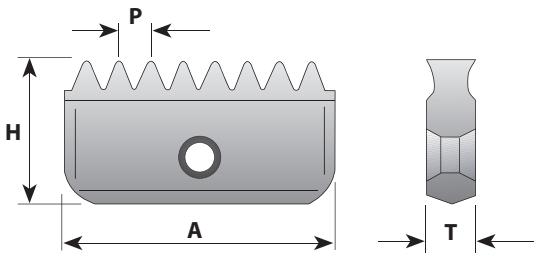


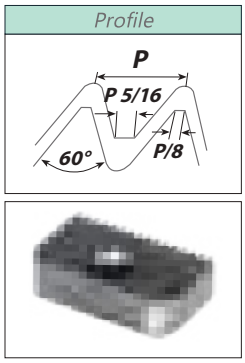


same insert for external and internal thread

(Pitch TPI) P	A=14 mm	A=21 mm	A=30 mm
18	14EX/IN18 PG (PG 9, 11, 13.5, 16)	21EX/IN18 PG (PG 16)	
16		21EX/IN16 PG (PG 21, 29, 36. 42, 48)	30EX/IN16 PG (PG 36, 42, 48)
H	7.5	12	16
T	3.1	4.7	5.6

UNJ



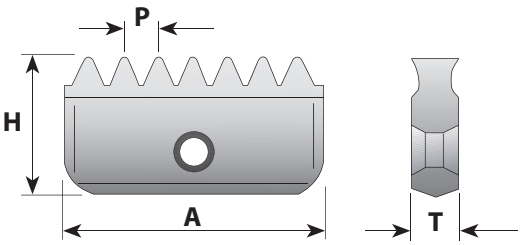


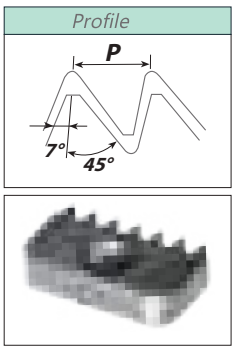
same insert for external and internal thread

(Pitch TPI) P	A=14 mm	A=21 mm
24	14EX24UNJ	21EX24UNJ
20	14EX20UNJ	21EX20UNJ
18	14EX18UNJ	21EX18UNJ
16	14EX16UNJ	21EX16UNJ
14	14EX14UNJ	21EX14UNJ
12	14EX12UNJ	21EX12UNJ
H	7.5	12
T	3.1	4.7

For internal UNJ threads it is common to use UN inserts as partial profile tool

American Buttress



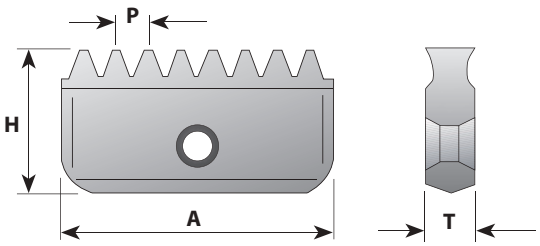


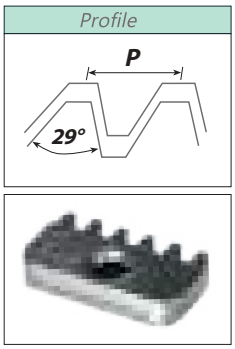
same insert for external and internal thread

(Pitch TPI) P	A=21 mm	A=30 mm	A=40 mm
16	21EX/IN16ABUT	30EX/IN16ABUT	
12	21EX/IN12ABUT	30EX/IN12ABUT	
10	21EX/IN10ABUT	30EX/IN10ABUT	
8	21EX/IN8ABUT	30EX/IN8ABUT	
6		30EX/IN6ABUT	
4		30EX/IN4ABUT*	40EX/IN4ABUT
H T	12 4.7	16 5.6	20 6.3

ABUT thread milling inserts are one-sided
Inserts to be used only on Multi-Insert toolholders

ACME





same insert for external and internal thread

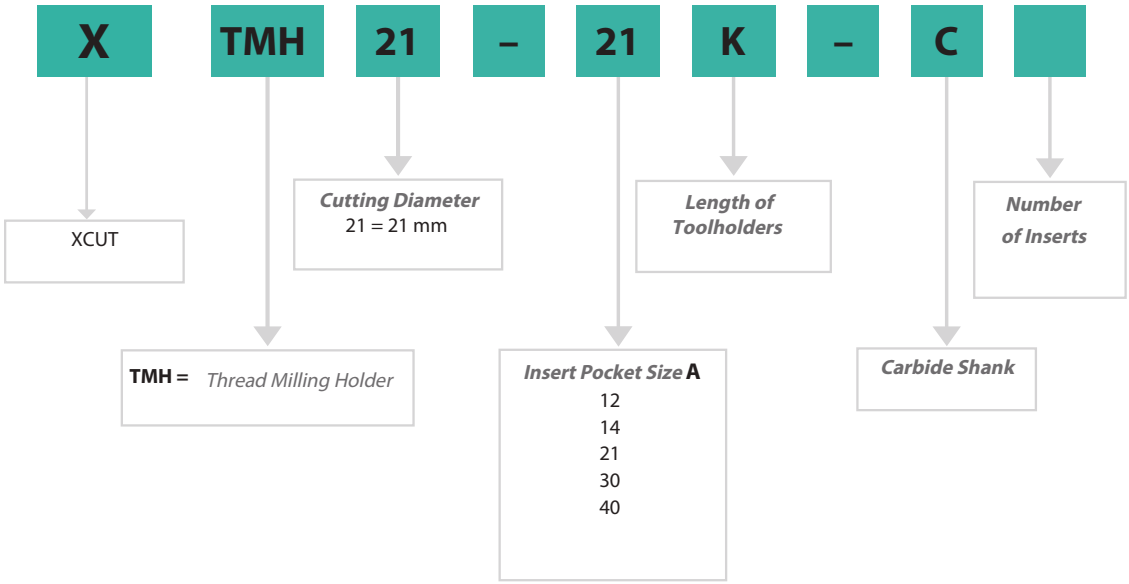
(Pitch TPI) P	A=21 mm	A=30 mm	A=40 mm
12	21IN12ACME	30IN12ACME	
10	21IN10ACME	30IN10ACME	
8	21IN8ACME	30IN8ACME	
6		30IN6ACME	
5		30IN5ACME	
4		30IN4ACME*	40IN4ACME
3.5			40IN3.5ACME
3			40IN3ACME *
H T	12 4.7	16 5.6	20 6.3

one cutting edge

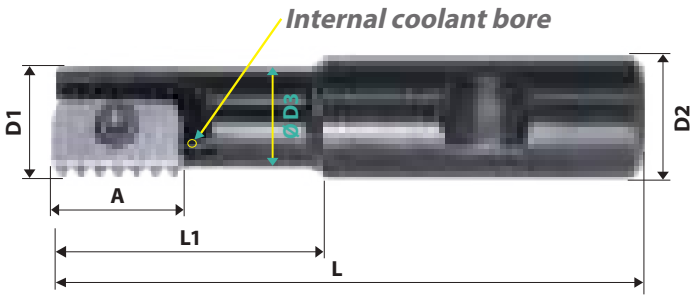
Thread Milling ToolHolders

PRODUCT DESIGNATION

EXAMPLE **: X-TMH21-21K-C**



TMH

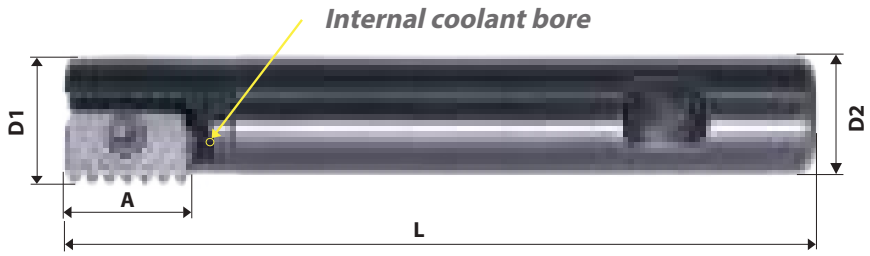


Single Insert Toolholders

(Item Number)	(Dimensions in mm)						(Insert Screw)	(Torx Key)
	A	D1	D2	D3	L 1 (SL)	L (GL)		
TMH09-12H	12	9.5	20	7.5	14	85	S12	TX12
TMH10-12H	12	9.9	20	7.6	16	85	S12	TX12
TMH12-14F	14	12.0	20	8.9	20	75	S14	TX14
TMH14-14H	14	14.5	20	11.2	25	85	S14	TX14
TMH17-14H	14	17.0	20	13.4	30	85	S14	TX14
TMH18-21H*	21	18.0	20	14.4	30	85	S21	TX21
TMH21-21H	21	21.0	20	16.5	40	94	S21	TX21
TMH29-30J	30	29.0	25	22.4	50	110	S30	TX30
TMH48-40M	40	48.0	40	35.0	78	153	S40	TX40

Can not be used with the following inserts: 21IN3.5ISO, 21IN8UN, 21IN7UN, 21EX/IN11BSPT, 21EX/IN11.5NPT, 21EX/IN11.5NPTF

TMH - L

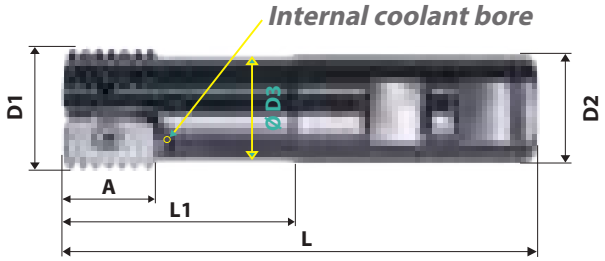


long shank toolholders

(Item Number)	(Dimensions in mm)				(Insert Screw)	(Torx Key)
	A	D1	D2	L (GL)		
TMH25-21K	21	25	20	125	S21	TX21
TMH31-30M	30	31	25	150	S30	TX30
TMH38-30M	30	38	32	150	S30	TX30
TMH48-40R	40	48	40	210	S40	TX40

For holders with long overhang reduce the cutting speed and feed rate by 20% to 40%, depending on workpiece material, pitch and overhang

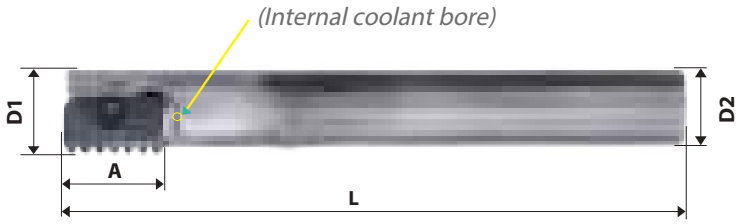
TMH



double sided Insert Toolholders

(Item Number)	(Dimensions in mm)						(Insert Screw)	(Torx Key)	(No. of Inserts)
	A	D1	D2	D3	L1	L			
TMH20-14H-2	14	20	20	16	41	93	S14	TX14	2
TMH30-21J-2	21	30	25	24	52	108	S21	TX21	2
TMH40-30L-2	30	40	32	30	70	130	S30	TX30	2
TMH50-40M-2	40	50	40	38	78	153	S40	TX40	2

TMH - L



Long Carbide Shank Toolholders

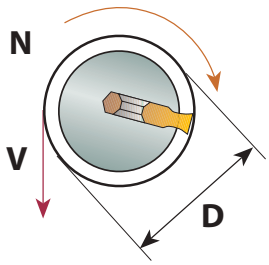
(Item Number)	(Dimensions in mm)				(Insert Screw)	(Torx Key)
	A	D1	D2	L		
TMH10-12KC*	12	9.9	8	125	S12	TX12
TMH13-14HC	14	13.2	10	110	S14	TX14
TMH13-14JC	14	13.2	10	155	S14	TX14
TMH15-14KC	14	15.2	12	175	S14	TX14
TMH21-21KC	21	21.0	16	130	S21	TX21
TMH21-21MC	21	21.0	16	200	S21	TX21
TMH27-30SC	30	27.0	20	270	S30	TX30

without coolant bore Holders with long overhang reduce the cutting speed by 20-40%, depending on workpiece, material, pitch and overhang

TEST REPORT	
(Internal thread)	M42 x 3
(Thread depth)	30.0 mm
(Material)	(Stainless Steel) : 1.4571
(Tool)	(Holder) : TMH21-21H
	(Insert) : 21IN3.0ISO
(Cutting parameters)	Vc: 135 m/min Fz: 0.072 mm/Z
(Coolant)	
(Tool life)	(443 Pieces, both cutting edges were used)

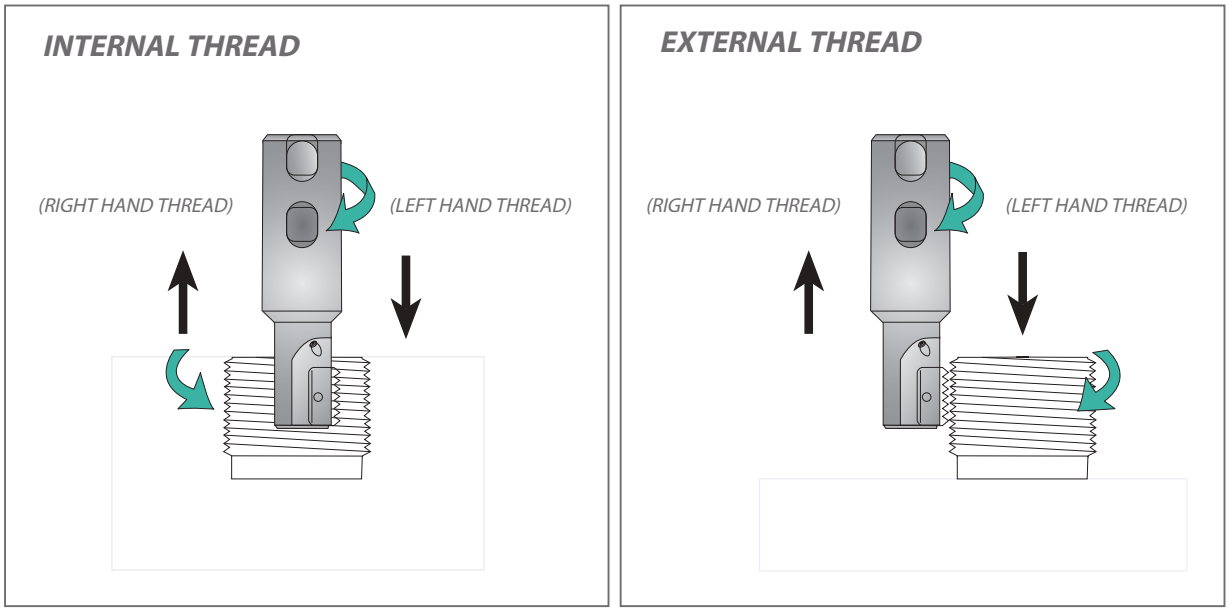
(Conversion of selected cutting speed to rotational speed is calculated using the following formula):

$$N = \frac{Vc \times 1000}{\pi \times D} = \frac{120 \times 1000}{3.14 \times 30} = 1274 \text{ RPM}$$



Vc= 120 m/min (Example)
D= 30 mm

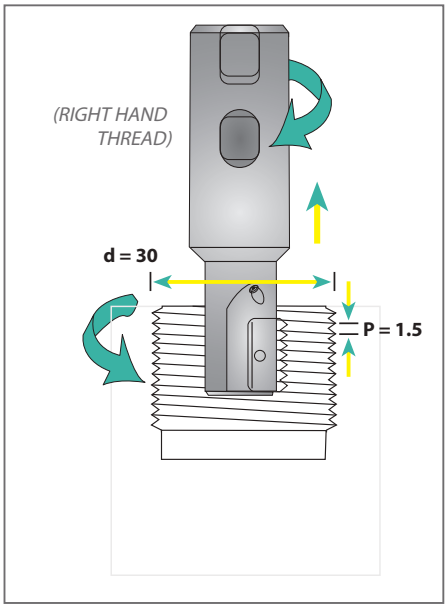
D= *(Cutting Diameter)*



(TOOL SELECTION)

(FOR INDEXABLE AND SOLID CARBIDE THREAD MILLING CUTTERS)Choosing a tool, please note that a tool diameter should be smal-ler than thread diameter .)

*(**Example:** Internal thread M30 x 1.5:*
You are looking for a Milling Cutter to produce d = 30 mm inter-nal right hand ISO thread with a thread pitch P = 1.5 mm)



(Chosen toolholder) **: TMH21-21H**
(Insert) **: 21IN1.5ISOXTGM**

If you need technical assistance, please call your local representative and ask for help in selecting the appropriate tool as well as for a CNC program to suit your CNC milling machine.)

MILL THREAD INSERTS SPEED AND FEED SELECTION)

XTGM

Sub Micron Grade with Titanium Aluminum Nitride multi-layer coating (ISO P10-P30; K10-K20). This is a general purpose grade, which can be used with all materials, it should be run at medium to high cutting speeds.)

(Recommended Feed Rate: 0.05 - 0.15 mm)

ISO	Material	*(Cutting Speed)* Vc (m/min) XTGM
P	*Low and Medium Carbon Steels)* *(High Carbon Steels)* *(Treated Steels)*	115 - 280 130 - 200 105 - 180
M	*(Stainless Steels, Cast Stainless Steels* *(Cast Steels)*	130 - 190 150 - 190
K	*(Cast Iron)*	80 - 170
N	*(Non-Ferrous and Aluminum)* *(Synthetics, Duroplastics, Thermoplastics)*	180 - 340 115 - 460
S	*(Nickel Alloys, Titanium Alloys)*	25 - 90

SOLID CARBIDE THREAD MILLS

(Thread Milling cutters for helical interpolation on CNC milling machines.)

ADVANTAGES :

- *same tool can be used for a variety of materials*
- *cutting diameter 2.2 mm and up*
- *longer tool life thanks to a special multi-layer coating process*
- *same tool used for r.h. & l.h. threads*
- spiral flutes allows smooth cutting operation
- *shorter machinig time due to 3 to 6 simultaneously engaged cutting edges*
- *thread is generated in one pass*
- *low cutting pressure allows thin wall machining*
- *threads in through and blind hold*
- excellent surface finish

TMC -*(Thread Mills for non-ferrous without internal coolant bore)*

TMCC - *(Thread Mills with internal coolant bore for blind holes)*

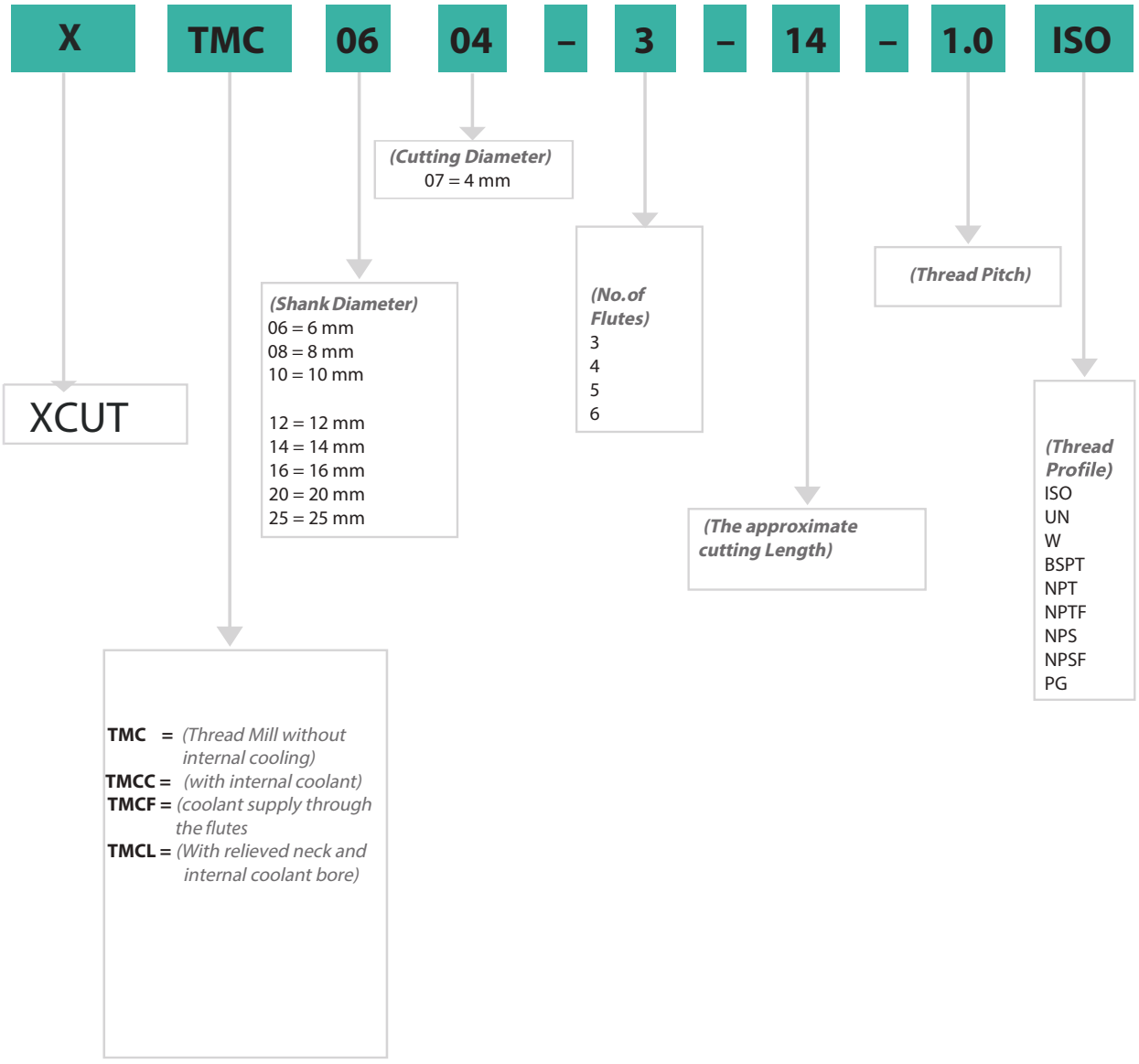
TMCF - *(Thread Mills with chips evacuation via coolant fluty)*

TMCL - *(Thread Mills with runout with internal coolant)*

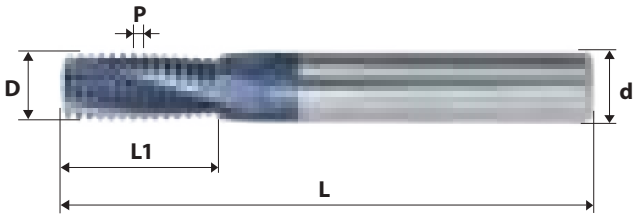
Mill Thread

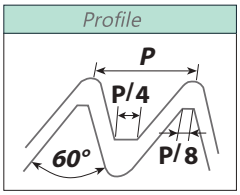
(PRODUCT DESIGNATION)

(EXAMPLE) **: XTMC0604-3-14-1.0 ISO**



ISO





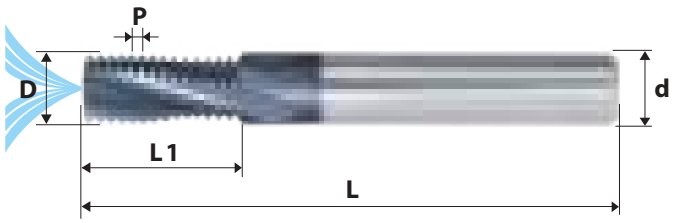
TiAlN coated

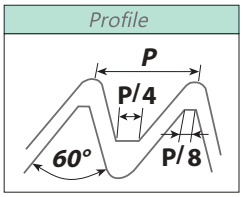
tools for internal threads

(Item Number)	*(Dimensions in mm)*							*(Flutes)*
	(coarse)	*(Pitch)*	*(fine)*	D	d	L1	L	
TMC06022-3-5-0.5ISO	M3	0.5	Ø 4	2.2	6	5.3	58	3
TMC06038-3-10-0.5ISO		0.5	Ø 5	3.8	6	10.3	58	3
TMC06031-3-7-0.7ISO	M4	0.7	Ø 5	3.1	6	7.4	58	3
TMC06045-3-10-0.75ISO		0.75	Ø 6	4.5	6	10.1	58	3
TMC06036-3-9-0.8ISO	M5	0.8	Ø 6	3.6	6	9.2	58	3
TMC0604-3-10-1.0ISO	M6	1.0	Ø 7	4.0	6	10.5	58	3
TMC0604-3-14-1.0ISO	M6	1.0	Ø 7	4.0	6	14.5	58	3
TMC0606-3-12-1.0ISO		1.0	Ø 9	6.0	6	12.5	58	3
TMC0808-4-16-1.0ISO		1.0	Ø 10	8.0	8	16.5	64	4
TMC0605-3-14-1.25ISO	M8	1.25	Ø 10	5.0	6	14.4	58	3
TMC0605-3-19-1.25ISO	M8	1.25	Ø 10	5.0	6	19.4	58	3
TMC0807-3-17-1.5ISO	M10	1.5	Ø 12	7.0	8	17.3	64	3
TMC0807-3-24-1.5ISO	M10	1.5	Ø 12	7.0	8	24.8	76	3
TMC1010-4-21-1.5ISO		1.5	Ø 14	10.0	10	21.8	73	4
TMC1616-6-33-1.5ISO		1.5	Ø 20	16.0	16	33.8	105	6
TMC0808-3-20-1.75ISO	M12	1.75	Ø 14	8.0	8	22.1	64	3
TMC0808-3-28-1.75ISO	M12	1.75	Ø 14	8.0	8	28.9	76	3
TMC1010-3-27-2.0ISO	M16	2.0	Ø 17	10.0	10	27.0	73	3
TMC1010-3-39-2.0ISO	M16	2.0	Ø 17	10.0	10	39.0	105	3
TMC1212-4-27-2.0ISO		2.0	Ø 18	12.0	12	27.0	84	4
TMC2020-6-41-2.0ISO		2.0	Ø 26	20.0	20	41.0	108	6
TMC1414-4-33-2.5ISO	M20	2.5	Ø 22	14.0	14	33.8	84	4
TMC1414-4-48-2.5ISO	M20	2.5	Ø 22	14.0	14	48.8	105	4
TMC1616-3-40-3.0ISO	M24	3.0	Ø 25	16.0	16	40.5	105	3
TMC1616-3-58-3.0ISO	M24	3.0	Ø 25	16.0	16	58.5	120	3
TMC2020-4-43-3.0ISO	M27	3.0	Ø 28	20.0	20	43.5	105	4

For thread mills with coolant bore see the following pages

ISO



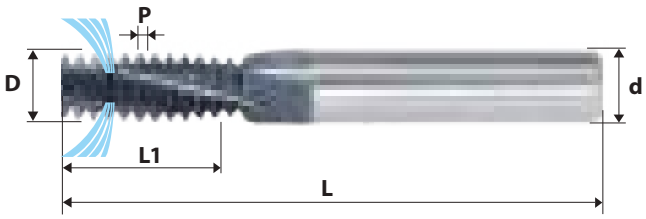


TiAlN coated

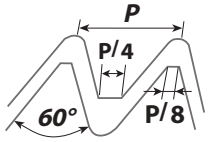
with internal coolant bore – tools for internal threads

(Item Number)	(Dimensions in mm)							(Flutes)
	(Pitch)	(coarse)	(fine)	D	d	L1	L	
TMCC06038-3-10-0.5ISO	0.5		Ø 5	3.8	6	10.3	58	3
TMCC06031-3-7-0.7ISO	0.7	M4	Ø 5	3.1	6	7.4	58	3
TMCC06045-3-10-0.75ISO	0.75		Ø 6	4.5	6	10.1	58	3
TMCC1010-4-24-0.75ISO	0.75		Ø 12	10.0	10	24.4	73	4
TMCC06038-3-9-0.8ISO	0.8	M5	Ø 6	3.8	6	9.2	58	3
TMCC06046-3-10-1.0ISO	1.0	M6	Ø 7	4.6	6	10.5	58	3
TMCC06046-3-14-1.0ISO	1.0	M6	Ø 7	4.6	6	14.5	58	3
TMCC0606-3-12-1.0ISO	1.0		Ø 9	6.0	6	12.5	58	3
TMCC0808-4-16-1.0ISO	1.0		Ø 10	8.0	8	16.5	64	4
TMCC1010-4-24-1.0ISO	1.0		Ø 12	10.0	10	24.5	73	4
TMCC0606-3-14-1.25ISO	1.25	M8	Ø 10	6.0	6	14.4	58	3
TMCC0606-3-19-1.25ISO	1.25	M8	Ø 10	6.0	6	19.4	58	3
TMCC08078-3-17-1.5ISO	1.5	M10	Ø 12	7.8	8	17.0	64	3
TMCC08078-3-24-1.5ISO	1.5	M10	Ø 12	7.8	8	24.8	76	3
TMCC1010-4-21-1.5ISO	1.5		Ø 14	10.0	10	21.8	73	4
TMCC1212-4-26-1.5ISO	1.5		Ø 16	12.0	12	26.3	84	4
TMCC1616-6-33-1.5ISO	1.5		Ø 20	16.0	16	33.8	105	6
TMCC1009-3-20-1.75ISO	1.75	M12	Ø 12	9.0	10	20.1	73	3
TMCC1009-3-28-1.75ISO	1.75	M12	Ø 12	9.0	10	28.9	73	3
TMCC1010-3-27-2.0ISO	2.0	M14	Ø 15	10.0	10	27.0	73	3
TMCC12118-4-27-2.0ISO	2.0	M16	Ø 17	11.8	12	27.0	84	4
TMCC12118-4-39-2.0ISO	2.0	M16	Ø 17	11.8	12	39.0	105	4
TMCC2020-6-41-2.0ISO	2.0		Ø 26	20.0	20	41.0	105	6
TMCC1615-5-33-2.5ISO	2.5	M20	Ø 22	15.0	16	33.8	105	5
TMCC1615-5-48-2.5ISO	2.5	M20	Ø 22	15.0	16	48.8	105	5
TMCC2018-4-40-3.0ISO	3.0	M24	Ø 25	18.0	20	40.5	105	4
TMCC2018-4-58-3.0ISO	3.0	M24	Ø 25	18.0	20	58.5	120	4
TMCC2020-4-43-3.0ISO	3.0	M27	Ø 27	20.0	20	43.5	105	4

ISO



Profile

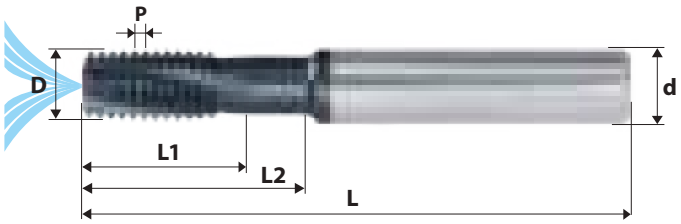


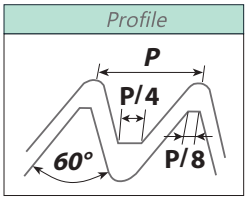
TiAlN coated

with internal coolant supply via flutes - tools for internal threads

(Item Number)	(Dimensions in mm)							(Flutes)
	(Pitch)	(coarse)	(fine)	D	d	L1	L	
TMCF06048-3-10-1.0ISO	1.0	M6	Ø 7	4.8	6	10.5	58	3
TMCF0606-3-12-1.0ISO	1.0		Ø 9	6.0	6	12.5	58	3
TMCF0808-4-16-1.0ISO	1.0		Ø 10	8.0	8	16.5	64	4
TMCF0606-3-14-1.25ISO	1.25	M8	Ø 10	6.0	6	14.4	58	3
TMCF0606-3-19-1.25ISO	1.25	M8	Ø 10	6.0	6	19.4	58	3
TMCF08078-3-17-1.5ISO	1.5	M10	Ø 12	7.8	8	17.0	64	3
TMCF1010-4-21-1.5ISO	1.5		Ø 14	10.0	10	21.8	73	4
TMCF1212-4-26-1.5ISO	1.5		Ø 16	12.0	12	26.3	84	4
TMCF1616-5-33-1.5ISO	1.5		Ø 20	16.0	16	33.8	101	5
TMCF1009-3-20-1.75ISO	1.75	M12	Ø 12	9.0	10	20.1	73	3
TMCF1009-3-28-1.75ISO	1.75	M12	Ø 12	9.0	10	28.9	73	3
TMCF1010-3-27-2.0ISO	2.0	M14	Ø 15	10.0	10	27.0	73	3
TMCF12118-4-27-2.0ISO	2.0	M16	Ø 17	11.8	12	27.0	84	4
TMCF1615-5-33-2.5ISO	2.5	M20	Ø 22	15.0	16	33.8	101	5

ISO



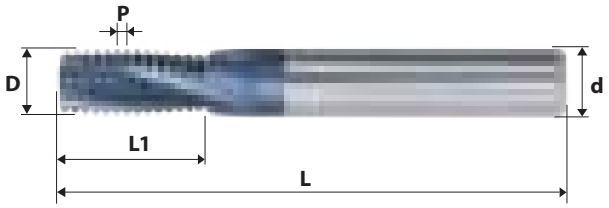


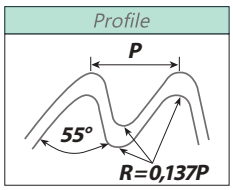
TiAlN coated

with relieved neck and internal coolant bore - tools for internal threads

(Item Number)	(Dimensions in mm)							(Flutes)
	(Pitch)	(fine)	D	d	L1	L2	L	
TMCL1010-4-32-1.0ISO	1.0	Ø 12	10	10	18.0	32.0	73	4
TMCL1212-4-38-1.0ISO	1.0	Ø 14	12	12	21.0	38.0	84	4
TMCL1616-6-45-1.0ISO	1.0	Ø 18	16	16	26.0	45.0	105	6
TMCL1010-4-30-1.5ISO	1.5	Ø 13	10	10	18.0	30.0	73	4
TMCL1212-4-34-1.5ISO	1.5	Ø 15	12	12	19.5	34.5	84	4
TMCL1616-6-43-1.5ISO	1.5	Ø 19	16	16	25.5	43.5	105	6
TMCL2020-6-60-1.5ISO	1.5	Ø 23	20	20	36.0	60.0	105	6
TMCL1212-4-42-2.0ISO	2.0	Ø 16	12	12	24.0	42.0	84	4
TMCL1616-5-45-2.0ISO	2.0	Ø 20	16	16	26.0	45.0	105	5
TMCL2020-6-56-2.0ISO	2.0	Ø 24	20	20	34.0	56.0	105	6
TMCL1616-4-45-3.0ISO	3.0	Ø 22	16	16	30.0	45.0	105	4
TMCL2020-5-54-3.0ISO	3.0	Ø 26	20	20	33.0	54.0	105	5
TMCL2020-4-45-3.5ISO	3.5	Ø 26	20	20	28.0	45.5	105	4

G55° - **BSF, BSP**



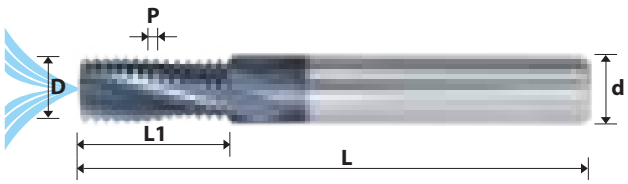


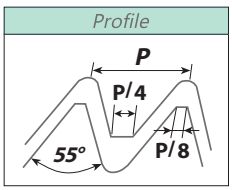
TiAlN coated

BSF, BSP - same tool for internal and external threads

(Item Number)	(Dimensions in mm)						(Flutes)
	(Pitch)	Standard	D	d	L1	L	
TMC0606-3-9-28W	28	G1/8	6	6	9.5	58	3
TMC0808-3-1419W	19	G1/4-3/8	8	8	14.0	64	3
TMC1212-4-19-14W	14	G1/2-7/8	12	12	19.0	84	4
TMC1212-4-26-14W	14	G1/2-7/8	12	12	26.3	84	4
TMC1212-3-24-11W	11	G≥1	12	12	24.2	84	3
TMC1616-4-38-11W	11	G≥1	16	16	38.1	105	4
TMC2020-5-47-11W	11	G≥1	20	20	47.3	105	5

G55° - **BSF, BSP**



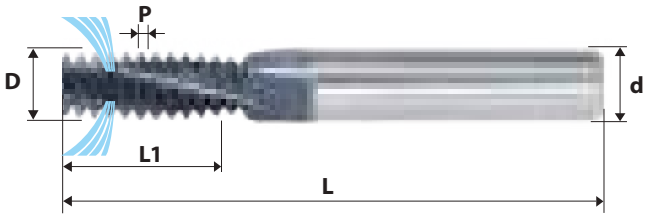


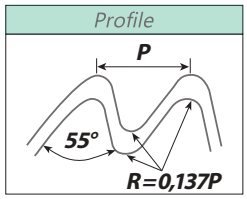
TiAlN coated

BSF, BSP with internal coolant bore – same tool for internal and external threads

(Item Number)	(Pitch) P in TPI	Standard	d in mm	D in mm	L1 in mm	L in mm	(Flutes)
TMCC08078-3-14-28W	28	G1/8	8	7.8	14.1	64	3
TMCC1010-4-16-19W	19	G1/4-3/8	10	10.0	16.7	73	4
TMCC1616-5-26-14W	14	G1/2-7/8	16	16.0	26.3	105	5
TMCC1616-4-38-11W	11	G≥1	16	16.0	38.1	105	4
TMCC2020-5-47-11W	11	G≥1	20	20.0	47.3	105	5

G55° - **BSF, BSP**



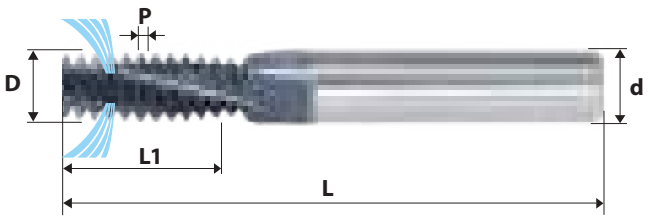


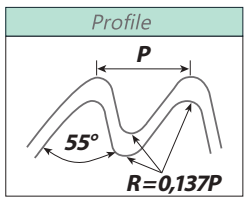
TiAlN coated

BSF, BSP with internal coolant supply through the flutes - same tool for internal and external *threads*

(Item Number)	*(Pitch)* P in TPI	Standard	d in mm	D in mm	*(Flutes)*	L1 in mm	L in mm
TMCF08078-3-14-28W	28	G1/8	8	7.8	3	14.1	64
TMCF1010-4-16-19W	19	G1/4-3/8	10	10.0	4	16.7	73
TMCF1616-5-26-14W	14	G1/2-7/8	16	16.0	5	26.3	101
TMCF1616-4-38-11W	11	G≥1	16	16.0	4	38.1	101

WHITWORTH - **BSW**





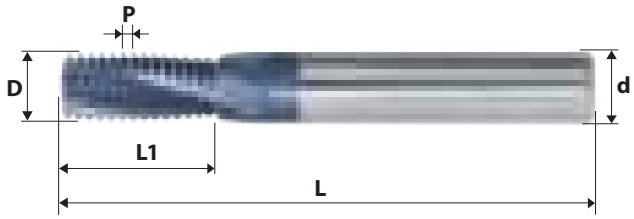
TiAlN coated

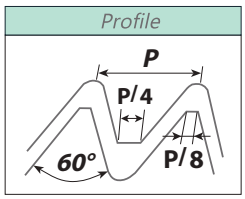
BSW with internal coolant supply through the flutes - same tool for internal and external *threads*

(Item Number)	*(Pitch)* P in TPI	Standard	d in mm	D in mm	*(Flutes)*	L1 in mm	L in mm
TMCF06046-3-12-20W	*20	1/4	6	4.6	3	12.1	58
TMCF06053-3-14-18W	18	5/16	6	5.3	3	14.8	58
TMCF08068-3-16-16W	16	3/8	8	6.8	3	16.7	64
TMCF10092-4-24-16W	16	1/2	10	9.2	4	24.6	73
TMCF08078-4-20-14W	14	7/16	8	7.8	4	20.9	64
TMCF10086-4-24-12W	12	1/2	10	8.6	4	24.4	73
TMCF12109-4-28-11W	11	5/8	12	10.9	4	28.9	84

Cutter without coolant

UN





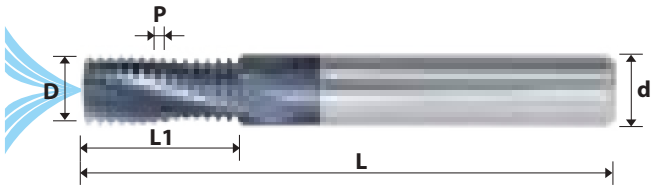
TiAlN coated

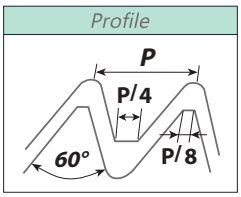
tools for internal threads

(Item Number)	(Pitch) P in TPI	UNC	UNF	UNFE	d in mm	D in mm	(Flutes)	L1 in mm	L in mm
TMC06025-3-6-40UN	40	5			6	2.5	3	6.0	58
TMC06032-3-6-32UN	32	8	10	12	6	3.2	3	6.8	58
TMC0604-3-11-28UN	28		1/4		6	4.0	3	11.3	58
TMC0606-3-14-28UN	28			7/16 - 1/2	6	6.0	3	14.1	58
TMC0605-3-14-24UN	24		5/16		6	5.0	3	14.3	58
TMC0807-3-21-24UN	24		3/8	9/16 - 5/8	8	7.0	3	20.6	64
TMC06045-3-12-20UN	20	1/4			6	4.5	3	12.1	58
TMC0807-3-21-20UN	20		7/16 - 1/2		8	7.0	3	21.0	64
TMC1212-5-27-20UN	20			3/4 - 1	12	12.0	5	27.3	84
TMC0605-3-14-18UN	18	5/16			6	5.0	3	14.8	58
TMC1010-4-26-18UN	18		9/16 - 5/8	$1^{1/8}$ -$1^{5/8}$	10	10.0	4	26.1	73
TMC0606-3-16-16UN	16	3/8			6	6.0	3	16.7	58
TMC1212-4-31-16UN	16		3/4		12	12.0	4	31.0	84
TMC0807-3-20-14UN	14	7/16			8	7.0	3	20.9	64
TMC1615-5-37-14UN	14		7/8		16	15.0	5	37.2	105
TMC0808-3-22-13UN	13	1/2			8	8.0	3	22.5	64
TMC1010-3-26-12UN	12	9/16			10	10.0	3	26.5	73
TMC1616-5-41-12UN	12		1 - $1^{1/2}$		16	16.0	5	41.3	105
TMC1010-3-28-11UN	11	5/8			10	10.0	3	28.9	73
TMC1212-3-34-10UN	10	3/4			12	12.0	3	34.3	84
TMC1615-3-38-9UN	9	7/8			16	15.0	3	38.1	150
TMC1616-3-42-8UN	8	1			16	16.0	3	42.9	105
TMC2020-4-45-7UN	7	$1^{1/8}$ -$1^{1/4}$			20	20.0	4	45.3	105

For thread mills with coolant bore see following pages

UN



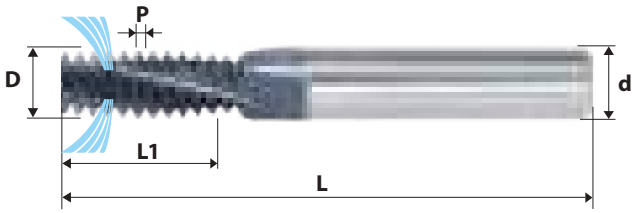


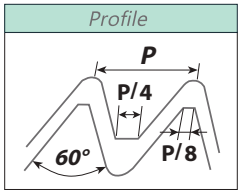
TiAlN coated

with internal coolant bore - tools for internal threads

(Item Number)	*(Pitch)* P in TPI	UNC	UNF	UNFE	d in mm	D in mm	*(Flutes)*	L1 in mm	L in mm
TMCC06032-3-6-32UN	32	8	10	12	6	3.2	3	6.8	58
TMCC0606-3-14-32UN	32			5/16	6	6.0	3	14.7	58
TMCC0808-4-18-32UN	32			3/8	8	8.0	4	18.7	64
TMCC0605-3-11-28UN	28		1/4		6	5.0	3	11.3	58
TMCC0606-3-14-28UN	28			7/16 - 1/2	6	6.0	3	14.1	58
TMCC08066-3-14-24UN	24		5/16		8	6.6	3	14.3	64
TMCC0808-4-21-24UN	24		3/8	9/16 - 5/8	8	8.0	4	20.6	64
TMCC06047-3-12-20UN	20	1/4			6	4.7	3	12.1	58
TMCC0808-3-21-20UN	20		7/16		8	8.0	3	21.0	64
TMCC1010-4-22-20UN	20		1/2		10	10.0	4	22.3	73
TMCC1212-5-27-20UN	20			3/4 - 1	12	12.0	5	27.3	84
TMCC06056-3-14-18UN	18	5/16			6	5.6	3	14.8	58
TMCC12113-4-26-18UN	18		9/16 - 5/8	$1^{1/8}$ - $1^{1/4}$	12	11.3	4	26.1	84
TMCC08067-3-16-16UN	16	3/8			8	6.7	3	16.7	64
TMCC1212-4-31-16UN	16		3/4		12	12.0	4	31.0	84
TMCC08077-3-20-14UN	14	7/16			8	7.7	3	20.9	64
TMCC1616-5-37-14UN	14		7/8		16	16.0	5	37.2	105
TMCC10092-3-22-13UN	13	1/2			10	9.2	3	22.5	73
TMCC12105-3-26-12UN	12	9/16			12	10.5	3	26.5	84
TMCC1616-5-41-12UN	12		1 - $1^{1/2}$		16	16.0	5	41.3	105
TMCC12114-3-28-11UN	11	5/8			12	11.4	3	28.9	84
TMCC16144-4-34-10UN	10	3/4			16	14.4	4	34.3	105
TMCC1616-3-38-9UN	9	7/8			16	16.0	3	38.1	105
TMCC20195-4-42-8UN	8	1			20	19.5	4	42.9	105
TMCC2020-4-45-7UN	7	$1^{1/8}$ - $1^{1/4}$			20	20.0	4	45.3	105

UN



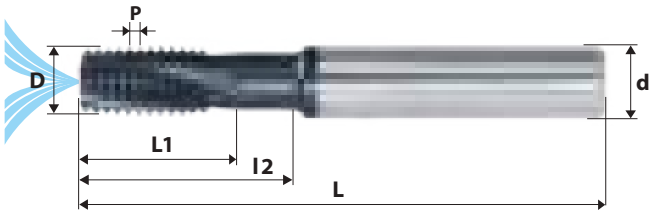


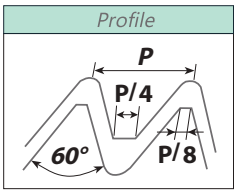
TiAlN coated

with internal coolant supply through the flutes - tools for internal threads

(Item Number)	*(Pitch)* P in TPI	UNC	UNF	UNFE	d in mm	D in mm	*(Flutes)*	L1 in mm	L in mm
TMCF0605-3-11-28UN	28		1/4		6	5.0	3	11.3	58
TMCF0606-3-14-28UN	28			7/16-1/2	6	6.0	3	14.1	58
TMCF08066-3-14-24UN	24		5/16		8	6.6	3	14.3	64
TMCF0808-4-21-24UN	24		3/8	9/16-5/8	8	8.0	4	20.6	64
TMCF0808-3-21-20UN	20		7/16		8	8.0	3	21.0	64
TMCF1010-4-22-20UN	20		1/2		10	10.0	4	22.3	73
TMCF1212-5-27-20UN	20			3/4-1	12	12.0	5	27.3	84
TMCF06056-3-14-18UN	18	5/16			6	5.6	3	14.8	58
TMCF12113-4-26-18UN	18		9/16-5/8	$1^{1/8}$ - $1^{5/8}$	12	11.3	4	26.1	84
TMCF08067-3-16-16UN	16	3/8			8	6.7	3	16.7	64
TMCF1212-4-31-16UN	16		3/4		12	12.0	4	31.0	84
TMCF08077-3-20-14UN	14	7/16			8	7.7	3	20.9	64
TMCF1616-5-37-14UN	14		7/8		16	16.0	5	37.2	101
TMCF10092-3-22-13UN	13	1/2			10	9.2	3	22.5	73
TMCF12105-3-26-12UN	12	9/16			12	10.5	3	26.5	84
TMCF12114-3-28-11UN	11	5/8			12	11.4	3	28.9	84
TMCF16144-4-34-10UN	10	3/4			16	14.4	4	34.3	101

UN



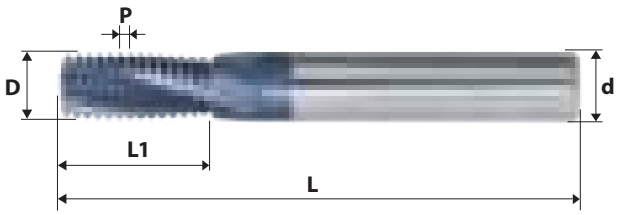


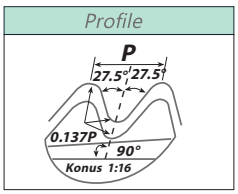
TiAlN coated

with relieved neck and internal coolant bore - tools for internal threads

(Item Number)	(Pitch) P in TPI	M fein (fine)	d in mm	D in mm	(Flutes)	L2 in mm	L1 in mm	L in mm
TMCL1010-4-30-20UN	20	Ø 12	10	10.0	4	17.8	30.5	73
TMCL1212-5-35-20UN	20	Ø 14	12	12.0	5	20.3	35.6	84
TMCL1616-6-43-20UN	20	Ø 18	16	16.0	6	25.4	43.2	105
TMCL1212-4-35-18UN	18	Ø 15	12	12.0	4	19.7	35.3	84
TMCL1212-4-35-16UN	16	Ø 15	12	12.0	4	20.7	35.0	84
TMCL1616-5-42-16UN	16	Ø 19	16	16.0	5	25.4	42.9	105
TMCL2020-6-58-16UN	16	Ø 23	20	20.0	6	36.5	58.8	105
TMCL1616-5-45-14UN	14	Ø 20	16	16.0	5	25.4	45.3	105
TMCL1212-4-42-12UN	12	Ø 16	12	12.0	4	25.4	42.3	84
TMCL2020-5-55-12UN	12	Ø 24	20	20.0	5	33.9	55.1	105

BSPT



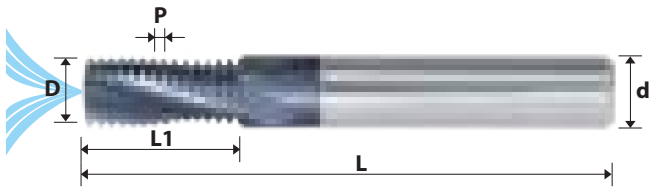


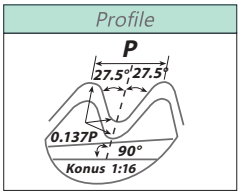
TiAlN coated

same tool for internal and external threads

(Item Number)	(Pitch) P in TPI	Standard	d in mm	D in mm	(Flutes)	L1 in mm	L in mm
TMC0606-3-9-28BSPT	28	RC 1/16 - 1/8	6	6.0	3	9.5	58
TMC0808-3-14-19BSPT	19	RC 1/4 - 3/8	8	8.0	3	14.0	64
TMC1212-4-19-14BSPT	14	RC 1/2 - 7/8	12	12.0	4	19.1	84
TMC1616-4-28-11BSPT	11	RC 1 - 2	16	16.0	4	28.9	105

BSPT



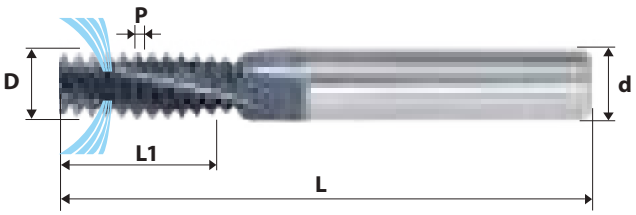


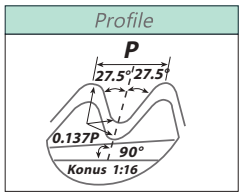
TiAlN coated

with internal coolant bore - same tool for internal and external threads

(Item Number)	*(Pitch)* P in TPI	Standard	d in mm	D in mm	*(Flutes)*	L1 in mm	L in mm
TMCC08078-3-14-28BSPT	28	RC 1/8	8	7.8	3	14.1	64
TMCC1010-4-16-19BSPT	19	RC 1/4 - 3/8	10	10.0	4	16.7	73
TMCC1616-5-26-14BSPT	14	RC 1/2 - 7/8	16	16.0	5	26.3	105
TMCC1616-4-28-11BSPT	11	RC 1 - 2	16	16.0	4	28.9	105

BSPT



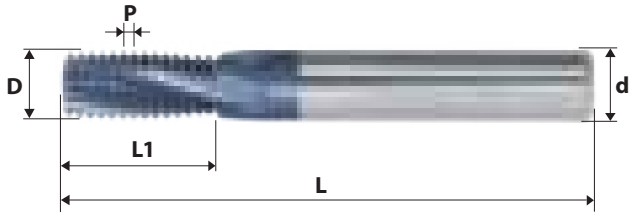


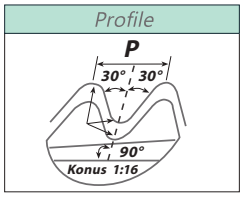
TiAlN coated

with internal coolant through the flutes - same tool for internal and external threads

(Item Number)	*(Pitch)* P in TPI	Standard	d in mm	D in mm	*(Flutes)*	L1 in mm	L in mm
TMCF08078-3-14-28BSPT	28	RC 1/8	8	7.8	3	14.1	64
TMCF1010-4-16-19BSPT	19	RC 1/4 - 3/8	10	10.0	4	16.7	73
TMCF1616-5-26-14BSPT	14	RC 1/2 - 7/8	16	16.0	5	26.3	101
TMCF1616-4-28-11BSPT	11	RC 1 - 2	16	16.0	4	28.9	101

NPT



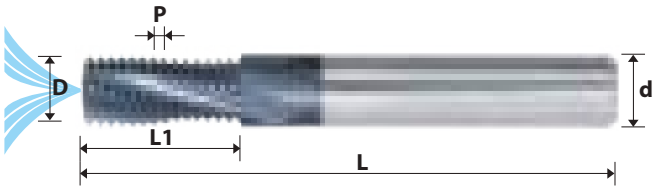


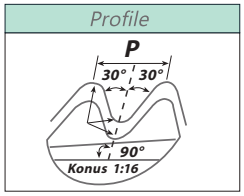
TiAlN coated

same tool for internal and external threads

(Item Number)	(Pitch) P in TPI	Standard	d in mm	D in mm	(Flutes)	L1 in mm	L in mm
TMC0606-3-9-27NPT	27	1/16 - 1/8	6	6.0	3	9.9	58
TMC0808-3-14-18NPT	18	1/4 - 3/8	8	8.0	3	14.8	64
TMC1212-4-20-14NPT	14	1/2 - 3/4	12	12.0	4	20.9	84
TMC1616-4-27-11.5NPT	11.5	1 - 2	16	16.0	4	27.6	105
TMC2020-4-39-8NPT	8	≥ 2 1/2	20	20.0	4	39.7	105

NPT



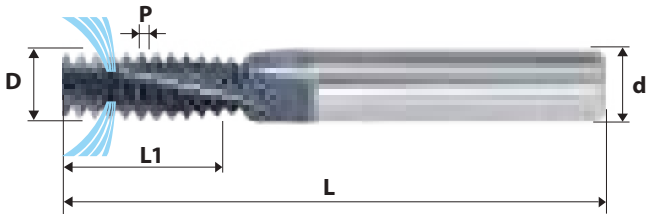


TiAlN coated

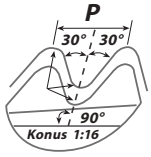
with internal coolant bore - same tool for internal and external threads

(Item Number)	(Pitch) P in TPI	Standard	d in mm	D in mm	(Flutes)	L1 in mm	L in mm
TMCC08076-3-10-27NPT	27	1/16 - 1/8	8	7.6	3	10.8	64
TMCC1010-4-16-18NPT	18	1/4 - 3/8	10	10.0	4	16.2	73
TMCC16155-4-22-14NPT	14	1/2 - 3/4	16	15.5	4	22.7	105
TMCC2020-4-29-11.5NPT	11.5	1 - 2	20	20.0	4	29.8	105
TMCC2020-4-39-8NPT	8	≥ 2 1/2	20	20.0	4	39.7	105

NPT



Profile

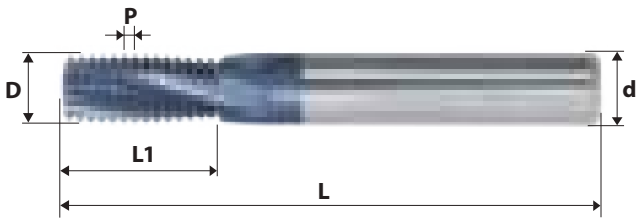


TiAlN coated

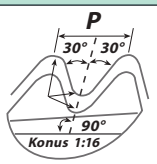
with internal coolant supply through the flutes - same tool for internal and external threads

(Item Number)	*(Pitch)* P in TPI	Standard	d in mm	D in mm	*(Flutes)*	L1 in mm	L in mm
TMCF08076-3-10-27NPT	27	1/8	8	7.6	3	10.8	64
TMCF1010-4-16-18NPT	18	1/4 - 3/8	10	10.0	4	16.2	73
TMCF16155-4-22-14NPT	14	1/2 - 3/4	16	15.5	4	22.7	101

NPTF



Profile



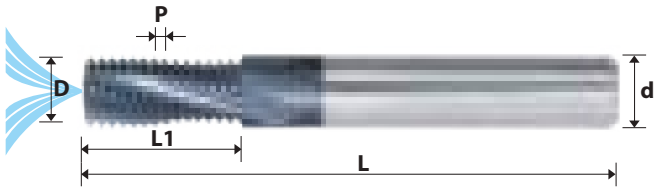
TiAlN coated

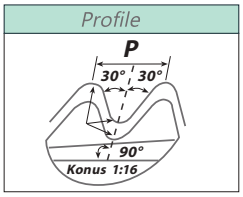
same tool for internal and external threads

(Item Number)	*(Pitch)* P in TPI	Standard	d in mm	D in mm	*(Flutes)*	L1 in mm	L in mm
TMC0606-3-9-27NPTF	27	1/16 - 1/8	6	6.0	3	9.9	58
TMC0808-3-14-18NPTF	18	1/4 - 3/8	8	8.0	3	14.8	64
TMC1212-4-20-14NPTF	14	1/2 - 3/4	12	12.0	4	20.9	84
TMC1616-4-27-11.5NPTF	11.5	1 - 2	16	16.0	4	27.6	105
TMC2020-4-39-8NPTF	8	≥ 2 1/2	20	20.0	4	39.7	105

For thread mills with coolant see following pages

NPTF



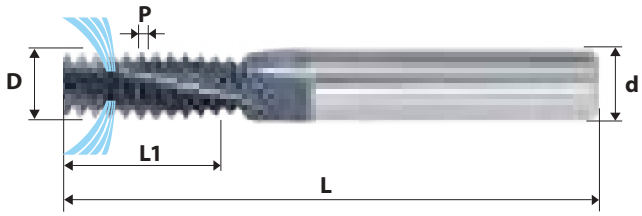


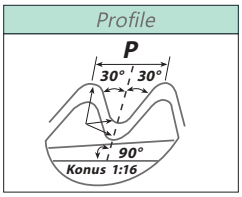
TiAlN coated

with internal coolant bore - same tool for internal and external threads

(Item Number)	*(Pitch)* P in TPI	Standard	d in mm	D in mm	*(Flutes)*	L1 in mm	L in mm
TMCC08076-3-10-27NPTF	27	1/8	8	7.6	3	10.8	64
TMCC1010-4-16-18NPTF	18	1/4 - 3/8	10	10.0	4	16.2	73
TMCC16155-4-22-14NPTF	14	1/2 - 3/4	16	15.5	4	22.7	105
TMCC2020-4-29-11.5NPTF	11.5	1 - 2	20	20.0	4	29.8	105
TMCC2020-4-39-8NPTF	8	≥ 2 1/2	20	20.0	4	39.7	105

NPTF



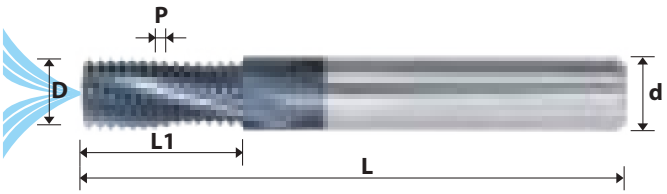


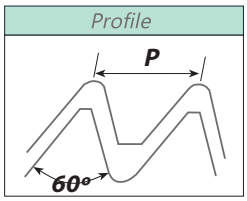
TiAlN coated

with internal coolant through the flutes - same tool for internal and external threads

(Item Number)	*(Pitch)* P in TPI	Standard	d in mm	D in mm	*(Flutes)*	L1 in mm	L in mm
TMCF08076-3-10-27NPTF	27	1/8	8	7.6	3	10.8	64
TMCF1010-4-16-18NPTF	18	1/4 - 3/8	10	10.0	4	16.2	73
TMCF16155-4-22-14NPTF	14	1/2 - 3/4	16	15.5	4	22.7	101

NPS



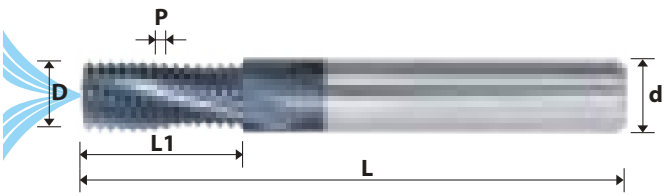


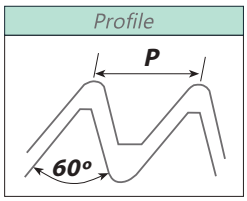
TiAlN coated

with internal coolant bore - same tool for internal and external threads

(Item Number)	(Pitch) P in TPI	Standard	d in mm	D in mm	(Flutes)	L1 in mm	L in mm
TMCC0312-3-04-27NPS	27	1/8	5/16	7.6	3	10.8	63
TMCC0375-4-06-18NPS	18	1/4 - 3/8	3/8	9.5	4	16.2	76
TMCC0625-4-08-14NPS	14	1/2 - 3/4	5/8	15.5	4	22.7	101
TMCC0750-4-11-11.5NPS	11.5	1 - 2	3/4	19.0	4	29.8	101

NPSF



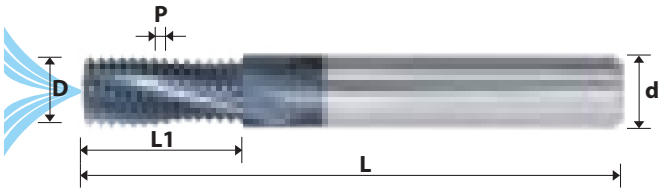


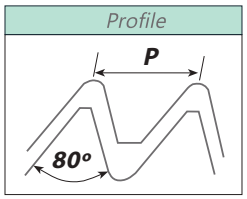
TiAlN coated

with internal coolant bore - same tool for internal and external threads

(Item Number)	(Pitch) P in TPI	Standard	d in mm	D in mm	(Flutes)	L1 in mm	L in mm
TMCC0312-3-04-27NPSF	27	1/8	5/16	7.6	3	10.8	63
TMCC0375-4-06-18NPSF	18	1/4 - 3/8	3/8	9.5	4	16.2	76
TMCC0625-4-08-14NPSF	14	1/2 - 3/4	5/8	15.5	4	22.7	101
TMCC0750-4-11-11.5NPSF	11.5	1 - 2	3/4	19.0	4	29.8	101

PG DIN 40430





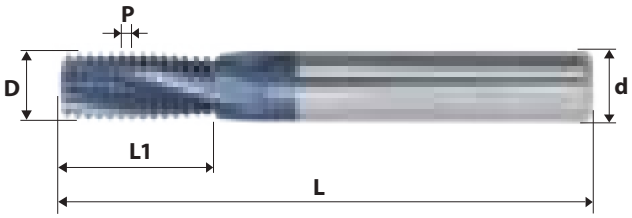
TiAlN coated

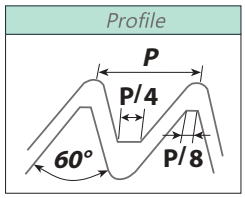
with internal coolant bore - same tool for internal and external threads

(Item Number)	*(Pitch)* P in TPI	Standard	d in mm	D in mm	*(Flutes)*	L1 in mm	L in mm
TMCC1010-4-19-20PG	20	Pg 7	10	10.0	4	19.7	73
TMCC1212-4-20-18PG	18	Pg 9, 11, 13.5, 16	12	12.0	4	20.5	84
TMCC1212-4-23-16PG	16	Pg 21, 29, 36, 42, 48	12	12.0	4	23.0	84

TEST REPORT	
Internal thread	M10 x 1
Thread depth	10.0 mm
Material	34CrNiMo6 (1.6582)
Tool	Holder: TMCC 0606-3-12-1.0 ISO
	Insert: 21IN3.0ISO
Cutting speed	Vc: 100 m/min Fz: 0.02 mm/Z
Coolant	Emulsion
Tool life	Pieces

ISO



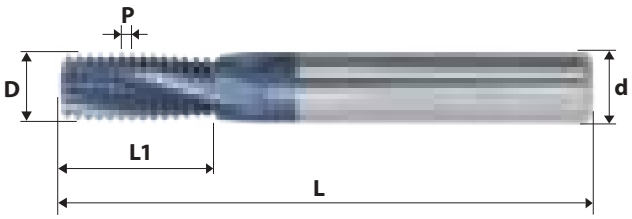


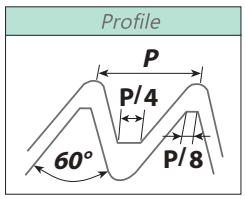
TiAlN coated

without internal coolant bore - for external threads

(Item Number)	*(Pitch)* in mm	d in mm	D in mm	*(No. of Flutes)*	L1 in mm	L in mm
EXTMC1010-4-16-1.0ISO	1.0	10	10.0	4	16.5	73
EXTMC1212-5-20-1.0ISO	1.0	12	12.0	5	20.5	84
EXTMC1010-4-16-1.25ISO	1.25	10	10.0	4	16.9	73
EXTMC1010-4-15-1.5ISO	1.5	10	10.0	4	15.8	73
EXTMC1212-4-20-1.5ISO	1.5	12	12.0	4	20.3	84
EXTMC1212-4-20-1.75ISO	1.75	12	12.0	4	20.1	84
EXTMC1010-3-17-2.0ISO	2.0	10	10.0	3	17.0	73
EXTMC1212-4-21-2.0ISO	2.0	12	12.0	4	21.0	84

UN





TiAlN coated

without internal coolant bore - for external threads

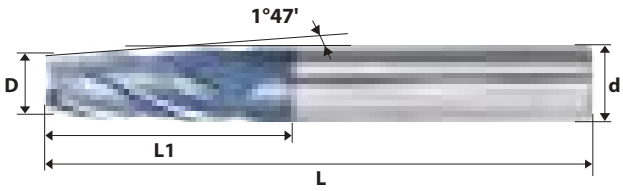
(Item Number)	*(Pitch)* in mm	d in mm	D in mm	*(No. of Flutes)*	L1 in mm	L in mm
EXTMC1010-4-16-24UN	24	10	10.0	4	16.4	73
EXTMV1212-5-21-20UN	20	12	12.0	5	21.0	84
EXTMC1212-4-20-18UN	18	12	12.0	4	20.5	84
EXTMC1212-4-21-16UN	16	12	12.0	4	21.4	84
EXTMC1212-4-20-14UN	14	12	12.0	4	20.9	84
EXTMC1212-4-20-12UN	12	12	12.0	4	20.1	84

TAPERED SOLIDE CARBIDE END MILLS

Solid carbide tapered end mills are used for milling preparation of conical threads before the thread milling operation.

ADVANTAGES :

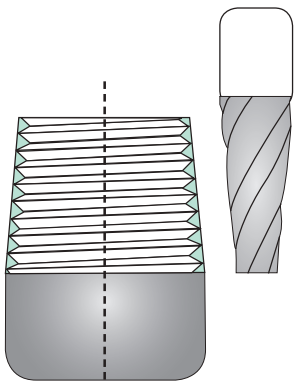
- *increases tool life of thread milling cutters and indexable inserts*
- *equal and uniform load along the cutting edge of the thread milling cutter*
- *shorter machining time of the thread milling operation, due to the tapered preparation*



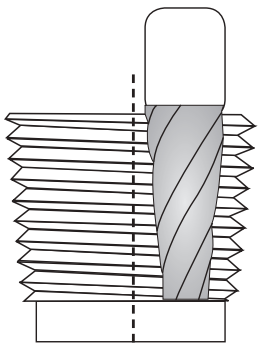
TiAlN coated

(Item Number)	*(Size)*	D in mm	d in mm	*(Flutes)*	L1 in mm	L in mm
CC0652-4-12	NPT 1/16" - 1/8" NPTF 1/16" - 1/8" BSPT 1/16" - 1/8	5.2	6	4	12	58
CC1085-4-24	NPT 1/8" - 1" NPTF 1/8" - 1" BSPT 1/8" - 1"	8.5	10	4	24	73
CC1210-4-32	NPT 1/4" - 3" NPTF 1/4" - 3" BSPT 1/4" - 3"	10.0	12	4	32	84

EXTERNAL MACHINING



INTERNAL MACHINING



Solid Carbide Mini ThreadMills

ADVANTAGES :

- *same tool can produce a wide range of threads and pitches*
- *spiral flutes allows smooth cutting operation*
- *same tool can produce both external & internal threads*
- *shorter machining time due to 3 to 6 simultaneously engaged cutting edges*
- *enables machining of deep holes*
- *thread length up to 5xD*
- *low cutting forces thanks to a special cutting edge profile*

TMCM

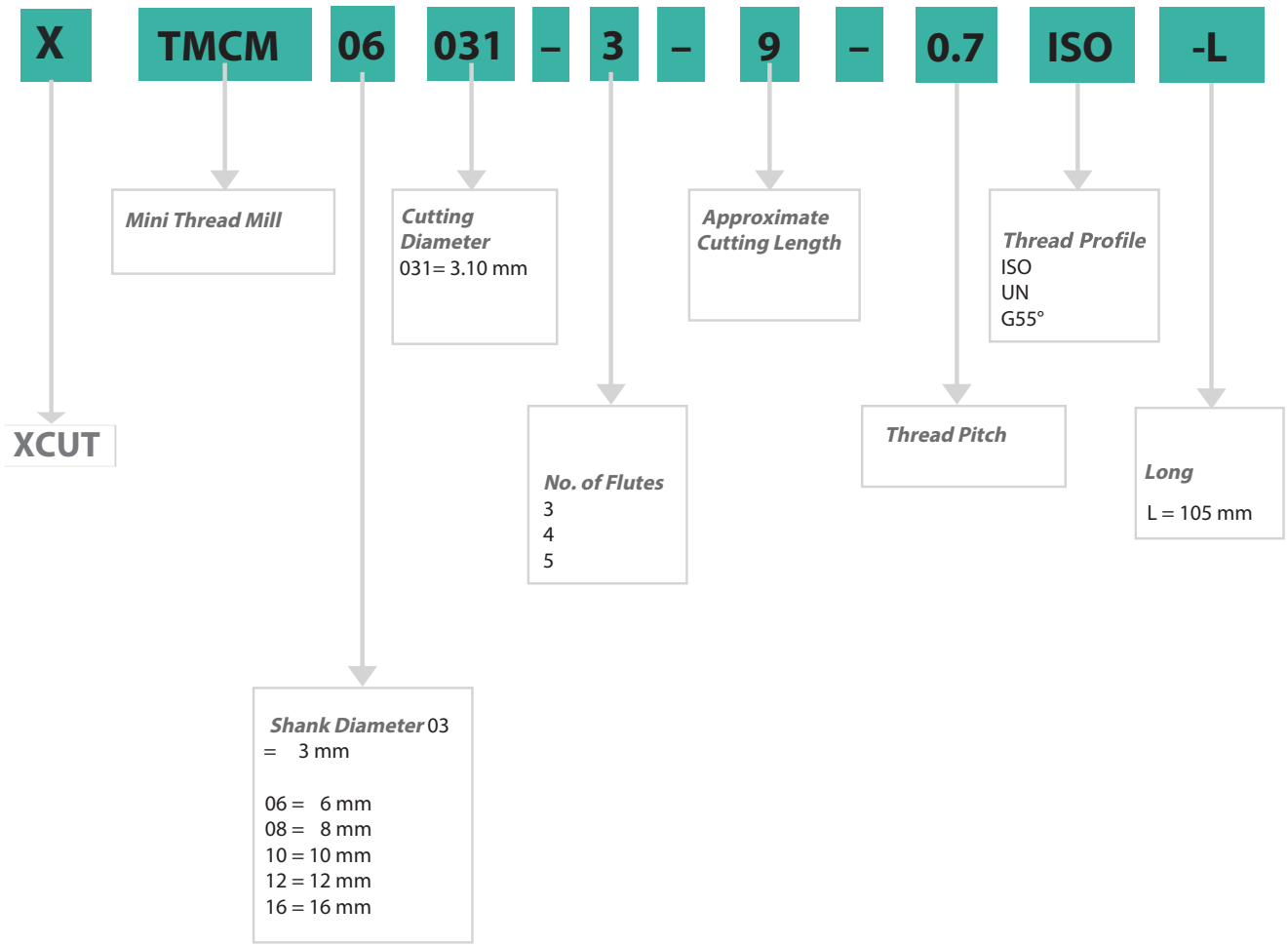
- *threads starting from ISO M1 x 0.25 and 0.08UN*
- *high cutting speed*
- *short machining time*
  machining of hardened materials up to 45 HrC

COATING TIALN

Titanium Aluminum Nitride multi-layer coating (ISO P10-P30 & K10 - K20). To be run at medium to high cutting speeds. General purpose for all materials.

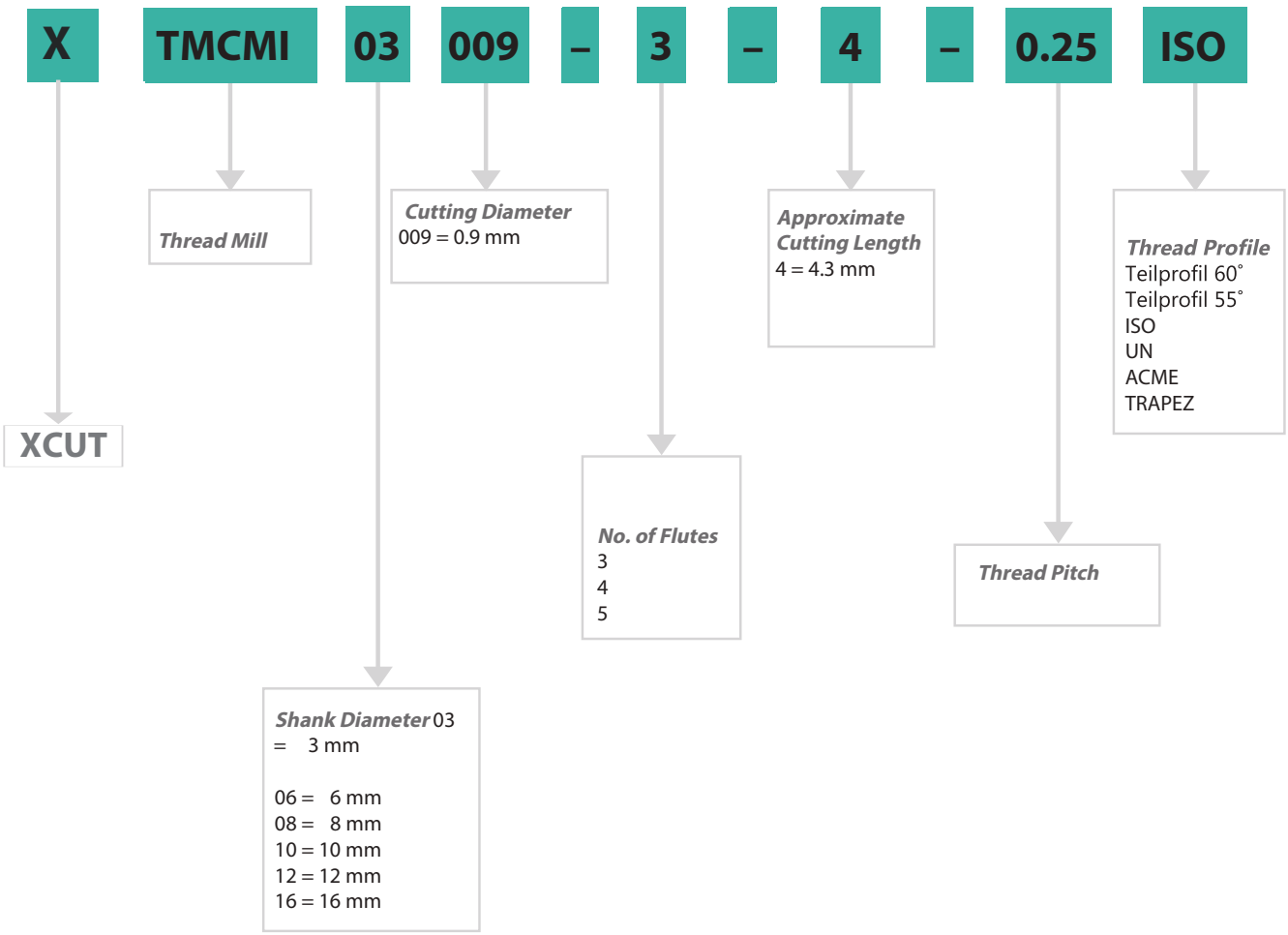
PRODUCT DESIGNATION

***EXAMPLE* : XTMCM0603-3-39-0.7ISO-L**

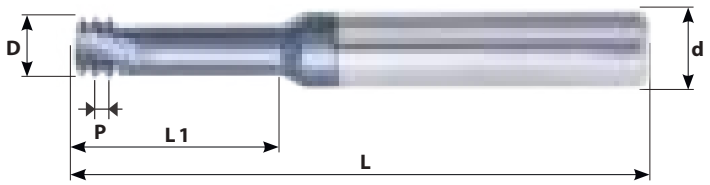


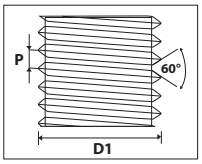
PRODUCT DESIGNATION

***EXAMPLE* : XTMCMI03009-3-3-0.25ISO**



ISO





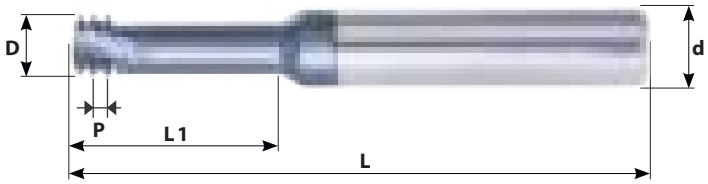
TiAlN coated

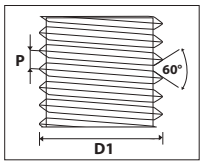
Mini Thread Mill ISO
for thread depth up to 2 x D1

(Item Number)	*Dimensions (mm)*						*(Flutes)*
	P	L	D1	d	D	L1	
TMCM03007-3-2-0.25ISO	0,25	39	M1	3	0,72	2,5	3
TMCM03009-3-3-0.25ISO	0,25	39	M1,2	3	0,90	3,0	3
TMCM06045-4-14-0.35IS0	0,35	58	M5	6	4,50	14,5	4
TMCM06016-3-4-0.4ISO	0,4	58	M2	6	1,53	4,5	3
TMCM06016-3-4-0.4ISO-L *	0,4	105	M2	6	1,53	4,5	3
TMCM06017-3-5-0.45ISO	0,45	58	M2,2	6	1,65	5,0	3
TMCM0602-3-5-0.45ISO	0,45	58	M2,5	6	1,95	5,5	3
TMCM0602-3-5-0.45ISO-L *	0,45	105	M2,5	6	1,95	5,5	3
TMCM06024-3-6-0.5ISO	0,5	58	M3	6	2,37	6,5	3
TMCM06024-3-6-0.5ISO-L *	0,5	105	M3	6	2,37	6,5	3
TMCM06028-3-70.6ISO	0,6	58	M3,5	6	2,75	7,5	3
TMCM06031-3-9-0.7ISO	0,7	58	M4	6	3,10	9,0	3
TMCM0808-4-25-0.75ISO	0,75	64	M10	8	8,00	25,0	4
TMCM06038-3-12-0.8ISO	0,8	58	M5	6	3,80	12,5	3
TMCM06047-3-14-1.0ISO	1,0	58	M6	6	4,65	14,0	3
TMCM0606-3-18-1.25ISO	1,25	58	M8	6	6,00	18,0	3
TMCM08078-3-23-1.5ISO	1,5	64	M10	8	7,80	23,0	3
TMCM1009-3-26-1.75ISO	1,75	73	M12	10	9,00	26,0	3
TMCM12118-4-35-2.0ISO	2,0	84	M16	12	11,80	35,0	4
TMCM1615-5-43-2.5ISO	2,5	105	M20	16	15,00	43,0	5

*long

ISO





TiAlN coated

Mini Thread Mill ISO
for thread depth up to 3 x D1

(Item Number)	*Dimensions (mm)*						*(Flutes)*
	P	L	D1	d	D	L1	
TMCM03011-3-4-0.3ISO	*0.3	39	M1.4	3	1.05	4.0	3
TMCM03012-3-5-0.35ISO	*0.35	39	M1.6	3	1.20	4.8	3
TMCM06012-3-5-0.35ISO-L*	0.35	105	M1.6	6	1.20	4.8	3
TMCM06045-4-14-0.35ISO	0.35	58	M5	6	4.50	14.5	4
TMCM03016-3-6-0.4ISO	*0.4	39	M2	3	1.53	6.0	3
TMCM03017-3-7-0.45ISO	*0.45	39	M2.2	3	1.65	7.0	3
TMCM0602-3-7-0.45ISO	0.45	58	M2.5	6	1.95	7.5	3
TMCM0602-3-8-0.45ISO-L*	0.45	105	M2.5	6	1.95	8.0	3
TMCM06024-3-9-0.5ISO	0.5	58	M3	6	2.37	9.5	3
TMCM06024-3-9-0.5ISO-L*	0.5	105	M3	6	2.37	9.5	3
TMCM06054-4-20-0.5ISO	0.5	58	M6, M7	6	5.35	20.0	4
TMCM06028-3-10-0.6ISO	0.6	58	M3.5	6	2.75	10.5	3
TMCM06031-3-12-0.7ISO	0.7	58	M4	6	3.10	12.5	3
TMCM06031-3-12-0.7ISO-L*	0.7	105	M4	6	3.10	12.5	3
TMCM06038-3-16-0.8ISO	0.8	58	M5	6	3.80	16.0	3
TMCM06038-3-16-0.8ISO-L*	0.8	105	M5	6	3.80	16.0	3
TMCM06047-3-20-1.0ISO	1.0	58	M6	6	4.65	20.0	3
TMCM06047-3-20-1.0ISO-L*	1.0	105	M6	6	4.65	20.0	3
TMCM0808-4-31-1.0ISO	1.0	64	M10	8	8.00	31.0	4
TMCM0606-3-24-1.25ISO	1.25	58	M8	6	6.00	24.0	3
TMCM0606-3-24-1.25ISO-L*	1.25	105	M8	6	6.00	24.0	3
TMCM08078-3-31-1.5ISO	1.5	64	M10	8	7.80	31.5	3
TMCM08078-3-31-1.5ISO-L*	1.5	105	M10	8	7.80	31.5	3
TMCM1009-3-37-1.75ISO	1.75	73	M12	10	9.00	37.8	3
TMCM12118-4-50-2.00ISO	2.0	105	M16	12	11.80	50.0	4

*long

tools for internal thread

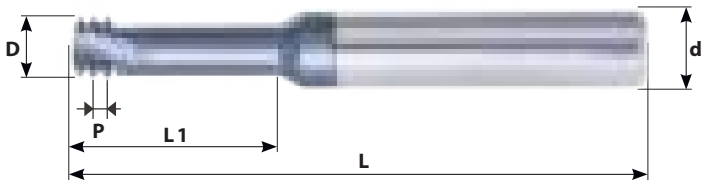
for thread depth up to 4 x D1

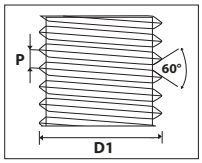
(Item Number)	(Dimensions mm)						(Flutes)
	P	L	D1	d	D	L1	
TMCM0302-3-10-0.45ISO	0.45	39	M2.5	3	1.95	10.5	3
TMCM03024-3-12-0.5ISO	0.5	39	M3	3	2.40	12.5	3
TMCM06031-3-16-0.7ISO	0.7	58	M4	6	3.10	16.7	3
TMCM0604-3-20-0.8ISO	0.8	58	M5	6	4.00	20.8	3
TMCM06048-3-25-1.0ISO	1.0	58	M6	6	4.80	25.0	3

For thread depth up to 5 x D1

(Item Number)	(Dimensions mm)						(Flutes)
	P	L	D1	d	D	L1	
TMCM03024-3-15-0.5ISO	0.5	39	M3	3	2.40	15.5	3

UN





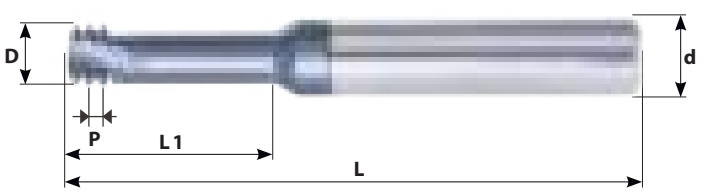
TiAlN coated

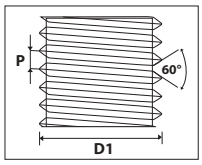
Mini Thread Mill UN
for thread depth up to 2 x D1

(Item Number)	UNC	UNF	*(TPI)* P	*(Dimensions mm)*				*(Flutes)*
				L	d	D	L1	
TMCM06014-3-3-72UN		1	72	58	6	1.45	3.7	3
TMCM06014-3-3-64UN	1	2	64	58	6	1.40	3.8	3
TMCM03016-3-4-56UN	2	3	56	39	3	1.65	4.4	3
TMCM06016-3-4-56UN	2	3	56	58	6	1.65	4.4	3
TMCM06019-3-548UN	3	4	48	58	6	1.90	5.2	3
TMCM06021-3-6-40UN	4		40	58	6	2.10	6.3	3
TMCM06021-3-6-40UN-L*	4		40	105	6	2.10	6.3	3
TMCM06024-3-7-40UN	5	6	40	58	6	2.45	7.0	3
TMCM06033-3-9-36UN		8	36	58	6	3.30	9.0	3
TMCM06025-3-7-32UN	6		32	58	6	2.55	7.1	3
TMCM06025-3-7-32UN-L*	6		32	105	6	2.55	7.1	3
TMCM06032-3-9-32UN	8		32	58	6	3.20	9.5	3
TMCM06032-3-9-32UN-L*	8		32	105	6	3.20	9.5	3
TMCM06037-3-10-32UN		10	32	58	6	3.70	10.5	3
TMCM06042-3-11-28UN		12	28	58	6	4.20	11.0	3
TMCM0605-3-14-28UN		1/4	28	58	6	5.00	14.5	3
TMCM06035-3-10-24UN	10,12		24	58	6	3.50	10.6	3
TMCM08066-3-17-24UN		5/16,3/8	24	64	8	6.60	17.0	3
TMCM06047-3-14-20UN	1/4		20	58	6	4.75	14.0	3
TMCM06047-3-14-20UN-L*	1/4		20	105	6	4.75	25.0	3
TMCM0808-3-25-20UN		7/16	20	64	8	8.00	25.0	3
TMCM0606-3-17-18UN	5/16		18	58	6	6.00	17.0	3
TMCM1212-4-35-18UN		5/8	18	84	12	12.00	35.0	4
TMCM08067-3-22-16UN	3/8		16	64	8	6.70	22.0	3
TMCM08077-3-25-14UN	7/16		14	64	8	7.70	25.0	3
TMCM10092-3-27-13UN	1/2		13	73	10	9.20	27.5	3
TMCM12105-3-31-12UN	9/16		12	84	12	10.50	31.5	3
TMCM12114-3-34-11UN	5/8		11	84	12	11.40	34.5	3
TMCM16144-4-41-10UN	3/4		10	105	16	14.40	41.5	4

*long

UN





TiAlN coated

Mini Thread Mill UN

for thread depth up to 3 x D1

(Item Number)	UNC	UNF	*(TPI)* P	*(Dimensions mm)* L	d	D	L1	*(Flutes)*
TMCM06012-3-4-80UN		0	80	58	6	1.15	4.0	3
TMCM03015-3-6-72UN		1	*72	39	3	1.45	6.0	3
TMCM06014-3-364UN	1	2	64	58	6	1.40	3.8	3
TMCM03016-3-6-56UN	2	3	56	39	3	1.65	6.6	3
TMCM06016-3-6-56UN	2	3	56	58	6	1.65	6.6	3
TMCM06016-3-6-56UN-L*	2	3	56	105	6	1.65	6.6	3
TMCM03021-3-8-40UN	4		40	39	3	2.10	8.0	3
TMCM06021-3-8-40UN	4		40	58	6	2.10	8.0	3
TMCM06021-3-8-40UN-L*	4		40	105	6	2.10	8.0	3
TMCM06024-3-9-40UN	5	6	40	58	6	2.45	9.6	3
TMCM03025-3-10-32UN	6		32	39	3	2.55	10.5	3
TMCM06025-3-10-32UN	6		32	58	6	2.55	10.5	3
TMCM06025-3-10-32UN-L*	6		32	105	6	2.55	10.5	3
TMCM06032-3-12-32UN	8		32	58	6	3.20	12.5	3
TMCM06032-3-12-32UN-L*	8		32	105	6	3.20	12.5	3
TMCM06037-3-15-32UN		10	32	58	6	3.70	15.0	3
TMCM06037-3-15-32UN-L*		10	32	105	6	3.70	15.0	3
TMCM0605-3-19-28UN		1/4	28	58	6	5.00	19.0	3
TMCM0605-3-19-28UN-L*	1/4		28	105	6	5.00	19.0	3
TMCM06035-3-15-24UN	10,12		24	58	6	3.50	15.5	3
TMCM08066-3-24-24UN		5/16,3/8	24	64	8	6.60	24.0	3
TMCM06047-3-19-20UN	1/4		20	58	6	4.75	19.0	3
TMCM06047-3-19-20UN-L*	1/4		20	105	6	4.75	19.0	3
TMCM0808-3-34-20UN		7/16	20	64	8	8.00	34.6	3
TMCM0606-3-23-18UN	5/16		18	58	6	6.00	23.0	3
TMCM1212-4-49-18UN		5/8	18	105	12	12.00	49.0	4
TMCM08067-3-30-16UN	3/8		16	64	8	6.70	30.2	3
TMCM08077-3-35-14UN	7/16		14	64	8	7.70	35.2	3
TMCM10092-3-40-13UN	1/2		13	73	10	9.20	27.5	3
TMCM12105-3-45-12UN	9/16		12	105	12	10.50	45.0	3
TMCM12114-3-50-11UN	5/8		11	105	12	11.40	50.0	3
TMCM16144-4-59-10UN	3/4		10	105	16	14.40	59.7	4

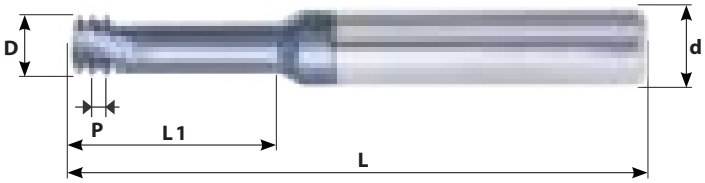
- Machining Titanium, surgical stainless steels and hardened materials up to 45 HRc Specially designed for production of dental implants

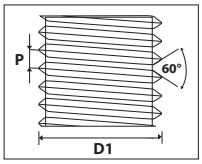
- Suitable for high speed high speed machining centers (30,000 - 40,000 RPM) and for standard machining centers (6,000 RPM and higher)

*long

- Can also be used for general purpose machining of regular & fine threads

UN





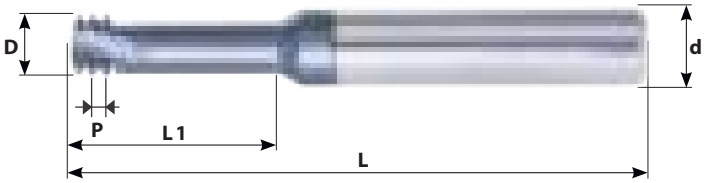
TiAlN coated

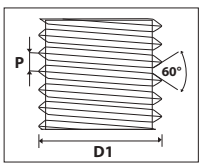
Mini Thread Mill UN

for thread depth up to 4 x D1

(Item Number)	UNC	UNF	*(TPI)* P	*(Dimensions mm)*				*(Flutes)*
				L	d	D	L1	
TMCM03016-3-9-56UN	2	3	56	39	3	1.65	9.2	3
TMCM03021-3-12-40UN	4		40	39	3	2.10	12.0	3
TMCM03025-3-14-32UN	6		32	39	3	2.55	14.8	3
TMCM06032-3-17-32UN	8		32	58	6	3.20	17.5	3
TMCM06037-3-20-32UN		10	32	58	6	3.70	20.0	3

UN





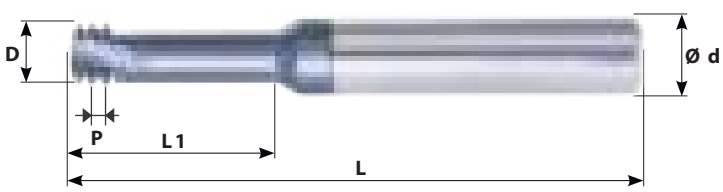
TiAlN coated

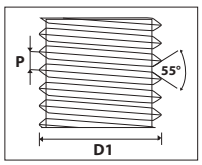
Mini Thread Mill UN

for thread depth up to 5 x D1

(Item Number)	UNC	UNF	*(TPI)* P	*(Dimensions mm)*				*(Flutes)*
				L	d	D	L1	
TMCM03012-3-8-80UN		0	80	39	3	1.15	8.0	3
TMCM03016-3-11-56UN	2	3	56	39	3	1.65	11.4	3

G55°





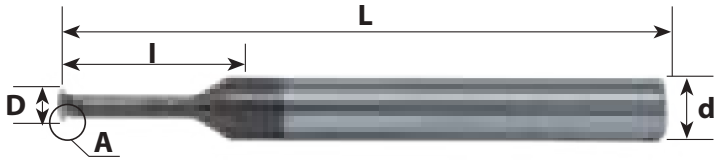
TiAlN coated

same Tool for internal and external thread

(Item Number)	*(TPI)* P	Standard	*Dimensions (mm)*				*(Flutes)*
			L	d	D	L1	
TMCM08078-3-19-28W	28	G 1/8	64	8	7.8	19.5	3
TMCM1010-4-30-19W	19	G 1/4 - 3/8	73	10	10.0	30.0	4
TMCM1212-4-37-14W	14	G 1/2 - 7/8	84	12	12.0	37.0	4
TMCM1616-4-44-11W	11	G ≥ 1	105	16	16.0	44.0	4

for thread depth up to 2 x D1

I PARTIAL PROFILE 60 ^{0}



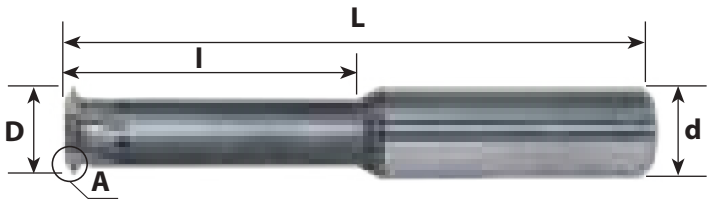
TiAlN coated

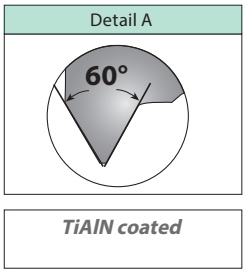
same Tool for internal and external thread

(Item Number)	*(Pitch)* mm	*(Pitch TPI)*	M Coarse	M Fine	UN, UNC, UNS UNF, UNEF	d mm	D	*(No. of Flutes)*	l	L
TMCMI03012-3-3-A60	0.25-0.35	100-72	M1.6 x 0.35	M1.6 x 0.25 M1.8 x 0.25 M2.0 x 0.25	0-80 UNF	3	1.15	3	3.1	39
TMCMI03014-3-4-A60	0.35-0.45	72-56	M2 x 0.4 M2.2 x 0.45	M2 x 0.35 M2.2 x 0.35	1-64 UNC, 1-72 UNF, 2-56 UNC, 2-64 UNF	3	1.40	3	3.7	39
TMCMI03019-3-5-A60	0.35-0.6	72-40	M2.5 x 0.45	M2.5 x 0.35 M3 x 0.35	3-84 UNC, 3-56 UNF, 4-40 UNC, 4-48 UNF	3	1.90	3	5.2	39
TMCMI03024-3-7-A60	0.5-0.8	48-32	M3 x 0.5 M3.5 x 0.6	M3.5 x 0.5	5-40 UNC, 5-44 UNF, 6-32 UNC, 6-40 UNF	3	2.45	3	7.0	39
TMCMI06032-3-9-A60	0.5-1.0	48-24	M4 x 0.7 M4.5 x 0.75	M4 x 0.5	8-32 UNC, 8-36 UNF, 10-24 UNC, 10-28 UNS, 10-32 UNF	6	3.20	3	9.5	58
TMCMI0604-3-12-A60	0.5-1.0	48-24	M5 x 0.8 M6 x 1.0	M5 x 0.5 M5.5 x 0.5 M5 x 0.75	10-36 UNS, 10-40 UNS, 10-48 UNS, 12-24 UNC, 12-28 UNF	6	4.00	3	12.5	58

Carbide grade: Ultra-fine sub-micron grade with *triple* PVD coating

I PARTIAL PROFILE 60





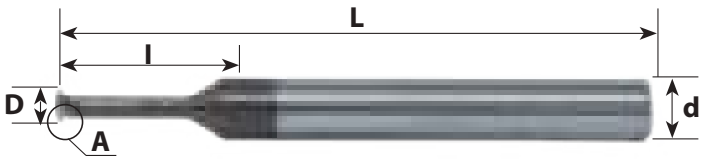
TiAlN coated

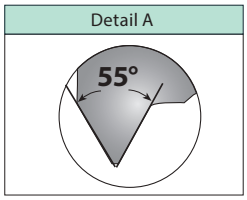
with internal coolant supply through the flutes, same tool for internal and external thread

(Item Number)	*(Pitch)* mm	*(Pitch TPI)*	*(Thread Dia. mm)*	d mm	D	*(No. of Flutes)*	l	L
TMCMI0605-4-20-A60	Int. 0.5 - 0.8 Ex. 0.4 - 0.8	56-28 64-32	Ø ≥ 6	6	5.0	4	20	58
TMCMI0808-4-28-A60			Ø ≥ 9	8	8.0	4	28	64
TMCMI1212-5-38-A60			Ø ≥ 13	12	12.0	5	38	84
TMCMI0808-4-30-A60	Int. 1.0 - 1.75 Ex. 0.8 - 1.5	28-14 32-16	Ø ≥ 10	8	8.0	4	30	64
TMCMI1010-4-35-A60			Ø ≥ 12	10	10.0	4	35	73
TMCMI1212-5-39-A60			Ø ≥ 14	12	12.0	5	39	84
TMCMI1212-5-40-A60	Int. 2.0 - 3.0 Ex. 1.75-2.5	13- 8 15-10	Ø ≥16	12	12.0	5	40	84
TMCMI1614-5-45-A60			Ø ≥18	16	14.0	5	45	101
TMCMI1616-5-50-A60			Ø ≥ 20	16	16.0	5	50	101

Carbide Grade: fine grain grade with multi-layer Titan Aluminium Nitride coating (ISO K10-K20). Very high heat resistance abnd smooth cutting at high speed garantee the best tool life. For general machining of regular and fine threads.

PARTIAL PROFILE 55 0





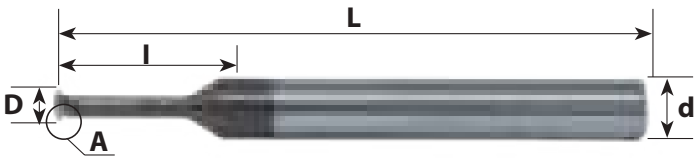
TiAlN coated

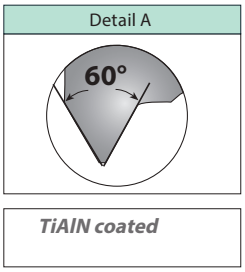
same tool for internal and external thread

(Item Number)	*(Pitch TPI)*	d	D	*(No. of Flutes)*	l	L
TMCMI03023-3-7-A55	40-32	3	2.25	3	7.0	39
TMCMI06044-3-14-A55	28-20	6	4.35	3	14.0	58
TMCMI06059-3-20-A55	28-18	6	5.85	3	20.5	58
TMCMI0807-3-23-A55	20-14	8	7.00	3	23.0	64

Carbide Grade: *Ultra-fine Sub-micron grade with triple PVD coating*

ISO





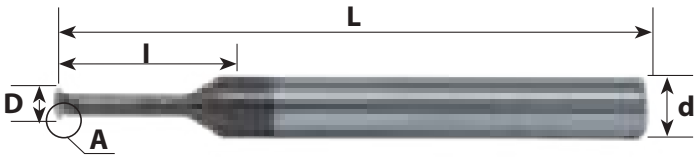
TiAlN coated

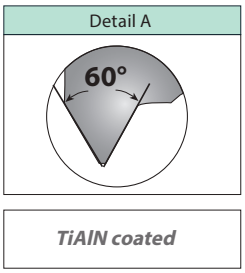
tools for internal thread

(Item Number)	*(Pitch)* mm	M Coarse	M Fine	d	D	*(No. of Flutes)*	l	L
TMCMI03007-3-3-0.25ISO	0.25	M1 x 0.25		3	0.72	3	3.6	39
TMCMI03009-3-4-0.25ISO	0.25	M1.2 x 0.25	M1.4 x 0.25 M1.6 x 0.25	3	0.90	3	4.3	39
TMCMI03011-3-5-0.3ISO	0.3	M1.4 x 0.3		3	1.05	3	5.0	39
TMCMI03012-3-6-0.35ISO	0.35	M1.6 x 0.35	M2 x 0.35 M2.2 x 0.35	3	1.20	3	5.7	39
TMCMI03016-3-7-0.4ISO	0.4	M2 x 0.4		3	1.55	3	7.1	39
TMCMI03024-3-10-0.5ISO	0.5	M3 x 0.5	M3.5 x 0.5 M4 x 0.5	3	2.37	3	10.6	39

for thread depth up to 3.5 x D1

UN





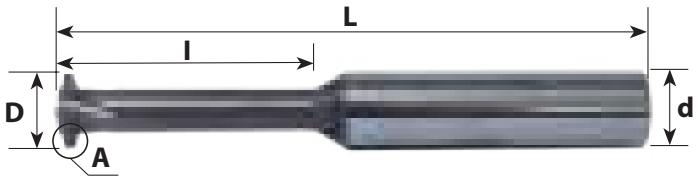
TiAlN coated

tools for internal thread

(Item Number)	*(Pitch)* mm	UNC	UNF	d	D	*(No. of Flutes)*	l	L
TMCMI03012-3-5-80UN	80		0	3	1.15	3	5.5	39
TMCMI03015-3-7-72UN	72		1	3	1.45	3	6.6	39
TMCMI03016-3-9-56UN	56	2	3	3	1.65	3	8.9	39
TMCMI03021-3-10-40UN	40	4		3	2.10	3	10.1	39

for thread depth up to 3.5 x D1

Trapez DIN 103



TiAlN coated

tools for internal thread

(Item Number)	*(Pitch)* mm	Thread size	d	D	No. of Flutes	l	L
TMCMI06055-3-13-1.5TR	1.5	Tr8x1.5 Tr9x1.5	6	5.5	3	13.5	58
TMCMI08066-3-21-2TR	2	Tr10x2 Tr11x2	8	6.6	3	21.0	64
TMCMI10086-4-25-2TR	2	Tr12x2 Tr14x2	10	8.6	4	25.0	73
TMCMI0807-3-25-3TR	3	Tr12x3	8	7.0	3	25.0	64
TMCMI10089-4-29-3TR	3	Tr14x3 Tr22x3	10	8.9	4	29.0	73
TMCMI10092-3-33-4TR	4	Tr16x4 Tr18x4 Tr20x4	10	9.2	3	33.0	73
TMCMI14135-4-45-5TR	5	Tr22x5 Tr24x5 Tr26x5	14	13.5	4	45.0	105

for thread depth up to.2 x D1

Thread Milling

MINI THREAD MILLS FOR HARDENED MATERIALS

ADVANTAGES :

- *lower cutting forces thanks to a special cutting edge geometry*
- *perfect solution for the Mold and Die Industry*
- *threading from ISO m1.4x0.3 and 0-80 UN*
- *thread length up to 2xD*
- *short chips increase safety*
- *short machining time*
- *machining at high cutting speeds*
- *short cycle time - increase a productivity*
- *ultra fine grade - special for hardened materials*
- *Coating provides high wear and heat resistance*

TMCMH

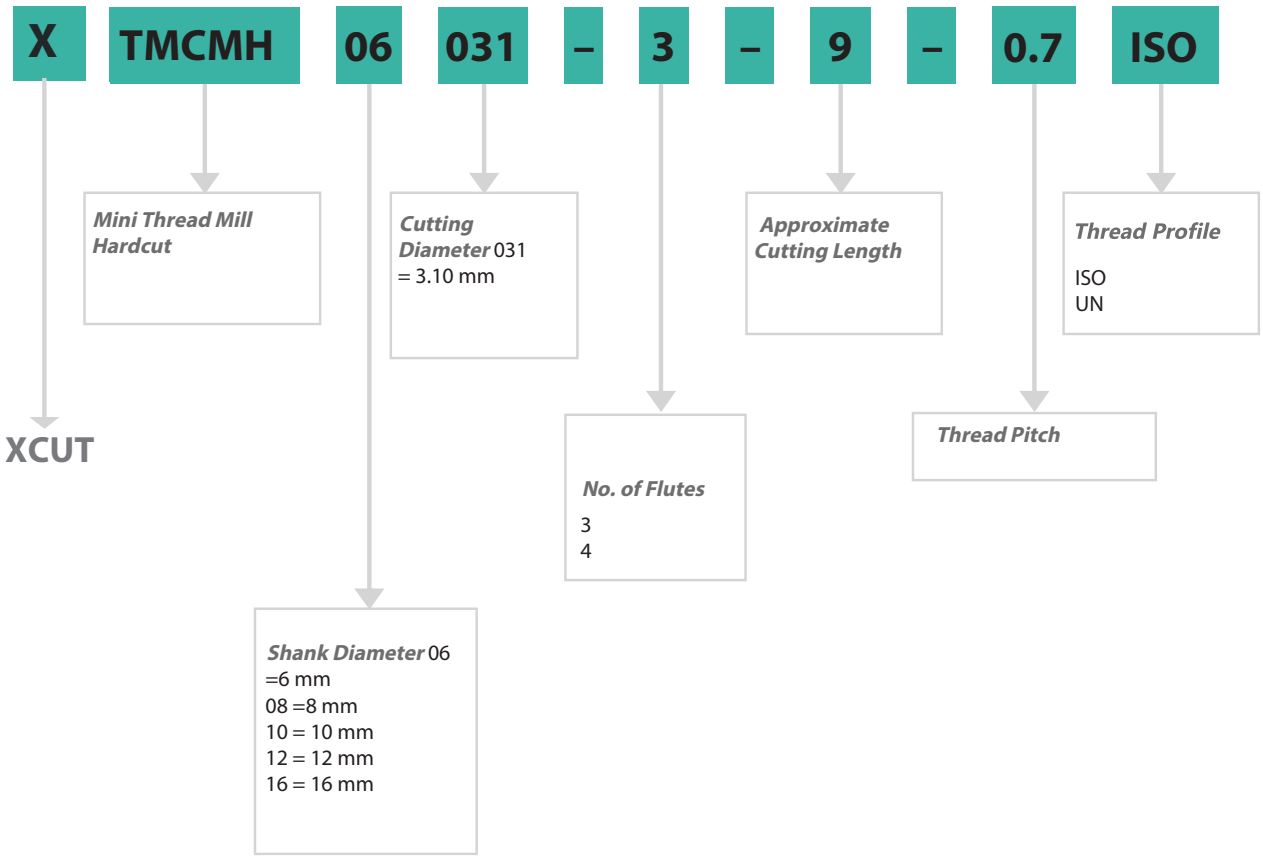
Thread Mills designed specifically for machining of hardened materials up to 62HRc. These tools provide high performance, improved cut and excellent surface.

CARBIDE GRADE WITH TIALN COATING

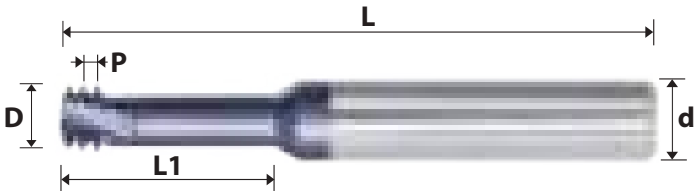
Ultra fine sub-micron grade with advanced triple PVD coating.

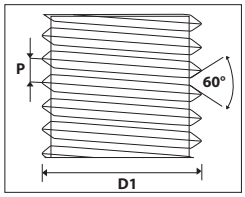
PRODUCT DESIGNATION

EXAMPLE: X-TMCH0631-3-9-0.7 ISO



ISO





for left hand spindle rotation use code M04

tools for internal thread for thread depth up to 2 x D1

(Item Number)	P *(Pitch)* in mm	L in mm	d in mm	D1 in mm	D in mm	L1 in mm	*(No. of Flutes)*
TMCMH06016-3-4-0.4ISO	0.4	58	6	M2	1.53	4.5	3
TMCMH06017-3-5-0.45ISO	0.45	58	6	M2.2	1.65	5.0	3
TMCMH0602-3-5-0.45ISO	0.45	58	6	M2.5	1.95	5.5	3
TMCMH06024-3-6-0.5ISO	0.5	58	6	M3	2.37	6.5	3
TMCMH06028-3-7-0.6ISO	0.6	58	6	M3.5	2.75	7.5	3
TMCMH06031-3-9-0.7ISO	0.7	58	6	M4	3.10	9.0	3
TMCMH06038-3-12-0.8ISO	0.8	58	6	M5	3.80	12.5	3
TMCMH06047-3-14-1.0ISO	1.0	58	6	M6	4.65	14.0	3
TMCMH0606-3-18-1.25ISO	1.25	58	6	M8	6.00	18.0	3
TMCMH08078-3-23-1.5ISO	1.5	64	8	M10	7.80	23.0	3
TMCMH1009-3-26-1.75ISO	1.75	73	10	M12	9.00	26.0	3
TMCMH12118-4-35-2.0ISO	2.0	84	12	M16	11.80	35.0	4

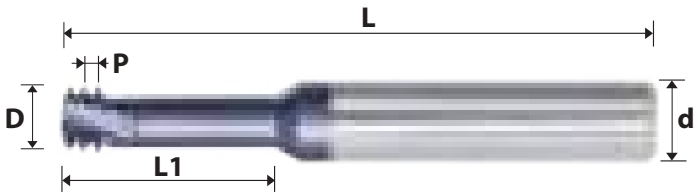
Order example: **XTMCMH08078-3-23-1.5ISO**

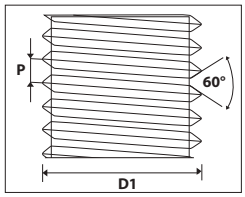
for thread depth up to 3 x D1

(Item Number)	P *(Pitch)* in mm	L in mm	d in mm	D1 in mm	D in mm	L1 in mm	*(No. of Flutes)*
TMCMH03011-3-4-0.3ISO	0.3	39	3	M1.4	1.05	4.0	3
TMCMH03012-3-5-0.35ISO	0.35	39	3	M1.6	1.20	4.8	3
TMCMH03016-3-6-0.4ISO	0.4	39	3	M2	1.53	6.0	3
TMCMH06017-3-7-0.45ISO	0.45	58	6	M2.2	1.65	7.0	3
TMCMH0602-3-7-0.45ISO	0.45	58	6	M2.5.	1.95	7.5	3
TMCMH06024-3-9-0.5ISO	0.5	58	6	M3	2.37	9.5	3
TMCMH06028-3-10-0.6ISO	0.6	58	6	M3.5	2.75	10.5	3
TMCMH06031-3-12-0.7ISO	0.7	58	6	M4	3.20	12.5	3
TMCMH06038-3-16-0.8ISO	0.8	58	6	M5	3.80	16.0	3
TMCMH06047-3-20-1.0ISO	1.0	58	6	M6	4.65	20.0	3
TMCMH0606-3-24-1.25ISO	1.25	58	6	M8	6.00	24.0	3

Order example: **XTMCMH08078-3-23-1.5ISO**

UN





for left hand spindle rotation use code M04

tools for internal thread for thread depth up to 2 x D1

(Item Number)	P *(Pitch)* in TPI	L in mm	UNC	UNF	d in mm	D in mm	L1 in mm	*(No. of Flutes)*
TMCMH06014-3-3-72UN	72	58		1	6	1.45	3.7	3
TMCMH06014-3-3-64UN	64	58	1	2	6	1.40	3.8	3
TMCMH06016-3-4-56UN	56	58	2	3	6	1.65	4.4	3
TMCMH06019-3-5-48UN	48	58	3	4	6	1.90	5.2	3
TMCMH06021-3-6-40UN	40	58	4		6	2.10	6.3	3
TMCMH06024-3-7-40UN	40	58	5	6	6	2.45	7.0	3
TMCMH06033-3-9-36UN	36	58		8	6	3.30	9.0	3
TMCMH06025-3-7-32UN	32	58	6		6	2.55	7.1	3
TMCMH06032-3-9-32UN	32	58	8		6	3.20	9.5	3
TMCMH06037-3-10-32UN	32	58		10	6	3.70	10.5	3
TMCMH06042-3-11-28UN	28	58		12	6	4.20	11.0	3
TMCMH0605-3-14-28UN	28	58		1/4	6	5.00	14.5	3
TMCMH06035-3-10-24UN	24	58	10, 12		6	3.50	10.6	3
TMCMH08066-3-17-24UN	24	64		5/16, 3/8	8	6.60	17.0	3
TMCMH06047-3-14-20UN	20	58	1/4		6	4.75	14.0	3
TMCMH0808-3-25-20UN	20	64		7/16	8	8.00	25.0	3
TMCMH0606-3-17-18UN	18	58	5/16		6	6.00	17.0	3
TMCMH1212-4-35-18UN	18	84		5/8	12	12.00	35.0	4
TMCMH08067-3-22-16UN	16	64	3/8		8	6.70	22.0	3
TMCMH08077-3-25-14UN	14	64	7/16		8	7.70	25.0	3
TMCMH10092-3-27-13UN	13	73	1/2		10	9.20	27.5	3
TMCMH12105-3-31-12UN	12	84	9/16		12	10.50	31.5	3
TMCMH12114-3-34-11UN	11	84	5/8		12	11.40	34.5	3
TMCMH16144-4-41-10UN	10	105	3/4		16	14.40	41.5	4

Order example: **XTMCMH12114-3-34-11UN**

MINI THREAD MILL XTMCMH TYPE

For left hand spindle rotation use code M04
TiAlN Ultra-fine grain carbide grade with a special triple PVD coating.

ISO	Material	Hardness HRc	Vc m/min	Feed mm/tooth													
				ø1	ø1:5	ø2	ø3	ø4	ø5	ø6	ø7	ø8	ø9	ø10	ø12	ø14	ø16
S	Nickel Alloys Titanium Alloys and High Temp. Alloys		20 - 40	0.03	0.03	0.03	0.04	0.04	0.05	0.06	0.06	0.06	0.07	0.07	0.07	0.08	0.08
H	Hardened Steels	45- 50	60- 70	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.08	0.09	0.10	0.11
		51 - 55	50 - 55	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.09	0.10
		56- 62	40- 50	0.01	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.08	0.09

TEST REPORT	
Internal thread	M4 x 0.7
Thread depth	10.0 mm
Material	1.2379
Tool	XTMCMH 06031-3-9-0.7 ISO
Cutting speed	Vc: 4 m/min Fz: 0.03 mm/Z
Coolant	Emulsion
Tool life	84 Pieces

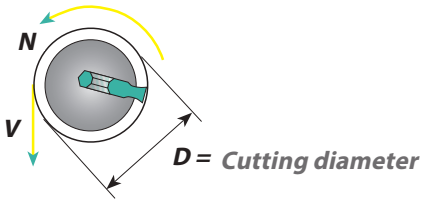
THREAD MILLING TECHNICAL SECTION

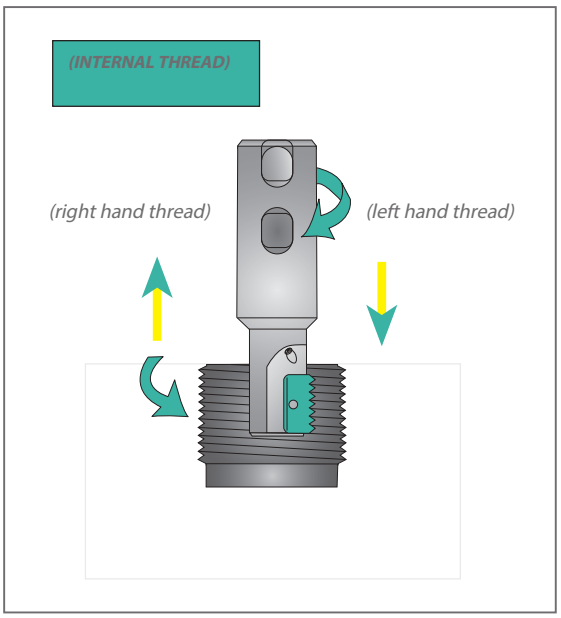
(CONVERSION OF CUTTING SPEED TO ROTATIONAL SPEED):

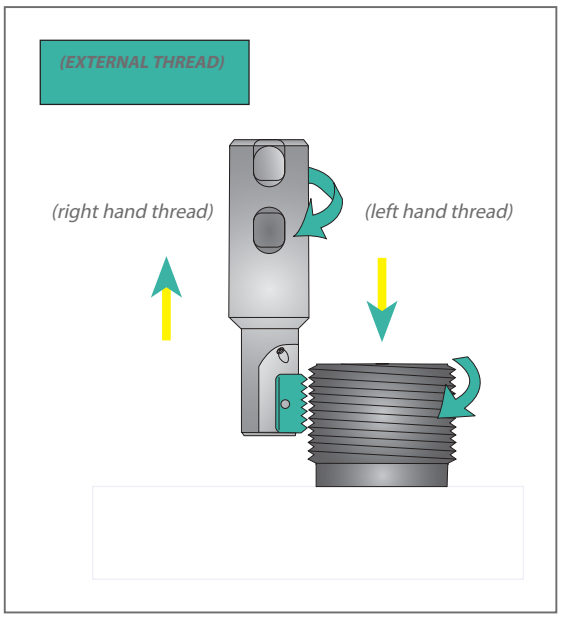
(Conversion of selected cutting speed to rotational speed is calculated using the following formula):

$$N = \frac{V \times 1000}{\pi \times D} = \frac{120 \times 1000}{3.14 \times 30} = 1274 \text{ UPM}$$

(Example): **V** = 120 m/min
D = 30 mm



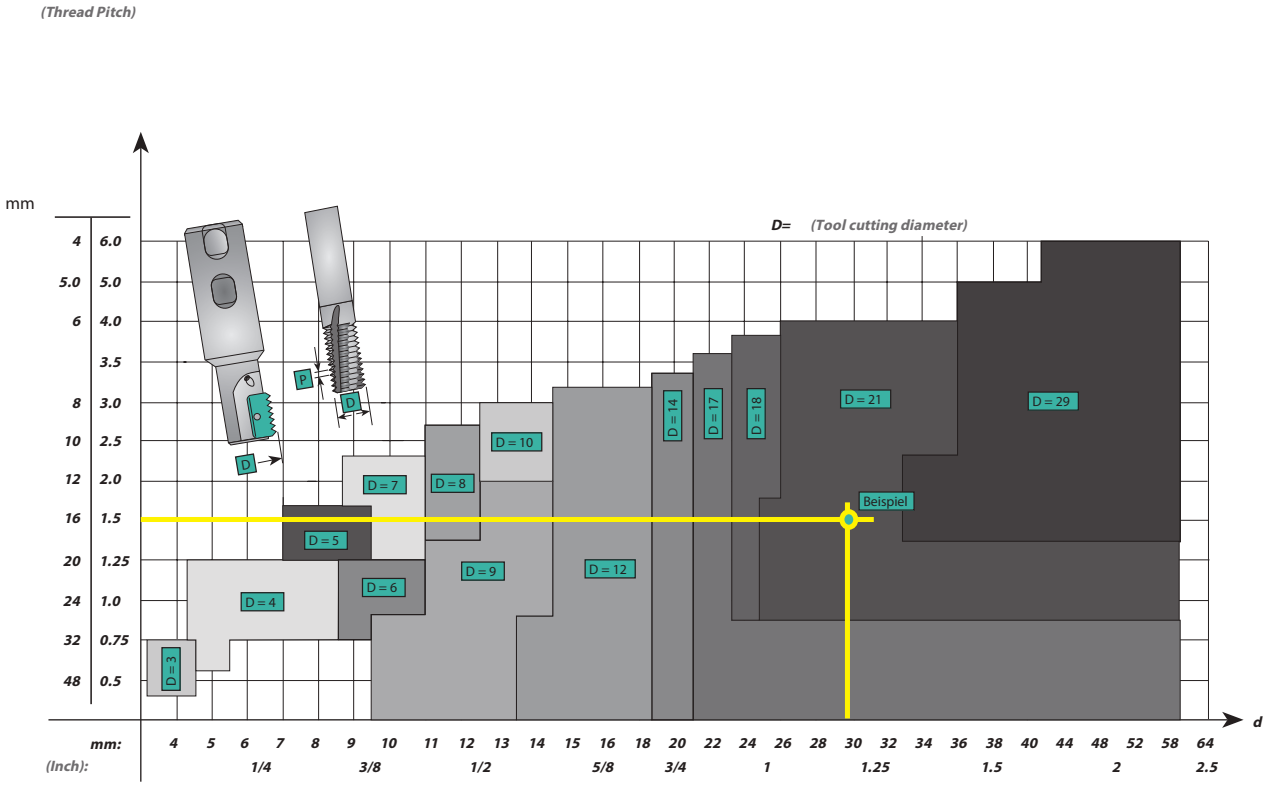




(SELECTION OF THREAD MILLS):

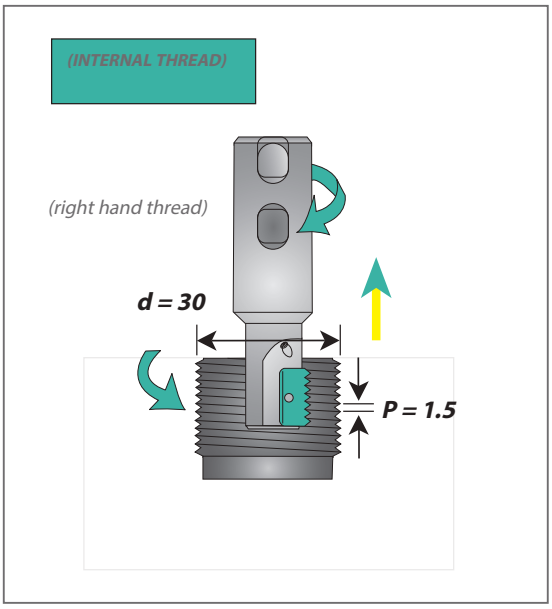
(For indexable and solid carbide thread mills)

The following chart provides a fairly accurate visual selection tool for Internal Threading. The chart is applicable for the following thread forms: ISO, UN, WHIT, NPT, NPTF, BSPT and PG.):



(Any tool with a small cutting diameter can produce larger diameter threads.
Example: Internal thread M30 x 1.5:*Find a Milling Tool to produce d=30 Internal right hand ISO thread with a thread pitch P=1.5 mm. As can be seen from the chart above, the two yellow lines intersect at the selected tool with a cutting diameter D=21 mm):*

(Chosen tool holder): **XTMH21-21H**
(Threading insert): **21IN1.5ISOXTGM**



(THREAD MILLING INSERTS SPEED AND FEED SELECTION):

Sub Micron Grade with Titanium Aluminum Nitride multi-layer coating (ISO P10-P30; K10-K20). This is a general purpose grade, which can be used with all materials, it should be run at medium to high cutting speeds.)

ISO	Material	Vc (m/min)
P	*Low and Medium Carbon Steels*	280 - 115
	High Carbon Steels	200 - 130
	Alloy Steels, Treated Steels	105 - 180
M	*Stainless Steels, Stainless cast steels*	130 - 190
	Cast Steels	150 - 190
K	*Cast Iron*	80 - 70
N	*Non-Ferrous & Aluminum*	180 - 340
	Synthetics, Duroplastics, Thermoplastics	115 - 460
S	*Nickel Alloys, Titanium Alloys*	25 - 90

(Recommended Feed Rate): 0.05 - 0.15 mm

(As you may note, cutting speed is shown as a range. In most standard cases speed in the middle of the range would be the first choice for a start. For hardened steels reduce cutting speed):

(CUTTING SPEED SELECTION):

X-TMC ***(TYPE)***

Sub Micron Grade with Titanium Aluminum Nitride multi-layer coating (ISO P10-P30; K10-K20). This is a general purpose grade, which can be used with all materials, it should be run at medium to high cutting speeds.)

ISO	Material	Vc (Cutting Speed) (m/min)	(Feed mm/tooth) (Cutting Diameter)										
			ø2	ø3	ø4	ø6	ø8	ø10	ø12	ø14	ø16	ø20	ø25
P	Low and Medium Carbon Steels <0.55%C	90-200	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18
	High Carbon Steels ≥0.55%C	100-145	0.02	0.03	0.03	0.05	0.06	0.07	0.08	0.09	0.10	0.12	0.15
	Alloy Steels, Treated Steels												
M	Stainless Steels - Ferritic	55-130	0.02	0.03	0.03	0.04	0.05	0.06	0.06	0.07	0.08	0.09	0.11
	Stainless Steels - Austenitic												
	Cast Steels	120-135	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.10
K	Cast Iron, modular cast iron, malleable iron	65-120	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18
N	Aluminum ≤12%Si, Copper	135-280	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18
	Aluminum >12% Si	90-200	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.10
	Plastic, Bronze, Brass	90-320	0.05	0.06	0.07	0.08	0.10	0.11	0.12	0.14	0.15	0.18	0.22
S	Nickel Alloys, Titanium Alloys												

(For cutters with long cutting length reduce feed rate by 40%)

xTMCC, X-TMCF ***(TYPE)***

ISO	Material	Vc (Cutting Speed) (m/min)	(Feed mm/tooth) (Cutting Diameter)										
			ø2	ø3	ø4	ø6	ø8	ø10	ø12	ø14	ø16	ø20	ø25
P	Low and Medium Carbon Steels <0.55%C	100-250	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18
	High Carbon Steels ≥0.55%C	110-180	0.02	0.03	0.03	0.05	0.06	0.07	0.08	0.09	0.10	0.12	0.15
	Alloy Steels, Treated Steels	90-60	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.10
M	Stainless Steels - Ferritic	60-160	0.02	0.03	0.03	0.04	0.05	0.06	0.06	0.07	0.08	0.09	0.11
	Stainless Steels - Austenitic	60-120	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.10
	Cast Steels	130-170	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.10
K	Cast Iron, modular cast iron, malleable iron	70-150	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18
N	Aluminum ≤12%Si, Copper	150-350	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18
	Aluminum >12% Si	100-250	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.10
	Plastic, Bronze, Brass	100-400	0.05	0.06	0.07	0.08	0.10	0.11	0.12	0.13	0.15	0.18	0.22
S	Nickel Alloys, Titanium Alloys	20-80	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.05

(For cutters with long cutting length reduce feed rate by 40%)

X-TMCL *(TYPE)*

(Solid carbide Thread mills with relieved neck and internal coolant for milling of medium for milling of medium to deep bores)

- *Machining of threads that should be milled to the bottom*
- *For machining of threads in medium and deep bores*

ADVANTAGES :

- *Provides high rigidity and stability (anti-vibration).*
- *Accomplishes deep threads in one pass*
- *Relatively low cutting forces due to short cutting length*
- *Threads length up to 3xD.*

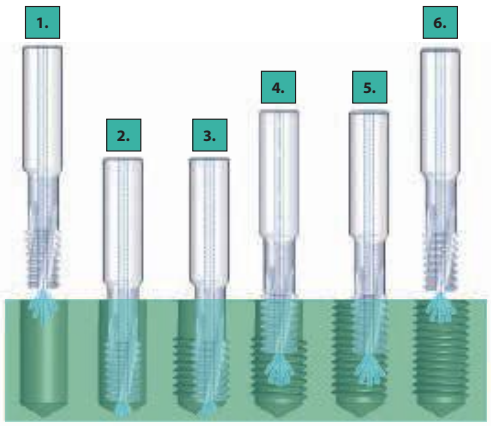
Sub Micron Grade with Titanium Aluminum Nitride multi-layer coating (ISO P10-P30; K10-K20). This is a general purpose grade, which can be used with all materials, it should be run at medium to high cutting speeds.)

ISO	Material	Vc (Cutting Speed) (m/min)	(Feed mm/tooth) (Cutting Diameter)					
			ø10	ø12	ø14	ø16	ø20	ø25
P	Low and Medium Carbon Steels <0.55%C	100 - 250	0.06	0.07	0.07	0.08	0.10	0.12
	High Carbon Steels ≥0.55%C	110 - 180	0.05	0.05	0.06	0.07	0.09	0.10
	Alloy Steels, Treated Steels	90 - 160	0.03	0.04	0.04	0.05	0.06	0.07
M	Stainless Steels - Ferritic	60 - 160	0.04	0.04	0.05	0.06	0.06	0.08
	Stainless Steels - Austenitic	60 - 120	0.04	0.04	0.04	0.05	0.06	0.07
	Cast Steels	130 - 170	0.03	0.04	0.04	0.05	0.06	0.07
K	Cast Iron, modular cast iron, malleable iron	70 - 150	0.06	0.07	0.07	0.08	0.10	0.12
N	Aluminum ≤12%Si, Copper	150 - 350	0.06	0.07	0.07	0.08	0.10	0.12
	Aluminum >12% Si	100 - 250	0.03	0.04	0.04	0.05	0.06	0.07
	Nickel Alloys, Titanium Alloys	100 - 400	0.08	0.09	0.10	0.11	0.13	0.15
S	Nickel Alloys, Titanium Alloys	20 - 80	0.02	0.02	0.02	0.03	0.03	0.03

1. *(START POINT)*

2. *(THREAD MILLING START POSITION 1. ENTRY)*

3. *(THREAD MILLING 1. ENTRY)*



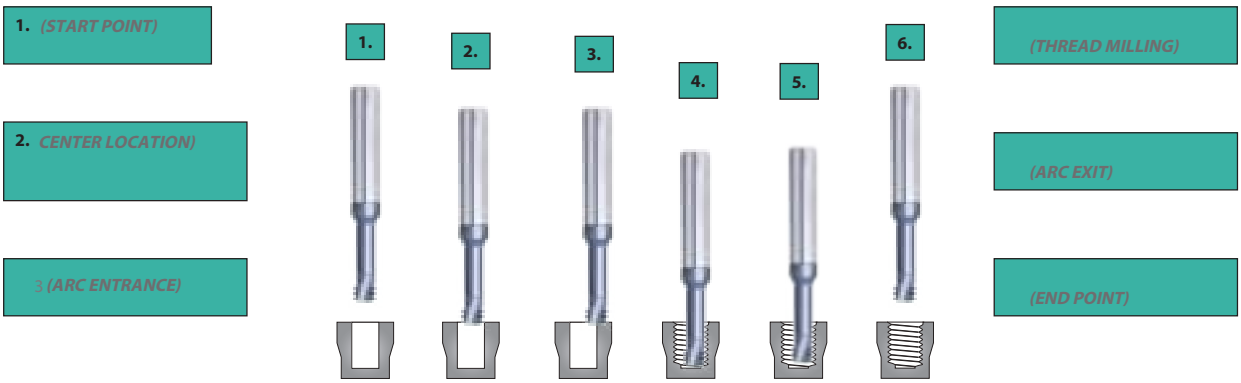
4. *(THREAD MILLING START POSITION 2. ENTRY)*

5. *(THREAD MILLING 2. ENTRY)*

6. *(END POINT)*

Sub Micron Grade with Titanium Aluminum Nitride multi-layer coating (ISO P10-P30; K10-K20). This is a general purpose grade, which can be used with all materials, it should be run at medium to high cutting speeds.)

ISO	Material	Vc (Cutting Speed) (m/min)	(Feed mm/tooth) (Cutting Diameter)													
			ø2	ø1.5	ø2	ø3	ø4	ø5	ø6	ø7	ø8	ø9	ø10	ø12	ø14	ø16
P	Low and Medium Carbon Steels <0.55%C	60-120	0.04	0.05	0.05	0.07	0.09	0.11	0.13	0.14	0.15	0.16	0.16	0.17	0.18	0.18
	High Carbon Steels ≥0.55%C	60- 90	0.03	0.04	0.05	0.06	0.08	0.09	0.10	0.12	0.13	0.14	0.14	0.16	0.17	0.18
	Alloy Steels, Treated Steels	50- 80	0.03	0.04	0.04	0.05	0.05	0.06	0.07	0.07	0.08	0.09	0.10	0.12	0.13	0.14
M	Stainless Steels - Ferritic	70-100	0.02	0.03	0.03	0.04	0.05	0.06	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13
	Stainless Steels - Austenitic	60- 90	0.02	0.03	0.03	0.04	0.05	0.06	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13
	Cast Steels	70- 90	0.03	0.04	0.04	0.05	0.05	0.06	0.07	0.07	0.08	0.09	0.10	0.12	0.13	0.14
K	Cast Iron, modular cast iron, malleable iron	40- 80	0.04	0.05	0.05	0.07	0.09	0.11	0.13	0.14	0.15	0.16	0.16	0.17	0.18	0.18
N	Aluminum ≤12%Si, Copper	100-200	0.04	0.05	0.05	0.07	0.09	0.11	0.13	0.14	0.15	0.16	0.16	0.17	0.18	0.18
	Aluminum >12% Si	60-140	0.03	0.03	0.03	0.04	0.05	0.06	0.06	0.07	0.08	0.09	0.10	0.11	0.13	0.14
	Nickel Alloys, Titanium Alloys	50-200	0.09	0.10	0.11	0.12	0.14	0.16	0.18	0.19	0.19	0.19	0.19	0.19	0.20	0.20
S	Nickel Alloys, Titanium Alloys	20- 40	0.03	0.03	0.03	0.04	0.04	0.05	0.06	0.06	0.06	0.07	0.07	0.07	0.08	0.08



Mini Thread mills vs. Taps

(Property)	(solid carbide thread mill)	(Tap)
(Thread surface quality)	(High)	(Medium)
(Thread geometry)	(Very accurate)	(Medium)
(Thread tolerances)	(4h, 5h, 6h with a standard cutter)	(6h with standard tap, 4h with a special tap)
(Machining time)	(Same as tap or shorter)	(Short)
(Machining load)	(Very small)	(High)
(Tool breakage)	(Almost impossible)	(frequent)
(Range of thread diameters)	(The same thread for wide range of diameters with the same pitch)	(Specific tap for each diameter)
(Right/Left hand threading)	(Same cutter for both threads)	(Specific tap required)
(Profile)	(Full profile)	(Partial profile)

(MINI THREAD MILLS X-TMCMH TYPES):

(Sub-Micron Grade with advanced triple PVD coating)

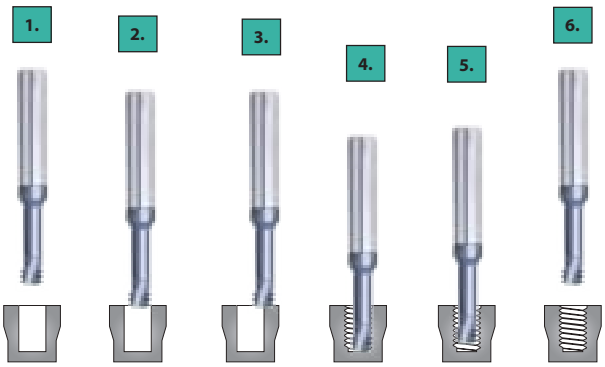
For left hand spindle rotation use code M04

ISO	Material	(Hardness) (HRc)	Vc (Cutting Speed) (m/min)	(Feed mm/tooth) (Cutting Diameter)													
				ø1	ø1.5	ø2	ø3	ø4	ø5	ø6	ø7	ø8	ø9	ø10	ø12	ø14	ø16
S	Nickel Alloys, Titanium Alloys		20-40	0.03	0.03	0.03	0.04	0.04	0.05	0.06	0.06	0.06	0.07	0.07	0.07	0.08	0.08
H	Hardened Steels	45-50 51-55 56-62	60-70 50-60 40-50	0.03 0.02 0.01	0.04 0.03 0.02	0.04 0.03 0.02	0.05 0.04 0.03	0.05 0.04 0.03	0.06 0.05 0.04	0.06 0.05 0.04	0.07 0.06 0.05	0.07 0.06 0.05	0.08 0.07 0.06	0.08 0.07 0.06	0.09 0.08 0.07	0.10 0.09 0.08	0.11 0.10 0.09

1. *(START POINT)*

2. *(CENTER POSITIONING)*

(ARC ENTRANCE)



4. *(THREAD MILLING)*

5 *(ARC EXIT)*

6. *(END POINT)*

(Machining example)	
(Application)	*(Internal Thread M4 X 0.7)*
(Thread Depth)	**8.0 mm**
(Type of Material)	*(Tool Steel: D2)*
(Hardness)	**60-62 (HRc)**
(Tools designation)	**X-TMCMH06031-3-9-0.7ISO**
(Machining parameters)	*(Cutting Speed: 44 m/min Feed: 0.03 mm/tooth)*
(Machine)	**Mori Seiki NV5000**
(Control)	**Fanuc**

MINI CHAMFERING TOOLS

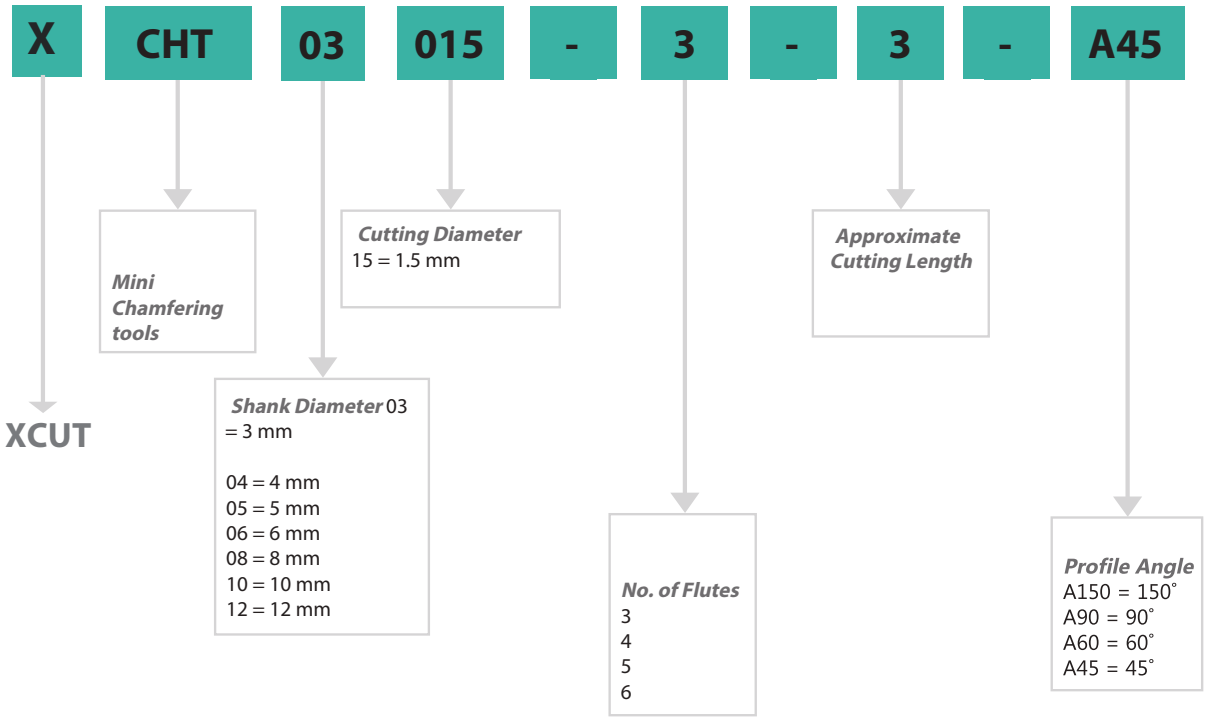
Fine grain carbide grade with multi-layer Titanium Aluminum Nitride coating (ISO K10 - K20). Very high resistance and smooth cuttin at high speed gurantee the best tool life. For general machining of regular and fine threads.

ADVANTAGES :

- *optimal for deburring, back chamfering and milling*
- *double side cutting*
- *Spiral flutes allows smooth cutting*

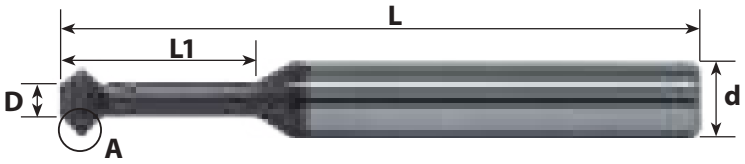
PRODUCT DESIGNATION

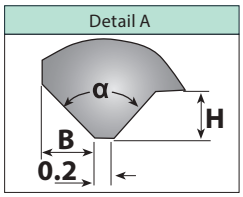
***EXAMPLE* : X-CHT0315-3-3-A45**

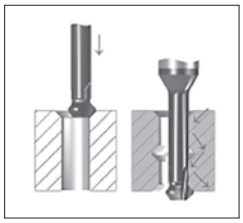


MINI CHAMFERIMG TOOLS

TiAlN coated







90°

(Item Number)	d	D	L1	H	B	◦	*(No. of Flutes)*	L
CHT03015-3-3-A90	3	1.5	3.8	3.8	0.4	90°	3	39
CHT0302-3-5-A90	3	2.0	5.0	5.0	0.5	90°	3	39
CHT03025-3-6-A90	3	2.5	6.3	6.3	0.6	90°	3	39
CHT0303-3-7-A90	3	3.0	7.5	7.5	0.7	90°	3	39
CHT04035-3-9-A90	4	3.5	8.8	8.8	0.8	90°	3	51
CHT0404-3-10-A90	4	4.0	10.0	10.0	0.9	90°	3	51
CHT05045-3-11-A90	5	4.5	11.3	11.3	1.1	90°	3	51
CHT0505-3-12-A90	5	5.0	12.5	12.5	1.2	90°	3	51
CHT06055-3-13-A90	6	5.5	13.8	13.8	1.3	90°	3	51
CHT0606-3-15-A90	6	6.0	15.0	15.0	1.6	90°	3	51

I Long Reach 90º

(Item Number)	d	D	L1	H	B	◦	*(No. of Flutes)*	L
CHT0303-3-12-A90	d3	3.0	12.0	0.6	0.7	90°	3	39
CHT04035-3-14-A90	4	3.5	14.0	0.7	0.8	90°	3	51
CHT0404-3-16-A90	4	4.0	16.0	0.8	0.9	90°	3	51
CHT0404-3-16-LA90	4	4.0	16.0	0.8	0.9	90°	3	105
CHT05045-3-18-A90	5	4.5	18.0	1.0	1.1	90°	3	51
CHT0505-3-20-A90	5	5.0	20.0	1.1	1.2	90°	3	51
CHT0505-3-20-LA90	5	5.0	20.0	1.1	1.2	90°	3	105
CHT06055-3-22-A90	6	5.5	22.0	1.2	1.3	90°	3	58
CHT0606-3-24-A90	6	6.0	24.0	1.5	1.6	90°	3	58
CHT0606-3-24-LA90	6	6.0	24.0	1.5	1.6	90°	3	105
CHT0808-4-28-A90	8	8.0	28.0	1.6	1.7	90°	4	64
CHT0808-4-28-LA90	8	8.0	28.0	1.6	1.7	90°	4	105
CHT1010-5-35-A90	10	10.0	35.0	1.8	1.9	90°	5	73
CHT1212-6-42-A90	12	12.0	42.0	2.1	2.2	90°	6	84

60º

(Item Number)	d	D	L1	H	B	◦	*(No. of Flutes)*	L
CHT0302-3-5-A60	3	2.0	5.0	0.4	0.3	60°	3	39
CHT0303-3-7-A60	3	3.0	7.5	0.6	0.3	60°	3	39
CHT04035-3-9-A60	4	3.5	8.8	0.7	0.5	60°	3	51
CHT0404-3-10-A60	4	4.0	10.0	0.8	0.5	60°	3	51

Notes

Notes

XCUT®
TECHNOLOGIES

MILLING

www.xcut.in

Notes

INDEX

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	±0.005	±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	
N*		±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

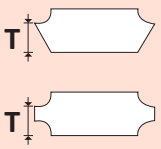
ISO
(METRIC)

S	P	K	N	12
(1)	(2)	(3)	(4)	(5)

(5)Cutting Edge Length (mm)						
I.C.	C	S	R	T	H	O
L						
5.56				09		
6.35	06	06	06	11		
7.94	08			13		
9.525	09	09	09	16		
12.7	12	12	12	22	05	05/13
15.875	16	15	15	27	09	06
17.94						07
20.2	19	19	19	33	10	08
25.4	25	25	25			

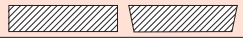
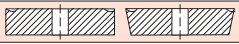
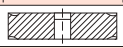
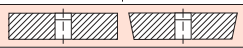
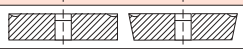
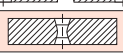
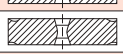
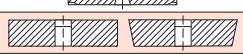
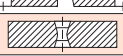
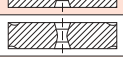
•Expressed as edge length for ISO.
•ANSI expresses the inscribed circle diameter in inches.

(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



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

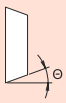
Milling Indexable Insert Identification System

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) Hole/ Chipbreaker Symbol

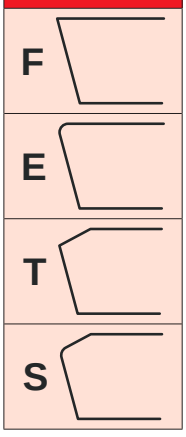
03	ED	T	R	CHIP BREAKER
(6)	(7)	(8)	(9)	(10)

(7) Lead Angle & Relief Angle of minor cutting edge

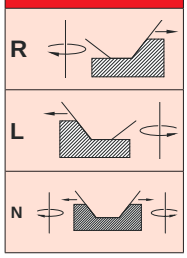



Lead Angle		Relief Angle of minor cutting edge	
A	45°	B	5°
D	60°	C	7°
E	75°	D	15°
F	85°	E	20°
P	90°	F	25°
Z	Special	G	30°
		N	0°
		P	11°
		Z	Special

(8) Edge Preparation



(09) Cutting direction



(10) Chip breaker

For Application

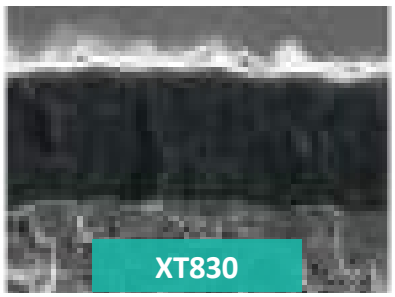
Notes

XCUT®
TECHNOLOGIES

ISO Milling

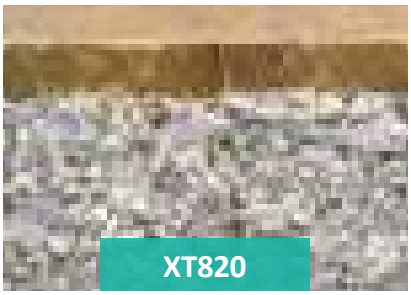
INDEX

GRADE INFORMATION



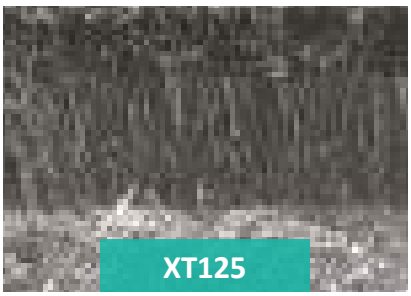
P05-P30| M05-M20 | K05-K20 | S05-S15 | H05-H10

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



P05-P30 | K05-K25

PVD coated grade suitable for stable and dry operations in medium to high cutting speed. The PVD coating is optimal in case of chip blockage. Ideal for Steel & stainless steel processing.



P05-P30 | M05-M30 | K05-K15

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-Temprature high hardness alloys.(Less Chromium & Nickel)

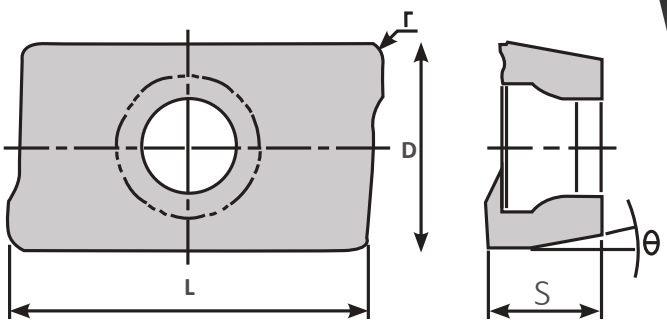
P05-P30 | K05-K25

Due to cemented carbide with high fracture & wear resistance, this grade is able to to machine with stability. High oxidation resistance and excellent heat resistance enables XT410 to achieve great tool life on all materials, even hardened

RECOMMENDED CUTTING CONDITIONS

ISO	Material Group	Relative Materials (DIN)	Hardness HB	Cutting speed (m/min)			
				XT 830	XT 820	XT 125	XT 410
P	Non-alloy steel	9 SMn 28, C35C50, C40E, C45E, 49 CrMo 4	125 - 250	150 - 250	90 - 250	150 - 250	200 - 300
	Low alloy steel	13 CrMo 44, 40NiCrM022, 58 CrV 4	200 - 350	140 - 200	90 - 200	150 - 250	170 - 270
	High alloy steel	X 40 CrMoV 5 1, X100 CrMoV 5 1, S6-5-5	200 - 325	80 - 130	80 - 130	80 - 200	100 - 180
M	Ferritic/ martensitic Stainless steel	X6Cr13, X10CrA118, X20CrNi175	200 - 240	130 - 190	80 - 180	80 - 160	130 - 190
	Austenitic Stainless steel	X5 CrNi 18 9, X5 CrNiMo 17 13 3 X6 CrNiTi 18 9	180	100 -200	100 -200	80 -200	170 -270
K	Grey cast iron	GG15, GG20, GGG40, GG-35	180 - 260	160 - 200	90 - 280		130 - 250
	Malleable castiron	GTS-35-10, GTS-35,GTS70-02, 20mN5	130 - 230	130 - 180			
S	Fe, Ni or Co based	X12 NICrAlTi 31 20, TiAl5Sn2	200 - 350	30 - 50			20 - 50
	Titanium and Ti-alloy based	TiCu2, TiAl6V4, TiAl6V4ELI	-	35 - 75			60 - 100
H	Hardended steel	C 105 W1,75 CrMoNiW 6 7	55 - 60 HRc	55 - 65		35 - 65	
	Chilled cast iron	G-X 260 NiCr 4 2, X15 CrNiSi 25 20	400	45 - 55		35 - 55	
	Cast iron	G-X 300 CrMo 15 3	55 HRc	55 - 65		35 - 65	

AOMT1236

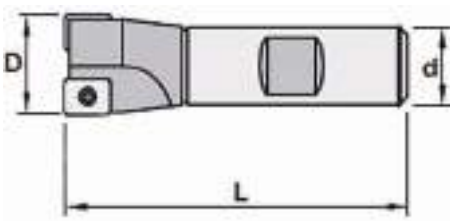


90 DEGREE MILLING INSERT.
2 CORNER INSERT SUITABLE FOR: SURFACING / SLOTTING/SHOULDER MILLING

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

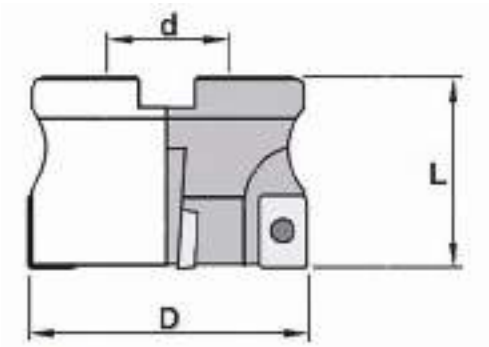
STOCKABLE NON STOCKABLE

END MILL CUTTER



DESIGNATION	D	d	L1	L	Z
016-85-AOMT12-T2	16	16	22	85	2
020-90-AOMT12-T3	20	20	25	90	3
025-95-AOMT12-T3	25	25	25	95	3
025-95-AOMT12-T4	25	25	25	95	4
032-95-AOMT12-T5	32	32	25	95	5

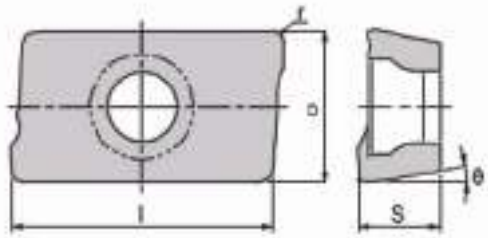
SHELL MILL CUTTER



DESIGNATION	D	d	L	Z
40-A22-AOMT12-Z6	40	22	40	6
50-A22-AOMT12-Z7	50	22	40	7

SCREW: SCREW FOR AOMT12

APKT1003

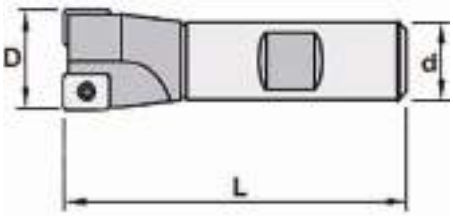


90 DEGREE LEAD ANGLE INSERT
2 CORNER INSERT SUITABLE FOR POCKET MILLING, COPYING & SURFACING

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

STOCKABLE NON STOCKABLE

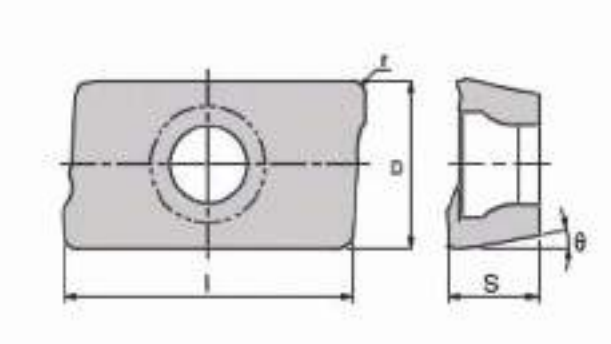
END MILL CUTTER



DESIGNATION	D	d	L1	L	Z
APKT10-DIA16-2FL-L200	16	16	60	200	2
APKT10-DIA20-2FL-L200	20	20	60	200	2
APKT10-DIA25-3FL-L200	25	25	60	200	3

SCREW - SCREW FOR APKT10

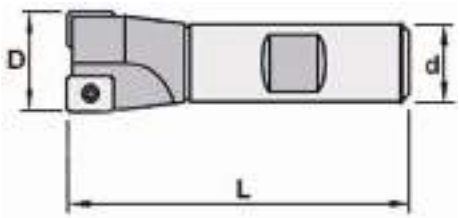
APKT1604



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

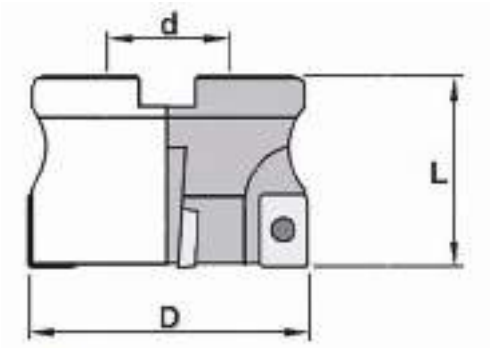
DESIGNATION	GRADE	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		l	D	S	Ø	r	MIN	MAX	MIN	MAX
APKT1604PDTR	XT830	16.3	9.5	5.3	11	0.8	0.10	0.32	0.50	15
APKT160424PDTR	XT830	16.3	9.5	5.3	11	2.4	0.10	0.32	0.50	15

STOCKABLE NON STOCKABLE



END MILL CUTTER

DESIGNATION	D	d	L1	L	Z
APKT16-DIA25-2FL-L200	25	25	50	200	2
APKT16-DIA32-3FL-L200	32	32	100	200	3

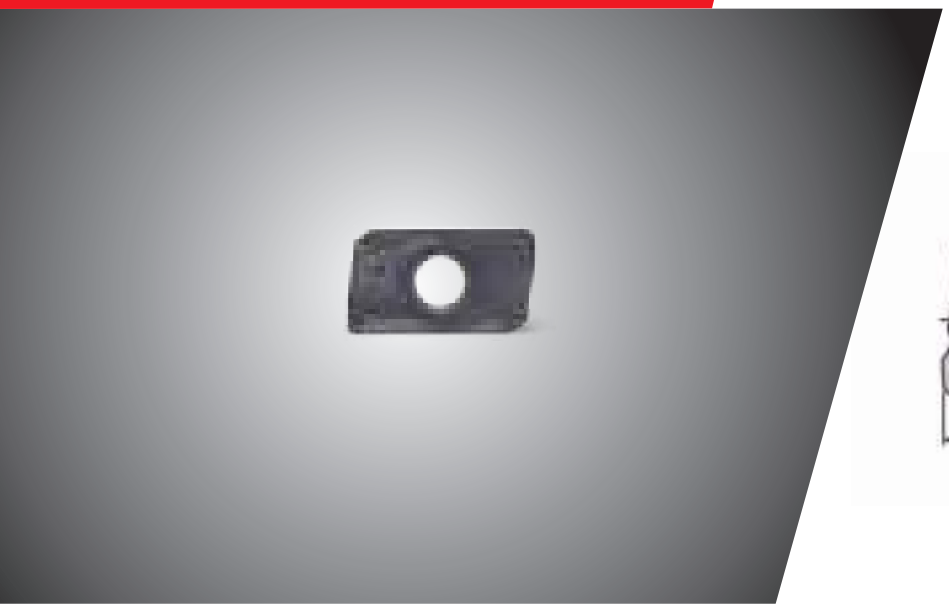


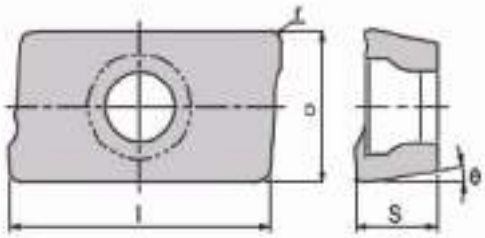
SHELL MILL CUTTER

DESIGNATION	D	d	L	Z
APKT16-DIA50-5FL	50	22	40	5
APKT16-DIA63-6FL	63	22	40	6
APKT16-DIA80-7FL	80	27	50	7
APKT16-DIA100-8FL	100	32	50	8

SCREW: SCREW FOR APKT16

APMT1135





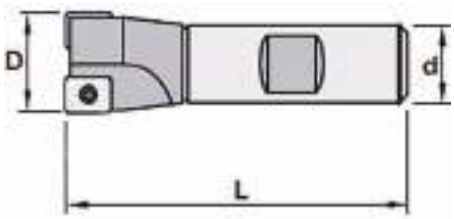
90 DEGREE LEAD ANGLE INSERT
2 CORNER INSERT SUITABLE FOR POCKET MILLING, COPYING & SURFACING

DESIGNATION	GRADE	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		L	D	S	Ø	R	MIN	MAX	MIN	MAX
APMT1135PDTR	XT830	11.18	6.2	3.5	11	0.4	0.07	0.15	0.5	5
APMT113508PDTR	XT830	11.18	6.2	3.5	11	0.8	0.07	0.22	0.5	10
APMT1135PDERH2	XT410	11.18	6.2	3.5	11	0.8	0.07	0.22	0.5	10
APMT1135PDERM2	XT410	11.18	6.2	3.5	11	0.8	0.07	0.22	0.5	10
APMT1135PDERH2	XT125	11.18	6.2	3.5	11	0.8	0.07	0.22	0.5	10
APMT1135PDERM2	XT125	11.18	6.2	3.5	11	0.8	0.07	0.22	0.5	10
APMT1135PDER	XT110	11.18	6.2	3.5	11	0.4	0.07	0.25	0.5	10

STOCKABLE NON STOCKABLE

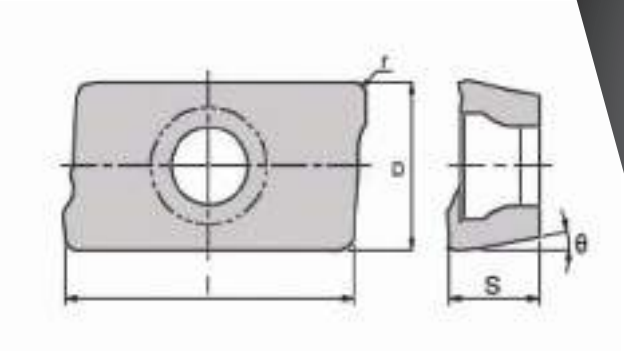
END MILL CUTTER

DESIGNATION	D	d	L1	L	Z
BAP300R-1616-200-2T	16	16	60	200	2
BAP300R-2020-200-2T	20	20	60	200	2
BAP300R-2525-200-3T	25	25	60	200	3



SCREW - SCREW FOR APMT11

APMT1604



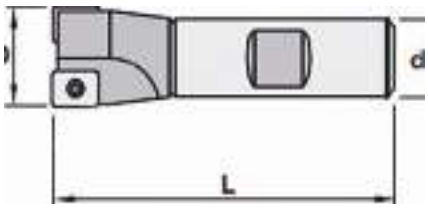
90 DEGREE LEAD ANGLE INSERT
2 CORNER INSERT SUITABLE FOR POCKET MILLING, COPYING & SURFACING

DESIGNATION	GRADE	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		I	D	S	Ø	r	MIN	MAX	MIN	MAX
APMT1604PDTR	XT110	17.19	5.5	4.76	11	0.8	0.09	0.3	0.5	13
APMT1604PDTR	XT830	17.19	9.5	5.5	11	0.8	0.09	0.3	0.5	13
APMT1604PDERH2	XT410	17.19	9.5	5.5	11	0.8	0.09	0.3	0.5	13
APMT1604PDERM2	XT410	17.19	9.5	5.5	11	0.8	0.09	0.3	0.5	13
APMT1604PDERH2	XT125	17.19	9.5	5.5	11	0.8	0.09	0.3	0.5	13
APMT1604PDERM2	XT125	17.19	9.5	5.5	11	0.8	0.09	0.3	0.5	13
APMT160420-GW	XT110	17.19	5.5	4.76	11	2	0.09	0.3	0.5	13
APMT160430PDER	XT125	17.19	5.5	4.76	11	3	0.09	0.3	0.5	13
APMT160430PDER	XT820	17.19	5.5	4.76	11	3	0.09	0.3	0.5	13

STOCKABLE NON STOCKABLE

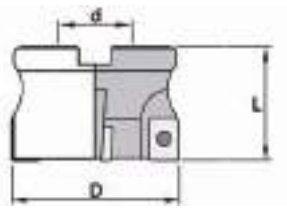
END MILL CUTTER

DESIGNATION	D	d	L1	L	Z
BAP400R-2525-200-2T	25	25	50	200	2
BAP400R-3232-200-3T	32	32	100	200	3



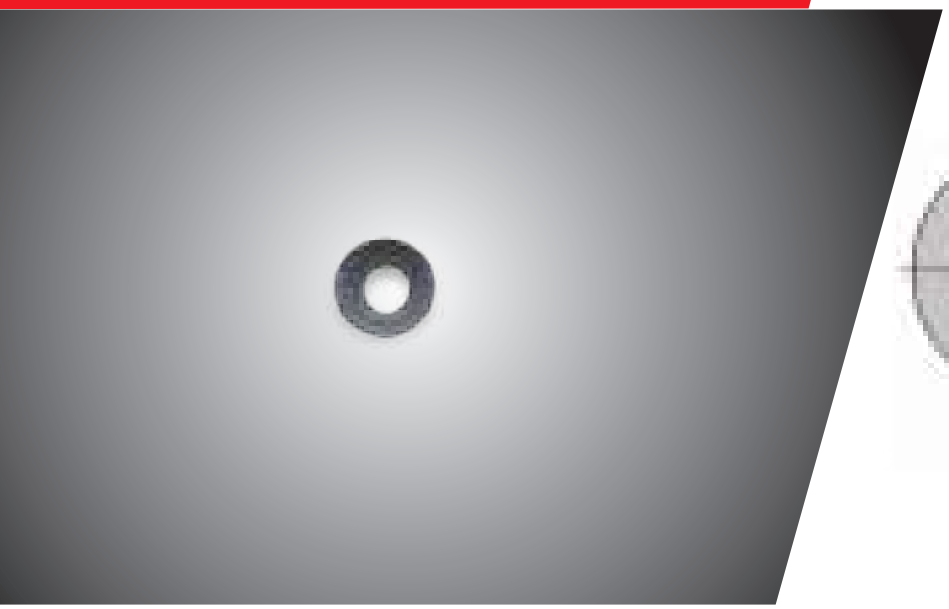
SHELL MILL CUTTER

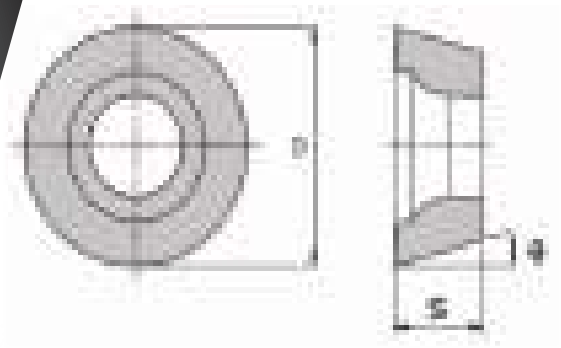
DESIGNATION	D	d	L	Z
050-A22-APMT/16	50	22	40	4
063-A22-APMT/16	63	22	40	5
080-A27-APMT/16	80	27	50	6



SCREW: SCREW FOR APMT16

RDMT0602



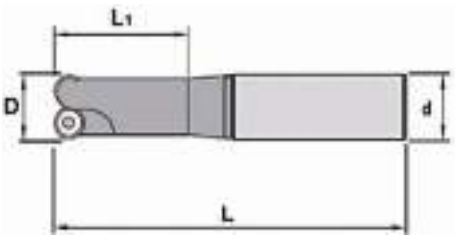


90 DEGREE LEAD ANGLE INSERT
SUITABLE FOR POCKET MILLING, COPYING & SURFACING

DESIGNATION	GRADE	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		L	D	S	Ø	R	MIN	MAX	MIN	MAX
RDMT0602 MO	XT830	-	6	2.38	15	-	0.1	0.48	0.3	1.5

STOCKABLE NON STOCKABLE

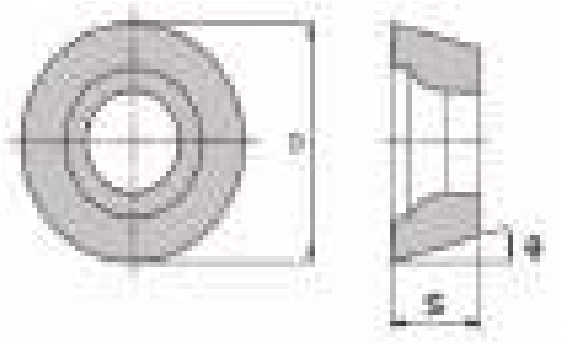
END MILL CUTTER



DESIGNATION	D	d	L1	L	Z
016-150-RDMT06-2T	16	16	150	25	2
020-180-RDMT06-3T	20	20	180	60	3
025-180-RDMT06-3T	25	25	180	80	3

SCREW - SCREW FOR RDMT06

RDMT0803

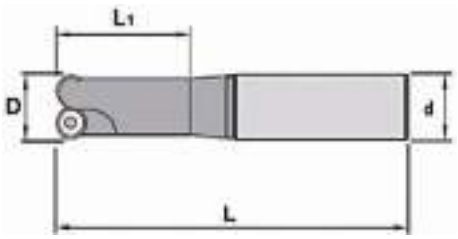


90 DEGREE LEAD ANGLE INSERT
SUITABLE FOR POCKET MILLING, COPYING & SURFACING

DESIGNATION	GRADE	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		L	D	S	Ø	R	MIN	MAX	MIN	MAX
RDMT0803 MO	XT830	-	8	3.18	15	-	0.1	0.45	0.3	2

STOCKABLE NON STOCKABLE

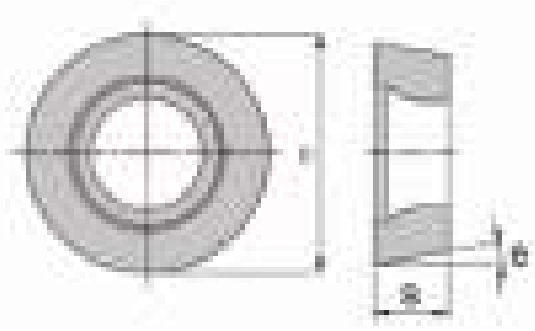
END MILL CUTTER



DESIGNATION	D	d	D	L	Z
020-180-RDMT08-2T	20	20	180	42	2
025-180-RDMT08-3T	25	25	180	60	3
032-180-RDMT08-3T	32	32	180	80	3

SCREW - SCREW FOR RDMT08

RDMT10T3

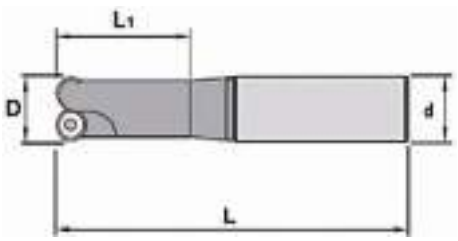


90 DEGREE LEAD ANGLE INSERT
SUITABLE FOR POCKET MILLING, COPYING & SURFACING

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

STOCKABLE NON STOCKABLE

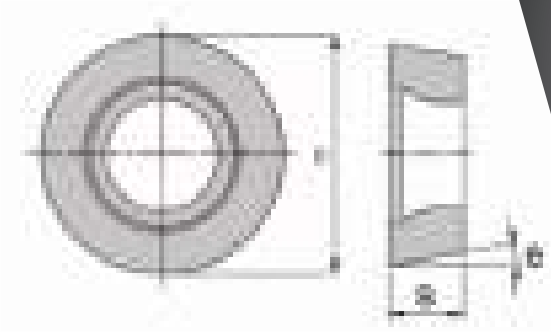
END MILL CUTTER

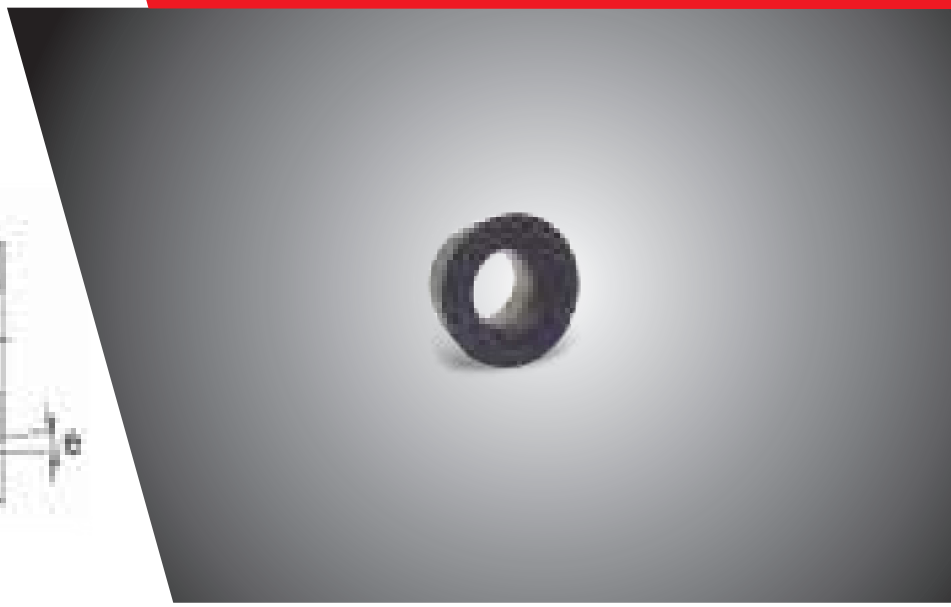


DESIGNATION	D	d	L1	L	Z
020-180-RDMT10-2T	20	20	42	180	2
025-180-RDMT10-3T	25	25	60	180	3
032-200-RDMT10-3T	32	32	80	180	3

SCREW - SCREW FOR RDMT10

RPMT10T3



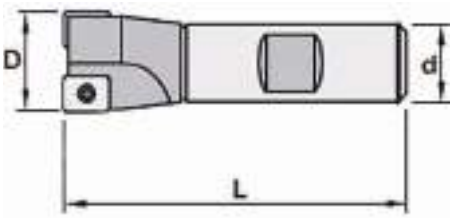


90 DEGREE LEAD ANGLE INSERT
SUITABLE FOR POCKET MILLING, COPYING & SURFACING

DESIGNATION	GRADE	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		I	D	S	Ø	R	MIN	MAX	MIN	MAX
RPMT10T3MO	XT830	-	10	3.97	11	-	0.1	0.64	0.3	2.5
RPMW10T3MO	XT830	-	10	3.97	11	-	0.1	0.64	0.3	2.5
RPMT10T3MO	XT125	-	10	3.97	11	-	0.1	0.64	0.3	2.5
RPMW10T3MO	XT125	-	10	3.97	11	-	0.1	0.64	0.3	2.5

STOCKABLE NON STOCKABLE

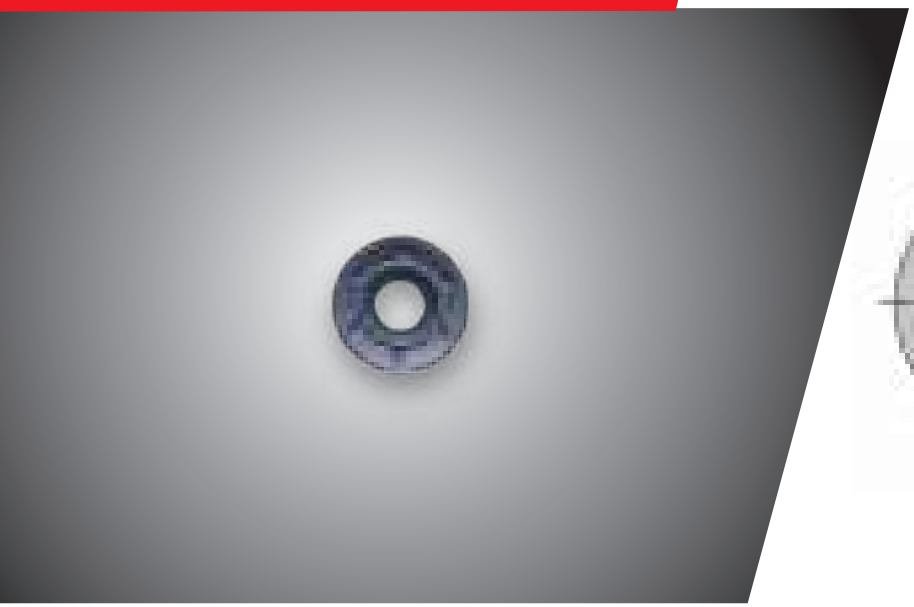
END MILL CUTTER

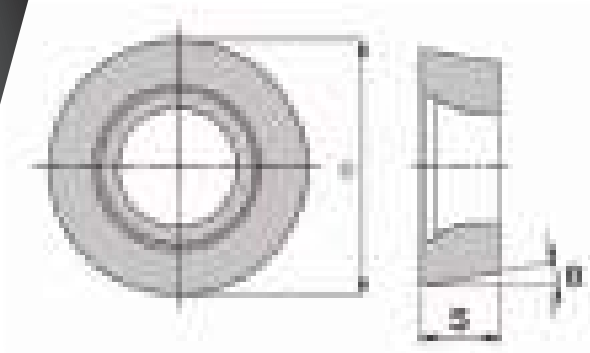


DESIGNATION	D	d	L1	L	Z
020-180-RPMT10-2T	20	20	80	180	2
025-180-RPMT10-3T	25	25	80	180	3
032-200-RPMT10-3T	32	32	105	200	3

SCREW - SCREW FOR RPMT10

RDMT1204





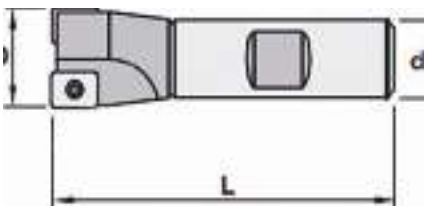
90 DEGREE LEAD ANGLE INSERT
SUITABLE FOR POCKET MILLING, COPYING & SURFACING

DESIGNATION	GRADE	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
RDMT1204MO	XT830	-	12	4.76	15	-	0.14	0.74	0.3	3
RDMW1204MO	XT830	-	12	4.76	15	-	0.1	0.74	0.3	3
RDMT1204MOTN	XT125	-	12	4.76	15	-	0.1	0.74	0.3	3

STOCKABLE NON STOCKABLE

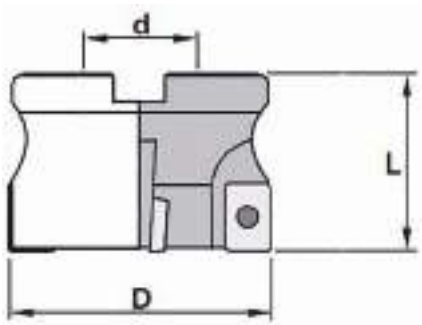
END MILL CUTTER

DESIGNATION	D	d	L1	L	Z
025-160L-RDMT1204 Z-2	25	25	50	160	2
032-160L-RDMT1204 Z-3	32	32	50	160	3
040-170L-RDMT1204-Z-4	40	32	60	170	4



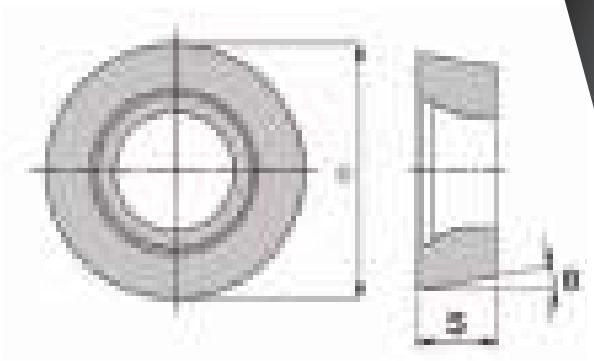
SHELL MILL CUTTER

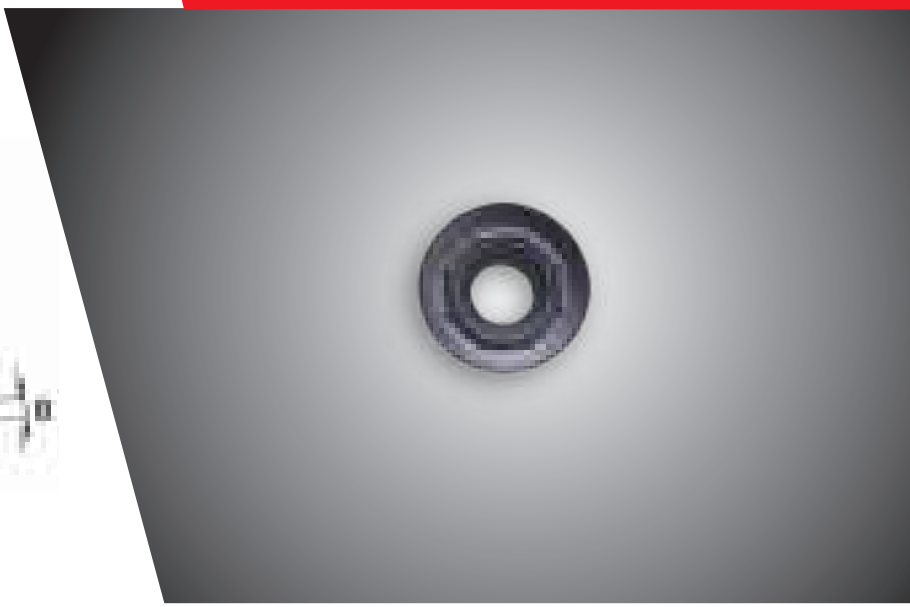
DESIGNATION	D	D1	d	L	Z
050-A22-RDMT1204 Z-4	50	38	22	40	4
052-A22-RDMT1204 Z-4	52	40	22	40	4
063-A27-RDMT1204-Z-5	63	51	27	40	5
080-A32-RDMT1204-Z-6	80	68	32	50	6
0100-A40-RDMT1204-Z-7	100	88	40	50	7



SCREW - SCREW FOR RDMT12

RPMT1204





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

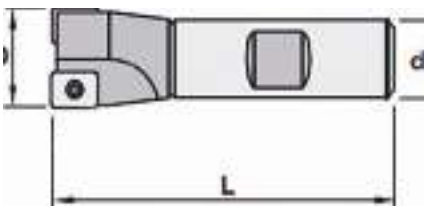
DESIGNATION	GRADE	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		L	D	S	Ø	R	MIN	MAX	MIN	MAX
RPMT1204MOSS *	XT830	-	12	4.76	11	-	0.14	0.74	0.3	3
RPMT1204MO	XT125	-	12	4.76	11	-	0.14	0.74	0.3	3
RPMW1204MO	XT125	-	12	4.76	11	-	0.14	0.74	0.3	3

STOCKABLE NON STOCKABLE

* SHARPER GEOMETRY FOR STAINLESS STEEL

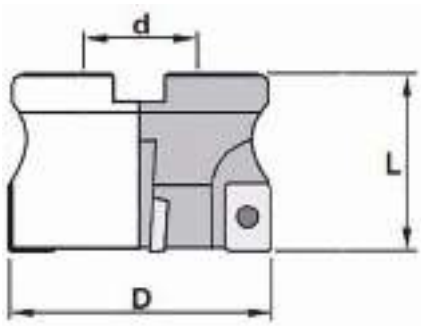
END MILL CUTTER

DESIGNATION	D	d	L1	L	Z
025-160L-RPMT1204-Z2	25	25	50	160	2
032-160L-RPMT1204-Z3	32	32	50	160	3
040-170L-RPMT12-Z4	40	32	60	170	4



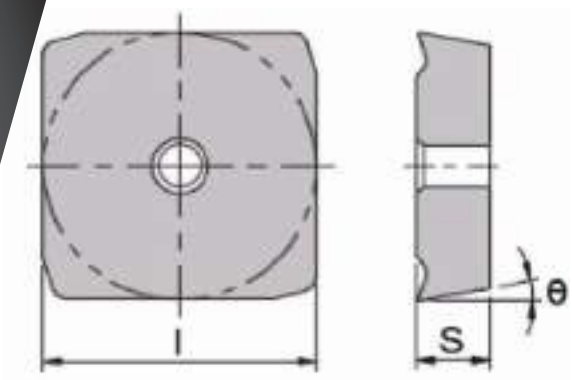
SHELL MILL CUTTER

DESIGNATION	D	D1	d	L	Z
050-A22-RPMT1204 Z-4	50	38	22	40	4
052-A22-RPMT1204 Z-4	52	40	22	40	4
063-A27-RPMT1204-Z-5	63	51	27	40	5
080-A32-RPMT1204-Z-6	80	68	32	50	6
0100-A40-RPMT1204-Z-7	100	88	40	50	7



SCREW - SCREW FOR RPMT12

SPKN1203

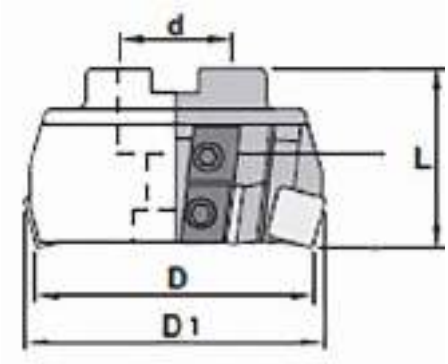


75 DEGREE LEAD ANGLE INSERT
APPLICATION : HIGH DEPTH OF CUT FACE MILLING

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

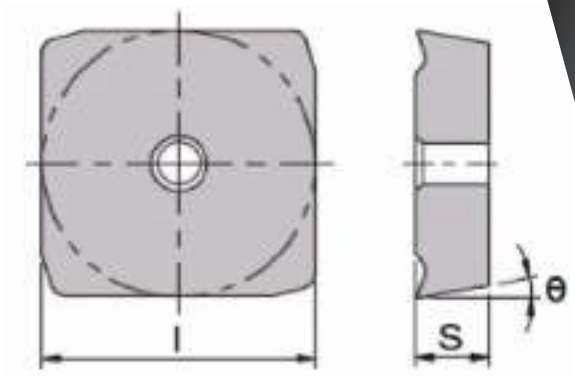
STOCKABLE NON STOCKABLE

SHELL MILL CUTTER



DESIGNATION	D	D1	d	L	Z
063-A22-Z4-SPKN12	63	69	22	40	4
080-A27-Z5-SPKN12	80	86	27	50	5
100-A32-Z7-SPKN12	100	106	32	50	7
125-A40-Z8-SPKN12	125	131	40	63	8

SPKN1504

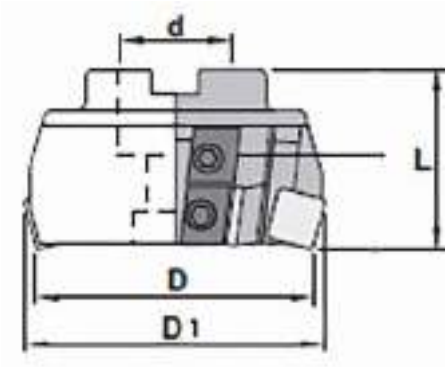


75 DEGREE LEAD ANGLE INSERT
APPLICATION : HIGH DEPTH OF CUT FACE MILLING

DESIGNATION	GRADE	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		L	D	S	Ø	R	MIN	MAX	MIN	MAX
SPKN1504EDTR	XT830	-	15.88	4.76	20	-	0.1	0.5	0.5	8

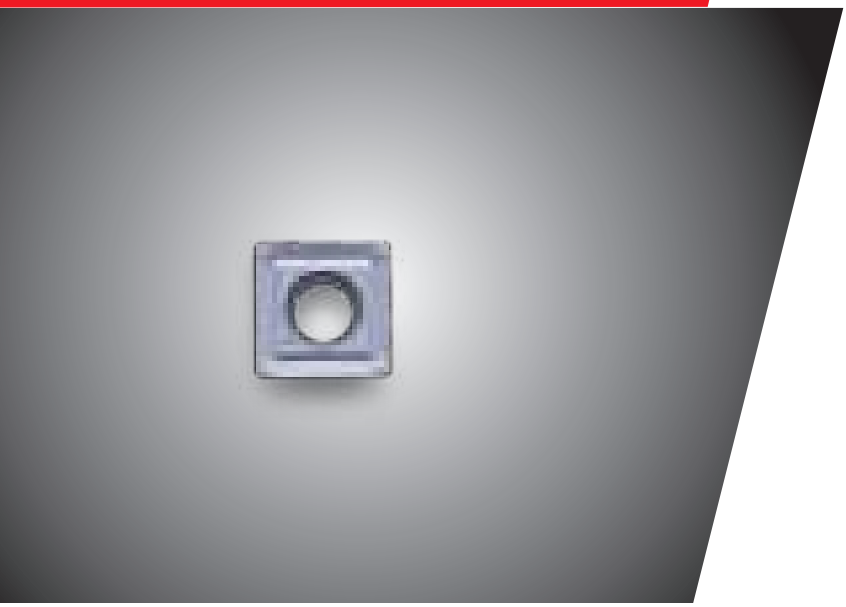
STOCKABLE NON STOCKABLE

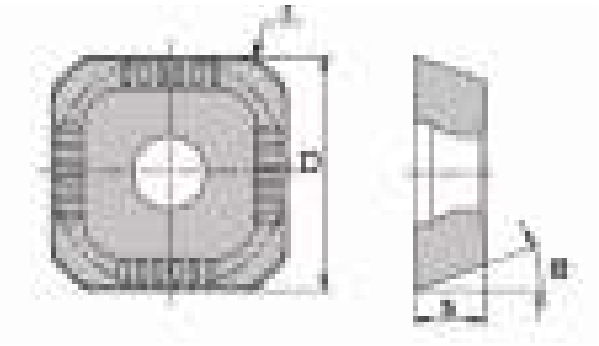
SHELL MILL CUTTER



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

SPMT1204





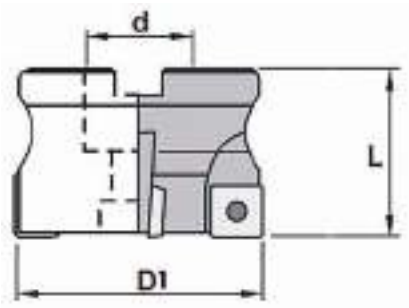
90 DEGREE LEAD ANGLE INSERT
4 CORNER INSERT SUITABLE FOR POCKET MILLING, COPYING & SURFACING

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

STOCKABLE NON STOCKABLE

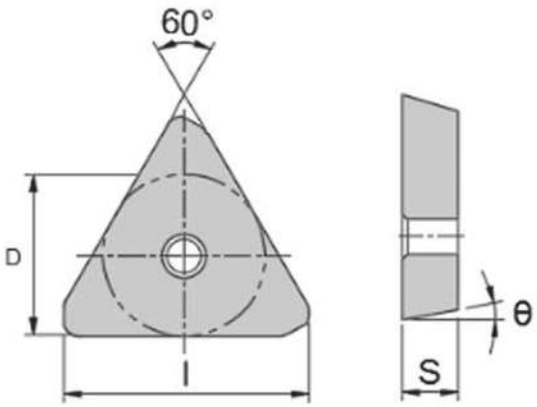
SHELL MILL CUTTER

DESIGNATION	D	D1	d	L	Z
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



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

TPKN1603



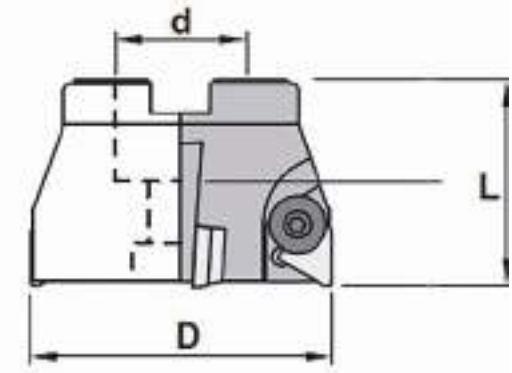
75 DEGREE LEAD ANGLE INSERT
APPLICATION : HIGH DEPTH OF CUT FACE MILLING

DESIGNATION	GRADE	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		L	D	S	Ø	R	MIN	MAX	MIN	MAX
TPKN1603	XT830	16.4	16.4	3.18	11	-	0.08	0.27	0.5	12
TPKR1603	XT830	16.4	16.4	3.18	11	-	0.09	0.22	0.5	12

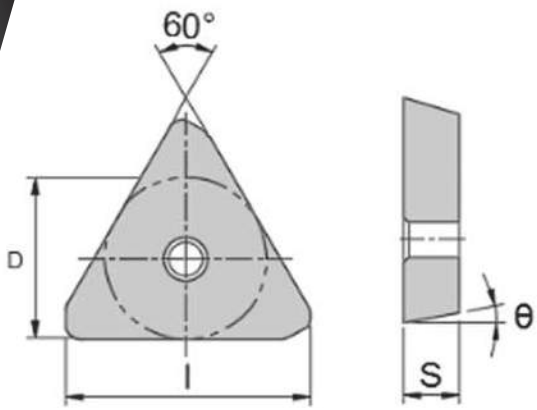
STOCKABLE NON STOCKABLE

SHELL MILL CUTTER

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



TPKN2204

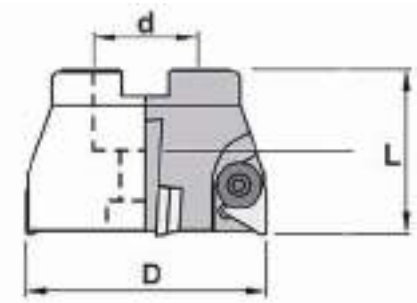


75 DEGREE LEAD ANGLE INSERT
APPLICATION : HIGH DEPTH OF CUT FACE MILLING

DESIGNATION	GRADE	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		L	D	S	Ø	R	MIN	MAX	MIN	MAX
TPKN2204	XT830	22.1	12.7	4.76	11	-	0.09	0.27	0.5	18
TPKR2204	XT830	16.4	9.525	3.18	11	-	0.09	0.22	0.5	18

STOCKABLE NON STOCKABLE

SHELL MILL CUTTER



DESIGNATION	D	d	L	Z
080-A27-TPKN22-5T	80	27	50	5
100-A32-TPKN22-6T	100	32	50	6
125-A40-TPKN22-7T	125	40	63	7
160-A40-TPKN22-9T	160	40	63	9

Notes

Notes

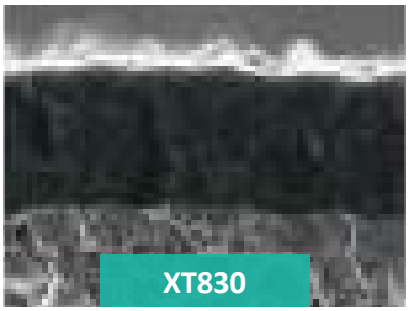
XCUT TECHNOLOGIES

Face Milling

Notes

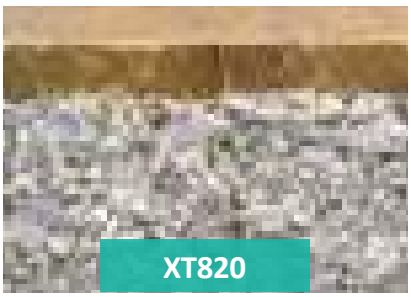
INDEX

GRADE INFORMATION



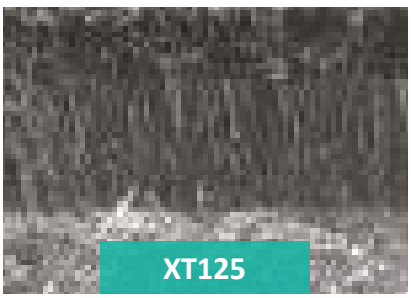
P05-P30| M05-M20 | K05-K20 | S05-S15 | H05-H10

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



P05-P30 | K05-K25

PVD coated grade suitable for stable and dry operations in medium to high cutting speed. The PVD coating is optimal in case of chip blockage. Ideal for Steel & stainless steel processing.



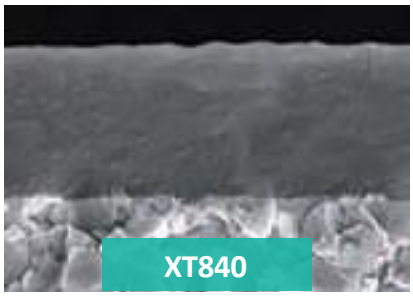
P05-P30 | M05-M30 | K05-K15

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-Temprature high hardness alloys.(Less Chromium & Nickel)

P05-P25 |K05-K30

Uses heat-resistance PVD Al_2O_3 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

GRADE INFORMATION



P10-P30 | K10-K25 | M10-M25

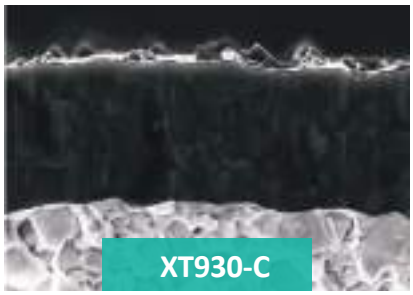
Composition: Co 10.5 %; mixed carbides 2.0 %; WC balance | Grain size: 1-2 µm | Hardness: HV30 1400 Coating specification: PVD TiAlTaN First choice for dry machining of steels and CI at high cutting speeds

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.

K05-K20| P05-P20 | M10-M25

Yellow coating. Around 7~9um AL20 and 6~8um TiCN,which for improving well resistance and toughness to protect basis impact .



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.

P10-P25| M10-M20 | K05-K15

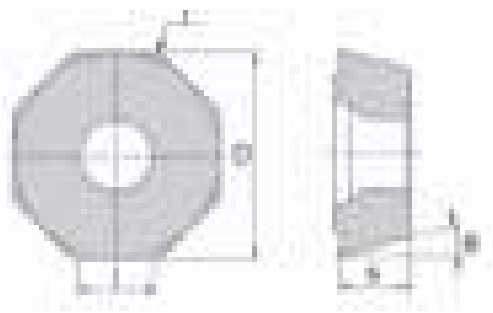
PVD coated grade, suitable for cast iron & processing whenever it is required high toughness and excellent resistance. Used with coolant in medium cutting speed, this quality ensures a remarkable insert life.

RECOMMENDED CUTTING CONDITIONS

ISO	Material Group	Relative Materials(DIN)	Hardness HB	Cutting speed (m/min)			
				XT 830	XT 820	XT 125	XT 480
P	Non-alloy steel	9 SMn 28, C35C50, C40E, C45E, 49 CrMo 4	125 - 250	150 - 250	90 - 250	150 - 250	80 - 180
	Low alloy steel	13 CrMo 44, 40NiCrM022, 58 CrV 4	200 - 350	140 - 200	90 - 200	150 - 250	80 - 180
	High alloy steel	X 40 CrMoV 5 1, X100 CrMoV 5 1, S6-5-5	200 - 325	80 - 130	80 - 130	80 - 200	80 - 130
M	Ferritic/ martensitic Stainless steel	X6Cr13, X10CrA118, X20CrNi175	200 - 240	130 - 190	80 - 180	80 - 160	
	Austenitic Stainless steel	X5 CrNi 18 9, X5 CrNiMo 17 13 3 X6 CrNiTi 18 9	180	100 -200	100 -200	80 -200	
K	Grey cast iron	GG15, GG20, GGG40, GG-35	180 - 260	160 - 200	100 - 280		90 - 200
	Malleable castiron	GTS-35-10, GTS-35,GTS70-02, 20mN5	130 - 230	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	Cutting speed (m/min)				
				XT840	XT430-G	XK3121	XT930-C	XT430
P	Non-alloy steel	9 SMn 28, C35C50, C40E, C45E, 49 CrMo 4	125 - 250	90-250	90-250		80-200	90-250
	Low alloy steel	13 CrMo 44, 40NiCrM022, 58 CrV 4	200 - 350	80-220	80-200		80-180	80-200
	High alloy steel	X 40 CrMoV 5 1, X100 CrMoV 5 1, S6-5-5	200 - 325	80-180			60-160	
M	Ferritic/ martens-itic Stainless steel	X6Cr13, X10CrA118, X20CrNi175	200 - 240		80-200		60-220	80-200
	Austenitic Stainless steel	X5 CrNi 18 9, X5 CrNiMo 17 13 3 X6 CrNiTi 18 9	180		60-180		60-180	60-180
K	Grey cast iron	GG15, GG20, GGG40, GG-35	180 - 260		90 - 200	70-350		90 - 200
	Malleable castiron	GTS-35-10, GTS-35,GTS70-02, 20mN5	130 - 230	90-240	90 - 200	70-280		90 - 200
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	Hardend-ed 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			50-150		
	Cast iron	G-X 300 CrMo 15 3	55 HRc			50-120		

ODMT0605



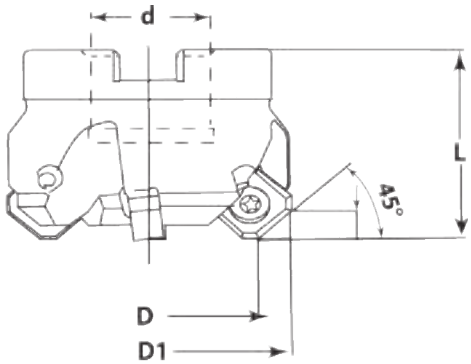
8 CORNER 45 DEGREE LEAD ANGLE SURFACING INSERT
APPLICATION: FACE MILLING, CHAMFERING, SURFACING

DESIGNATION	GRADE	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		l	D	S	Ø	r	MIN	MAX	MIN	MAX
ODMT060508TN	XT830	-	15.88	5.56	15	-	0.12	0.45	0.4	4
ODMW060508TN	XT830	-	15.88	5.56	15	-	0.12	0.45	0.4	4

STOCKABLE NON STOCKABLE

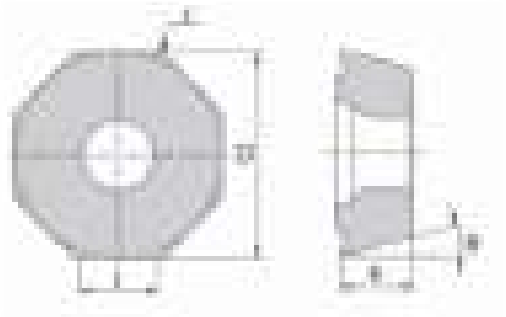
SHELL MILL CUTTER

DESIGNATION	D	D1	d	L	Z
063-22-ODMT06-5T	63	73	22	50	5
080-27-ODMT06-5T	80	90	27	50	5
0100-32-ODMT06-6T	100	110	32	50	6
0125-40-ODMT06-7T	125	135	40	63	7
0160-40-ODMT06-9T	160	170	40	63	9



SCREW: SCREW FOR ODMT06

OFMT05T3



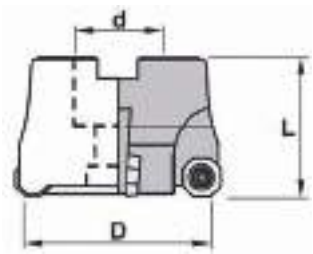
8 CORNER 45 DEGREE LEAD ANGLE FACE MILLING INSERT.
SUITABLE FOR: SURFACING / CHAMFERING

DESIGNATION	GRADE	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		L	D	S	Ø	R	MIN	MAX	MIN	MAX
OFMT05T3 TN	XT830	-	12.7	4	25	-	0.12	0.40	0.4	3.5

STOCKABLE NON STOCKABLE

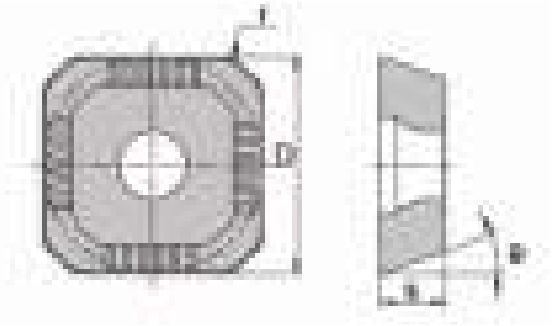
SHELL MILL CUTTER

DESIGNATION	D	d	L	Z
063-22-OFMT05-5T	63	22	40	5
080-27-OFMT05-6T	80	27	50	6
0100-32-OFMT05-7T	100	32	50	7
0125-40-OFMT05-8T	125	40	63	8



SCREW - SCREW FOR OFMT05

SEHT1204



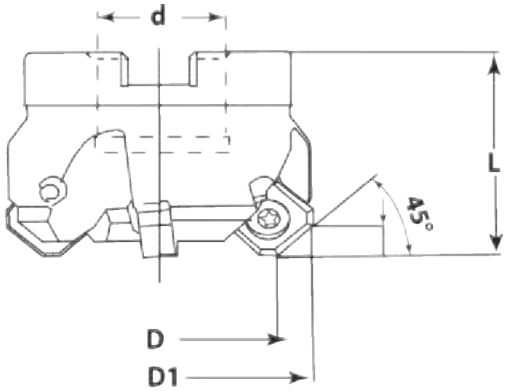
45 DEGREE LEAD ANGLE INSERT
4 CUTTING CORNER INSERT SUITABLE FOR FACE MILLING OF ALUMINIUM

DESIGNATION	GRADE	DIMENSIONS				FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		di	F	S	R	MIN	MAX	MIN	MAX
SEHT1204AFFN	XA320	13.29	11	4.76	-	0.05	0.2	0.2	2

STOCKABLE NON STOCKABLE

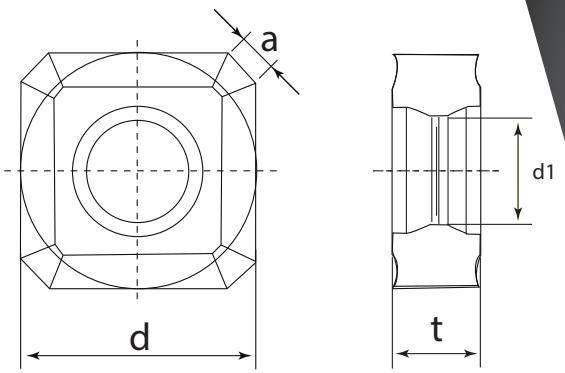
SHELL MILL CUTTER

DESIGNATION	D	D1	d	L	Z
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



SCREW - SCREW M4 FOR SEHT12

SNMX1205



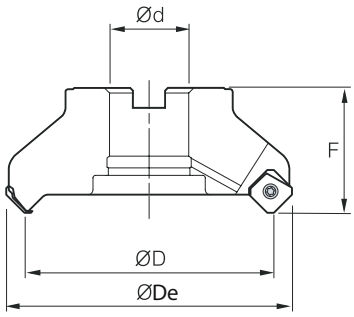
45 DEGREE LEAD ANGLE INSERT
8 CUTTING CORNER INSERT SUITABLE FOR FACE MILLING

DESIGNATION	GRADE	DIMENSIONS				FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		d	a	d1	t	MIN	MAX	MIN	MAX
SNMX1205ANN	XT125	12.7	1.8	6	5.5	0.08	0.32	0.5	5
SNMX1205ANN	XT820	12.7	1.8	6	5.5	0.08	0.3	0.5	5
SNMX1205ANN	XT840	12.7	1.8	6	5.5	0.08	0.3	0.5	5
SNMX1205ANN	XT430	12.7	1.8	6	5.5	0.08	0.3	0.5	5
SNMX1205ANN	XT930-C	12.7	1.8	6	5.5	0.08	0.3	0.5	5
SNMX1205ANN	XK3121	12.7	1.8	6	5.5	0.08	0.35	0.5	5
SNMX1205ANN	XT840-PK*	12.7	1.8	6	5.5	0.08	0.3	0.5	5

STOCKABLE NON STOCKABLE *-IMPROVED VERSION OF XT840 , WITH SPECIAL COATING

SHELL MILL CUTTER

DESIGNATION	D	De	d	F	Z
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

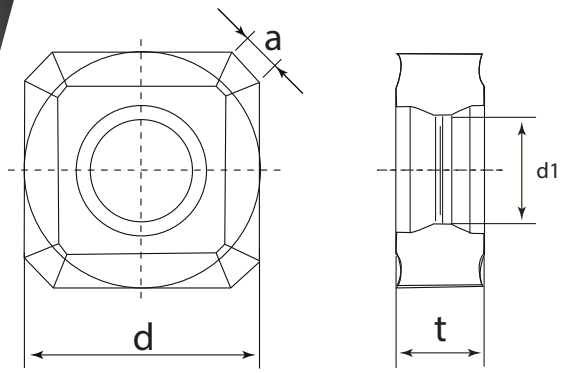


SCREW - SCREW M4 FOR SNMX1205

***LH Cutters available on request**

***Corner Radius 1.2 available on request**

SNMX1206



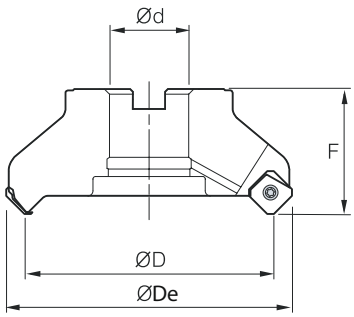
45 DEGREE LEAD ANGLE INSERT
8 CUTTING CORNER INSERT SUITABLE FOR FACE MILLING

DESIGNATION	GRADE	DIMENSIONS				FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		d	a	d1	t	MIN	MAX	MIN	MAX
SNMX1206ANN	XT830	12.7	1.8	6	5.5	0.08	0.25	0.5	5
SNMX1206ANN	XT430-G	12.7	1.8	6	5.5	0.08	0.30	0.5	5

STOCKABLE NON STOCKABLE

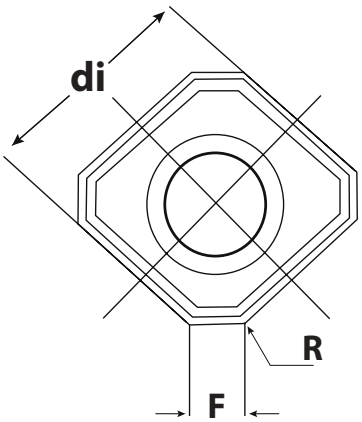
SHELL MILL CUTTER

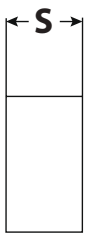
DESIGNATION	D	De	d	F	Z
XTSM-D50-Z4-SNMX1206-45	50	63	22	40	4
XTSM-D63-Z6-SNMX1206-45	63	76	22	40	6
XTSM-D80-Z7-SNMX1206-45	80	93	27	50	7
XTSM-D100-Z8-SNMX1206-45	100	113	32	63	8
XTSM-D125-Z10-SNMX1206-45	125	138	40	63	10
XTSM-D160-Z12-SNMX1206-45	160	173	40	63	12



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

SNMX1306





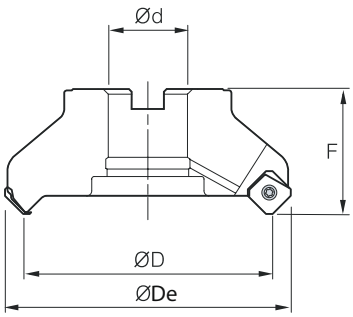
45 DEGREE LEAD ANGLE INSERT
8 CUTTING CORNER INSERT SUITABLE FOR FACE MILLING

DESIGNATION	GRADE	DIMENSIONS				FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		di	F	S	R	MIN	MAX	MIN	MAX
SNMX130605	XT480	13	3	6.2	0.5	0.05	0.2	0.5	4

STOCKABLE NON STOCKABLE

SHELL MILL CUTTER

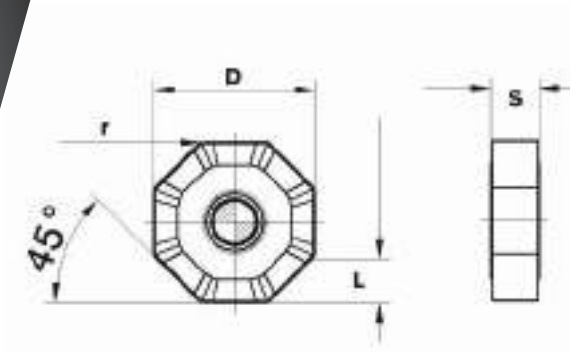
DESIGNATION	D	D1	d	L	Z
H-SOSF45-8/16-D40-04-22R	40	50.4	4	40	22
H-SOSF45-8/16-D50-04-22R	50	60.4	4	40	22
H-SOSF45-8/16-D63-08-22R	63	73.4	8	40	22
H-SOSF45-8/16-D80-07-27R	80	90.4	7	50	27
H-SOSF45-8/16-D100-08-32R	100	110.4	8	50	32
H-SOSF45-8/16-D125-10-40R	125	135.6	10	63	40
H-SOSF45-8/16-D160-12-40R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



SCREW - SCREW FOR SNMX13

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

ONMX1306



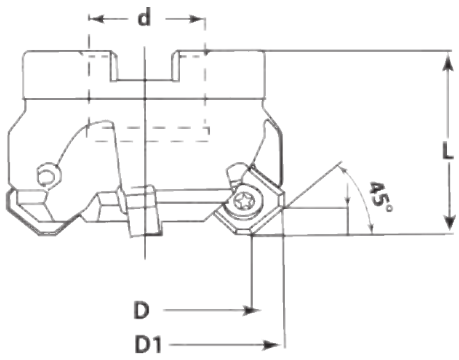
45 DEGREE LEAD ANGLE INSERT
16 CUTTING CORNER INSERT SUITABLE FOR FACE MILLING

DESIGNATION	GRADE	DIMENSIONS				FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		L	D	S	r	MIN	MAX	MIN	MAX
ONMX130605	XT480	13	3.5	5.5	0.5	0.08	0.22	0.5	2.5

STOCKABLE NON STOCKABLE

SHELL MILL CUTTER

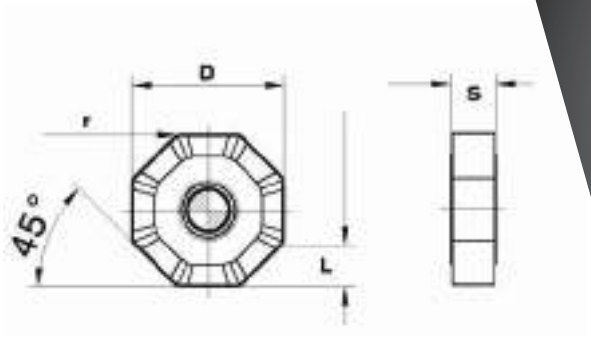
DESIGNATION	D	D1	d	L	Z
H-SOSF45-8/16-D40-04-22R	40	45	22	40	4
H-SOSF45-8/16-D50-04-22R	50	55	22	50	4
H-SOSF45-8/16-D63-06-22R	63	68	22	50	6
H-SOSF45-8/16-D80-07-27R	80	85	27	50	7
H-SOSF45-8/16-D100-08-32R	100	105	32	50	8
H-SOSF45-8/16-D125-10-40R	125	130	40	63	10
H-SOSF45-8/16-D160-12-40R	160	165	40	63	12



SCREW - SCREW FOR ONMX13

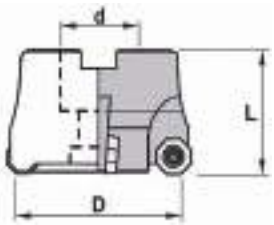
***CUTTER CAN BE USED WITH 2 TYPES OF INSERTS**
SNMX130605 (PG.317) & ONMX130605

ONMU0806



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

DESIGNATION	GRADE	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		L	D	S	Ø	R	MIN	MAX	MIN	MAX
ONMU080608	XT830	6	20.2	6	-	0.8	0.1	0.3	0.5	3.5
ONMU080608	XT430	6	20.2	6	-	0.8	0.1	0.3	0.5	3.5
ONMU080608	XT430-G	6	20.2	6	-	0.8	0.1	0.3	0.5	3.5
ONMU080608	XK3121	6	20.2	6	-	0.8	0.1	0.3	0.5	3.5
ONMU080608	XK3315-N	6	20.2	6	-	0.8	0.1	0.3	0.5	3.5



STOCKABLE NON STOCKABLE

SHELL MILL CUTTER

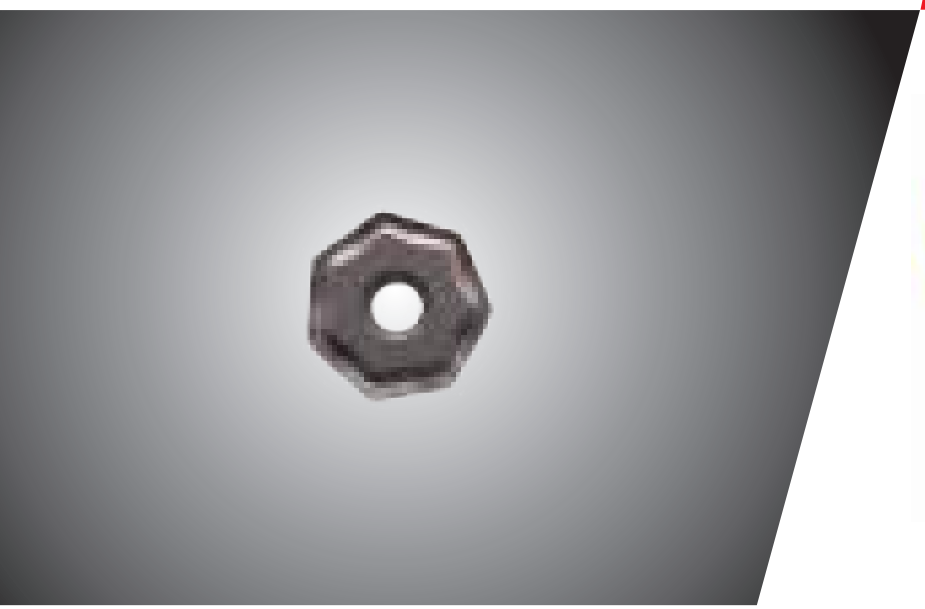
DESIGNATION	D	d	L	Z
XTSM-D50-Z4-ONMU0806	50	22	40	4
XTSM-D63-Z5-ONMU0806	63	22	40	5
XTSM-D80-Z6-ONMU0806	80	27	50	6
XTSM-D100-Z7-ONMU0806	100	32	50	7
XTSM-D125-Z8-ONMU0806	125	40	63	8
XTSM-D160-Z10-ONMU0806	160	40	63	10
XTSM-D160-Z12-ONMU08	160	40	63	12
XTSM-D200-Z14-ONMU08	200	60	63	14
XTSM-D250-Z16-ONMU08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

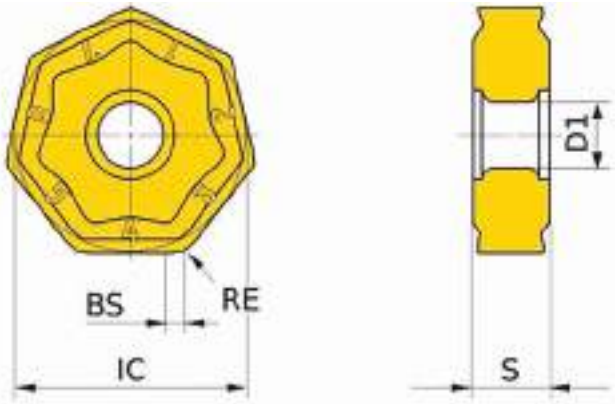
***LH Cutter available on request**
SCREW - SCREW M5 FOR ONMU08

ONMU WEDGE TYPE CUTTER

DESIGNATION	D	Z	A	CLAMP-ING WEDGE CODE	SCREW CODE
XTSM-D63-Z8-ONMU0806WG	63	8	22	CLAMP-ING WEDGE FOR ONMU08	WEDGE-SCREW FOR ONMU08
XTSM-D80-Z10-ONMU0806WG	80	10	27		
XTSM-D100-Z14-ONMU0806WG	100	14	32		
XTSM-D125-Z18-ONMU0806WG	125	18	40		

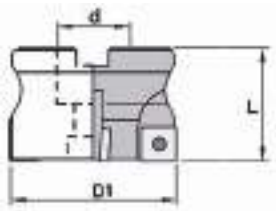
XNKU2006





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

DESIGNATION	GRADE	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		BS	D1	IC	S	RE	MIN	MAX	MIN	MAX
XNKU2006ZN	XT820	0.99	5.69	20	6.1	0.8	0.1	0.3	0.5	5.5
XNKU2006ZN	XK3121	0.99	5.69	20	6.1	0.8	0.1	0.3	0.5	5.5
XNKU2006ZN	XK3225	0.99	5.69	20	6.1	0.8	0.1	0.3	0.5	5.5



STOCKABLE NON STOCKABLE

SHELL MILL CUTTER

DESIGNATION	D	d	L	Z
XTSM-D50-Z4-XNKU2006	50	22	40	4
XTSM-D63-Z5-XNKU2006	63	22	40	5
XTSM-D80-Z6-XNKU2006	80	27	50	6
XTSM-D100-Z7-XNKU2006	100	32	50	7
XTSM-D125-Z8-XNKU2006	125	40	63	8
XTSM-D160-Z9-XNKU2006	160	40	63	9
XTSM-D200-Z12-XNKU2006	200	60	63	12
XTSM-D250-Z16-XNKU2006	250	60	63	16

***LH Cutter available on request**

SCREW - SCREW M5 FOR XNKU20

XNKU WEDGE TYPE CUTTER

DESIGNATION	D	Z	A	CLAMP-ING WEDGE CODE	SCREW CODE
XTSM-D63-Z6-WG-XNKU2006	63	6	22	CLAMP-ING WEDGE FOR XNKU20	WEDGE SCREW FOR XNKU20
XTSM-D80-Z8-WG-XNKU2006	80	8	27		
XTSM-D100-Z10-WG-XNKU2006	100	10	32		
XTSM-D125-Z12-WG-XNKU2006	125	12	40		

Notes

Notes

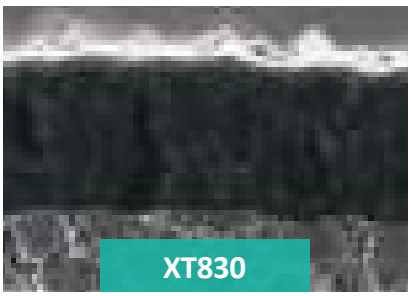
XCUT®
TECHNOLOGIES

Shoulder Milling

Notes

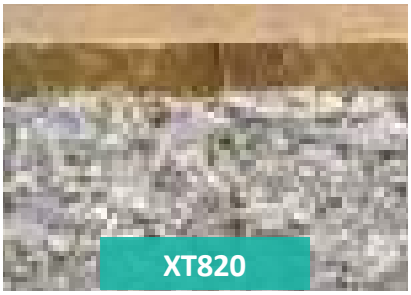
INDEX

GRADE INFORMATION



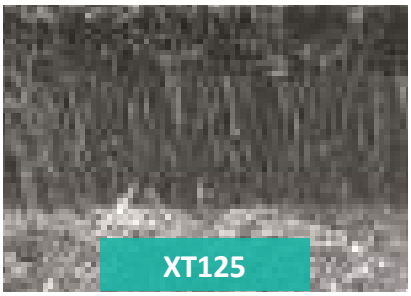
PO5-P30| MO5-M20 | K05-K20 | S05-S15 | H05-H10

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



P05-P30 | K05-K25

PVD coated grade suitable for stable and dry operations in medium to high cutting speed. The PVD coating is optimal in case of chip blockage. Ideal for Steel & stainless steel processing.

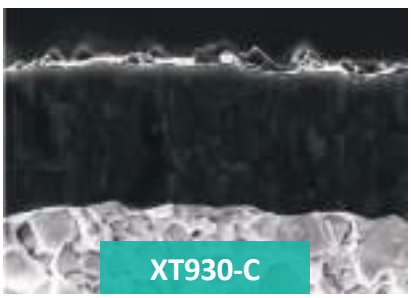


P05-P30 | M05-M30 | K05-K15

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-Temprature high hardness alloys.(Less Chromium & Nickel)

P05-P25 |K05-K30

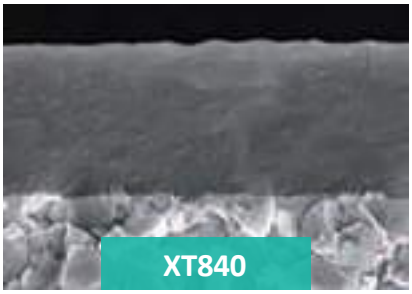
Uses heat-resistance PVD Al203 coating which has best hot hardness compared to previous PVD coatings, has better wear resistance. The smooth rake face and sharp cutting edge due to advanced technology with PVD coating, to ensure the workpiece without burr, also reduce the built-up edge. Suitable for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



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.

GRADE INFORMATION



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

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).

K05-K20| P05-P20 | M10-M25

Yellow coating. Around 7~9um AL20 and 6~8um TiCN,which for improving well resistance and toughness to protect basis impact

P10-P25| M10-M20 | K05-K15

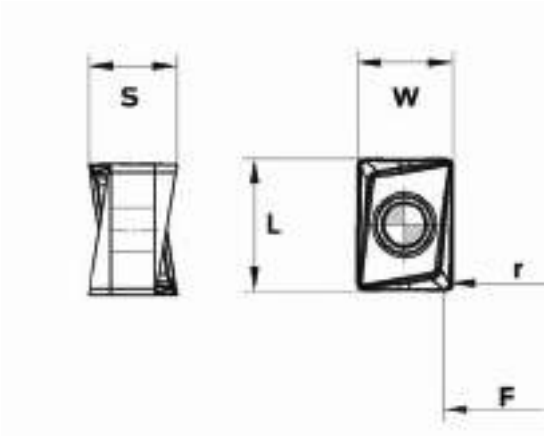
PVD coated grade, suitable for cast iron & processing whenever it is required high toughness and excellent resistance. Used with coolant in medium cutting speed, this quality ensures a remarkable insert life.

RECOMMENDED CUTTING CONDITIONS

ISO	Material Group	Relative Materials(DIN)	Hardness HB	Cutting speed (m/min)			
				XT 830	XT 820	XT 125	XT 480
P	Non-alloy steel	9 SMn 28, C35C50, C40E, C45E, 49 CrMo 4	125 - 250	150 - 250	90 - 250	150 - 250	80 - 180
	Low alloy steel	13 CrMo 44, 40NiCrM022, 58 CrV 4	200 - 350	140 - 200	90 - 200	150 - 250	80 - 180
	High alloy steel	X 40 CrMoV 5 1, X100 CrMoV 5 1, S6-5-5	200 - 325	80 - 130	80 - 130	80 - 200	80 - 130
M	Ferritic/mar-tensitic Stainless steel	X6Cr13, X10CrA118, X20CrNi175	200 - 240	130 - 190	80 - 180	80 - 160	
	Austenitic Stainless steel	X5 CrNi 18 9, X5 CrNiMo 17 13 3 X6 CrNiTi 18 9	180	100 -200	100 -200	80 -200	
K	Grey cast iron	GG15, GG20, GGG40, GG-35	180 - 260	160 - 200	100 - 280		90 - 200
	Malleable castiron	GTS-35-10, GTS-35,GTS70-02, 20mN5	130 - 230	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		35 - 65	
	Chilled cast iron	G-X 260 NiCr 4 2, X15 CrNiSi 25 20	400	45 - 55		35 - 55	
	Cast iron	G-X 300 CrMo 15 3	55 HRc	55 - 65		35 - 65	

ISO	Material Group	Relative Materials(DIN)	Hardness HB	Cutting speed (m/min)				
				XT840	XT930	XK3121	XT930-C	XT430
P	Non-alloy steel	9 SMn 28, C35C50, C40E, C45E, 49 CrMo 4	125 - 250	90-250			80-200	90-250
	Low alloy steel	13 CrMo 44, 40NiCrM022, 58 CrV 4	200 - 350	80-220	80-220		80-180	80-200
	High alloy steel	X 40 CrMoV 5 1, X100 CrMoV 5 1, S6-5-5	200 - 325	80-180	80-180		60-160	
M	Ferritic/mar-tensitic Stainless steel	X6Cr13, X10CrA118, X20CrNi175	200 - 240		80-220		60-220	80-200
	Austenitic Stainless steel	X5 CrNi 18 9, X5 CrNiMo 17 13 3 X6 CrNiTi 18 9	180		80-200		60-180	60-180
K	Grey cast iron	GG15, GG20, GGG40, GG-35	180 - 260			70-350		90 - 200
	Malleable castiron	GTS-35-10, GTS-35,GTS70-02, 20mN5	130 - 230	90-240		70-280		90 - 200
S	Fe, Ni or Co based	X12 NICrAlTi 31 20, TiAl5Sn2	200 - 350		40-120		40-120	
	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	
	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



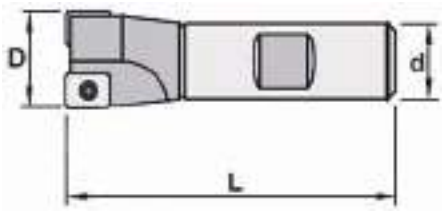
90 DEGREE LEAD ANGLE INSERT - 4 CUTTING EDGES
SUITABLE FOR POCKET, FACE, SLOT,ANGLED & SHOULDER MILLING

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

STOCKABLE NON STOCKABLE

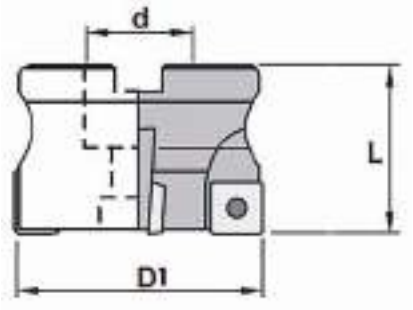
END MILL TYPE

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



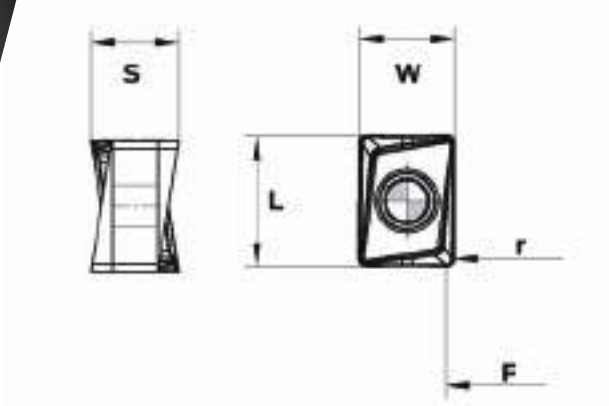
SHELL MILL CUTTER

DESGINATION	D	d	H	Z
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



SCREW - SCREW M4 FOR LNKU12

LNKX0904



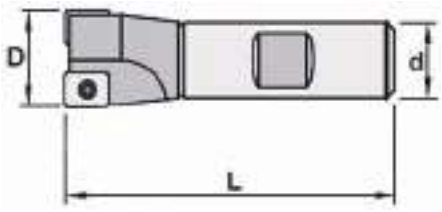
90 DEGREE LEAD ANGLE INSERT - 4 CUTTING EDGES
SUITABLE FOR POCKET, FACE, SLOT,ANGLED & SHOULDER MILLING

DESIGNATION	GRADE	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		W	F	S	r	L	MIN	MAX	MIN	MAX
LNKX090408	XT480	6.6	2.5	5.5	0.8	8.6	0.07	0.2	1	4

STOCKABLE NON STOCKABLE

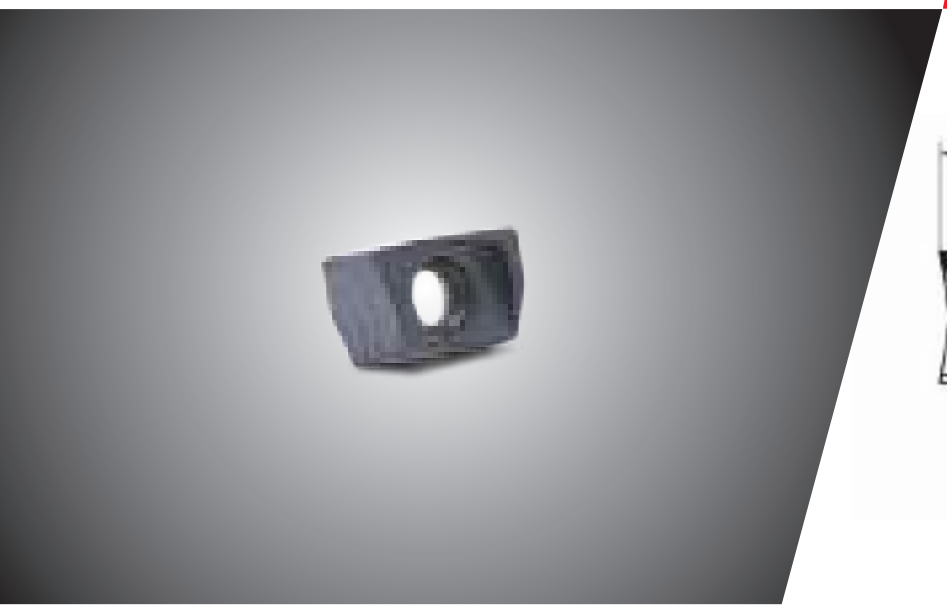
END MILL CUTTER

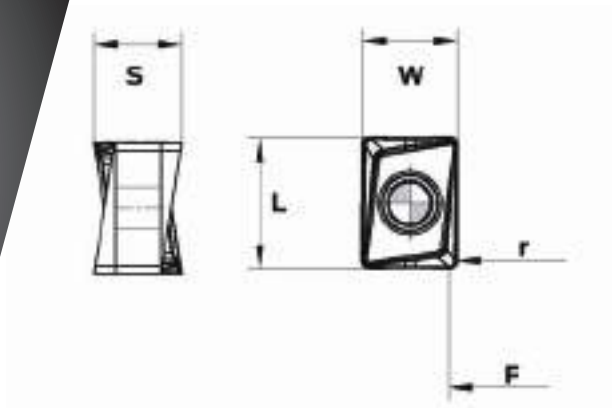
DESIGNATION	D	d	Z	L
H-SASF90-1616-T2-0904-125	16	16	2	125
H-SASF90-2020-T3-0904-125	20	20	3	125
H-SASF90-2525-T4-0904-125	25	25	4	125



SCREW - SCREW FOR LNKX09

LNKX1205





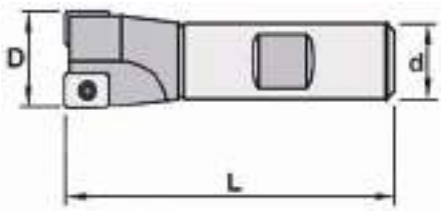
90 DEGREE LEAD ANGLE INSERT - 4 CUTTING EDGES
SUITABLE FOR POCKET, FACE, SLOT,ANGLED & SHOULDER MILLING

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

STOCKABLE NON STOCKABLE

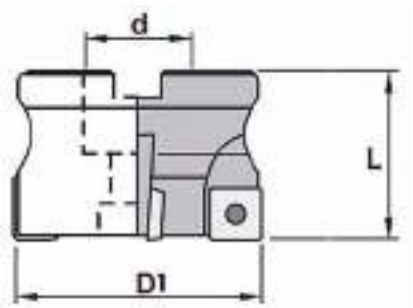
END MILL CUTTER

DESIGNATION	D	d	Z	L
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



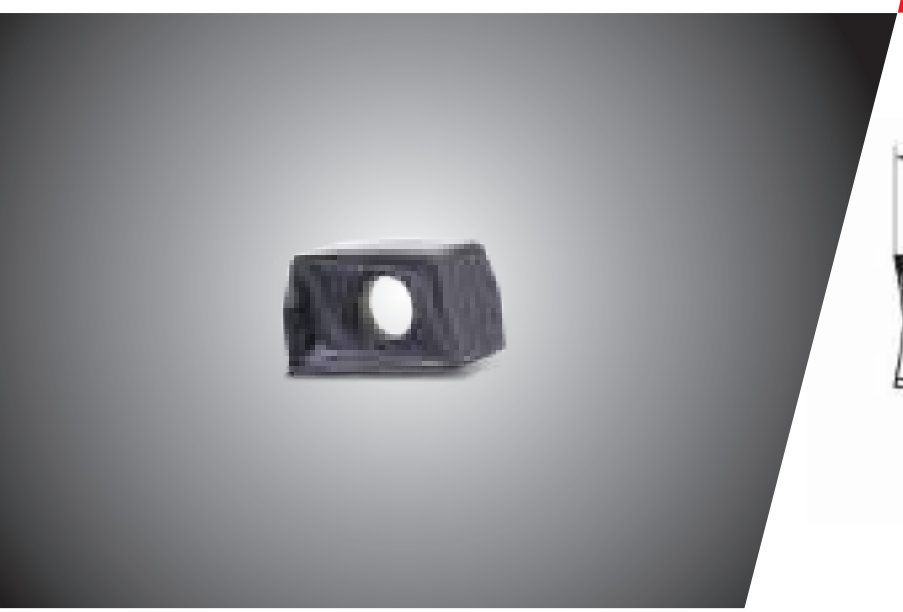
SHELL MILL CUTTER

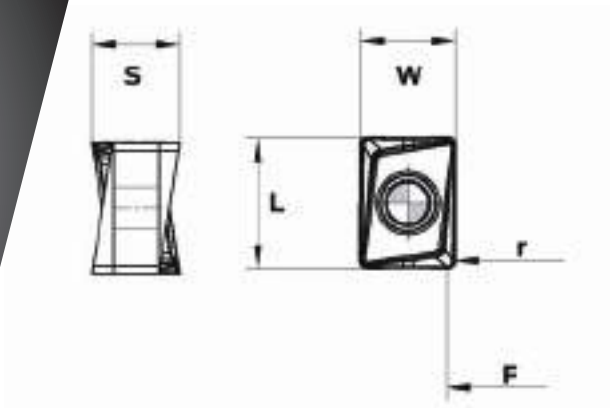
DESIGNATION	D	d	L	Z
H-SASF90-D40-04-16-1205R	80	16	40	4
H-SASF90-D50-05-22-1205R	50	22	40	5
H-SASF90-D63-06-27-1205R	63	27	50	6



SCREW - SCREW FOR LNKX12

LNKX1706





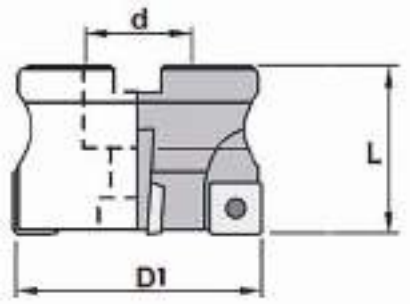
90 DEGREE LEAD ANGLE INSERT - 4 CUTTING EDGES
SUITABLE FOR POCKET, FACE, SLOT,ANGLED & SHOULDER MILLING

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

STOCKABLE NON STOCKABLE

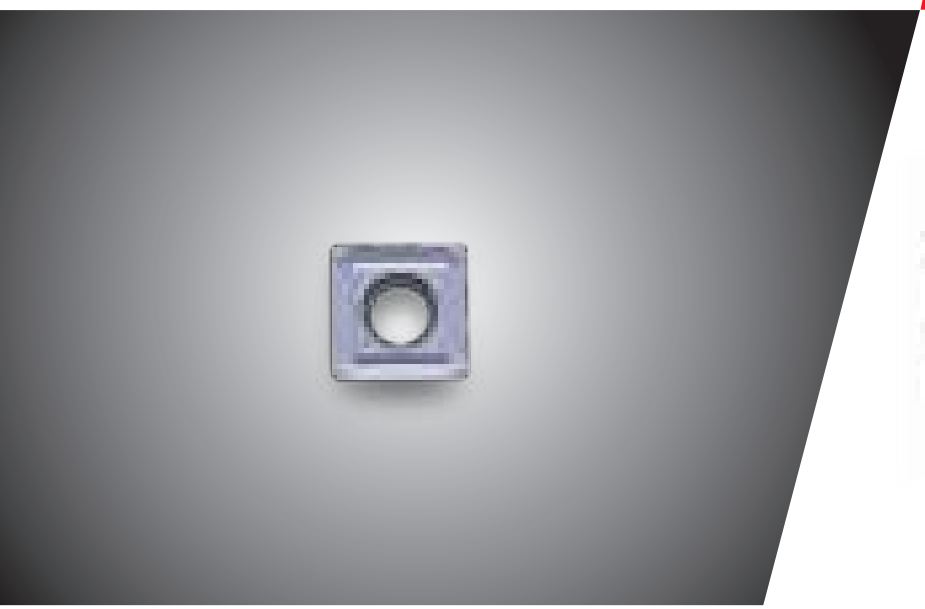
SHELL MILL CUTTER

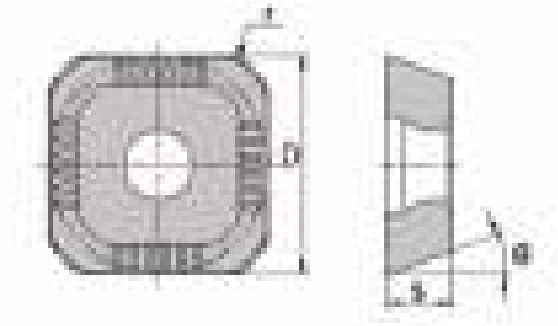
DESIGNATION	D	d	L	Z
H-SASF90-D50-04-22-1706R	50	22	40	4
H-SASF90-D63-05-27-1706R	63	27	50	5
H-SASF90-D80-07-27-1706R	80	27	50	7
H-SASF90-D100-08-32-1706R	100	32	50	8



SCREW - SCREW FOR LNKX17

SDMT1204





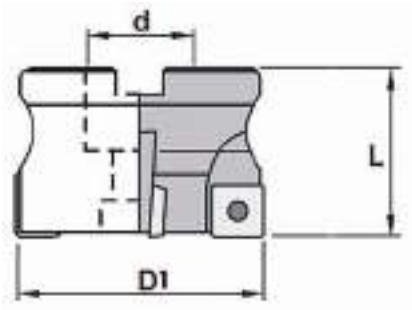
90 DEGREE LEAD ANGLE INSERT - 4 CUTTING EDGES
SUITABLE FOR POCKET, FACE, SLOT,ANGLED & SHOULDER MILLING

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

STOCKABLE NON STOCKABLE

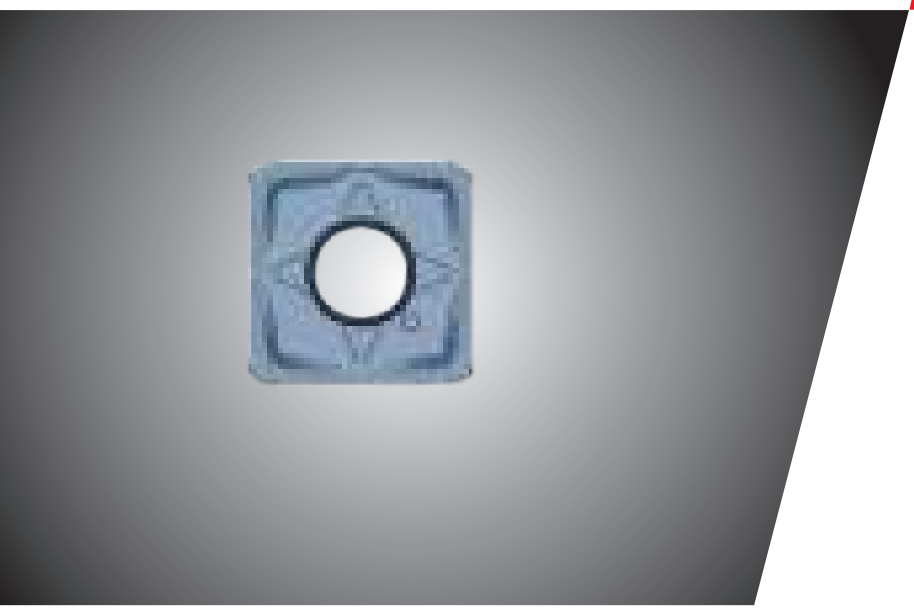
SHELL MILL CUTTER

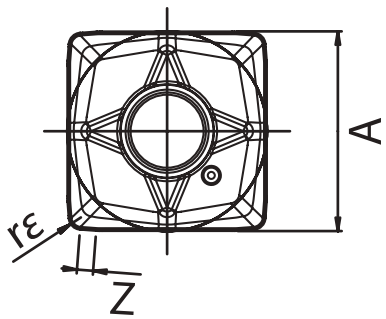
DESIGNATION	D	d	L	Z
XTSM-D50-A22-Z4-SDMT1204	50	22	40	4
XTSM-D63-A22-Z5-SDMT1204	63	22	50	5
XTSM-D80-A27-Z6-SDMT1204	80	27	50	6
XTSM-D100-A32-Z7-SDMT1204	100	32	50	7
XTSM-D125-A40-Z8-SDMT1204	125	40	63	8



SCREW - SCREW M4 FOR SDMT12

SNMU1206





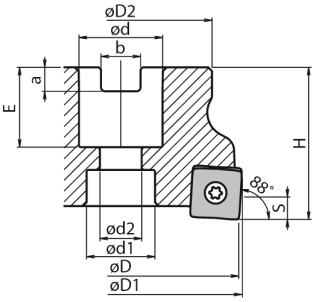
88 DEGREE MILLING INSERT - 8 CUTTING EDGES
SUITABLE FOR POCKET MILLING, FACING & SURFACING

DESIGNATION	GRADE	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		A	T	ØD	Z	rε	MIN	MAX	MIN	MAX
SNMU1206EN-GM	XT430	13	5.51	4.7	1	0.8	0.08	0.24	0.5	3.5
SNMU1206EN-GM	XT840	13	5.51	4.7	1	0.8	0.08	0.3	0.5	3.5
SNMU1206EN-GM	XT930-C	13	5.51	4.7	1	0.8	0.08	0.3	0.5	3.5

STOCKABLE NON STOCKABLE

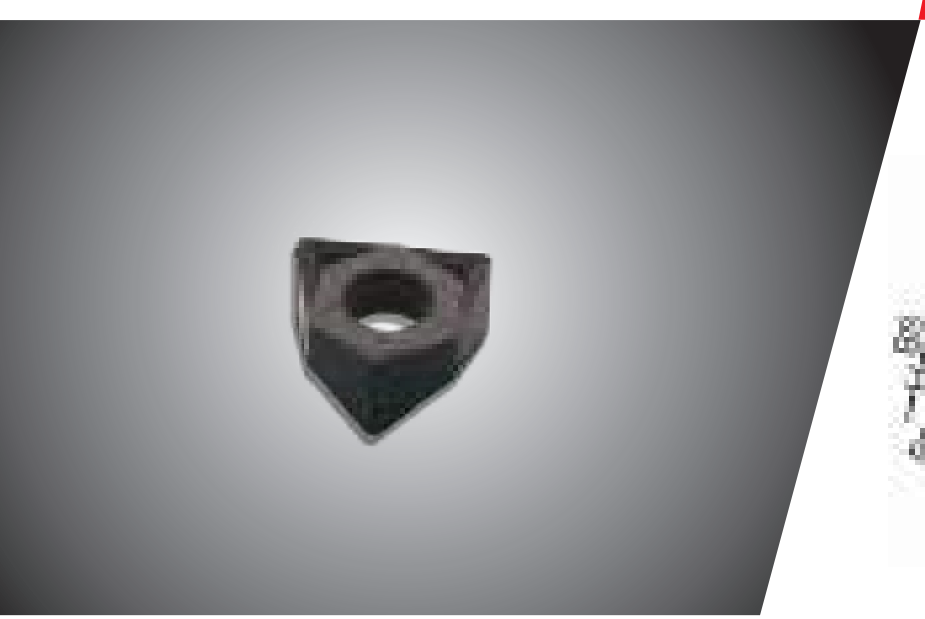
SHELL MILL CUTTER

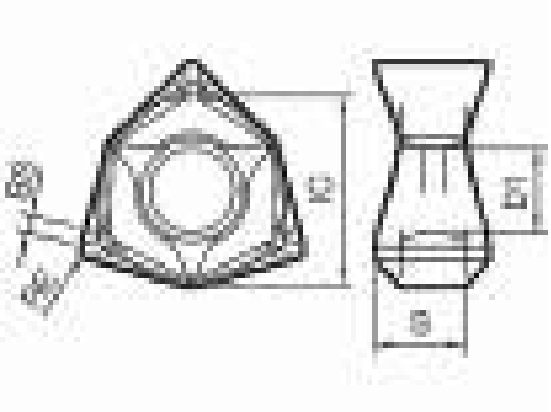
DESIGNATION	DIMENSIONS									
	ØD	ØD1	ØD2	ØD	ØD1	ØD2	H	E	A	B
XTSM-D40-Z2-SNMU1206- 88°	40	52	48	22	17.5	11	40	21	6.3	10.4
XTSM-D50-Z4-SNMU1206- 88°	50	65			18					
XTSM-D63-Z5-SNMU1206- 88°	63	82	70	27	20	13	50	24	7	12.4
XTSM-D80-Z7-SNMU1206- 88°	80	102	78	32	45	-		30	8	14.4
XTSM-D100-A32-Z7- SNMU1206-88°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



SCREW - M3.5 x 9-S

WNMX08





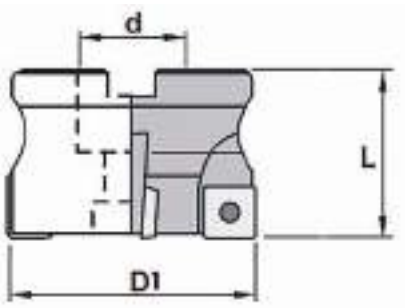
90 DEGREE LEAD ANGLE INSERT 6 CUTTING EDGES
SUITABLE FOR POCKET, FACE, SLOT,ANGLED & SHOULDER MILLING

DESIGNATION	GRADE	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		D1	S	BS	IC	RE	MIN	MAX	MIN	MAX
WNMX080608-GM	XT820	6.2	6.65	1.3	14.02	0.8	0.08	0.4	0.5	7
WNMX080608-GM	XK3121	6.2	6.65	1.3	14.02	0.8	0.08	0.4	0.5	7
WNMX080608-GM	XT430	6.2	6.65	1.3	14.02	0.8	0.08	0.4	0.5	7
WNMX080608-GM	XT125	6.2	6.65	1.3	14.02	0.8	0.08	0.4	0.5	7
WNMX080608-GM	XT840	6.2	6.65	1.3	14.02	0.8	0.08	0.4	0.5	7
WNMX080608-GM	XT930-C	6.2	6.65	1.3	14.02	0.8	0.08	0.4	0.5	7

STOCKABLE NON STOCKABLE

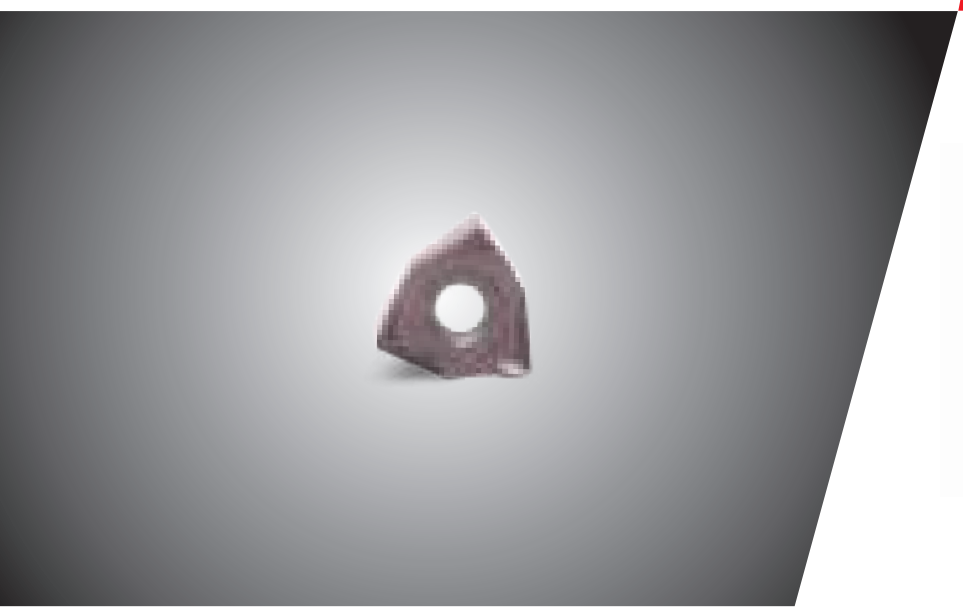
SHELL MILL CUTTER

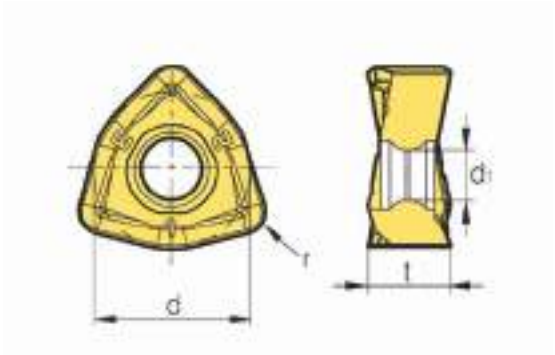
DESIGNATION	ØD	Ød	L	Z
XTSM-D50-A22-Z4-WNMX08-PRE	50	22	40	4
XTSM-D63-A22-Z4-WNMX08-PRE	63	22	40	4
XTSM-D63-A22-Z5-WNMX08-PRE	63	22	40	5
XTSM-D80-A27-Z5-WNMX08-PRE	80	27	50	5
XTSM-D80-A27-Z7-WNMX08-PRE	80	27	50	7
XTSM-D100-A32-Z7-WNMX08-PRE	100	32	50	7
XTSM-D100-A32-Z9-WNMX08-PRE	100	32	50	9
XTSM-D125-A40-Z8-WNMX08-PRE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



SCREW - SCREW FOR WNMX08-M5X14

XNEX08





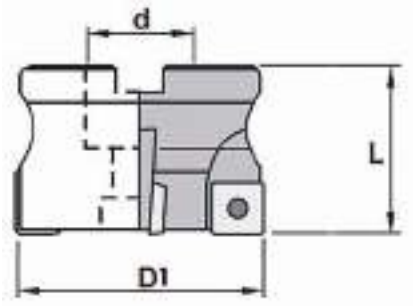
90 DEGREE LEAD ANGLE INSERT 6 CUTTING EDGES
SUITABLE FOR POCKET MILLING, COPYING & SURFACING

DESIGNATION	GRADE	DIMENSIONS				FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		d	t	d1	r	MIN	MAX	MIN	MAX
XNEX080608	XT820	12.5	6.56	7.5	0.8	0.08	0.4	0.5	7
XNEX080608	XK3121	12.5	6.56	7.5	0.8	0.08	0.4	90	7
XNEX080608	XT430	12.5	6.56	7.5	0.8	0.08	0.4	90	7

STOCKABLE NON STOCKABLE

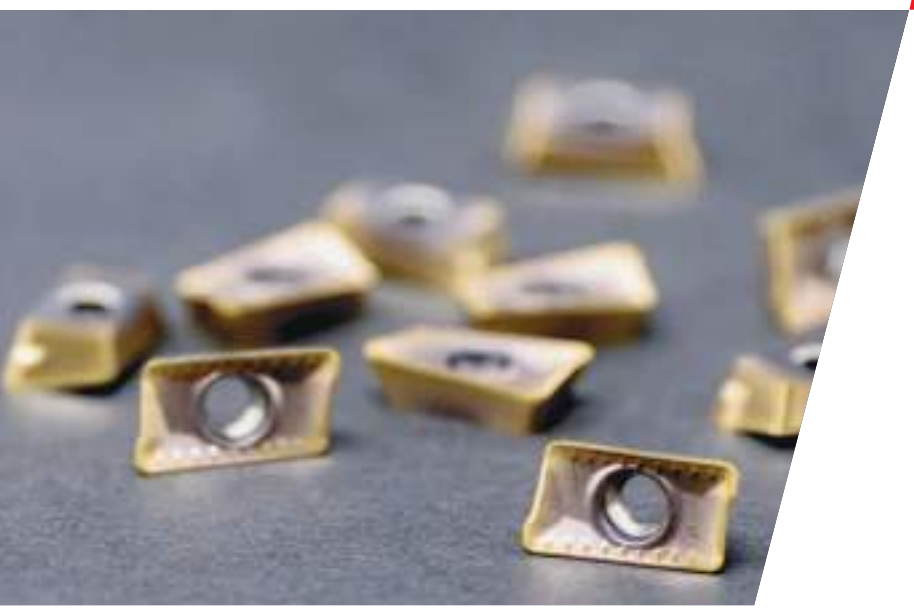
SHELL MILL CUTTER

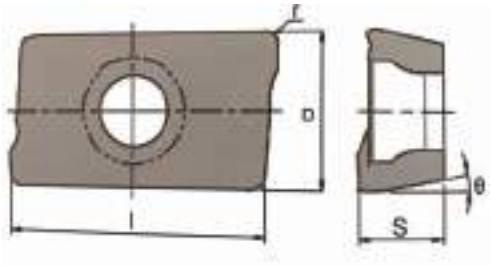
DESIGNATION	ØD	Ød	F	Z
XTSM-D50-Z4-XNEX08-90	50	22	40	4
XTSM-D63-Z6-XNEX08-90	50	22	40	5
XTSM-D80-Z7-XNEX08-90	63	27	40	6
XTSM-D100-Z8-XNEX08-90	80	27	50	7
XTSM-D125-Z10-XNEX08-90	100	32	50	8



SCREW - SCREW FOR XNEX08

XPKX11T3





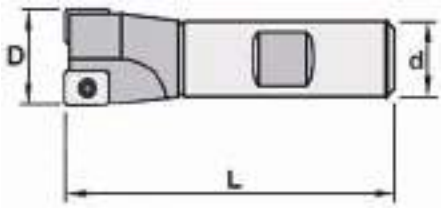
90 DEGREE LEAD ANGLE INSERT
2 CORNER INSERT SUITABLE FOR POCKET MILLING, COPYING & SURFACING

DESIGNATION	GRADE	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		L	D	S	ø	R	MIN	MAX	MIN	MAX
XPKX11T304-GM	XT125	12.24	6.50	3.60	11	0.8	0.06	0.20	0.50	3.00
XPKX11T308-GM	XT125	12.24	6.50	3.60	11	0.8	0.07	0.26	0.50	3.00
XPKX11T308-GM	XT820	12.24	6.50	3.60	11	0.8	0.07	0.26	0.50	3.00
XPKX11T316-GM	XT125	12.24	6.50	3.60	11	1.6	0.07	0.26	0.50	3.00

STOCKABLE NON STOCKABLE

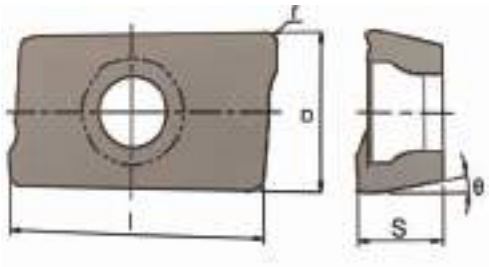
END MILL CUTTER

DESIGNATION	D	d	L1	L	Z
XPKX11-DIA16-2FL-L200	16	16	60	200	2
XPKX11-DIA20-3FL-L200	20	20	60	200	3
XPKX11-DIA25-4FL-L200	25	25	60	200	4
XPKX11-DIA32-4FL-L200	32	32	60	200	4



SCREW- SCREW (M2.5X6) FOR XPKX11

XPKX1604



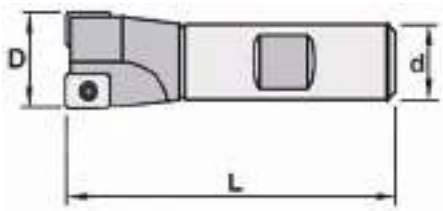
90 DEGREE LEAD ANGLE INSERT
2 CORNER INSERT SUITABLE FOR POCKET MILLING, COPYING & SURFACING

DESIGNATION	GRADE	DIMENSIONS					FEED (MM/ TOOTH)		DEPTH OF CUT(MM)	
		I	D	S	ø	r	MIN	MAX	MIN	MAX
XPKX160408PDTR	XT830	16.3	9.5	9.5	11	0.8	0.10	0.32	0.50	8
XPKX160412PDTR	XT830	16.3	9.5	9.5	11	1.2	0.10	0.32	0.50	8
XPKX160416PDTR	XT830	16.3	9.5	9.5	11	1.6	0.10	0.32	0.50	8
XPKX160424PDTR	XT830	16.3	9.5	9.5	11	2.4	0.10	0.32	0.50	8

STOCKABLE NON STOCKABLE

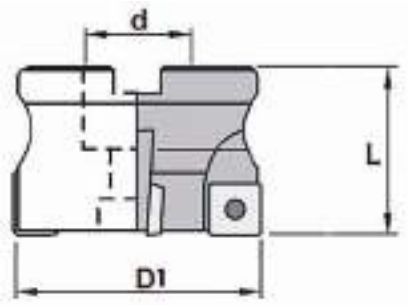
END MILL CUTTER

DESIGNATION	D	d	L1	L	Z
XPKX16-DIA25-2FL-L200	25	25	50	200	2
XPKX16-DIA32-3FL-L200	32	32	50	200	3



SHELL MILL CUTTER

DESIGNATION	D	d	L	Z
XPKX16-DIA50-5FL	50	22	40	5
XPKX16-DIA63-6FL	63	22	40	6
XPKX16-DIA80-7FL	80	27	50	7
XPKX16-DIA100-8FL	100	32	50	8



SCREW: SCREW (M4 X 8) FOR XPKX1604

Notes

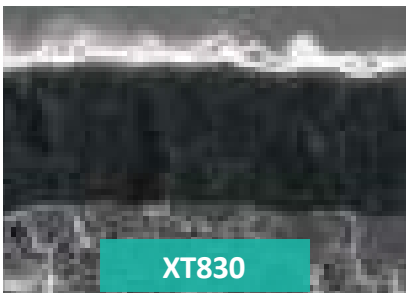
XCUT®
TECHNOLOGIES

High Feed Milling

Notes

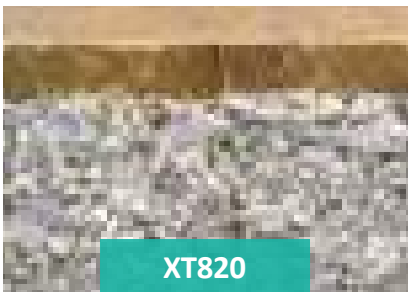
INDEX

GRADE INFORMATION



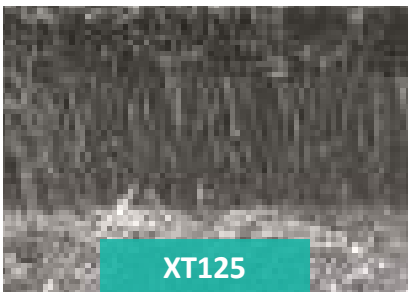
P05-P30| M05-M20 | K05-K20 | S05-S15 | H05-H10

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



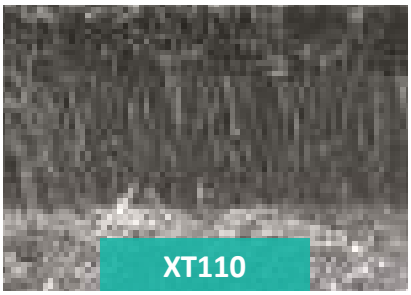
P05-P30 | K05-K25

PVD coated grade suitable for stable and dry operations in medium to high cutting speed. The PVD coating is optimal in case of chip blockage. Ideal for Steel & stainless steel processing.



P05-P30 | M05-M30 | K05-K15

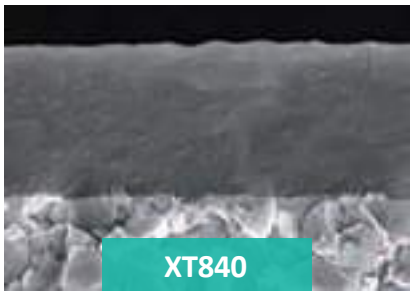
2-4 µ ALCrN+AlCrSiN PVD Coated, Combinating with ultra fine particles'substrates with High-Toughness, suitable for all materials in light & medium load Milling. Suitable for Steels, Stainless Steel & High-Temprature high hardness alloys.(Less Chromium & Nickel)



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 Irons.

GRADE INFORMATION

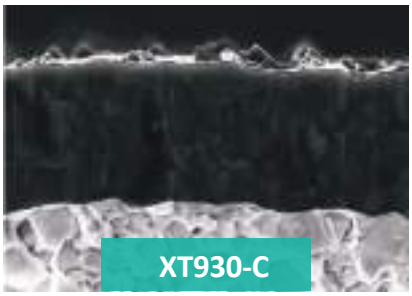


P10-P30 | K10-K25 | M10-M25

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

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.

RECOMMENDED CUTTING CONDITIONS

ISO	Material Group	Relative Materials(DIN)	Hardness HB	Cutting speed (m/min)			
				XT 830	XT 820	XT 125	XT 110
P	Non-alloy steel	9 SMn 28, C35C50, C40E, C45E, 49 CrMo 4	125 - 250	100 - 250	90 - 250	150 - 250	80 - 180
	Low alloy steel	13 CrMo 44, 40NiCrM022, 58 CrV 4	200 - 350	100 - 200	90 - 200	150 - 250	80 - 150
	High alloy steel	X 40 CrMoV 5 1, X100 CrMoV 5 1, S6-5-5	200 - 325	80 - 130	80 - 130	80 - 200	80 - 130
M	Ferritic/ martensitic Stainless steel	X6Cr13, X10CrA118, X20CrNi175	200 - 240	130 - 190	80 - 180	80 - 160	80-180
	Austenitic Stainless steel	X5 CrNi 18 9, X5 CrNiMo 17 13 3 X6 CrNiTi 18 9	180	100 -200	100 -200	80 -200	60-160
K	Grey cast iron	GG15, GG20, GGG40, GG-35	180 - 260	160 - 200	100 - 280		90 - 200
	Malleable castiron	GTS-35-10, GTS-35,GTS70-02, 20mN5	130 - 230	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		35-55	
	Chilled cast iron	G-X 260 NiCr 4 2, X15 CrNiSi 25 20	400	45 - 55		35-70	
	Cast iron	G-X 300 CrMo 15 3	55 HRc	55 - 65		35-65	

ISO	Material Group	Relative Materials(DIN)	Hardness HB	Cutting speed (m/min)		
				XT840	XT930	XT930-C
P	Non-alloy steel	9 SMn 28, C35C50, C40E, C45E, 49 CrMo 4	125 - 250	90-250		80-200
	Low alloy steel	13 CrMo 44, 40NiCrM022, 58 CrV 4	200 - 350	80-220	80-220	80-180
	High alloy steel	X 40 CrMoV 5 1, X100 CrMoV 5 1, S6-5-5	200 - 325	80-180	80-180	60-160
M	Ferritic/mar-tensitic Stainless steel	X6Cr13, X10CrA118, X20CrNi175	200 - 240		80-220	60-220
	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	90-240		
S	Fe, Ni or Co based	X12 NICrAlTi 31 20, TiAl5Sn2	200 - 350		40-120	40-120
	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
	Chilled cast iron	G-X 260 NiCr 4 2, X15 CrNiSi 25 20	400			
	Cast iron	G-X 300 CrMo 15 3	55 HRc			

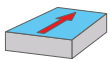
SPLX

Customer benefits

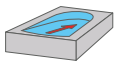
- With feed rates up to 3 mm/ tooth and closely pitched tools. very high chip removal rates are achieved.
- Maximum tool life thanks to special coating.
- Maximised economy thanks to 4 cutting edges.
- Reduced machining noise and vibration. light cutting geometries.

Application

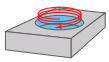
1) Face milling



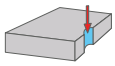
2) Angled milling



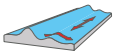
3) Helical plunging



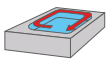
4) Plunge milling



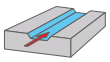
5) Profile milling



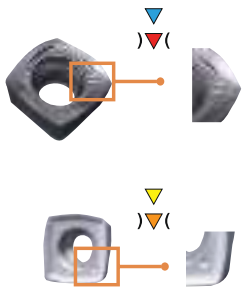
6) Pocket milling



7) Slot milling



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.

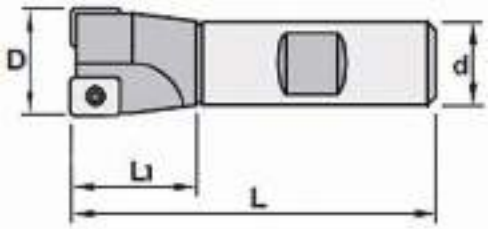
INSERT DESIGNATION	F_z[mm]	A_P[mm]
SPLX070305HP-XT840	0.10 - 1.50	0.10 - 0.80
SPLX10T308HP-XT840	0.10 - 2.50	0.10 - 1.0
SPLX130410HP-XT840	0.10 - 1.50	0.10 - 1.5
SPLX070305SM-XT930	0.10 - 1.50	0.10 - 0.80
SPLX10T308SM-XT930	0.10 - 2.50	0.10 - 1.0
SPLX130410SM-XT930	0.10 - 1.50	0.10 - 1.5

STOCKABLE NON STOCKABLE

CUTTER DETAILS - END MILL TYPE

DESIGNATION	D	L1	D	L	Z
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

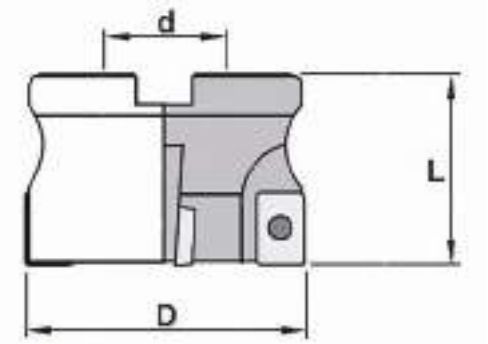
END MILL CUTTER



CUTTER DETAILS - SHELL MILL TYPE

DESIGNATION	D	D	L	Z
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	63	7
XTFFC-D125-A40-Z8-SPLX13	125	40	63	8

SHELL MILL CUTTER



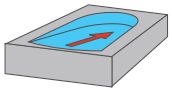
STOCKABLE NON STOCKABLE

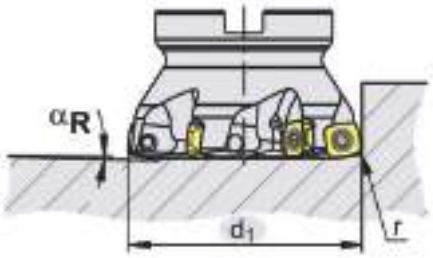
INSERT SIZE	SCREW SIZE
SPLX07	M2.5 x 5-T8
SPLX10	M3.5 x 8.6-T15
SPLX13	M4.5 x10.5-T20

Thru-Coolant Bodies Available On Request!

SPLX Technical Information

Application data (angled ramping)

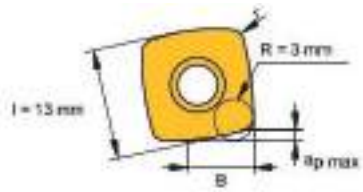




Description	d_1 [mm]	α_R [°]
XTFFC-1616-50FL-T2-SPLX07	16	5.9
XTFFC-2020-50FL-T3-SPLX07	20	3.2
XTFFC-2525-60FL-T4-SPLX07	25	2.0
XTFFC-2525-60FL-T2-SPLX10	25	3.6
XTFFC-D40-A16-Z4-SPLX10	40	1.2
XTFFC-D50-A22-Z5-SPLX10	50	0.9
XTFFC-D63-A22-Z6-SPLX10	63	0.8
XTFFC-D50-A22-Z4-SPLX13	50	1.5
XTFFC-D63-A22-Z5-SPLX13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

SPLX Technical Information

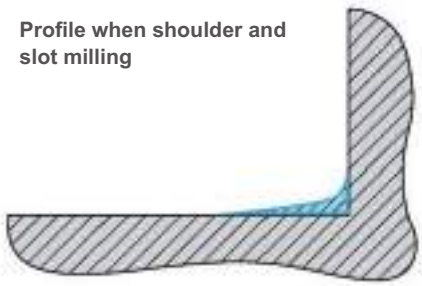
Depth of cut and remaining material



R = programmed radius

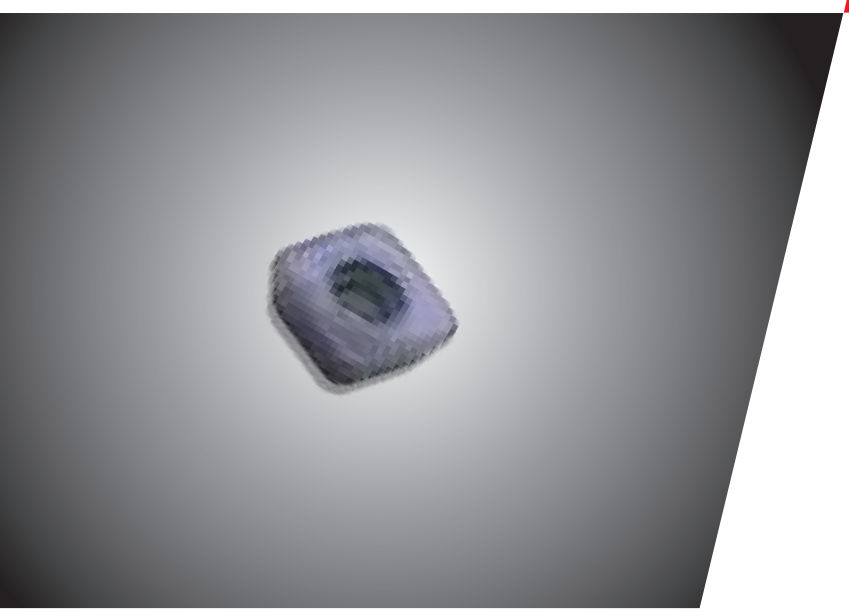
Recommended $f_z \geq 0.5$ / tooth

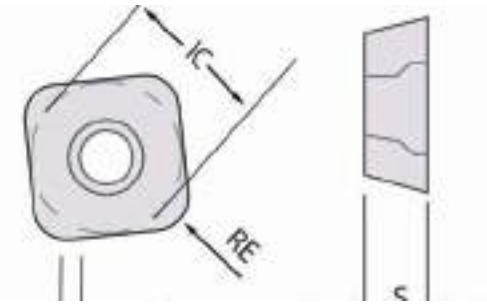
Profile when shoulder and slot milling



Insert	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	5.9	0.8	1.0
SPLX13	13	3.0	8.5	1.0	2.0

SDKW13





4 CORNER HIGH FEED INSERT

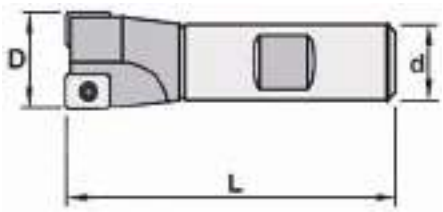
Reduces tool pressure and rake angles for smoother cutting

DESIGNATION	GRADE	RE	BS	IC	S	FZ	AP max
SDKW 130420-HF	XT830	1.9	1.45	12.7	4.7	0.60~1.20	0.3-2
SDKT 130420-HF	XT830	1.9	1.45	12.7	4.7	0.60~1.40	0.3-2

STOCKABLE NON STOCKABLE

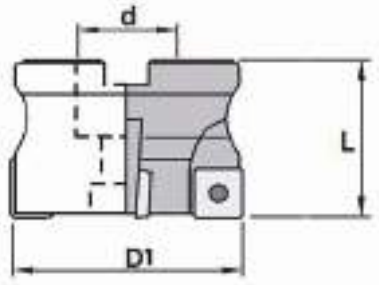
END MILL CUTTER

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

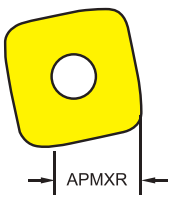


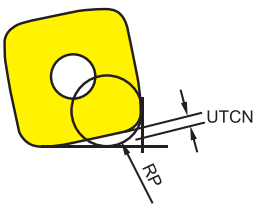
SHELL MILL CUTTER

DESIGNATION	D	DE	D	L	Z
XTFFC-D50-Z4-SDKW1304	50	38	22	40	4
XTFFC-D63-Z5-SDKW1304	63	76	22	40	5
XTFFC-D80-Z6-SDKW1304	80	93	27	50	6
XTFFC-D100-Z7-SDKW130	100	113	32	63	7
XTFFC-D125-210-SDKW1304	125	138	40	63	10



Technical Information





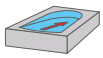
APMXR Radial AP Max	RP Programmed Corner R	UTCN Uncut Thickness
8.6	R3.5	0.94

XOGU11

Application

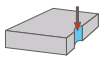
1) Face milling

2) Angled milling

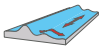


3) Helical plunging

4) Plunge milling



5) Profile milling



6) Pocket milling

7) Slot milling

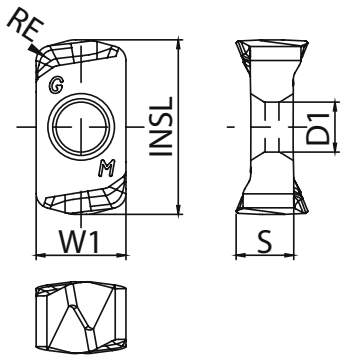
Benefits

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

HFL | Applicable inserts

Description	GRADE	DIMENSIONS (MM)				
		W1	S	D2	INSL	RE
XOGU110310-GM	XT830	6.2	3.96	3.45	11.9	1.0
XOGU110310-GM	XT930-C	6.2	3.96	3.45	11.9	1.0
XOGU110310-GM	XT125	6.2	3.96	3.45	11.9	1.0
XOGU110310-GM	XT820	6.2	3.96	3.45	11.9	1.0

STOCKABLE NON STOCKABLE



HFL | End mill

Standard (Straight)

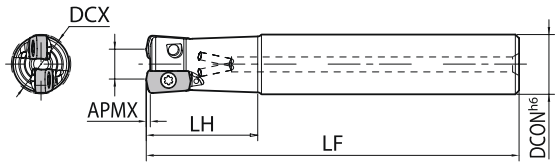


Fig.1

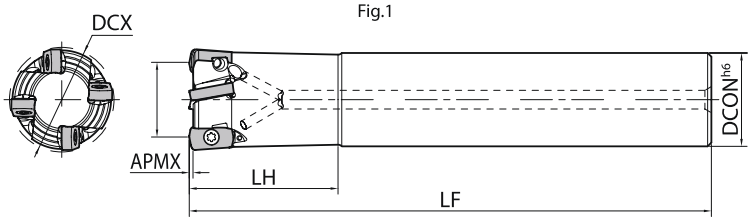


Fig.2

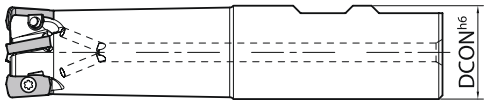


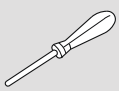
Fig.3

Toolholder dimensions

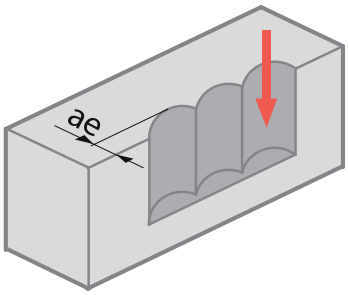
SHANK	DESIGNATION	NO OF INSERTS	DIMENSIONS (MM)				
			DCX	DCON	LH	LF	APMX
Standard (Straight)	HFL16-S16-03-2T-100L-XOGU11	2	16	16	30	100	1
	HFL20-S20-03-3T-130L-XOGU11	3	20	20	50	130	1
	HFL25-S25-03-4T-140L-XOGU11	4	25	25	60	140	1
	HFL32-S32-03-5T-150L-XOGU11	5	32	32	70	150	1
Arbour Type	HFL40R-A16-03-6T-XOGU11	6	40	16	-	-	1
	HFL50R-A22-03-8T-XOGU11	8	50	22			1

STOCKABLE NON STOCKABLE

Spare parts and applicable inserts

Description	Spare parts		Applicable inserts
	Clamp screw	Wrench	
			
HFL...-XOGU11-...	M3x7	T-8	XOGU110310-GM

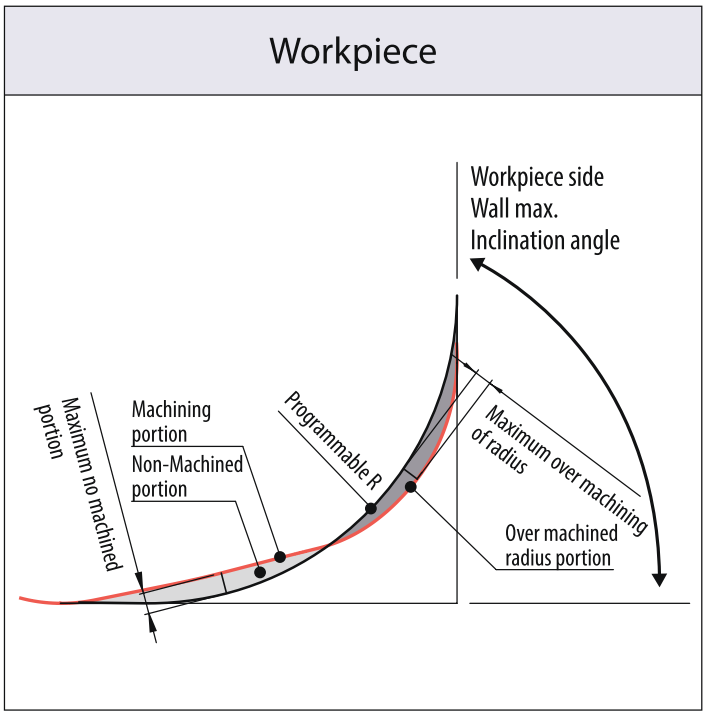
Plunging



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

Description	Maximum width of cut (ae)
HFL	3.5

Approximate programming radius adjustment

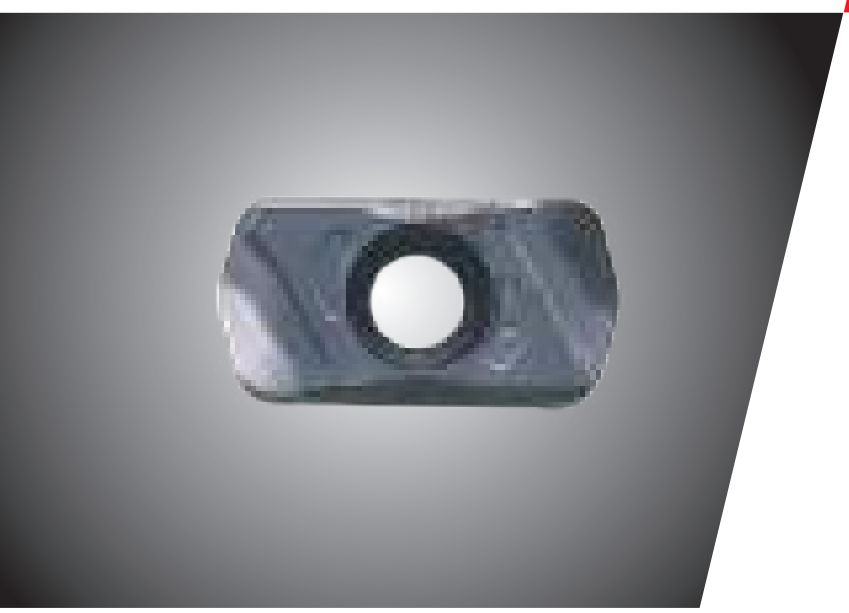


HFL		
Programmable R. (mm)	Overcut Portion (mm)	Undercut Portion (mm)
R1.6 (Recommended)	0	0.39
R2.0	0.09	0.35
R2.5	0.26	0.26
R3.0	0.46	0.17

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

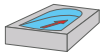
ZNMU10



Application

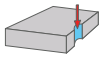
1) Face milling

2) Angled milling

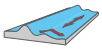


3) Helical plunging

4) Plunge milling



5) Profile milling



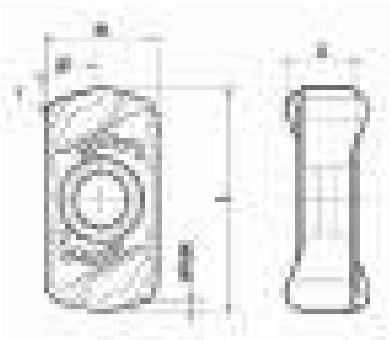
6) Pocket milling

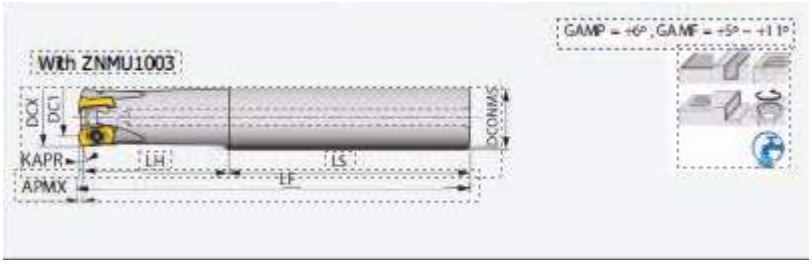
7) Slot milling

4 CORNER HI-FEED INSERT

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

STOCKABLE NON STOCKABLE



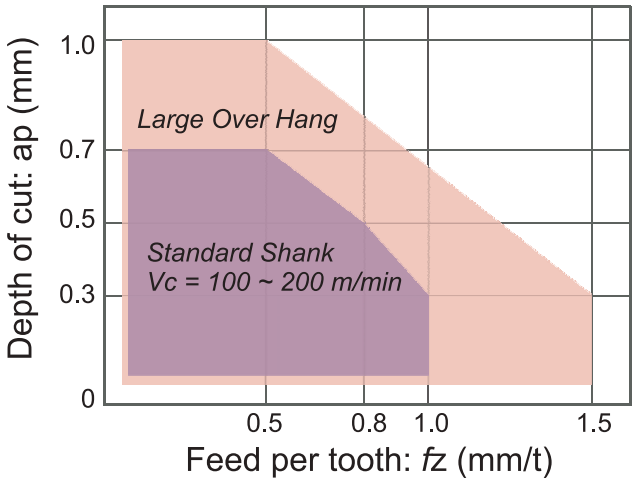


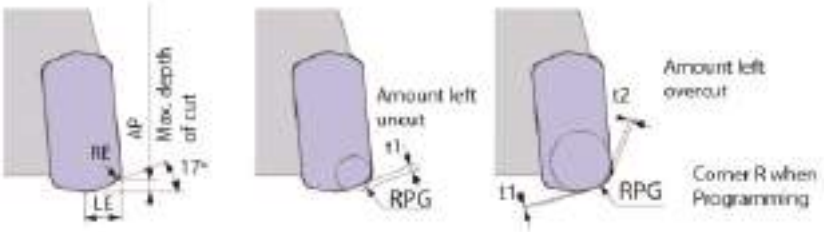
DESIGNATION	D	d	L1	L	Z
XTFFC-1616-30FL-T2-ZNMU100	16	16	60	200	2
XTFFC-2020-45FL-T3-ZNMU100	20	20	60	200	3
XTFFC-2525-40FL-T4-ZNMU100	25	25	60	200	4

STOCKABLE NON STOCKABLE

Tool geometry on programming:

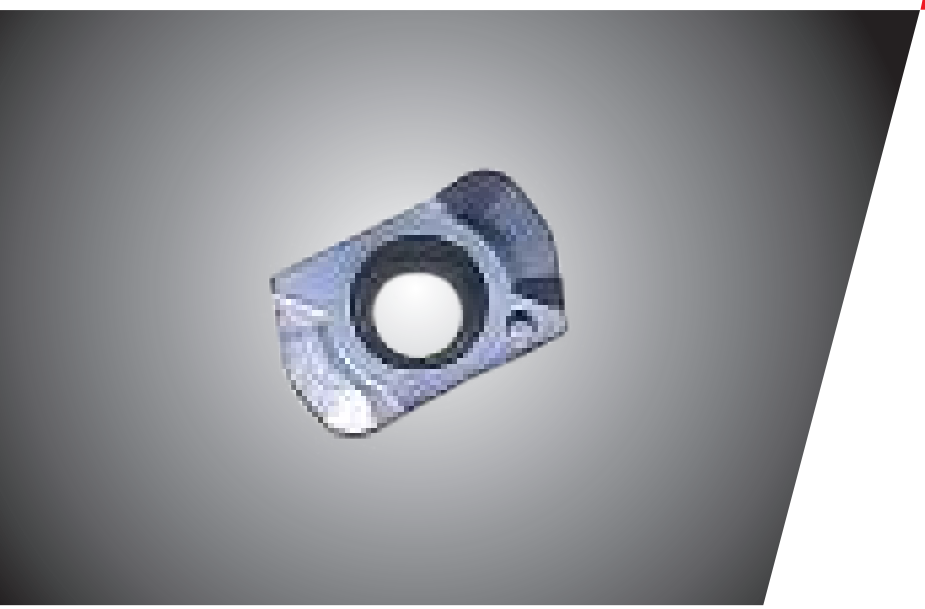
The tool should be considered as radius cutter, when programming for CAM. The corner radius should be set as R = 1.5mm. If larger radius is used, overcutting will occur. The following table shows the amount left uncut (t1) and overcut (t2).

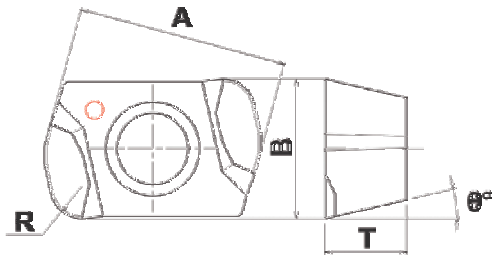




MAX.DEPT OF CUT APMX (MM)	CORNER RADIUS RE (MM)	LE (MM)	CORNER R WHEN PRO-GRAMMING RPG	AMOUNT LEFT UNCUT T1(MM)	AMOUNT LEFT UNCUT T2(MM)
1.0	1.2	3.0	1.0	0.6	-
1.0	1.2	3.0	1.5	0.5	-
1.0	1.2	3.0	2.0	0.25	0.08
1.0	1.2	3.0	2.5	0.14	0.26

ZOMW06





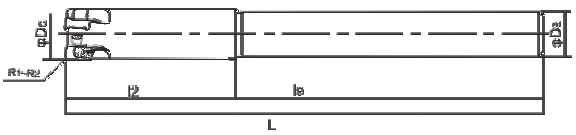
2 CORNER HI FEED INSERT WITH CORNER RADIUS 1
3D GEOMETRY ALLOWS FOR LOWER CUTTING FORCE AND MULTI BLADE POSSIBILITY

DESIGNATION	GRADE	DIMENSION (MM)				
		A	T	B	R	E
ZOMW060210	XT930	6.5	2.5	4.3	1.0	13

STOCKABLE NON STOCKABLE

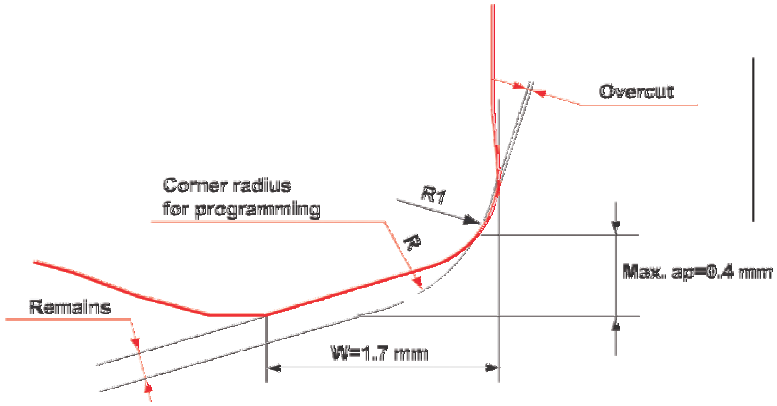
END MILL CUTTER

Type	Item	No.of Inserts	Dimensions (mm)				
			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

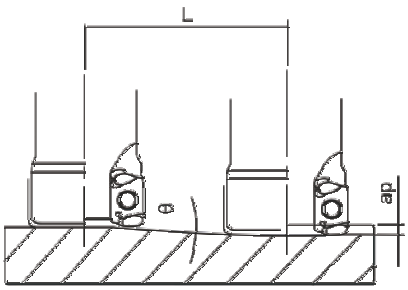
Definition of Corner Radius for Programming



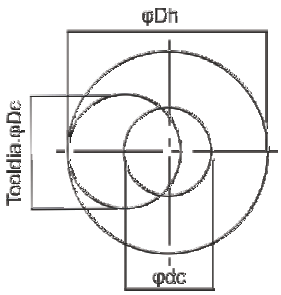
Corner Radius for Programming	Over Cut	Remains (mm)
R1.0 (Recommended)	0	0.17
R1.5	0.09	0.08
R2.0	0.30	0

Instructions for Profile Milling with "ZOMW06" Type Insert

Helical Interpolation



Helical Interpolation



Calculation of Tool Pass Dia.

$$\varphi dc = \varphi Dh - \varphi Dc$$

Tool Pass dia. Bore dia. Tool dia.

- Depth of cut per one circle should not exceed max. depth of cut ap.
- Down cutting is recommended, 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 s tandard cutting condition table.

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

Notes

Notes

XCUT®
TECHNOLOGIES

SOLID CARBIDE SERIES

XCUT TECHNOLOGIES DH-S

XCUT TECHNOLOGIES VARI

XCUT TECHNOLOGIES DELTA - MAXX

XCUT TECHNOLOGIES DELTA HARD

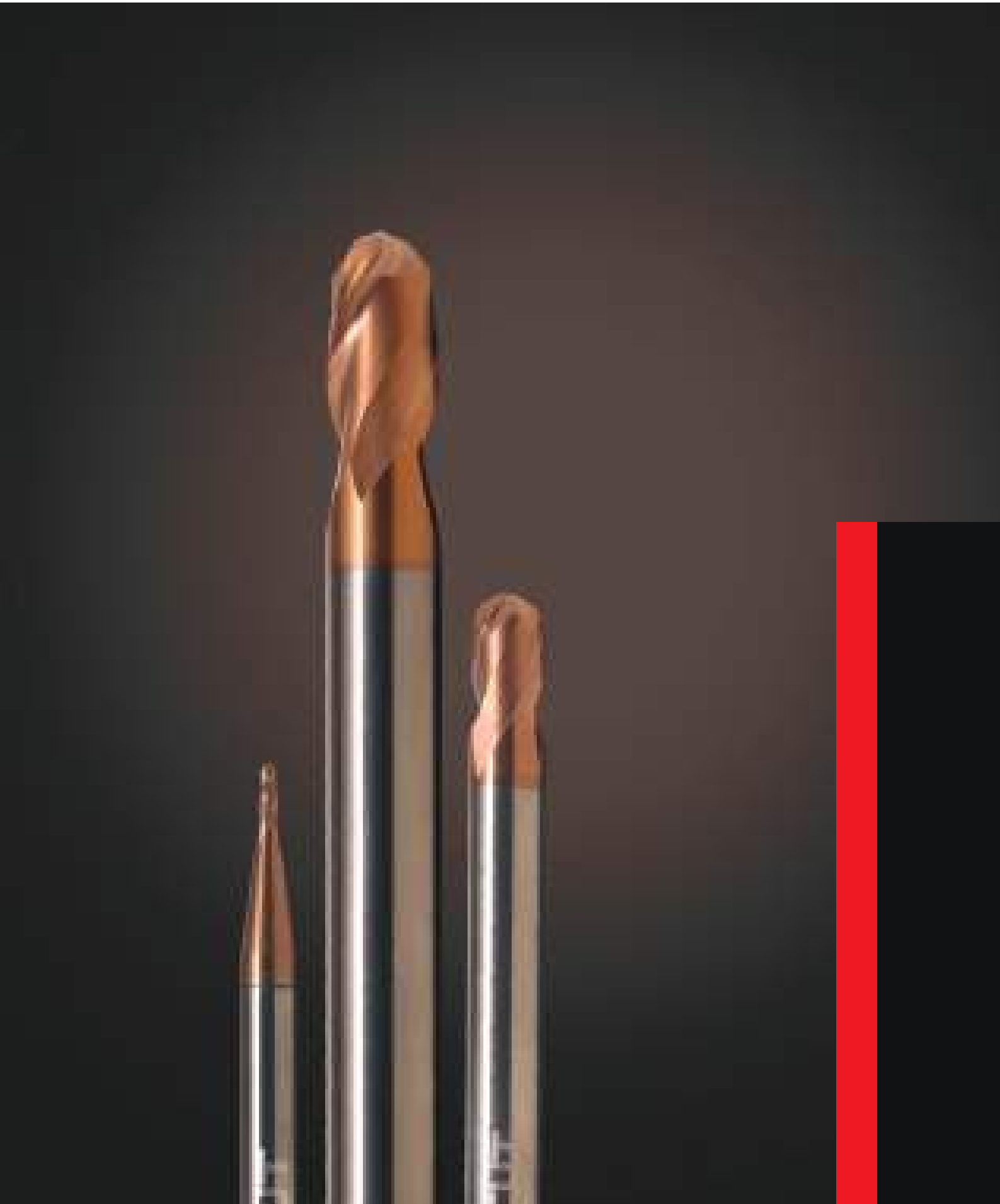
XCUT TECHNOLOGIES MULTI

XCUT TECHNOLOGIES PREMIUM

Notes

XCUT TECHNOLOGIES

DH-S



Application

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

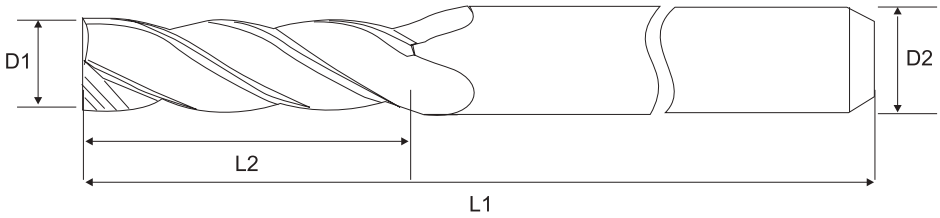
features

- 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

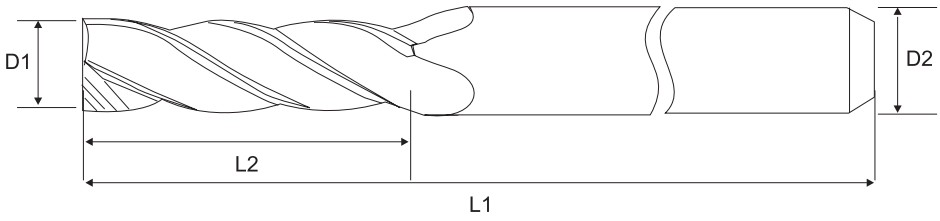
4 Flute Standard Endmills



ITEM DESCRIPTION	DIA	SHANK	WL	OAL	STOCK
EM1N4D4DH-S	1	4	3	50	O
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	5	13	50	●
EM5N4D6DH-S	5	6	13	50	●
EM6N4DH-S	6	6	15	50	●
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 O NONSTOCKABLE

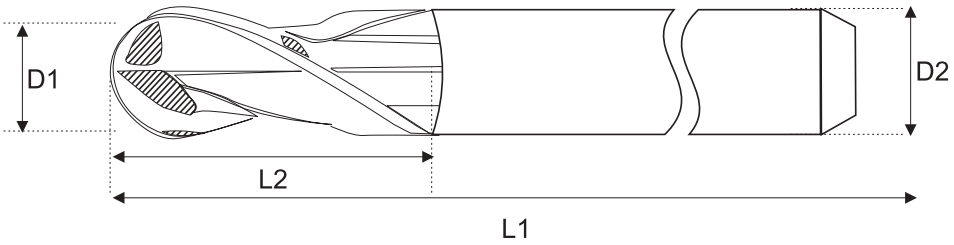
4 Flute Square Long & Extra Long Endmills



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

● STOCKABLE O NONSTOCKABLE

2 Flute Standard Ballnose



ITEM DESCRIPTION	DIA	SHANK	WL	OAL	STOCK
BN0.8N2F6DH-S	R0.4	4	6	50	O
BN1N2D4DH-S	R0.5	4	2	50	●
BN1N2F6DH-S	R0.5	4	6	50	O
BN1N2F10DH-S	R0.5	4	10	50	O
BN1.5N2D4DH-S	R0.75	4	4	50	●
BN1.5N2F10DH-S	R0.75	4	10	50	O
BN1.5N2F12DH-S	R0.75	4	12	50	O
BN2N2D4DH-S	R1	4	4	50	●
BN2N2F10DH-S	R1	4	10	50	O
BN2N2F12DH-S	R1	4	12	50	O
BN2.5N2D4DH-S	R1.25	4	6	50	O
BN3N2D4DH-S	R1.5	4	6	50	●
BN3N2F12DH-S	R1.5	4	12	50	O
BN3N2F20DH-S	R1.5	4	20	50	O
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

0.8 µm

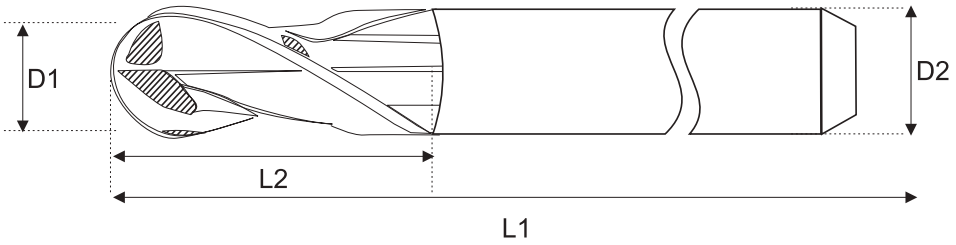
Co 12%

HRC ▸68

2 flutes

● STOCKABLE o NONSTOCKABLE

2 Flute Long & Extra Long Ballnose



ITEM DESCRIPTION	DIA	SHANK	WL	OAL	STOCK
BN3XL2D4DH-S	R1.5	4	8	100	O
BN4L2DH-S	R2	4	10	75	●
BN4XL2DH-S	R2	4	10	100	●
BN6L2DH-S	R3	6	12	75	O
BN6LR2DH-S	R3	6	12	100	●
BN8L2DH-S	R4	8	16	75	O
BN8LR2DH-S	R4	8	16	100	●
BN10LR2DH-S	R5	10	20	100	●
BN12LR2DH-S	R6	12	24	100	●

● STOCKABLE O NONSTOCKABLE

TiSi

MG

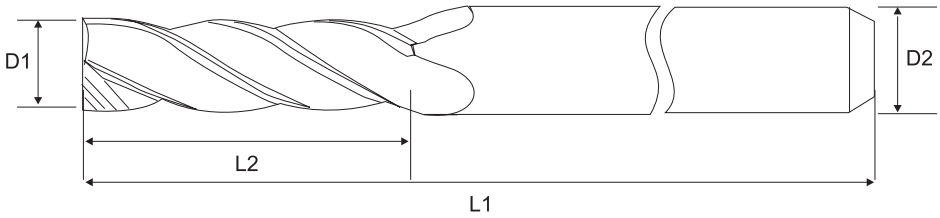
0.8 µm

Co 12%

HRC ▸68

2 flutes

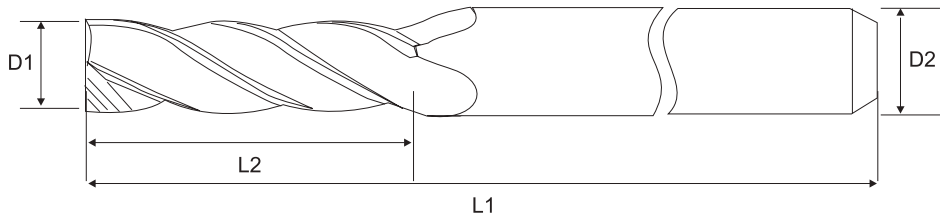
4 Flute Corner Radius Standard Endmills



ITEM DESCRIPTION	DIA	SHANK	WL	OAL	STOCK
EM3N4CR0.5D4DH-S	3R0.5	4	6	50	O
EM3N4CR1D4DH-S	3R1	4	6	50	O
EM4N4CR0.5DH-S	4R0.5	4	8	50	O
EM4N4CR1DH-S	4R1	4	8	50	O
EM5N4CR0.5D6DH-S	5R0.5	6	10	50	O
EM5N4CR1D6DH-S	5R1	6	10	50	O
EM6N4CR0.5DH-S	6R0.5	6	12	50	●
EM6N4CR1DH-S	6R1	6	12	50	●
EM8N4CR0.5DH-S	8R0.5	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 O NONSTOCKABLE

4 Flute Corner Radius Long & Extra Long Endmills



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

TiSi

MG

0.8 µm

Co 12%

HRC ▸68

4 flute

● STOCKABLE O NONSTOCKABLE

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 D2 SKH, SKS 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	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	187 ~ 188	0.005 ~ 0.007	≤0.05D(MAX0.5)	≤0.1D	39730 ~ 40000	400 ~ 560
		2	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	0.000 ~ 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 ~ 0.003	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 240
		0.8	2	101	0.002 ~ 0.003	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 240
		1	2	126	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	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	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL (63~68 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	126	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	2	140 ~ 234	0.002 ~ 0.003	≤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 ~ 210
		12	2	140 ~ 234	0.015 ~ 0.017	≤0.05D(MAX0.5)	≤0.2D	3720 ~ 6210	110 ~ 210
		14	2	140 ~ 234	0.017 ~ 0.019	≤0.05D(MAX0.5)	≤0.2D	3190 ~ 5320	110 ~ 200
		16	2	140 ~ 234	0.019 ~ 0.021	≤0.05D(MAX0.5)	≤0.2D	2790 ~ 4660	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	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL (63~68 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	126	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	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	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	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	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	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 ~ 262	0.095 ~ 0.104	≤0.05D(MAX0.5)	≤0.2D	2980 ~ 4170	570 ~ 870

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	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 ~ 0.004	≤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	175 ~ 188	0.005 ~ 0.007	≤0.05D(MAX0.5)	≤0.1D	37080 ~ 40000	370 ~ 560
		2	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 ~ 244	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	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, SUS 420 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	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 ~ 225	0.008 ~ 0.010	≤0.05D(MAX0.5)	≤0.2D	23840 ~ 35750	380 ~ 720
		2.5	2	150 ~ 225	0.010 ~ 0.012	≤0.05D(MAX0.5)	≤0.2D	19070 ~ 28600	380 ~ 690
		3	2	150 ~ 225	0.012 ~ 0.015	≤0.05D(MAX0.5)	≤0.2D	15890 ~ 23840	380 ~ 720
		4	2	150 ~ 225	0.017 ~ 0.019	≤0.05D(MAX0.5)	≤0.2D	11920 ~ 17880	410 ~ 680
		5	2	150 ~ 225	0.021 ~ 0.024	≤0.05D(MAX0.5)	≤0.2D	9530 ~ 14300	400 ~ 690
		6	2	150 ~ 225	0.026 ~ 0.029	≤0.05D(MAX0.5)	≤0.2D	7950 ~ 11920	410 ~ 690
		8	2	150 ~ 225	0.033 ~ 0.036	≤0.05D(MAX0.5)	≤0.2D	5960 ~ 8940	390 ~ 640
		10	2	150 ~ 225	0.039 ~ 0.043	≤0.05D(MAX0.5)	≤0.2D	4770 ~ 7150	370 ~ 610
		12	2	150 ~ 225	0.045 ~ 0.050	≤0.05D(MAX0.5)	≤0.2D	3970 ~ 5960	360 ~ 600
		14	2	150 ~ 225	0.052 ~ 0.057	≤0.05D(MAX0.5)	≤0.2D	3410 ~ 5110	350 ~ 580
		16	2	150 ~ 225	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 ~ 225	0.071 ~ 0.078	≤0.05D(MAX0.5)	≤0.2D	2380 ~ 3580	340 ~ 560

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 ~ 0.001	≤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 ~ 0.003	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 240
		0.8	2	101	0.002 ~ 0.003	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 240
		1	2	126	0.002 ~ 0.004	≤0.05D(MAX0.5)	≤0.1D	40000	160 ~ 320
		1.5	2	140 ~ 188	0.004 ~ 0.006	≤0.05D(MAX0.5)	≤0.1D	29660 ~ 40000	240 ~ 480
		2	2	140 ~ 210	0.006 ~ 0.008	≤0.05D(MAX0.5)	≤0.2D	22250 ~ 33370	270 ~ 530
		2.5	2	140 ~ 210	0.008 ~ 0.010	≤0.05D(MAX0.5)	≤0.2D	17800 ~ 26700	280 ~ 530
		3	2	140 ~ 210	0.010 ~ 0.012	≤0.05D(MAX0.5)	≤0.2D	14830 ~ 22250	300 ~ 530
		4	2	140 ~ 210	0.013 ~ 0.015	≤0.05D(MAX0.5)	≤0.2D	11120 ~ 16680	290 ~ 500
		5	2	140 ~ 210	0.017 ~ 0.019	≤0.05D(MAX0.5)	≤0.2D	8900 ~ 13350	300 ~ 510
		6	2	140 ~ 210	0.021 ~ 0.023	≤0.05D(MAX0.5)	≤0.2D	7420 ~ 11120	310 ~ 510
		8	2	140 ~ 210	0.026 ~ 0.029	≤0.05D(MAX0.5)	≤0.2D	5560 ~ 8340	290 ~ 480
		10	2	140 ~ 210	0.031 ~ 0.034	≤0.05D(MAX0.5)	≤0.2D	4450 ~ 6670	280 ~ 450
		12	2	140 ~ 210	0.036 ~ 0.040	≤0.05D(MAX0.5)	≤0.2D	3710 ~ 5560	270 ~ 440
		14	2	140 ~ 210	0.041 ~ 0.046	≤0.05D(MAX0.5)	≤0.2D	3180 ~ 4770	260 ~ 440
		16	2	140 ~ 210	0.047 ~ 0.051	≤0.05D(MAX0.5)	≤0.2D	2780 ~ 4170	260 ~ 430
		18	2	140 ~ 210	0.052 ~ 0.057	≤0.05D(MAX0.5)	≤0.2D	2470 ~ 3710	260 ~ 420
		20	2	139 ~ 210	0.057 ~ 0.063	≤0.05D(MAX0.5)	≤0.2D	2220 ~ 3340	250 ~ 420

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 (63~68 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	0.001 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	35750 ~ 40000	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 ~ 200
		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	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDENED STEEL (63~68 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 ~ 40000	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	M26,27	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	37240 ~ 40000	300 ~ 480
		1.5	2	117 ~ 164	0.007 ~ 0.009	≤0.05D(MAX0.5)	≤0.1D	24830 ~ 34760	350 ~ 630
		2	2	117 ~ 164	0.010 ~ 0.012	≤0.05D(MAX0.5)	≤0.2D	18620 ~ 26070	370 ~ 630
		2.5	2	117 ~ 164	0.013 ~ 0.016	≤0.05D(MAX0.5)	≤0.2D	14900 ~ 20860	390 ~ 670
		3	2	117 ~ 164	0.016 ~ 0.019	≤0.05D(MAX0.5)	≤0.2D	12410 ~ 17380	400 ~ 660
		4	2	117 ~ 164	0.022 ~ 0.025	≤0.05D(MAX0.5)	≤0.2D	9310 ~ 13030	410 ~ 650
		5	2	117 ~ 164	0.029 ~ 0.032	≤0.05D(MAX0.5)	≤0.2D	7450 ~ 10430	430 ~ 670
		6	2	117 ~ 164	0.035 ~ 0.038	≤0.05D(MAX0.5)	≤0.2D	6210 ~ 8690	430 ~ 660
		8	2	117 ~ 164	0.043 ~ 0.048	≤0.05D(MAX0.5)	≤0.2D	4660 ~ 6520	400 ~ 630
		10	2	117 ~ 164	0.052 ~ 0.057	≤0.05D(MAX0.5)	≤0.2D	3720 ~ 5210	390 ~ 590
		12	2	117 ~ 164	0.061 ~ 0.067	≤0.05D(MAX0.5)	≤0.2D	3100 ~ 4340	380 ~ 580
		14	2	117 ~ 164	0.069 ~ 0.076	≤0.05D(MAX0.5)	≤0.2D	2660 ~ 3720	370 ~ 570
		16	2	117 ~ 164	0.078 ~ 0.085	≤0.05D(MAX0.5)	≤0.2D	2330 ~ 3260	360 ~ 550
		18	2	117 ~ 164	0.086 ~ 0.095	≤0.05D(MAX0.5)	≤0.2D	2070 ~ 2900	360 ~ 550
		20	2	117 ~ 164	0.095 ~ 0.104	≤0.05D(MAX0.5)	≤0.2D	1860 ~ 2610	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	-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 ~ 0.004	≤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 ~ 19470	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 ~ 0.038	≤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	1740 ~ 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	14900 ~ 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	93 ~ 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	93 ~ 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	93 ~ 140	0.058 ~ 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

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 ~ 0.001	≤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	87 ~ 101	0.002 ~ 0.003	≤0.05D(MAX0.5)	≤0.1D	34760 ~ 40000	140 ~ 240
		0.8	2	87 ~ 101	0.002 ~ 0.003	≤0.05D(MAX0.5)	≤0.1D	34760 ~ 40000	140 ~ 240
		1	2	87 ~ 126	0.002 ~ 0.004	≤0.05D(MAX0.5)	≤0.1D	27810 ~ 40000	110 ~ 320
		1.5	2	87 ~ 131	0.004 ~ 0.006	≤0.05D(MAX0.5)	≤0.1D	18540 ~ 27810	150 ~ 330
		2	2	87 ~ 131	0.006 ~ 0.008	≤0.05D(MAX0.5)	≤0.2D	13900 ~ 20860	170 ~ 330
		2.5	2	87 ~ 131	0.008 ~ 0.010	≤0.05D(MAX0.5)	≤0.2D	11120 ~ 16680	180 ~ 330
		3	2	87 ~ 131	0.010 ~ 0.012	≤0.05D(MAX0.5)	≤0.2D	9270 ~ 13900	190 ~ 330
		4	2	87 ~ 131	0.013 ~ 0.015	≤0.05D(MAX0.5)	≤0.2D	6950 ~ 10430	180 ~ 310
		5	2	87 ~ 131	0.017 ~ 0.019	≤0.05D(MAX0.5)	≤0.2D	5560 ~ 8340	190 ~ 320
		6	2	87 ~ 131	0.021 ~ 0.023	≤0.05D(MAX0.5)	≤0.2D	4630 ~ 6950	190 ~ 320
		8	2	87 ~ 131	0.026 ~ 0.029	≤0.05D(MAX0.5)	≤0.2D	3480 ~ 5210	180 ~ 300
		10	2	87 ~ 131	0.031 ~ 0.034	≤0.05D(MAX0.5)	≤0.2D	2780 ~ 4170	170 ~ 280
		12	2	87 ~ 131	0.036 ~ 0.040	≤0.05D(MAX0.5)	≤0.2D	2320 ~ 3480	170 ~ 280
		14	2	88 ~ 131	0.041 ~ 0.046	≤0.05D(MAX0.5)	≤0.2D	1990 ~ 2980	160 ~ 270
		16	2	87 ~ 131	0.047 ~ 0.051	≤0.05D(MAX0.5)	≤0.2D	1740 ~ 2610	160 ~ 270
		18	2	87 ~ 131	0.052 ~ 0.057	≤0.05D(MAX0.5)	≤0.2D	1540 ~ 2320	160 ~ 260
		20	2	87 ~ 131	0.057 ~ 0.063	≤0.05D(MAX0.5)	≤0.2D	1390 ~ 2090	160 ~ 260

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 (63~68 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 (63~68 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	66 ~ 101	0.000 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	26070 ~ 40000	20 ~ 80
		0.8	2	66 ~ 101	0.000 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	26070 ~ 40000	20 ~ 80
		1	2	66 ~ 109	0.001 ~ 0.001	≤0.05D(MAX0.5)	≤0.1D	20860 ~ 34760	40 ~ 70
		1.5	2	66 ~ 109	0.001 ~ 0.002	≤0.05D(MAX0.5)	≤0.1D	13900 ~ 23170	30 ~ 90
		2	2	66 ~ 109	0.002 ~ 0.002	≤0.05D(MAX0.5)	≤0.2D	10430 ~ 17380	40 ~ 70
		2.5	2	66 ~ 109	0.002 ~ 0.003	≤0.05D(MAX0.5)	≤0.2D	8340 ~ 13900	30 ~ 80
		3	2	66 ~ 109	0.003 ~ 0.004	≤0.05D(MAX0.5)	≤0.2D	6950 ~ 11590	40 ~ 90
		4	2	65 ~ 109	0.004 ~ 0.005	≤0.05D(MAX0.5)	≤0.2D	5210 ~ 8690	40 ~ 90
		5	2	66 ~ 109	0.006 ~ 0.006	≤0.05D(MAX0.5)	≤0.2D	4170 ~ 6950	50 ~ 80
		6	2	66 ~ 109	0.007 ~ 0.008	≤0.05D(MAX0.5)	≤0.2D	3480 ~ 5790	50 ~ 90
		8	2	66 ~ 109	0.009 ~ 0.010	≤0.05D(MAX0.5)	≤0.2D	2610 ~ 4340	50 ~ 90
		10	2	66 ~ 109	0.010 ~ 0.011	≤0.05D(MAX0.5)	≤0.2D	2090 ~ 3480	40 ~ 80
		12	2	66 ~ 109	0.012 ~ 0.013	≤0.05D(MAX0.5)	≤0.2D	1740 ~ 2900	40 ~ 80
		14	2	66 ~ 109	0.014 ~ 0.015	≤0.05D(MAX0.5)	≤0.2D	1490 ~ 2480	40 ~ 70
		16	2	65 ~ 109	0.016 ~ 0.017	≤0.05D(MAX0.5)	≤0.2D	1300 ~ 2170	40 ~ 70
		18	2	66 ~ 109	0.017 ~ 0.019	≤0.05D(MAX0.5)	≤0.2D	1160 ~ 1930	40 ~ 70
		20	2	65 ~ 109	0.019 ~ 0.021	≤0.05D(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	≤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	0.002 ~ 0.003	≤0.05D(MAX0.5)	≤0.1D	40000	320 ~ 480
		0.8	4	101	0.002 ~ 0.003	≤0.05D(MAX0.5)	≤0.1D	40000	320 ~ 480
		1	4	126	0.003 ~ 0.004	≤0.05D(MAX0.5)	≤0.1D	40000	480 ~ 640
		1.5	4	187 ~ 188	0.005 ~ 0.007	≤0.05D(MAX0.5)	≤0.1D	39730 ~ 40000	790 ~ 1120
		2	4	187 ~ 251	0.007 ~ 0.009	≤0.05D(MAX0.5)	≤0.2D	29790 ~ 40000	830 ~ 1440
		2.5	4	187 ~ 262	0.010 ~ 0.012	≤0.05D(MAX0.5)	≤0.2D	23840 ~ 33370	950 ~ 1600
		3	4	187 ~ 262	0.012 ~ 0.014	≤0.05D(MAX0.5)	≤0.2D	19860 ~ 27810	950 ~ 1560
		4	4	187 ~ 262	0.017 ~ 0.019	≤0.05D(MAX0.5)	≤0.2D	14900 ~ 20860	1010 ~ 1590
		5	4	187 ~ 262	0.021 ~ 0.024	≤0.05D(MAX0.5)	≤0.2D	11920 ~ 16680	1000 ~ 1600
		6	4	187 ~ 262	0.026 ~ 0.029	≤0.05D(MAX0.5)	≤0.2D	9930 ~ 13900	1030 ~ 1610
		8	4	187 ~ 262	0.033 ~ 0.036	≤0.05D(MAX0.5)	≤0.2D	7450 ~ 10430	980 ~ 1500
		10	4	187 ~ 262	0.039 ~ 0.043	≤0.05D(MAX0.5)	≤0.2D	5960 ~ 8340	930 ~ 1430
		12	4	187 ~ 262	0.045 ~ 0.050	≤0.05D(MAX0.5)	≤0.2D	4970 ~ 6950	890 ~ 1390
		14	4	187 ~ 262	0.052 ~ 0.057	≤0.05D(MAX0.5)	≤0.2D	4260 ~ 5960	890 ~ 1360
		16	4	187 ~ 262	0.058 ~ 0.064	≤0.05D(MAX0.5)	≤0.2D	3720 ~ 5210	860 ~ 1330
		18	4	187 ~ 262	0.065 ~ 0.071	≤0.05D(MAX0.5)	≤0.2D	3310 ~ 4630	860 ~ 1310
		20	4	187 ~ 262	0.071 ~ 0.078	≤0.05D(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 HRC) 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
		5	4	175 ~ 245	0.017 ~ 0.019	≤0.05D(MAX0.5)	≤0.2D	11120 ~ 15570	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	4	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 (63~68 HRC) 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 (60~65 HRC) 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
		1.5	4	50 ~ 70	0.008 ~ 0.011	≤ 1.0 D	≤ 0.3 D	10610 ~ 14850	340 ~ 650
		2	4	50 ~ 70	0.012 ~ 0.015	≤ 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

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	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)
HARDEDNED STEEL (63~68 HRC) AISI D2	M33	1	4	30 ~ 50	0.001 ~ 0.002	≤ 1.0 D	≤ 0.3 D	9550 ~ 15920	40 ~ 130
		1.5	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
		2.5	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
		5	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

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 (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

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	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

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 (63~68 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 (63~68 HRC) AISI D2	M33	1	4	24 ~ 40	0.001 ~ 0.002	≤ 1.0 D	≤ 0.3 D	7640 ~ 12730	30 ~ 100
		1.5	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
		2.5	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	≤ 0.5 D (MAX0.5)	2550 ~ 4240	50 ~ 100
		4	4	24 ~ 40	0.007 ~ 0.008	≤ 1.0 D	≤ 0.5 D (MAX0.5)	1910 ~ 3180	50 ~ 100
		5	4	24 ~ 40	0.009 ~ 0.010	≤ 1.0 D	≤ 0.5 D (MAX0.5)	1530 ~ 2550	60 ~ 100
		6	4	24 ~ 40	0.011 ~ 0.012	≤ 1.0 D	≤ 0.5 D (MAX0.5)	1270 ~ 2120	60 ~ 100
		8	4	24 ~ 40	0.013 ~ 0.015	≤ 1.0 D	≤ 0.5 D (MAX0.5)	950 ~ 1590	50 ~ 100
		10	4	24 ~ 40	0.016 ~ 0.018	≤ 1.0 D	≤ 0.5 D (MAX0.5)	760 ~ 1270	50 ~ 90
		12	4	24 ~ 40	0.019 ~ 0.021	≤ 1.0 D	≤ 0.5 D (MAX0.5)	640 ~ 1060	50 ~ 90
		14	4	24 ~ 40	0.021 ~ 0.024	≤ 1.0 D	≤ 0.5 D (MAX0.5)	550 ~ 910	50 ~ 90
		16	4	24 ~ 40	0.024 ~ 0.026	≤ 1.0 D	≤ 0.5 D (MAX0.5)	480 ~ 800	50 ~ 80
		18	4	24 ~ 40	0.027 ~ 0.029	≤ 1.0 D	≤ 0.5 D (MAX0.5)	420 ~ 710	50 ~ 80
		20	4	24 ~ 40	0.029 ~ 0.032	≤ 1.0 D	≤ 0.5 D (MAX0.5)	380 ~ 640	40 ~ 80
		22	4	24 ~ 40	0.032 ~ 0.035	≤ 1.0 D	≤ 0.5 D (MAX0.5)	350 ~ 580	40 ~ 80
		25	4	24 ~ 40	0.036 ~ 0.040	≤ 1.0 D	≤ 0.5 D (MAX0.5)	310 ~ 510	40 ~ 80

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 (45~52HRC) 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
		5	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

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	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

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 (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	M26	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
		5	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 ~ 190
		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

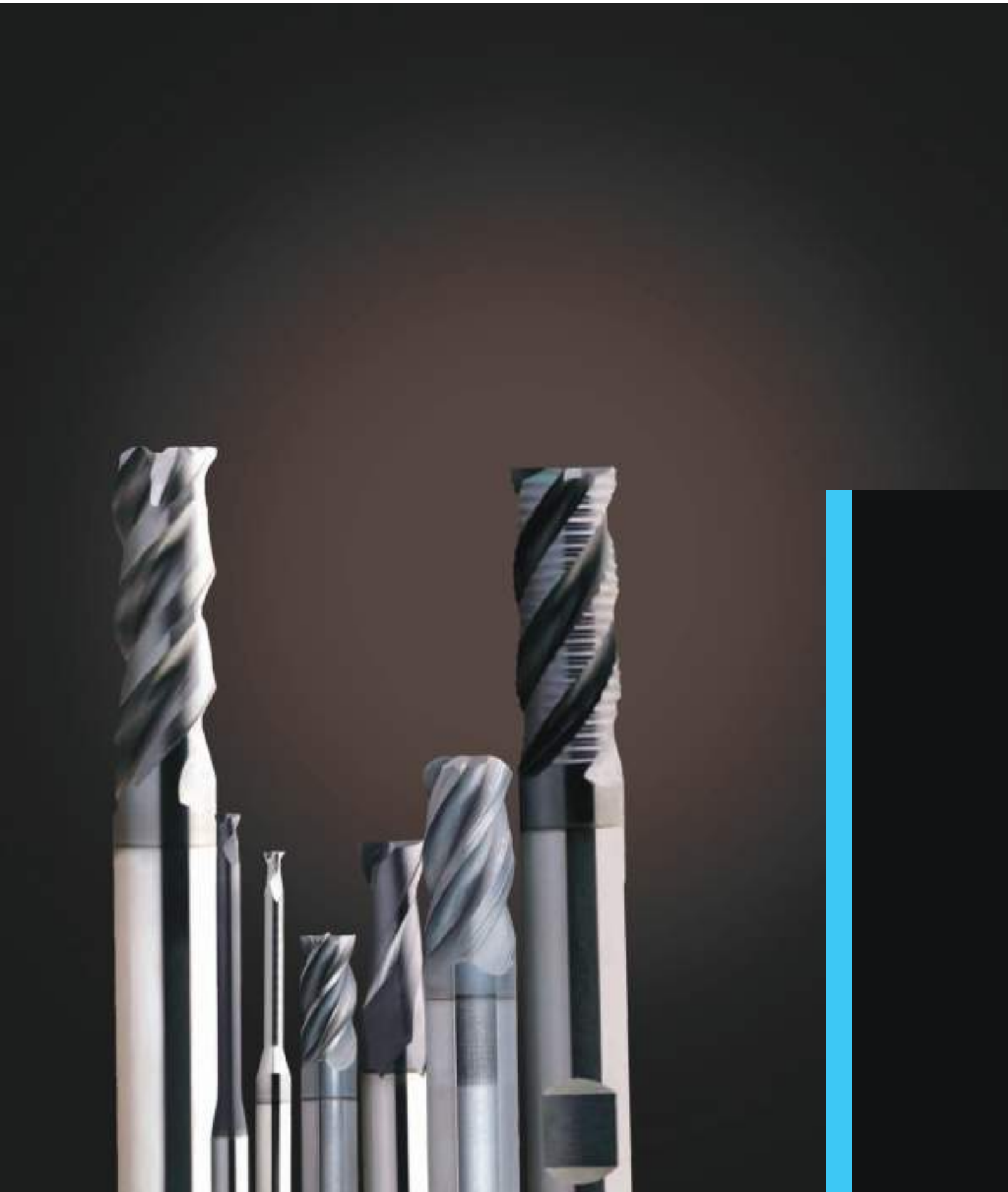
SIDE MILLING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDEDNED STEEL (63~68 HRC) AISI H13	M33	1	4	15 ~ 25	0.001 ~ 0.002	≤ 1.0 D	≤ 0.3 D	4770 ~ 7960	20 ~ 60
		1.5	4	15 ~ 25	0.002 ~ 0.003	≤ 1.0 D	≤ 0.3 D	3180 ~ 5310	30 ~ 60
		2	4	15 ~ 25	0.003 ~ 0.004	≤ 1.0 D	≤ 0.3 D	2390 ~ 3980	30 ~ 60
		2.5	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
		8	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

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 (45~52HRC) AISI H13	M26	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	90 ~ 140

XCUT TECHNOLOGIES VARI



4 Flute Square Endmill Up To 30 HRC

MG

0.8 µm

Co 10%

HRC ▸35

AlCrN

4 flute

40°

CODE	D1	D2	L1	L2	AVAILABLITY
EM1N4D3V	1	3	40	3	O
EM1N4D4V	1	4	40	3	O
EM1.5N4D3V	1.5	3	40	4.5	O
EM1.5N4D4V	1.5	4	40	4.5	O
EM2N4D3V	2	3	40	6.5	O
EM2N4D4V	2	4	40	6.5	O
EM2.5N4D3V	2.5	3	40	6.5	O
EM2.5N4D4V	2.5	4	40	6.5	O
EM3N4V	3	3	40	9	O
EM3N4D6V	3	6	50	9	O
EM4N4V	4	4	50	12	O
EM4N4D6V	4	6	50	12	O
EM5N4V	5	5	50	15	O
EM5N4D6V	5	6	50	15	O
EM6N4V	6	6	60	20	O
EM8N4V	8	8	64	20	O
EM10N4V	10	10	75	22	O
EM12N4V	12	12	75	25	O
EM14N4V	14	14	90	32	O
EM16N4V	16	16	90	32	O
EM18N4V	18	18	100	38	O
EM20N4V	20	20	100	38	O

● STOCKABLE ○ NONSTOCKABLE

Corner Radius 4 Flute Square Endmill Up To 30 HRC

CODE	D1	D2	L1	L2	R	AVAILABLITY
EM3N4CR0.3V	3	3	40	9	0.3	O
EM3N4CR0.5V	3	3	40	9	0.5	O
EM3N4D4CR0.3V	3	4	40	9	0.3	O
EM3N4D4CR0.5V	3	4	40	9	0.5	O
EM3N4D6CR0.3V	3	6	50	9	0.3	O
EM3N4D6CR0.5V	3	6	50	9	0.5	O
EM4N4CR0.3V	4	4	50	12	0.3	O
EM4N4CR0.5V	4	4	50	1	0.5	O
EM4N4CR1V	4	4	50	2	1	O
EM4N4D6CR0.3V	4	6	50	12	0.3	O
EM4N4D6CR0.5V	4	6	50	12	0.5	O
EM4N4D6CR1V	4	6	50	12	1	O
EM5N4CR0.3V	5	5	50	15	0.3	O
EM5N4CR0.5V	5	5	50	15	0.5	O
EM5N4CR1V	5	5	50	15	1	O
EM5N4D6CR0.3V	5	6	50	15	0.3	O
EM5N4D6CR0.5V	5	6	50	15	0.5	O
EM5N4D6CR1V	5	6	50	15	1	O
EM6N4CR0.3V	6	6	50	16	0.3	O
EM6N4CR0.5V	6	6	50	16	0.5	O
EM6N4CR1V	6	6	50	16	1	O

To Be continued...

● STOCKABLE ○ NONSTOCKABLE

Corner Radius 4 Flute Square Endmill Up To 30 HRC

MG

0.8 µm

Co 10%

HRC ▸35

AlCrN

4 flute

40°

CODE	D1	D2	L1	L2	R	AVAILABLITY
EM8N4CR0.3V	8	8	64	20	0.3	O
EM8N4CR0.5V	8	8	64	20	0.5	O
EM8N4CR1V	8	8	64	20	1	O
EM8N4CR1.5V	8	8	64	20	1.5	O
EM8N4CR2V	8	8	64	20	2	O
EM10N4CR0.3V	10	10	70	22	0.3	O
EM10N4CR0.5V	10	10	70	22	0.5	O
EM10N4CR1V	10	10	70	22	1	O
EM10N4CR1.5V	10	10	70	22	1.5	O
EM10N4CR2V	10	10	70	22	2	O
EM12N4CR0.3V	12	12	75	25	0.3	O
EM12N4CR0.5V	12	12	75	25	0.5	O
EM12N4CR1V	12	12	75	25	1	O
EM12N4CR1.5V	12	12	75	25	1.5	O
EM12N4CR2V	12	12	75	25	2	O
EM12N4CR2.5V	12	12	75	25	2.5	O
EM12N4CR3V	12	12	75	25	3	O

● STOCKABLE O NONSTOCKABLE

To Be continued...

Corner Radius 4 Flute Square Endmill Up To 30 HRC

CODE	D1	D2	L1	L2	R	AVAILABLITY
EM12N4(83)CR3V	12	12	83	26	3	O
EM14N4CR0.3V	14	14	83	32	0.3	O
EM14N4CR0.5V	14	14	83	32	0.5	O
EM14N4CR1V	14	14	83	32	1	O
EM14N4CR2V	14	14	83	32	2	O
EM14N4CR3V	14	14	83	32	3	O
EM16N4CR0.5V	16	16	90	32	0.5	O
EM16N4CR1V	16	16	90	32	1	O
EM16N4CR1.5V	16	16	90	32	1.5	O
EM16N4CR2V	16	16	90	32	2	O
EM16N4CR2.5V	16	16	90	32	2.5	O
EM16N4CR3V	16	16	90	32	3	O
EM16N4CR4V	16	16	90	32	4	O
EM18N4CR0.3V	18	18	92	38	0.3	O
EM18N4CR0.5V	18	18	92	38	0.5	O
EM18N4CR1V	18	18	92	38	1	O
EM18N4CR2V	18	18	92	38	2	O
EM18N4CR3V	18	18	92	38	3	O

MG

0.8 µm

Co 10%

HRC ▸35

AlCrN

4 flute

40°

● STOCKABLE O NONSTOCKABLE

To Be continued...

Corner Radius 4 Flute Square Endmill Up To 30 HRC

MG

0.8 µm

Co 10%

HRC ▸35

AlCrN

4 flute

40°

CODE	D1	D2	L1	L2	R	AVAILABLITY
EM18N4CR3V	18	18	92	38	3	O
EM20N4CR0.5V	20	20	100	38	20	O
EM20N4CR1V	20	20	100	38	20	O
EM20N4CR1.5V	20	20	100	38	20	O
EM20N4CR2V	20	20	100	38	20	O
EM20N4CR2.5V	20	20	100	38	20	O
EM20N4CR3V	20	20	100	38	20	O
EM20N4CR4V	20	20	100	38	20	O

● STOCKABLE ○ NONSTOCKABLE

Chamfer 4 Flute Square Endmill

CODE	D1	D2	L1	L2	C	AVAILABLITY
EM4N4C0.1V	4	6	57	11	0.1	O
EM5N4C0.1V	5	6	57	13	0.1	O
EM6N4C0.1V	6	6	57	13	0.1	O
EM8N4C0.2V	8	8	64	20	0.2	O
EM10N4C0.2V	10	10	72	22	0.2	O
EM12N4C0.2V	12	12	83	26	0.2	O
EM14N4C0.3V	14	14	83	26	0.3	O
EM16N4C0.3V	16	16	92	32	0.3	O
EM18N4C0.3V	18	18	92	32	0.3	O
EM20N4C0.4V	20	20	104	38	0.4	O

● STOCKABLE O NONSTOCKABLE

Plunge Mill 3 Flute Square Endmill

MG

0.8 µm

Co 10%

HRC ▸35

AlCrN

3 flute

45°

CODE	D1	D2	L1	L2	L3	C	AVAILABLITY
EM1N3D4C0.1NV	1	4	50	1.5	5	0.1	O
EM1.5N3D4C0.1NV	1.5	4	50	2.3	7.5	0.1	O
EM2N3D4C0.1NV	2	4	50	3	10	0.1	O
EM2.5N3D4C0.1NV	2.5	4	50	3.8	12.5	0.1	O
EM3N3D6C0.2NV	3	6	50	6	15	0.2	O
EM4N3D6C0.2NV	4	6	50	8	20	0.2	O
EM5N3D6C0.25NV	5	6	50	10	20	0.25	O
EM6N3C0.25NV	6	6	50	13	20	0.25	O
EM8N3C0.3NV	8	8	64	20	30	0.3	O
EM10N3C0.3NV	10	10	75	22	32	0.3	O
EM12N3C0.3NV	12	12	75	25	37	0.3	O
EM16N3C0.3NV	16	16	90	32	46	0.3	O

● STOCKABLE o NONSTOCKABLE

4 Flute Square Endmill Up To 45 HRC

CODE	D1	D2	L1	L2	L3	AVAILABLITY
EM3N4D6NV	3	6	57	9	15	O
EM4N4D6NV	4	6	57	12	20	O
EM5N4D6NV	5	6	57	13	20	O
EM6N4NV	6	6	57	13	20	O
EM8N4NV	8	8	64	20	30	O
EM10N4NV	10	10	72	22	32	O
EM12N4NV	12	12	83	26	37	O
EM14N4NV	14	14	83	32	44	O
EM16N4NV	16	16	92	32	46	O
EM18N4NV	18	18	92	38	53	O
EM20N4NV	20	20	104	38	58	O

● STOCKABLE O NONSTOCKABLE

Corner Radius 4 Flute Square Endmill Up To 45 HRC

MG
0.8 µm
Co 10%
HRC ▸35
AlCrN
4 flute
40°

CODE	D1	D2	L1	L2	L3	R	AVAILABLITY
EM3N4D6CR0.3NV	3	6	50	9	15	0.3	O
EM3N4D6CR0.5NV	3	6	50	9	15	0.5	O
EM4N4D6CR0.3NV	4	6	57	12	20	0.3	O
EM4N4D6CR0.5NV	4	6	57	12	20	0.5	O
EM4N4D6CR1NV	4	6	57	12	20	1	O
EM5N4D6CR0.3NV	5	6	57	15	20	0.3	O
EM5N4CR0.5NV	5	6	57	15	20	0.5	O
EM6N4CR0.3NV	6	6	57	16	20	0.3	O
EM6N4CR0.5NV	6	6	57	16	20	0.5	O
EM6N4CR1NV	6	6	57	16	20	1	O
EM8N4CR0.3NV	8	8	64	20	30	0.3	O
EM8N4CR0.5NV	8	8	64	20	30	0.5	O
EM8N4CR1NV	8	8	64	20	30	1	O
EM8N4CR1.5NV	8	8	64	20	30	1,5	O
EM8N4CR2NV	8	8	64	20	30	2	O
EM10N4CR0.3NV	10	10	72	22	32	0.3	O
EM10N4CR0.5NV	10	10	72	22	32	0.5	O
EM10N4CR1NV	10	10	72	22	32	1	O
EM10N4CR1.5NV	10	10	72	22	32	1.5	O
EM10N4CR2NV	10	10	72	22	32	2	O
EM12N4CR0.3NV	12	12	83	26	37	0.3	O
EM12N4CR0.5NV	12	12	83	26	37	0.5	O
EM12N4CR1NV	12	12	83	26	37	1	O
EM12N4CR2NV	12	12	83	26	37	2	O
EM12N4CR2.5NV	12	12	83	26	37	2.5	O
EM12N4CR3NV	12	12	83	26	37	3	O
EM14N4CR0.3NV	14	14	83	32	44	0.3	O
EM14N4CR0.5NV	14	14	83	32	44	0.5	O
EM14N4CR1NV	14	14	83	32	44	1	O
EM14N4CR2NV	14	14	83	32	44	2	O
EM14N4CR3NV	14	14	83	32	44	3	O

● STOCKABLE O NONSTOCKABLE

To Be continued...

Corner Radius 4 Flute Square Endmill Up To 45 HRC

CODE	D1	D2	L1	L2	L3	R	AVAILABLITY
EM16N4CR0.3NV	16	16	92	32	46	0.3	O
EM16N4CR0.5NV	16	16	92	32	46	0.5	O
EM16N4CR1NV	16	16	92	32	46	1	O
EM16N4CR2NV	16	16	92	32	46	2	O
EM16N4CR2.5NV	16	16	92	32	46	2.5	O
EM16N4CR3NV	16	16	92	32	46	3	O
EM16N4CR4NV	16	16	92	32	46	4	O
EM18N4CR0.5NV	18	18	92	38	53	0.3	O
EM18N4CR1NV	18	18	92	38	53	0.5	O
EM18N4CR1.5NV	18	18	92	38	53	1	O
EM18N4CR2NV	18	18	92	38	53	2	O
EM18N4CR3NV	18	18	92	38	53	3	O
EM20N4CR0.3NV	20	20	104	38	58	0.3	O
EM20N4CR0.5NV	20	20	104	38	58	0.5	O
EM20N4CR1NV	20	20	104	38	58	1	O
EM20N4CR2NV	20	20	104	38	58	2	O
EM20N4CR2.5NV	20	20	104	38	58	2.5	O
EM20N4CR3NV	20	20	104	38	58	3	O
EM20N4CR4NV	20	20	104	38	58	4	O

● STOCKABLE o NONSTOCKABLE

Rougher Chamfer 4 Flute Square Endmill

MG

0.8 µm

Co 10%

HRC ▸35

AlCrN

4 flute

40°

CODE	D1	D2	L1	L2	C	AVAILABLITY
EMR6N4C0.1V	6	6	50	16	0.1	O
EMR6N4(57)C0.1V	6	6	57	16	0.1	O
EMR8N4C0.2V	8	8	64	20	0.2	O
EMR10N4C0.2V	10	10	70	22	0.2	O
EMR10N4(72)C0.2V	10	10	72	22	0.2	O
EMR10N4(75)C0.2V	10	10	75	22	0.2	O
EMR12N4C0.2V	12	12	75	26	0.2	O
EMR12N4(83)C0.2V	12	12	83	26	0.2	O
EMR14N4C0.3V	14	14	83	26	0.3	O
EMR14N4(90)C0.3V	14	14	90	32	0.3	O
EMR16N4C0.3V	16	16	90	32	0.3	O
EMR16N4(92)C0.3V	16	16	92	32	0.3	O
EMR18N4C0.3V	18	18	92	32	0.3	O
EMR18N4(100)C0.3V	18	18	100	38	0.3	O
EMR20N4C0.4V	20	20	100	38	0.4	O
EMR20N4(104)C0.4V	20	2	104	38	0.4	O

● STOCKABLE ○ NONSTOCKABLE

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

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)
STAINLESS STEEL UP TO 35 HRC)	M16	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 HARD-ENED 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 ~ 0.022	≤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

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	≤1.0D	1.0 D	40000	640 ~ 960
		1.5	4	130 ~ 170	0.006 ~ 0.008	≤1.0D	1.0 D	27590 ~ 36080	660 ~ 1150
		2	4	130 ~ 170	0.009 ~ 0.011	≤1.0D	1.0 D	20690 ~ 27060	740 ~ 1190
		2.5	4	130 ~ 170	0.011 ~ 0.013	≤1.0D	1.0 D	16550 ~ 21650	730 ~ 1130
		3	4	130 ~ 170	0.014 ~ 0.016	≤1.0D	1.0 D	13790 ~ 18040	770 ~ 1150
		4	4	130 ~ 170	0.018 ~ 0.021	≤1.0D	1.0 D	10350 ~ 13530	750 ~ 1140
		5	4	130 ~ 170	0.023 ~ 0.026	≤1.0D	1.0 D	8280 ~ 10820	760 ~ 1130
		6	4	130 ~ 170	0.028 ~ 0.031	≤1.0D	1.0 D	6900 ~ 9020	770 ~ 1120
		8	4	130 ~ 170	0.034 ~ 0.037	≤1.0D	1.0 D	5170 ~ 6760	700 ~ 1000
		10	4	130 ~ 170	0.040 ~ 0.044	≤1.0D	1.0 D	4140 ~ 5410	660 ~ 950
		12	4	130 ~ 170	0.045 ~ 0.050	≤1.0D	1.0 D	3450 ~ 4510	620 ~ 900
		14	4	130 ~ 170	0.051 ~ 0.056	≤1.0D	1.0 D	2960 ~ 3870	600 ~ 870
		16	4	130 ~ 170	0.057 ~ 0.063	≤1.0D	1.0 D	2590 ~ 3380	590 ~ 850
		18	4	130 ~ 170	0.063 ~ 0.069	≤1.0D	1.0 D	2300 ~ 3010	580 ~ 830
		20	4	130 ~ 170	0.068 ~ 0.075	≤1.0D	1.0 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 ~ 140	0.006 ~ 0.008	≤1.0D	1.0 D	25460 ~ 29710	610 ~ 950
		2	4	120 ~ 140	0.009 ~ 0.011	≤1.0D	1.0 D	19100 ~ 22280	690 ~ 980
		2.5	4	120 ~ 140	0.011 ~ 0.013	≤1.0D	1.0 D	15280 ~ 17830	670 ~ 930
		3	4	120 ~ 140	0.014 ~ 0.016	≤1.0D	1.0 D	12730 ~ 14850	710 ~ 950
		4	4	120 ~ 140	0.018 ~ 0.021	≤1.0D	1.0 D	9550 ~ 11140	690 ~ 940
		5	4	120 ~ 140	0.023 ~ 0.026	≤1.0D	1.0 D	7640 ~ 8910	700 ~ 930
		6	4	120 ~ 140	0.028 ~ 0.031	≤1.0D	1.0 D	6370 ~ 7430	710 ~ 920
		8	4	120 ~ 140	0.034 ~ 0.037	≤1.0D	1.0 D	4770 ~ 5570	650 ~ 820
		10	4	120 ~ 140	0.040 ~ 0.044	≤1.0D	1.0 D	3820 ~ 4460	610 ~ 780
		12	4	120 ~ 140	0.045 ~ 0.050	≤1.0D	1.0 D	3180 ~ 3710	570 ~ 740
		14	4	120 ~ 140	0.051 ~ 0.056	≤1.0D	1.0 D	2730 ~ 3180	560 ~ 710
		16	4	120 ~ 140	0.057 ~ 0.063	≤1.0D	1.0 D	2390 ~ 2790	540 ~ 700
		18	4	120 ~ 140	0.063 ~ 0.069	≤1.0D	1.0 D	2120 ~ 2480	530 ~ 680
		20	4	120 ~ 140	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	≤1.0D	1.0 D	19100 ~ 25460	230 ~ 510
		1.5	4	60 ~ 80	0.005 ~ 0.007	≤1.0D	1.0 D	12730 ~ 16980	250 ~ 480
		2	4	60 ~ 80	0.007 ~ 0.009	≤1.0D	1.0 D	9550 ~ 12730	270 ~ 460
		2.5	4	60 ~ 80	0.009 ~ 0.011	≤1.0D	1.0 D	7640 ~ 10190	280 ~ 450
		3	4	60 ~ 80	0.011 ~ 0.013	≤1.0D	1.0 D	6370 ~ 8490	280 ~ 440
		4	4	60 ~ 80	0.015 ~ 0.017	≤1.0D	1.0 D	4770 ~ 6370	290 ~ 430
		5	4	60 ~ 80	0.019 ~ 0.021	≤1.0D	1.0 D	3820 ~ 5090	290 ~ 430
		6	4	60 ~ 80	0.023 ~ 0.026	≤1.0D	1.0 D	3180 ~ 4240	290 ~ 440
		8	4	60 ~ 80	0.029 ~ 0.032	≤1.0D	1.0 D	2390 ~ 3180	280 ~ 410
		10	4	60 ~ 80	0.035 ~ 0.038	≤1.0D	1.0 D	1910 ~ 2550	270 ~ 390
		12	4	60 ~ 80	0.041 ~ 0.045	≤1.0D	1.0 D	1590 ~ 2120	260 ~ 380
		14	4	60 ~ 80	0.046 ~ 0.051	≤1.0D	1.0 D	1360 ~ 1820	250 ~ 370
		16	4	60 ~ 80	0.052 ~ 0.057	≤1.0D	1.0 D	1190 ~ 1590	250 ~ 360
		18	4	60 ~ 80	0.058 ~ 0.063	≤1.0D	1.0 D	1060 ~ 1410	250 ~ 360
		20	4	60 ~ 80	0.063 ~ 0.070	≤1.0D	1.0 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	0.003 ~ 0.005	≤1.0D	1.0 D	19100 ~ 25460	230 ~ 510
		1.5	4	60 ~ 80	0.006 ~ 0.008	≤1.0D	1.0 D	12730 ~ 16980	310 ~ 540
		2	4	60 ~ 80	0.009 ~ 0.011	≤1.0D	1.0 D	9550 ~ 12730	340 ~ 560
		2.5	4	60 ~ 80	0.012 ~ 0.014	≤1.0D	1.0 D	7640 ~ 10190	370 ~ 570
		3	4	60 ~ 80	0.014 ~ 0.017	≤1.0D	1.0 D	6370 ~ 8490	360 ~ 580
		4	4	60 ~ 80	0.020 ~ 0.023	≤1.0D	1.0 D	4770 ~ 6370	380 ~ 590
		5	4	60 ~ 80	0.026 ~ 0.028	≤1.0D	1.0 D	3820 ~ 5090	400 ~ 570
		6	4	60 ~ 80	0.031 ~ 0.034	≤1.0D	1.0 D	3180 ~ 4240	390 ~ 580
		8	4	60 ~ 80	0.039 ~ 0.043	≤1.0D	1.0 D	2390 ~ 3180	370 ~ 550
		10	4	60 ~ 80	0.046 ~ 0.051	≤1.0D	1.0 D	1910 ~ 2550	350 ~ 520
		12	4	60 ~ 80	0.054 ~ 0.059	≤1.0D	1.0 D	1590 ~ 2120	340 ~ 500
		14	4	60 ~ 80	0.062 ~ 0.068	≤1.0D	1.0 D	1360 ~ 1820	340 ~ 500
		16	4	60 ~ 80	0.069 ~ 0.076	≤1.0D	1.0 D	1190 ~ 1590	330 ~ 480
		18	4	60 ~ 80	0.077 ~ 0.085	≤1.0D	1.0 D	1060 ~ 1410	330 ~ 480
		20	4	60 ~ 80	0.085 ~ 0.093	≤1.0D	1.0 D	950 ~ 1270	320 ~ 470

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)
NICKEL BASED ALLOYS HARDENED UP TO 35 HRC	M19,23	1	4	60 ~ 80	0.003 ~ 0.005	≤1.0D	1.0 D	19100 ~ 25460	230 ~ 510
		1.5	4	60 ~ 80	0.005 ~ 0.007	≤1.0D	1.0 D	12730 ~ 16980	250 ~ 480
		2	4	60 ~ 80	0.007 ~ 0.009	≤1.0D	1.0 D	9550 ~ 12730	270 ~ 460
		2.5	4	60 ~ 80	0.009 ~ 0.011	≤1.0D	1.0 D	7640 ~ 10190	280 ~ 450
		3	4	60 ~ 80	0.011 ~ 0.013	≤1.0D	1.0 D	6370 ~ 8490	280 ~ 440
		4	4	60 ~ 80	0.015 ~ 0.017	≤1.0D	1.0 D	4770 ~ 6370	290 ~ 430
		5	4	60 ~ 80	0.019 ~ 0.022	≤1.0D	1.0 D	3820 ~ 5090	290 ~ 450
		6	4	60 ~ 80	0.023 ~ 0.026	≤1.0D	1.0 D	3180 ~ 4240	290 ~ 440
		8	4	60 ~ 80	0.029 ~ 0.032	≤1.0D	1.0 D	2390 ~ 3180	280 ~ 410
		10	4	60 ~ 80	0.035 ~ 0.038	≤1.0D	1.0 D	1910 ~ 2550	270 ~ 390
		12	4	60 ~ 80	0.041 ~ 0.045	≤1.0D	1.0 D	1590 ~ 2120	260 ~ 380
		14	4	60 ~ 80	0.046 ~ 0.051	≤1.0D	1.0 D	1360 ~ 1820	250 ~ 370
		16	4	60 ~ 80	0.052 ~ 0.057	≤1.0D	1.0 D	1190 ~ 1590	250 ~ 360
		18	4	60 ~ 80	0.058 ~ 0.063	≤1.0D	1.0 D	1060 ~ 1410	250 ~ 360
		20	4	60 ~ 80	0.063 ~ 0.070	≤1.0D	1.0 D	950 ~ 1270	240 ~ 360

Cutting Parameter - Square Endmill Roughing

SIDE MILLING		SQUARE ENDMILL ROUGHING							
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 ~ 0.008	≤ 1.5 D	≤ 0.5 D	40000	800 ~ 1280
		1.5	4	143 ~ 187	0.009 ~ 0.012	≤ 1.5 D	≤ 0.5 D	30350 ~ 39680	1090 ~ 1900
		2	4	143 ~ 187	0.012 ~ 0.015	≤ 1.5 D	≤ 0.5 D	22760 ~ 29760	1090 ~ 1790
		2.5	4	143 ~ 187	0.015 ~ 0.019	≤ 1.5 D	≤ 0.5 D	18210 ~ 23810	1090 ~ 1810
		3	4	143 ~ 187	0.019 ~ 0.022	≤ 1.5 D	≤ 0.5 D	15170 ~ 19840	1150 ~ 1750
		4	4	143 ~ 187	0.025 ~ 0.029	≤ 1.5 D	≤ 0.5 D	11380 ~ 14880	1140 ~ 1730
		5	4	143 ~ 187	0.032 ~ 0.036	≤ 1.5 D	≤ 0.5 D	9100 ~ 11900	1160 ~ 1710
		6	4	143 ~ 187	0.039 ~ 0.043	≤ 1.5 D	≤ 0.5 D	7590 ~ 9920	1180 ~ 1710
		8	4	143 ~ 187	0.047 ~ 0.052	≤ 1.5 D	≤ 0.5 D	5690 ~ 7440	1070 ~ 1550
		10	4	143 ~ 187	0.055 ~ 0.060	≤ 1.5 D	≤ 0.5 D	4550 ~ 5950	1000 ~ 1430
		12	4	143 ~ 187	0.063 ~ 0.069	≤ 1.5 D	≤ 0.5 D	3790 ~ 4960	960 ~ 1370
		14	4	143 ~ 187	0.071 ~ 0.078	≤ 1.5 D	≤ 0.5 D	3250 ~ 4250	920 ~ 1330
		16	4	143 ~ 187	0.079 ~ 0.087	≤ 1.5 D	≤ 0.5 D	2840 ~ 3720	900 ~ 1290
		18	4	143 ~ 187	0.087 ~ 0.096	≤ 1.5 D	≤ 0.5 D	2530 ~ 3310	880 ~ 1270
		20	4	143 ~ 187	0.095 ~ 0.105	≤ 1.5 D	≤ 0.5 D	2280 ~ 2980	870 ~ 1250

SIDE MILLING		SQUARE ENDMILL ROUGHING							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
ALLOY STEEL TOOLSTEEL PRE-HARDENED STEEL (30~45 HRC) AISI H13 NAK	M10,11,12 13,14	1	4	126	0.005 ~ 0.008	≤ 1.5 D	≤ 0.5 D	40000	800 ~ 1280
		1.5	4	132 ~ 154	0.009 ~ 0.012	≤ 1.5 D	≤ 0.5 D	28010 ~ 32680	1010 ~ 1570
		2	4	132 ~ 154	0.012 ~ 0.015	≤ 1.5 D	≤ 0.5 D	21010 ~ 24510	1010 ~ 1470
		2.5	4	132 ~ 154	0.015 ~ 0.019	≤ 1.5 D	≤ 0.5 D	16810 ~ 19610	1010 ~ 1490
		3	4	132 ~ 154	0.019 ~ 0.022	≤ 1.5 D	≤ 0.5 D	14010 ~ 16340	1060 ~ 1440
		4	4	132 ~ 154	0.025 ~ 0.029	≤ 1.5 D	≤ 0.5 D	10500 ~ 12250	1050 ~ 1420
		5	4	132 ~ 154	0.032 ~ 0.036	≤ 1.5 D	≤ 0.5 D	8400 ~ 9800	1080 ~ 1410
		6	4	132 ~ 154	0.039 ~ 0.043	≤ 1.5 D	≤ 0.5 D	7000 ~ 8170	1090 ~ 1410
		8	4	132 ~ 154	0.047 ~ 0.052	≤ 1.5 D	≤ 0.5 D	5250 ~ 6130	990 ~ 1280
		10	4	132 ~ 154	0.055 ~ 0.060	≤ 1.5 D	≤ 0.5 D	4200 ~ 4900	920 ~ 1180
		12	4	132 ~ 154	0.063 ~ 0.069	≤ 1.5 D	≤ 0.5 D	3500 ~ 4080	880 ~ 1130
		14	4	132 ~ 154	0.071 ~ 0.078	≤ 1.5 D	≤ 0.5 D	3000 ~ 3500	850 ~ 1090
		16	4	132 ~ 154	0.079 ~ 0.087	≤ 1.5 D	≤ 0.5 D	2630 ~ 3060	830 ~ 1060
		18	4	132 ~ 154	0.087 ~ 0.096	≤ 1.5 D	≤ 0.5 D	2330 ~ 2720	810 ~ 1040
		20	4	132 ~ 154	0.095 ~ 0.105	≤ 1.5 D	≤ 0.5 D	2100 ~ 2450	800 ~ 1030

Cutting Parameter - Square Endmill Roughing

SIDE MILLING		SQUARE ENDMILL ROUGHING							
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	66 ~ 88	0.004 ~ 0.006	≤ 1.5 D	≤ 0.5 D	21010 ~ 28010	340 ~ 670
		1.5	4	66 ~ 88	0.006 ~ 0.009	≤ 1.5 D	≤ 0.5 D	14010 ~ 18670	340 ~ 670
		2	4	66 ~ 88	0.009 ~ 0.012	≤ 1.5 D	≤ 0.5 D	10500 ~ 14010	380 ~ 670
		2.5	4	66 ~ 88	0.012 ~ 0.015	≤ 1.5 D	≤ 0.5 D	8400 ~ 11200	400 ~ 670
		3	4	66 ~ 88	0.015 ~ 0.018	≤ 1.5 D	≤ 0.5 D	7000 ~ 9340	420 ~ 670
		4	4	66 ~ 88	0.021 ~ 0.024	≤ 1.5 D	≤ 0.5 D	5250 ~ 7000	440 ~ 670
		5	4	66 ~ 88	0.027 ~ 0.030	≤ 1.5 D	≤ 0.5 D	4200 ~ 5600	450 ~ 670
		6	4	66 ~ 88	0.032 ~ 0.036	≤ 1.5 D	≤ 0.5 D	3500 ~ 4670	450 ~ 670
		8	4	66 ~ 88	0.040 ~ 0.044	≤ 1.5 D	≤ 0.5 D	2630 ~ 3500	420 ~ 620
		10	4	66 ~ 88	0.048 ~ 0.053	≤ 1.5 D	≤ 0.5 D	2100 ~ 2800	400 ~ 590
		12	4	66 ~ 88	0.056 ~ 0.062	≤ 1.5 D	≤ 0.5 D	1750 ~ 2330	390 ~ 580
		14	4	66 ~ 88	0.064 ~ 0.071	≤ 1.5 D	≤ 0.5 D	1500 ~ 2000	380 ~ 570
		16	4	66 ~ 88	0.072 ~ 0.079	≤ 1.5 D	≤ 0.5 D	1310 ~ 1750	380 ~ 550
		18	4	66 ~ 88	0.080 ~ 0.088	≤ 1.5 D	≤ 0.5 D	1170 ~ 1560	370 ~ 550
		20	4	66 ~ 88	0.088 ~ 0.097	≤ 1.5 D	≤ 0.5 D	1050 ~ 1400	370 ~ 540

SIDE MILLING		SQUARE ENDMILL ROUGHING							
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	66 ~ 88	0.005 ~ 0.007	≤ 1.5 D	≤ 0.5 D	21010 ~ 28010	420 ~ 780
		1.5	4	66 ~ 88	0.008 ~ 0.011	≤ 1.5 D	≤ 0.5 D	14010 ~ 18670	450 ~ 820
		2	4	66 ~ 88	0.012 ~ 0.015	≤ 1.5 D	≤ 0.5 D	10500 ~ 14010	500 ~ 840
		2.5	4	66 ~ 88	0.016 ~ 0.019	≤ 1.5 D	≤ 0.5 D	8400 ~ 11200	540 ~ 850
		3	4	66 ~ 88	0.020 ~ 0.023	≤ 1.5 D	≤ 0.5 D	7000 ~ 9340	560 ~ 860
		4	4	66 ~ 88	0.028 ~ 0.031	≤ 1.5 D	≤ 0.5 D	5250 ~ 7000	590 ~ 870
		5	4	66 ~ 88	0.035 ~ 0.039	≤ 1.5 D	≤ 0.5 D	4200 ~ 5600	590 ~ 870
		6	4	66 ~ 88	0.043 ~ 0.048	≤ 1.5 D	≤ 0.5 D	3500 ~ 4670	600 ~ 900
		8	4	66 ~ 88	0.054 ~ 0.059	≤ 1.5 D	≤ 0.5 D	2630 ~ 3500	570 ~ 830
		10	4	66 ~ 88	0.064 ~ 0.071	≤ 1.5 D	≤ 0.5 D	2100 ~ 2800	540 ~ 800
		12	4	66 ~ 88	0.075 ~ 0.083	≤ 1.5 D	≤ 0.5 D	1750 ~ 2330	530 ~ 770
		14	4	66 ~ 88	0.086 ~ 0.094	≤ 1.5 D	≤ 0.5 D	1500 ~ 2000	520 ~ 750
		16	4	66 ~ 88	0.096 ~ 0.106	≤ 1.5 D	≤ 0.5 D	1310 ~ 1750	500 ~ 740
		18	4	66 ~ 88	0.107 ~ 0.118	≤ 1.5 D	≤ 0.5 D	1170 ~ 1560	500 ~ 740
		20	4	66 ~ 88	0.117 ~ 0.129	≤ 1.5 D	≤ 0.5 D	1050 ~ 1400	490 ~ 720

Cutting Parameter - Square Endmill Roughing

SIDE MILLING		SQUARE ENDMILL ROUGHING							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
NICKEL BASED ALLOYS HARD-ENED UP TO 35 HRC	M19,23	1	4	66 ~ 88	0.004 ~ 0.006	≤ 1.5 D	≤ 0.5 D	21010 ~ 28010	340 ~ 670
		1.5	4	66 ~ 88	0.006 ~ 0.009	≤ 1.5 D	≤ 0.5 D	14010 ~ 18670	340 ~ 670
		2	4	66 ~ 88	0.009 ~ 0.012	≤ 1.5 D	≤ 0.5 D	10500 ~ 14010	380 ~ 670
		2.5	4	66 ~ 88	0.012 ~ 0.015	≤ 1.5 D	≤ 0.5 D	8400 ~ 11200	400 ~ 670
		3	4	66 ~ 88	0.015 ~ 0.018	≤ 1.5 D	≤ 0.5 D	7000 ~ 9340	420 ~ 670
		4	4	66 ~ 88	0.021 ~ 0.024	≤ 1.5 D	≤ 0.5 D	5250 ~ 7000	440 ~ 670
		5	4	66 ~ 88	0.027 ~ 0.030	≤ 1.5 D	≤ 0.5 D	4200 ~ 5600	450 ~ 670
		6	4	66 ~ 88	0.032 ~ 0.036	≤ 1.5 D	≤ 0.5 D	3500 ~ 4670	450 ~ 670
		8	4	66 ~ 88	0.040 ~ 0.044	≤ 1.5 D	≤ 0.5 D	2630 ~ 3500	420 ~ 620
		10	4	66 ~ 88	0.048 ~ 0.053	≤ 1.5 D	≤ 0.5 D	2100 ~ 2800	400 ~ 590
		12	4	66 ~ 88	0.056 ~ 0.062	≤ 1.5 D	≤ 0.5 D	1750 ~ 2330	390 ~ 580
		14	4	66 ~ 88	0.064 ~ 0.071	≤ 1.5 D	≤ 0.5 D	1500 ~ 2000	380 ~ 570
		16	4	66 ~ 88	0.072 ~ 0.079	≤ 1.5 D	≤ 0.5 D	1310 ~ 1750	380 ~ 550
		18	4	66 ~ 88	0.080 ~ 0.088	≤ 1.5 D	≤ 0.5 D	1170 ~ 1560	370 ~ 550
		20	4	66 ~ 88	0.088 ~ 0.097	≤ 1.5 D	≤ 0.5 D	1050 ~ 1400	370 ~ 540

Cutting Parameter - Square Endmill Roughing

SLOTTING		SQUARE ENDMILL ROUGHING							
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	≤1.0 D	1.0 D	40000	640 ~ 960
		1.5	4	143 ~ 187	0.007 ~ 0.009	≤1.0 D	1.0 D	30350 ~ 39680	850 ~ 1430
		2	4	143 ~ 187	0.010 ~ 0.012	≤1.0 D	1.0 D	22760 ~ 29760	910 ~ 1430
		2.5	4	143 ~ 187	0.012 ~ 0.015	≤1.0 D	1.0 D	18210 ~ 23810	870 ~ 1430
		3	4	143 ~ 187	0.015 ~ 0.018	≤1.0 D	1.0 D	15170 ~ 19840	910 ~ 1430
		4	4	143 ~ 187	0.020 ~ 0.023	≤1.0 D	1.0 D	11380 ~ 14880	910 ~ 1370
		5	4	143 ~ 187	0.026 ~ 0.029	≤1.0 D	1.0 D	9100 ~ 11900	950 ~ 1380
		6	4	143 ~ 187	0.031 ~ 0.034	≤1.0 D	1.0 D	7590 ~ 9920	940 ~ 1350
		8	4	143 ~ 187	0.038 ~ 0.041	≤1.0 D	1.0 D	5690 ~ 7440	860 ~ 1220
		10	4	143 ~ 187	0.044 ~ 0.048	≤1.0 D	1.0 D	4550 ~ 5950	800 ~ 1140
		12	4	143 ~ 187	0.050 ~ 0.055	≤1.0 D	1.0 D	3790 ~ 4960	760 ~ 1090
		14	4	143 ~ 187	0.057 ~ 0.062	≤1.0 D	1.0 D	3250 ~ 4250	740 ~ 1050
		16	4	143 ~ 187	0.063 ~ 0.070	≤1.0 D	1.0 D	2840 ~ 3720	720 ~ 1040
		18	4	143 ~ 187	0.070 ~ 0.077	≤1.0 D	1.0 D	2530 ~ 3310	710 ~ 1020
		20	4	143 ~ 187	0.076 ~ 0.084	≤1.0 D	1.0 D	2280 ~ 2980	690 ~ 1000

SLOTTING		SQUARE ENDMILL ROUGHING							
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 13,14	1	4	126	0.004 ~ 0.006	≤1.0 D	1.0 D	40000	640 ~ 960
		1.5	4	132 ~ 154	0.007 ~ 0.009	≤1.0 D	1.0 D	28010 ~ 32680	780 ~ 1180
		2	4	132 ~ 154	0.010 ~ 0.012	≤1.0 D	1.0 D	21010 ~ 24510	840 ~ 1180
		2.5	4	132 ~ 154	0.012 ~ 0.015	≤1.0 D	1.0 D	16810 ~ 19610	810 ~ 1180
		3	4	132 ~ 154	0.015 ~ 0.018	≤1.0 D	1.0 D	14010 ~ 16340	840 ~ 1180
		4	4	132 ~ 154	0.020 ~ 0.023	≤1.0 D	1.0 D	10500 ~ 12250	840 ~ 1130
		5	4	132 ~ 154	0.026 ~ 0.029	≤1.0 D	1.0 D	8400 ~ 9800	870 ~ 1140
		6	4	132 ~ 154	0.031 ~ 0.034	≤1.0 D	1.0 D	7000 ~ 8170	870 ~ 1110
		8	4	132 ~ 154	0.038 ~ 0.041	≤1.0 D	1.0 D	5250 ~ 6130	800 ~ 1010
		10	4	132 ~ 154	0.044 ~ 0.048	≤1.0 D	1.0 D	4200 ~ 4900	740 ~ 940
		12	4	132 ~ 154	0.050 ~ 0.055	≤1.0 D	1.0 D	3500 ~ 4080	700 ~ 900
		14	4	132 ~ 154	0.057 ~ 0.062	≤1.0 D	1.0 D	3000 ~ 3500	680 ~ 870
		16	4	132 ~ 154	0.063 ~ 0.070	≤1.0 D	1.0 D	2630 ~ 3060	660 ~ 860
		18	4	132 ~ 154	0.070 ~ 0.077	≤1.0 D	1.0 D	2330 ~ 2720	650 ~ 840
		20	4	132 ~ 154	0.076 ~ 0.084	≤1.0 D	1.0 D	2100 ~ 2450	640 ~ 820

Cutting Parameter - Square Endmill Roughing

SLOTTING		SQUARE ENDMILL ROUGHING							
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	66 ~ 88	0.003 ~ 0.005	≤1.0 D	1.0 D	21010 ~ 28010	250 ~ 560
		1.5	4	66 ~ 88	0.005 ~ 0.007	≤1.0 D	1.0 D	14010 ~ 18670	280 ~ 520
		2	4	66 ~ 88	0.007 ~ 0.010	≤1.0 D	1.0 D	10500 ~ 14010	290 ~ 560
		2.5	4	66 ~ 88	0.010 ~ 0.012	≤1.0 D	1.0 D	8400 ~ 11200	340 ~ 540
		3	4	66 ~ 88	0.012 ~ 0.014	≤1.0 D	1.0 D	7000 ~ 9340	340 ~ 520
		4	4	66 ~ 88	0.017 ~ 0.019	≤1.0 D	1.0 D	5250 ~ 7000	360 ~ 530
		5	4	66 ~ 88	0.021 ~ 0.024	≤1.0 D	1.0 D	4200 ~ 5600	350 ~ 540
		6	4	66 ~ 88	0.026 ~ 0.029	≤1.0 D	1.0 D	3500 ~ 4670	360 ~ 540
		8	4	66 ~ 88	0.032 ~ 0.036	≤1.0 D	1.0 D	2630 ~ 3500	340 ~ 500
		10	4	66 ~ 88	0.039 ~ 0.043	≤1.0 D	1.0 D	2100 ~ 2800	330 ~ 480
		12	4	66 ~ 88	0.045 ~ 0.050	≤1.0 D	1.0 D	1750 ~ 2330	320 ~ 470
		14	4	66 ~ 88	0.051 ~ 0.057	≤1.0 D	1.0 D	1500 ~ 2000	310 ~ 460
		16	4	66 ~ 88	0.058 ~ 0.064	≤1.0 D	1.0 D	1310 ~ 1750	300 ~ 450
		18	4	66 ~ 88	0.064 ~ 0.071	≤1.0 D	1.0 D	1170 ~ 1560	300 ~ 440
		20	4	66 ~ 88	0.070 ~ 0.078	≤1.0 D	1.0 D	1050 ~ 1400	290 ~ 440

SLOTTING		SQUARE ENDMILL ROUGHING							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
TITANIUM AL-LOYS HARDEDNED UP TO 35 HRC	M17	1	4	66 ~ 88	0.004 ~ 0.006	≤1.0 D	1.0 D	21010 ~ 28010	340 ~ 670
		1.5	4	66 ~ 88	0.007 ~ 0.009	≤1.0 D	1.0 D	14010 ~ 18670	390 ~ 670
		2	4	66 ~ 88	0.010 ~ 0.012	≤1.0 D	1.0 D	10500 ~ 14010	420 ~ 670
		2.5	4	66 ~ 88	0.013 ~ 0.015	≤1.0 D	1.0 D	8400 ~ 11200	440 ~ 670
		3	4	66 ~ 88	0.016 ~ 0.019	≤1.0 D	1.0 D	7000 ~ 9340	450 ~ 710
		4	4	66 ~ 88	0.022 ~ 0.025	≤1.0 D	1.0 D	5250 ~ 7000	460 ~ 700
		5	4	66 ~ 88	0.028 ~ 0.032	≤1.0 D	1.0 D	4200 ~ 5600	470 ~ 720
		6	4	66 ~ 88	0.035 ~ 0.038	≤1.0 D	1.0 D	3500 ~ 4670	490 ~ 710
		8	4	66 ~ 88	0.043 ~ 0.047	≤1.0 D	1.0 D	2630 ~ 3500	450 ~ 660
		10	4	66 ~ 88	0.052 ~ 0.057	≤1.0 D	1.0 D	2100 ~ 2800	440 ~ 640
		12	4	66 ~ 88	0.060 ~ 0.066	≤1.0 D	1.0 D	1750 ~ 2330	420 ~ 620
		14	4	66 ~ 88	0.069 ~ 0.075	≤1.0 D	1.0 D	1500 ~ 2000	410 ~ 600
		16	4	66 ~ 88	0.077 ~ 0.085	≤1.0 D	1.0 D	1310 ~ 1750	400 ~ 600
		18	4	66 ~ 88	0.085 ~ 0.094	≤1.0 D	1.0 D	1170 ~ 1560	400 ~ 590
		20	4	66 ~ 88	0.094 ~ 0.103	≤1.0 D	1.0 D	1050 ~ 1400	390 ~ 580

Cutting Parameter - Square Endmill Roughing

SLOTTING		SQUARE ENDMILL ROUGHING							
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	66 ~ 88	0.003 ~ 0.006	≤1.0 D	1.0 D	21010 ~ 28010	250 ~ 670
		1.5	4	66 ~ 88	0.005 ~ 0.008	≤1.0 D	1.0 D	14010 ~ 18670	280 ~ 600
		2	4	66 ~ 88	0.007 ~ 0.010	≤1.0 D	1.0 D	10500 ~ 14010	290 ~ 560
		2.5	4	66 ~ 88	0.010 ~ 0.013	≤1.0 D	1.0 D	8400 ~ 11200	340 ~ 580
		3	4	66 ~ 88	0.012 ~ 0.015	≤1.0 D	1.0 D	7000 ~ 9340	340 ~ 560
		4	4	66 ~ 88	0.017 ~ 0.019	≤1.0 D	1.0 D	5250 ~ 7000	360 ~ 530
		5	4	66 ~ 88	0.021 ~ 0.024	≤1.0 D	1.0 D	4200 ~ 5600	350 ~ 540
		6	4	66 ~ 88	0.026 ~ 0.029	≤1.0 D	1.0 D	3500 ~ 4670	360 ~ 540
		8	4	66 ~ 88	0.032 ~ 0.036	≤1.0 D	1.0 D	2630 ~ 3500	340 ~ 500
		10	4	66 ~ 88	0.039 ~ 0.043	≤1.0 D	1.0 D	2100 ~ 2800	330 ~ 480
		12	4	66 ~ 88	0.045 ~ 0.050	≤1.0 D	1.0 D	1750 ~ 2330	320 ~ 470
		14	4	66 ~ 88	0.051 ~ 0.057	≤1.0 D	1.0 D	1500 ~ 2000	310 ~ 460
		16	4	66 ~ 88	0.058 ~ 0.064	≤1.0 D	1.0 D	1310 ~ 1750	300 ~ 450
		18	4	66 ~ 88	0.064 ~ 0.071	≤1.0 D	1.0 D	1170 ~ 1560	300 ~ 440
		20	4	66 ~ 88	0.070 ~ 0.078	≤1.0 D	1.0 D	1050 ~ 1400	290 ~ 440

Cutting Parameter - Square Endmill Plungemill

		SQUARE ENDMILL PLUNGE-MILL									
						DRILLING		SLOTTING		SLIDE MILING	
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	N (MIN-1)	FZ (MM)	VF (MM/MIN)	FZ (MM)	VF (MM/MIN)	FZ (MM)	VF (MM/MIN)
ALUMINIUM ALLOY EXCEPT SOFT ALUMINIUM ALLOYS	M05, M06, M07, M08, M09	1	3	85	27,060	0.001	81	0.003	244	0.005	406
		1.5	3	85	18,040	0.003	179	0.008	406	0.014	763
		2	3	85	13,530	0.006	227	0.012	487	0.023	942
		2.5	3	85	10,820	0.008	256	0.017	536	0.032	1049
		3	3	85	9,020	0.010	276	0.021	568	0.041	1120
		4	3	85	6,760	0.015	300	0.030	609	0.060	1209
		5	3	85	5,410	0.019	315	0.039	633	0.078	1263
		6	3	85	4,510	0.024	325	0.048	649	0.096	1299
		7	3	85	3,870	0.025	288	0.050	576	0.099	1151
		8	3	85	3,380	0.026	260	0.051	520	0.103	1041
		9	3	85	3,010	0.026	239	0.053	478	0.106	955
		10	3	85	2,710	0.027	222	0.055	443	0.109	886
		11	3	85	2,460	0.028	208	0.056	415	0.113	830
		12	3	85	2,250	0.029	196	0.058	392	0.116	783
		16	3	85	1,690	0.032	164	0.065	327	0.129	654

Cutting Parameter - Square Endmill Plungemill

		SQUARE ENDMILL PLUNGE-MILL									
						DRILLING		SLOTTING		SLIDE MILING	
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	N (MIN-1)	FZ (MM)	VF (MM/MIN)	FZ (MM)	VF (MM/MIN)	FZ (MM)	VF (MM/MIN)
CARBON STEEL CAST IRON	M10, M11, M12 M13, M14,M15	1	3	50	15,920	0.002	72	0.003	143	0.006	286
		1.5	3	50	10,610	0.006	186	0.006	193	0.012	385
		2	3	50	7,960	0.010	244	0.009	217	0.018	434
		2.5	3	50	6,370	0.015	278	0.012	232	0.024	464
		3	3	50	5,310	0.019	301	0.015	242	0.030	484
		4	3	50	3,980	0.028	329	0.021	254	0.043	509
		5	3	50	3,180	0.036	347	0.027	262	0.055	523
		6	3	50	2,650	0.045	358	0.034	267	0.067	533
		7	3	50	2,270	0.045	307	0.035	240	0.070	480
		8	3	50	1,990	0.045	269	0.037	220	0.074	439
		9	3	50	1,770	0.045	239	0.038	204	0.077	408
		10	3	50	1,590	0.045	215	0.040	191	0.080	383
		11	3	50	1,450	0.045	195	0.042	181	0.084	362
		12	3	50	1,330	0.045	179	0.043	173	0.087	345
		16	3	50	990	0.045	134	0.050	149	0.100	298

Cutting Parameter - Square Endmill Extra Long

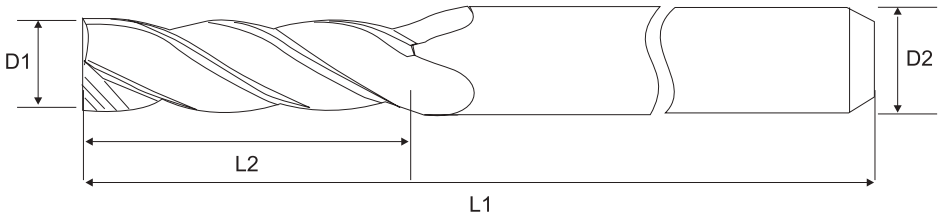
SLOTTING		SQUARE ENDMILL							
MATERIAL	MATERIAL GROUPS	D1 (MM)	Z	VC (M/MIN)	FZ (MM)	AP (MM)	AE (MM)	N (MIN-1)	VF (MM/MIN)
HARDEDNED STEEL (63~68 HRC) AISI D2	M33	1	4	15 ~ 25	0.001 ~ 0.001	≤ 0.05 D	1.0 D	4770 ~ 7960	20 ~ 30
		1.5	4	15 ~ 25	0.002 ~ 0.002	≤ 0.05 D	1.0 D	3180 ~ 5310	30 ~ 40
		2	4	15 ~ 25	0.002 ~ 0.003	≤ 0.05 D	1.0 D	2390 ~ 3980	20 ~ 50
		2.5	4	15 ~ 25	0.003 ~ 0.004	≤ 0.05 D	1.0 D	1910 ~ 3180	20 ~ 50
		3	4	15 ~ 25	0.004 ~ 0.005	≤ 0.05 D	1.0 D	1590 ~ 2650	30 ~ 50
		4	4	15 ~ 25	0.005 ~ 0.006	≤ 0.05 D	1.0 D	1190 ~ 1990	20 ~ 50
		5	4	15 ~ 25	0.007 ~ 0.008	≤ 0.05 D	1.0 D	950 ~ 1590	30 ~ 50
		6	4	15 ~ 25	0.009 ~ 0.010	≤ 0.05 D	1.0 D	800 ~ 1330	30 ~ 50
		8	4	15 ~ 25	0.011 ~ 0.012	≤ 0.05 D	1.0 D	600 ~ 990	30 ~ 50
		10	4	15 ~ 25	0.013 ~ 0.014	≤ 0.05 D	1.0 D	480 ~ 800	20 ~ 40
		12	4	15 ~ 25	0.015 ~ 0.017	≤ 0.05 D	1.0 D	400 ~ 660	20 ~ 40
		14	4	15 ~ 25	0.017 ~ 0.019	≤ 0.05 D	1.0 D	340 ~ 570	20 ~ 40
		16	4	15 ~ 25	0.019 ~ 0.021	≤ 0.05 D	1.0 D	300 ~ 500	20 ~ 40
		18	4	15 ~ 25	0.021 ~ 0.024	≤ 0.05 D	1.0 D	270 ~ 440	20 ~ 40
		20	4	15 ~ 25	0.023 ~ 0.026	≤ 0.05 D	1.0 D	240 ~ 400	20 ~ 40
		22	4	15 ~ 25	0.026 ~ 0.028	≤ 0.05 D	1.0 D	220 ~ 360	20 ~ 40
		25	4	15 ~ 25	0.029 ~ 0.032	≤ 0.05 D	1.0 D	190 ~ 320	20 ~ 40

Notes

XCUT TECHNOLOGIES

DELTA - MAXX

4 Flute Standard Endmill

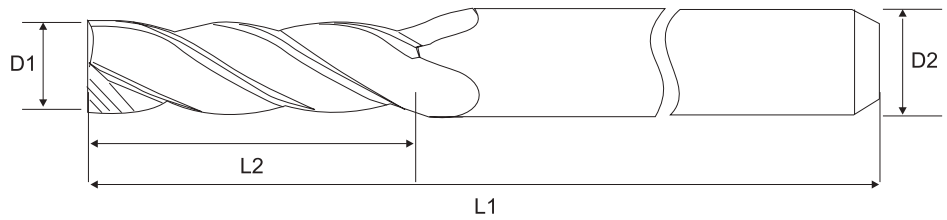


ITEM CODE	DIA	SHANK	FL	OAL	Availability
EM1N4D4DM	1	4	4	50	●
EM1.5N4D4DM	1.5	4	4	50	●
EM2N4D4DM	2	4	6	50	●
EM2.5N4D4DM	2.5	4	8	50	●
EM3N4D4DM	3	4	8	50	●
EM3N4DM	3	3	8	50	●
EM4N4DM	4	4	10	50	●
EM5N4DM	5	5	13	50	●
EM5N4D6DM	5	6	13	50	●
EM6N4DM	6	6	15	50	●
EM8N4DM	8	8	20	60	●
EM10N4DM	10	10	25	75	●
EM12N4DM	12	12	30	75	●
EM16N4D	16	16	40	100	○
EM20N4D	20	20	40	100	●

● STOCKABLE ○ NONSTOCKABLE

TiAlN
MG
0.8 µm
Co 10%
HRC 50
4 flute

4 Flute Long Endmill Series



ITEM CODE	DIA	SHANK	FL	OAL	Availability
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	●

● STOCKABLE ○ NONSTOCKABLE

TiAlN

MG

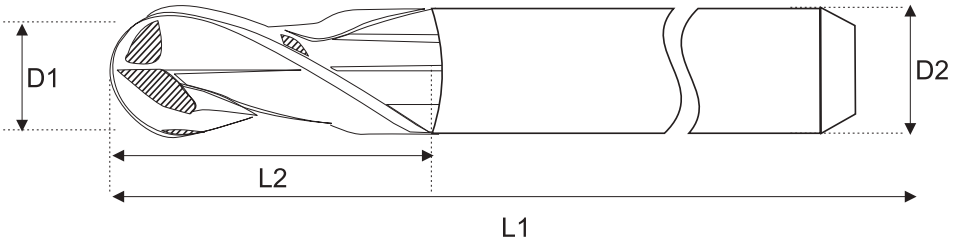
0.8 µm

Co 10%

HRC ▸50

4 flute

2 Flute Standard Ballnose Line

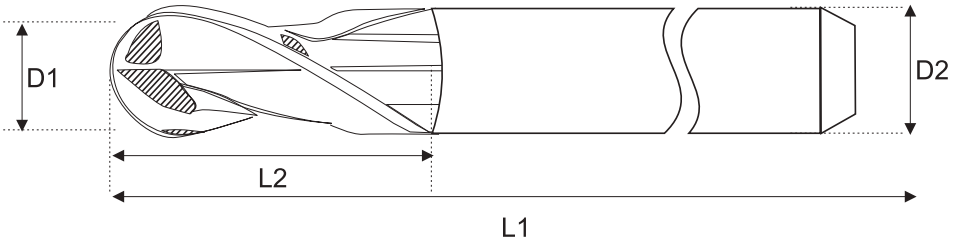


ITEM CODE	DIA	SHANK	FL	OAL	Availability
BN1N2D4DM	1	4	3	50	●
BN1.5N2D4DM	1.5	4	4	50	●
BN2N2D4DM	2	4	4	50	●
BN2.5N2D4DM	2.5	4	6	50	●
BN3N2D4DM	3	4	6	50	●
BN4N2DM	4	4	8	50	●
BN6N2DM	6	6	12	50	●
BN8N2DM	8	8	16	60	●
BN10N2DM	10	10	20	75	●
BN12N2DM	12	12	25	75	●

● STOCKABLE ○ NONSTOCKABLE

TiAlN
MG
0.8 µm
Co 10%
HRC 50
2 flutes

2 Flute Long Ballnose Series



ITEM CODE	DIA	SHANK	FL	OAL	Availability
BN3L2D4DM	3	4	8	75	●
BN4L2DM	4	4	10	75	●
BN6L2DM	6	6	15	75	●
BN8L2DM	8	8	10	75	●
BN3XL2D4DM	3	4	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	●

● STOCKABLE ○ NONSTOCKABLE

TiAlN

MG

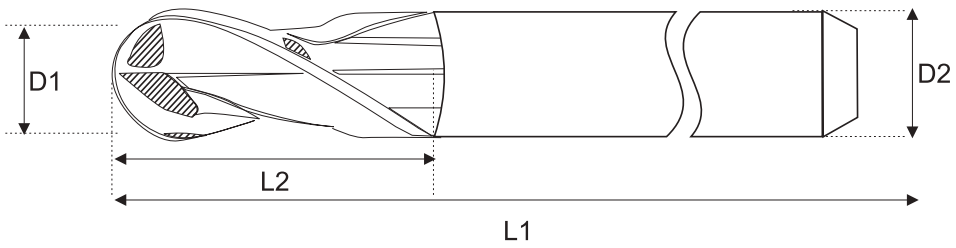
0.8 µm

Co 10%

HRC ›50

2 flutes

4 Flute Ballnose Line

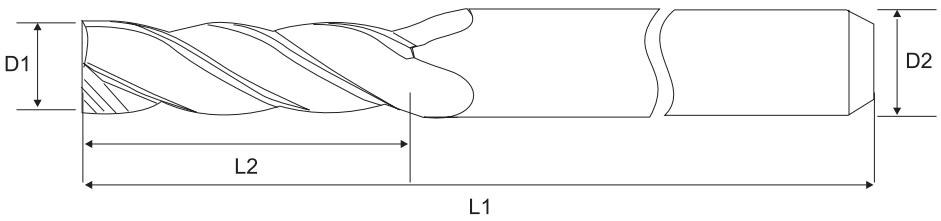


ITEM CODE	DIA	SHANK	FL	OAL	Availability
BN1N4D4DEXT	1	4	2	50	●
BN1.5N4D4DEXT	1.5	4	3	50	●
BN2N4D4DEXT	2	4	4	50	●
BN2.5N4D4DEXT	2.5	4	5	50	●
BN3N4D4DEXT	3	4	6	50	●
BN3N4DEXT	3	3	6	50	●
BN4N4DEXT	4	4	8	50	●
BN5N4DEXT	5	5	10	50	●
BN6N4DEXT	6	6	12	50	●
BN8N4DEXT	8	8	16	60	●

● STOCKABLE o NONSTOCKABLE

TiAlN
MG
0.8 µm
Co 10%
HRC 50
4 flute

4 Flute Corner Radius Endmill



ITEM CODE	DIA	SHANK	FL	OAL	Availability
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	●

● STOCKABLE ○ NONSTOCKABLE

TiAlN

MG

0.8 µm

Co 10%

HRC 50

4 flute

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

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)
STAINLESS STEEL UP TO 35 HRC)	M16	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 HARD-ENED 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 ~ 0.022	≤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

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	≤1.0D	1.0 D	40000	640 ~ 960
		1.5	4	130 ~ 170	0.006 ~ 0.008	≤1.0D	1.0 D	27590 ~ 36080	660 ~ 1150
		2	4	130 ~ 170	0.009 ~ 0.011	≤1.0D	1.0 D	20690 ~ 27060	740 ~ 1190
		2.5	4	130 ~ 170	0.011 ~ 0.013	≤1.0D	1.0 D	16550 ~ 21650	730 ~ 1130
		3	4	130 ~ 170	0.014 ~ 0.016	≤1.0D	1.0 D	13790 ~ 18040	770 ~ 1150
		4	4	130 ~ 170	0.018 ~ 0.021	≤1.0D	1.0 D	10350 ~ 13530	750 ~ 1140
		5	4	130 ~ 170	0.023 ~ 0.026	≤1.0D	1.0 D	8280 ~ 10820	760 ~ 1130
		6	4	130 ~ 170	0.028 ~ 0.031	≤1.0D	1.0 D	6900 ~ 9020	770 ~ 1120
		8	4	130 ~ 170	0.034 ~ 0.037	≤1.0D	1.0 D	5170 ~ 6760	700 ~ 1000
		10	4	130 ~ 170	0.040 ~ 0.044	≤1.0D	1.0 D	4140 ~ 5410	660 ~ 950
		12	4	130 ~ 170	0.045 ~ 0.050	≤1.0D	1.0 D	3450 ~ 4510	620 ~ 900
		14	4	130 ~ 170	0.051 ~ 0.056	≤1.0D	1.0 D	2960 ~ 3870	600 ~ 870
		16	4	130 ~ 170	0.057 ~ 0.063	≤1.0D	1.0 D	2590 ~ 3380	590 ~ 850
		18	4	130 ~ 170	0.063 ~ 0.069	≤1.0D	1.0 D	2300 ~ 3010	580 ~ 830
		20	4	130 ~ 170	0.068 ~ 0.075	≤1.0D	1.0 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 ~ 140	0.006 ~ 0.008	≤1.0D	1.0 D	25460 ~ 29710	610 ~ 950
		2	4	120 ~ 140	0.009 ~ 0.011	≤1.0D	1.0 D	19100 ~ 22280	690 ~ 980
		2.5	4	120 ~ 140	0.011 ~ 0.013	≤1.0D	1.0 D	15280 ~ 17830	670 ~ 930
		3	4	120 ~ 140	0.014 ~ 0.016	≤1.0D	1.0 D	12730 ~ 14850	710 ~ 950
		4	4	120 ~ 140	0.018 ~ 0.021	≤1.0D	1.0 D	9550 ~ 11140	690 ~ 940
		5	4	120 ~ 140	0.023 ~ 0.026	≤1.0D	1.0 D	7640 ~ 8910	700 ~ 930
		6	4	120 ~ 140	0.028 ~ 0.031	≤1.0D	1.0 D	6370 ~ 7430	710 ~ 920
		8	4	120 ~ 140	0.034 ~ 0.037	≤1.0D	1.0 D	4770 ~ 5570	650 ~ 820
		10	4	120 ~ 140	0.040 ~ 0.044	≤1.0D	1.0 D	3820 ~ 4460	610 ~ 780
		12	4	120 ~ 140	0.045 ~ 0.050	≤1.0D	1.0 D	3180 ~ 3710	570 ~ 740
		14	4	120 ~ 140	0.051 ~ 0.056	≤1.0D	1.0 D	2730 ~ 3180	560 ~ 710
		16	4	120 ~ 140	0.057 ~ 0.063	≤1.0D	1.0 D	2390 ~ 2790	540 ~ 700
		18	4	120 ~ 140	0.063 ~ 0.069	≤1.0D	1.0 D	2120 ~ 2480	530 ~ 680
		20	4	120 ~ 140	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	≤1.0D	1.0 D	19100 ~ 25460	230 ~ 510
		1.5	4	60 ~ 80	0.005 ~ 0.007	≤1.0D	1.0 D	12730 ~ 16980	250 ~ 480
		2	4	60 ~ 80	0.007 ~ 0.009	≤1.0D	1.0 D	9550 ~ 12730	270 ~ 460
		2.5	4	60 ~ 80	0.009 ~ 0.011	≤1.0D	1.0 D	7640 ~ 10190	280 ~ 450
		3	4	60 ~ 80	0.011 ~ 0.013	≤1.0D	1.0 D	6370 ~ 8490	280 ~ 440
		4	4	60 ~ 80	0.015 ~ 0.017	≤1.0D	1.0 D	4770 ~ 6370	290 ~ 430
		5	4	60 ~ 80	0.019 ~ 0.021	≤1.0D	1.0 D	3820 ~ 5090	290 ~ 430
		6	4	60 ~ 80	0.023 ~ 0.026	≤1.0D	1.0 D	3180 ~ 4240	290 ~ 440
		8	4	60 ~ 80	0.029 ~ 0.032	≤1.0D	1.0 D	2390 ~ 3180	280 ~ 410
		10	4	60 ~ 80	0.035 ~ 0.038	≤1.0D	1.0 D	1910 ~ 2550	270 ~ 390
		12	4	60 ~ 80	0.041 ~ 0.045	≤1.0D	1.0 D	1590 ~ 2120	260 ~ 380
		14	4	60 ~ 80	0.046 ~ 0.051	≤1.0D	1.0 D	1360 ~ 1820	250 ~ 370
		16	4	60 ~ 80	0.052 ~ 0.057	≤1.0D	1.0 D	1190 ~ 1590	250 ~ 360
		18	4	60 ~ 80	0.058 ~ 0.063	≤1.0D	1.0 D	1060 ~ 1410	250 ~ 360
		20	4	60 ~ 80	0.063 ~ 0.070	≤1.0D	1.0 D	950 ~ 1270	240 ~ 360

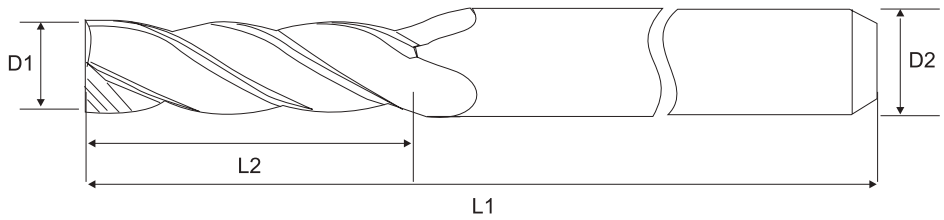
Cutting Parameter - Square Endmill Standard

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	0.003 ~ 0.005	≤1.0D	1.0 D	19100 ~ 25460	230 ~ 510
		1.5	4	60 ~ 80	0.006 ~ 0.008	≤1.0D	1.0 D	12730 ~ 16980	310 ~ 540
		2	4	60 ~ 80	0.009 ~ 0.011	≤1.0D	1.0 D	9550 ~ 12730	340 ~ 560
		2.5	4	60 ~ 80	0.012 ~ 0.014	≤1.0D	1.0 D	7640 ~ 10190	370 ~ 570
		3	4	60 ~ 80	0.014 ~ 0.017	≤1.0D	1.0 D	6370 ~ 8490	360 ~ 580
		4	4	60 ~ 80	0.020 ~ 0.023	≤1.0D	1.0 D	4770 ~ 6370	380 ~ 590
		5	4	60 ~ 80	0.026 ~ 0.028	≤1.0D	1.0 D	3820 ~ 5090	400 ~ 570
		6	4	60 ~ 80	0.031 ~ 0.034	≤1.0D	1.0 D	3180 ~ 4240	390 ~ 580
		8	4	60 ~ 80	0.039 ~ 0.043	≤1.0D	1.0 D	2390 ~ 3180	370 ~ 550
		10	4	60 ~ 80	0.046 ~ 0.051	≤1.0D	1.0 D	1910 ~ 2550	350 ~ 520
		12	4	60 ~ 80	0.054 ~ 0.059	≤1.0D	1.0 D	1590 ~ 2120	340 ~ 500
		14	4	60 ~ 80	0.062 ~ 0.068	≤1.0D	1.0 D	1360 ~ 1820	340 ~ 500
		16	4	60 ~ 80	0.069 ~ 0.076	≤1.0D	1.0 D	1190 ~ 1590	330 ~ 480
		18	4	60 ~ 80	0.077 ~ 0.085	≤1.0D	1.0 D	1060 ~ 1410	330 ~ 480
		20	4	60 ~ 80	0.085 ~ 0.093	≤1.0D	1.0 D	950 ~ 1270	320 ~ 470

XCUT TECHNOLOGIES

DELTA HARD

4 Flute Standard Endmill



ITEM CODE	DIA	SHANK	FL	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	●
EM5N4DH	5	5	13	50	●
EM5N4D6DH	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 ○ NONSTOCKABLE

TiSi

MG

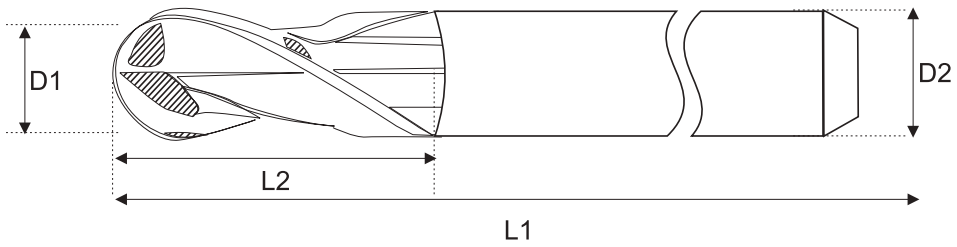
0.8 µm

Co 10%

HRC 60

4 flute

2 Flute Standard Ballnose



ITEM CODE	DIA	SHANK	FL	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 ○ NONSTOCKABLE

TiSi

MG

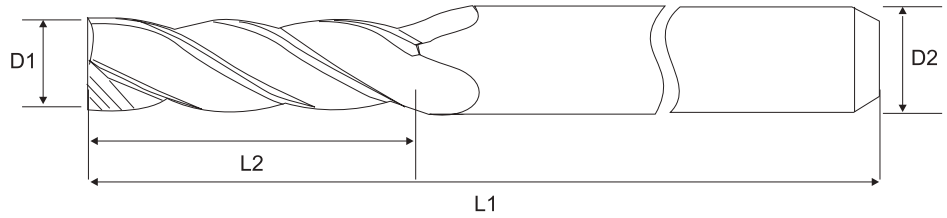
0.8 µm

Co 10%

HRC ▸60

2 flutes

4 Flute Long Endmill Series



ITEM CODE	DIA	SHANK	FL	OAL	Availablity
EM3L4D4DH	3	4	15	75	●
EM4L4DH	4	4	15	75	●
EM5L4D6DH	5	6	20	75	●
EM6L4DH	6	6	24	75	●
EM8L4DH	8	8	25	75	●
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 ○ NONSTOCKABLE

TiSi

MG

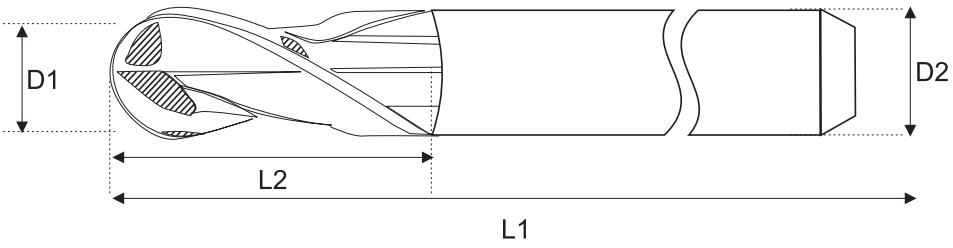
0.8 µm

Co 10%

HRC ›60

4 flute

2 Flute Long Ballnose Series



ITEM CODE	DIA	SHANK	FL	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 ○ NONSTOCKABLE

TiSi

MG

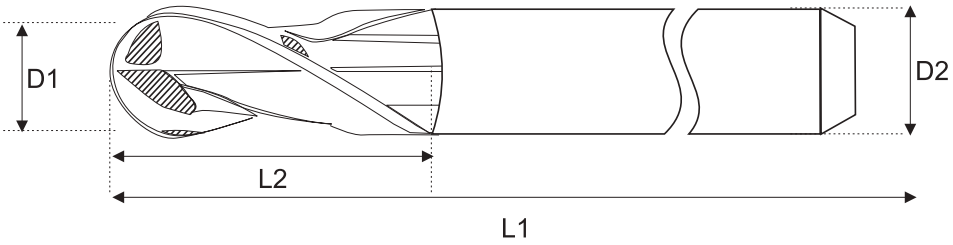
0.8 µm

Co 10%

HRC ▸60

2 flutes

4 Flute Ballnose Line



ITEM CODE	DIA	SHANK	FL	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 ○ NONSTOCKABLE

TiSi

MG

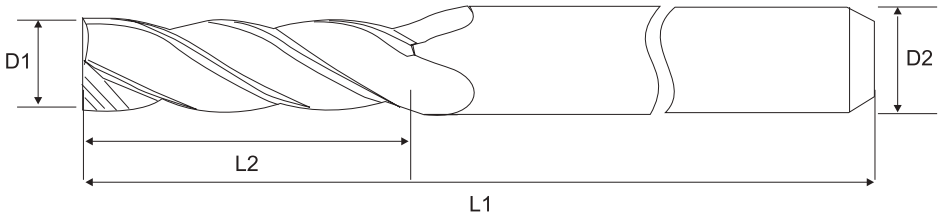
0.8 µm

Co 10%

HRC >60

4 flute

4 Flute Corner Radius Endmill



ITEM CODE	DIA	SHANK	FL	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 ○ NONSTOCKABLE

TiSi

MG

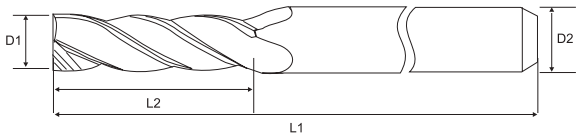
0.8 µm

Co 10%

HRC 60

4 flute

Extra Long Length 4 Flute Square Endmill



CODE	(D1)	(D2)	(L2)	(L1)	(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 ○ NONSTOCKABLE

TiSi

MG

0.8 µm

Co 10%

HRC ›60

4 flute

2 Flute Rib Endmill

Item Number	DIA	NECK LENGTH	OAL	SHANK	Availablity
ME0.3F2LN2D4DH	0.3	2	50	4	O
ME0.3F4LN2D4DH	0.3	4	50	4	O
ME0.4F2LN2D4DH	0.4	2	50	4	O
ME0.4F4LN2D4DH	0.4	4	50	4	O
	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	O
ME0.6F6LN2D4DH	0.6	6	50	4	O
ME0.6F8LN2D4DH	0.6	8	50	4	O
ME0.8F4LN2D4DH	0.8	4	50	4	O
ME0.8F6LN2D4DH	0.8	6	50	4	O
ME0.8F8LN2D4DH	0.8	8	50	4	O
ME0.8F10LN2D4DH	0.8	10	50	4	O
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	O
ME2.5F16LN2D4DH	2.5	16	50	4	O
ME2.5F20LN2D4DH	2.5	20	50	4	O
ME3F12LN2D4DH	3	12	50	4	●
ME3F16LN2D4DH	3	16	50	4	●
ME3F20LN2D4DH	3	20	50	4	●
ME3F25LN2D4DH	3	25	50	4	O

TiSi

MG

0.8 µm

Co 10%

HRC ›60

2 flutes

● STOCKABLE O NONSTOCKABLE

Please note : Flute length of all above tools is 2 x Diameter . For eg: for 0.5mm Dia, Flute length is 1mm.

2 Flute BallNose Rib Endmill

Item Number	DIA	NECK LENGTH	OAL	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	O
MB0.6F6LN2D4DH	0.6	6	50	4	O
MB0.6F8LN2D4DH	0.6	8	50	4	O
MB0.8F4LN2D4DH	0.8	4	50	4	O
MB0.8F6LN2D4DH	0.8	6	50	4	O
MB0.8F8LN2D4DH	0.8	8	50	4	O
MB0.8F10LN2D4DH	0.8	10	50	4	O
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	O
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	O
MB2.5F10LN2D4DH	2.5	10	50	4	O
MB2.5F16LN2D4DH	2.5	16	50	4	O
MB2.5F20LN2D4DH	2.5	20	50	4	O
MB3F12LN2D4DH	3	12	50	4	●
MB3F16LN2D4DH	3	16	50	4	●
MB3F20LN2D4DH	3	20	50	4	●
MB3F25LN2D4DH	3	25	50	4	O

TiSi

MG

0.8 µm

Co 10%

HRC ›60

2 flutes

● STOCKABLE O NONSTOCKABLE

Please note : Flute length of all above tools is 2 x Diameter . For eg: for 0.5mm Dia, Flute length is 1mm.

4 Flute Rib Endmill

Item Number	DIA	NECK LENGTH	OAL	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	O
ME1.5F10LN4D4DH	1.5	10	50	4	●
ME1.5F12LN4D4DH	1.5	12	50	4	O
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	O
ME2.5F16LN4D4DH	2.5	16	50	4	O
ME2.5F20LN4D4DH	2.5	20	50	4	O
ME3F12LN4D4DH	3	12	50	4	●
ME3F16LN4D4DH	3	16	50	4	●
ME3F20LN4D4DH	3	20	50	4	●
ME3F25LN4D4DH	3	25	50	4	O

TiSi

MG

0.8 µm

Co 10%

HRC ›60

4 flute

● STOCKABLE O NONSTOCKABLE

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	0.5	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	13,592	111	0.024	37	0.003	11,650	82
1.0	16	1.0D	0.025	38	0.004	12,144	89	0.021	33	0.003	10,409	65
1.2	6	1.0D	0.096	65	0.007	17,361	250	0.082	56	0.006	14,881	188
1.2	8	1.0D	0.080	61	0.007	16,154	217	0.068	52	0.006	13,846	163
1.2	10	1.0D	0.060	56	0.006	14,947	186	0.051	48	0.005	12,812	139
1.2	12	1.0D	0.048	52	0.006	13,740	157	0.041	44	0.005	11,777	118
1.4	6	1.0D	0.140	70	0.008	15,916	264	0.119	60	0.007	13,642	200
1.4	8	1.0D	0.112	65	0.007	14,881	231	0.095	56	0.007	12,755	175
1.4	10	1.0D	0.080	61	0.007	13,846	200	0.068	52	0.006	11,868	151
1.4	12	1.0D	0.070	56	0.006	12,812	171	0.060	48	0.006	10,981	130
1.4	14	1.0D	0.056	52	0.006	11,777	145	0.048	44	0.005	10,095	110
1.4	16	1.0D	0.051	52	0.006	11,777	145	0.043	44	0.005	10,095	110
1.5	6	1.0D	0.150	70	0.009	14,855	259	0.128	60	0.008	12,732	212
1.5	8	1.0D	0.120	65	0.008	13,889	226	0.102	56	0.007	11,904	185
1.5	10	1.0D	0.100	61	0.007	12,923	196	0.085	52	0.007	11,077	160
1.5	12	1.0D	0.075	56	0.007	11,958	168	0.064	48	0.006	10,249	137
1.5	14	1.0D	0.067	56	0.007	11,958	168	0.057	48	0.006	10,249	137
1.5	16	1.0D	0.060	52	0.006	10,992	142	0.051	44	0.006	9,422	116
1.5	18	1.0D	0.050	47	0.006	10,027	118	0.043	41	0.005	8,594	97
1.5	20	1.0D	0.046	47	0.006	10,027	118	0.039	41	0.005	8,594	97
1.6	6	1.0D	0.213	70	0.009	13,926	259	0.181	60	0.008	11,937	199
1.6	8	1.0D	0.128	65	0.008	13,021	226	0.109	56	0.007	11,161	174
1.6	10	1.0D	0.107	61	0.008	12,116	196	0.091	52	0.007	10,385	151
1.6	12	1.0D	0.091	61	0.008	12,116	196	0.078	52	0.007	10,385	151
1.6	14	1.0D	0.080	56	0.007	11,210	168	0.068	48	0.006	9,609	129
1.6	16	1.0D	0.064	52	0.007	10,305	142	0.054	44	0.006	8,833	109
1.6	18	1.0D	0.058	52	0.007	10,305	142	0.049	44	0.006	8,833	109
1.6	20	1.0D	0.053	47	0.006	9,400	118	0.045	41	0.005	8,057	91
1.8	6	1.0D	0.240	70	0.010	12,379	255	0.204	60	0.009	10,611	198
1.8	8	1.0D	0.180	70	0.010	12,379	255	0.153	60	0.009	10,611	198
1.8	10	1.0D	0.144	65	0.009	11,574	223	0.122	56	0.008	9,921	173
1.8	12	1.0D	0.120	61	0.009	10,769	193	0.102	52	0.008	9,231	150
1.8	14	1.0D	0.103	61	0.009	10,769	193	0.087	52	0.008	9,231	150
1.8	16	1.0D	0.090	56	0.008	9,965	165	0.077	48	0.007	8,541	128
1.8	18	1.0D	0.072	52	0.007	9,160	140	0.061	44	0.007	7,852	108
1.8	20	1.0D	0.065	52	0.007	9,160	140	0.056	44	0.007	7,852	108
2.0	6	1.0D	0.267	70	0.011	11,141	252	0.227	60	0.010	9,550	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

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

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, 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

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

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	0.000 ~ 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	190 ~ 270
		10	4	35 ~ 45	0.041 ~ 0.045	≤0.2D	1.0D	1110 ~ 1430	180 ~ 260
		12	4	35 ~ 45	0.048 ~ 0.053	≤0.2D	1.0D	930 ~ 1190	180 ~ 250
		14	4	35 ~ 45	0.055 ~ 0.060	≤0.2D	1.0D	800 ~ 1020	180 ~ 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

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-HARD-ENED 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	90 ~ 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 - 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)
HARDENED STEEL (45 - 55 HRC)	M26 M32	1	4	20 ~ 30	0.001 ~ 0.001	≤0.05D	1.0D	6370 ~ 9550	30 ~ 40
		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 ~ 60
		2.5	4	20 ~ 30	0.003 ~ 0.004	≤0.1D	1.0D	2550 ~ 3820	30 ~ 60
		3	4	20 ~ 30	0.004 ~ 0.005	≤0.1D	1.0D	2120 ~ 3180	30 ~ 60
		4	4	20 ~ 30	0.005 ~ 0.006	≤0.1D	1.0D	1590 ~ 2390	30 ~ 60
		5	4	20 ~ 30	0.007 ~ 0.008	≤0.1D	1.0D	1270 ~ 1910	40 ~ 60
		6	4	20 ~ 30	0.009 ~ 0.010	≤0.1D	1.0D	1060 ~ 1590	40 ~ 60
		8	4	20 ~ 30	0.011 ~ 0.012	≤0.1D	1.0D	800 ~ 1190	40 ~ 60
		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

Notes

XCUT TECHNOLOGIES MULTI

High Performance Drill L/D3

MG

0.8 µm

Co 10%

HRC ▸45

AlTin

2 flutes

CODE EXAMPLE	D1	D2	L1	L2	L3	L4	AVAILABLITY
HP3D3M	3 - 3.7	6	62	19		37	O
HP3.8D3M	3.8 - 4.7	6	66	23		37	O
HP4.8D3M	4.8 - 6	6	66	27		37	O
HP6.1D3M	6.1 - 7	8	79	33		37	O
HP7.1D3M	7.1 - 8	8	79	40		37	O
HP8.1D3M	8.1 - 10	10	89	45		41	O
HP10.1D3M	10.1 - 12	12	102	53		46	O
HP12.1D3M	12.1 - 14	14	107	58		46	O

● STOCKABLE O NONSTOCKABLE

Note :
Witstle Notch available on request
Order Code eg. - “HP6.8D3M” for dia 6.8mm

High Performance Thru Coolant Drill L/D5

CODE EXAMPLE	D1	D2	L1	L2	L4	AVAILABLITY
HP3D5TRM	3 - 3.7	6	66	27	37	O
HP3.8D5TRM	3.8 - 4.7	6	74	35	37	O
HP4.8D5TRM	4.8 - 6	6	82	43	37	O
HP6.1D5TRM	6.1 - 8	8	91	52	37	O
HP8.1D5TRM	8.1 - 10	10	103	59	41	O
HP10.1D5TRM	10.1 - 12	12	118	69	46	O
HP12.1D5TRM	12.1 - 14	14	124	75	46	O

● STOCKABLE O NONSTOCKABLE

Note :
Witstle Notch available on request
Order Code eg. - “HP6.8D5TRM” for dia 6.8mm

MG

0.8 µm

Co 10%

HRC ▸45

AlTin

2 flutes

Jobber Drill L/D 3

MG

0.8 µm

Co 10%

HRC ▸45

AlTin

2 flutes

CODE	D1	D2	L1	L2	AVAILABLITY
JD1D3S2M	1	2	40	6	●
JD1.1D3S2M	1.1	2	40	7	O
JD1.2D3S2M	1.2	2	40	8	●
JD1.3D3S2M	1.3	2	40	8	●
JD1.4D3S2M	1.4	2	40	9	●
JD1.5D3S2M	1.5	2	40	9	●
JD1.6D3S2M	1.6	2	40	10	●
JD1.7D3S2M	1.7	2	40	10	●
JD1.8D3S2M	1.8	2	40	11	●
JD1.9D3S2M	1.9	2	40	11	●
JD2D3M	2	2	40	12	●
JD2.1D3M	2.1	2.1	40	12	●
JD2.2D3M	2.2	2.2	40	13	●
JD2.3D3M	2.3	2.3	46	13	●
JD2.4D3M	2.4	2.4	46	14	●
JD2.5D3M	2.5	2.5	46	14	●
JD2.6D3M	2.6	2.6	46	14	●
JD2.7D3M	2.7	2.7	46	16	●
JD2.8D3M	2.8	2.8	49	16	●
JD2.9D3M	2.9	2.9	49	16	●
JD3D3M	3	3	49	16	●
JD3.1D3M	3.1	3.1	49	18	●
JD3.2D3M	3.2	3.2	49	18	●
JD3.3D3M	3.3	3.3	52	18	●
JD3.4D3M	3.4	3.4	52	20	●
JD3.5D3M	3.5	3.5	52	20	●
JD3.6D3M	3.6	3.6	52	20	O
JD3.7D3M	3.7	3.7	52	20	●
JD3.8D3M	3.8	3.8	55	22	●
JD3.9D3M	3.9	3.9	55	22	●
JD4D3M	4	4	55	22	●

● STOCKABLE O NONSTOCKABLE

To Be continued...

Jobber Drill L/D 3

CODE	D1	D2	L1	L2	AVAILABLITY
JD4.1D3M	4.1	4.1	55	22	●
JD4.2D3M	4.2	4.2	55	22	●
JD4.3D3M	4.3	4.3	58	24	●
JD4.4D3M	4.4	4.4	58	24	●
JD4.5D3M	4.5	4.5	58	24	●
JD4.6D3M	4.6	4.6	58	24	●
JD4.7D3M	4.7	4.7	58	24	●
JD4.8D3M	4.8	4.8	62	26	●
JD4.9D3M	4.9	4.9	62	26	O
JD5D3M	5	5	62	26	●
JD5.1D3M	5.1	5.1	62	26	●
JD5.2D3M	5.2	5.2	62	26	●
JD5.3D3M	5.3	5.3	66	26	●
JD5.4D3M	5.4	5.4	66	28	O
JD5.5D3M	5.5	5.5	66	28	●
JD5.6D3M	5.6	5.6	66	28	●
JD5.7D3M	5.7	5.7	66	28	O
JD5.8D3M	5.8	5.8	70	28	●
JD5.9D3M	5.9	5.9	70	28	●
JD6D3M	6	6	70	28	●
JD6.1D3M	6.1	6.1	70	31	●
JD6.2D3M	6.2	6.2	70	31	●
JD6.3D3M	6.3	6.3	70	31	●
JD6.4D3M	6.4	6.4	70	31	O
JD6.5D3M	6.5	6.5	70	31	●
JD6.6D3M	6.6	6.6	70	31	O
JD6.7D3M	6.7	6.7	70	31	●
JD6.8D3M	6.8	6.8	74	34	●
JD6.9D3M	6.9	6.9	74	34	O
JD7D3M	7	7	74	34	●
JD7.1D3M	7.1	7.1	74	34	O

MG

0.8 µm

Co 10%

HRC ▸45

AlTin

2 flutes

● STOCKABLE O NONSTOCKABLE

To Be continued...

Jobber Drill L/D 3

MG

0.8 µm

Co 10%

HRC ▸45

AlTin

2 flutes

CODE	D1	D2	L1	L2	AVAILABLITY
JD7.2D3M	7.2	7.2	74	34	O
JD7.3D3M	7.3	7.3	79	34	O
JD7.4D3M	7.4	7.4	79	34	O
JD7.5D3M	7.5	7.5	79	34	O
JD7.6D3M	7.6	7.6	79	37	O
JD7.7D3M	7.7	7.7	79	37	O
JD7.8D3M	7.8	7.8	79	37	O
JD7.9D3M	7.9	7.9	79	37	O
JD8D3M	8	8	79	37	O
JD8.1D3M	8.1	8.1	79	37	O
JD8.2D3M	8.2	8.2	79	37	O
JD8.3D3M	8.3	8.3	84	37	O
JD8.4D3M	8.4	8.4	84	37	O
JD8.5D3M	8.5	8.5	84	37	O
JD8.6D3M	8.6	8.6	84	40	O
JD8.7D3M	8.7	8.7	84	40	O
JD8.8D3M	8.8	8.8	84	40	O
JD8.9D3M	8.9	8.9	84	40	O
JD9D3M	9	9	84	40	O
JD9.1D3M	9.1	9.1	84	40	O
JD9.2D3M	9.2	9.2	84	40	O
JD9.3D3M	9.3	9.3	89	40	O
JD9.4D3M	9.4	9.4	89	40	O
JD9.5D3M	9.5	9.5	89	40	O
JD9.6D3M	9.6	9.6	89	43	O
JD9.7D3M	9.7	9.7	89	43	O
JD9.8D3M	9.8	9.8	89	43	O
JD9.9D3M	9.9	9.9	89	43	O
JD10D3M	10	10	89	43	O
JD10.2D3M	10.2	10.2	89	43	O
JD10.5D3M	10.5	10.5	95	43	O

● STOCKABLE ○ NONSTOCKABLE

To Be continued...

Jobber Drill L/D 3

CODE	D1	D2	L1	L2	AVAILABLITY
JD10.8D3M	10.8	10.8	95	47	O
JD11D3M	11.0	11.0	95	47	O
JD11.2D3M	11.2	11.2	102	47	O
JD11.3D3M	11.3	11.3	102	47	O
JD11.5D3M	11.5	11.5	102	47	O
JD11.8D3M	11.8	11.8	102	47	O
JD12D3M	12.0	12.0	102	51	O
JD12.2D3M	12.2	12.2	102	51	O
JD12.5D3M	12.5	12.5	103	51	O
JD12.7D3M	12.7	12.7	103	51	O
JD12.8D3M	12.8	12.8	103	51	O
JD13D3M	13.0	13.0	103	51	O
JD13.5D3M	13.5	13.5	107	54	O
JD13.7D3M	13.7	13.7	107	54	O
JD13.8D3M	13.8	13.8	107	54	O
JD14D3M	14.0	14.0	107	54	O
JD14.5D3M	14.5	14.5	111	56	O
JD15D3M	15.0	15.0	111	56	O
JD15.3D3M	15.3	15.3	111	56	O
JD15.5D3M	15.5	15.5	115	58	O
JD15.8D3M	15.8	15.8	115	58	O
JD16D3M	16.0	16.0	115	58	O

MG

0.8 µm

Co 10%

HRC ▸45

AlTin

2 flutes

● STOCKABLE O NONSTOCKABLE

Jobber Drill L/D 5

MG

0.8 µm

Co 10%

HRC ▸45

AlTin

2 flutes

CODE	D1	D2	L1	L2	AVAILABLITY
JD1D5S2M	1.0	2	40	12	O
JD1.1D5S2M	1.1	2	40	14	O
JD1.2D5S2M	1.2	2	40	16	O
JD1.3D5S2M	1.3	2	40	16	O
JD1.4D5S2M	1.4	2	40	18	O
JD1.5D5S2M	1.5	2	40	18	O
JD1.6D5S2M	1.6	2	49	20	O
JD1.7D5S2M	1.7	2	49	20	O
JD1.8D5S2M	1.8	2	49	22	O
JD1.9D5S2M	1.9	2	49	22	O
JD2D5M	2.0	2	49	24	O
JD2.1D5M	2.1	2.1	49	24	O
JD2.2D5M	2.2	2.2	53	27	O
JD2.3D5M	2.3	2.3	53	27	O
JD2.4D5M	2.4	2.4	57	30	O
JD2.5D5M	2.5	2.5	57	30	O
JD2.6D5M	2.6	2.6	57	30	O
JD2.7D5M	2.7	2.7	61	33	O
JD2.8D5M	2.8	2.8	61	33	O
JD2.9D5M	2.9	2.9	61	33	O
JD3D5M	3.0	3	61	33	O
JD3.1D5M	3.1	3.1	65	36	O
JD3.2D5M	3.2	3.2	65	36	O
JD3.3D5M	3.3	3.3	65	36	O
JD3.4D5M	3.4	3.4	70	39	O
JD3.5D5M	3.5	3.5	70	39	O
JD3.6D5M	3.6	3.6	70	39	O
JD3.7D5M	3.7	3.7	70	39	O
JD3.8D5M	3.8	3.8	75	43	O
JD3.9D5M	3.9	3.9	75	43	O
JD4D5M	4.0	4	75	43	O

● STOCKABLE O NONSTOCKABLE

To Be continued...

Jobber Drill L/D 5

CODE	D1	D2	L1	L2	AVAILABLITY
JD4.1D5M	4.1	4.1	75	43	O
JD4.2D5M	4.2	4.2	75	43	O
JD4.3D5M	4.3	4.3	80	47	O
JD4.4D5M	4.4	4.4	80	47	O
JD4.5D5M	4.5	4.5	80	47	O
JD4.6D5M	4.6	4.6	80	47	O
JD4.7D5M	4.7	4.7	80	47	O
JD4.8D5M	4.8	4.8	86	52	O
JD4.9D5M	4.9	4.9	86	52	O
JD5D5M	5.0	5.0	86	52	O
JD5.1D5M	5.1	5.1	86	52	O
JD5.2D5M	5.2	5.2	86	52	O
JD5.3D5M	5.3	5.3	86	52	O
JD5.4D5M	5.4	5.4	93	57	O
JD5.5D5M	5.5	5.5	93	57	O
JD5.6D5M	5.6	5.6	93	57	O
JD5.7D5M	5.7	5.7	93	57	O
JD5.8D5M	5.8	5.8	93	57	O
JD5.9D5M	5.9	5.9	93	57	O
JD6D5M	6	6	93	57	O
JD6.1D5M	6.1	6.1	101	63	O
JD6.2D5M	6.2	6.2	101	63	O
JD6.3D5M	6.3	6.3	101	63	O
JD6.4D5M	6.4	6.4	101	63	O
JD6.5D5M	6.5	6.5	101	63	O
JD6.6D5M	6.6	6.6	101	63	O
JD6.7D5M	6.7	6.7	101	63	O
JD6.8D5M	6.8	6.8	109	69	O
JD6.9D5M	6.9	6.9	109	69	O
JD7D5M	7	7	109	69	O
JD7.1D5M	7.1	7.1	109	69	O

MG

0.8 µm

Co 10%

HRC ▸45

AlTin

2 flutes

● STOCKABLE o NONSTOCKABLE

To Be continued...

Jobber Drill L/D 5

MG

0.8 µm

Co 10%

HRC ▸45

AlTin

2 flutes

CODE	D1	D2	L1	L2	AVAILABLITY
JD7.2D5M	7.2	7.2	109	69	O
JD7.3D5M	7.3	7.3	109	69	O
JD7.4D5M	7.4	7.4	109	69	O
JD7.5D5M	7.5	7.5	109	69	O
JD7.6D5M	7.6	7.6	117	75	O
JD7.7D5M	7.7	7.7	117	75	O
JD7.8D5M	7.8	7.8	117	75	O
JD7.9D5M	7.9	7.9	117	75	O
JD8D5M	8	8	117	75	O
JD8.1D5M	8.1	8.1	117	75	O
JD8.2D5M	8.2	8.2	117	75	O
JD8.3D5M	8.3	8.3	117	75	O
JD8.4D5M	8.4	8.4	117	75	O
JD8.5D5M	8.5	8.5	117	75	O
JD8.6D5M	8.6	8.6	125	81	O
JD8.7D5M	8.7	8.7	125	81	O
JD8.8D5M	8.8	8.8	125	81	O
JD8.9D5M	8.9	8.9	125	81	O
JD9D5M	9	9	125	81	O
JD9.1D5M	9.1	9.1	125	81	O
JD9.2D5M	9.2	9.2	125	81	O
JD9.3D5M	9.3	9.3	125	81	O
JD9.4D5M	9.4	9.4	125	81	O
JD9.5D5M	9.5	9.5	125	81	O
JD9.6D5M	9.6	9.6	133	87	O
JD9.7D5M	9.7	9.7	133	87	O
JD9.8D5M	9.8	9.8	133	87	O
JD9.9D5M	9.9	9.9	133	87	O
JD10D5M	10	10	133	87	O
JD10.2D5M	10.2	10.2	133	87	O
JD10.5D5M	10.5	10.5	133	87	O

To Be continued...

● STOCKABLE ○ NONSTOCKABLE

Jobber Drill L/D 5

CODE	D1	D2	L1	L2	AVAILABLITY
JD10.8D5M	10.8	10.8	142	94	O
JD11D5M	11	11	142	94	O
JD11.2D5M	11.2	11.2	142	94	O
JD11.3D5M	11.3	11.3	142	94	O
JD11.5D5M	11.5	11.5	142	94	O
JD11.8D5M	11.8	11.8	151	101	O
JD12D5M	12	12	151	101	O
JD12.2D5M	12.2	12.2	151	101	O
JD12.5D5M	12.5	12.5	151	101	O
JD12.8D5M	12.8	12.8	151	101	O
JD13D5M	13	13	151	101	O
JD13.5D5M	13.5	13.5	160	108	O
JD13.8D5M	13.8	13.8	160	108	O
JD14D5M	14	14	160	108	O
JD14.5D5M	14.5	14.5	169	114	O
JD15D5M	15	15	169	114	O
JD15.3D5M	15.3	15.3	169	114	O
JD15.5D5M	15.5	15.5	178	120	O
JD15.8D5M	15.8	15.8	178	120	O
JD16D5M	16	16	178	120	O

MG

0.8 µm

Co 10%

HRC ▸45

AlTiN

2 flutes

● STOCKABLE o NONSTOCKABLE

Cutting Parameter - DRILL L/D 3, 5


A


B

TYPE OF STEEL	MATERIAL GROUPS	CUTTING SPEED VC =(M/MIN)				FEEDS F (MM/REV) FOR DIAMETER RANGES (MM)										
		TYPE	APPLICATION RANGE	VC		1	2	3	4	5	6	8	10	12	16	20
THERMO PLASTICS WITHOUT FILLERS	M01	A	250 ~ 400	250	400	0.057	0.105	0.150	0.193	0.235	0.277	0.356	0.434	0.510	0.657	0.800
		B	250 ~ 370	250	370	0.047	0.089	0.130	0.170	0.208	0.247	0.322	0.395	0.468	0.610	0.750
ALUMINIUM COMMERCIAL PURE AL-ALLOYS WROUGHT	M02	A	120 ~ 300	120	300	0.072	0.119	0.160	0.197	0.231	0.264	0.325	0.382	0.436	0.536	0.630
		B	120 ~ 230	120	230	0.062	0.104	0.140	0.173	0.204	0.234	0.289	0.341	0.391	0.483	0.570
COPPER PURE	M03	A	125 ~ 125	125	125	0.056	0.093	0.125	0.154	0.182	0.207	0.256	0.301	0.344	0.425	0.500
		B	120 ~ 120	120	120	0.042	0.073	0.100	0.126	0.150	0.173	0.218	0.260	0.300	0.377	0.450
ZINC-ALLOYS	M04	A	180 ~ 220	180	220	0.061	0.108	0.150	0.189	0.227	0.263	0.333	0.399	0.462	0.584	0.700
		B	180 ~ 210	180	210	0.051	0.092	0.130	0.166	0.201	0.234	0.299	0.361	0.421	0.538	0.650
ALUMINIUM-SLILICON ALLOYS CAST, BELOW 10% SI	M05	A	200 ~ 300	200	300	0.057	0.105	0.150	0.193	0.235	0.277	0.356	0.434	0.510	0.657	0.800
		B	200 ~ 270	200	270	0.047	0.089	0.130	0.170	0.208	0.247	0.322	0.395	0.468	0.610	0.750
ALUMINIUM-SLILICON ALLOYS CAST, 10% - 14% SI	M06	A	180 ~ 220	180	220	0.072	0.119	0.160	0.197	0.231	0.264	0.325	0.382	0.436	0.536	0.630
		B	180 ~ 210	180	210	0.055	0.095	0.130	0.163	0.194	0.223	0.279	0.332	0.383	0.479	0.570
ALUMINIUM-SLILICON ALLOYS CAST, MORE THAN 14% SI	M07	A	120 ~ 180	120	180	0.072	0.119	0.160	0.197	0.231	0.264	0.325	0.382	0.436	0.536	0.630
		B	120 ~ 160	120	160	0.055	0.095	0.130	0.163	0.194	0.223	0.279	0.332	0.383	0.479	0.570
BRASS	M08	A	120 ~ 180	120	180	0.056	0.093	0.125	0.154	0.182	0.207	0.256	0.301	0.344	0.425	0.500
		B	120 ~ 160	120	160	0.042	0.073	0.100	0.126	0.150	0.173	0.218	0.260	0.300	0.377	0.450
BRONZE	M09	A	120 ~ 180	120	180	0.063	0.105	0.140	0.172	0.202	0.231	0.284	0.334	0.381	0.468	0.550
		B	120 ~ 160	120	160	0.056	0.093	0.125	0.154	0.182	0.207	0.256	0.301	0.344	0.425	0.500
CAST IRON GG 10... GG20	M10	A	50 ~ 130	50	130	0.039	0.071	0.100	0.128	0.154	0.180	0.230	0.278	0.324	0.414	0.500
		B	50 ~ 110	50	110	0.038	0.065	0.090	0.113	0.134	0.155	0.195	0.232	0.268	0.336	0.400
CAST IRON, MALLEABLE IRON	M11-M14	A	50 ~ 130	50	130	0.039	0.071	0.100	0.128	0.154	0.180	0.230	0.278	0.324	0.414	0.500
		B	50 ~ 110	50	110	0.026	0.048	0.070	0.091	0.112	0.132	0.172	0.212	0.250	0.326	0.400
STEEL AND CAST STEEL UP TO 700 N/MM² - 210HB	M15	A	80 ~ 120	80	120	0.044	0.074	0.100	0.124	0.147	0.169	0.210	0.249	0.285	0.355	0.420
		B	80 ~ 110	80	110	0.032	0.057	0.080	0.102	0.123	0.144	0.184	0.222	0.259	0.331	0.400
STAINLESS STEEL -SUS 300	M16	A	30 ~ 55	30	55	0.024	0.043	0.060	0.077	0.093	0.108	0.138	0.167	0.194	0.248	0.300
		B	30 ~ 50	30	50	0.020	0.035	0.050	0.064	0.077	0.090	0.115	0.139	0.162	0.207	0.250
TITANIUM COMMERCIAL TITANIUM ALLOYS UP TO 700 N/MM²	M17	A	45 ~ 45	45	45	0.028	0.047	0.063	0.078	0.091	0.104	0.128	0.151	0.172	0.213	0.250
		B	45 ~ 45	45	45	0.028	0.045	0.060	0.074	0.086	0.098	0.120	0.141	0.160	0.196	0.230
STEEL AND CAST STEEL ~30 HRC -210 - 295 HB	M18	A	80 ~ 135	80	135	0.056	0.090	0.120	0.147	0.171	0.194	0.238	0.278	0.315	0.385	0.450
		B	80 ~ 110	80	110	0.032	0.057	0.080	0.102	0.123	0.144	0.184	0.222	0.259	0.331	0.400

Cutting Parameter - DRILL L/D 3, 5


A


B

TYPE OF STEEL	MATERIAL GROUPS	CUTTING SPEED VC =(M/MIN)				FEEDS F (MM/REV) FOR DIAMETER RANGES (MM)										
		TYPE	APPLICATION RANGE	VC		1	2	3	4	5	6	8	10	12	16	20
NI AND CO ALLOYS	M19	A	30 ~ 50	30	50	0.026	0.044	0.060	0.074	0.088	0.101	0.125	0.148	0.170	0.211	0.250
		B	25 ~ 45	25	45	0.028	0.045	0.060	0.074	0.086	0.098	0.120	0.141	0.160	0.196	0.230
STAINLESS STEEL -SUS 400	M20	A	30 ~ 60	30	60	0.041	0.063	0.080	0.095	0.109	0.121	0.144	0.165	0.184	0.219	0.250
		B	30 ~ 55	30	55	0.050	0.071	0.087	0.101	0.113	0.124	0.144	0.161	0.177	0.205	0.230
TITANIUM COMMERCIAL TITANIUM ALLOYS OVER 700 N/MM²	M21	A	40 ~ 40	40	40	0.028	0.047	0.063	0.078	0.091	0.104	0.128	0.151	0.172	0.213	0.250
		B	40 ~ 40	40	40	0.028	0.045	0.060	0.074	0.086	0.098	0.120	0.141	0.160	0.196	0.230
STEEL AND CAST STEEL ~ 40 HRC - 360 - 440B	M22	A	60 ~ 85	60	85	0.036	0.060	0.080	0.098	0.116	0.132	0.162	0.191	0.218	0.268	0.315
		B	60 ~ 70	60	70	0.033	0.053	0.070	0.085	0.099	0.111	0.135	0.157	0.177	0.215	0.250
NI AND CO ALLOYS UP TO 1200 N/MM²	M23	A	20 ~ 40	20	40	0.022	0.037	0.050	0.062	0.073	0.083	0.102	0.121	0.138	0.170	0.200
		B	20 ~ 37	20	37	0.017	0.029	0.040	0.050	0.060	0.069	0.087	0.104	0.120	0.151	0.180
NI AND CO ALLOYS MORE THAN 1200 N/MM²	M24	A	20 ~ 35	20	35	0.017	0.029	0.040	0.050	0.060	0.069	0.087	0.104	0.120	0.151	0.180
		B	20 ~ 30	20	30	0.015	0.026	0.035	0.044	0.052	0.060	0.074	0.088	0.101	0.126	0.150
STEEL AND CAST STEEL ~ 35 HRC - 295 - 360B	M25	A	40 ~ 60	40	60	0.022	0.037	0.050	0.062	0.073	0.083	0.102	0.121	0.138	0.170	0.200
		B	30 ~ 45	30	45	0.018	0.030	0.040	0.049	0.058	0.066	0.082	0.096	0.110	0.136	0.160
HARDENED STEEL ~52 HRC	M26	A	15 ~ 25	15	25	0.010	0.020	0.030	0.040	0.050	0.060	0.080	0.100	0.120	0.160	0.200
		B	15 ~ 25	15	25	0.633	0.378	0.280	0.226	0.192	0.167	0.135	0.115	0.100	0.081	0.068
CHILLED CAST IRON	M27	A	40 ~ 40	40	40	0.022	0.037	0.050	0.062	0.073	0.083	0.102	0.121	0.138	0.170	0.200
		B	35 ~ 35	35	35	0.017	0.029	0.040	0.050	0.059	0.068	0.085	0.100	0.115	0.143	0.170
HARDENED STEEL ~52 -65 HRC	M28	A	10 ~ 15	10	15	0.012	0.021	0.030	0.039	0.047	0.055	0.070	0.085	0.100	0.128	0.156
		B	10 ~ 13	10	13	0.012	0.021	0.028	0.035	0.041	0.047	0.059	0.070	0.080	0.099	0.118
PLASTIC , REINFORCED WITH ORGANIC FILLERS.	M29	A	200 ~ 375	200	375	0.047	0.089	0.130	0.170	0.208	0.247	0.322	0.395	0.468	0.610	0.750
		B	200 ~ 350	200	350	0.032	0.066	0.100	0.135	0.170	0.206	0.277	0.350	0.423	0.571	0.720
GRAPHITE	M30	A	200 ~ 400	200	400	0.047	0.089	0.130	0.170	0.208	0.247	0.322	0.395	0.468	0.610	0.750
		B	200 ~ 375	200	375	0.031	0.065	0.100	0.136	0.172	0.209	0.283	0.359	0.436	0.592	0.750
HEAT- RESISTAANT STEEL	M31	A	25 ~ 40	25	40	0.015	0.028	0.040	0.052	0.064	0.076	0.099	0.121	0.144	0.187	0.230
		B	25 ~ 37	25	37	0.010	0.020	0.030	0.040	0.050	0.060	0.080	0.100	0.120	0.160	0.200
NICKEL BASE ALLOYS PRE-HARDENED (E.G INCONEL 718)	M32	A	20 ~ 35	20	35	0.016	0.028	0.040	0.051	0.062	0.072	0.092	0.111	0.130	0.166	0.200
		B	30 ~ 33	30	33	0.011	0.020	0.030	0.039	0.049	0.058	0.076	0.094	0.111	0.146	0.180
HARDENED STEEL ~ 63-68 HRC	M33	A	7 ~ 12	7	12	0.007	0.013	0.020	0.027	0.033	0.040	0.053	0.067	0.080	0.107	0.133
		B	7 ~ 11	7	11	0.007	0.014	0.020	0.026	0.032	0.037	0.049	0.059	0.070	0.091	0.111

Notes

XCUT TECHNOLOGIES PREMIUM

High Performance Drill L/D 3

MG

0.8 µm

Co 10%

HRC ▸55

AlTin

2 flutes

CODE	D1	D2	L1	L2	L3	L4	AVAILABLITY
HP3D3P	3	6	62	14	20	36	O
HP3.1D3P	3.1	6	62	14	20	36	O
HP3.2D3P	3.2	6	62	14	20	36	O
HP3.3D3P	3.3	6	62	14	20	36	●
HP3.4D3P	3.4	6	62	14	20	36	O
HP3.5D3P	3.5	6	62	14	20	36	O
HP3.6D3P	3.6	6	62	14	20	36	O
HP3.7D3P	3.7	6	62	14	20	36	O
HP3.8D3P	3.8	6	66	17	24	36	O
HP3.9D3P	3.9	6	66	17	24	36	O
HP4D3P	4	6	66	17	24	36	O
HP4.1D3P	4.1	6	66	17	24	36	O
HP4.2D3P	4.2	6	66	17	24	36	●
HP4.3D3P	4.3	6	66	17	24	36	O
HP4.4D3P	4.4	6	66	17	24	36	O
HP4.5D3P	4.5	6	66	17	24	36	O
HP4.6D3P	4.6	6	66	17	24	36	O
HP4.7D3P	4.7	6	66	17	24	36	O
HP4.8D3P	4.8	6	66	20	28	36	O
HP4.9D3P	4.9	6	66	20	28	36	O
HP5D3P	5	6	66	20	28	36	●
HP5.1D3P	5.1	6	66	20	28	36	O
HP5.2D3P	5.2	6	66	20	28	36	O
HP5.3D3P	5.3	6	66	20	28	36	O
HP5.4D3P	5.4	6	66	20	28	36	O
HP5.5D3P	5.5	6	66	20	28	36	O
HP5.6D3P	5.6	6	66	20	28	36	O
HP5.7D3P	5.7	6	66	20	28	36	O
HP5.8D3P	5.8	6	66	20	28	36	O
HP5.9D3P	5.9	6	66	20	28	36	O
HP6D3P	6	6	66	20	28	36	O

● STOCKABLE O NONSTOCKABLE

To Be continued...

High Performance Drill L/D 3

CODE	D1	D2	L1	L2	L3	L4	AVAILABLITY
HP6.1D3P	6.1	8	79	24	34	36	O
HP6.2D3P	6.2	8	79	24	34	36	O
HP6.3D3P	6.3	8	79	24	34	36	O
HP6.4D3P	6.4	8	79	24	34	36	O
HP6.5D3P	6.5	8	79	24	34	36	O
HP6.6D3P	6.6	8	79	24	34	36	O
HP6.7D3P	6.7	8	79	24	34	36	O
HP6.8D3P	6.8	8	79	24	34	36	●
HP6.9D3P	6.9	8	79	24	34	36	O
HP7D3P	7	8	79	24	34	36	O
HP7.1D3P	7.1	8	79	29	41	36	O
HP7.2D3P	7.2	8	79	29	41	36	O
HP7.3D3P	7.3	8	79	29	41	36	O
HP7.4D3P	7.4	8	79	29	41	36	O
HP7.5D3P	7.5	8	79	29	41	36	O
HP7.6D3P	7.6	8	79	29	41	36	O
HP7.7D3P	7.7	8	79	29	41	36	O
HP7.8D3P	7.8	8	79	29	41	36	O
HP7.9D3P	7.9	8	79	29	41	36	O
HP8D3P	8	8	79	29	41	36	O
HP8.1D3P	8.1	10	89	35	47	40	O
HP8.2D3P	8.2	10	89	35	47	40	O
HP8.3D3P	8.3	10	89	35	47	40	O
HP8.4D3P	8.4	10	89	35	47	40	O
HP8.5D3P	8.5	10	89	35	47	40	●
HP8.6D3P	8.6	10	89	35	47	40	O
HP8.7D3P	8.7	10	89	35	47	40	O
HP8.8D3P	8.8	10	89	35	47	40	O
HP8.9D3P	8.9	10	89	35	47	40	O
HP9D3P	9	10	89	35	47	40	O
HP9.1D3P	9.1	10	89	35	47	40	O

MG

0.8 µm

Co 10%

HRC ▸55

AlTin

2 flutes

● STOCKABLE O NONSTOCKABLE

To Be continued...

High Performance Drill L/D 3

MG

0.8 µm

Co 10%

HRC ▸55

AlTin

2 flutes

CODE	D1	D2	L1	L2	L3	L4	AVAILABLITY
HP9.2D3P	9.2	10	89	35	47	40	O
HP9.3D3P	9.3	10	89	35	47	40	O
HP9.4D3P	9.4	10	89	35	47	40	O
HP9.5D3P	9.5	10	89	35	47	40	O
HP9.6D3P	9.6	10	89	35	47	40	O
HP9.7D3P	9.7	10	89	35	47	40	O
HP9.8D3P	9.8	10	89	35	47	40	O
HP9.9D3P	9.9	10	89	35	47	40	O
HP10D3P	10	10	89	35	47	40	●
HP10.2D3P	10.2	12	102	40	55	45	●
HP10D3P	10.3	12	102	40	55	45	O
HP10.5D3P	10.5	12	102	40	55	45	●
HP10.8D3P	10.8	12	102	40	55	45	O
HP11D3P	11	12	102	40	55	45	●
HP11.2D3P	11.2	12	102	40	55	45	O
HP11.5D3P	11.5	12	102	40	55	45	●
HP11.8D3P	11.8	12	102	40	55	45	O
HP12D3P	12	12	102	40	55	45	●
HP12.2D3P	12.2	14	107	43	60	45	●
HP12.5D3P	12.5	14	107	43	60	45	●
HP12.8D3P	12.8	14	107	43	60	45	O

● STOCKABLE O NONSTOCKABLE

To Be continued...

High Performance Drill L/D 3

CODE	D1	D2	L1	L2	L3	L4	AVAILABLITY
HP13D3P	13	14	107	43	60	45	●
HP13.5D3P	13.5	14	107	43	60	45	O
HP14D3P	14	14	107	43	60	45	●
HP14.5D3P	14.5	16	115	45	65	48	●
HP15D3P	15	16	115	65	65	48	●
HP15.5D3P	15.5	16	115	65	65	48	O
HP16D3P	16	16	115	65	65	48	●
HP16.5D3P	16.5	18	123	73	73	48	O
HP17D3P	17	18	123	73	73	48	O
HP17.5D3P	17.5	18	123	73	73	48	O
HP18D3P	18	18	123	73	73	48	●
HP18.5D3P	18.5	20	131	79	79	50	O
HP19D3P	19	20	131	79	79	50	O
HP19.5D3P	19.5	20	131	79	79	50	O
HP20D3P	20	20	131	79	79	50	O

● STOCKABLE O NONSTOCKABLE

MG

0.8 µm

Co 10%

HRC ▸55

AlTiN

2 flutes

High Performance Drill L/D 5

MG

0.8 µm

Co 10%

HRC ▸55

AlTin

2 flutes

CODE	D1	D2	L1	L2	L3	L4	AVAILABLITY
HP3D5P	3	6	66	23	28	36	O
HP3.1D5P	3.1	6	66	23	28	36	O
HP3.2D5P	3.2	6	66	23	28	36	O
HP3.3D5P	3.3	6	66	23	28	36	●
HP3.4D5P	3.4	6	66	23	28	36	O
HP3.5D5P	3.5	6	66	23	28	36	O
HP3.6D5P	3.6	6	66	23	28	36	O
HP3.7D5P	3.7	6	66	23	28	36	O
HP3.8D5P	3.8	6	74	29	36	36	O
HP3.9D5P	3.9	6	74	29	36	36	O
HP4D5P	4	6	74	29	36	36	O
HP4.1D5P	4.1	6	74	29	36	36	O
HP4.2D5P	4.2	6	74	29	36	36	●
HP4.3D5P	4.3	6	74	29	36	36	O
HP4.4D5P	4.4	6	74	29	36	36	O
HP4.5D5P	4.5	6	74	29	36	36	O
HP5D5P	5	6	82	35	44	36	●
HP5.1D5P	5.1	6	82	35	44	36	O
HP5.2D5P	5.2	6	82	35	44	36	O
HP5.3D5P	5.3	6	82	35	44	36	O
HP5.4D5P	5.4	6	82	35	44	36	O
HP5.5D5P	5.5	6	82	35	44	36	O
HP5.6D5P	5.6	6	82	35	44	36	O
HP5.7D5P	5.7	6	82	35	44	36	O
HP5.8D5P	5.8	6	82	35	44	36	O
HP5.9D5P	5.9	6	82	35	44	36	O
HP6D5P	6	6	82	35	44	36	O

● STOCKABLE O NONSTOCKABLE

To Be continued...

High Performance Drill L/D 5

CODE	D1	D2	L1	L2	L3	L4	AVAILABLITY
HP6.1D5P	6.1	8	91	43	53	36	O
HP6.2D5P	6.2	8	91	43	53	36	O
HP6.3D5P	6.3	8	91	43	53	36	O
HP6.4D5P	6.4	8	91	43	53	36	O
HP6.5D5P	6.5	8	91	43	53	36	O
HP6.6D5P	6.6	8	91	43	53	36	O
HP6.7D5P	6.7	8	91	43	53	36	O
HP6.8D5P	6.8	8	91	43	53	36	●
HP6.9D5P	6.9	8	91	43	53	36	O
HP7D5P	7	8	91	43	53	36	O
HP7.1D5P	7.1	8	91	43	53	36	O
HP7.2D5P	7.2	8	91	43	53	36	O
HP7.3D5P	7.3	8	91	43	53	36	O
HP7.4D5P	7.4	8	91	43	53	36	O
HP7.5D5P	7.5	8	91	43	53	36	O
HP7.6D5P	7.6	8	91	43	53	36	O
HP7.7D5P	7.7	8	91	43	53	36	O
HP7.8D5P	7.8	8	91	43	53	36	O
HP7.9D5P	7.9	8	91	43	53	36	O
HP8D5P	8	8	91	43	53	36	O
HP8.1D5P	8.1	10	103	49	61	40	O
HP8.2D5P	8.2	10	103	49	61	40	O
HP8.3D5P	8.3	10	103	49	61	40	O
HP8.4D5P	8.4	10	103	49	61	40	O
HP8.5D5P	8.5	10	103	49	61	40	●
HP8.6D5P	8.6	10	103	49	61	40	O
HP8.7D5P	8.7	10	103	49	61	40	O
HP8.8D5P	8.8	10	103	49	61	40	O
HP8.9D5P	8.9	10	103	49	61	40	O
HP9D5P	9	10	103	49	61	40	O
HP9.1D5P	9.1	10	103	49	61	40	O

MG

0.8 µm

Co 10%

HRC ▸55

AlTin

2 flutes

● STOCKABLE O NONSTOCKABLE

To Be continued...

High Performance Drill L/D 5

MG

0.8 µm

Co 10%

HRC ▸55

AlTin

2 flutes

CODE	D1	D2	L1	L2	L3	L4	AVAILABLITY
HP9.2D5P	9.2	10	103	49	61	40	O
HP9.3D5P	9.3	10	103	49	61	40	O
HP9.4D5P	9.4	10	103	49	61	40	O
HP9.5D5P	9.5	10	103	61	61	40	O
HP9.6D5P	9.6	10	103	61	61	40	O
HP9.7D5P	9.7	10	103	61	61	40	O
HP9.8D5P	9.8	10	103	61	61	40	O
HP9.9D5P	9.9	10	103	61	61	40	O
HP10D5P	10	10	103	61	61	40	●
HP10.2D5P	10.2	12	118	71	71	45	●
HP10.5D5P	10.5	12	118	71	71	45	●
HP10.8D5P	10.8	12	118	71	71	45	O
HP11D5P	11	12	118	71	71	45	●
HP11.2D5P	11.2	12	118	71	71	45	O
HP11.5D5P	11.5	12	118	71	71	45	O
HP11.8D5P	11.8	12	118	71	71	45	●
HP12D5P	12	12	118	71	71	45	●
HP12.5D5P	12.5	14	124	77	77	45	O
HP13D5P	13	14	124	77	77	45	●
HP13.5D5P	13.5	14	124	77	77	45	O
HP14D5P	14	14	124	77	77	45	●
HP14.5D5P	14.5	16	133	83	83	48	O
HP15D5P	15	16	133	83	83	48	O

● STOCKABLE O NONSTOCKABLE

To Be continued...

High Performance Drill L/D 5

CODE	D1	D2	L1	L2	L3	L4	AVAILABLITY
HP15.5D5P	15.5	16	133	83	83	48	O
HP16D5P	16	16	133	83	83	48	O
HP16.5D5P	16.5	18	143	93	93	48	O
HP16.7D5P	16.7	18	143	93	93	48	O
HP17D5P	17	18	143	93	93	48	O
HP17.3D5P	17.3	18	143	93	93	48	O
HP17.5D5P	17.5	18	143	93	93	48	O
HP17.7D5P	17.7	18	143	93	93	48	O
HP18D5P	18	18	143	93	93	48	O
HP18.2D5P	18.2	20	153	101	93	48	O
HP18.5D5P	18.5	20	153	101	101	50	O
HP18.7D5P	18.7	20	153	101	101	50	O
HP19D5P	19	20	153	101	101	50	O
HP19.5D5P	19.5	20	153	101	101	50	O
HP19.7D5P	19.7	20	153	101	101	50	O
HP20D5P	20	20	153	101	101	50	O

● STOCKABLE O NONSTOCKABLE

MG

0.8 µm

Co 10%

HRC ▸55

AlTin

2 flutes

High Performance Thru Coolant Drill L/D 3

MG

0.8 µm

Co 10%

HRC ▸55

AlTin

2 flutes

CODE	D1	D2	L1	L2	L3	L4	AVAILABLITY
HP3D3TRP	3	3	56	14	20	36	O
HP3.1D3TRP	3.1	3	56	14	20	36	O
HP3.2D3TRP	3.2	3	56	14	20	36	O
HP3.3D3TRP	3.3	6	56	14	20	36	●
HP3.4D3TRP	3.4	6	56	14	20	36	O
HP3.5D3TRP	3.5	6	56	14	20	36	O
HP3.6D3TRP	3.6	6	56	16	20	36	O
HP3.7D3TRP	3.7	6	56	16	20	36	O
HP3.8D3TRP	3.8	6	56	16	20	36	O
HP3.9D3TRP	3.9	6	56	16	20	36	O
HP4D3TRP	4	4	56	16	20	36	O
HP4.1D3TRP	4.1	4	56	16	20	36	O
HP4.2D3TRP	4.2	4	56	17	20	36	O
HP4.3D3TRP	4.3	6	66	18	24	36	O
HP4.4D3TRP	4.4	6	66	18	24	36	O
HP4.5D3TRP	4.5	6	66	18	24	36	O
HP4.6D3TRP	4.6	6	66	18	24	36	O
HP4.7D3TRP	4.7	6	66	19	24	36	O
HP4.8D3TRP	4.8	6	66	19	26	36	O
HP4.9D3TRP	4.9	6	66	19	26	36	O
HP5D3TRP	5	6	66	20	28	36	●
HP5.1D3TRP	5.1	6	66	20	28	36	O
HP5.2D3TRP	5.2	6	66	20	28	36	O
HP5.3D3TRP	5.3	6	66	20	28	36	O
HP5.4D3TRP	5.4	6	66	20	28	36	O

● STOCKABLE O NONSTOCKABLE

To Be continued...

High Performance Thru Coolant Drill L/D 3

CODE	D1	D2	L1	L2	L3	L4	AVAILABLITY
HP5.5D3TRP	5.5	6	66	20	28	36	O
HP5.6D3TRP	5.6	6	66	20	28	36	O
HP5.7D3TRP	5.7	6	66	20	28	36	O
HP5.8D3TRP	5.8	6	66	20	28	36	O
HP5.9D3TRP	5.9	6	66	20	28	36	O
HP6D3TRP	6	6	66	20	28	36	O
HP6.1D3TRP	6.1	6	66	20	28	36	O
HP6.2D3TRP	6.1	8	79	24	34	36	O
HP6.3D3TRP	6.2	8	79	24	34	36	O
HP6.4D3TRP	6.3	8	79	24	34	36	O
HP6.5D3TRP	6.4	8	79	24	34	36	O
HP6.6D3TRP	6.5	8	79	24	34	36	O
HP6.7D3TRP	6.6	8	79	24	34	36	O
HP6.8D3TRP	6.7	8	79	24	34	36	O
HP6.9D3TRP	6.8	8	79	24	34	36	●
HP6.9D3TRH	6.9	8	79	24	34	36	O
HP7D3TRP	7	8	79	24	34	36	O
HP7.1D3TRP	7.1	8	79	29	41	36	O
HP7.2D3TRP	7.2	8	79	29	41	36	O
HP7.3D3TRP	7.3	8	79	29	41	36	O
HP7.4D3TRP	7.4	8	79	29	41	36	O
HP7.5D3TRP	7.5	8	79	29	41	36	O
HP7.6D3TRP	7.6	8	79	29	41	36	O
HP7.7D3TRP	7.7	8	79	29	41	36	O
HP7.8D3TRP	7.8	8	79	29	41	36	O
HP7.9D3TRP	7.9	8	79	29	41	36	O
HP8D3TRP	8	8	79	29	41	36	O
HP8.1D3TRP	8.1	8	79	29	41	36	O
HP8.2D3TRP	8.2	10	89	35	47	40	O
HP8.3D3TRP	8.3	10	89	35	47	40	O

MG

0.8 µm

Co 10%

HRC ▸55

AlTin

2 flutes

● STOCKABLE ○ NONSTOCKABLE

To Be continued...

High Performance Thru Coolant Drill L/D 3

MG

0.8 µm

Co 10%

HRC ▸55

AlTin

2 flutes

CODE	D1	D2	L1	L2	L3	L4	AVAILABLITY
HP8.4D3TRP	8.4	10	89	35	47	40	O
HP8.5D3TRP	8.5	10	89	35	47	40	●
HP8.6D3TRP	8.6	10	89	35	47	40	O
HP8.7D3TRP	8.7	10	89	35	47	40	O
HP8.8D3TRP	8.8	10	89	35	47	40	O
HP8.9D3TRP	8.9	10	89	35	47	40	O
HP9D3TRP	9	10	89	35	47	40	O
HP9.1D3TRP	9.1	10	89	35	47	40	O
HP9.2D3TRP	9.2	10	89	35	47	40	O
HP9.3D3TRP	9.3	10	89	35	47	40	O
HP9.4D3TRP	9.4	10	89	35	47	40	O
HP9.5D3TRP	9.5	10	89	35	47	40	O
HP9.6D3TRP	9.6	10	89	35	47	40	O
HP9.7D3TRP	9.7	10	89	35	47	40	O
HP9.8D3TRP	9.8	10	89	35	47	40	O
HP9.9D3TRP	9.9	10	89	35	47	40	O
HP10D3TRP	10	10	89	35	47	40	●
HP10.2D3TRP	10.2	12	102	40	55	45	●
HP10.5D3TRP	10.5	12	102	40	55	45	●
HP10.8D3TRP	10.8	12	102	40	55	45	O
HP11D3TRP	11	12	102	40	55	45	●
HP11.2D3TRP	11.2	12	102	40	55	45	O
HP11.5D3TRP	11.5	12	102	40	55	45	O
HP11.8D3TRP	11.8	12	102	40	55	45	O
HP12D3TRP	12	12	102	40	55	45	●
HP12.2D3TRP	12.2	14	107	43	60	45	O
HP12.5D3TRP	12.5	14	107	43	60	45	O
HP12.8D3TRP	12.8	14	107	43	60	45	O
HP13D3TRP	13	14	107	43	60	45	O

● STOCKABLE O NONSTOCKABLE

To Be continued...

High Performance Thru Coolant Drill L/D 3

CODE	D1	D2	L1	L2	L3	L4	AVAILABLITY
HP13.5D3TRP	13.5	14	107	43	60	45	O
HP14D3TRP	14	14	107	43	60	45	●
HP14.5D3TRP	14.5	16	115	45	65	48	O
HP15D3TRP	15	16	115	65	65	48	O
HP15.5D3TRP	15.5	16	115	65	65	48	O
HP15.8D3TRH	15.8	16	115	65	65	48	O
HP16D3TRP	16	16	115	65	65	48	O
HP16.5D3TRP	16.5	18	123	73	73	48	O
HP17D3TRP	17	18	123	73	73	48	O
HP17.5D3TRP	17.5	18	123	73	73	48	O
HP18D3TRP	18	18	123	73	73	48	O
HP18.5D3TRP	18.5	20	131	79	79	50	O
HP19D3TRP	19	20	131	79	79	50	O
HP19.5D3TRP	19.5	20	131	79	79	50	O
HP20D3TRP	20	20	131	79	79	50	O

● STOCKABLE O NONSTOCKABLE

MG

0.8 µm

Co 10%

HRC ▸55

AlTin

2 flutes

High Performance Thru Coolant Drill L/D 5

MG

0.8 µm

Co 10%

HRC ▸55

AlTin

2 flutes

CODE	D1	D2	L1	L2	L3	L4	AVAILABLITY
HP3D5TRP	3	3	68	21	28	36	O
HP3.1D5TRP	3.1	6	68	21	28	36	O
HP3.2D5TRP	3.2	6	68	21	28	36	O
HP3.3D5TRP	3.3	6	68	21	28	36	●
HP3.4D5TRP	3.4	6	68	21	28	36	O
HP3.5D5TRP	3.5	6	68	21	28	36	O
HP3.6D5TRP	3.6	6	68	24	28	36	O
HP3.7D5TRP	3.7	6	68	24	28	36	O
HP3.8D5TRP	3.8	6	68	24	28	36	O
HP3.9D5TRP	3.9	6	68	24	28	36	O
HP3D5TRP	4	4	68	24	28	36	O
HP3.1D5TRP	4.1	6	68	26	32	36	O
HP3.2D5TRP	4.2	4	68	26	32	36	O
HP3.3D5TRP	4.3	6	82	26	36	36	O
HP3.4D5TRP	4.4	6	82	26	36	36	O
HP3.5D5TRP	4.5	6	82	28	36	36	O
HP5D5TRP	5	6	82	35	44	36	●
HP5.1D5TRP	5.1	6	82	35	44	36	O
HP5.2D5TRP	5.2	6	82	35	44	36	O
HP5.3D5TRP	5.3	6	82	35	44	36	O
HP5.4D5TRP	5.4	6	82	35	44	36	O

● STOCKABLE O NONSTOCKABLE

High Performance Thru Coolant Drill L/D 5

CODE	D1	D2	L1	L2	L3	L4	AVAILABLITY
HP5.5D5TRP	5.5	6	82	35	44	36	O
HP5.6D5TRP	5.6	6	82	35	44	36	O
HP5.7D5TRP	5.7	6	82	35	44	36	O
HP5.8D5TRP	5.8	6	82	35	44	36	O
HP5.9D5TRP	5.9	6	82	35	44	36	O
HP6D5TRP	6	6	82	35	44	36	O
HP6.1D5TRP	6.1	6	82	35	44	36	O
HP6.2D5TRP	6.1	8	91	43	53	36	O
HP6.3D5TRP	6.2	8	91	43	53	36	O
HP6.4D5TRP	6.3	8	91	43	53	36	O
HP6.5D5TRP	6.4	8	91	43	53	36	O
HP6.6D5TRP	6.5	8	91	43	53	36	O
HP6.7D5TRP	6.6	8	91	43	53	36	O
HP6.8D5TRP	6.7	8	91	43	53	36	O
HP6.9D5TRP	6.8	8	91	43	53	36	●
HP6.9D5TRH	6.9	8	91	43	53	36	O
HP7D5TRP	7	8	91	43	53	36	O
HP7.1D5TRP	7.1	8	91	43	53	36	O
HP7.2D5TRP	7.2	8	91	43	53	36	O
HP7.3D5TRP	7.3	8	91	43	53	36	O
HP7.4D5TRP	7.4	8	91	43	53	36	O
HP7.5D5TRP	7.5	8	91	43	53	36	O
HP7.6D5TRP	7.6	8	91	43	53	36	O
HP7.7D5TRP	7.7	8	91	43	53	36	O
HP7.8D5TRP	7.8	8	91	43	53	36	O
HP7.9D5TRP	7.9	8	91	43	53	36	O
HP8D5TRP	8	8	91	43	53	36	O
HP8.1D5TRP	8.1	8	91	43	53	36	O
HP8.2D5TRP	8.2	10	103	49	61	40	O
HP8.3D5TRP	8.3	10	103	49	61	40	O

MG

0.8 µm

Co 10%

HRC ▸55

AlTin

2 flutes

● STOCKABLE O NONSTOCKABLE

To Be continued...

High Performance Thru Coolant Drill L/D 5

MG

0.8 µm

Co 10%

HRC ▸55

AlTin

2 flutes

CODE	D1	D2	L1	L2	L3	L4	AVAILABLITY
HP8.4D5TRP	8.4	10	103	49	61	40	O
HP8.5D5TRP	8.5	10	103	49	61	40	●
HP8.6D5TRP	8.6	10	103	49	61	40	O
HP8.7D5TRP	8.7	10	103	49	61	40	O
HP8.8D5TRP	8.8	10	103	49	61	40	O
HP8.9D5TRP	8.9	10	103	49	61	40	O
HP9D5TRP	9	10	103	49	61	40	O
HP9.1D5TRP	9.1	10	103	49	61	40	O
HP9.2D5TRP	9.2	10	103	49	61	40	O
HP9.3D5TRP	9.3	10	103	49	61	40	O
HP9.4D5TRP	9.4	10	103	49	61	40	O
HP9.5D5TRP	9.5	10	103	61	61	40	O
HP9.6D5TRP	9.6	10	103	61	61	40	O
HP9.7D5TRP	9.7	10	103	61	61	40	O
HP9.8D5TRP	9.8	10	103	61	61	40	O
HP9.9D5TRP	9.9	10	103	61	61	40	O
HP10D5TRP	10	10	103	61	61	40	●
HP10.2D5TRP	10.2	12	118	71	71	45	●
HP10.5D5TRP	10.5	12	118	71	71	45	●
HP10.8D5TRP	10.8	12	118	71	71	45	●
HP11D5TRP	11	12	118	71	71	45	●
HP11.2D5TRP	11.2	12	118	71	71	45	●
HP11.5D5TRP	11.5	12	118	71	71	45	O
HP11.8D5TRP	11.8	12	118	71	71	45	●
HP12D5TRP	12	12	118	71	71	45	●
HP12.5D5TRP	12.5	14	124	77	77	45	●
HP12.7D5TRH	12.7	14	124	77	77	45	O
HP12.8D5TRH	12.8	14	124	77	77	45	O
HP13D5TRP	13	14	124	77	77	45	●

● STOCKABLE O NONSTOCKABLE

To Be continued...

High Performance Thru Coolant Drill L/D 5

CODE	D1	D2	L1	L2	L3	L4	AVAILABLITY
HP13.5D5TRP	13.5	14	124	77	77	45	●
HP14D5TRP	14.0	14	124	77	77	45	●
HP14.5D5TRP	14.5	16	133	83	83	48	O
HP15D5TRP	15.0	16	133	83	83	48	O
HP15.5D5TRP	15.5	16	133	83	83	48	O
HP16D5TRP	16.0	16	133	83	83	48	O
HP16.5D5TRP	16.5	18	143	93	93	48	O
HP16.7D5TRP	16.7	18	143	93	93	48	O
HP17D5TRP	17.0	18	143	93	93	48	O
HP17.3D5TRP	17.3	18	143	93	93	48	O
HP17.5D5TRP	17.5	18	143	93	93	48	O
HP17.7D5TRP	17.7	18	143	93	93	48	O
HP18D5TRP	18.0	18	143	93	93	48	O
HP18.2D5TRP	18.2	20	153	101	101	50	O
HP18.5D5TRP	18.5	20	153	101	101	50	O
HP18.7D5TRP	18.7	20	153	101	101	50	O
HP19D5TRP	19.0	20	153	101	101	50	O
HP19.5D5TRP	19.5	20	153	101	101	50	O
HP19.7D5TRP	19.7	20	153	101	101	50	O
HP20D5TRP	20	20	153	101	101	50	O

● STOCKABLE O NONSTOCKABLE

MG

0.8 µm

Co 10%

HRC ▸55

AlTin

2 flutes

Jobber Drill L/D 3

MG

0.8 µm

Co 10%

HRC ▸45

AlTin

2 flutes

CODE	D1	D2	L1	L2	AVAILABLITY
JD1D3P	1	1	40	6	O
JD1.1D3P	1.1	1.1	40	7	O
JD1.2D3P	1.2	1.2	40	8	O
JD1.3D3P	1.3	1.3	40	8	O
JD1.4D3P	1.4	1.4	40	9	O
JD1.5D3P	1.5	1.5	40	9	O
JD1.6D3P	1.6	1.6	40	10	O
JD1.7D3P	1.7	1.7	40	10	O
JD1.8D3P	1.8	1.8	40	11	O
JD1.9D3P	1.9	1.9	40	11	O
JD2D3P	2	2	40	12	O
JD2.1D3P	2.1	2.1	40	12	O
JD2.2D3P	2.2	2.2	40	13	O
JD2.3D3P	2.3	2.3	46	13	O
JD2.4D3P	2.4	2.4	46	14	O
JD2.5D3P	2.5	2.5	46	14	O
JD2.6D3P	2.6	2.6	46	14	O
JD2.7D3P	2.7	2.7	46	16	O
JD2.8D3P	2.8	2.8	49	16	O
JD2.9D3P	2.9	2.9	49	16	O
JD3D3P	3	3	49	16	O
JD3.1D3P	3.1	3.1	49	18	O
JD3.2D3P	3.2	3.2	49	18	O
JD3.3D3P	3.3	3.3	52	18	O
JD3.4D3P	3.4	3.4	52	20	O
JD3.5D3P	3.5	3.5	52	20	O
JD3.6D3P	3.6	3.6	52	20	O
JD3.7D3P	3.7	3.7	52	20	O
JD3.8D3P	3.8	3.8	55	22	O
JD3.9D3P	3.9	3.9	55	22	O
JD4D3P	4	4	55	22	O

To Be continued...

● STOCKABLE O NONSTOCKABLE

Jobber Drill L/D 3

CODE	D1	D2	L1	L2	AVAILABLITY
JD4.1D3P	4.1	4.1	55	22	O
JD4.2D3P	4.2	4.2	55	22	O
JD4.3D3P	4.3	4.3	58	24	O
JD4.4D3P	4.4	4.4	58	24	O
JD4.5D3P	4.5	4.5	58	24	O
JD4.6D3P	4.6	4.6	58	24	O
JD4.7D3P	4.7	4.7	58	24	O
JD4.8D3P	4.8	4.8	62	26	O
JD4.9D3P	4.9	4.9	62	26	O
JD5D3P	5	5	62	26	O
JD5.1D3P	5.1	5.1	62	26	O
JD5.2D3P	5.2	5.2	62	26	O
JD5.3D3P	5.3	5.3	66	26	O
JD5.4D3P	5.4	5.4	66	28	O
JD5.5D3P	5.5	5.5	66	28	O
JD5.6D3P	5.6	5.6	66	28	O
JD5.7D3P	5.7	5.7	66	28	O
JD5.8D3P	5.8	5.8	70	28	O
JD5.9D3P	5.9	5.9	70	28	O
JD6D3P	6	6	70	28	O
JD6.1D3P	6.1	6.1	70	31	O
JD6.2D3P	6.2	6.2	70	31	O
JD6.3D3P	6.3	6.3	70	31	O
JD6.4D3P	6.4	6.4	70	31	O
JD6.5D3P	6.5	6.5	70	31	O
JD6.6D3P	6.6	6.6	70	31	O
JD6.7D3P	6.7	6.7	70	31	O
JD6.8D3P	6.8	6.8	74	34	O
JD6.9D3P	6.9	6.9	74	34	O
JD7D3P	7	7	74	34	O
JD7.1D3P	7.1	7.1	74	34	O

MG

0.8 µm

Co 10%

HRC ▸45

AlTin

2 flutes

To Be continued...

● STOCKABLE O NONSTOCKABLE

Jobber Drill L/D 3

MG

0.8 µm

Co 10%

HRC ▸45

AlTin

2 flutes

CODE	D1	D2	L1	L2	AVAILABLITY
JD7.2D3P	7.2	7.2	74	34	O
JD7.3D3P	7.3	7.3	79	34	O
JD7.4D3P	7.4	7.4	79	34	O
JD7.5D3P	7.5	7.5	79	34	O
JD7.6D3P	7.6	7.6	79	37	O
JD7.7D3P	7.7	7.7	79	37	O
JD7.8D3P	7.8	7.8	79	37	O
JD7.9D3P	7.9	7.9	79	37	O
JD8D3P	8	8	79	37	O
JD8.1D3P	8.1	8.1	79	37	O
JD8.2D3P	8.2	8.2	79	37	O
JD8.3D3P	8.3	8.3	84	37	O
JD8.4D3P	8.4	8.4	84	37	O
JD8.5D3P	8.5	8.5	84	37	O
JD8.6D3P	8.6	8.6	84	40	O
JD8.7D3P	8.7	8.7	84	40	O
JD8.8D3P	8.8	8.8	84	40	O
JD8.9D3P	8.9	8.9	84	40	O
JD9D3P	9	9	84	40	O
JD9.1D3P	9.1	9.1	84	40	O
JD9.2D3P	9.2	9.2	84	40	O
JD9.3D3P	9.3	9.3	89	40	O
JD9.4D3P	9.4	9.4	89	40	O
JD9.5D3P	9.5	9.5	89	40	O
JD9.6D3P	9.6	9.6	89	43	O
JD9.7D3P	9.7	9.7	89	43	O
JD9.8D3P	9.8	9.8	89	43	O
JD9.9D3P	9.9	9.9	89	43	O
JD10D3P	10	10	89	43	O
JD10.2D3P	10.2	10.2	89	43	O
JD10.3D3P	10.3	10.5	89	43	O
JD10.5D3P	10.5	10.5	95	43	O

● STOCKABLE O NONSTOCKABLE

To Be continued...

Jobber Drill L/D 3

CODE	D1	D2	L1	L2	AVAILABLITY
JD11D3P	11.0	11.0	95	47	O
JD11.5D3P	11.5	11.5	102	47	O
JD12D3P	12.0	12.0	102	51	O
JD13D3P	13.0	13.0	103	51	O
JD15D3P	15.0	15.0	111	56	O

● STOCKABLE o NONSTOCKABLE

MG

0.8 µm

Co 10%

HRC ▸45

AlTin

2 flutes

Cutting Parameter - DRILL L/D 3, 5


A


B

TYPE OF STEEL	MATE-RIAL GROUPS	CUTTING SPEED VC =(M/MIN)				FEEDS F (MM/REV) FOR DIAMETER RANGES (MM)										
		TYPE	APPLICA-TION RANGE	VC		1	2	3	4	5	6	8	10	12	16	20
THERMO PLASTICS WITHOUT FILLERS	M01	A	250 ~ 400	250	400	0.057	0.105	0.150	0.193	0.235	0.277	0.356	0.434	0.510	0.657	0.800
		B	250 ~ 370	250	370	0.047	0.089	0.130	0.170	0.208	0.247	0.322	0.395	0.468	0.610	0.750
ALUMINIUM COMMERCIAL PURE AL-ALLOYS WROUGHT	M02	A	120 ~ 300	120	300	0.072	0.119	0.160	0.197	0.231	0.264	0.325	0.382	0.436	0.536	0.630
		B	120 ~ 230	120	230	0.062	0.104	0.140	0.173	0.204	0.234	0.289	0.341	0.391	0.483	0.570
COPPER PURE	M03	A	125 ~ 125	125	125	0.056	0.093	0.125	0.154	0.182	0.207	0.256	0.301	0.344	0.425	0.500
		B	120 ~ 120	120	120	0.042	0.073	0.100	0.126	0.150	0.173	0.218	0.260	0.300	0.377	0.450
ZINC-ALLOYS	M04	A	180 ~ 220	180	220	0.061	0.108	0.150	0.189	0.227	0.263	0.333	0.399	0.462	0.584	0.700
		B	180 ~ 210	180	210	0.051	0.092	0.130	0.166	0.201	0.234	0.299	0.361	0.421	0.538	0.650
ALUMINIUM-SLILICON ALLOYS CAST, BELOW 10% SI	M05	A	200 ~ 300	200	300	0.057	0.105	0.150	0.193	0.235	0.277	0.356	0.434	0.510	0.657	0.800
		B	200 ~ 270	200	270	0.047	0.089	0.130	0.170	0.208	0.247	0.322	0.395	0.468	0.610	0.750
ALUMINIUM-SLILICON ALLOYS CAST, 10% - 14% SI	M06	A	180 ~ 220	180	220	0.072	0.119	0.160	0.197	0.231	0.264	0.325	0.382	0.436	0.536	0.630
		B	180 ~ 210	180	210	0.055	0.095	0.130	0.163	0.194	0.223	0.279	0.332	0.383	0.479	0.570
ALUMINIUM-SLILICON ALLOYS CAST, MORE THAN 14% SI	M07	A	120 ~ 180	120	180	0.072	0.119	0.160	0.197	0.231	0.264	0.325	0.382	0.436	0.536	0.630
		B	120 ~ 160	120	160	0.055	0.095	0.130	0.163	0.194	0.223	0.279	0.332	0.383	0.479	0.570
BRASS	M08	A	120 ~ 180	120	180	0.056	0.093	0.125	0.154	0.182	0.207	0.256	0.301	0.344	0.425	0.500
		B	120 ~ 160	120	160	0.042	0.073	0.100	0.126	0.150	0.173	0.218	0.260	0.300	0.377	0.450
BRONZE	M09	A	120 ~ 180	120	180	0.063	0.105	0.140	0.172	0.202	0.231	0.284	0.334	0.381	0.468	0.550
		B	120 ~ 160	120	160	0.056	0.093	0.125	0.154	0.182	0.207	0.256	0.301	0.344	0.425	0.500
CAST IRON GG 10... GG20	M10	A	50 ~ 130	50	130	0.039	0.071	0.100	0.128	0.154	0.180	0.230	0.278	0.324	0.414	0.500
		B	50 ~ 110	50	110	0.038	0.065	0.090	0.113	0.134	0.155	0.195	0.232	0.268	0.336	0.400
CAST IRON, MALLEABLE IRON	M11-M14	A	50 ~ 130	50	130	0.039	0.071	0.100	0.128	0.154	0.180	0.230	0.278	0.324	0.414	0.500
		B	50 ~ 110	50	110	0.026	0.048	0.070	0.091	0.112	0.132	0.172	0.212	0.250	0.326	0.400
STEEL AND CAST STEEL UP TO 700 N/MM² - 210HB	M15	A	80 ~ 120	80	120	0.044	0.074	0.100	0.124	0.147	0.169	0.210	0.249	0.285	0.355	0.420
		B	80 ~ 110	80	110	0.032	0.057	0.080	0.102	0.123	0.144	0.184	0.222	0.259	0.331	0.400
STAINLESS STEEL -SUS 300	M16	A	30 ~ 55	30	55	0.024	0.043	0.060	0.077	0.093	0.108	0.138	0.167	0.194	0.248	0.300
		B	30 ~ 50	30	50	0.020	0.035	0.050	0.064	0.077	0.090	0.115	0.139	0.162	0.207	0.250
TITANIUM COMMERCIAL TITANIUM ALLOYS UP TO 700 N/MM²	M17	A	45 ~ 45	45	45	0.028	0.047	0.063	0.078	0.091	0.104	0.128	0.151	0.172	0.213	0.250
		B	45 ~ 45	45	45	0.028	0.045	0.060	0.074	0.086	0.098	0.120	0.141	0.160	0.196	0.230
STEEL AND CAST STEEL ~30 HRC -210 - 295 HB	M18	A	80 ~ 135	80	135	0.056	0.090	0.120	0.147	0.171	0.194	0.238	0.278	0.315	0.385	0.450
		B	80 ~ 110	80	110	0.032	0.057	0.080	0.102	0.123	0.144	0.184	0.222	0.259	0.331	0.400

Cutting Parameter - DRILL L/D 3, 5

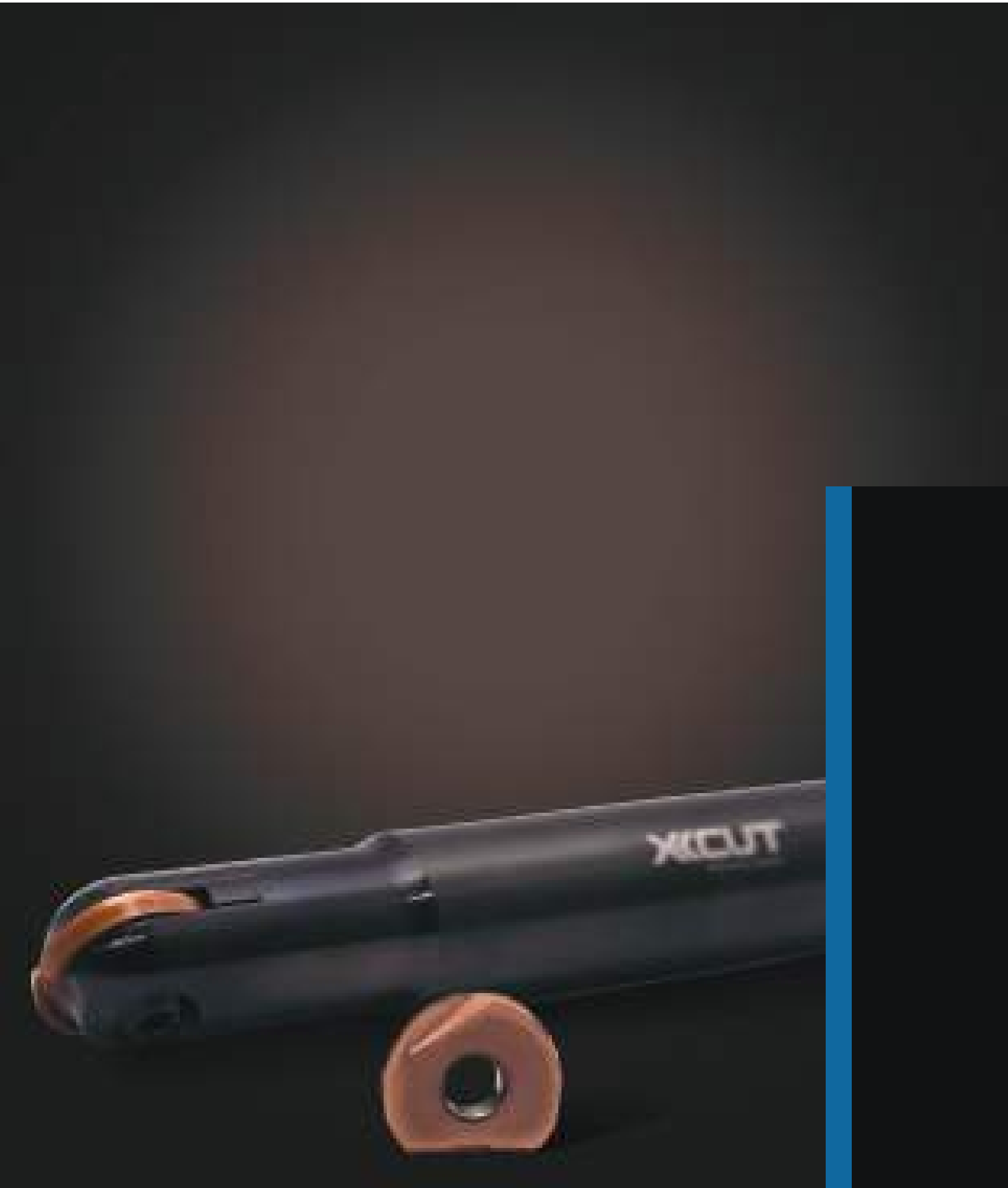

A


B

TYPE OF STEEL	MATE-RIAL GROUPS	CUTTING SPEED VC =(M/MIN)				FEEDS F (MM/REV) FOR DIAMETER RANGES (MM)										
		TYPE	APPLICATION RANGE	VC		1	2	3	4	5	6	8	10	12	16	20
NI AND CO ALLOYS	M19	A	30 ~ 50	30	50	0.026	0.044	0.060	0.074	0.088	0.101	0.125	0.148	0.170	0.211	0.250
		B	25 ~ 45	25	45	0.028	0.045	0.060	0.074	0.086	0.098	0.120	0.141	0.160	0.196	0.230
STAINLESS STEEL -SUS 400	M20	A	30 ~ 60	30	60	0.041	0.063	0.080	0.095	0.109	0.121	0.144	0.165	0.184	0.219	0.250
		B	30 ~ 55	30	55	0.050	0.071	0.087	0.101	0.113	0.124	0.144	0.161	0.177	0.205	0.230
TITANIUM COMMERCIAL TITANIUM ALLOYS OVER 700 N/MM²	M21	A	40 ~ 40	40	40	0.028	0.047	0.063	0.078	0.091	0.104	0.128	0.151	0.172	0.213	0.250
		B	40 ~ 40	40	40	0.028	0.045	0.060	0.074	0.086	0.098	0.120	0.141	0.160	0.196	0.230
STEEL AND CAST STEEL ~ 40 HRC - 360 - 440B	M22	A	60 ~ 85	60	85	0.036	0.060	0.080	0.098	0.116	0.132	0.162	0.191	0.218	0.268	0.315
		B	60 ~ 70	60	70	0.033	0.053	0.070	0.085	0.099	0.111	0.135	0.157	0.177	0.215	0.250
NI AND CO ALLOYS UP TO 1200 N/MM²	M23	A	20 ~ 40	20	40	0.022	0.037	0.050	0.062	0.073	0.083	0.102	0.121	0.138	0.170	0.200
		B	20 ~ 37	20	37	0.017	0.029	0.040	0.050	0.060	0.069	0.087	0.104	0.120	0.151	0.180
NI AND CO ALLOYS MORE THAN 1200 N/MM²	M24	A	20 ~ 35	20	35	0.017	0.029	0.040	0.050	0.060	0.069	0.087	0.104	0.120	0.151	0.180
		B	20 ~ 30	20	30	0.015	0.026	0.035	0.044	0.052	0.060	0.074	0.088	0.101	0.126	0.150
STEEL AND CAST STEEL ~ 35 HRC - 295 - 360B	M25	A	40 ~ 60	40	60	0.022	0.037	0.050	0.062	0.073	0.083	0.102	0.121	0.138	0.170	0.200
		B	30 ~ 45	30	45	0.018	0.030	0.040	0.049	0.058	0.066	0.082	0.096	0.110	0.136	0.160
HARDENED STEEL ~52 HRC	M26	A	15 ~ 25	15	25	0.010	0.020	0.030	0.040	0.050	0.060	0.080	0.100	0.120	0.160	0.200
		B	15 ~ 25	15	25	0.633	0.378	0.280	0.226	0.192	0.167	0.135	0.115	0.100	0.081	0.068
CHILLED CAST IRON	M27	A	40 ~ 40	40	40	0.022	0.037	0.050	0.062	0.073	0.083	0.102	0.121	0.138	0.170	0.200
		B	35 ~ 35	35	35	0.017	0.029	0.040	0.050	0.059	0.068	0.085	0.100	0.115	0.143	0.170
HARDENED STEEL ~52 -65 HRC	M28	A	10 ~ 15	10	15	0.012	0.021	0.030	0.039	0.047	0.055	0.070	0.085	0.100	0.128	0.156
		B	10 ~ 13	10	13	0.012	0.021	0.028	0.035	0.041	0.047	0.059	0.070	0.080	0.099	0.118
PLASTIC , REINFORCED WITH ORGANIC FILLERS.	M29	A	200 ~ 375	200	375	0.047	0.089	0.130	0.170	0.208	0.247	0.322	0.395	0.468	0.610	0.750
		B	200 ~ 350	200	350	0.032	0.066	0.100	0.135	0.170	0.206	0.277	0.350	0.423	0.571	0.720
GRAPHITE	M30	A	200 ~ 400	200	400	0.047	0.089	0.130	0.170	0.208	0.247	0.322	0.395	0.468	0.610	0.750
		B	200 ~ 375	200	375	0.031	0.065	0.100	0.136	0.172	0.209	0.283	0.359	0.436	0.592	0.750
HEAT- RESISTAANT STEEL	M31	A	25 ~ 40	25	40	0.015	0.028	0.040	0.052	0.064	0.076	0.099	0.121	0.144	0.187	0.230
		B	25 ~ 37	25	37	0.010	0.020	0.030	0.040	0.050	0.060	0.080	0.100	0.120	0.160	0.200
NICKEL BASE ALLOYS PRE-HARDENED (E.G INCONEL 718)	M32	A	20 ~ 35	20	35	0.016	0.028	0.040	0.051	0.062	0.072	0.092	0.111	0.130	0.166	0.200
		B	30 ~ 33	30	33	0.011	0.020	0.030	0.039	0.049	0.058	0.076	0.094	0.111	0.146	0.180
HARDENED STEEL ~ 63-68 HRC	M33	A	7 ~ 12	7	12	0.007	0.013	0.020	0.027	0.033	0.040	0.053	0.067	0.080	0.107	0.133
		B	7 ~ 11	7	11	0.007	0.014	0.020	0.026	0.032	0.037	0.049	0.059	0.070	0.091	0.111

Notes

XCUT TECHNOLOGIES XIB



Application

1. Copy Milling on Curved Surfaces
2. Profiling / Semi Finishing & Finishing in Die & Mould Application

Product features & benefits

1. Two Grades covering all materials (Soft as well as Hard)
2. High Accuracy Insert Positioning and High Rigidity Clamping
3. Significant reduction in Tooling Cost for semi finish and finishing applications

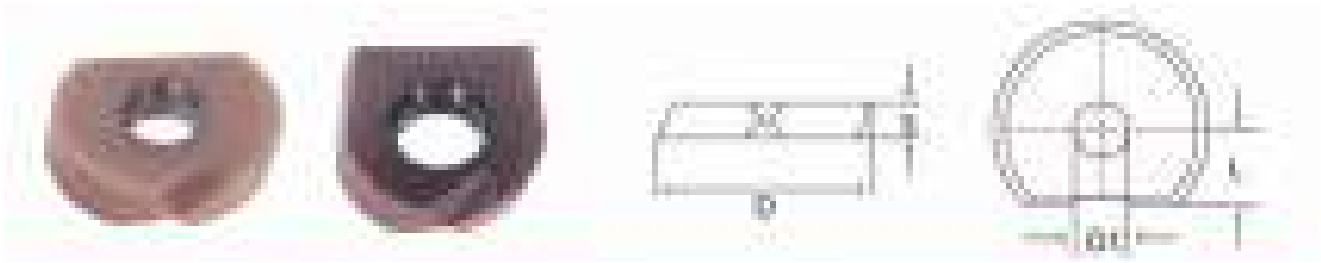
Grade Details

D: Versatile Substrate with TiAiN coating gives good tool life. Suitable for roughing and semi finishing for all materials, especially steels and cast iron upto HrC 30.

DH: Ultra Fine Grain Substrate with TiSi base coating gives higher toughness and better edge

strength. Suitable for roughing semi finishing and Finishing for all materials including stainless steel and hard materials upto HrC 55.

Insert Specification



XIB - 100	10	4	5	2.5		●
XIB - 160	16	5	6	3	●	●
XIB - 250	25	6	9	4	●	●

Ordering Code XIB - 080 - D | XIB - 080 - DH

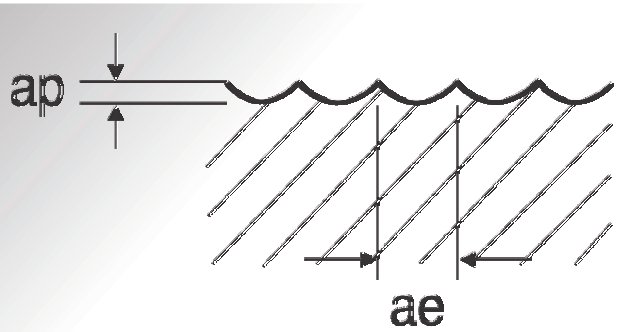
Cutter Body Specification

Item Description	D	d	L1	L	Insert	Insert Screw	Wrench	Stock-able
XIBHC12-4R-100L-1T-080	8	12	25	100	XIB-080	M3W7-080	T8B	
XIBHC12-4R-130L-1T-080	8	12	25	130	XIB-080	M3W7-080	T8B	●
XIBHC12-4R-160L-1T-080	8	12	30	160	XIB-080	M3W7-080	T8B	
XIBHC10-5R-100L-1T-100	10	10	30	100	XIB-100	M4W9-100	T15B	
XIBHC12-5R-130L-1T-100	10	12	30	130	XIB-100	M4W9-100	T15B	●
XIBHC12-5R-160L-1T-100	10	12	35	160	XIB-100	M4W9-100	T15B	
XIBHC12-6R-130L-1T-120	12	12	30	130	XIB-120	M5W9-120	T20B	●
XIBHC12-6R-160L-1T-120	12	12	30	160	XIB-120	M5W9-120	T20B	●
XIBHC16-6R-160L-1T-120	12	16	30	160	XIB-120	M5W9-120	T20B	
XIBHC16-8R-120L-1T-160	16	16	30	120	XIB-160	M5W13-160	T20B	●
XIBHC16-8R-160L-1T-160	16	16	30	160	XIB-160	M5W13-160	T20B	●
XIBHC16-8R-180L-1T-160	16	16	35	180	XIB-160	M5W13-160	T20B	
XIBHC16-8R-200L-17-160	16	16	45	200	XIB-160	M5W13-160	T20B	●
XIBHC20-10R-160L-17-200	20	20	30	160	XIB-200	M5W17-200	T20B	
XIBHC20-10R-200L-1T-200	20	20	35	200	XIB-200	M5W17-200	T20B	
XIBHC25-10R-160L-1T-200	20	25	30	160	XIB-200	M5W17-200	T20B	●
XIBHC25-10R-200L-1T-200	20	25	60	200	XIB-200	M5W17-200	T20B	●
XIBHC25-10R-250L-1T-200	20	25	50	250	XIB-200	M5W17-200	T20B	
XIBHC25-12.5R-160L-1T-250	25	25	35	160	XIB-250	M6W12-250	T30M	●
XIBHC25-12.5R-200L-1T-250	25	25	40	200	XIB-250	M6W12-250	T30M	●
XIBHC25-12.5R-250L-1T-250	25	25	60	250	XIB-250	M6W12-250	T30M	
XIBHC32-12.5R-200L-1T-250	25	32	50	200	XIB-250	M6W12-250	T30M	
XIBHC32-12.5R-250L-1T-250	25	32	85	250	XIB-250	M6W12-250	T30M	
XIBHC32-16R-200L-1T-250	32	32	55	200	XIB-320	M080W250-16R	T30M	
XIBHC32-16R-250L-1T-250	32	32	70	250	XIB-320	M080W250-16R	T30M	
XIBHC32-16R-300L-1T-250	32	32	80	300	XIB-320	M080W250-16R	T30M	

Carbide shanks with moduler heads available on request

Parameters

WORK MATERIAL		NON-ALLOYED STEEL ALLOY STEEL CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		DIE TOOL STEELS PRE-HARDENED		HARDENED STEELS	
HARDNESS	HB	~280		280~380		380~480		480~740	
	HRc	~30		30~40		40~50		50~65	
STRENGTH	N/mm2	~1000		1000~1250		1250~1500		~1500	
XIB Types		D		DH		DH		DH	
CUTTING CONDITION		Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
Roughing Finishing		(m/min)	(mm/t)	(m/min)	(mm/t)	(m/min)	(mm/t)	(m/min)	(mm/t)
8		160~320	0.20~0.20	80~220	0.20~0.20	60~200	0.15~0.20	50~180	0.10~0.20
10		160~360	0.20~0.20	80~220	0.20~0.20	60~200	0.15~0.20	50~180	0.10~0.20
12		160~380	0.20~0.20	80~220	0.20~0.20	60~200	0.15~0.20	50~180	0.10~0.20
16		160~480	0.25~0.30	80~200	0.25~0.30	60~180	0.20~0.30	50~150	0.15~0.30
20		160~580	0.25~0.40	80~200	0.25~0.40	60~180	0.20~0.40	50~150	0.15~0.40
25		160~600	0.25~0.50	80~180	0.25~0.50	60~160	0.20~0.50	50~120	0.15~0.50
32		160~700	0.25~0.60	80~180	0.25~0.60	60~160	0.20~0.60	50~120	0.15~0.60



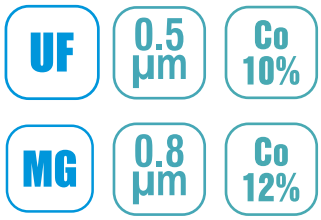
ae : Roughing - 0.1 x D
Finishing - Under Ø12 : 0.25mm
Ø12~Ø17 : 0.30mm
From Ø20 : 0.40mm
ap : Roughing - Under Ø16 : 0.025 x D
From Ø16 : 0.05 x D
Finishing - 0.1mm

Material Group And Application

MATERIAL GROUP		MILLING							DRILLING		
M02	ALUMINIUM COMMERCIAL PURE AL-ALLOYS WROUGHT						*				
M03	COPPER PURE						*				
M04	ZINC-ALLOYS, MAGNESIUM ALLOYS						*				
M05	ALUMINIUM-SLILICONALLOYS CAST, BELOW 10% SI						*				
M06	ALUMINIUM-SLILICON ALLOYS CAST, 10%-14% SI						*				
M07	ALUMINIUM-SLILICON ALLOYS CAST, MORE THAN 14% SI						*				
M08	BRASS										*
M09	BRONZE										*
M10	CAST IRON GG 10... GG 20 COBALT CHROME										*
M11	CAST IRON GG 25... GG 35		O	*							*
M12	NODULAR IRON (SG-IRON) GGG40-GGG50		O	*							*
M13	NODULAR IRON (SG-IRON) GGG60-GGG90		O	*							*
M14	MALLEABLE IRON		O	*							*
M15	STEEL & CAST STEEL UP TO 700 N/MM^2-210 HB		O	*							*
M18	STEEL & CAST STEEL FROM 700 N/MM^2UP TO 1000 N/MM^2 ~30 HRC-210-295 HB		O	*						*	
M22	STEEL FROM 1300 N/MM^2 TO 1600 N/MM^2 SPRING STEEL - HARD WEARING RESISTANT STEEL ~40 HRC-360-440 HB	O	*							*	
M31	HEAT - RESISTANT STEEL	O	*							*	
M16	STAINLESS STEEL UP TO 35 HRC				*						
M20	STAINLESS STEEL MORE THAN 35 HRC				O	*					
M17	TITANIUM COMMERCIAL TITANIUM ALLOYS UP TO 35 HRC				*						
M19	NI & CO ALLOYS UP TO 900 N/MM^2 - 266 HB				*						
M21	TITANIUM COMMERCIAL TITANIUM ALLOYS OVER 35 HRC				O	*					
M23	NI & CO ALLOYS UP TO 1200 N/MM^2~35 HRC - 266 - 352 HB				O	*					
M24	NI & CO ALLOYS MORE THAN 1200 N/MM^2 ~45 HRC -> 352 HB				O	*					
M32	NICKEL BASE ALLOYS PRE-HARDENED (E.G. INCONEL 718)				O	*					
M26	HARDENED STEEL ~ 52 HRC	*							*		
M27	CHILLED CAST IRON	*							*		
M28	HARDENED STEEL ~ 52 - 65 HRC	*							*		
M33	HARDENED STEEL ~ 63 - 68 HRC	*						*	*		
M01	THERMOPLASTICS WITHOUT FILLERS							*			
M29	PLASTIC, REINFORCED WITH ORGANIC FILLERS							*			
M30	GRAPHITE										
	* FIRST CHOICE O SECOND CHOICE	SUPREME	HARD	MULTI	VARI	VARI-EX	ALU	GR	SUPREME	HARD	MULTI

Guidelines to icons

CARBIDE



Super Micro Grain

Micro Grain

FLUTE

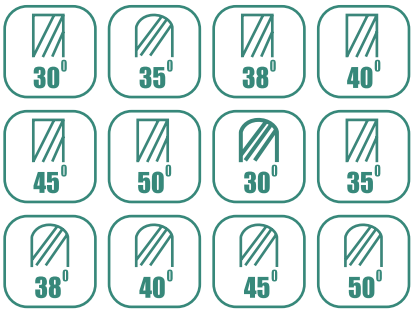
WORK MATERIAL

Work material hardness is up to
HRC30^0,HRC40^0, HRC45^0, HRC50^0, HRC55^0, HRC60^0

CORNER RADIUS

HELIX ANGLE

Helix 30^0, 35^0, 38^0, 40^0, 45^0, 50^0



COATING

AlCrN — Suitable for low to medium high speed, wet and dry machining and good for machining steel with hardness and high temperature alloy up toHRC 52.

AlTin — Suitable for medium and high speed, wet and dry machining and good for machining steel with hardness up to HRC 52.

DLC — Suitable for machining graphite and composite reinforced plastic fiber glass (GRP) (e.g. graphite electrodes, crucibles, boats)

TiALN — Generally used on all kind of machining with benefits of long tool life.

TiSi — suitable for high speed (wet/dry) and hard machining for difficult materials above HRC 52. Suitable for high speed machining with hard-ened steel above HRC 60

UNC — Uncoated

SHRINK NECK

Best For Long Neck Machining

Tools identification system

ITEM CODE	TYPE	DIMENSION	COATING
EM8N4	HARD, DH-S,DELTA HARD,VARI	18x60	EXT
END MILLS & BALL NOSE			

EM	DIA	LENGTH	FLUTE	TYPE	DIMENSION	COATING
EM	8	S	2	H	8x18x60	TIN
BN		N	3	P		TIC
ME		L	4	M		TiALN (EXT)
MB		LR	6	V		ALD
ENR		XL	8	DH-S		AlTiN
		LN		DM		TiSi
				DH		DLC
						AlCrN

ITEM CODE	DIMENSION	COATING
JD9.3D5	22x60	EXT
DRILLS		

EM	DIA	D	5	DIMENSION	COATING
JD	9.3	DEPTH	TIMES DIA (L/D)	22x60	TIN
HP			3		TICN
SD			5		TiALN
MD			7		ALD
			12		

Notes

www.x-cut.in

XCUT®
TECHNOLOGIES

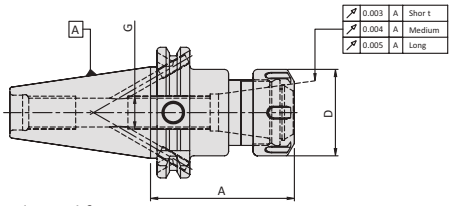
CNC MACHINE AND TOOL HOLDING SYSTEMS

Notes

Contents

DIN 69871 (SK) Tool Holders

Collet chuck Type ER for collets to DIN 6499



Balanced for G6.3 12,000 rpm

TAPER SIZE		DESIGNATION	COLLET TYPE	RANGE	D (mm)	A (mm)	G	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
SK 30	Short	XCCH/ER16-70/SK30	ER 16	1-10	28	70	M10	FORM "AD"	0.7	*
		XCCH/ER25-70/SK30	ER 25	2-16	42	70	M12	FORM “AD”	0.7	*
		XCCH/ER32-70/SK30	ER 32	2-20	50	70	M12	FORM "AD"	0.8	*
	Medium	XCCH/ER16-100/SK30	ER 16	1-10	28	100	M10	FORM “AD”	0.8	*
		XCCH/ER25-100/SK30	ER 25	2-16	42	100	M12	FORM "AD"	0.9	*
		XCCH/ER32-100/SK30	ER32	2-20	50	100	M12	FORM “AD”	1.1	*
SK 40	Short	XCCH/ER16-70/SK40	ER16	1-10	28	70	M10	FORM “AD/B”	1.0	●
		XCCH/ER20-70/SK40	ER20	1-13	34	70	M12	FORM “AD/B”	1.1	O
		XCCH/ER25-70/SK40	ER25	2-16	42	70	M16	FORM “AD/B”	1.1	●
		XCCH/ER32-70/SK40	ER32	2-20	50	70	M22X1.5	FORM “AD/B”	1.2	●
		XCCH/ER40-80/SK40	ER40	3-26	63	80	M22X1.5	FORM “AD/B”	1.5	●
	Medium	XCCH/ER16-100/SK40	ER16	1-10	28	100	M10	FORM “AD/B”	1.2	●
		XCCH/ER20-100/SK40	ER20	1-13	34	70	M12	FORM “AD/B”	1.3	O
		XXCCH/ER25-100/SK40	ER 25	2-16	42	100	M16	FORM “AD/B”	1.3	●
		XCCH/ER32-100/SK40	ER32	2-20	50	100	M22X1.5	FORM “AD/B”	1.5	●
		XCCH/ER40-100/SK40	ER40	3-26	63	100	M22X1.5	FORM “AD/B”	1.8	O
	Long	XCCH/ER16-160/SK40	ER16	1-10	28	160	M10	FORM “AD/B”	1.6	O
		XCCH/ER20-160/SK40	ER20	1-13	34	160	M12	FORM “AD/B”	1.6	O
		XCCH/ER25-160/SK40	ER25	2-16	42	160	M16	FORM “AD/B”	1.7	O
		XCCH/ER32-160/SK40	ER32	2-20	50	160	M22X1.5	FORM “AD/B”	2.0	O
		XCCH/ER40-160/SK40	ER40	3-26	63	160	M22X1.5	FORM “AD/B”	2.0	O
SK 50	Short	XCCH/ER16-63/SK50	ER16	1-10	28	63	M10	FORM “AD/B”	3.0	O
		XCCH/ER20-70/SK50	ER20	1-13	34	70	M12	FORM “AD/B”	3.0	O
		XCCH/ER25-70/SK50	ER25	2-16	42	70	M16	FORM “AD/B”	3.0	O
		XCCH/ER32-70/SK50	ER32	2-20	50	70	M22X1.5	FORM “AD/B”	3.0	O
		XCCH/ER40-80/SK50	ER40	3-26	63	80	M22X1.5	FORM “AD/B”	3.3	O
	Medium	XCCH/ER16-100/SK50	ER16	1-10	28	100	M10	FORM “AD/B”	3.1	O
		XCCH/ER20-100/SK50	ER20	1-13	34	100	M12	FORM “AD/B”	3.2	O
		XCCH/ER25-100/SK50	ER25	2-16	42	100	M16	FORM “AD/B”	3.2	●
		XCCH/ER32-100/SK50	ER32	2-20	50	100	M22X1.5	FORM “AD/B”	3.2	●
		XCCH/ER40-100/SK50	ER40	3-26	63	100	M22X1.5	FORM “AD/B”	4.5	●
	Long	XCCH/ER16-160/SK50	ER16	1-10	28	160	M10	FORM “AD/B”	3.6	O
		XCCH/ER20-160/SK50	ER20	1-13	34	160	M12	FORM “AD/B”	3.6	O
		XCCH/ER25-160/SK50	ER25	2-16	42	160	M16	FORM “AD/B”	3.7	O
		XCCH/ER32-160/SK50	ER32	2-20	50	160	M22X1.5	FORM “AD/B”	4.3	●
		XCCH/ER40-160/SK50	ER40	3-26	63	160	M22X1.5	FORM “AD/B”	5.3	O
Fine balanced holders			Balanced for G2.5 15,000 rpm							
SK 40	Short	XCCH(F)/ER16-70/SK40	ER16	1-10	28	70	M10	FORM “AD/B”	1.0	O
		XCCH(F)/ER25-70/SK40	ER25	2-16	42	70	M16	FORM “AD/B”	1.0	O
		XCCH(F)/ER32-70/SK40	ER32	2-20	50	70	M22X1.5	FORM “AD/B”	1.2	O
		XCCH(F)/ER40-80/SK40	ER40	3-26	63	80	M22X1.5	FORM “AD/B”	1.5	O
	Medium	XCCH(F)/ER16-100/SK40	ER16	1-10	28	100	M10	FORM “AD/B”	1.2	O
		XCCH(F)/ER25-100/SK40	ER25	2-16	42	100	M16	FORM “AD/B”	1.3	O
		XCCH(F)/ER32-100/SK40	ER32	2-20	50	100	M22X1.5	FORM “AD/B”	1.5	O

- Data carrier bore (10mm) as standard for all holders
- Delivery includes: Clamping nut (balanced) & adjusting screw

Spare Parts & Accessories

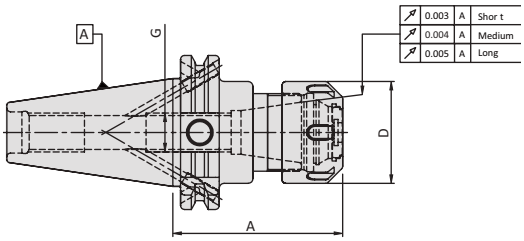

Pull Stud
Page No 60


ER - Collet
Page No 56


Clamping Nut
Page No 58


Wrench
Page No 57

Collet chuck Type ER with clamping nut for sealing disc



Balanced for G6.3 12,000 rpm

TAPER SIZE		DESIGNATION	COLLET TYPE	RANGE	D (mm)	A (mm)	G	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
SK 40	Short	XCCH/ERC25-75/SK40	ER 25	2-16	42	75	M16	FORM “AD/B”	1.1	O
		XCCH/ERC32-75/SK40	ER 32	2-20	50	75	M22X1.5	FORM “AD/B”	1.2	O
		XCCH/ERC40-85/SK40	ER 40	3-26	63	85	M22X1.5	FORM “AD/B”	1.5	O
	Medium	XCCH/ERC25-105/SK40	ER 25	2-16	42	105	M16	FORM “AD/B”	1.3	O
		XCCH/ERC32-105/SK40	ER 32	2-20	50	105	M22X1.5	FORM “AD/B”	1.5	O
		XCCH/ERC40-105/SK40	ER 40	3-26	63	105	M22X1.5	FORM “AD/B”	1.8	O
SK 50	Short	XCCH/ERC25-75/SK50	ER 25	2-16	42	75	M16	FORM “AD/B”	3.0	O
		XCCH/ERC32-75/SK50	ER 32	2-20	50	75	M22X1.5	FORM “AD/B”	3.0	O
	Medium	XCCH/ERC25-105/SK50	ER 25	2-16	42	105	M16	FORM “AD/B”	3.2	O
		XCCH/ERC32-105/SK50	ER 32	2-20	50	105	M22X1.5	FORM “AD/B”	3.6	O
Fine balanced holders			Balanced for G2.5 15,000 rpm							
SK 40	Short	XCCH(F)/ERC25-75/SK40	ER 25	2-16	42	75	M16	FORM “AD/B”	1.1	O
		XCCH(F)/ERC32-75/SK40	ER 32	2-20	50	75	M22X1.5	FORM “AD/B”	1.2	O
		XCCH(F)/ERC40-85/SK40	ER 40	3-26	63	85	M22X1.5	FORM “AD/B”	1.5	O
	Medium	XCCH(F)/ERC25-105/SK40	ER 25	2-16	42	105	M16	FORM “AD/B”	1.3	O
		XCCH(F)/ERC32-105/SK40	ER 32	2-20	50	105	M22X1.5	FORM “AD/B”	1.5	O
		XCCH(F)/ERC40-105/SK40	ER 40	3-26	63	105	M22X1.5	FORM “AD/B”	1.8	O

- Data carrier bore (10mm) as standard for all holders
- Coolant pressure max. 20 bar
- Please order sealing disc separately (See page 59)
- Delivery includes : Clamping nut (balanced) & adjusting screw

Spare Parts & Accessories

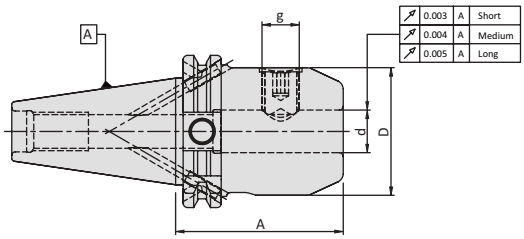

Sealing disc
Page No 59


ER - Collet
Page No 56


Clamping Nut
Page No 58


Wrench
Page No 57

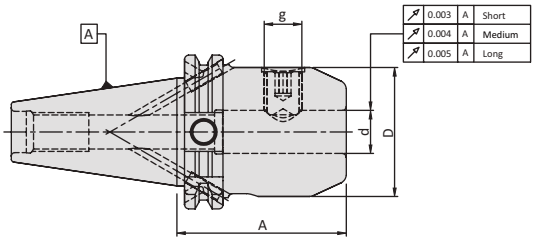
End mill holder (Weldon) DIN 1835-B



Balanced for G6.3 8,000 rpm

TAPER SIZE		DESIGNATION	d (mm)	D (mm)	A (mm)	g	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
SK 30		XSLH/06-50/SK30	6	25	50	M6	FORM "AD"	0.6	*
		XSLH/08-50/SK30	8	28	50	M8	FORM “AD”	0.6	*
		XSLH/10-50/SK30	10	35	50	M10	FORM "AD"	0.7	*
		XSLH/12-50/SK30	12	42	50	M12	FORM “AD”	0.8	*
		XSLH/14-63/SK30	14	44	63	M12	FORM "AD"	0.9	*
		XSLH/16-63/SK30	16	48	63	M14	FORM “AD”	1.0	*
		XSLH/18-63/SK30	18	50	63	M14	FORM “AD”	1.0	*
		XSLH/20-70/SK30	20	52	70	M16	FORM “AD”	1.0	*
SK 40	Extra short	XSLH/16-35/SK40*	16	48	35	M14	FORM “AD”	1.0	O
		XSLH/20-35/SK40*	20	50	35	M16	FORM “AD”	1.0	O
		XSLH/25-35/SK40*	25	50	35	M16	FORM “AD”	1.0	●
		XSLH/32-65/SK40*	32	50	65	M16	FORM “AD”	1.2	●
	Short	XSLH/06-50/SK40	6	25	50	M6	FORM “AD/B”	1.0	●
		XSLH/08-50/SK40	8	28	50	M8	FORM “AD/B”	1.0	●
		XSLH/10-50/SK40	10	35	50	M10	FORM “AD/B”	1.1	●
		XSLH/12-50/SK40	12	42	50	M12	FORM “AD/B”	1.2	●
		XSLH/14-50/SK40	14	44	50	M12	FORM “AD/B”	1.2	O
		XSLH/16-63/SK40	16	48	63	M14	FORM “AD/B”	1.2	O
		XSLH/18-63/SK40	18	50	63	M14	FORM “AD/B”	1.4	O
		XSLH/20-63/SK40	20	50	63	M16	FORM “AD/B”	1.5	●
		XSLH/25-100/SK40	25	65	100	M18	FORM “AD/B”	2.7	●
		XSLH/32-100/SK40	32	72	100	M20	FORM “AD/B”	2.5	●
		XSLH/40-120/SK40	40	80	120	M20	FORM “AD/B”	3	●
	Medium	XSLH/06-100/SK40	6	25	100	M6	FORM “AD/B”	1.2	O
		XSLH/08-100/SK40	8	28	100	M8	FORM “AD/B”	1.2	O
		XSLH/10-100/SK40	10	35	100	M10	FORM “AD/B”	1.4	O
		XSLH/12-100/SK40	12	42	100	M12	FORM “AD/B”	1.6	O
		XSLH/14-100/SK40	14	44	100	M12	FORM “AD/B”	1.7	O
		XSLH/16-100/SK40	16	48	100	M14	FORM “AD/B”	1.7	O
		XSLH/18-100/SK40	18	50	100	M14	FORM “AD/B”	2.0	O
		XSLH/20-100/SK40	20	52	100	M16	FORM “AD/B”	2.0	O
	Long	XSLH/06-160/SK40	6	25	160	M6	FORM “AD/B”	1.5	O
		XSLH/08-160/SK40	8	28	160	M8	FORM “AD/B”	1.5	O
		XSLH/10-160/SK40	10	35	160	M10	FORM “AD/B”	1.7	O
		XSLH/12-160/SK40	12	42	160	M12	FORM “AD/B”	2.2	O
		XSLH/14-160/SK40	14	44	160	M12	FORM “AD/B”	2.3	O
		XSLH/16-160/SK40	16	48	160	M14	FORM “AD/B”	1.7	O
		XSLH/18-160/SK40	18	50	160	M14	FORM “AD/B”	2.6	O
		XSLH/20-160/SK40	20	52	160	M16	FORM “AD/B”	2.8	O
		XSLH/25-160/SK40	25	65	160	M18	FORM “AD/B”	3.8	O
		XSLH/32-160/SK40	32	72	160	M20	FORM “AD/B”	4.4	O

End mill holder (Weldon) DIN 1835-B



Balanced for G6.3 8,000 rpm

TAPER SIZE		DESIGNATION	d (mm)	D (mm)	A (mm)	g	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
SK 50	Short	XSLH/06-63/SK50	6	25	63	M6	FORM "AD/B"	2.7	O
		XSLH/08-63/SK50	8	28	63	M8	FORM "AD/B"	2.7	O
		XSLH/10-63/SK50	10	35	63	M10	FORM "AD/B"	2.9	O
		XSLH/12-63/SK50	12	42	63	M12	FORM "AD/B"	3.0	O
		XSLH/14-63/SK50	14	44	63	M12	FORM "AD/B"	3.0	O
		XSLH/16-63/SK50	16	48	63	M14	FORM "AD/B"	3.0	O
		XSLH/18-63/SK50	18	50	63	M14	FORM "AD/B"	3.0	O
		XSLH/20-63/SK50	20	52	63	M16	FORM "AD/B"	3.1	●
		XSLH/25-80/SK50	25	65	80	M18	FORM "AD/B"	3.7	●
		XSLH/32-100/SK50	32	72	100	M20	FORM "AD/B"	5.1	●
		XSLH/40-100/SK50	40	80	100	M20	FORM "AD/B"	6.5	●
	Medium	XSLH/06-100/SK50	6	25	100	M6	FORM "AD/B"	3.0	O
		XSLH/08-100/SK50	8	28	100	M8	FORM "AD/B"	3.0	O
		XSLH/10-100/SK50	10	35	100	M10	FORM "AD/B"	3.2	O
		XSLH/12-100/SK50	12	42	100	M12	FORM "AD/B"	3.4	O
		XSLH/14-100/SK50	14	44	100	M12	FORM "AD/B"	3.4	O
		XSLH/16-100/SK50	16	48	100	M14	FORM "AD/B"	3.6	O
		XSLH/18-100/SK50	18	50	100	M14	FORM "AD/B"	3.6	O
		XSLH/20-100/SK50	20	52	100	M16	FORM "AD/B"	3.7	O
		XSLH/25-120/SK50	25	65	120	M18	FORM "AD/B"	4.3	O
	Long	XSLH/06-160/SK50	6	25	160	M6	FORM "AD/B"	3.4	O
		XSLH/08-160/SK50	8	28	160	M8	FORM "AD/B"	3.4	O
		XSLH/10-160/SK50	10	35	160	M10	FORM "AD/B"	3.9	O
		XSLH/12-160/SK50	12	42	160	M12	FORM "AD/B"	4.1	O
		XSLH/14-160/SK50	14	44	160	M12	FORM "AD/B"	4.1	O
		XSLH/16-160/SK50	16	48	160	M14	FORM "AD/B"	4.5	O
		XSLH/18-160/SK50	18	50	160	M14	FORM "AD/B"	4.6	O
		XSLH/20-160/SK50	20	52	160	M16	FORM "AD/B"	4.8	O
		XSLH/25-160/SK50	25	65	160	M18	FORM "AD/B"	6.0	O
		XSLH/32-160/SK50	32	72	160	M20	FORM "AD/B"	6.6	O
		XSLH/40-160/SK50	40	80	160	M20	FORM "AD/B"	6.9	O

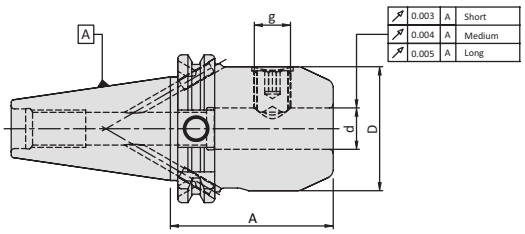
- Data carrier bore (10mm) as standard for all holders
- Bore tolerance H4
- Delivery includes : Locking screw

Spare Parts & Accessories


Pull Stud
Page No 60


Locking Screw
Page No 62

End mill holder (Weldon) DIN 1835-B (Fine balanced)



Balanced for G2.5 15,000 rpm

TAPER SIZE		DESIGNATION	d (mm)	D (mm)	A (mm)	g	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
SK 40	Extra Short	XSLH(F)/16-35/SK40*	16	48	35	M14	FORM "AD"	1.0	O
		XSLH(F)/20-35/SK40*	20	50	35	M16	FORM “AD”	1.0	O
		XSLH(F)/25-35/SK40*	25	50	35	M16	FORM "AD"	1.0	O
	Short	XSLH(F)/06-50/SK40	6	25	50	M6	FORM “AD/B”	1.0	O
		XSLH(F)/08-50/SK40	8	28	50	M8	FORM “AD/B”	1.0	O
		XSLH(F)/10-50/SK40	10	35	50	M10	FORM “AD/B”	1.1	O
		XSLH(F)/12-50/SK40	12	42	50	M12	FORM “AD/B”	1.2	O
		XSLH(F)/14-50/SK40	14	44	50	M14	FORM “AD/B”	1.2	O
		XSLH(F)/16-63/SK40	16	48	63	M14	FORM “AD/B”	1.2	O
		XSLH(F)/18-63/SK40	18	50	63	M14	FORM “AD/B”	1.4	O
		XSLH(F)/20-63/SK40	20	50	63	M16	FORM “AD/B”	1.5	O
		XSLH(F)/25-100/SK40	25	65	100	M18	FORM “AD/B”	2.7	O
		XSLH(F)/32-100/SK40	32	72	100	M20	FORM “AD/B”	2.5	O
	Medium	XSLH(F)/06-100/SK40	6	25	100	M6	FORM “AD/B”	1.2	O
		XSLH(F)/08-100/SK40	8	28	100	M8	FORM “AD/B”	1.2	O
		XSLH(F)/10-100/SK40	10	35	100	M10	FORM “AD/B”	1.4	O
		XSLH(F)/12-100/SK40	12	42	100	M12	FORM “AD/B”	1.6	O
		XSLH(F)/16-100/SK40	16	48	100	M14	FORM “AD/B”	1.7	O
		XSLH(F)/20-100/SK40	20	52	100	M16	FORM “AD/B”	2.0	O
	Long	XSLH(F)/06-160/SK40	6	25	160	M6	FORM “AD/B”	1.5	O
		XSLH(F)/08-160/SK40	8	28	160	M8	FORM “AD/B”	1.5	O
		XSLH(F)/10-160/SK40	10	35	160	M10	FORM “AD/B”	1.7	O
		XSLH(F)/12-160/SK40	12	42	160	M12	FORM “AD/B”	2.2	O
		XSLH(F)/14-160/SK40	14	44	160	M12	FORM “AD/B”	2.3	O
		XSLH(F)/16-160/SK40	16	48	160	M14	FORM “AD/B”	1.7	O
		XSLH(F)/18-160/SK40	18	50	160	M14	FORM “AD/B”	2.6	O
		XSLH(F)/20-160/SK40	20	52	160	M16	FORM “AD/B”	2.8	O
		XSLH(F)/25-160/SK40	25	65	160	M18	FORM “AD/B”	3.8	O
SK 50		XSLH(F)/06-63/SK50	6	25	63	M6	FORM “AD/B”	2.7	O
		XSLH(F)/08-63/SK50	8	28	63	M8	FORM “AD/B”	2.7	O
		XSLH(F)/10-63/SK50	10	35	63	M10	FORM “AD/B”	2.9	O
		XSLH(F)/12-63/SK50	12	42	63	M12	FORM “AD/B”	3.0	O
		XSLH(F)/14-63/SK50	14	44	63	M12	FORM “AD/B”	3.0	O
		XSLH(F)/16-63/SK50	16	48	63	M14	FORM “AD/B”	3.0	O
		XSLH(F)/18-63/SK50	18	50	63	M14	FORM “AD/B”	3.0	O
		XSLH(F)/20-63/SK50	20	52	63	M16	FORM “AD/B”	3.1	O
		XSLH(F)/25-80/SK50	25	65	80	M18	FORM “AD/B”	3.7	O
		XSLH(F)/32-100/SK50	32	72	100	M20	FORM “AD/B”	5.1	O

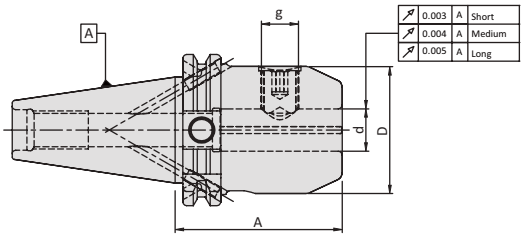
- Data carrier bore (10mm) as standard for all holders
- Bore tolerance H4
- * Extra short holders :
  - Locking screws are located in the same plane as drive slots.
  - Gives maximum rigidity due to short projection.
- Delivery includes : Locking screw

Spare Parts & Accessories

Pull Stud
Page No 60

Locking Screw
Page No 62

End mill holder to DIN 6359 with coolant channel for Weldon type end mills to DIN 1835-B



Balanced for G6.3 8,000 rpm

TAPER SIZE		DESIGNATION	d (mm)	D (mm)	A (mm)	g	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
SK 40	Extra Short	XSLH-K/16-35/SK40*	16	48	35	M14	FORM "AD/B"	0.9	O
		XSLH-K/20-35/SK40*	20	50	35	M16	FORM "AD/B"	0.9	O
		XSLH-K/25-35/SK40*	25	50	35	M16	FORM "AD/B"	0.8	O
		XSLH-K/32-65/SK40*	32	50	65	M16	FORM "AD/B"	1.5	O
	Short	XSLH-K/06-50/SK40	6	25	50	M6	FORM "AD/B"	0.9	O
		XSLH-K/08-50/SK40	8	28	50	M8	FORM "AD/B"	0.9	O
		XSLH-K/10-50/SK40	10	35	50	M10	FORM "AD/B"	1.0	O
		XSLH-K/12-50/SK40	12	42	50	M12	FORM "AD/B"	1.0	O
		XSLH-K/14-50/SK40	14	44	50	M12	FORM "AD/B"	1.0	O
		XSLH-K/16-63/SK40	16	48	63	M14	FORM "AD/B"	1.2	O
		XSLH-K/18-63/SK40	18	50	63	M14	FORM "AD/B"	1.3	O
		XSLH-K/20-63/SK40	20	50	63	M16	FORM "AD/B"	1.3	O
		XSLH-K/25-100/SK40	25	65	100	M18	FORM "AD/B"	2.3	O
		XSLH-K/32-100/SK40	32	72	100	M20	FORM "AD/B"	2.5	O
		XSLH-K/40-120/SK40	40	80	120	M20	FORM "AD/B"	3.4	O
	Medium	XSLH-K/06-100/SK40	6	25	100	M6	FORM "AD/B"	1.1	O
		XSLH-K/08-100/SK40	8	28	100	M8	FORM "AD/B"	1.1	O
		XSLH-K/10-100/SK40	10	35	100	M10	FORM "AD/B"	1.3	O
		XSLH-K/12-100/SK40	12	42	100	M12	FORM "AD/B"	1.5	O
		XSLH-K/14-100/SK40	14	44	100	M12	FORM "AD/B"	1.6	O
		XSLH-K/16-100/SK40	16	48	100	M14	FORM "AD/B"	1.7	O
		XSLH-K/18-100/SK40	18	50	100	M14	FORM "AD/B"	1.8	O
		XSLH-K/20-100/SK40	20	52	100	M16	FORM "AD/B"	1.9	O
SK 50		XSLH-K/06-63/SK50	6	25	63	M6	FORM "AD/B"	2.7	O
		XSLH-K/08-63/SK50	8	28	63	M8	FORM "AD/B"	2.7	O
		XSLH-K/10-63/SK50	10	35	63	M10	FORM "AD/B"	2.8	O
		XSLH-K/12-63/SK50	12	42	63	M12	FORM "AD/B"	2.9	O
		XSLH-K/14-63/SK50	14	44	63	M12	FORM "AD/B"	2.9	O
		XSLH-K/16-63/SK50	16	48	63	M14	FORM "AD/B"	3.0	O
		XSLH-K/18-63/SK50	18	50	63	M14	FORM "AD/B"	3.0	O
		XSLH-K/20-63/SK50	20	52	63	M16	FORM "AD/B"	3.2	O
		XSLH-K/25-80/SK50	25	65	80	M18	FORM "AD/B"	4.6	O
		XSLH-K/32-100/SK50	32	72	100	M20	FORM "AD/B"	6.4	O
		XSLH-K/40-100/SK50	40	80	100	M20	FORM "AD/B"	7.3	O
Fine Balanced Holders					Balanced for G2.5 15,000 rpm				
SK 40		XSLH-K(F)/06-50/SK40	6	25	50	M6	FORM "AD/B"	0.9	O
		XSLH-K(F)/08-50/SK40	8	28	50	M8	FORM "AD/B"	0.9	O
		XSLH-K(F)/10-50/SK40	10	35	50	M10	FORM "AD/B"	1.0	O
		XSLH-K(F)/12-50/SK40	12	42	50	M12	FORM "AD/B"	1.0	O
		XSLH-K(F)/14-50/SK40	14	44	50	M12	FORM "AD/B"	1.0	O
		XSLH-K(F)/16-63/SK40	16	48	63	M14	FORM "AD/B"	1.2	O
		XSLH-K(F)/18-63/SK40	18	50	63	M14	FORM "AD/B"	1.3	O
		XSLH-K(F)/20-63/SK40	20	50	63	M16	FORM "AD/B"	1.3	O
		XSLH-K(F)/25-100/SK40	25	65	100	M18	FORM "AD/B"	2.3	O

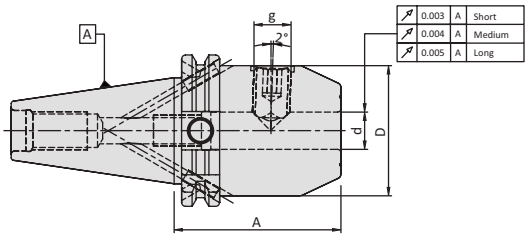
- Data carrier bore (10mm) as standard for all holders
- Bore tolerance H4
- * Extra short holders :
  - Locking screws are located in the same plane as drive slots.
  - Gives maximum rigidity due to short projection.
- with two coolant channels along the side of the bore.
- Delivery includes : Locking screw

Spare Parts & Accessories


Pull Stud
Page No 60


Locking Screw
Page No 62

End mill holder to DIN 6359 for Whistle Notch for end mills to DIN 1835-E



TAPER SIZE		DESIGNATION	d (mm)	D (mm)	A (mm)	G	g	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
Balanced for G6.3 8,000 rpm										
SK 40	Short	XSLH-E/06-50/SK40	6	25	50	M5	M6	FORM "AD/B"	1	O
		XSLH-E/08-50/SK40	8	28	50	M6	M8	FORM "AD/B"	1	O
		XSLH-E/10-50/SK40	10	35	50	M8	M10	FORM "AD/B"	1.1	O
		XSLH-E/12-50/SK40	12	42	50	M10	M12	FORM "AD/B"	1.2	O
		XSLH-E/14-50/SK40	14	44	50	M10	M12	FORM "AD/B"	1.2	O
		XSLH-E/16-63/SK40	16	48	63	M12	M14	FORM "AD/B"	1.2	O
		XSLH-E/18-63/SK40	18	50	63	M12	M14	FORM "AD/B"	1.4	O
		XSLH-E/20-63/SK40	20	50	63	M16	M16	FORM "AD/B"	1.5	O
		XSLH-E/25-100/SK40	25	65	100	M20	M18	FORM "AD/B"	2.3	O
		XSLH-E/32-100/SK40	32	72	100	M20	M20	FORM "AD/B"	2.5	O
		XSLH-E/40-120/SK40	40	80	120	M20	M20	FORM "AD/B"	3.0	O
	Medium	XSLH-E/06-130/SK40	6	25	130	M5	M6	FORM "AD/B"	1.2	O
		XSLH-E/08-130/SK40	8	28	130	M6	M8	FORM "AD/B"	1.3	O
		XSLH-E/10-130/SK40	10	35	130	M8	M10	FORM "AD/B"	1.5	O
		XSLH-E/12-130/SK40	12	42	130	M10	M12	FORM "AD/B"	1.8	O
		XSLH-E/16-130/SK40	16	48	130	M12	M14	FORM "AD/B"	2.1	O
		XSLH-E/20-130/SK40	20	52	130	M16	M16	FORM "AD/B"	2.3	O
		XSLH-E/25-130/SK40	25	65	130	M20	M18	FORM "AD/B"	3.0	O
SK 50		XSLH-E/06-63/SK50	6	25	63	M5	M6	FORM "AD/B"	3.5	O
		XSLH-E/08-63/SK50	8	28	63	M6	M8	FORM "AD/B"	3.6	O
		XSLH-E/10-63/SK50	10	35	63	M8	M10	FORM "AD/B"	3.7	O
		XSLH-E/12-63/SK50	12	42	63	M10	M12	FORM "AD/B"	3.9	O
		XSLH-E/14-63/SK50	14	44	63	M10	M12	FORM "AD/B"	3.9	O
		XSLH-E/16-63/SK50	16	48	63	M12	M14	FORM "AD/B"	3.9	O
		XSLH-E/18-63/SK50	18	50	63	M12	M14	FORM "AD/B"	4.0	O
		XSLH-E/20-63/SK50	20	52	63	M16	M16	FORM "AD/B"	4.0	O
		XSLH-E/25-80/SK50	25	65	80	M20	M18	FORM "AD/B"	4.7	O
		XSLH-E/32-100/SK50	32	72	100	M20	M20	FORM "AD/B"	5.1	O
		XSLH-E/40-100/SK50	40	80	100	M20	M20	FORM "AD/B"	6.5	O
Fine Balanced Holders						Balanced for G2.5 15,000 rpm				
SK 40	Short	XSLH-E(F)/06-50/SK40	6	25	50	M5	M6	FORM "AD/B"	1.0	O
		XSLH-E(F)/08-50/SK40	8	28	50	M6	M8	FORM "AD/B"	1.0	O
		XSLH-E(F)/10-50/SK40	10	35	50	M8	M10	FORM "AD/B"	1.1	O
		XSLH-E(F)/12-50/SK40	12	42	50	M10	M12	FORM "AD/B"	1.2	O
		XSLH-E(F)/14-50/SK40	14	44	50	M10	M12	FORM "AD/B"	1.2	O
		XSLH-E(F)/16-63/SK40	16	48	63	M12	M14	FORM "AD/B"	1.2	O
		XSLH-E(F)/18-63/SK40	18	50	63	M12	M14	FORM "AD/B"	1.4	O
		XSLH-E(F)/20-63/SK40	20	50	63	M16	M16	FORM "AD/B"	1.5	O
	Medium	XSLH-E(F)/06-130/SK40	6	25	130	M5	M6	FORM "AD/B"	1.2	O
		XSLH-E(F)/08-130/SK40	8	28	130	M6	M8	FORM "AD/B"	1.3	O
		XSLH-E(F)/10-130/SK40	10	35	130	M8	M10	FORM "AD/B"	1.5	O
		XSLH-E(F)/12-130/SK40	12	42	130	M10	M12	FORM "AD/B"	1.8	O
		XSLH-E(F)/16-130/SK40	16	48	130	M12	M14	FORM "AD/B"	2.1	O
		XSLH-E(F)/20-130/SK40	20	52	130	M16	M16	FORM "AD/B"	2.3	O
		XSLH-E(F)/25-130/SK40	25	65	130	M20	M18	FORM "AD/B"	3.0	O

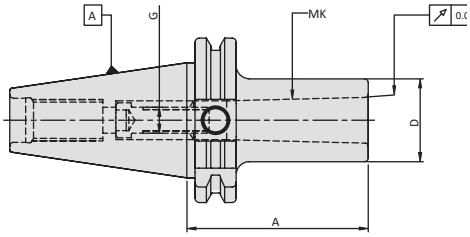
- Data carrier bore (10mm) as standard for all holders
- Bore tolerance H4
- Groove on face for easy identification (to distinguish from Weldon)
- Delivery includes : Locking screw & adjusting screw

Spare Parts & Accessories


Pull Stud


Locking Screw

Morse taper with Thread DIN 6364 / 228A



Balanced for G6.3 8,000 rpm

TAPER SIZE	DESIGNATION	MK	D (mm)	A (mm)	G	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
SK 40	XMTB/MT1-50/SK40	MT1	25	50	M6	FORM "A"	1.0	O
	XMTB/MT2-50/SK40	MT2	32	50	M10	FORM "A"	1.0	O
	XMTB/MT3-70/SK40	MT3	40	70	M12	FORM "A"	1.1	O
	XMTB/MT4-95/SK40	MT4	48	95	M16	FORM "A"	1.2	O
SK 50	XMTB/MT1-45/SK50	MT1	25	45	M6	FORM "A"	2.7	O
	XMTB/MT2-60/SK50	MT2	32	60	M10	FORM "A"	2.8	O
	XMTB/MT3-65/SK50	MT3	40	65	M12	FORM "A"	2.9	O
	XMTB/MT4-95/SK50	MT4	48	95	M16	FORM "A"	3.2	O
	XMTB/MT5-120/SK50	MT5	63	120	M24	FORM "A"	4.0	O

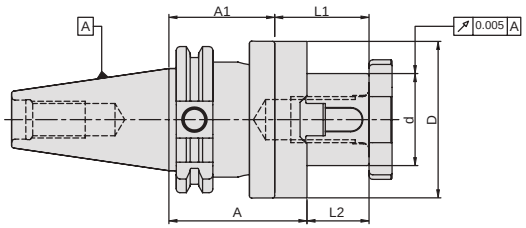
- Data carrier bore (10mm) as std. for all holders
- Delivery includes : build-in draw screw

Spare Parts & Accessories


Socket head Screw
Page No 65


Pull Stud
Page No 60

Combi shell mill holder to DIN 6358

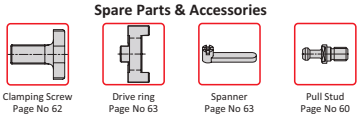


Balanced for G6.3 8,000 rpm

TAPER SIZE		DESIGNATION	d (mm)	D (mm)	A (mm)	A1 (mm)	L1 (mm)	L2 (mm)	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
SK 30		XFSH/16-50/SK30	16	32	50	40	27	17	FORM "A"	0.7	*
		XFSH/22-50/SK30	22	40	50	38	31	19	FORM “A”	0.9	*
		XFSH/27-55/SK30	27	48	55	43	33	21	FORM “A”	1.0	*
		XFSH/32-60/SK30	32	58	60	46	38	24	FORM “A”	1.4	*
SK 40	Short	XFSH/16-55/SK40	16	32	55	45	27	17	FORM “A”	1.1	O
		XFSH/22-55/SK40	22	40	55	43	31	19	FORM “A”	1.3	O
		XFSH/27-55/SK40	27	48	55	43	33	21	FORM "A"	1.5	O
		XFSH/32-60/SK40	32	58	60	46	38	24	FORM “A”	1.8	O
		XFSH/40-60/SK40	40	70	60	46	41	27	FORM “A”	2.1	O
	Medium	XFSH/16-100/SK40	16	32	100	90	27	17	FORM “A”	1.4	O
		XFSH/22-100/SK40	22	40	100	88	31	19	FORM “A”	1.8	O
		XFSH/27-100/SK40	27	48	100	88	33	21	FORM “A”	2.2	O
		XFSH/32-100/SK40	32	58	100	86	38	24	FORM "A"	2.6	O
		XFSH/40-100/SK40	40	70	100	86	41	27	FORM “A”	2.8	O
SK 50	Short	XFSH/16-55/SK50	16	32	55	45	27	17	FORM “A”	2.9	O
		XFSH/22-55/SK50	22	40	55	43	31	19	FORM “A”	3.1	O
		XFSH/27-55/SK50	27	48	55	43	33	21	FORM “A”	3.3	O
		XFSH/32-55/SK50	32	58	55	41	38	24	FORM “A”	3.5	O
		XFSH/40-55/SK50	40	70	55	41	41	27	FORM "A"	3.7	O
		XFSH/50-70/SK50	50	90	70	54	46	30	FORM “A”	4.3	O
	Medium	XFSH/16-100/SK50	16	32	100	90	27	17	FORM “A”	3.4	O
		XFSH/22-100/SK50	22	40	100	88	31	19	FORM “A”	3.6	O
		XFSH/27-100/SK50	27	48	100	88	33	21	FORM “A”	3.9	O
		XFSH/32-100/SK50	32	58	100	86	38	24	FORM “A”	4.2	O
		XFSH/40-100/SK50	40	70	100	86	41	27	FORM “A”	4.9	O

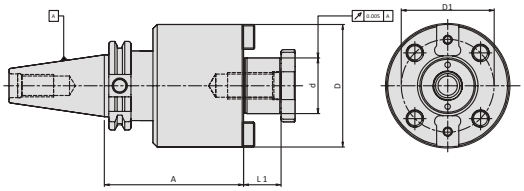
- Data carrier bore (10mm) as standard for all holders
- Delivery includes : Parallel key, drive ring and clamping screw

Spare Parts & Accessories



Clamping Screw Page No 62
Drive ring Page No 63
Spanner Page No 63
Pull Stud Page No 60

Shell mill holder to DIN 6357 for cutters with drive key



Balanced for G6.3 8,000 rpm

TAPER SIZE		DESIGNATION	d (mm)	D (mm)	A (mm)	L1 (mm)	D1	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
SK 30		XSMH/16-40/SK30	16	38	40	17		FORM "A"	0.7	*
		XSMH/22-40/SK30	22	43	40	19		FORM "A"	0.9	*
		XSMH/27-40/SK30	27	43	40	21		FORM "A"	1.1	*
		XSMH/32-50/SK30	32	78	50	24		FORM "A"	1.5	*
SK 40	Short	XSMH/16-35/SK40	16	38	35	17		FORM "AD/B"	1.0	●
		XSMH/22-35/SK40	22	48	35	19		FORM "AD/B"	1.0	●
		XSMH/27-40/SK40	27	50	40	21		FORM "AD/B"	1.1	●
		XSMH/32-50/SK40	32	78	50	24		FORM "AD/B"	1.3	●
		XSMH/40-50/SK40 +	40	88	50	27	66.7	FORM "AD/B"	1.6	O
	Medium	XSMH/16-100/SK40	16	38	100	17		FORM "AD/B"	1.8	●
		XSMH/22-100/SK40	22	48	100	19		FORM "AD/B"	2.1	●
		XSMH/27-100/SK40	27	58	100	21		FORM "AD/B"	2.6	●
		XSMH/32-100/SK40	32	78	100	24		FORM "AD/B"	3.6	O
		XSMH/40-100/SK40 +	40	88	100	27	66.7	FORM "AD/B"	4.3	O
	Long	XSMH/16-160/SK40	16	38	160	17		FORM "AD/B"	2.1	O
		XSMH/22-160/SK40	22	48	160	19		FORM "AD/B"	2.7	●
		XSMH/27-160/SK40	27	58	160	21		FORM "AD/B"	3.7	O
		XSMH/32-160/SK40	32	78	160	24		FORM "AD/B"	5.8	O
		XSMH/40-160/SK40 +	40	88	160	27	66.7	FORM "AD/B"	6.6	O
SK 50	Short	XSMH/16-44/SK50	16	38	44	17		FORM "AD/B"	2.8	O
		XSMH/22-44/SK50	22	48	44	19		FORM "AD/B"	3.0	O
		XSMH/27-44/SK50	27	50	44	21		FORM "AD/B"	3.2	O
		XSMH/32-40/SK50	32	78	40	24		FORM "AD/B"	4.0	O
		XSMH/40-50/SK50 +	40	88	50	27	66.7	FORM "AD/B"	4.2	O
		XSMH/60-70/SK50 +	60	129	70	40	101.6	FORM "A"	4.8	O
	Medium	XSMH/16-100/SK50	16	38	100	17		FORM "AD/B"	3.6	●
		XSMH/22-100/SK50	22	48	100	19		FORM "AD/B"	4.0	●
		XSMH/27-100/SK50	27	50	100	21		FORM "AD/B"	4.4	●
		XSMH/32-100/SK50	32	78	100	24		FORM "AD/B"	5.2	●
		XSMH/40-100/SK50 +	40	88	100	27	66.7	FORM "AD/B"	6.0	O
	Long	XSMH/16-160/SK50	16	38	160	17		FORM "AD/B"	3.9	O
		XSMH/22-160/SK50	22	48	160	19		FORM "AD/B"	4.2	O
		XSMH/27-160/SK50	27	50	160	21		FORM "AD/B"	5.3	O
		XSMH/32-160/SK50	32	78	160	24		FORM "AD/B"	7.2	O
		XSMH/40-160/SK50 +	40	88	160	27	66.7	FORM "AD/B"	8.8	O

- Data carrier bore (10mm) as standard for all holders
- Coolant bore on the pilot face (holder with Form"AD/B") as standard for all holders

+D = Ø 40, D = Ø 60 With additional 4 screw holes to DIN 2079

- Delivery includes : Drive keys and clamping screw

Spare Parts & Accessories


Spanner
Page No 63

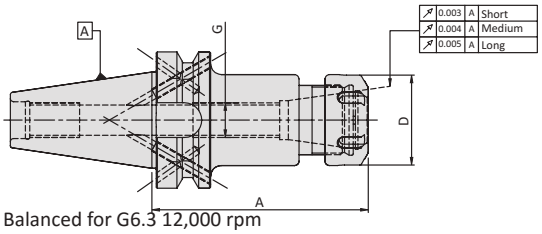

Clamping Screw
Page No 62


Drive Key
Page No 64


Pull Stud
Page No 60

DIN JIS B 6339 (MAS 403 BT) Tool Holders

Collet chuck Type ER for collets to DIN 6499



Balanced for G6.3 12,000 rpm

TAPER SIZE		DESIGNATION	COLLET TYPE	RANGE	D (mm)	A (mm)	G	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
BT 30	Short	XCCH/ER16-70/BT30	ER 16	1-10	28	70	M10	FORM "AD"	0.7	●
		XCCH/ER20-70/BT30	ER 20	1-13	34	70	M12	FORM “AD”	0.9	●
		XCCH/ER25-70/BT30	ER 25	2-16	42	70	M12	FORM “AD”	0.6	●
	Medium	XCCH/ER32-70/BT30	ER 32	2-20	50	70	M12	FORM “AD”	0.8	●
		XCCH/ER16-100/BT30	ER 16	1-10	28	100	M10	FORM “AD”	0.7	●
		XCCH/ER20-100/BT30	ER 20	1-13	34	100	M12	FORM “AD”	1.3	O
		XCCH/ER25-100/BT30	ER 25	2-16	42	100	M12	FORM “AD”	0.6	●
BT 40	Short	XCCH/ER16-70/BT40	ER 16	1-10	28	70	M10	FORM “AD/B”	1.0	●
		XCCH/ER20-70/BT40	ER 20	1-13	34	70	M12	FORM “AD/B”	1.2	●
		XCCH/ER25-70/BT40	ER 25	2-16	42	70	M16	FORM “AD/B”	1.0	●
		XCCH/ER32-70/BT40	ER 32	2-20	50	70	M22X1.5	FORM “AD/B”	1.2	●
		XCCH/ER40-80/BT40	ER 40	3-26	63	80	M22X1.5	FORM “AD/B”	1.2	●
	Medium	XCCH/ER16-100/BT40	ER 16	1-10	28	100	M10	FORM “AD/B”	1.2	●
		XCCH/ER20-100/BT40	ER 20	1-13	34	100	M12	FORM “AD/B”	1.4	O
		XCCH/ER25-100/BT40	ER 25	2-16	42	100	M16	FORM “AD/B”	1.4	●
		XCCH/ER32-100/BT40	ER 32	2-20	50	100	M22X1.5	FORM “AD/B”	1.5	●
		XCCH/ER40-100/BT40	ER 40	3-26	63	100	M22X1.5	FORM “AD/B”	1.8	O
	Long	XCCH/ER16-160/BT40	ER 16	1-10	28	160	M10	FORM “AD/B”	1.6	●
		XCCH/ER20-160/BT40	ER 20	1-13	34	160	M12	FORM “AD/B”	1.6	O
		XCCH/ER25-160/BT40	ER 25	2-16	42	160	M16	FORM “AD/B”	2.1	●
		XCCH/ER32-160/BT40	ER 32	2-20	50	160	M22X1.5	FORM “AD/B”	2.5	●
		XCCH/ER40-160/BT40	ER 40	3-26	63	160	M22X1.5	FORM “AD/B”	2.6	O
BT 50	Short	XCCH/ER20-70/BT50	ER 20	1-13	34	70	M12	FORM “AD/B”	4.0	O
		XCCH/ER25-70/BT50	ER 25	2-16	42	70	M16	FORM “AD/B”	3.4	●
		XCCH/ER32-70/BT50	ER 32	2-20	50	70	M22X1.5	FORM “AD/B”	3.5	●
		XCCH/ER40-80/BT50	ER 40	3-26	63	80	M22X1.5	FORM “AD/B”	3.6	O
	Medium	XCCH/ER16-100/BT50	ER 16	1-10	28	100	M10	FORM “AD/B”	3.6	O
		XCCH/ER20-100/BT50	ER 20	1-13	34	100	M12	FORM “AD/B”	4.0	O
		XCCH/ER25-100/BT50	ER 25	2-16	42	100	M16	FORM “AD/B”	3.8	●
		XCCH/ER32-100/BT50	ER 32	2-20	50	100	M22X1.5	FORM “AD/B”	3.9	●
		XCCH/ER40-100/BT50	ER 40	3-26	63	100	M22X1.5	FORM “AD/B”	3.8	●
	Long	XCCH/ER16-160/BT50	ER 16	1-10	28	160	M10	FORM “AD/B”	4.1	O
		XCCH/ER20-160/BT50	ER 20	1-13	34	160	M12	FORM “AD/B”	4.1	O
		XCCH/ER25-160/BT50	ER 25	2-16	42	160	M16	FORM “AD/B”	4.1	●
		XCCH/ER32-160/BT50	ER 32	2-20	50	160	M22X1.5	FORM “AD/B”	4.6	●
		XCCH/ER40-160/BT50	ER 40	3-26	63	160	M22X1.5	FORM “AD/B”	4.6	O
Fine Balanced Holders						Balance for G2.5 15,000 rpm				
BT 40	Short	XCCH(F)/ER16-70/BT40	ER 16	1-10	28	70	M10	FORM “AD/B”	1.0	O
		XCCH(F)/ER25-70/BT40	ER 25	2-16	42	70	M16	FORM “AD/B”	1.0	O
		XCCH(F)/ER32-70/BT40	ER 32	2-20	50	70	M22X1.5	FORM “AD/B”	1.2	O
		XCCH(F)/ER40-80/BT40	ER 40	3-26	63	80	M22X1.5	FORM “AD/B”	1.2	O
	Medium	XCCH(F)/ER16-100/BT40	ER 16	1-10	28	100	M10	FORM “AD/B”	1.2	O
		XCCH(F)/ER25-100/BT40	ER 25	2-16	42	100	M16	FORM “AD/B”	1.4	O
		XCCH(F)/ER32-100/BT40	ER 32	2-20	50	100	M22X1.5	FORM “AD/B”	1.5	O

• Delivery includes : Clamping nut (balanced) & adjusting screw

Spare Parts & Accessories

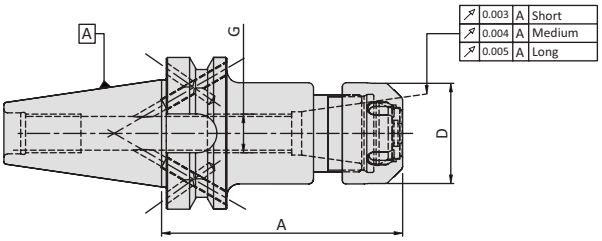

Pull Stud
Page No 60


ER - Collet
Page No 56


Clamping Nut
Page No 58


Wrench
Page No 57

Collet chuck Type ER with clamping nut for sealing disc



Balanced for G6.3 12,000 rpm

TAPER SIZE		DESIGNATION	COLLET TYPE	RANGE	D (mm)	A (mm)	G	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
BT 40	Short	XCCH/ERC25-75/BT40	ER 25	2-16	42	75	M16	FORM "AD/B"	1.0	O
		XCCH/ERC32-75/BT40	ER 32	2-20	50	75	M22X1.5	FORM "AD/B"	1.2	O
		XCCH/ERC40-85/BT40	ER 40	3-26	63	85	M22X1.5	FORM "AD/B"	1.4	O
	Medium	XCCH/ERC25-105/BT40	ER 25	2-16	42	105	M16	FORM "AD/B"	1.4	O
		XCCH/ERC32-105/BT40	ER 32	2-20	50	105	M22X1.5	FORM "AD/B"	1.5	O
Fine Balanced Holders			Balance for G2.5 15,000 rpm							
BT 40	Short	XCCH(F)/ERC25-75/BT40	ER 25	2-16	42	75	M16	FORM "AD/B"	1.0	O
		XCCH(F)/ERC32-75/BT40	ER 32	2-20	50	75	M22X1.5	FORM "AD/B"	1.2	O
		XCCH(F)/ERC40-85/BT40	ER 40	3-26	63	85	M22X1.5	FORM "AD/B"	1.2	O
	Medium	XCCH(F)/ERC25-105/BT40	ER 25	2-16	42	105	M16	FORM "AD/B"	1.4	O
		XCCH(F)/ERC32-105/BT40	ER 32	2-20	50	105	M22X1.5	FORM "AD/B"	1.5	O

- Coolant pressure max. 20 bar
- Please order sealing disc separately (See page 59)
- Delivery includes : Clamping nut (balanced) & adjusting screw

Spare Parts & Accessories

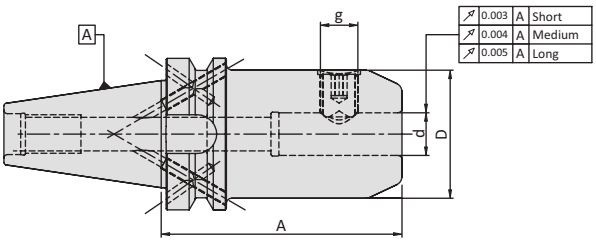

Sealing disc
Page No 59


ER - Collet
Page No 56


Clamping Nut
Page No 58


Wrench
Page No 57

End mill holder (Weldon) DIN 1835-B



Balanced for G6.3 8,000 rpm

TAPER SIZE		DESIGNATION	d (mm)	D (mm)	A (mm)	g	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
BT 30		XSLH/06-50/BT30	6	25	50	M6	FORM "AD"	0.6	O
		XSLH/08-50/BT30	8	28	50	M8	FORM “AD”	0.6	O
		XSLH/10-50/BT30	10	35	50	M10	FORM “AD”	0.8	O
		XSLH/12-50/BT30	12	42	50	M12	FORM “AD”	0.9	O
		XSLH/14-50/BT30	14	44	50	M12	FORM “AD”	0.9	O
		XSLH/16-63/BT30	16	48	63	M14	FORM “AD”	0.9	O
		XSLH/18-63/BT30	18	50	63	M14	FORM “AD”	1.0	O
		XSLH/20-63/BT30	20	52	63	M16	FORM “AD”	1.0	O
BT 40	Extra Short	XSLH/16-35/BT40*	16	48	35	M14	FORM “AD”	1.0	●
		XSLH/20-35/BT40*	20	52	35	M16	FORM “AD”	1.0	●
		XSLH/25-35/BT40*	25	45	35	M16	FORM “AD”	0.9	O
		XSLH/32-65/BT40*	32	63	65	M20	FORM “AD”	1.5	O
	Short	XSLH/06-50/BT40	6	25	50	M6	FORM “AD/B”	1.0	●
		XSLH/08-50/BT40	8	28	50	M8	FORM “AD/B”	1.0	●
		XSLH/10-63/BT40	10	35	63	M10	FORM “AD/B”	1.1	●
		XSLH/12-63/BT40	12	42	63	M12	FORM “AD/B”	1.2	●
		XSLH/14-63/BT40	14	44	63	M12	FORM “AD/B”	1.2	O
		XSLH/16-63/BT40	16	48	63	M14	FORM “AD/B”	1.2	●
		XSLH/18-63/BT40	18	50	63	M14	FORM “AD/B”	1.4	O
		XSLH/20-63/BT40	20	52	63	M16	FORM “AD/B”	1.5	●
		XSLH/25-90/BT40	25	65	90	M18	FORM “AD/B”	2.0	●
		XSLH/32-100/BT40	32	72	100	M20	FORM “AD/B”	2.5	●
		XSLH/40-120/BT40	40	80	120	M20	FORM “AD/B”	3.0	●
	Medium	XSLH/06-100/BT40	6	25	100	M6	FORM “AD/B”	1.2	O
		XSLH/08-100/BT40	8	28	100	M8	FORM “AD/B”	1.2	O
		XSLH/10-100/BT40	10	35	100	M10	FORM “AD/B”	1.4	O
		XSLH/12-100/BT40	12	42	100	M12	FORM “AD/B”	1.6	O
		XSLH/14-100/BT40	14	44	100	M12	FORM “AD/B”	1.7	O
		XSLH/16-100/BT40	16	48	100	M14	FORM “AD/B”	1.7	O
		XSLH/18-100/BT40	18	50	100	M14	FORM “AD/B”	2.0	O
		XSLH/20-100/BT40	20	52	100	M16	FORM “AD/B”	2.0	O
		XSLH/06-160/BT40	6	25	160	M6	FORM “AD/B”	1.6	O
	Long	XSLH/08-160/BT40	8	28	160	M8	FORM “AD/B”	1.7	O
		XSLH/10-160/BT40	10	35	160	M10	FORM “AD/B”	2.0	O
		XSLH/12-160/BT40	12	42	160	M12	FORM “AD/B”	2.2	O
		XSLH/14-160/BT40	14	44	160	M12	FORM “AD/B”	2.3	O
		XSLH/16-160/BT40	16	48	160	M14	FORM “AD/B”	2.6	O
		XSLH/18-160/BT40	18	50	160	M14	FORM “AD/B”	2.8	O
		XSLH/20-160/BT40	20	52	160	M16	FORM “AD/B”	2.9	O
		XSLH/25-160/BT40	25	65	160	M18	FORM “AD/B”	3.8	O

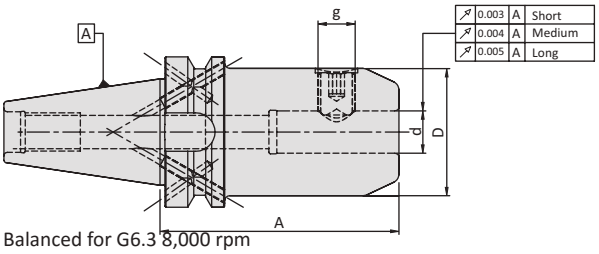
- Bore tolerance H4
- * Extra short holders :
  - Locking screws are located in the same plane as drive slots.
  - Gives maximum rigidity due to short projection.
- Delivery includes : Locking screw

Spare Parts & Accessories


Pull Stud


Locking Screw

End mill holder (Weldon) DIN 1835-B

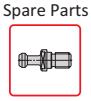


Balanced for G6.3 8,000 rpm

TAPER SIZE		DESIGNATION	d (mm)	D (mm)	A (mm)	g	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
BT 50	Short	XSLH/06-63/BT50	6	25	63	M6	FORM "AD/B"	3.5	O
		XSLH/08-63/BT50	8	28	63	M8	FORM "AD/B"	3.6	O
		XSLH/10-63/BT50	10	35	63	M10	FORM "AD/B"	3.7	O
		XSLH/12-80/BT50	12	42	80	M12	FORM "AD/B"	3.9	O
		XSLH/14-80/BT50	14	44	80	M12	FORM "AD/B"	3.9	O
		XSLH/16-80/BT50	16	48	80	M14	FORM "AD/B"	3.9	●
		XSLH/18-80/BT50	18	50	80	M14	FORM "AD/B"	4.0	O
		XSLH/20-80/BT50	20	52	80	M16	FORM "AD/B"	4.0	●
		XSLH/25-100/BT50	25	65	100	M18	FORM "AD/B"	4.7	●
		XSLH/32-105/BT50	32	72	105	M20	FORM "AD/B"	5.1	●
		XSLH/40-110/BT50	40	80	110	M20	FORM "AD/B"	6.5	O
	Medium	XSLH/06-100/BT50	6	25	100	M6	FORM "AD/B"	3.7	O
		XSLH/08-100/BT50	8	28	100	M8	FORM "AD/B"	3.7	O
		XSLH/10-100/BT50	10	35	100	M10	FORM "AD/B"	3.9	O
		XSLH/12-100/BT50	12	42	100	M12	FORM "AD/B"	4.1	O
		XSLH/14-100/BT50	14	44	100	M12	FORM "AD/B"	4.2	O
		XSLH/16-100/BT50	16	48	100	M14	FORM "AD/B"	4.2	O
		XSLH/18-100/BT50	18	50	100	M14	FORM "AD/B"	4.3	O
		XSLH/20-100/BT50	20	52	100	M16	FORM "AD/B"	4.3	O
	Long	XSLH/06-160/BT50	6	25	160	M6	FORM "AD/B"	4.0	O
		XSLH/08-160/BT50	8	28	160	M8	FORM "AD/B"	4.1	O
		XSLH/10-160/BT50	10	35	160	M10	FORM "AD/B"	4.5	O
		XSLH/12-160/BT50	12	42	160	M12	FORM "AD/B"	4.6	O
		XSLH/14-160/BT50	14	44	160	M12	FORM "AD/B"	4.8	O
		XSLH/16-160/BT50	16	48	160	M14	FORM "AD/B"	5.0	O
		XSLH/18-160/BT50	18	50	160	M14	FORM "AD/B"	5.1	O
		XSLH/20-160/BT50	20	52	160	M16	FORM "AD/B"	5.2	O
		XSLH/25-160/BT50	25	65	160	M18	FORM "AD/B"	6.1	O
		XSLH/32-160/BT50	32	72	160	M20	FORM "AD/B"	6.7	O

- Bore tolerance H4
- Delivery includes : Locking screw

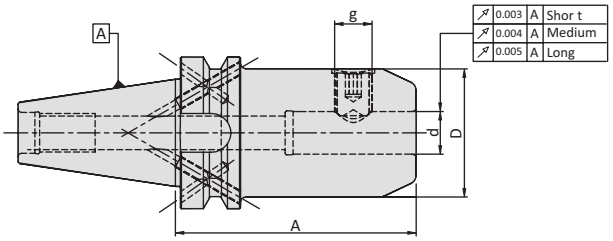
Spare Parts & Accessories



Pull Stud
Page No 60

Locking Screw
Page No 62

End mill holder (Weldon) DIN 1835-B (Fine balanced)



Balanced for G6.3 8,000 rpm

TAPER SIZE		DESIGNATION	d (mm)	D (mm)	A (mm)	g	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
BT 40	Extra Short	XSLH(F)/16-35/BT40*	16	48	35	M14	FORM "AD"	1.0	O
		XSLH(F)/20-35/BT40*	20	52	35	M16	FORM "AD"	1.0	O
		XSLH(F)/25-35/BT40*	25	45	35	M16	FORM "AD"	0.9	O
	Short	XSLH(F)/06-50/BT40	6	25	50	M6	FORM "AD/B"	1.0	O
		XSLH(F)/08-50/BT40	8	28	50	M8	FORM "AD/B"	1.0	O
		XSLH(F)/10-63/BT40	10	35	63	M10	FORM "AD/B"	1.1	O
		XSLH(F)/12-63/BT40	12	42	63	M12	FORM "AD/B"	1.2	O
		XSLH(F)/14-63/BT40	14	44	63	M12	FORM "AD/B"	1.2	O
		XSLH(F)/16-63/BT40	16	48	63	M14	FORM "AD/B"	1.2	O
		XSLH(F)/18-63/BT40	18	50	63	M14	FORM "AD/B"	1.4	O
		XSLH(F)/20-63/BT40	20	52	63	M16	FORM "AD/B"	1.5	O
		XSLH(F)/25-90/BT40	25	65	90	M18	FORM "AD/B"	2.0	O
		XSLH(F)/32-100/BT40	32	72	100	M20	FORM "AD/B"	2.5	O
	Medium	XSLH(F)/06-100/BT40	6	25	100	M6	FORM "AD/B"	1.2	O
		XSLH(F)/08-100/BT40	8	28	100	M8	FORM "AD/B"	1.2	O
		XSLH(F)/10-100/BT40	10	35	100	M10	FORM "AD/B"	1.4	O
		XSLH(F)/12-100/BT40	12	42	100	M12	FORM "AD/B"	1.6	O
		XSLH(F)/16-100/BT40	16	48	100	M14	FORM "AD/B"	1.7	O
		XSLH(F)/20-100/BT40	20	52	100	M16	FORM "AD/B"	2.0	O
	Long	XSLH(F)/06-160/BT40	6	25	160	M6	FORM "AD/B"	1.6	O
		XSLH(F)/08-160/BT40	8	28	160	M8	FORM "AD/B"	1.7	O
		XSLH(F)/10-160/BT40	10	35	160	M10	FORM "AD/B"	2.0	O
		XSLH(F)/12-160/BT40	12	42	160	M12	FORM "AD/B"	2.2	O
		XSLH(F)/14-160/BT40	14	44	160	M12	FORM "AD/B"	2.3	O
		XSLH(F)/16-160/BT40	16	48	160	M14	FORM "AD/B"	2.6	O
		XSLH(F)/18-160/BT40	18	50	160	M14	FORM "AD/B"	2.8	O
		XSLH(F)/20-160/BT40	20	52	160	M16	FORM "AD/B"	2.9	O
		XSLH(F)/25-160/BT40	25	65	160	M18	FORM "AD/B"	3.8	O

- Bore tolerance H4

* Extra short holders :
- Locking screws are located in the same plane as drive slots.
- Gives maximum rigidity due to short projection.

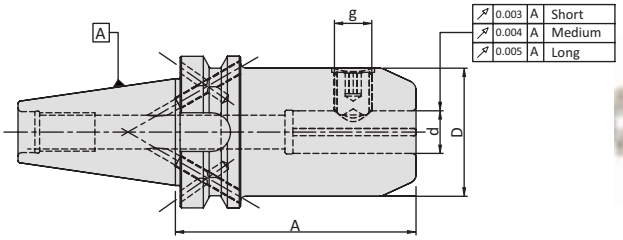
- Delivery includes : Locking screw

Spare Parts & Accessories


Pull Stud
Page No 60


Locking Screw
Page No 62

End mill holder to DIN 6359 with coolant channel for Weldon type end mills to DIN 1835-B



Balanced for G6.3 8,000 rpm

TAPER SIZE		DESIGNATION	d (mm)	D (mm)	A (mm)	g	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
BT 40	Extra Short	XSLH-K/16-35/BT40*	16	48	35	M14	FORM "AD"	1.0	O
		XSLH-K/20-35/BT40*	20	52	35	M16	FORM "AD"	1.0	O
		XSLH-K/25-35/BT40*	25	45	35	M16	FORM "AD"	0.9	O
		XSLH-K/32-65/BT40*	32	63	65	M20	FORM "AD"	1.5	O
	Short	XSLH-K/06-50/BT40	6	25	50	M6	FORM "AD/B"	1.0	O
		XSLH-K/08-50/BT40	8	28	50	M8	FORM "AD/B"	1.0	O
		XSLH-K/10-63/BT40	10	35	63	M10	FORM "AD/B"	1.1	O
		XSLH-K/12-63/BT40	12	42	63	M12	FORM "AD/B"	1.2	O
		XSLH-K/14-63/BT40	14	44	63	M12	FORM "AD/B"	1.2	O
		XSLH-K/16-63/BT40	16	48	63	M14	FORM "AD/B"	1.2	O
		XSLH-K/18-63/BT40	18	50	63	M14	FORM "AD/B"	1.1	O
		XSLH-K/20-63/BT40	20	52	63	M16	FORM "AD/B"	1.5	O
		XSLH-K/25-90/BT40	25	65	90	M18	FORM "AD/B"	2.3	O
		XSLH-K/32-100/BT40	32	72	100	M20	FORM "AD/B"	2.5	O
		XSLH-K/40-120/BT40	40	80	120	M20	FORM "AD/B"	3.0	O
BT 50		XSLH-K/06-63/BT50	6	25	63	M6	FORM "AD/B"	3.5	O
		XSLH-K/08-63/BT50	8	28	63	M8	FORM "AD/B"	3.6	O
		XSLH-K/10-63/BT50	10	35	63	M10	FORM "AD/B"	3.7	O
		XSLH-K/12-80/BT50	12	42	80	M12	FORM "AD/B"	3.9	O
		XSLH-K/14-80/BT50	14	44	80	M12	FORM "AD/B"	3.9	O
		XSLH-K/16-80/BT50	16	48	80	M14	FORM "AD/B"	3.9	O
		XSLH-K/18-80/BT50	18	50	80	M14	FORM "AD/B"	4.0	O
		XSLH-K/20-80/BT50	20	52	80	M16	FORM "AD/B"	4.0	O
		XSLH-K/25-100/BT50	25	65	100	M18	FORM "AD/B"	4.7	O
		XSLH-K/32-105/BT50	32	72	105	M20	FORM "AD/B"	5.1	O
		XSLH-K/40-110/BT50	40	80	110	M20	FORM "AD/B"	6.5	O
	Fine Balanced Holders				Balanced for G2.5 15,000 rpm				
BT 40		XSLH-K(F)/06-50/BT40	6	25	50	M6	FORM "AD/B"	1.0	O
		XSLH-K(F)/08-50/BT40	8	28	50	M8	FORM "AD/B"	1.0	O
		XSLH-K(F)/10-63/BT40	10	35	63	M10	FORM "AD/B"	1.1	O
		XSLH-K(F)/12-63/BT40	12	42	63	M12	FORM "AD/B"	1.2	O
		XSLH-K(F)/14-63/BT40	14	44	63	M12	FORM "AD/B"	1.2	O
		XSLH-K(F)/16-63/BT40	16	48	63	M14	FORM "AD/B"	1.2	O
		XSLH-K(F)/18-63/BT40	18	50	63	M14	FORM "AD/B"	1.1	O
		XSLH-K(F)/20-63/BT40	20	52	63	M16	FORM "AD/B"	1.5	O
		XSLH-K(F)/25-90/BT40	25	65	90	M18	FORM "AD/B"	2.3	O

- Bore tolerance H4
- with two coolant channels along the side of the bore.

* Extra short holders :
- Locking screws are located in the same plane as drive slots.
- Gives maximum rigidity due to short projection.

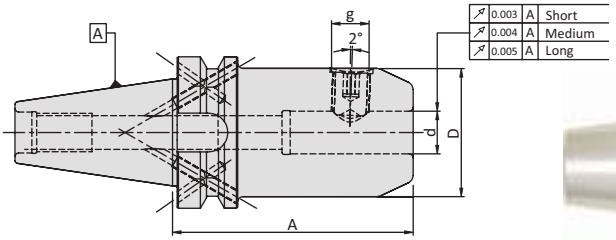
- Delivery includes : Locking screw

Spare Parts & Accessories


Pull Stud
Page No 60


Locking Screw
Page No 62

End mill holder to DIN 6359 for Whistle Notch for end mills to DIN 1835-E



Balanced for G6.3 8,000 rpm

TAPER SIZE	DESIGNATION	d (mm)	D (mm)	A (mm)	G	g	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
BT 40	XSLH-E/06-50/BT40	6	25	50	M5	M6	FORM "AD/B"	1.0	O
	XSLH-E/08-50/BT40	8	28	50	M6	M8	FORM "AD/B"	1.0	O
	XSLH-E/10-63/BT40	10	35	63	M8	M10	FORM "AD/B"	1.1	O
	XSLH-E/12-63/BT40	12	42	63	M10	M12	FORM "AD/B"	1.2	O
	XSLH-E/14-63/BT40	14	44	63	M10	M12	FORM "AD/B"	1.2	O
	XSLH-E/16-63/BT40	16	48	63	M12	M14	FORM "AD/B"	1.2	O
	XSLH-E/18-63/BT40	18	50	63	M12	M14	FORM "AD/B"	1.4	O
	XSLH-E/20-63/BT40	20	52	63	M16	M16	FORM "AD/B"	1.5	O
	XSLH-E/25-90/BT40	25	65	90	M20	M18	FORM "AD/B"	2.3	O
	XSLH-E/32-100/BT40	32	72	100	M20	M20	FORM "AD/B"	2.5	O
	XSLH-E/40-120/BT40	40	80	120	M20	M20	FORM "AD/B"	3.0	O
BT 50	XSLH-E/06-63/BT50	6	25	63	M5	M6	FORM "AD/B"	3.5	O
	XSLH-E/08-63/BT50	8	28	63	M6	M8	FORM "AD/B"	3.6	O
	XSLH-E/10-63/BT50	10	35	63	M8	M10	FORM "AD/B"	3.7	O
	XSLH-E/12-80/BT50	12	42	80	M10	M12	FORM "AD/B"	3.9	O
	XSLH-E/14-80/BT50	14	44	80	M10	M12	FORM "AD/B"	3.9	O
	XSLH-E/16-80/BT50	16	48	80	M12	M14	FORM "AD/B"	3.9	O
	XSLH-E/18-80/BT50	18	50	80	M12	M14	FORM "AD/B"	4.0	O
	XSLH-E/20-80/BT50	20	52	80	M16	M16	FORM "AD/B"	4.0	O
	XSLH-E/25-100/BT50	25	65	100	M20	M18	FORM "AD/B"	4.7	O
	XSLH-E/32-105/BT50	32	72	105	M20	M20	FORM "AD/B"	5.1	O
	XSLH-E/40-115/BT50	40	80	115	M20	M20	FORM "AD/B"	6.5	O
	Fine Balanced Holders		Balanced for G2.5 15,000 rpm						
BT 40	XSLH-E(F)/06-50/BT40	6	25	50	M5	M6	FORM "AD/B"	1.0	O
	XSLH-E(F)/08-50/BT40	8	28	50	M6	M8	FORM "AD/B"	1.0	O
	XSLH-E(F)/10-63/BT40	10	35	63	M8	M10	FORM "AD/B"	1.1	O
	XSLH-E(F)/12-63/BT40	12	42	63	M10	M12	FORM "AD/B"	1.2	O
	XSLH-E(F)/14-63/BT40	14	44	63	M10	M12	FORM "AD/B"	1.2	O
	XSLH-E(F)/16-63/BT40	16	48	63	M12	M14	FORM "AD/B"	1.2	O
	XSLH-E(F)/18-63/BT40	18	50	63	M12	M14	FORM "AD/B"	1.4	O
	XSLH-E(F)/20-63/BT40	20	52	63	M16	M16	FORM "AD/B"	1.5	O

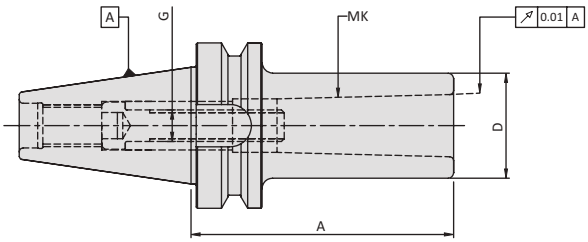
- Bore tolerance H4
- Groove on face for easy identification (to distinguish from Weldon)
- Delivery includes : Locking screw & adjusting screw

Spare Parts & Accessories


Pull Stud
Page No 60


Locking Screw
Page No 62

Morse taper with Thread DIN 6364 / 228A



Balanced for G6.3 8,000 rpm

TAPER SIZE	DESIGNATION	MK	D (mm)	A (mm)	G	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
BT40	XMTB/MT1-50/BT40	MT1	25	50	M6	FORM "AD"	1.1	O
	XMTB/MT2-50/BT40	MT2	32	50	M10	FORM "AD"	1.1	O
	XMTB/MT3-70/BT40	MT3	40	70	M12	FORM "AD"	1.3	O
	XMTB/MT4-95/BT40	MT4	48	95	M16	FORM "AD"	1.5	O
BT 50	XMTB/MT1-45/BT50	MT1	25	45	M6	FORM "AD"	3.8	O
	XMTB/MT2-60/BT50	MT2	32	60	M10	FORM "AD"	3.6	O
	XMTB/MT3-65/BT50	MT3	40	65	M12	FORM "AD"	3.6	O
	XMTB/MT4-85/BT50	MT4	48	85	M16	FORM "AD"	3.7	O
	XMTB/MT5-118/BT50	MT5	63	118	M20	FORM "AD"	3.8	O

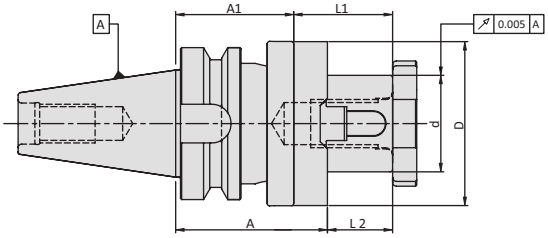
• Delivery includes : built-in draw screw

Spare Parts & Accessories

Socket head Screw
Page No 65

Pull Stud
Page No 60

Combi shell mill holder to DIN 6358



Balanced for G6.3 8,000 rpm

TAPER SIZE		DESIGNATION	d (mm)	D (mm)	A (mm)	A1 (mm)	L1 (mm)	L2 (mm)	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
BT 30		XFSH/16-45/BT30	16	32	45	35	27	17	FORM "A"	0.7	O
		XFSH/22-47/BT30	22	40	47	35	31	19	FORM "A"	0.8	O
		XFSH/27-49/BT30	27	46	49	37	33	21	FORM "A"	1.0	O
		XFSH/16-80/BT30	16	32	80	70	27	17	FORM "A"	0.9	O
		XFSH/22-80/BT30	22	40	80	68	31	19	FORM "A"	1.1	O
		XFSH/27-90/BT30	27	48	90	78	33	21	FORM "A"	1.3	O
BT 40	Short	XFSH/16-55/BT40	16	32	55	45	27	17	FORM "A"	1.1	O
		XFSH/22-55/BT40	22	40	55	43	31	19	FORM "A"	1.3	O
		XFSH/27-55/BT40	27	48	55	43	33	21	FORM "A"	1.5	O
		XFSH/32-60/BT40	32	58	60	46	38	24	FORM "A"	1.8	O
		XFSH/40-60/BT40	40	70	60	46	41	27	FORM "A"	2.1	O
	Medium	XFSH/16-100/BT40	16	32	100	90	27	17	FORM "A"	1.4	O
		XFSH/22-100/BT40	22	40	100	88	31	19	FORM "A"	1.8	O
		XFSH/27-100/BT40	27	48	100	88	33	21	FORM "A"	2.2	O
		XFSH/32-100/BT40	32	58	100	86	38	24	FORM "A"	2.6	O
		XFSH/40-100/BT40	40	70	100	86	41	27	FORM "A"	2.8	O
BT 50		XFSH/16-70/BT50	16	32	70	60	27	17	FORM "A"	3.8	O
		XFSH/22-70/BT50	22	40	70	58	31	19	FORM "A"	4.1	O
		XFSH/27-70/BT50	27	48	70	58	33	21	FORM "A"	4.2	O
		XFSH/32-70/BT50	32	58	70	56	38	24	FORM "A"	4.5	O
		XFSH/40-70/BT50	40	70	70	56	41	27	FORM “A”	5	O

• Delivery includes : Parallel key, drive ring and clamping screw

Spare Parts & Accessories

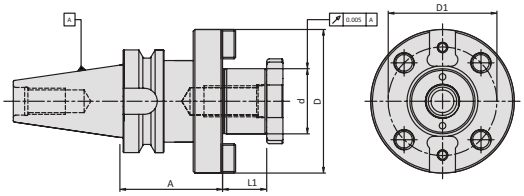

Clamping Screw
Page No 62


Drive ring
Page No 63


Spanner
Page No 63


Pull Stud
Page No 60

Shell mill holder to DIN 6357 for cutters with drive key



Balanced for G6.3 8,000 rpm

TAPER SIZE		DESIGNATION	d (mm)	D (mm)	A (mm)	L1 (mm)	D1	COOLANT SUPPLY	N/W (KG)	AVAILABILITY
BT30		XSMH/16-40/BT30	16	38	40	17		FORM "A"	0.7	O
		XSMH/22-40/BT30	22	48	40	19		FORM "A"	0.9	O
		XSMH/27-40/BT30	27	58	40	21		FORM "A"	1.0	O
		XSMH/32-50/BT30	32	78	50	24		FORM "A"	1.8	O
BT 40	Short	XSMH/16-40/BT40	16	38	40	17		FORM "AD/B"	1.1	O
		XSMH/22-40/BT40	22	48	40	19		FORM "AD/B"	1.1	●
		XSMH/27-40/BT40	27	58	40	21		FORM "AD/B"	1.2	●
		XSMH/32-50/BT40	32	78	50	24		FORM "AD/B"	1.4	●
		XSMH/40-50/BT40✢	40	88	50	27	66.7	FORM "AD/B"	1.7	●
	Medium	XSMH/16-100/BT40	16	38	100	17		FORM "AD/B"	1.7	●
		XSMH/22-100/BT40	22	48	100	19		FORM "AD/B"	2.2	●
		XSMH/27-100/BT40	27	58	100	21		FORM "AD/B"	2.6	●
		XSMH/32-100/BT40	32	78	100	24		FORM "AD/B"	3.7	●
		XSMH/40-100/BT40✢	40	88	100	27	66.7	FORM "AD/B"	4.3	O
	Long	XSMH/16-160/BT40	16	38	160	17		FORM "AD/B"	2.2	O
		XSMH/22-160/BT40	22	48	160	19		FORM "AD/B"	3.0	●
		XSMH/27-160/BT40	27	58	160	21		FORM "AD/B"	3.8	O
		XSMH/32-160/BT40	32	78	160	24		FORM "AD/B"	4.6	O
		XSMH/40-160/BT40✢	40	88	160	27	66.7	FORM "AD/B"	6.9	O
BT 50	Short	XSMH/16-63/BT50	16	38	63	17		FORM "AD/B"	3.6	O
		XSMH/22-63/BT50	22	48	63	19		FORM "AD/B"	3.5	O
		XSMH/27-63/BT50	27	58	63	21		FORM "AD/B"	3.7	O
		XSMH/32-60/BT50	32	78	60	24		FORM "AD/B"	3.6	O
		XSMH/40-60/BT50✢	40	88	60	27	66.7	FORM "AD/B"	3.7	O
		XSMH/60-80/BT50✢	60	129	80	40	101.6	FORM "A"	8.5	O
	Medium	XSMH/16-100/BT50	16	38	100	17		FORM "AD/B"	4.0	O
		XSMH/22-100/BT50	22	48	100	19		FORM "AD/B"	4.3	●
		XSMH/27-100/BT50	27	58	100	21		FORM "AD/B"	4.7	●
		XSMH/32-100/BT50	32	78	100	24		FORM "AD/B"	5.8	●
		XSMH/40-100/BT50	40	88	100	27	66.7	FORM "AD/B"	6.4	O
	Long	XSMH/16-160/BT50 ✢	16	38	160	17		FORM "AD/B"	4.0	●
		XSMH/22-160/BT50	22	48	160	19		FORM "AD/B"	4.3	●
		XSMH/27-160/BT50	27	58	160	21		FORM "AD/B"	6.0	●
		XSMH/32-160/BT50	32	78	160	24		FORM "AD/B"	8.0	●
		XSMH/40-160/BT50✢	40	88	160	27	66.7	FORM "AD/B"	9.0	●

- Coolant bore on the pilot face (holder with Form"AD/B") as standard for all holders

✢D = Ø 40, D = Ø 60 With additional 4 screw holes to DIN 2079

- Delivery includes : Drive keys and clamping screw

Spare Parts & Accessories

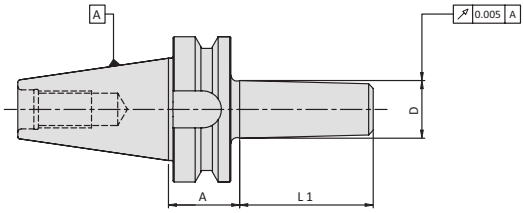

Spanner
Page No 63


Clamping Screw
Page No 62


Drive Key
Page No 64


Pull Stud
Page No 60

Drill chuck adaptor to DIN 238



Balanced for G6.3 8,000 rpm

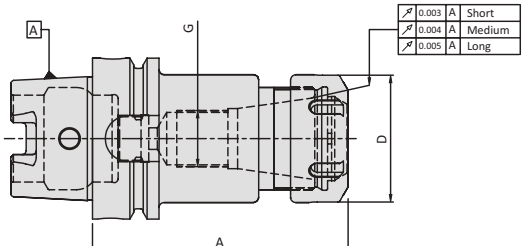
TAPER SIZE	DESIGNATION	D (mm)	A (mm)	L1 (mm)	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
BT 30	XDCA/B12-25/BT30	B12	25	18.5	FORM "A"	0.5	O
	XDCA/B16-25/BT30	B16	25	24	FORM "A"	0.6	O
BT 40	XDCA/B12-32/BT40	B12	32	18.5	FORM "A"	1.0	O
	XDCA/B16-32/BT40	B16	32	24	FORM "A"	1.2	O
	XDCA/B18-32/BT40	B18	32	32	FORM "A"	1.2	O
BT 50	XDCA/B16-45/BT50	B16	45	24	FORM "A"	2.3	O
	XDCA/B18-45/BT50	B18	45	32	FORM “A”	2.4	O

Spare Parts & Accessories

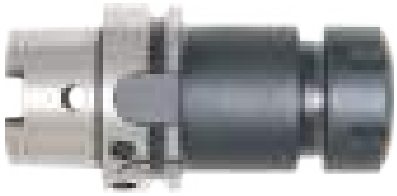
Pull Stud
Page No 60

DIN 69893 (HSK) Tool Holders

Collet chuck Type ER for collets to DIN 6499



Fine Balanced Holders



Balanced for G2.5 15,000 rpm

TAPER SIZE		DESIGNATION	COLLET TYPE	RANGE	D (mm)	A (mm)	G	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
HSK-A32		XCCH/ER16M-65/HSK-A32	ER16M	1-10	22	65	M10	FORM "AD"	0.3	*
		XCCH/ER20M-70/HSK-A32	ER20M	1-13	28	70	M12	FORM "AD"	0.4	*
		XCCH/ER25M-70/HSK-A32	ER25M	2-16	35	70	M10	FORM "AD"	0.4	*
HSK-A40	Short	XCCH/ER16M-70/HSK-A40	ER16M	1-10	22	70	M10	FORM "AD"	0.4	●
		XCCH/ER20-80/HSK-A40	ER20	1-13	34	80	M12	FORM "AD"	0.5	O
		XCCH/ER25-80/HSK-A40	ER25	2-16	42	80	M16	FORM "AD"	0.5	●
		XCCH/ER32-100/HSK-A40	ER32	2-20	50	100	M22X1.5	FORM "AD"	0.7	O
	Medium	XCCH/ER16M-120/HSK-A40	ER16M	1-10	22	120	M10	FORM "AD"	0.6	O
		XCCH/ER20M-120/HSK-A40	ER20M	1-13	28	120	M12	FORM "AD"	0.5	O
		XCCH/ER25M-120/HSK-A40	ER25M	2-16	35	120	M16	FORM "AD"	0.75	O
HSK-A50		XCCH/ER16M-80/HSK-A50	ER16M	1-10	22	80	M10	FORM "AD"	0.9	O
		XCCH/ER20-95/HSK-A50	ER20	1-13	34	95	M12	FORM "AD"	1.00	O
		XCCH/ER25-95/HSK-A50	ER25	2-16	42	95	M16	FORM "AD"	1.05	O
		XCCH/ER32-100/HSK-A50	ER32	2-20	50	100	M22X1.5	FORM "AD"	0.85	●
HSK-A63		XCCH/ER16M-100/HSK-A63	ER16M	1-10	22	100	M10	FORM "AD"	1.3	O
		XCCH/ER20-100/HSK-A63	ER20	1-13	34	100	M12	FORM "AD"	1.3	O
		XCCH/ER25-100/HSK-A63	ER25	2-16	42	100	M16	FORM "AD"	1.7	O
		XCCH/ER32-100/HSK-A63	ER32	2-20	50	100	M22X1.5	FORM "AD"	2.3	O
		XCCH/ER40-120/HSK-A63	ER40	3-26	63	120	M22X1.5	FORM "AD"	2.7	O
Balanced for G6.3 15,000 rpm										
HSK-A63	Long	XCCH/ER16M-160/HSK-A63	ER16M	1-10	22	160	M10	FORM "AD"	1.2	O
		XCCH/ER20M-160/HSK-A63	ER20M	1-13	28	160	M12	FORM "AD"	1.2	O
		XCCH/ER25M-160/HSK-A63	ER25M	2-16	35	160	M16	FORM "AD"	1.7	O
		XCCH/ER32-160/HSK-A63	ER32	2-20	50	160	M22X1.5	FORM "AD"	2.3	O
		XCCH/ER40-160/HSK-A63	ER40	3-26	63	160	M22X1.5	FORM "AD"	2.8	O
HSK-A100		XCCH/ER20-100/HSK-A100	ER20	1-13	34	100	M12	FORM "AD"	2.5	O
		XCCH/ER25-100/HSK-A100	ER25	2-16	42	100	M16	FORM "AD"	2.7	O
		XCCH/ER32-100/HSK-A100	ER32	2-20	50	100	M22X1.5	FORM "AD"	2.9	O
		XCCH/ER40-120/HSK-A100	ER40	3-26	63	120	M22X1.5	FORM "AD"	2.3	O
Balanced for G6.3 15,000 rpm										
HSK-A100	Long	XCCH/ER20-160/HSK-A100	ER20	1-13	34	160	M12	FORM "AD"	2.5	O
		XCCH/ER25-160/HSK-A100	ER25	2-16	42	160	M16	FORM "AD"	3.2	O
		XCCH/ER32-160/HSK-A100	ER32	2-20	50	160	M22X1.5	FORM "AD"	3.5	O
		XCCH/ER40-160/HSK-A100	ER40	3-26	63	160	M22X1.5	FORM "AD"	3.8	O

- Please order coolant tube separately (See page 67)
- Delivery includes : Clamping nut (balanced) & adjusting screw

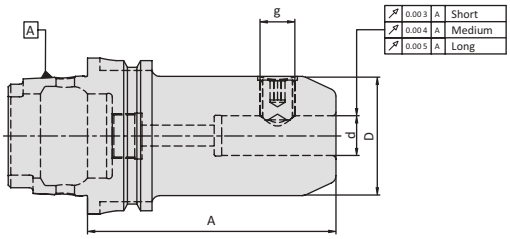
Spare Parts & Accessories


ER - Collet
Page No 56


Clamping Nut
Page No 58


Wrench
Page No 57

End mill holder (Weldon) DIN 1835-B



Fine Balanced Holders

Balanced for G2.5 15,000 rpm

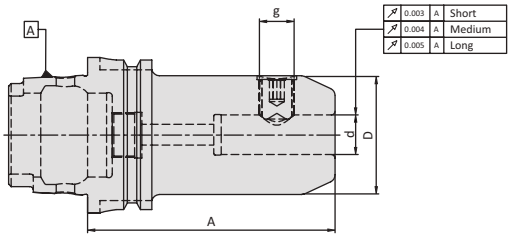
TAPER SIZE		DESIGNATION	d (mm)	D (mm)	A (mm)	g	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
HSK-A32		XSLH/06-60/HSK-A32	06	25	60	M6	FORM "AD"	0.3	*
		XSLH/08-60/HSK-A32	08	28	60	M8	FORM “AD”	0.3	*
		XSLH/10-65/HSK-A32	10	35	65	M10	FORM "AD"	0.4	*
		XSLH/12-75/HSK-A32	12	42	75	M12	FORM “AD”	0.6	*
HSK-A40		XSLH/16-75/HSK-A32	16	48	75	M14	FORM "AD"	0.7	O
		XSLH/06-60/HSK-A40	06	25	60	M6	FORM “AD”	0.4	O
		XSLH/08-60/HSK-A40	08	28	60	M8	FORM "AD"	0.4	O
		XSLH/10-65/HSK-A40	10	34	65	M10	FORM “AD”	0.5	O
		XSLH/12-70/HSK-A40	12	42	70	M12	FORM "AD"	0.6	O
		XSLH/16-80/HSK-A40	16	48	80	M14	FORM “AD”	0.8	O
		XSLH/20-80/HSK-A40	20	52	80	M16	FORM "AD"	0.8	O
HSK-A50		XSLH/06-65/HSK-A50	06	25	65	M6	FORM “AD”	0.6	O
		XSLH/08-65/HSK-A50	08	28	65	M8	FORM "AD"	0.6	O
		XSLH/10-65/HSK-A50	10	35	65	M10	FORM “AD”	0.7	O
		XSLH/12-80/HSK-A50	12	42	80	M12	FORM "AD"	0.7	O
		XSLH/16-80/HSK-A50	16	48	80	M14	FORM “AD”	0.7	O
		XSLH/20-80/HSK-A50	20	52	80	M16	FORM "AD"	0.1	O
		XSLH/25-105/HSK-A50	25	65	105	M18	FORM “AD”	1.2	O
		XSLH/32-120/HSK-A50	32	72	120	M20	FORM "AD"	1.3	O
HSK-A63	Short	XSLH/06-65/HSK-A63	06	25	65	M6	FORM “AD”	1.0	O
		XSLH/08-65/HSK-A63	08	28	65	M8	FORM "AD"	1.0	O
		XSLH/10-65/HSK-A63	10	35	65	M10	FORM “AD”	1.0	O
		XSLH/12-80/HSK-A63	12	42	80	M12	FORM "AD"	1.4	O
		XSLH/14-80/HSK-A63	14	44	80	M12	FORM “AD”	1.4	O
		XSLH/16-80/HSK-A63	16	48	80	M14	FORM "AD"	1.4	O
		XSLH/18-80/HSK-A63	18	50	80	M14	FORM “AD”	1.7	O
		XSLH/20-80/HSK-A63	20	52	80	M16	FORM "AD"	1.7	O
	Medium	XSLH/06-100/HSK-A63	06	25	100	M6	FORM “AD”	1.18	O
		XSLH/08-100/HSK-A63	08	28	100	M8	FORM "AD"	1.18	O
		XSLH/10-100/HSK-A63	10	35	100	M10	FORM “AD”	1.18	O
		XSLH/12-100/HSK-A63	12	42	100	M12	FORM "AD"	1.5	O
		XSLH/16-100/HSK-A63	16	48	100	M14	FORM “AD”	1.7	O
		XSLH/25-110/HSK-A63	25	65	110	M18	FORM “AD”	2.5	O
		XSLH/32-110/HSK-A63	32	72	110	M20	FORM "AD"	2.5	O
		XSLH/40-125/HSK-A63	40	80	160	M20	FORM “AD”	3.2	O
Balanced for G6.3 15,000 rpm									
HSK-A63	Long	XSLH/06-160/HSK-A63	06	25	160	M6	FORM “AD”	1.4	O
		XSLH/08-160/HSK-A63	08	28	160	M8	FORM "AD"	1.5	O
		XSLH/10-160/HSK-A63	10	35	160	M10	FORM “AD”	1.8	O
		XSLH/12-160/HSK-A63	12	42	160	M12	FORM “AD”	1.8	O
		XSLH/16-160/HSK-A63	16	48	160	M14	FORM "AD"	1.8	O
		XSLH/20-160/HSK-A63	20	52	160	M16	FORM “AD”	1.67	O

- Bore tolerance H4
- Please order coolant tube separately (See page 67)
- Delivery includes : Locking screw

Spare Parts & Accessories

Locking Screw
Page No 62

End mill holder (Weldon) DIN 1835-B



Balanced for G6.3 15,000 rpm

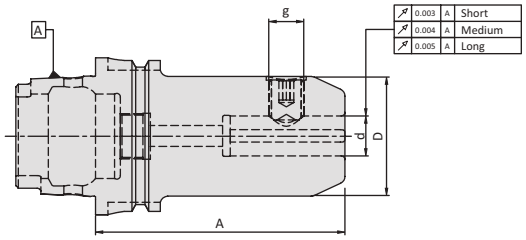
TAPER SIZE		DESIGNATION	d (mm)	D (mm)	A (mm)	g	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
HSK-A100		XSLH/06-80/HSK-A100	06	25	80	M6	FORM "AD"	2.5	*
		XSLH/08-80/HSK-A100	08	28	80	M8	FORM "AD"	2.4	*
		XSLH/10-80/HSK-A100	10	35	80	M10	FORM "AD"	2.5	*
		XSLH/12-80/HSK-A100	12	42	80	M12	FORM "AD"	2.7	*
		XSLH/14-80/HSK-A100	14	44	80	M12	FORM "AD"	2.7	*
		XSLH/16-100/HSK-A100	16	48	100	M14	FORM "AD"	2.8	*
		XSLH/18-100/HSK-A100	18	50	100	M14	FORM "AD"	2.9	*
		XSLH/20-100/HSK-A100	20	52	100	M16	FORM "AD"	3.2	●
		XSLH/25-100/HSK-A100	25	65	100	M18	FORM "AD"	3.7	●
		XSLH/32-100/HSK-A100	32	72	100	M20	FORM "AD"	4.0	●
		XSLH/40-105/HSK-A100	40	80	105	M20	FORM "AD"	4.7	*
Balanced for G6.3 10,000 rpm									
HSK-A100	Long	XSLH/06-160/HSK-A100	06	25	160	M6	FORM "AD"	2.7	*
		XSLH/08-160/HSK-A100	08	28	160	M8	FORM "AD"	2.9	*
		XSLH/10-160/HSK-A100	10	35	160	M10	FORM "AD"	3.1	*
		XSLH/12-160/HSK-A100	12	42	160	M12	FORM "AD"	3.6	*
		XSLH/16-160/HSK-A100	16	48	160	M14	FORM "AD"	3.9	*
		XSLH/20-160/HSK-A100	20	52	160	M16	FORM "AD"	4.4	*
		XSLH/25-160/HSK-A100	25	65	160	M18	FORM "AD"	5.3	*

- Bore tolerance H4
- Please order coolant tube separately (See page 67)
- Delivery includes : Locking screw

Spare Parts & Accessories

Locking Screw
Page No 62

End mill holder to DIN 6359 with coolant channel for Weldon type end mills to DIN 1835-B



Fine Balanced Holders

Balanced for G2.5 15,000 rpm

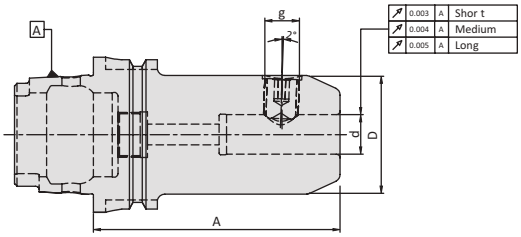
TAPER SIZE	DESIGNATION	d (mm)	D (mm)	A (mm)	g	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
HSK-A63	XSLH-K/06-65/HSK-A63	06	25	65	M6	FORM "AD"	1.2	*
	XSLH-K/08-65/HSK-A63	08	28	65	M8	FORM “AD”	1.2	*
	XSLH-K/10-65/HSK-A63	10	35	65	M10	FORM "AD"	1.2	*
	XSLH-K/12-80/HSK-A63	12	42	80	M12	FORM “AD”	1.4	*
	XSLH-K/14-80/HSK-A63	14	44	80	M12	FORM "AD"	1.4	*
	XSLH-K/16-80/HSK-A63	16	48	80	M14	FORM “AD”	1.4	*
	XSLH-K/18-80/HSK-A63	18	50	80	M14	FORM "AD"	1.4	*
	XSLH-K/20-80/HSK-A63	20	52	80	M16	FORM “AD”	1.4	*
	XSLH-K/25-110/HSK-A63	25	65	110	M18	FORM "AD"	2.5	*
	XSLH-K/32-110/HSK-A63	32	72	110	M20	FORM “AD”	2.7	*
	XSLH-K/40-125/HSK-A63	40	80	125	M20	FORM "AD"	3.1	*
Balanced for G6.3 15,000 rpm								
HSK-A100	XSLH-K/06-80/HSK-A100	06	25	80	M6	FORM "AD"	2.2	*
	XSLH-K/08-80/HSK-A100	08	28	80	M8	FORM “AD”	2.2	*
	XSLH-K/10-80/HSK-A100	10	35	80	M10	FORM "AD"	2.3	*
	XSLH-K/12-80/HSK-A100	12	42	80	M12	FORM “AD”	2.4	*
	XSLH-K/14-80/HSK-A100	14	44	80	M12	FORM "AD"	2.5	*
	XSLH-K/16-100/HSK-A100	16	48	100	M14	FORM “AD”	2.8	*
	XSLH-K/18-100/HSK-A100	18	50	100	M14	FORM "AD"	2.9	*
	XSLH-K/20-100/HSK-A100	20	52	100	M16	FORM “AD”	3.1	*
	XSLH-K/25-100/HSK-A100	25	65	100	M18	FORM "AD"	3.5	*
	XSLH-K/32-100/HSK-A100	32	72	100	M20	FORM “AD”	3.8	*
	XSLH-K/40-105/HSK-A100	40	80	105	M20	FORM "AD"	4.7	*

- Bore tolerance H4
- Please order coolant tube separately (See page 67)
- with two coolant channels along the side of the bore.
- Delivery includes : Locking screw

Spare Parts & Accessories

Locking Screw
Page No 62

End mill holder to DIN 6359 for Whistle Notch for end mills to DIN 1835-E



Fine Balanced Holders

Balanced for G2.5 15,000 rpm

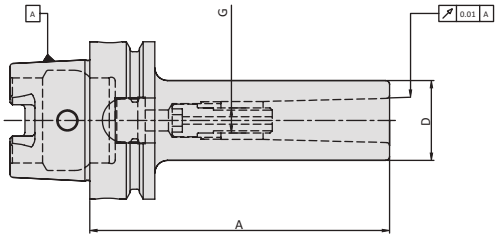
TAPER SIZE	DESIGNATION	d (mm)	D (mm)	A (mm)	g	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
HSK-A63	XSLH-E/06-80/HSK-A63	06	25	80	M6	FORM "AD"	0.9	*
	XSLH-E/08-80/HSK-A63	08	28	80	M8	FORM "AD"	1.0	*
	XSLH-E/10-80/HSK-A63	10	35	80	M10	FORM "AD"	1.1	*
	XSLH-E/12-90/HSK-A63	12	42	90	M12	FORM "AD"	1.4	●
	XSLH-E/14-90/HSK-A63	14	44	90	M12	FORM "AD"	1.4	*
	XSLH-E/16-100/HSK-A63	16	48	100	M14	FORM "AD"	1.6	*
	XSLH-E/18-100/HSK-A63	18	50	100	M14	FORM "AD"	1.7	*
	XSLH-E/20-100/HSK-A63	20	52	100	M16	FORM "AD"	1.8	●
	XSLH-E/25-110/HSK-A63	25	65	110	M18	FORM "AD"	2.4	●
	XSLH-E/32-110/HSK-A63	32	72	110	M20	FORM "AD"	2.7	*
Balanced for G6.3 15,000 rpm								
HSK-A100	XSLH-E/06-90/HSK-A100	06	25	90	M6	FORM "AD"	2.3	*
	XSLH-E/08-90/HSK-A100	08	28	90	M8	FORM "AD"	2.3	*
	XSLH-E/10-90/HSK-A100	10	35	90	M10	FORM "AD"	2.5	*
	XSLH-E/12-100/HSK-A100	12	42	100	M12	FORM "AD"	2.7	*
	XSLH-E/14-100/HSK-A100	14	44	100	M12	FORM "AD"	2.7	*
	XSLH-E/16-100/HSK-A100	16	48	100	M14	FORM "AD"	2.8	*
	XSLH-E/18-100/HSK-A100	18	50	100	M14	FORM "AD"	3.0	*
	XSLH-E/20-110/HSK-A100	20	52	110	M16	FORM "AD"	3.4	*
	XSLH-E/25-120/HSK-A100	25	65	120	M18	FORM "AD"	4.0	*
	XSLH-E/32-120/HSK-A100	32	72	120	M20	FORM "AD"	4.4	*
	XSLH-E/40-120/HSK-A100	40	80	120	M20	FORM "AD"	4.7	*

- Bore tolerance H4
- Please order coolant tube separately (See page 67)
- Groove on face for easy identification (to distinguish from Weldon)
- Delivery includes : Locking screw & adjusting screw

Spare Parts & Accessories

Locking Screw
Page No 62

Morse taper with thread DIN 6364 / 228A



Balanced for G6.3 15,000 rpm

TAPER SIZE	DESIGNATION	MK	D (mm)	A (mm)	G	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
HSK-A63	XMTB/MT1-100/HSK-A63	MT1	25	100	M6	FORM "A"	1.5	*
	XMTB/MT2-120/HSK-A63	MT2	32	120	M10	FORM “A”	2.0	*
	XMTB/MT3-140/HSK-A63	MT3	40	140	M12	FORM "A"	2.2	*
	XMTB/MT4-160/HSK-A63	MT4	48	160	M16	FORM “A”	2.5	*
Balanced for G6.3 10,000 rpm								
HSK-A100	XMTB/MT1-110/HSK-A100	MT1	25	110	M6	FORM “A”	2.4	*
	XMTB/MT2-120/HSK-A100	MT2	32	120	M10	FORM "A"	2.4	*
	XMTB/MT3-150/HSK-A100	MT3	40	150	M12	FORM “A”	3.0	*
	XMTB/MT4-170/HSK-A100	MT4	48	170	M16	FORM "A"	3.4	*
	XMTB/MT5-200/HSK-A100	MT5	63	200	M20	FORM “A”	4.5	*

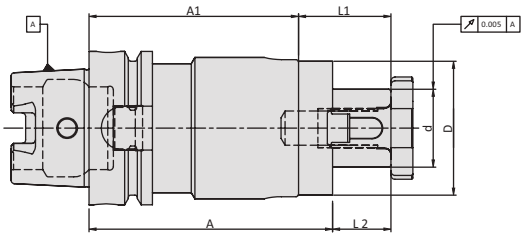
- Please order coolant tube separately (See page 67)
- Delivery includes : built-in draw screw

Spare Parts & Accessories

Stopper Screw
Page No 68

Socket head Screw
Page No 68

Combi shell mill holder to DIN 6358

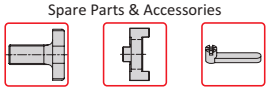


Balanced for G6.3 15,000 rpm

TAPER SIZE		DESIGNATION	d (mm)	D (mm)	A (mm)	A1 (mm)	L1 (mm)	L2 (mm)	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
HSK-A63	Short	XFSH/16-60/HSK-A63	16	32	60	50	27	17	FORM "A"	1.0	*
		XFSH/22-60/HSK-A63	22	40	60	48	31	19	FORM "A"	1.0	*
		XFSH/27-60/HSK-A63	27	48	60	48	33	21	FORM "A"	1.2	*
		XFSH/32-60/HSK-A63	32	53	60	46	38	24	FORM "A"	1.4	*
		XFSH/40-70/HSK-A63	40	70	70	56	41	27	FORM "A"	1.8	*
	Medium	XFSH/16-100/HSK-A63	16	32	100	90	27	17	FORM "A"	1.4	*
		XFSH/22-100/HSK-A63	22	40	100	88	31	19	FORM "A"	1.49	*
		XFSH/27-100/HSK-A63	27	48	100	88	33	21	FORM "A"	1.81	*
		XFSH/32-100/HSK-A63	32	58	100	86	38	24	FORM "A"	2.5	*
		XFSH/40-100/HSK-A63	40	70	100	86	41	27	FORM "A"	2.8	*
Balanced for G6.3 10,000 rpm											
HSK-A63	Long	XFSH/16-160/HSK-A63	16	32	160	150	27	17	FORM "A"	2.5	*
		XFSH/22-160/HSK-A63	22	40	160	148	31	19	FORM "A"	2.6	*
		XFSH/27-160/HSK-A63	27	48	160	148	33	21	FORM "A"	2.8	*
		XFSH/32-160/HSK-A63	32	58	160	146	38	24	FORM "A"	3.3	*
		XFSH/40-160/HSK-A63	40	70	160	146	41	27	FORM "A"	3.5	*
HSK-A100		XFSH/16-60/HSK-A100	16	32	60	50	27	17	FORM "A"	2.4	*
		XFSH/22-60/HSK-A100	22	40	60	48	31	19	FORM "A"	2.6	*
		XFSH/27-60/HSK-A100	27	48	60	48	33	21	FORM "A"	2.8	*
		XFSH/32-60/HSK-A100	32	58	60	46	28	24	FORM "A"	3.0	*
		XFSH/40-70/HSK-A100	40	70	70	56	41	27	FORM "A"	3.4	*

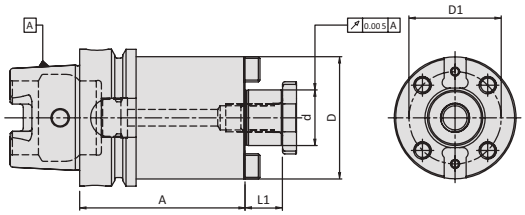
- Please order coolant tube separately (See page 67)
- Delivery includes : Parallel key, drive ring and clamping screw

Spare Parts & Accessories



Clamping Screw Page No 62 | Drive ring Page No 63 | Spanner Page No 63

Shell mill holder to DIN 6357 for cutters with drive key



Fine Balanced Holders

Balanced for G2.5 15,000 rpm

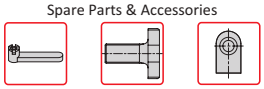
TAPER SIZE		DESIGNATION	d (mm)	D (mm)	A (mm)	L1 (mm)	D1	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
HSK-A63	Short	XSMH/16-50/HSK-A63	16	38	50	17		FORM "AD"	1.1	●
		XSMH/22-50/HSK-A63	22	48	50	19		FORM “AD”	1.1	●
		XSMH/27-60/HSK-A63	27	58	60	21		FORM “AD”	1.3	●
		XSMH/32-60/HSK-A63	32	78	60	24		FORM “AD”	1.4	●
		XSMH/40-60/HSK-A63 ✢	40	88	60	27	66.7	FORM “AD”	1.9	●
		XSMH(A)/16-50/HSK-A63	16	38	50	17		FORM “A”	1.1	*
		XSMH(A)/22-50/HSK-A63	22	48	50	19		FORM "A"	1.3	*
		XSMH(A)/27-60/HSK-A63	27	58	60	21		FORM “A”	1.7	*
		XSMH(A)/32-60/HSK-A63	32	78	60	24		FORM "A"	1.8	*
		XSMH(A)/40-60/HSK-A63 ✢	40	88	60	27	66.7	FORM “A”	2.0	*
	Medium	XSMH(A)/16-100/HSK-A63	16	38	100	17		FORM "A"	1.4	*
		XSMH(A)/22-100/HSK-A63	22	48	100	19		FORM “A”	2.0	*
		XSMH(A)/27-100/HSK-A63	27	58	100	21		FORM "A"	2.6	*
		XSMH(A)/32-100/HSK-A63	32	78	100	24		FORM “A”	3.2	*
		XSMH(A)/40-100/HSK-A63 ✢	40	88	100	27	66.7	FORM “A”	3.8	*
		XSMH/16-100/HSK-A63	16	38	100	17		FORM “AD”	1.4	●
		XSMH/22-100/HSK-A63	22	48	100	19		FORM “AD”	1.8	●
		XSMH/27-100/HSK-A63	27	58	100	21		FORM “AD”	2.0	●
		XSMH/32-100/HSK-A63	32	78	100	24		FORM “AD”	2.6	*
		XSMH/40-100/HSK-A63 ✢	40	88	100	27	66.7	FORM “AD”	3.1	*
HSK-A100		XSMH/16-50/HSK-A100	16	38	50	17		FORM “AD”	2.3	*
		XSMH/22-50/HSK-A100	22	48	50	19		FORM “AD”	2.5	●
		XSMH/27-50/HSK-A100	27	58	50	21		FORM “AD”	2.7	●
		XSMH/32-50/HSK-A100	32	78	50	24		FORM “AD”	2.8	*
		XSMH/40-60/HSK-A100 ✢	40	88	60	27	66.7	FORM “AD”	3.8	*
		XSMH/60-70/HSK-A100 ✢	60	129	70	40	101.6	FORM “AD”	6.0	*

- Coolant bore on the pilot face (holder with Form”AD”) as standard for all holders

✢D = Ø 40, D = Ø 60 With additional 4 screw holes to DIN 2079

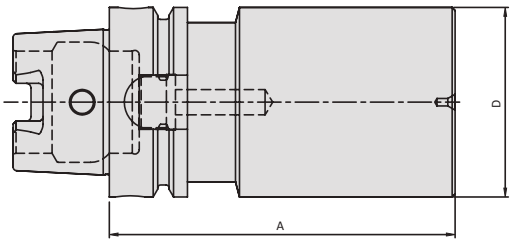
- Please order coolant tube separately (See page 67)
- Delivery includes : Drive keys and clamping screw

Spare Parts & Accessories



Spanner Page No 63 | Clamping Screw Page No 62 | Drive Key Page No 64

Boring bar blanks

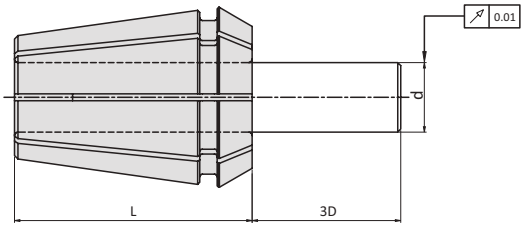


TAPER SIZE	DESIGNATION	D (mm)	A (mm)	COOLANT SUPPLY	N/W (Kg)	AVAILABILITY
HSK-A32	XBBB/35-150/HSK-A32	35	150	FORM "A"	1.1	*
HSK-A40	XBBB/40-150/HSK-A40	40	150	FORM "A"	1.4	●
	XBBB/52-200/HSK-A40	52	200	FORM "A"	2.1	O
HSK-A50	XBBB/52-200/HSK-A50	52	200	FORM "A"	2.8	O
	XBBB/63-200/HSK-A50	63	200	FORM "A"	3.2	O
HSK-A63	XBBB/63-200/HSK-A63	63	200	FORM "A"	4.8	●
	XBBB/80-250/HSK-A63	80	250	FORM "A"	9.0	●
HSK-A100	XBBB/63-200/HSK-A100	63	200	FORM "A"	6.2	●
	XBBB/80-250/HSK-A100	80	250	FORM "A"	9.1	*
	XBBB/97.5-250/HSK-A100	97.5	250	FORM “A”	15.0	●

• Please order coolant tube separately (See page 67)
• Delivery includes : Steep taper and flange hardened, body left soft.

Accessories

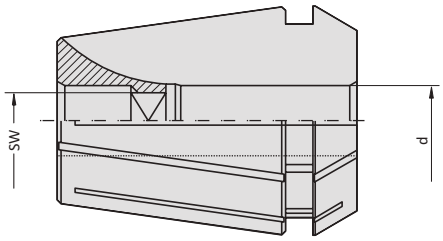
Collets DIN 6499 ER-System



CLAMPING RANGE d (mm)	4008E ER 11-... d=11.5mm L=18mm (1.0-7.0) DESIGNATION	AVAILABILITY	426E ER 16... d=17mm L=27mm (1.0-10.0) DESIGNATION	AVAILABILITY	ER 20-... d=21mm L=31mm (1.0-13.0) DESIGNATION	AVAILABILITY	430E ER 25-... d=26mm L=35mm (2.0-16.0) DESIGNATION	AVAILABILITY	470E ER 32-... d=33mm L=40mm (2.0-20.0) DESIGNATION	AVAILABILITY	472E ER 40-... d=41mm L=46mm (3.0-26.0) DESIGNATION	AVAILABILITY
1.0-0.5(1/32")	ER11-1.0	O	ER16-1.0	O	ER20-1.0	O						
2.0-1.0(1/16")	ER11-2.0	O	ER16-2.0	O	ER20-2.0	O	ER25-2.0	O	ER32-2.0	O		
3.0-2.0	ER11-3.0	O	ER16-3.0	O	ER20-3.0	O	ER25-3.0	O	ER32-3.0	O	ER40-3.0	O
4.0-3.0(5/32")	ER11-4.0	O	ER16-4.0	●	ER20-4.0	●	ER25-4.0	●	ER32-4.0	●	ER40-4.0	O
5.0-4.0(3/16")	ER11-5.0	O	ER16-5.0	●	ER20-5.0	●	ER25-5.0	●	ER32-5.0	●	ER40-5.0	O
6.0-5.0(7/32")	ER11-6.0	O	ER16-6.0	●	ER20-6.0	●	ER25-6.0	●	ER32-6.0	●	ER40-6.0	O
7.0-6.0	ER11-7.0	O	ER16-7.0	O	ER20-7.0	O	ER25-7.0	O	ER32-7.0	O	ER40-7.0	O
8.0-7.0(5/16")			ER16-8.0	●	ER20-8.0	●	ER25-8.0	●	ER32-8.0	●	ER40-8.0	●
9.0-8.0(11/32")			ER16-9.0	O	ER20-9.0	O	ER25-9.0	O	ER32-9.0	O	ER40-9.0	O
10.0-9.0			ER16-10.0	●	ER20-10.0	●	ER25-10.0	●	ER32-10.0	●	ER40-10.0	●
11.0-10.0					ER20-11.0	O	ER25-11.0	O	ER32-11.0	O	ER40-11.0	O
12.0-11.0(15/32")					ER20-12.0	●	ER25-12.0	●	ER32-12.0	●	ER40-12.0	●
13.0-12.0(½")					ER20-13.0	O	ER25-13.0	O	ER32-13.0	O	ER40-13.0	O
14.0-13.0							ER25-14.0	●	ER32-14.0	●	ER40-14.0	O
15.0-14.0							ER25-15.0	O	ER32-15.0	O	ER40-15.0	O
16.0-15.0(5/8")							ER25-16.0	O	ER32-16.0	●	ER40-16.0	●
17.0-16.0(21/32")									ER32-17.0	O	ER40-17.0	O
18.0-17.0									ER32-18.0	●	ER40-18.0	O
19.0-18.0									ER32-19.0	O	ER40-19.0	O
20.0-19.0(25/32")									ER32-20.0	●	ER40-20.0	●
21.0-20.0(13/16")											ER40-21.0	O
22.0-21.0											ER40-22.0	O
23.0-22.0											ER40-23.0	O
24.0-23.0(15/16")											ER40-24.0	O
25.0-24.0(31/32")											ER40-25.0	●
26.0-25.0											ER40-26.0	O

How to order
ER11-1.0

Tap Collet ER-System with internal square DIN 6499



SHANK d (mm) Ø	SQUARE SW (mm) Ø	426G ER 16-... d=16.7mm L=27.5mm DESIGNATION	AVAILABILITY	ER 20-... d=21mm L=31mm DESIGNATION	AVAILABILITY	430G ER 25-... d=25.7mm L=34mm DESIGNATION	AVAILABILITY	470G ER 32-... d=33mm L=40mm DESIGNATION	AVAILABILITY	472G ER 40-... d=41mm L=46mm DESIGNATION	AVAILABILITY
3.5	2.7	ER16-3.5x2.7	O			ER25-3.5x2.7	O				
4.0	3.0	ER16-4.0x3.0	O			ER25-4.0x3.0	O				
4.5	3.4	ER16-4.5x3.4	O	ER20-4.5x3.4	O	ER25-4.5x3.4	O	ER32-4.5x3.4	O		
5.5	4.3	ER16-5.5x4.3	O	ER20-5.5x4.3	O						
6.0	4.9	ER16-6.0x4.9	O	ER20-6.0x4.9	O	ER25-6.0x4.9	O	ER32-6.0x4.9	O	ER40-6.0x4.9	O
7.0	5.5	ER16-7.0x5.5	O	ER20-7.0x5.5	O	ER25-7.0x5.5	O	ER32-7.0x5.5	O	ER40-7.0x5.5	O
8.0	6.2		O	ER20-8.0x6.2	O	ER25-8.0x6.2	O	ER32-8.0x6.2	O	ER40-8.0x6.2	O
9.0	7.0			ER20-9.0x7.0	O	ER25-9.0x7.0	O	ER32-9.0x7.0	O	ER40-9.0x7.0	O
10.0	8.0			ER20-10.0x8.0	O	ER25-10.0x8.0	O	ER32-10.0x8.0	O	ER40-10.0x8.0	O
11.0	9.0					ER25-11.0x9.0	O	ER32-11.0x9.0	O	ER40-11.0x9.0	O
12.0	9.0					ER25-12.0x9.0	O	ER32-12.0x9.0	O	ER40-12.0x9.0	O
14.0	11.0						O	ER32-14.0x11.0	O	ER40-14.0x11.0	O
16.0	12.0						O	ER32-16.0x12.0	O	ER40-16.0x12.0	O
18.0	14.5						O		O	ER40-18.0x14.5	O
20.0	16.0									ER40-20.0x16	O

How to order
ER16-3.5X2.7

Wrench

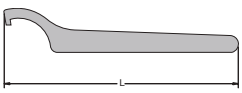


Fig. A

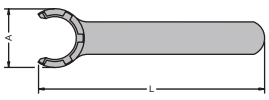


Fig.B

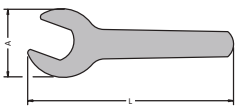


Fig.C

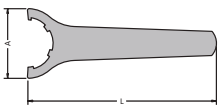
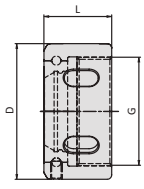


Fig.D

DESIGNATION	FOR CLAMPING NUT	A (mm)	L (mm)	Fig	AVAILABILITY
OZ16(RDO25)-WR	OZ16(RDO25)	-	160.0	A	O
OZ25(RDO35)-WR	OZ25(RDO35)	-	228.0	A	O
OZ32(RDO44)-WR	OZ32(RDO44)	-	280.0	A	O
E11M	ER11M-DIN 6499	16.8	90.0	B	O
E20M	ER20M-DIN 6499	29.0	120.0	B	O
E16M	ER16M-DIN 6499	22.5	110.0	B	O
E25M	ER25M-DIN 6499	36.0	130.0	B	O
GS25(SW25)	ER16 - DIN 6499	42.0	140.0	C	●
E20	ER20 - DIN 6499	54.0	168.0	C	●
E25	ER25 - DIN 6499	65.0	210.0	D	●
E32	ER32 - DIN 6499	75.0	250.0	D	●
E40	ER40 - DIN 6499	90.0	290.0	D	●

Clamping nut OZ(RDO) to DIN 6388 D ball-bearing version



DESIGNATION	SIZE	D	L	G	AVAILABILITY
OZ16(RDO25)	2-16	43.0	24.0	M33X1.5	O
OZ25(RDO35)	2-25	60.0	30.0	M48X2	O
OZ32(RDO44)	3-32	72.0	34.0	M60X2.5	O

Clamping nut ER to DIN 6499-balanced

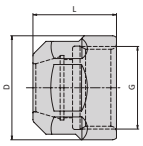


FIG.1

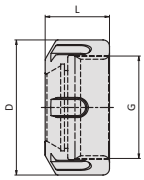
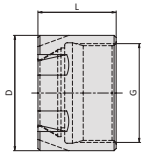


FIG.1

DESIGNATION	SIZE	D	L	G	Fig	AVAILABILITY
ER16 - DIN 6499	1-10	28.0	17.5	M22X1.5	1	O
ER20 - DIN 6499	1-13	34.0	19.0	M25X1.5	1	O
ER25 - DIN 6499	2-16	42.0	20.0	M32X1.5	2	O
ER32 - DIN 6499	2-20	50.0	22.5	M40X1.5	2	O
ER40 - DIN 6499	3-26	63.0	25.5	M50X1.5	2	O

Clamping nut “Mini” ER DIN 6499



DESIGNATION	SIZE	D	L	G	AVAILABILITY
ER11M-DIN6499	1-7	16.0	11.3	M13X0.75	O
ER16M-DIN6499	1-10	22.0	17.0	M19X1.0	O
ER20M-DIN6499	1-13	28.0	19.0	M24X1.0	O
ER25M-DIN6499	2-16	35.0	20.0	M30X1.0	O

Clamping nut ER for sealing discs to DIN 6499

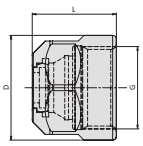


FIG.1

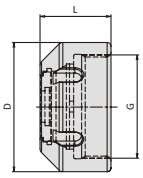


FIG.1

DESIGNATION	SIZE	D	L	G	Fig	AVAILABILITY
ER16 - IC	1-10	28.0	22.5	M22X1.5	1	O
ER20 - IC	1-13	34.0	24.0	M25X1.5	1	O
ER25 - IC	2-16	42.0	25.0	M32X1.5	2	O
ER32 - IC	2-20	50.0	27.5	M40X1.5	2	O
ER40 - IC	3-26	63.0	30.5	M50X1.5	2	O

Sealing discs for ER Clamping nut

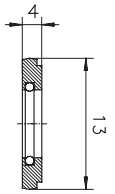


Fig
SD ER 16

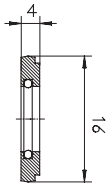


Fig
SD ER 20

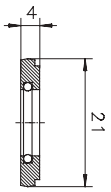


Fig
SD ER 25

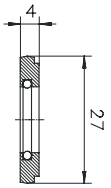


Fig
SD ER 32

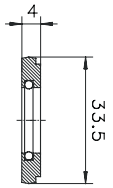


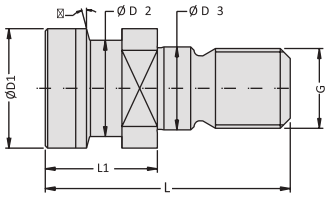
Fig
SD ER 40

SD - ER... SEALING CAPACITY	SD - ER 16 DESIGNATION	AVAILABILITY	SD - ER 20 DESIGNATION	AVAILABILITY	SD - ER 25 DESIGNATION	AVAILABILITY	SD - ER 32 DESIGNATION	AVAILABILITY	SD - ER 40 DESIGNATION	AVAILABILITY
3.0-2.5	SD-ER16-3.0	O	SD-ER20-3.0	O	SD-ER25-3.0	O	SD-ER32-3.0	O	SD-ER40-3.0	O
3.5-3.0	SD-ER16-3.5	O	SD-ER20-3.5	O	SD-ER25-3.5	O	SD-ER32-3.5	O	SD-ER40-3.5	O
4.0-3.5	SD-ER16-4.0	O	SD-ER20-4.0	O	SD-ER25-4.0	O	SD-ER32-4.0	O	SD-ER40-4.0	O
4.5-4.0	SD-ER16-4.5	O	SD-ER20-4.5	O	SD-ER25-4.5	O	SD-ER32-4.5	O	SD-ER40-4.5	O
5.0-4.5	SD-ER16-5.0	O	SD-ER20-5.0	O	SD-ER25-5.0	O	SD-ER32-5.0	O	SD-ER40-5.0	O
5.5-5.0	SD-ER16-5.5	O	SD-ER20-5.5	O	SD-ER25-5.5	O	SD-ER32-5.5	O	SD-ER40-5.5	O
6.0-5.5	SD-ER16-6.0	O	SD-ER20-6.0	O	SD-ER25-6.0	O	SD-ER32-6.0	O	SD-ER40-6.0	O
6.5-6.0	SD-ER16-6.5	O	SD-ER20-6.5	O	SD-ER25-6.5	O	SD-ER32-6.5	O	SD-ER40-6.5	O
7.0-6.5	SD-ER165-7.0	O	SD-ER20-7.0	O	SD-ER25-7.0	O	SD-ER32-7.0	O	SD-ER40-7.0	O
7.5-7.0	SD-ER16-7.5	O	SD-ER20-7.5	O	SD-ER25-7.5	O	SD-ER32-7.5	O	SD-ER40-7.5	O
8.0-7.5	SD-ER16-8.0	O	SD-ER20-8.0	O	SD-ER25-8.0	O	SDER32-8.0	O	SD-ER40-8.0	O
8.5-8.0	SD-ER16-8.5	O	SD-ER20-8.5	O	SD-ER25-8.5	O	SD-ER32-8.5	O	SD-ER40-8.5	O
9.0-8.5	SD-ER16-9.0	O	SD-ER20-9.0	O	SD-ER25-9.0	O	SD-ER32-9.0	O	SD-ER40-9.0	O
9.5-9.0	SD-ER16-9.5	O	SD-ER20-9.5	O	SD-ER25-9.5	O	SD-ER32-9.5	O	SD-ER40-9.5	O
10.0-9.5	SD-ER16-10.0	O	SD-ER20-10.0	O	SD-ER25-10.0	O	SD-ER32-10.0	O	SD-ER40-10.0	O
10.5-10.0			SD-ER20-10.5	O	SD-ER25-10.5	O	SD-ER32-10.5	O	SD-ER40-10.5	O
11.0-10.5			SD-ER20-11.0	O	SD-ER25-11.0	O	SD-ER32-11.0	O	SD-ER40-11.0	O
11.5-11.0			SD-ER20-11.5	O	SD-ER25-11.5	O	SD-ER32-11.5	O	SD-ER40-11.5	O
12.0-11.5			SD-ER20-12.0	O	SD-ER25-12.0	O	SD-ER32-12.0	O	SD-ER40-12.0	O
12.5-12.0			SD-ER20-12.5	O	SD-ER25-12.5	O	SD-ER32-12.5	O	SD-ER40-12.5	O
13.0-12.5			SD-ER20-13.0	O	SD-ER25-13.0	O	SD-ER32-13.0	O	SD-ER40-13.0	O
13.5-13.0					SD-ER25-13.5	O	SD-ER32-13.5	O	SD-ER40-13.5	O
14.0-13.5					SD-ER25-14.0	O	SD-ER32-14.0	O	SD-ER40-14.0	O
14.5-14.0					SD-ER25-14.5	O	SD-ER32-14.5	O	SD-ER40-14.5	O
15.0-14.5					SD-ER25-15.0	O	SD-ER32-15.0	O	SD-ER40-15.0	O
15.5-15.0					SD-ER25-15.5	O	SD-ER32-15.5	O	SD-ER40-15.5	O
16.0-15.5					SD-ER25-16.0	O	SD-ER32-16.0	O	SD-ER40-16.0	O
16.5-16.0							SD-ER32-16.5	O	SD-ER40-16.5	O
17.0-16.5							SD-ER32-17.0	O	SD-ER40-17.0	O
17.5-17.0							SD-ER32-17.5	O	SD-ER40-17.5	O
18.0-17.5							SD-ER32-18.0	O	SD-ER40-18.0	O
18.5-18.0							SD-ER32-18.5	O	SD-ER40-18.5	O
19.0-18.5							SD-ER32-19.0	O	SD-ER40-19.0	O
19.5-19.0							SD-ER32-19.5	O	SD-ER40-19.5	O
20.0-19.5							SD-ER32-20.0	O	SD-ER40-20.0	O
20.5-20.0									SD-ER40-20.5	O
21.0-20.5									SD-ER40-21.0	O
21.5-21.0									SD-ER40-21.5	O
22.0-21.5									SD-ER40-22.0	O
22.5-22.0									SD-ER40-22.5	O
23.0-22.5									SD-ER40-23.0	O
23.5-23.0									SD-ER40-23.5	O
24.0-23.5									SD-ER40-24.0	O
24.5-24.0									SD-ER40-24.5	O
25.0-24.5									SD-ER40-25.0	O
25.5-25.0									SD-ER40-25.5	O
26.0-25.5									SD-ER40-26.0	O

How to order
SD - ER16-3.0

Pull stud

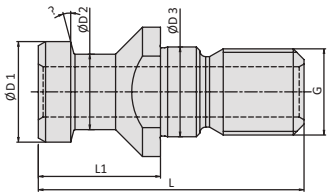
Pull stud DIN 2080



DESIGNATION	G	Ø D 1 (mm)	Ø D 2 (mm)	Ø D 3 (mm)	L (mm)	L1 (mm)	Θ	AVAILABILITY
BN 164 - ISO 40	M16	25.3	21.1	17	53.1	25.1	15°	O
BN 164 - ISO 50	M24	39.6	32	25	65.1	25.1	0°	O

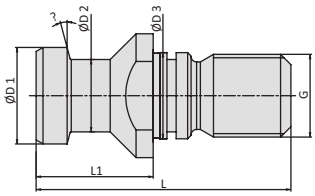
Pull stud DIN 69872 A+B

Type A (With through hole, without O-ring)



DESIGNATION	G	Ø D 1 (mm)	Ø D 2 (mm)	Ø D 3 (mm)	L (mm)	L1 (mm)	Θ	AVAILABILITY
BN 164 - SK 30	M12	13.0	9.0	13.0	44.0	24.0	15°	O
BN 164 - SK 40	M16	19.0	14.0	17.0	54.0	26.0	15°	O
BN 164 - SK 50	M24	28.0	21.0	25.0	74.0	34.0	15°	O

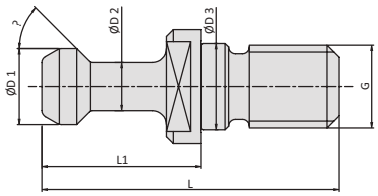
Type B (without through hole, incl. O-ring)



DESIGNATION	G	Ø D 1 (mm)	Ø D 2 (mm)	Ø D 3 (mm)	L (mm)	L1 (mm)	Θ	AVAILABILITY
BN 164B - SK 40	M16	19.0	14.0	17.0	54.0	26.0	15°	O
BN 164B - SK 50	M24	28.0	21.0	25.0	74.0	34.0	15°	O

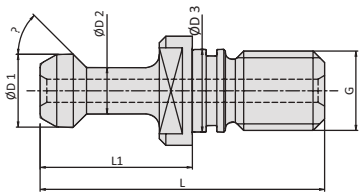
Pull stud MAS BT A+B

Type A (without through hole, without O-ring)



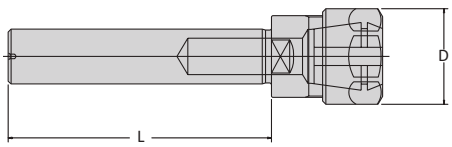
DESIGNATION	G	Ø D 1 (mm)	Ø D 2 (mm)	Ø D 3 (mm)	L (mm)	L1 (mm)	Θ	AVAILABILITY
BN 164 - BT 30	M12	11.0	7.0	12.5	43.0	23.0	45°	O
BN 164 - BT 40	M16	15.0	10.0	17.0	60.0	35.0	45°	O
BN 164 - BT 50	M24	23.0	17.0	25.0	85.0	45.0	45°	O
BN 164 - BT 30-60	M12	11.0	7.0	12.5	43.0	23.0	60°	O
BN 164 - BT 40-60	M16	15.0	10.0	17.0	60.0	35.0	60°	O
BN 164 - BT 50-60	M24	23.0	17.0	25.0	85.0	45.0	60°	O
BN 164 - BT 40-90	M16	15.0	10.0	17.0	60.0	35.0	90°	O
BN 164 - BT 50-90	M24	23.0	17.0	25.0	85.0	45.0	90°	O

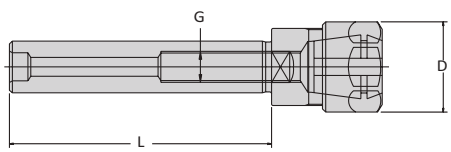
Type B (with through hole, incl. O-ring)



DESIGNATION	G	Ø D 1 (mm)	Ø D 2 (mm)	Ø D 3 (mm)	L (mm)	L1 (mm)	Θ	AVAILABILITY
BN 164B - BT 30	M12	11.0	7.0	12.5	43.0	23.0	45°	O
BN 164B - BT 40	M16	15.0	10.0	17.0	60.0	35.0	45°	O
BN 164B - BT 50	M24	23.0	17.0	25.0	85.0	45.0	45°	O
BN 164B - BT 30-60	M12	11.0	7.0	12.5	43.0	23.0	60°	O
BN 164B - BT 40-60	M16	15.0	10.0	17.0	60.0	35.0	60°	O
BN 164B - BT 50-60	M24	23.0	17.0	25.0	85.0	45.0	60°	O
BN 164B - BT 40-90	M16	15.0	10.0	17.0	60.0	35.0	90°	O
BN 164B - BT 50-90	M24	23.0	17.0	25.0	85.0	45.0	90°	O

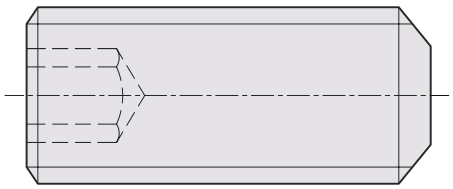
Collet chuck Type ER With Cylinder Shank





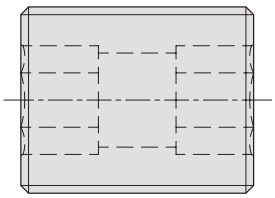
SIZE	DESIGNATION	e COLLET TYPE	RANGE	D (mm)	L (mm)	G	Fig	COOLANT SUPPLY	AVAILABILITY
CYL 8	XCCH/ER11M-56/CYL8	ER 11	1-7	16	56		1	Form "A"	O
CYL 10	XCCH/ER16M-60/CYL10	ER 16	1-10	22	60		1	Form "A"	O
CYL 12	XCCH/ER11M-80/CYL12	ER 11	1-7	16	80		1	Form "A"	O
CYL 16	XCCH/ER11M-100/CYL16	ER 11	1-7	16	100	M 6	2	Form "AD"	O
	XCCH/ER16M-60/CYL16	ER 16	1-10	22	60	M 8	2	Form "AD"	O
	XCCH/ER20M-100/CYL16	ER 20	1-13	28	100	M 8	2	Form "AD"	O
CYL 20	XCCH/ER16M-100/CYL20	ER 16	1-10	22	100	M 10	2	Form "AD"	O

Locking screw for Weldon & Whistle Notch to DIN 1835 B



	DESIGNATION	(mm) (FOR SIZE)	AVAILABILITY
Extra Short	M 14 X 14 DIN 1835	16	O
	M 16 X 12 DIN 1835	20	O
	M 16 X 1 X 10.5	25 & 32	O
	M 16 X 1 X 8.5	25	O
	M 20 X 2 X 16 DIN 1835	32	O
Standard Version	M 6 X 10 DIN 1835	6	O
	M 8 X 10 DIN 1835	8	O
	M 10 X 12 DIN 1835	10	O
	M 12 X 16 DIN 1835	12 & 14	O
	M 14 X 16 DIN 1835	16 & 18	O
	M 16 X 16 DIN 1835	20	O
	M 18 X 2 X 20 DIN 1835	25	O
	M 20 X 2 X 20 DIN 1835	32&40	O

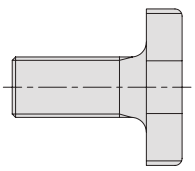
Adjusting screw with coolant hole for Whistle Notch holder



DESIGNATION	(mm) (FOR SIZE)	AVAILABILITY
M 14 X 14 DIN 1835	16	O
M 5 X 15-001	6	O
M 6 X 15-001	8	O
M 8 X 15-001	10	O
M 10 X 15-001	12&14	O
M 12 X 15-001	16&18	O
M 16 X 15-001	20	O
M 20 X 15-001	25&32	O

Spare parts for Combi & shell mill holder

Clamping screw to DIN 6367

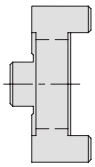


DESIGNATION	(mm) (FOR SIZE)	AVAILABILITY
M 8 X 16 - DIN 6367	16	O
M 10 X 22 - DIN 6367	22	O
M 12 X 27 - DIN 6367	27	O
M 16 X 32 - DIN 6367	32	O
M 20 X 40 - DIN 6367	40	O

Spanner to DIN 6368

DESIGNATION	(mm) (FOR SIZE)	AVAILABILITY
S-16-DIN6368	16	O
S-22-DIN6368	22	O
S-27-DIN6368	27	O
S-32-DIN6368	32	O
S-40-DIN6368	40	O

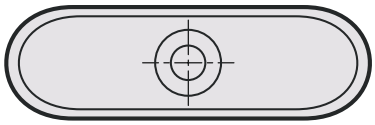
Drive ring to DIN 6366



DESIGNATION	(mm) (FOR SIZE)	AVAILABILITY
C - 16 DIN 6366	16	O
C - 22 DIN 6366	22	O
C - 27 DIN 6366	27	O
C - 32 DIN 6366	32	O
C - 40 DIN 6366	40	O

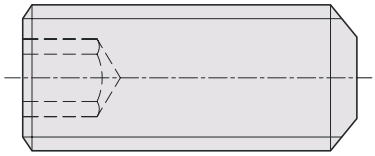
Spare parts for Combi & shell mill holder

Parallel key to DIN 6885



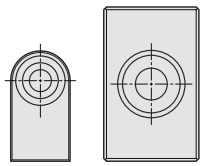
DESIGNATION	(mm) (FOR SIZE)	AVAILABILITY
C 4 X 4 X 20 DIN 6885	16	O
C 6 X 6 X 25 DIN 6885	22	O
C 7 X 7 X 25 DIN 6885	27	O
C 8 X 7 X 28 DIN 6885	32	O
C 10 X 8 X 32 DIN 6885	40	O

Threaded stud to DIN 913



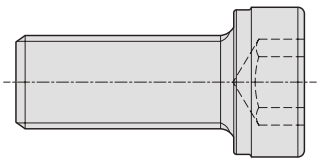
DESIGNATION	(mm) (FOR SIZE)	AVAILABILITY
M 3 X 3 DIN 913	16	O
M 3 X 5 DIN 913	22,27,32	O
M 3 X 7 DIN 913	40	O

Drive keys



DESIGNATION	(mm) (FOR SIZE)	AVAILABILITY
DIA 16 - 8X8X14	16	O
DIA 22 - 10X10X17	22	O
DIA 27 - 12X14X20	27	O
DIA 32 - 14X14X22	32	O
DIA 40 - 15.9X16X21	40	O
DIA 60 - 25.4X25X31	60	O

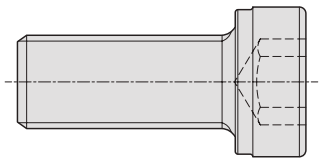
Socket head Screw to DIN 912



DESIGNATION	(mm) (FOR SIZE)	AVAILABILITY
M 3 X 8 - DIN 912	16	O
M 4 X 8 - DIN 912	22	O
M 4 X 14 - DIN 912	27	O
M 5 X 13 - DIN 912	32	O
M 6 X 16 - DIN 912	40	O
M 12 X 25 - DIN 912	60	O

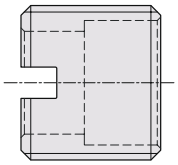
Spare Parts for Morse taper with thread

Socket Head Screw



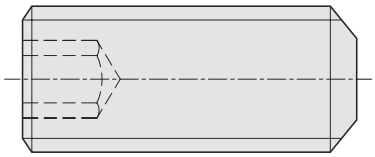
TAPER SIZE (SK/BT/ISO)	MK	DESIGNATION	AVAILABILITY
40 & 50	1	M 6 x 21-004	O
	2	M 10 x 30-004	O
	3	M 12 x 40-004	O
	4	M 16 x 40-004	O
	5	M 20 x 60-004	O

Stopper Screw



TAPER SIZE (SK/BT/ISO)	MK	DESIGNATION	AVAILABILITY
40 & 50	1	M 16 x 10-006	O
	2	M 16 x 8-006	O
	3	M 20 x 1.5 x 10-006	O
	4	M 26 x 1.5 x 10-006	O
	5	M 36 x 2.5 x 15-006	O

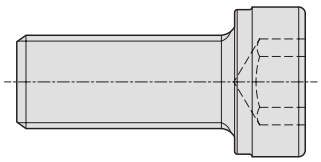
Threaded stud DIN 913



TAPER SIZE (SK/BT/ISO)	MK	DESIGNATION	AVAILABILITY
40 & 50	1	M 5 x 6 - DIN 913	O
	2	M 5 x 6 - DIN 913	O
	3	M 5 x 6 - DIN 913	O
	4	M 5 x 6 - DIN 913	O
	5	M 5 x 6 - DIN 913	O

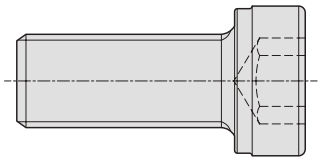
Spare Parts for Reduction Sleeves

Socket Head Screw



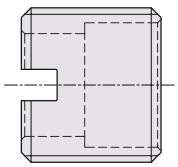
TAPER SIZE (ISO DIN2080)	INSIDE TAPER	DESIGNATION	AVAILABILITY
ISO 30	ISO 30	M 12 x 35-005	O
ISO 40	ISO 40	M 16 x 55-005	O
ISO 50	ISO 40	M 16 x 40-005	O
ISO 50	ISO 50	M 24 x 60-005	O

Socket Head Screw



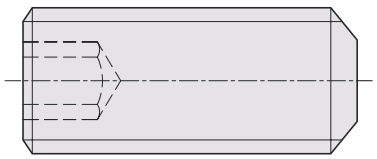
TAPER SIZE (SK/BT)	INSIDE TAPER	DESIGNATION	AVAILABILITY
SK40/BT40	**SK 30**	**M 12 x 40-005**	O
SK40/BT40	**SK 40**	**M 16 x 60-005**	O
SK50/BT50	**SK 40**	**M 16 x 50-005**	O
SK50/BT50	**SK 50**	**M 24 x 85-005**	O

Stopper Screw

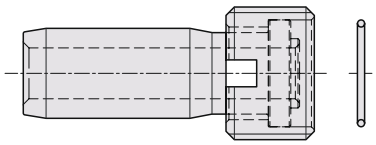


TAPER SIZE (SK/BT/ISO)	INSIDE TAPER	DESIGNATION	AVAILABILITY
40	**30**	**M18x1.5x10-006**	O
	40	**M26x1.5x13-006**	O
50	**40**	**M26x1.5x13-006**	O
	50	**M36x2.5x15-006**	O

Threaded Stud DIN 913



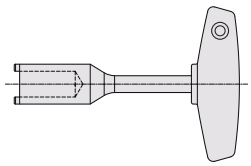
DESIGNATION (SK/BT/ISO)	AVAILABILITY
M 5 X 6 - DIN 913	O



Coolant tube for HSK chuck For coolant transfer for HSK tools incl. round gasket DIN 3770 and union nut

DESIGNATION	HSK SIZE	AVAILABILITY
HSK 32 - 10	HSK 32	O
HSK 40 - 12	HSK 40	O
HSK 50 - 16	HSK 50	O
HSK 63 - 18	HSK 63	O
HSK 80 - 20	HSK 80	O
HSK 100 - 24	HSK 100	O

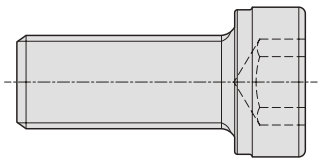
Installation wrench for coolant pipe



DESIGNATION	HSK SIZE	AVAILABILITY
HSK 32-8.5X115	HSK 32	O
HSK 40-10.5X115	HSK 40	O
HSK 50-14.5X115	HSK 50	O
HSK 63-16.5X136	HSK 63	O
HSK 80-18.5X136	HSK 80	O
HSK 100-22X136	HSK 100	O

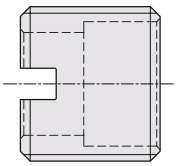
Spare Parts for Morse taper with thread

Socket Head Screw



TAPER SIZE (HSK)	MK	DESIGNATION	AVAILABILITY
A63 & A 100	1	M 06 x 20-002	O
	2	M 10 x 30-002	O
	3	M 12 x 30-002	O
	4	M 16 x 45-002	O
	5	M 20 x 55-DIN 912-IC	O

Stopper Screw

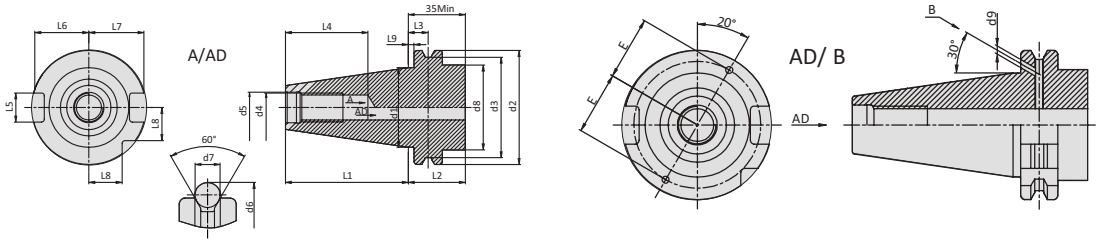


TAPER SIZE (HSK)	MK	DESIGNATION	AVAILABILITY
A63 & A100	1	M 10 x 1.0-LH x 6-003	O
	2	M 15 x 1.5-LH x 6-003	O
	3	M 20 x 1.5-LH x 6-003	O
	4	M 24 x 1.5-LH x 8.5-003	O
	5	M 26 x 2.0-LH x 11-003	O

Technical Details

Tool Shank

DIN 69871 (SK)



FORM "A"

Without Coolant feed

FORM "AD"

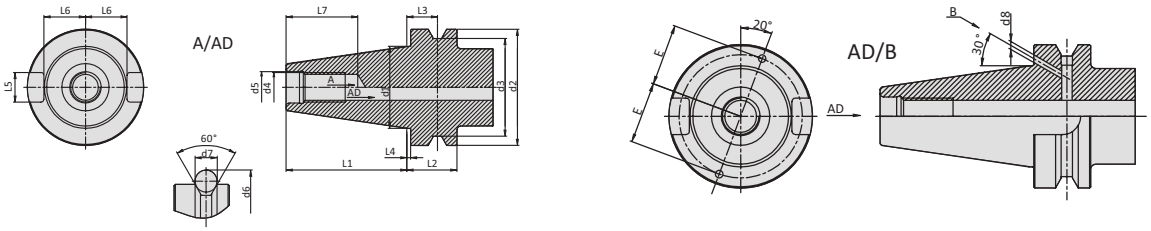
With through coolant feed
Centrally (Axial)

FORM "AD/B"

With Coolant feed
Via Flange or centrally (Axial)

SIZE	d1	d2	d3	d4	d5	d6	d7	d8	d9	L1	L2	L3	L4	L5	L6	L7	L8	E
30	31,75	50,00	44,30	M12	13	59,30	7	45MAX	-	47,80	15,9	11,1	33.5MIN	16,1	16,4	19,0	15,0	21
40	44,45	63,55	56,25	M16	17	72,30	7	50MAX	4	71,6	15,9	11,1	42.5MIN	16,1	22,8	25,0	18,5	27
50	69,85	97,50	91,25	M24	25	107,25	7	80MAX	6	104,95	15,9	11,1	61.5MIN	25,4	35,5	37,7	30,0	42

JIS B6339 (MAS 403 BT)



FORM "A"

Without Coolant feed

FORM "AD"

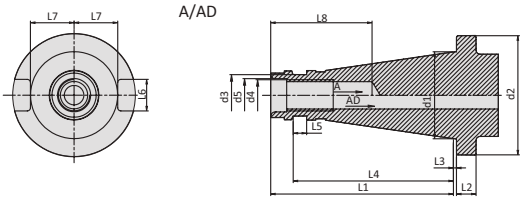
With through coolant feed
Centrally (Axial)

FORM "AD/B"

With coolant feed
Via flange or Centrally (Axial)

SIZE	D1	D2	D3	D4	D5	D6	D7	D8	L1	L2	L3	L4	L5	L6	L7	E
30	31,75	46	38	M12	12,5	56,14	8	-	48,40	20	13,60	2	16,1	16,3	34MIN	-
40	44,45	63	53	M16	17,0	75,68	10	4	65,40	25	16,60	2	16,1	22,5	43MIN	27
50	69,85	100	85	M24	25,0	119,02	15	6	101,80	35	23,20	3	25,7	35,4	62MIN	42

DIN 2080 (ISO)



SIZE	D1	D2	D3	D4	D5	D6	D7	L1	L2	L3	L4	L5	L6	L7	L8
30	31,75	50	17,04	M12	13	56,14	8	68,4	8	1,6	-	-	16,1	16,2	34MIN
40	44,45	63	21,01	M16	17	75,68	10	93,4	10	1,6	82,0	7	16,1	22,5	43MIN
50	69,85	97,50	32,00	M24	26	119,02	15	126,8	12	3,2	115,0	13,0	25,7	35,3	62MIN

Coolant Supply - Instruction for change Form “AD” ⇌ Form “B”

TYPE 1

Form "AD"

(Delivery Condition)

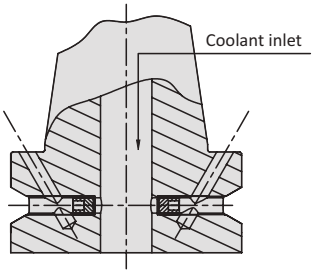


Fig 1

Form "B ”

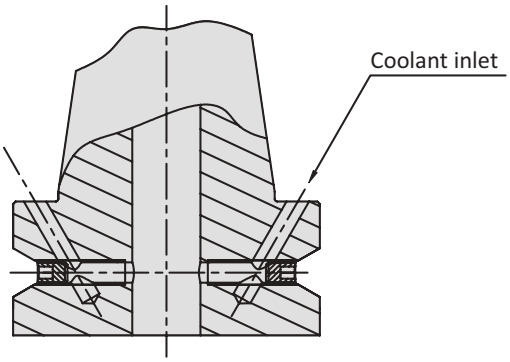


Fig 2

As delivered the adaptors are suitable for coolant supply according to form AD (centrally as shown in Fig1). To switch to form B, unscrew the M5 screws to the top as shown in the Fig 2 and secure with Loctite.

TYPE 2

Form "AD"

(Delivery Condition)

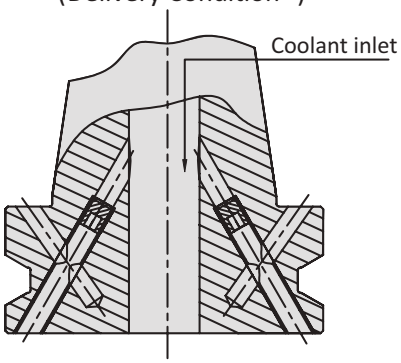


Fig 1

Form "B ”

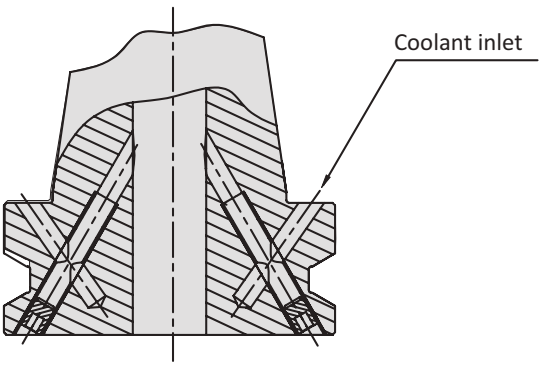
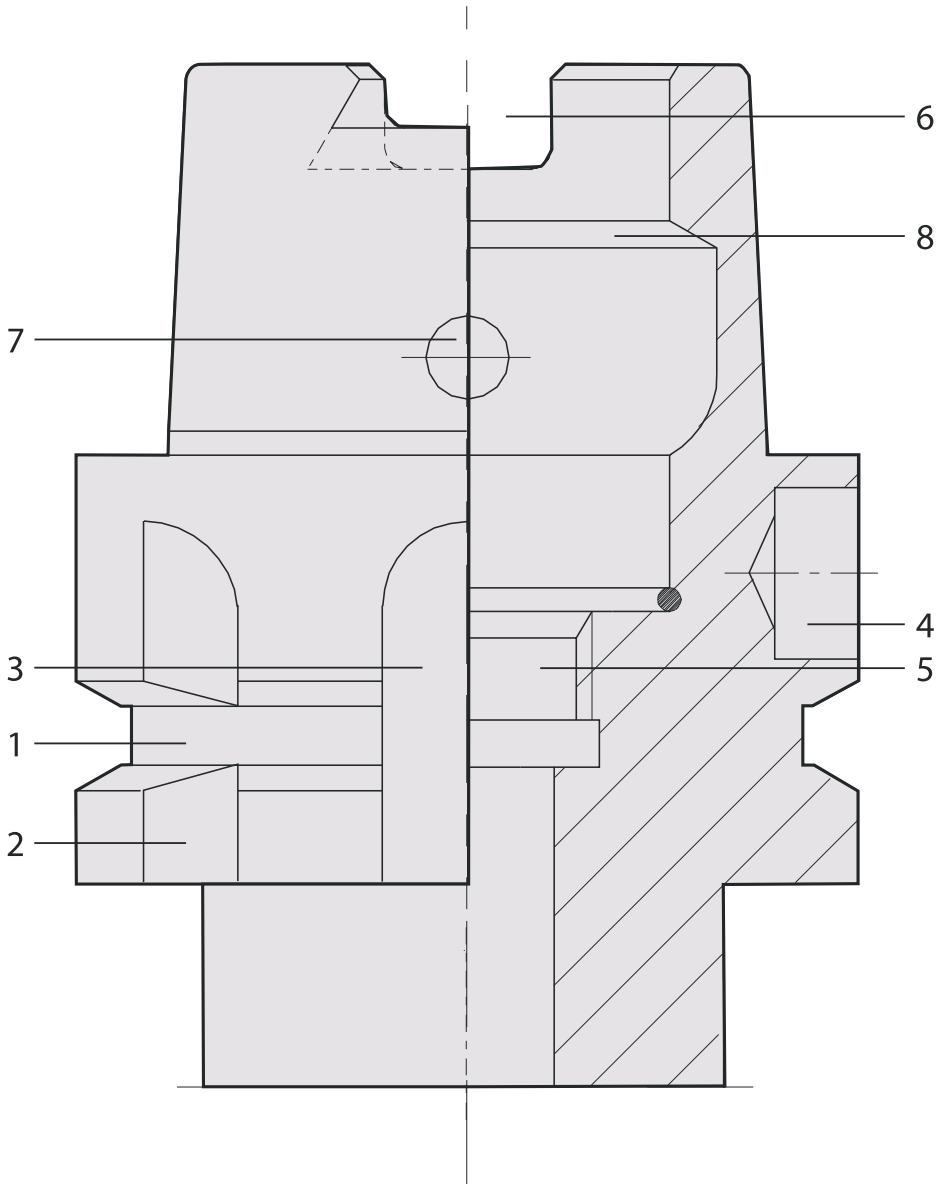


Fig 2

As delivered the adaptors are suitable for coolant supply according to form AD (centrally as shown in Fig1). To switch to form B, unscrew the M5 screws to the top as shown in the Fig 2 and secure with Loctite.

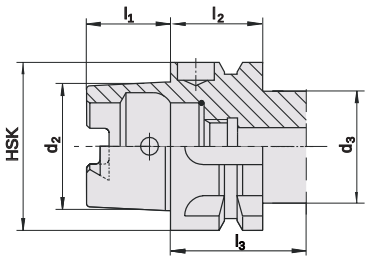
Term definition of HSK-A interface for automatic tooling systems



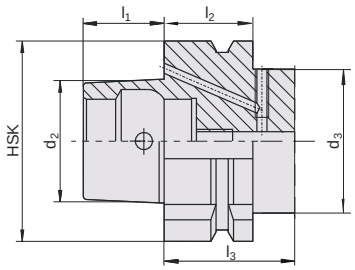
1. Gripper groove – circular groove
2. Index notch – sickle-shaped notch across Gripper groove
3. Keyway on collar – index notch e.g. for tool magazines. Form closed torque transmission to spindle on HSK-B/D
4. Coding/identification – hole in collar for attachment of identification system (code chip)
5. Thread for coolant tube – for attachment of coolant tube
6. Keyway on taper shank – form closed torque Transmission to spindle
7. Radial bore in taper shank – necessary for manual clamping systems
8. Clamping shoulder – circular chamfer for clamping

Overview tool shanks HSK DIN 69893

Form A

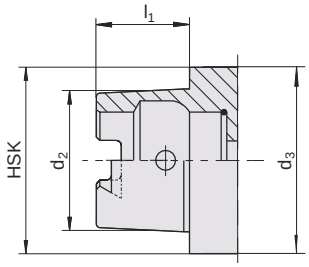


Form B

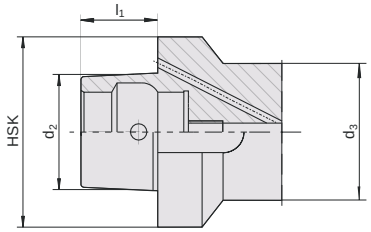


Hollow-shank taper for automatic tool changing with gripping and locating groove. Manual operation is possible through the access hole in the taper. Torque is transmitted both positively and non-positively.

Form C

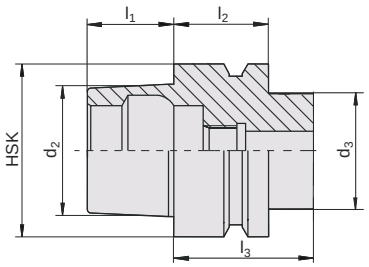


Form D

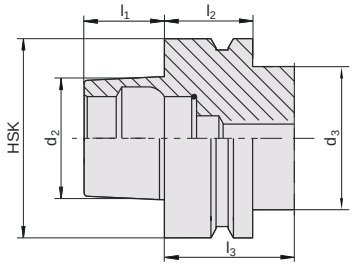


Hollow-shank taper for manual tool changing.
Operation is possible through the access hole in the taper.
Torque is transmitted both positively and non-positively.

Form E



Form F



Hollow-shank taper for automatic tool changing (manual operation through access hole in taper not possible). Torque is transmitted non-positively.

HSK-A+C	d2	d3	l1	l2	l3	HSK-B+D	d2	d3	l1	l2	l3
32	24	26	16	20	35	40	24	34	16	20	34
40	30	34	20	20	35	50	30	42	20	26	42
50	38	42	25	26	42	63	38	53	25	26	42
63	48	53	32	26	42	80	48	68	32	26	42
80	60	68	40	26	42	100	60	68	40	29	42
100	75	68	50	29	45						
HSK-E	d2	d3	l1	l2	l3	HSK-F	d2	d3	l1	l2	l3
25	19	20	13	10	20	50	30	42	20	26	42
32	24	26	16	20	35	63	38	63	25	26	42
40	30	34	20	20	35	80	48	68	32	26	42
50	38	42	25	26	42						
63	48	53	32	26	42						

Notes

XCUT®
TECHNOLOGIES

Threading & Tiny Tool Solid Carbide PCD/CBN Tool

Trial Report

ENQUIRY SHEETS

Threading & Tiny Tool Solid Carbide PCD/CBN Tool

www.xcut.in

Threading & Tiny Tool Enquiry Sheet

Company :

Contact Person :

Contact :

E-mail :

Tool Details :

Diagram :

Applications :

Solid Carbide Enquiry Sheet

Company :

Contact Person :

Contact :

E-mail :

Tool Details :

Diagram :

Applications :

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

Blade Selection & Enquiry Sheet

Company : _____

Address : _____

_____

Contact Person : _____ Phone : _____

Contact Person : _____ Phone : _____

Email : _____ Email : _____

Machine Information

Make : _____ No. of Machine: _____Model :_____

Type : □ Vertical □ Horizontal

Blade Spec : _____Blade Speed (sfm) : _____ Feed Rate : _____

Blade Information

Manufacturer : _____Length : _____Width : _____Thickness : _____Tooth Pitch : _____

Type : □ Supreme □ STD □ Other _____

Production Usage (per day): □ Light (2 hrs. or less) □ Medium (3-6 hrs.) □ Heavy (7 hrs. or more)

Monthly blade usage : Current blade distributor : Current blade cost :

Application Information

Solid Square	Solid Round	I-Beam	Angle Iron	Channel Iron	Round Tubing	Square Tubing
□	□	□	□	□	□	□

Types of Cutting

□ Single Piece Cut-off

□ Bundled Cut-off

No. Of pieces :

Diameter :

Sketch :

Material being cut	
Type	Grade
□ Non-Ferrous	
□ Mild Carbon Steels	
□ Tool Steels	
□ Stainless Steels	
□ Super Alloys	
□ Other	

Problem with present blade

□ Breaking blades □ Premature dulling

□ Tooth strippage □ Crooked cut

□ Cost

Others :

Requesting Tool / Recommendtions / Remarks

XCEED TOOLINGS PVT. LTD.	User Name		XCUT
	Engg. Name		

Test Data Report

Distributor		Workpiece Sketch & Operation
Industry		
Workpiece Name		
Material & Hardness		
Diameter of work		
Machine Type		

	Description	COMPETITOR		XCUT		Remarks
Tool	Insert (Grade)					
	Tool Holder					
Cutting Condition	Cutting Speed : Vc (m/min)					
	RPM (min^{-1})					
	Feed Rate : f (mm/rev)					
	Cutting Depth : ap (mm)					
	Coolant	☐ Wet ☐ Dry		☐ Wet ☐ Dry		
Test Data		Tool Life		Tool Life		
		pc	min	pc	min	
	1st Edge					
	2nd Edge					
	3rd Edge					
	4th Edge					
	5th Edge					
	6th Edge					
	7th Edge					
	8th Edge					
	Average					
	Results	☐ OK ☐ NG		☐ OK ☐ NG		

No	Facts		XCUT
1	Tool Life / Edge (Average)		
2	Number of Edges		
3	Insert Price (INR)		
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 white column only
☐ Light blue column will calculate automaticaly, do not input data

CAUTION

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.

Notes

Notes

Notes

Notes

Notes

Notes


HEAD OFFICE
REGIONAL OFFICE
BRANCH OFFICE

Marketed By XCEED TOOLING PVT LTD

Plot No. 8, Ground Floor, Gyan Bhavan, Kumta Street, Ballard Estate,
Mumbai- 400001. Maharashtra, India
Mobile: +91-8879640290 Toll Free no.: 1800226676

* Head Office

OUR NETWORK

● AHMEDABAD ● AURANGABAD ● BENGALURU ● CHENNAI ● COIMBATORE ● DELHI ● DUBAI ● INDORE ● KOLHAPUR ● MUMBAI* ● PUNE ● RAJKOT
• Baroda • Belgaum • Hyderabad • Hosur • Nagpur • Nashik • Surat • Raipur • Kolkata • Jamshedpur