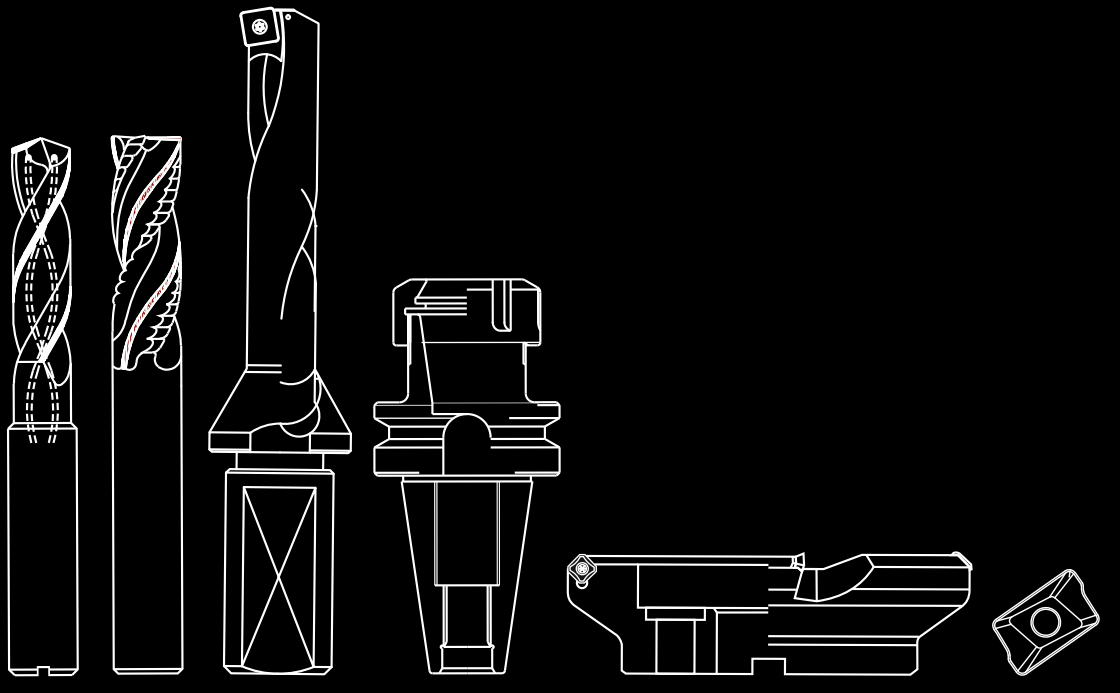
BLOOD®

ROTATING GENIUS

PRODUCT CATALOG



THINK CARBIDE, THINK BLOOD...

DENKEN HARTMETALL, DENKEN BLOOD...

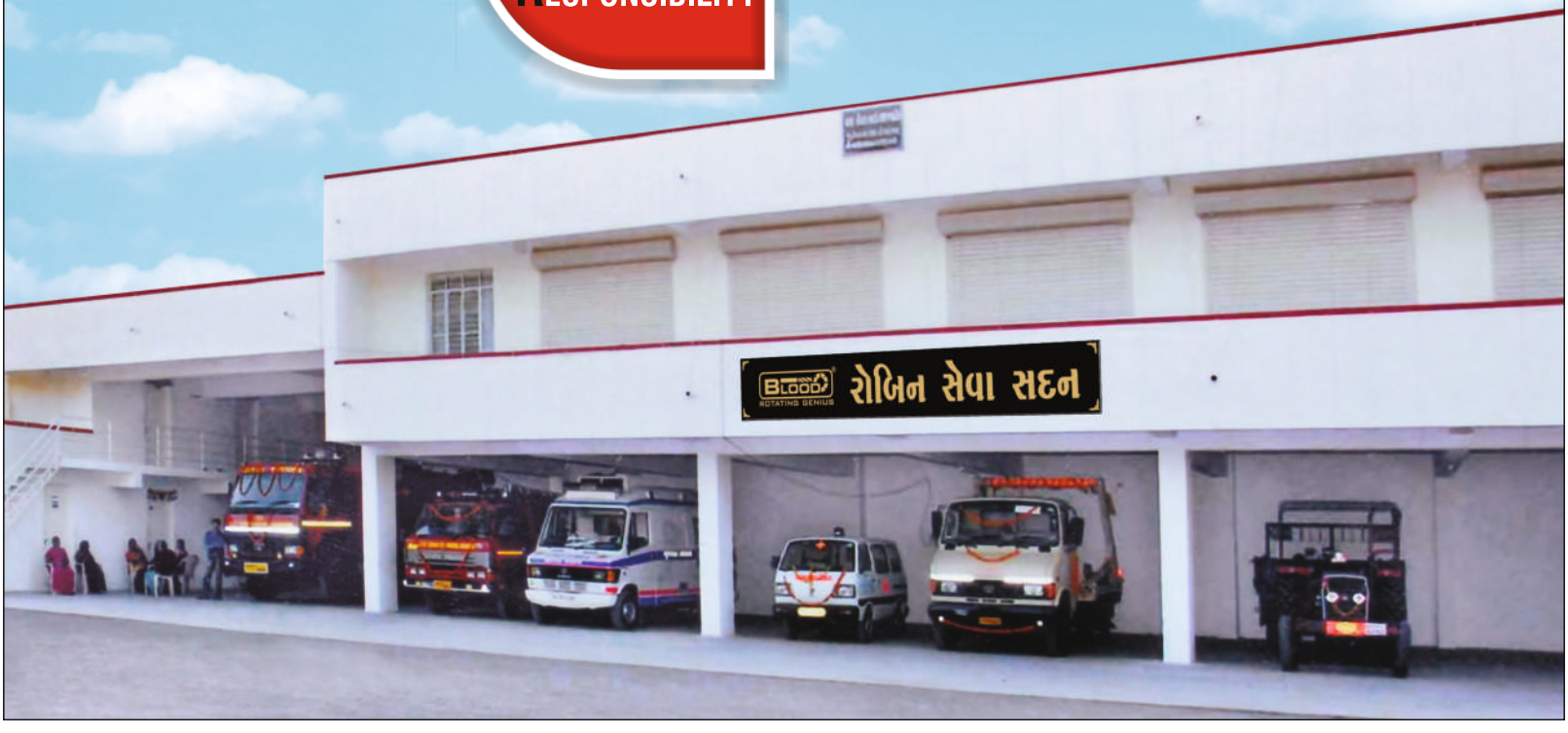
CARBIDE TOOLS | CNC TOOLINGS | INDEXABLE PRODUCTS

Robin Precision Products Pvt. Ltd. plays an important role by generous contribution towards CSR (Corporate Social Responsibility).

We at GIDC Lodhika Indl. Assn., run **Emergency Service Centre** in the name of **Robin Seva Sadan** which houses Fire Station and well equipped Ambulance Van to serve Indl. Estate and nearby rural areas.

Our founder Chairman - **Ramesh Vora** is seen welcoming the then Hon'ble Cabinet Minister Mr. Saurabh Patel (Govt. of Gujarat) at the Inaugural Ceremony on 10th Dec. 2010.

CORPORATE SOCIAL RESPONSIBILITY



From the desk of Director

Dear Customers,

Since our inception, one belief has guided us: excellence is built on precision, consistency, and trust.

What began in 2007 as a vision has today evolved into a complete product range. Solid Carbide Cutting Tools, CNC Toolings, and Indexable Inserts, engineered to deliver performance and reliability across industries.

For us, service is more than availability; it is an attitude of standing with our customers in every machining challenge. That's why each *BLOOD*® product, from an endmill to a tool holder or insert - is not just a tool, but a solution designed for innovation and productivity.

I sincerely thank our customers and partners whose trust fuels our journey. As we move forward, *BLOOD*® Tools remains committed to investing in technology, talent, and service to strengthen our presence as a global brand from India.

"***Cutting • Holding • Indexing - Global Precision from India.***"

Samir Vora
Director

History

Our Journey

Robin Precision Products Pvt. Ltd., part of the Robin Group of Companies, has a proud history of delivering high-quality cutting tools since last four decades.

Our story began in 1979 when our Founder Chairman, Mr. Ramesh Vora, completed his Mechanical Engineering degree. In 1982, he started his own company, Standard Tools, in Rajkot, focussing on manufacturing HSS metal cutting tools with advanced machines and in-house heat treatment. Later in 1991, he entered into textile machinery spares with the launch of Robin Engineering Co.

In 2006, after gaining valuable experience and completing his engineering degree, Mr. Samir Vora with his brothers established Robin Precision Products Pvt. Ltd. to manufacture Solid Carbide Tools and CNC Toolings. At that time, we were proud to be the first and only manufacturer of Solid Carbide Tools in the state of Gujarat.

With a qualified team and a modern hi-tech facility, we launched our premium brand BLOOD®, offering a complete range of Solid Carbide Tools, Carbide Inserts, and CNC Toolings.

Today, we not only serve industries across India but also export our products to international markets, earning trust for our precision, consistency, and customer-first approach.

Our journey continues with a commitment to innovation, quality, and global standards.

From the Desk of Directors

Ramesh Vora
CMD

So far Metal Cutting Tools is concerned, future demand would be more and more stringent and specific. Our future depends on how far we can satisfy the demand.

Samir Vora
Director - Sales & Mktg.

BLOOD® has always been the answer to today's metal cutting challenges. Quality is never something people want less of. And that is where our strength lies. This is how we turn our vision into reality.

Ravi Vora
Director

We have no problem with low-priced competitors because that's what they think their product is worth of. Since our values are stronger than Carbide, we are ready to tackle any challenges that may come across.

Rishi Vora
Director

We do more than simply make tools, by helping our valued customers achieve higher productivity. When you look for cutting tool, you are looking for a better solution. And that is a role we are already comfortable with.

Core Purpose:

"To improve productivity by providing optimum tooling solutions"

Core Values:

- Business Ethics
- Teamwork
- Customer Focus
- Quick Management Action
- Innovation
- Safety

Mission Statement:

We at **Robin Precision Products Pvt. Ltd.** strive hard to offer better quality tools at very attractive prices.

Our mission is to create optimum tooling solutions that help our valued customers meet their CNC Tooling challenges-no matter how demanding those challenges may be.

To do this, we focus our every resource necessary to :

- Understand the customer's needs.
- Design & develop tooling that matches the customer's requirement for speed, precision and tool life.
- Deliver tools on schedule every time.
- Follow-up after the sale to ensure customer satisfaction.

Core Desire: Step by step to the top

www.bloodtools.com

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Carbide Tools

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Carbide Tools

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Indexable Products

BLOOD®
ROTATING GENIUS

CARBIDE TOOLS

TECHNICAL INTRODUCTION

ICON GUIDE

1	Endface Type	Square End 	Ballnose 	Corner Radius 	Corner Chamfer 	90° 	118° 	140° 
2	Helix Angle	Helix  5°	Helix  7°	Helix  30°	Helix  45°	Helix  48°	Helix  55°	Variable Helix  X° Y°
3	No. of Flutes	Flutes Z = 1	Flutes Z = 2	Flutes Z = 3	Flutes Z = 4	Flutes Z = 6	Flutes Z = 8	Flutes Z = 10
4	Material Series	Series Regular	Series B+ve	Series iSeries	Series NF	Series O+ve		
5	Work Material Hardness	HRC Regular ≈35	HRC B+ve ≤48	HRC iSeries / O+ve ≤62				
6	Coating	Coating Duro Coat	Coating Tuff Coat	Coating Ultra Coat				
7	Tool Length Series	Tool Length R	Tool Length L	Tool Length X	L x D 2	L x D 3	L x D 5	L x D 8
8	Tolerance	Shank Dia h6	Mill Dia e8	Drill Dia m7	Reamer Dia H7			
9	Standard	Standard DIN 6537	Standard DIN 333 A	Standard BS 328				

TOOL SELECTION CHART

Series Code	Regular	B+ve	Aluminister NF	iSeries	O+ve
Material	MS, CI, EN-8, & all Non-Hardened Steel	SS, High Carbon Steel, EN-9, EN-21, High Alloy Steel, Case Hardened Steel	Aluminium, Brass, Copper and all Non-Ferrous Material	Tool S.S., Hot Die Steel, OHNS, EN-31, P20, all Hardened Steel	Applicable for all ISO Work Materials
Hardness	upto 30~40 HRC	upto 48 ≤ HRC	NA	upto 62 ≤ HRC	upto 30~62 HRC
Coating	Duro Coat	Duro Coat	Ultra Coat	Tuff Coat	Tuff Coat
Raw Material	10% Cobalt Grain Size 0.5 um	12% Cobalt Grain Size 0.3 um	10% Cobalt Grain Size 0.5 um	12% Cobalt Grain Size 0.2 um	12% Cobalt Grain Size 0.2 um

1. WORKPIECE MATERIAL

STEEL
Reference material:
Low alloy steel, CMC02.1/HB 180.

ALUMINIUM ALLOYS
Reference material:
Cast, non-ageing, CMC 30.21/HB 75.

STAINLESS STEEL
Reference material:
Austenitic stainless steel,
CMC 05.21HB 180.

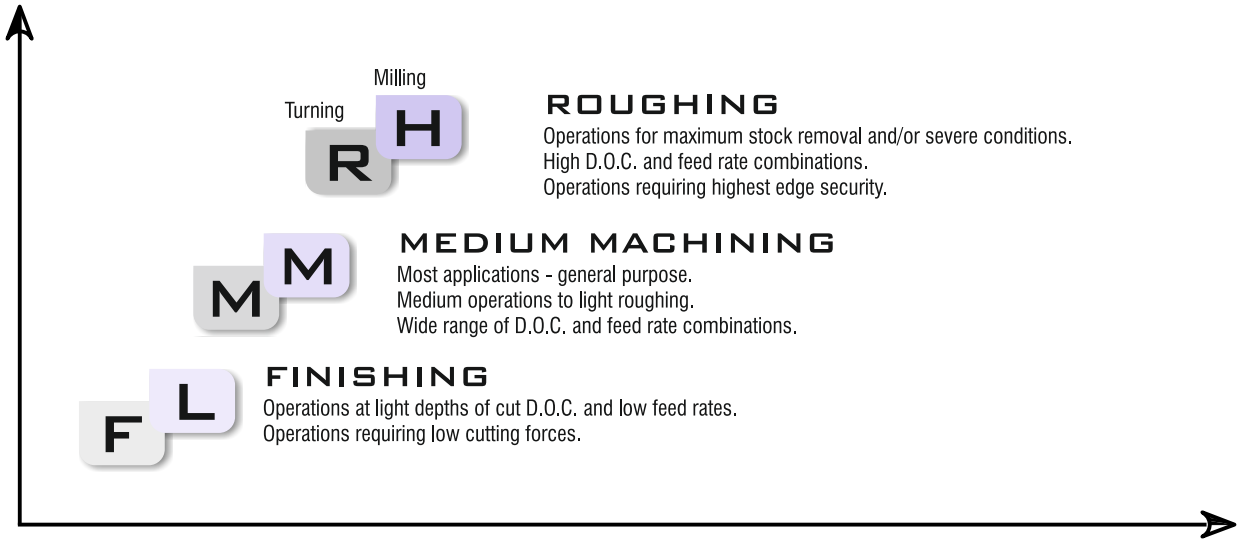
HEAT RESISTANT ALLOYS
Reference material:
Ni-based, CMC 20.22/Hb 350.

CAST IRON
Reference material:
Grey cast iron, CMC 08.2/HB 220
Nodular cast iron, CMC 09.2/HB 250.

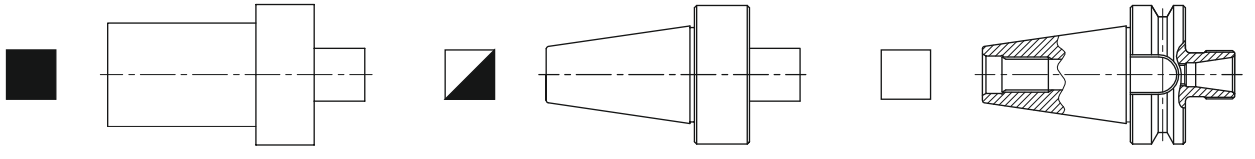
HARDENED STEEL
Reference material:
Hardened and tempered,
CMC 04.1/HRC 60.

2. TYPE OF APPLICATION (TURNING/MILLING)

a_p Depth of cut, mm



3. MACHINING CONDITIONS



GOOD CONDITIONS
- Continuous cuts. High speeds.
- Pre-machined work piece.
- Excellent component clamping.
- Small overhangs.

AVERAGE CONDITIONS
- Profiling cuts. Moderate speeds.
- Forged or cast workpiece.
- Good component clamping.

DIFFICULT CONDITIONS
- Interrupted cuts.
- Low speeds.
- Heavy cast or forged skin on workpiece.
- Poor component clamping.

GENERAL INFORMATION:

RPM Conversion Table

Dia mm	Cutting Speed m / min													
	20	30	40	50	60	70	80	90	100	120	140	150	180	200
1.0	6370	9550	12740	15920	19110	22290	25480	28660	31850	38220	44590	47770	57320	63690
1.2	5310	7960	10620	13270	15920	18580	21230	23890	26540	31850	37150	39810	47770	53080
1.5	4250	6370	8490	10620	12740	14860	16990	19110	21230	25480	29720	31850	38220	42460
1.8	3540	5310	7080	8850	10620	12380	14150	15920	17690	21230	24770	26540	31850	35390
2.0	3180	4780	6370	7960	9550	11150	12740	14330	15920	19110	22290	23890	28660	31850
2.2	2900	4340	5790	7240	8690	10130	11580	13030	14480	17370	20270	21710	26060	28950
2.5	2550	3820	5100	6370	7640	8920	10190	11460	12740	15290	17830	19110	22930	25480
2.8	2270	3410	4550	5690	6820	7960	9100	10240	11370	13650	15920	17060	20470	22750
3.0	2120	3180	4250	5310	6370	7430	8490	9550	10620	12740	14860	15920	19110	21230
3.5	1820	2730	3640	4550	5460	6370	7280	8190	9100	10920	12740	13650	16380	18200
4.0	1590	2390	3180	3980	4780	5570	6370	7170	7960	9550	11150	11940	14330	15920
4.5	1420	2120	2830	3540	4250	4950	5660	6370	7080	8490	9910	10620	12740	14150
5.0	1270	1910	2550	3180	3820	4460	5100	5730	6370	7640	8920	9550	11460	12740
5.5	1160	1740	2320	2900	3470	4050	4630	5210	5790	6950	8110	8690	10420	11580
6.0	1060	1590	2120	2650	3180	3720	4250	4780	5310	6370	7430	7960	9550	10620
6.5	980	1470	1960	2450	2940	3430	3920	4410	4900	5880	6860	7350	8820	9800
7.0	910	1360	1820	2270	2730	3180	3640	4090	4550	5460	6370	6820	8190	9100
7.5	850	1270	1700	2120	2550	2970	3400	3820	4250	5100	5940	6370	7640	8490
8.0	800	1190	1590	1990	2390	2790	3180	3580	3980	4780	5570	5970	7170	7960
8.5	750	1120	1500	1870	2250	2620	3000	3370	3750	4500	5250	5620	6740	7490
9.0	710	1060	1420	1770	2120	2480	2830	3180	3540	4250	4950	5310	6370	7080
9.5	670	1010	1340	1680	2010	2350	2680	3020	3350	4020	4690	5030	6030	6700
10	640	960	1270	1590	1910	2230	2550	2870	3180	3820	4460	4780	5730	6370
11	580	870	1160	1450	1740	2030	2320	2610	2900	3470	4050	4340	5210	5790
12	530	800	1060	1330	1590	1860	2120	2390	2650	3180	3720	3980	4780	5310
13	490	730	980	1220	1470	1710	1960	2200	2450	2940	3430	3670	4410	4900
14	450	680	910	1140	1360	1590	1820	2050	2270	2730	3180	3410	4090	4550
15	420	640	850	1060	1270	1490	1700	1910	2120	2550	2970	3180	3820	4250
16	400	600	800	1000	1190	1390	1590	1790	1990	2390	2790	2990	3580	3980
17	370	560	750	940	1120	1310	1500	1690	1870	2250	2620	2810	3370	3750
18	350	530	710	880	1060	1240	1420	1590	1770	2120	2480	2650	3180	3540
19	340	500	670	840	1010	1170	1340	1510	1680	2010	2350	2510	3020	3350
20	320	480	640	800	960	1110	1270	1430	1590	1910	2230	2390	2870	3180
21	300	450	610	760	910	1060	1210	1360	1520	1820	2120	2270	2730	3030
22	290	430	580	720	870	1010	1160	1300	1450	1740	2030	2170	2610	2900
23	280	420	550	690	830	970	1110	1250	1380	1660	1940	2080	2490	2770
24	270	400	530	660	800	930	1060	1190	1330	1590	1860	1990	2390	2650
25	250	380	510	640	760	890	1020	1150	1270	1530	1780	1910	2290	2550

ISO Tolerance Measure Table (mm)

Dia (mm)	< 3	3-6	6-10	10-18	18-30	30-50	50-65	65-80
e7	-14	-20	-25	-32	-40	-50	-60	-60
	-24	-32	-40	-50	-61	-75	-90	-90
e8	-14	-20	-25	-32	-40	-50	-60	-60
	-28	-38	-47	-59	-73	-89	-106	-106
e9	-14	-20	-25	-32	-40	-50	-60	-60
	-39	-50	-61	-75	-92	-112	-134	-134
h5	0	0	0	0	0	0	0	0
	-4	-5	-6	-8	-9	-11	-13	-13
h6	0	0	0	0	0	0	0	0
	-6	-8	-9	-11	-13	-16	-19	-19
h7	0	0	0	0	0	0	0	0
	-10	-12	-15	-18	-21	-25	-30	-30
h8	0	0	0	0	0	0	0	0
	-14	-18	-22	-27	-33	-39	-46	-46
h9	0	0	0	0	0	0	0	0
	-25	-30	-36	-43	-52	-62	-74	-74
h10	0	0	0	0	00	0	0	0
	-40	-48	-58	-70	-84	-100	-120	-120
h11	0	0	0	0	0	0	0	0
	-60	-75	-90	-110	-130	-160	-190	-190
h16	0	0	0	0	0	0	0	0
	-600	-750	-900	-1100	-1300	-1600	-1900	-1900
js14	+125	+150	+180	+215	+260	+310	+370	+370
	-125	-150	-180	-215	-260	-310	-370	-370
js16	+300	+375	+450	+550	+650	+800	+950	+950
	-300	-375	-450	-550	-650	-800	-950	-950
k11	+60	+75	+90	+110	+130	+160	+190	+190
	0	0	0	0	0	0	0	0
k12	+100	+120	+150	+180	+210	+250	+300	+300
	0	0	0	0	0	0	0	0
m6	+8	+12	+15	+18	+21	+25	+30	+30
	+2	+4	+6	+7	+8	+9	+11	+11
m7	+12	+16	+21	+25	+29	+34	+41	+41
	+2	+4	+6	+7	+8	+9	+11	+11
z9	+51	+65	+78	+103	+140	+198	+246	+284
	+26	+35	+42	+60	+88	+136	+172	+210
H5	+4	+5	+6	+8	+9	+11	+13	+13
	0	0	0	0	0	0	0	0
H6	+6	+8	+9	+11	+13	+16	+19	+19
	0	0	0	0	0	0	0	0
H7	+10	+12	+15	+18	+21	+25	+30	+30
	0	0	0	0	0	0	0	0
H8	+14	+18	+22	+27	+33	+39	+46	+46
	0	0	0	0	0	0	0	0
H9	+25	+30	+36	+43	+52	+62	+74	+74
	0	0	0	0	0	0	0	0
H10	+40	+48	+58	+70	+84	+100	+120	+120
	0	0	0	0	0	0	0	0
H11	+60	+75	+90	+110	+130	+160	+190	190
	0	0	0	0	0	0	0	0
P6	-6	-9	-12	-15	-18	-21	-26	-26
	-12	-17	-21	-26	-31	-37	-45	-45
P7	-6	-8	-9	-11	-14	-17	-21	-21
	-16	-20	-24	-29	-35	-42	-51	-51
P9	-6	-12	-15	-18	-22	-26	-32	-32
	-31	-42	-51	-61	-74	-88	-106	-106

BLOOD®
ROTATING GENIUS

ENDMILLS

NOMENCLATURE FOR SOLID CARBIDE CUTTING TOOLS

1. TOOL TYPE

E = End Mill
F = Rougher
D = High Performance Drill
SD = Step Drill
R = Reamer
CD = Center Drill
DM = Drill Mill
HM = Hole Mill
GRB = Ground Rod Blank

2. END SHAPE

End Mill End Shape	Drill Point Angle
S = Square End	X = 118°
B = Ball Nose	Y = 140°
R = Corner Radius	Z = Other than X & Y
F = Rougher	

- "i" Before item code for ordering i-Series tools.

3. HELIX ANGLE

A = 10° - 20°
B = 20° - 30°
C = 30° - 45°
D = 50° - 60°
F = Other than above

4. FLUTES

END MILL No. of Flutes	DRILL Flute Length
1 = Single Flute	2 = 2 x D
2 = Two Flute	3 = 3 x D
3 = Three Flute	5 = 5 x D
4 = Four Flute	8 = 8 x D
6 = Six Flute	S = Stub

5. CUTTING DIA

END MILL	DRILL	CENTER DRILL
060 = 6 mm	032 = 3.2 mm	160 = 1.6 mm
080 = 8 mm	100 = 10.0 mm	250 = 2.5 mm
100 = 10 mm	125 = 12.5 mm	630 = 6.3 mm

6. SHANK DIA

CENTER DRILL
040 = 4.0 mm
063 = 6.3 mm
160 = 16.0 mm

7. SERIES

S = Stub	TC = Through Coolant
R = Regular	STN = Stub Taper Neck
L = Long	LN = Long Neck
X = Extra Long	TN = Taper Neck
XL = Extreme Long	

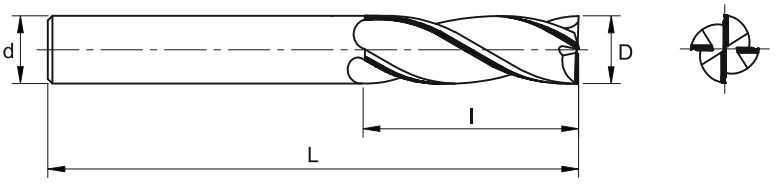
8. MATERIAL SERIES

R
B+ve
O+ve
NF
iSeries

SOLID CARBIDE SQUARE ENDMILL
REGULAR SERIES

Square End	Series	Helix	Flutes	HRC
	Regular	 30°	Z = 2 Z = 4	≈35

Coating	Tool Length	Shank Dia	Mill Dia
Duro Coat	R	h6	e8



ESB4 R

ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
ESB2 005 R	0.5	4	1.25	50
ESB2 008 R	0.8	4	1.50	50
ESB4 010 R	1.0	4	3	50
ESB4 015 R	1.5	4	4	50
ESB4 020 R	2.0	4	6	50
ESB4 025 R	2.5	4	8	50
ESB4 030 R	3	3	10	39
ESB4 035 R	3.5	3.5	10	39
ESB4 040 R	4	4	14	50
ESB4 045 R	4.5	4.5	15	50
ESB4 050 R	5	5	16	50
ESB4 055 R	5.5	5.5	16	50
ESB4 060 R	6	6	19	64
ESB4 065 R	6.5	6.5	19	64

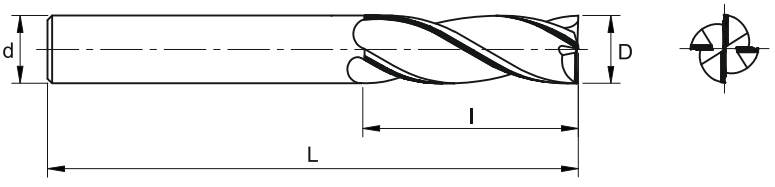
ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
ESB4 070 R	7	7	19	64
ESB4 080 R	8	8	21	64
ESB4 090 R	9	9	21	64
ESB4 100 R	10	10	25	70
ESB4 110 R	11	11	25	70
ESB4 120 R	12	12	25	75
ESB4 130 R	13	13	26	75
ESB4 140 R	14	14	30	80
ESB4 150 R	15	15	30	80
ESB4 160 R	16	16	32	80
ESB4 180 R	18	18	35	100
ESB4 200 R	20	20	38	100
ESB4 220 R	22	22	38	100
ESB4 250 R	25	25	38	100

- ESB2 Series (2 Flutes) available on request
- Intermediate sizes, Weldon Flat available on request

SOLID CARBIDE SQUARE ENDMILL LONG SERIES

Square End	Series	Helix	Flutes	HRC
	Regular	30°	Z = 4	≈35

Coating	Tool Length	Shank Dia	Mill Dia
Duro Coat	L	h6	e8



ESB4 L

P M K N S H

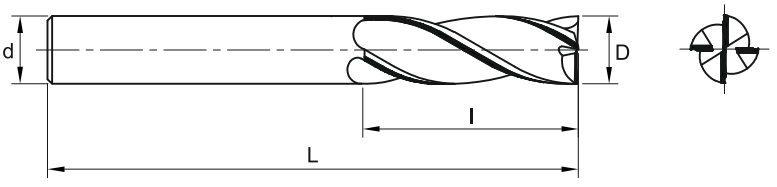
ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
ESB4 030 L	3	3	19	57
ESB4 040 L	4	4	19	57
ESB4 050 L	5	5	25	64
ESB4 060 L	6	6	28	75
ESB4 080 L	8	8	29	75
ESB4 100 L	10	10	32	75
ESB4 120 L	12	12	51	100
ESB4 140 L	14	14	57	127
ESB4 160 L	16	16	57	127
ESB4 180 L	18	18	57	127
ESB4 200 L	20	20	57	127
ESB4 250 L	25	25	57	127

- ESB2 Series (2 Flutes) available on request
- Intermediate sizes, Weldon Flat available on request

SOLID CARBIDE SQUARE ENDMILL
EXTRA LONG SERIES

Square End	Series	Helix	Flutes	HRC
	Regular	 30°	Z = 4	≈35

Coating	Tool Length	Shank Dia	Mill Dia
Duro Coat	X	h6	e8



END MILLS

ESB4 X

P M K N S H

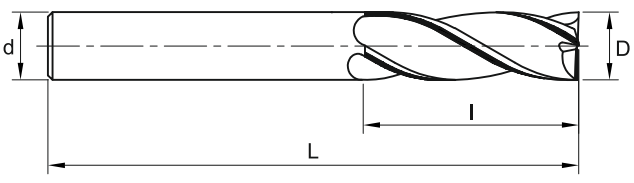
ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
ESB4 030 X	3	3	25	75
ESB4 040 X	4	4	28	75
ESB4 050 X	5	5	32	75
ESB4 060 X	6	6	39	100
ESB4 080 X	8	8	42	100
ESB4 100 X	10	10	45	100
ESB4 120 X	12	12	76	150
ESB4 140 X	14	14	76	150
ESB4 160 X	16	16	76	150
ESB4 180 X	18	18	76	150
ESB4 200 X	20	20	76	150
ESB4 250 X	25	25	76	150

- ESB2 Series (2 Flutes) available on request
- Intermediate sizes, Weldon Flat available on request
- i-Series available on request

SOLID CARBIDE SQUARE ENDMILL
XL SERIES

Square End	Series	Helix	Flutes	HRC
	Regular	 30°	Z = 4	≈35

Coating	Tool Length	Shank Dia	Mill Dia
Duro Coat	XL	h6	e8



ESB4 XL

P M K N S H

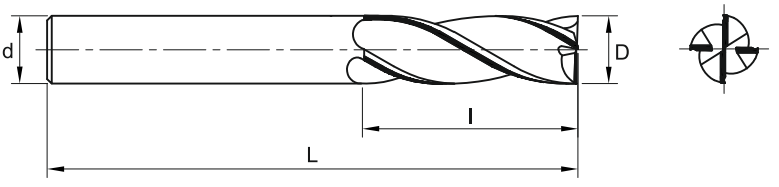
ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
ESB4 030 XL	3	3	25	100
ESB4 040 XL	4	4	28	100
ESB4 050 XL	5	5	32	100
ESB4 060 XL	6	6	40	150
ESB4 080 XL	8	8	42	150
ESB4 100 XL	10	10	45	150
ESB4 120 XL	12	12	76	200
ESB4 160 XL	16	16	76	200
ESB4 200 XL	20	20	76	200
ESB4 250 XL	25	25	76	200

- B+ve Series available on request
- i-Series available on request

SOLID CARBIDE SQUARE ENDMILL
XXL SERIES

Square End	Series	Helix	Flutes	HRC
	Regular	30°	Z = 4	≈35

Coating	Tool Length	Shank Dia	Mill Dia
Duro Coat	XXL	h6	e8



P M K N S H

ESB4 XXL

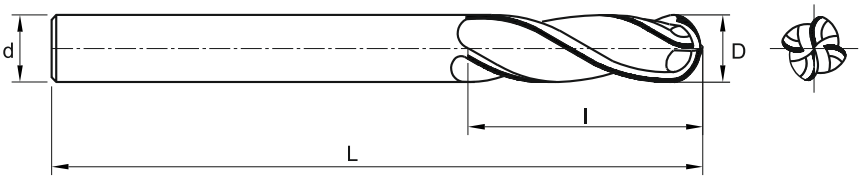
ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
ESB4 060 XXL	6	6	45	200
ESB4 080 XXL	8	8	50	200
ESB4 100 XXL	10	10	65	200
ESB4 120 XXL	12	12	76	250
ESB4 160 XXL	16	16	76	250
ESB4 200 XXL	20	20	76	250

- B+ve Series available on request
- i-Series available on request

SOLID CARBIDE BALLNOSE ENDMILL
REGULAR SERIES

Ballnose	Series	Helix	Flutes	Coating
	Regular	30°	Z = 2 Z = 4	Duro Coat

Tool Length	Shank Dia	Mill Dia	HRC
R	h6	e8	≈35



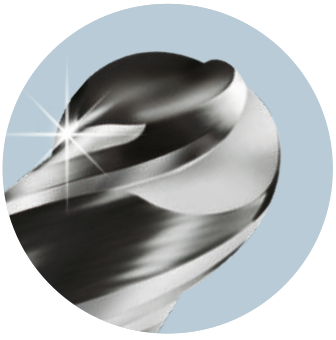
EBB4 R

P M K N S H

ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
EBB2 005 R	0.5	4	1.25	50
EBB2 008 R	0.5	4	1.25	50
EBB4 010 R	1.0	4	3	50
EBB4 015 R	1.5	4	4	50
EBB4 020 R	2.0	4	5	50
EBB4 025 R	2.5	4	7	50
EBB4 030 R	3	4	10	39
EBB4 035 R	3.5	3.5	10	39
EBB4 040 R	4	4	14	50
EBB4 045 R	4.5	4.5	14	50
EBB4 050 R	5	5	16	50
EBB4 055 R	5.5	5.5	16	50
EBB4 060 R	6	6	19	64
EBB4 065 R	6.5	6.5	19	64

ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
EBB4 070 R	7	7	19	64
EBB4 080 R	8	8	21	64
EBB4 090 R	9	9	21	64
EBB4 100 R	10	10	25	70
EBB4 110 R	11	11	25	70
EBB4 120 R	12	12	25	75
EBB4 130 R	13	13	26	75
EBB4 140 R	14	14	30	80
EBB4 150 R	15	15	30	80
EBB4 160 R	16	16	32	80
EBB4 180 R	18	18	35	100
EBB4 200 R	20	20	38	100
EBB4 220 R	22	22	38	100
EBB4 250 R	25	25	38	100

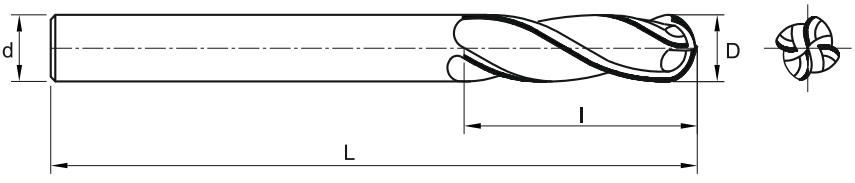
- EBB2 Series (2 Flutes) available on request
- Intermediate sizes, Weldon Flat available on request



SOLID CARBIDE BALLNOSE ENDMILL LONG SERIES

Ballnose	Series	Helix	Flutes	HRC
	Regular	30°	Z = 4	≈35

Coating	Tool Length	Shank Dia	Mill Dia
Duro Coat	L	h6	e8

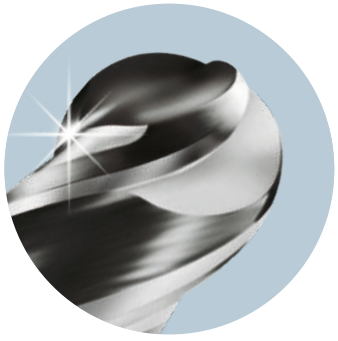


EBB4 L

P M K N S H

ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
EBB4 030 L	3	3	19	57
EBB4 040 L	4	4	19	57
EBB4 050 L	5	5	25	64
EBB4 060 L	6	6	28	75
EBB4 080 L	8	8	29	75
EBB4 100 L	10	10	32	75
EBB4 120 L	12	12	51	100
EBB4 140 L	14	14	57	127
EBB4 160 L	16	16	57	127
EBB4 180 L	18	18	57	127
EBB4 200 L	20	20	57	127
EBB4 250 L	25	25	57	127

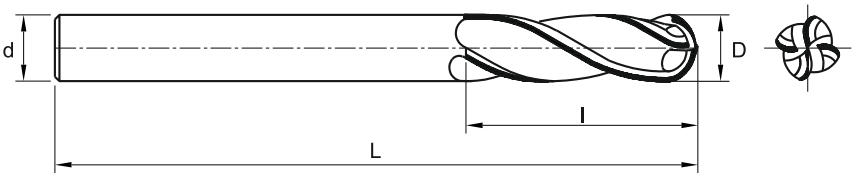
- EBB2 Series (2 Flutes) available on request
- Intermediate sizes, Weldon Flat available on request
- i-Series available on request



SOLID CARBIDE BALLNOSE ENDMILL
EXTRA LONG SERIES

Ballnose	Series	Helix	Flutes	HRC
	Regular	 30°	Z = 4	≈35

Coating	Tool Length	Shank Dia	Mill Dia
Duro Coat	X	h6	e8

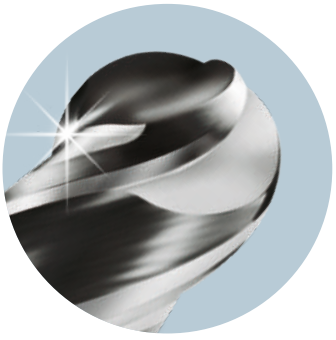


EBB4 X

P M K N S H

ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
EBB4 030 X	3	3	25	75
EBB4 040 X	4	4	28	75
EBB4 050 X	5	5	32	75
EBB4 060 X	6	6	39	100
EBB4 080 X	8	8	42	100
EBB4 100 X	10	10	45	100
EBB4 120 X	12	12	76	150
EBB4 140 X	14	14	76	150
EBB4 160 X	16	16	76	150
EBB4 180 X	18	18	76	150
EBB4 200 X	20	20	76	150
EBB4 250 X	25	25	76	150

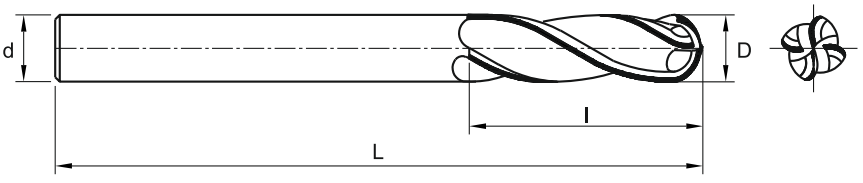
- EBB2 Series (2 Flutes) available on request
- Intermediate sizes, Weldon Flat available on request
- i-Series available on request



SOLID CARBIDE BALLNOSE ENDMILL
XL SERIES

Ballnose	Series	Helix	Flutes	HRC
	Regular	30°	Z = 4	≈35

Coating	Tool Length	Shank Dia	Mill Dia
Duro Coat	XL	h6	e8

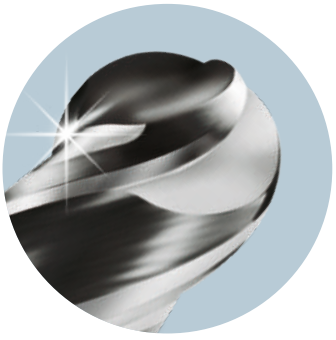


EBB4 XL

P	M	K	N	S	H
■	◪	■	◪	□	□

ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
EBB4 030 XL	3	3	25	100
EBB4 040 XL	4	4	28	100
EBB4 050 XL	5	5	32	100
EBB4 060 XL	6	6	40	150
EBB4 080 XL	8	8	42	150
EBB4 100 XL	10	10	45	150
EBB4 120 XL	12	12	76	200
EBB4 160 XL	16	16	76	200
EBB4 200 XL	20	20	76	200

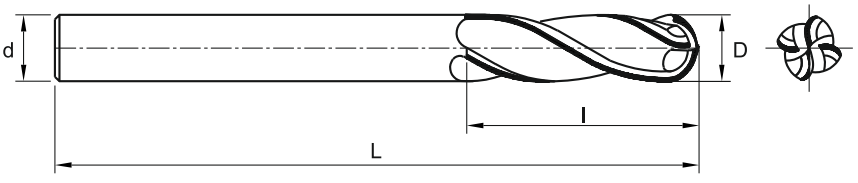
- EBB2 Series (2 Flutes) available on request
- Intermediate sizes, Weldon Flat available on request



SOLID CARBIDE BALLNOSE ENDMILL
XXL SERIES

Ballnose	Series	Helix	Flutes	HRC
	Regular	 30°	Z = 4	≈35

Coating	Tool Length	Shank Dia	Mill Dia
Duro Coat	XXL	h6	e8



EBB4 XXL

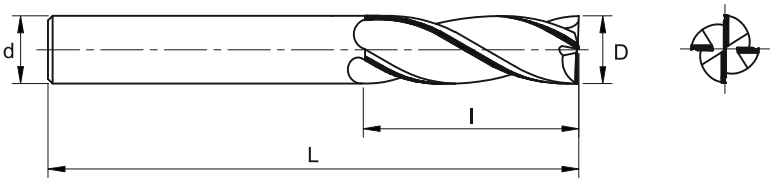
ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
EBB4 060 XXL	6	6	45	200
EBB4 080 XXL	8	8	50	200
EBB4 100 XXL	10	10	65	200
EBB4 120 XXL	12	12	76	250
EBB4 160 XXL	16	16	76	250
EBB4 200 XXL	20	20	76	250

- B+ve Series available on request
- i-Series available on request

SOLID CARBIDE SQUARE ENDMILL
B+VE SERIES

Square End	Series	Helix	Flutes	HRC
	B+ve	 30°	Z = 2 Z = 4	≤48

Coating	Tool Length	Shank Dia	Mill Dia
Duro Coat	R	h6	e8



ESB4 R B+ve

P M K N S H

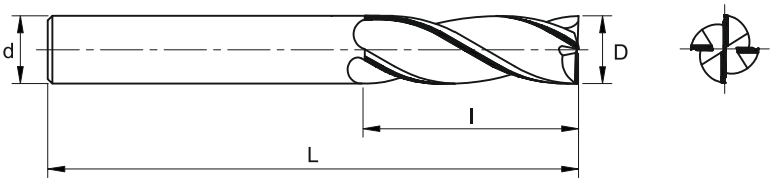
ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L	ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
ESB2 005 R B+ve	0.5	4	1.25	50	ESB4 070 R B+ve	7	7	19	64
ESB2 008 R B+ve	0.8	4	1.50	50	ESB4 080 R B+ve	8	8	21	64
ESB4 010 R B+ve	1.0	4	3	50	ESB4 090 R B+ve	9	9	21	64
ESB4 015 R B+ve	1.5	4	4	50	ESB4 100 R B+ve	10	10	25	70
ESB4 020 R B+ve	2.0	4	6	50	ESB4 110 R B+ve	11	11	25	70
ESB4 025 R B+ve	2.5	4	8	50	ESB4 120 R B+ve	12	12	25	75
ESB4 030 R B+ve	3	3	10	39	ESB4 130 R B+ve	13	13	26	75
ESB4 035 R B+ve	3.5	3.5	10	39	ESB4 140 R B+ve	14	14	30	80
ESB4 040 R B+ve	4	4	14	50	ESB4 150 R B+ve	15	15	30	80
ESB4 045 R B+ve	4.5	4.5	15	50	ESB4 160 R B+ve	16	16	32	80
ESB4 050 R B+ve	5	5	16	50	ESB4 180 R B+ve	18	18	35	100
ESB4 055 R B+ve	5.5	5.5	16	50	ESB4 200 R B+ve	20	20	38	100
ESB4 060 R B+ve	6	6	19	64	ESB4 220 R B+ve	22	22	38	100
ESB4 065 R B+ve	6.5	6.5	19	64	ESB4 250 R B+ve	25	25	38	100

- ESB2 Series (2 Flutes) available on request
- Long & Extra Long Series available on request
- Intermediate sizes, Weldon Flat available on request

SOLID CARBIDE SQUARE ENDMILL
iSERIES

Square End	Series	Helix	Flutes	HRC
	iSeries	30°	Z = 4	≤62

Coating	Tool Length	Shank Dia	Mill Dia
Tuff Coat	R	h6	e8



P M K N S H

iESB4 R B+ve

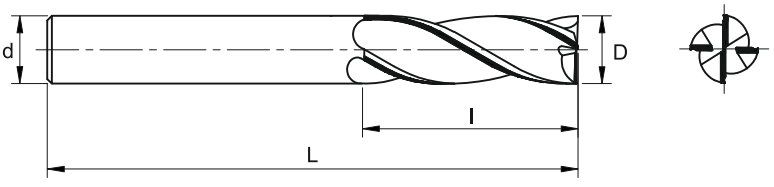
ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
iESB4 030 R B+ve	3	3	10	39
iESB4 040 R B+ve	4	4	14	50
iESB4 050 R B+ve	5	5	16	50
iESB4 060 R B+ve	6	6	19	64
iESB4 080 R B+ve	8	8	21	64
iESB4 100 R B+ve	10	10	25	70
iESB4 120 R B+ve	12	12	25	75
iESB4 140 R B+ve	14	14	30	80
iESB4 160 R B+ve	16	16	32	80
iESB4 180 R B+ve	18	18	35	100
iESB4 200 R B+ve	20	20	38	100
iESB4 250 R B+ve	25	25	38	100

- iESB2 Series (2 Flutes) available on request
- Intermediate sizes, Weldon Flat available on request

SOLID CARBIDE SQUARE ENDMILL
iSERIES (LONG)

Square End	Series	Helix	Flutes	HRC
	iSeries	 30°	Z = 4	≤62

Coating	Tool Length	Shank Dia	Mill Dia
Tuff Coat	L	h6	e8



P M K N S H

iESB4 L B+ve

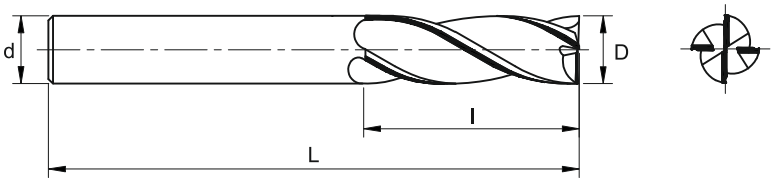
ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
iESB4 030 L B+ve	3	3	19	57
iESB4 040 L B+ve	4	4	19	57
iESB4 050 L B+ve	5	5	25	64
iESB4 060 L B+ve	6	6	28	75
iESB4 080 L B+ve	8	8	29	75
iESB4 100 L B+ve	10	10	32	75
iESB4 120 L B+ve	12	12	51	100
iESB4 140 L B+ve	14	14	57	127
iESB4 160 L B+ve	16	16	57	127
iESB4 180 L B+ve	18	18	57	127
iESB4 200 L B+ve	20	20	57	127
iESB4 250 L B+ve	25	25	57	127

- iESB2 Series (2 Flutes) available on request
- Intermediate sizes, Weldon Flat available on request

SOLID CARBIDE SQUARE ENDMILL iSERIES (EXTRA LONG)

Square End	Series	Helix	Flutes	HRC
	iSeries	 30°	Z = 4	≤62

Coating	Tool Length	Shank Dia	Mill Dia
Tuff Coat	X	h6	e8



iESB4 X B+ve

P M K N S H

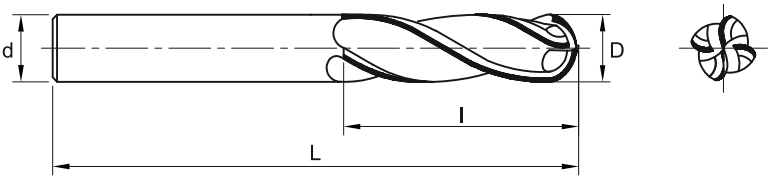
ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
iESB4 030 X B+ve	3	3	25	75
iESB4 040 X B+ve	4	4	28	75
iESB4 050 X B+ve	5	5	32	75
iESB4 060 X B+ve	6	6	39	100
iESB4 080 X B+ve	8	8	42	100
iESB4 100 X B+ve	10	10	45	100
iESB4 120 X B+ve	12	12	76	150
iESB4 140 X B+ve	14	14	76	150
iESB4 160 X B+ve	16	16	76	150
iESB4 180 X B+ve	18	18	76	150
iESB4 200 X B+ve	20	20	76	150
iESB4 250 X B+ve	25	25	76	150

- iESB2 Series (2 Flutes) available on request
- Intermediate sizes, Weldon Flat available on request

SOLID CARBIDE BALLNOSE ENDMILL
B+VE SERIES

Ballnose	Series	Helix	Flutes	HRC
	B+ve	 30°	Z = 2 Z = 4	≤48

Coating	Tool Length	Shank Dia	Mill Dia
Duro Coat	R	h6	e8



EBB4 R B+ve

P M K N S H

ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
EBB2 005 R B+ve	0.5	4	1.25	50
EBB2 008 R B+ve	0.8	4	1.25	50
EBB4 010 R B+ve	1.0	4	3	50
EBB4 015 R B+ve	1.5	4	4	50
EBB4 020 R B+ve	2.0	4	5	50
EBB4 025 R B+ve	2.5	4	7	50
EBB4 030 R B+ve	3	3	10	39
EBB4 035 R B+ve	3.5	3.5	10	39
EBB4 040 R B+ve	4	4	14	50
EBB4 045 R B+ve	4.5	4.5	14	50
EBB4 050 R B+ve	5	5	16	50
EBB4 055 R B+ve	5.5	5.5	16	50
EBB4 060 R B+ve	6	6	19	64
EBB4 065 R B+ve	6.5	6.5	19	64

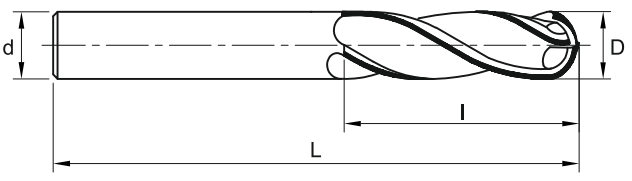
ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
EBB4 070 R B+ve	7	7	19	64
EBB4 080 R B+ve	8	8	21	64
EBB4 090 R B+ve	9	9	21	64
EBB4 100 R B+ve	10	10	25	70
EBB4 110 R B+ve	11	11	25	70
EBB4 120 R B+ve	12	12	25	75
EBB4 130 R B+ve	13	13	26	75
EBB4 140 R B+ve	14	14	30	80
EBB4 150 R B+ve	15	15	30	80
EBB4 160 R B+ve	16	16	32	80
EBB4 180 R B+ve	18	18	35	100
EBB4 200 R B+ve	20	20	38	100
EBB4 220 R B+ve	22	22	38	100
EBB4 250 R B+ve	25	25	38	100

- EBB2 Series (2 Flutes) available on request
- Long & Extra Long Series available on request
- Intermediate sizes, Weldon Flat available on request

SOLID CARBIDE BALLNOSE ENDMILL
iSERIES

Ballnose	Series	Helix	Flutes	HRC
	iSeries	 30°	Z = 4	≤62

Coating	Tool Length	Shank Dia	Mill Dia
Tuff Coat	R	h6	e8



iEBB4 R B+ve

P M K N S H

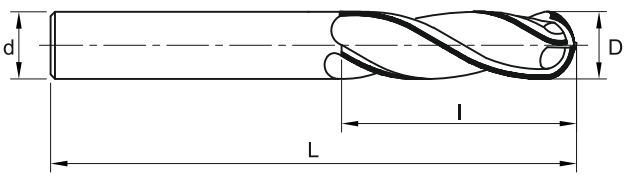
ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
iEBB4 030 R B+ve	3	3	10	39
iEBB4 040 R B+ve	4	4	14	50
iEBB4 050 R B+ve	5	5	16	50
iEBB4 060 R B+ve	6	6	19	64
iEBB4 080 R B+ve	8	8	21	64
iEBB4 100 R B+ve	10	10	25	70
iEBB4 120 R B+ve	12	12	25	75
iEBB4 140 R B+ve	14	14	30	80
iEBB4 160 R B+ve	16	16	32	80
iEBB4 180 R B+ve	18	18	35	100
iEBB4 200 R B+ve	20	20	38	100
iEBB4 250 R B+ve	25	25	38	100

• iEBB2 Series available on request

SOLID CARBIDE BALLNOSE ENDMILL iSERIES (LONG)

Ballnose	Series	Variable Helix	Flutes	HRC
	iSeries	 30°	Z = 4	≤62

Coating	Tool Length	Shank Dia	Mill Dia
Tuff Coat	L	h6	e8



P M K N S H

iEBB4 L B+ve

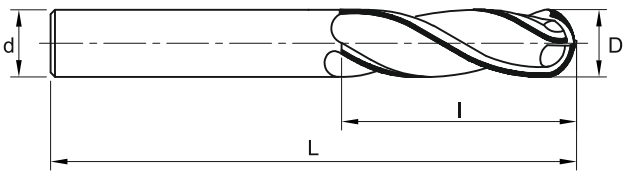
ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
iEBB4 030 L B+ve	3	3	19	57
iEBB4 040 L B+ve	4	4	19	57
iEBB4 050 L B+ve	5	5	25	64
iEBB4 060 L B+ve	6	6	28	75
iEBB4 080 L B+ve	8	8	29	75
iEBB4 100 L B+ve	10	10	32	75
iEBB4 120 L B+ve	12	12	51	100
iEBB4 140 L B+ve	14	14	57	127
iEBB4 160 L B+ve	16	16	57	127
iEBB4 180 L B+ve	18	18	57	127
iEBB4 200 L B+ve	20	20	57	127
iEBB4 250 L B+ve	25	25	57	127

- iEBB2 Series (2 Flutes) available on request
- Intermediate sizes, Weldon Flat available on request

SOLID CARBIDE BALLNOSE ENDMILL iSERIES (EXTRA LONG)

Ballnose	Series	Variable Helix	Flutes	HRC
	iSeries	 30°	Z = 4	≤62

Coating	Tool Length	Shank Dia	Mill Dia
Tuff Coat	X	h6	e8



iEBB4 X B+ve

P M K N S H

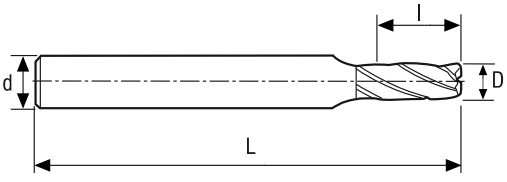
ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
iEBB4 030 X B+ve	3	3	25	75
iEBB4 040 X B+ve	4	4	28	75
iEBB4 050 X B+ve	5	5	32	75
iEBB4 060 X B+ve	6	6	39	100
iEBB4 080 X B+ve	8	8	42	100
iEBB4 100 X B+ve	10	10	45	100
iEBB4 120 X B+ve	12	12	76	150
iEBB4 140 X B+ve	14	14	76	150
iEBB4 160 X B+ve	16	16	76	150
iEBB4 180 X B+ve	18	18	76	150
iEBB4 200 X B+ve	20	20	76	150
iEBB4 250 X B+ve	25	25	76	150

- iEBB2 Series (2 Flutes) available on request
- Intermediate sizes, Weldon Flat available on request

SOLID CARBIDE 3 FLUTE HIGH SPEED MACHINING ENDMILL (O+VE SERIES)

Corner Chamfer	Series	Variable Helix	Flutes	HRC
	O+ve	48°	Z = 3	≤62

Coating	Tool Length	Shank Dia	Mill Dia
Tuff Coat	R/L	h6	e8



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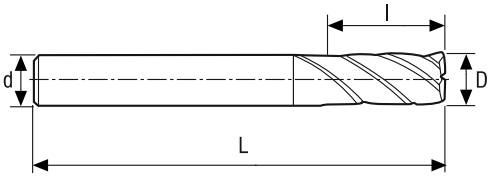

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P M K N S H

iESD3 R/L O+ve

	ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L	CHAMFER CORNER
Regular Length	iESD3 040.060 RC O+ve	4	6	10	55	0.045
	iESD3 050.060 RC O+ve	5	6	12	55	0.055
	iESD3 060 RC O+ve	6	6	14	55	0.075
	iESD3 080 RC O+ve	8	8	18	60	0.100
	iESD3 100 RC O+ve	10	10	22	70	0.125
	iESD3 120 RC O+ve	12	12	26	80	0.150
	iESD3 140 RC O+ve	14	14	30	80	0.175
	iESD3 160 RC O+ve	16	16	34	90	0.200
	iESD3 200 RC O+ve	20	20	42	108	0.250
Long Length	iESD3 040.060 LC O+ve	4	6	14	60	0.045
	iESD3 050.060 LC O+ve	5	6	18	60	0.055
	iESD3 060 LC O+ve	6	6	20	64	0.075
	iESD3 080 LC O+ve	8	8	28	70	0.100
	iESD3 100 LC O+ve	10	10	35	85	0.125
	iESD3 120 LC O+ve	12	12	40	95	0.150
	iESD3 160 LC O+ve	16	16	50	108	0.200
	iESD3 200 LC O+ve	20	20	60	125	0.250

RECOMMENDED PARAMETERS

CUTTING DATA - SLOTTING

Material Group	BMG	ap/Dc	fz												Vc
			2	3	4	5	6	8	10	12	14	16	20	25	
P	P3	1.00	0.015	0.022	0.030	0.036	0.044	0.060	0.075	0.085	0.095	0.110	0.120	0.140	165(140-185)
	P4	1.00	0.014	0.022	0.028	0.036	0.042	0.055	0.070	0.085	0.095	0.100	0.120	0.140	145(125-170)
	P5	1.00	0.014	0.022	0.028	0.036	0.042	0.055	0.070	0.085	0.095	0.100	0.120	0.130	140 (120-160)
	P6	1.00	0.014	0.020	0.028	0.034	0.042	0.055	0.070	0.080	0.095	0.100	0.120	0.130	160 (135-180)
	P7	1.00	0.014	0.020	0.028	0.034	0.042	0.055	0.070	0.080	0.095	0.100	0.120	0.130	150 (125-170)
M	M1	0.80	0.011	0.017	0.022	0.028	0.034	0.044	0.055	0.065	0.075	0.080	0.095	0.110	95 (85-110)
	M2	0.80	0.010	0.015	0.020	0.026	0.030	0.040	0.050	0.060	0.065	0.075	0.085	0.095	80 (70-90)
	M3	0.65	0.008	0.012	0.016	0.020	0.024	0.032	0.040	0.048	0.055	0.060	0.070	0.075	65 (55-70)
	M4	0.48	0.007	0.011	0.014	0.018	0.022	0.028	0.036	0.042	0.046	0.050	0.060	0.065	49 (43-55)
	M5	0.48	0.007	0.011	0.014	0.018	0.022	0.028	0.036	0.042	0.046	0.050	0.060	0.065	41 (36-46)
K	K2	1.00	0.011	0.016	0.022	0.028	0.032	0.044	0.055	0.065	0.075	0.080	0.090	0.100	140 (125-160)
	K3	1.00	0.011	0.016	0.022	0.028	0.032	0.044	0.055	0.065	0.075	0.080	0.090	0.100	120 (105-135)
	K4	0.70	0.010	0.015	0.020	0.024	0.030	0.040	0.050	0.060	0.065	0.075	0.085	0.095	115 (100-130)
	K5	0.70	0.009	0.013	0.018	0.022	0.026	0.036	0.044	0.055	0.060	0.065	0.075	0.085	70 (65-80)
N	N1	0.70	0.014	0.022	0.028	0.036	0.042	0.055	0.070	0.085	0.095	0.100	0.120	0.130	930 (780-1100)
	N2	0.70	0.014	0.022	0.028	0.036	0.042	0.055	0.070	0.085	0.095	0.100	0.120	0.130	600 (500-700)
	N3	0.70	0.014	0.022	0.028	0.036	0.042	0.055	0.070	0.085	0.095	0.100	0.120	0.130	400 (335-465)
S	S1	0.40	0.006	0.009	0.013	0.016	0.019	0.026	0.032	0.038	0.044	0.048	0.055	0.060	40 (30-50)
	S2	0.40	0.006	0.009	0.013	0.016	0.019	0.026	0.032	0.038	0.044	0.048	0.055	0.060	40 (30-50)
	S3	0.40	0.006	0.009	0.012	0.015	0.018	0.024	0.030	0.036	0.040	0.044	0.050	0.055	25 (15-35)
	S11	1.00	0.012	0.018	0.024	0.030	0.036	0.048	0.060	0.070	0.080	0.090	0.100	0.110	85 (60-110)
H	H5	0.50	0.004	0.006	0.008	0.010	0.012	0.016	0.020	0.024	0.026	0.030	0.034	0.038	50 (40-60)
	H8	0.50	0.004	0.007	0.009	0.012	0.014	0.018	0.024	0.028	0.030	0.034	0.040	0.044	49 (39-60)

Cutting Speed	**VC = m/min**
Feed per Tooth	**fz = mm**
ap (mm)/Dc (mm)	**= factor**

All cutting data are optimum target values
* BMG : Blood Material Group

* Trochoidal Milling, Circular Interpolation, Helical Interpolation, Ramping operations also possible with O+ve Series of Tools.

RECOMMENDED PARAMETERS

CUTTING DATA -SIDE MILLING ae/Dc=0.4

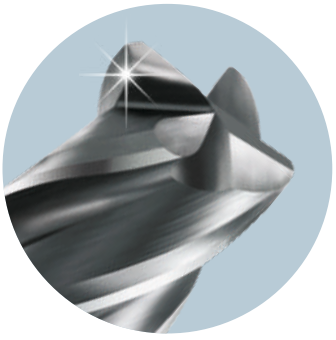
Material Group	BMG	ap/Dc	fz												Vc
			2	3	4	5	6	8	10	12	14	16	20	25	
P	P3	1.00	0.015	0.022	0.030	0.038	0.044	0.060	0.075	0.090	0.100	0.110	0.130	0.140	205 (175-235)
	P4	1.00	0.015	0.022	0.030	0.036	0.044	0.060	0.075	0.085	0.095	0.110	0.120	0.140	180 (155-205)
	P5	1.00	0.014	0.022	0.028	0.036	0.042	0.055	0.070	0.085	0.095	0.110	0.120	0.140	175 (150-200)
	P6	1.00	0.014	0.022	0.028	0.036	0.042	0.055	0.070	0.085	0.095	0.100	0.120	0.140	200 (170-225)
	P7	1.00	0.014	0.022	0.028	0.036	0.042	0.055	0.070	0.085	0.095	0.100	0.120	0.140	185 (160-215)
M	M1	1.10	0.011	0.017	0.022	0.028	0.034	0.044	0.055	0.065	0.075	0.085	0.095	0.110	120 (105-135)
	M2	1.20	0.010	0.015	0.020	0.026	0.030	0.040	0.050	0.060	0.070	0.075	0.085	0.100	100 (90-115)
	M3	0.80	0.008	0.012	0.016	0.020	0.024	0.032	0.040	0.048	0.055	0.060	0.070	0.080	80 (70-90)
	M4	0.60	0.007	0.011	0.014	0.018	0.022	0.028	0.036	0.042	0.048	0.055	0.060	0.070	60 (55-70)
	M5	0.60	0.007	0.011	0.014	0.018	0.022	0.028	0.036	0.042	0.048	0.055	0.060	0.070	50 (45-55)
K	K2	1.00	0.011	0.017	0.022	0.028	0.034	0.044	0.055	0.065	0.075	0.080	0.095	0.110	180 (155-200)
	K3	1.00	0.011	0.017	0.022	0.028	0.034	0.044	0.055	0.065	0.075	0.080	0.095	0.110	150 (130-170)
	K4	1.00	0.010	0.015	0.020	0.026	0.030	0.040	0.050	0.060	0.070	0.075	0.085	0.100	145 (130-165)
	K5	1.00	0.009	0.014	0.018	0.022	0.028	0.036	0.046	0.055	0.060	0.070	0.080	0.090	90 (75-100)
N	N1	1.20	0.014	0.022	0.028	0.036	0.042	0.055	0.070	0.085	0.095	0.110	0.120	0.140	1175 (970-1350)
	N2	1.20	0.014	0.022	0.028	0.036	0.042	0.055	0.070	0.085	0.095	0.110	0.120	0.140	750 (630-880)
	N3	1.20	0.014	0.022	0.028	0.036	0.042	0.055	0.070	0.085	0.095	0.110	0.120	0.140	500 (415-580)
S	S11	1.00	0.012	0.018	0.024	0.030	0.036	0.050	0.060	0.070	0.080	0.090	0.100	0.120	110 (80-140)
	S12	1.00	0.012	0.018	0.024	0.030	0.036	0.050	0.060	0.070	0.080	0.090	0.100	0.120	85 (60-110)
	S13	0.85	0.011	0.016	0.022	0.026	0.032	0.042	0.055	0.065	0.070	0.080	0.090	0.100	65 (47-85)

CUTTING DATA - SIDE MILLING ae/Dc=0.2

Material Group	BMG	ap/Dc	fz												Vc
			2	3	4	5	6	8	10	12	14	16	20	25	
S	S1	0.60	0.008	0.012	0.016	0.020	0.024	0.032	0.040	0.048	0.055	0.060	0.070	0.075	55 (41-70)
	S2	0.60	0.008	0.012	0.016	0.020	0.024	0.032	0.040	0.048	0.055	0.060	0.070	0.075	55 (41-70)
	S3	0.60	0.007	0.011	0.015	0.019	0.022	0.030	0.038	0.044	0.050	0.055	0.065	0.070	35 (21-48)
H	H5	1.00	0.005	0.007	0.010	0.013	0.015	0.020	0.026	0.030	0.034	0.036	0.042	0.048	70 (55-85)
	H8	1.00	0.006	0.008	0.012	0.014	0.017	0.024	0.028	0.034	0.038	0.042	0.048	0.055	70 (55-80)

Cutting Speed	**Vc = m/min**
Feed per Tooth	**fz = mm**
ap (mm)/Dc (mm)	**= factor**

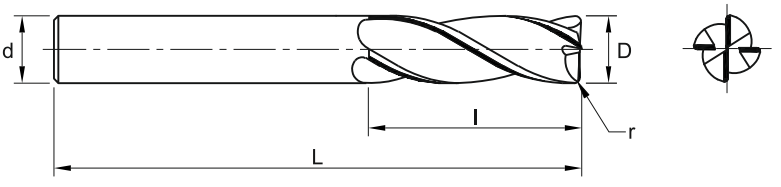
All cutting data are optimum target values
* BMG : Blood Material Group



SOLID CARBIDE ENDMILL
CORNER RADIUS

Corner Radius	Series	Helix	Flutes	HRC
	Regular	30°	Z = 4	≈35

Coating	Tool Length	Shank Dia	Mill Dia
Duro Coat	R	h6	e8



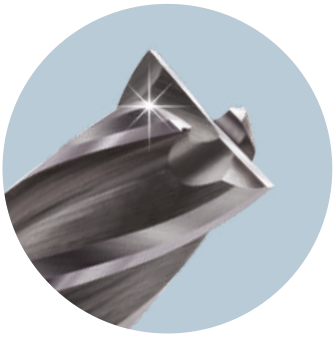
ER B4

P M K N S H

ITEM CODE	MILL DIA D	RADIUS R	SHANK DIA d	CEL l	OAL L
ER05 B4 030	3	0.5	3	10	39
ER10 B4 030	3	1.0	3	10	39
ER05 B4 040	4	0.5	4	14	50
ER10 B4 040	4	1.0	4	14	50
ER05 B4 050	5	0.5	5	16	50
ER10 B4 050	5	1.0	5	16	50
ER05 B4 060	6	0.5	6	19	64
ER10 B4 060	6	1	6	19	64
ER15 B4 060	6	1.5	6	19	64
ER05 B4 080	8	0.5	8	21	64
ER10 B4 080	8	1	8	21	64
ER20 B4 080	8	2	8	21	64
ER05 B4 100	10	0.5	10	25	70
ER10 B4 100	10	1	10	25	70
ER20 B4 100	10	2	10	25	70

ITEM CODE	MILL DIA D	RADIUS R	SHANK DIA d	CEL l	OAL L
ER25 B4 100	10	2.5	10	25	70
ER05 B4 120	12	0.5	12	25	75
ER10 B4 120	12	1	12	25	75
ER20 B4 120	12	2	12	25	75
ER30 B4 120	12	3	12	25	75
ER10 B4 140	14	1	14	30	80
ER20 B4 140	14	2	14	30	80
ER30 B4 140	14	3	14	30	80
ER10 B4 160	16	1	16	32	80
ER20 B4 160	16	2	16	32	80
ER30 B4 160	16	3	16	32	80
ER10 B4 200	20	1	20	38	100
ER20 B4 200	20	2	20	38	100
ER30 B4 200	20	3	20	38	100

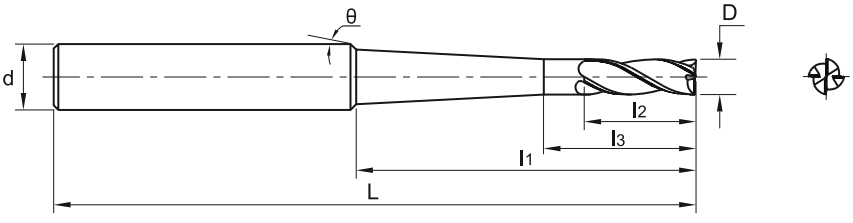
- ER B2 Series (2 Flutes) available on request
- B+ve Series available on request
- iSeries available on request



SOLID CARBIDE TAPER NECK SQUARE ENDMILL TN SERIES (B+VE)

Square End	Series	Helix	Flutes	HRC
	B+ve	 30°	Z = 4	≤48

Coating	Shank Dia	Mill Dia
Duro Coat	h6	e8



P M K N S H

ESB4 TN B+ve

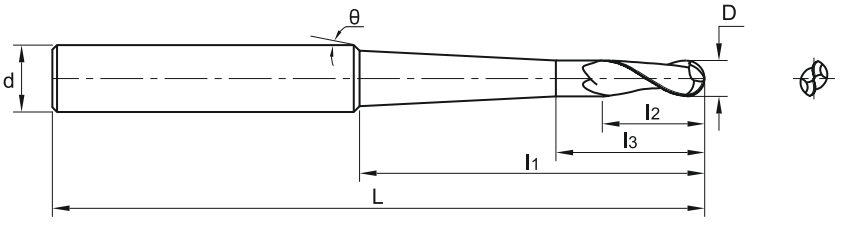
ITEM CODE	MILL DIA D	SHANK DIA d	CEL l_2	l_3	RELIEVE LENGTH l_1	OAL L	ANGLE θ
ESB4 020 TN B+ve	2	4	4	6	23	60	3°
ESB4 030 TN B+ve	3	6	6	9	35	75	3°
ESB4 040 TN B+ve	4	6	8	11	27	75	3°
ESB4 050 TN B+ve	5	8	10	13	49	100	2°
ESB4 060 TN B+ve	6	8	12	15	51	100	1.5°
ESB4 080 TN B+ve	8	10	14	17	53	100	1.5°

- ESB2 Series (2 Flutes) available on request
- iSeries and Regular Series available on request

SOLID CARBIDE TAPER NECK BALLNOSE
TN SERIES

Ballnose	Series	Helix	Flutes	HRC
	B+ve	 30°	Z = 2	≤48

Coating	Shank Dia	Mill Dia
Duro Coat	h6	e8



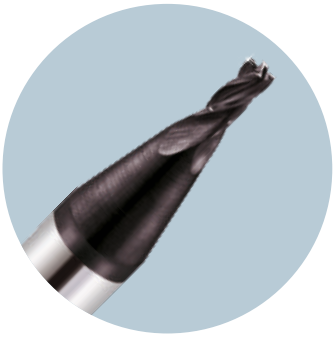
EBB2 TN B+ve

P M K N S H

ITEM CODE	MILL DIA D	SHANK DIA d	CEL l_2	l_3	RELIEVE LENGTH l_1	OAL L	ANGLE θ
EBB2 020 TN B+ve	2	4	4	6	23	60	2.5°
EBB2 030 TN B+ve	3	6	6	9	40	75	2.5°
EBB2 040 TN B+ve	4	6	8	11	37	75	2°
EBB2 050 TN B+ve	5	8	10	13	49	100	2°
EBB2 060 TN B+ve	6	8	12	16	51	100	1.5°
EBB2 080 TN B+ve	8	10	14	17	53	100	1.5°

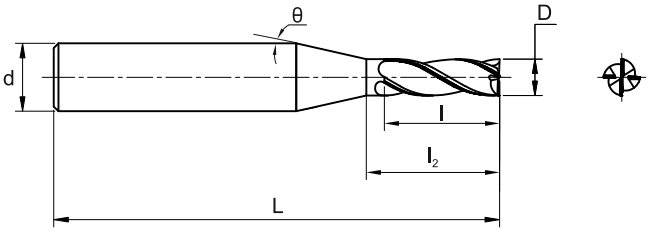
- EBB4 Series (4 Flutes) available on request
- iSeries and Regular Series available on request

SOLID CARBIDE STUB TAPER NECK ENDMILL STN SERIES



Square End	Series	Helix	Flutes	HRC
	Regular	30°	Z = 4	≈35

Coating	Tool Length	Shank Dia	Mill Dia
Duro Coat	S	h6	e8



ESB4 STN

P M K N S H

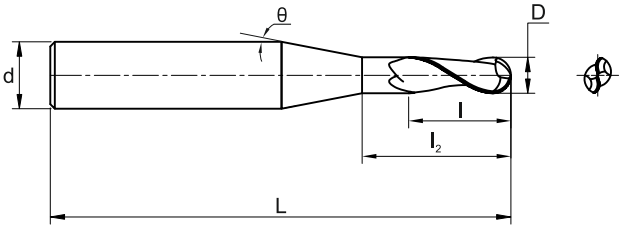
ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	l_2	OAL L	ANGLE θ
ESB4 020 STN	2	4	4	6	50	6°
ESB4 030 STN	3	6	6	9	50	8.5°
ESB4 040 STN	4	6	8	11	50	5°
ESB4 050 STN	5	8	10	13	75	5°
ESB4 060 STN	6	8	12	14	75	3°

- ESB2 Series (2 Flutes) available on request
- B+ve Series available on request
- iSeries available on request

SOLID CARBIDE STUB TAPER NECK BALLNOSE STN SERIES

Ballnose	Series	Helix	Flutes	HRC
	Regular	 30°	Z = 2	≈35

Coating	Tool Length	Shank Dia	Mill Dia
Duro Coat	S	h6	e8



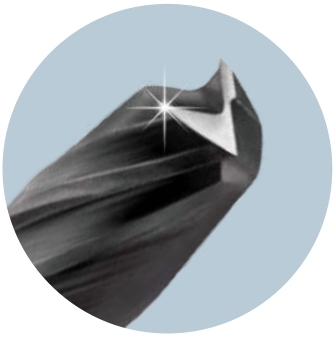
EBB2 STN

P M K N S H

ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	L_2	OAL L	ANGLE θ
EBB2 020 STN	2	4	4	6	50	6^0
EBB2 030 STN	3	6	6	9	50	8.5^0
EBB2 040 STN	4	6	8	11	50	5^0
EBB2 050 STN	5	8	10	13	75	5^0
EBB2 060 STN	6	8	12	15	75	3^0

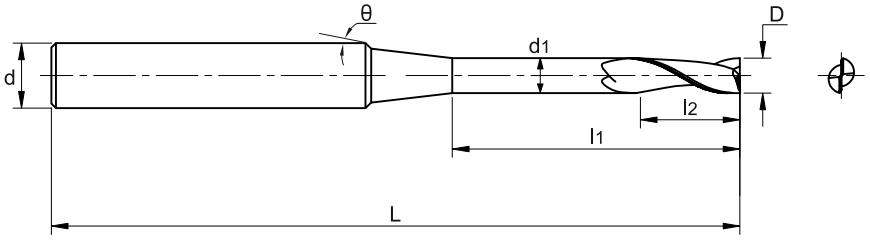
- EBB4 Series (4 Flutes) available on request
- B+ve Series available on request
- iSeries available on request

SOLID CARBIDE LONG NECK ENDMILL
LN SERIES



Square End	Series	Helix	Flutes	Coating	HRC
	Regular	 30°	Z = 2	Duro Coat	≈35

Tool Length	Tool Length	Tool Length	Shank Dia	Mill Dia
R	L	X	h6	e8

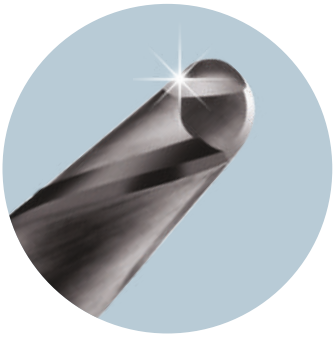


ESB2 LN

P M K N S H

ITEM CODE	MILL DIA D	RELIEVE LENGTH l_1	RELIEVE DIA d_1	SHANK DIA d	CEL l_2	OAL L	ANGLE θ
ESB2 010 LN R	1.0	6	0.95	4	2	45	15°
ESB2 010 LN L	1.0	10	0.95	4	2	45	15°
ESB2 010 LN X	1.0	14	0.95	4	2	50	15°
ESB2 015 LN R	1.5	8	1.45	4	3	45	15°
ESB2 015 LN L	1.5	12	1.45	4	3	45	15°
ESB2 015 LN X	1.5	16	1.45	4	3	50	15°
ESB2 020 LN R	2.0	12	1.95	4	4	45	10°
ESB2 020 LN L	2.0	16	1.95	4	4	50	10°
ESB2 020 LN X	2.0	20	1.95	4	4	55	10°
ESB2 030 LN R	3.0	16	2.90	6	5	55	10°
ESB2 030 LN L	3.0	20	2.90	6	5	60	10°
ESB2 030 LN X	3.0	25	2.90	6	5	64	10°

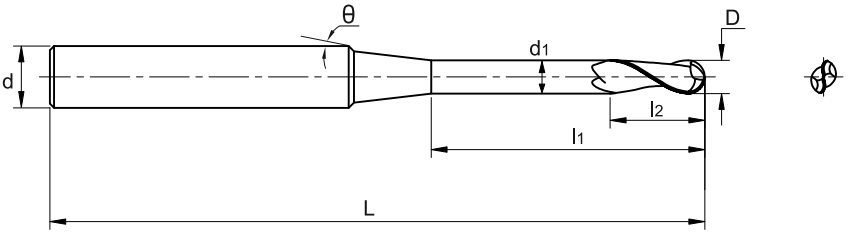
- ESB4 Series (4 Flutes) available on request
- B+ve Series available on request
- iSeries available on request



SOLID CARBIDE LONG NECK BALLNOSE
LN SERIES

Ballnose	Series	Helix	Flutes	Coating	HRC
	Regular	 30°	Z = 2	Duro Coat	≈35

Tool Length	Tool Length	Tool Length	Shank Dia	Mill Dia
R	L	X	h6	e8



EBB2 LN

P M K N S H

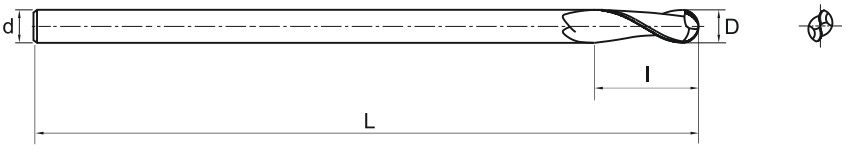
ITEM CODE	MILL DIA D	RELIEVE LENGTH l_1	RELIEVE DIA d_1	SHANK DIA d	CEL l_2	OAL L	ANGLE θ
EBB2 010 LN R	1.0	6	0.95	4	2	45	15°
EBB2 010 LN L	1.0	10	0.95	4	2	45	15°
EBB2 010 LN X	1.0	14	0.95	4	2	50	15°
EBB2 015 LN R	1.5	8	1.45	4	3	45	15°
EBB2 015 LN L	1.5	12	1.45	4	3	45	15°
EBB2 015 LN X	1.5	16	1.45	4	3	50	15°
EBB2 020 LN R	2.0	12	1.95	4	4	45	10°
EBB2 020 LN L	2.0	16	1.95	4	4	50	10°
EBB2 020 LN X	2.0	20	1.95	4	4	55	10°
EBB2 030 LN R	3.0	16	2.90	6	5	55	10°
EBB2 030 LN L	3.0	20	2.90	6	5	60	10°
EBB2 030 LN X	3.0	25	2.90	6	5	64	10°

- EBB4 Series (4 Flutes) available on request
- B+ve Series available on request
- iSeries available on request

SOLID CARBIDE SHORT FLUTE LONG REACH BALLNOSE ENDMILL

Ballnose	Series	Helix	Flutes	HRC
	Regular	 30°	Z = 2	≈35

Coating	Shank Dia	Mill Dia
Duro Coat	h6	e8



EBB2S L

P M K N S H

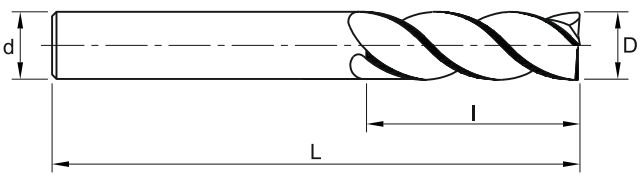
ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
EBB2S 040 L	4	4	10	75
EBB2S 060 L	6	6	12	100
EBB2S 080 L	8	8	14	100
EBB2S 100 L	10	10	18	100
EBB2S 120 L	12	12	22	150

- EBB4S Series (4 Flutes) available on request
- B+ve Series available on request
- iSeries available on request

SOLID CARBIDE ENDMILL
NF SERIES - REGULAR

Square End	Series	Helix	Flutes	HRC
	NF	 45°	Z = 3	≈35

Coating	Tool Length	Shank Dia	Mill Dia
Uncoated	R	h6	e8



.ESC3 R

P M K N S H

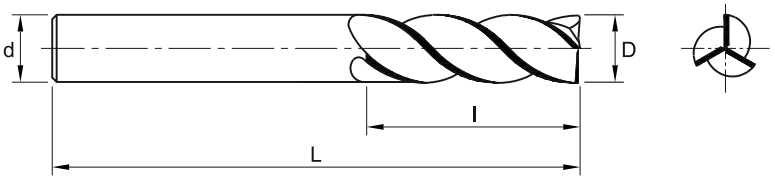
ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
.ESC3 030 R NF	3	3	9	50
.ESC3 040 R NF	4	4	12	50
.ESC3 050 R NF	5	5	15	50
.ESC3 060 R NF	6	6	18	50
.ESC3 080 R NF	8	8	20	60
.ESC3 100 R NF	10	10	25	70
.ESC3 120 R NF	12	12	25	75
.ESC3 140 R NF	14	14	30	80
.ESC3 160 R NF	16	16	32	80
.ESC3 180 R NF	18	18	35	100
.ESC3 200 R NF	20	20	45	100

• Coating available on request

SOLID CARBIDE ENDMILL
NF SERIES - LONG

Square End	Series	Helix	Flutes	HRC
	NF		Z = 3	≈35

Coating	Tool Length	Shank Dia	Mill Dia
Uncoated	L	h6	e8



END MILLS

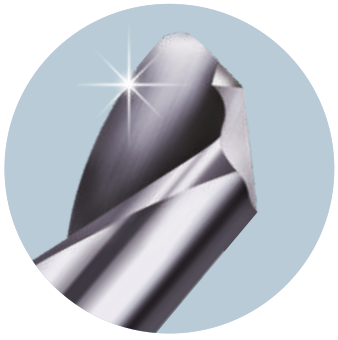
.ESC3 L

P M K N S H

ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
.ESC3 030 L NF	3	3	12	60
.ESC3 040 L NF	4	4	16	60
.ESC3 050 L NF	5	5	20	60
.ESC3 060 L NF	6	6	25	75
.ESC3 080 L NF	8	8	32	75
.ESC3 100 L NF	10	10	45	100
.ESC3 120 L NF	12	12	45	100
.ESC3 120 L NF	14	14	51	100
.ESC3 160 L NF	16	16	65	127
.ESC3 180 L NF	18	18	75	127
.ESC3 200 L NF	20	20	75	127

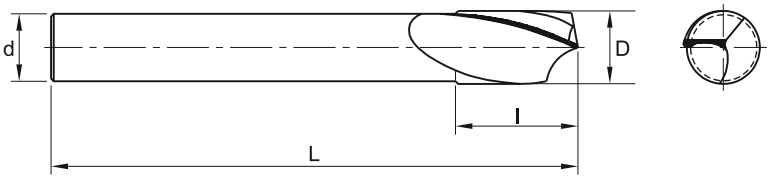
• Coating available on request

SOLID CARBIDE SINGLE LIP TOOL



Corner Radius	Series	Helix	Flutes	HRC
	NF	30°	Z = 1	≈35

Coating	Tool Length	Tool Length	Shank Dia	Mill Dia
Uncoated	R	L	h6	e8

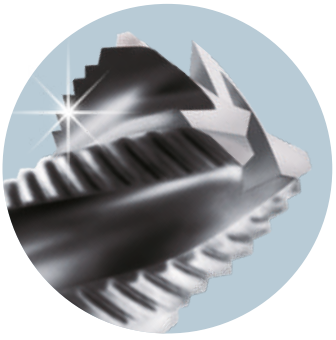


.ESB1

P M K N S H

ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
.ESB1 0306 L NF	3	6	4	50
.ESB1 0406 L NF	4	6	6	60
.ESB1 0506 L NF	5	6	8	60
.ESB1 0606 L NF	6	6	9	75
.ESB1 0706 L NF	7	6	10	75
.ESB1 0908 L NF	9	8	12	75
.ESB1 1110 R NF	11	10	14	75
.ESB1 1110 L NF	11	10	14	100
.ESB1 1312 R NF	13	12	16	75
.ESB1 1312 L NF	13	12	16	100
.ESB1 1514 R NF	15	14	18	75
.ESB1 1514 L NF	15	14	18	100
.ESB1 1716 R NF	17	16	20	75
.ESB1 1716 L NF	17	16	20	100

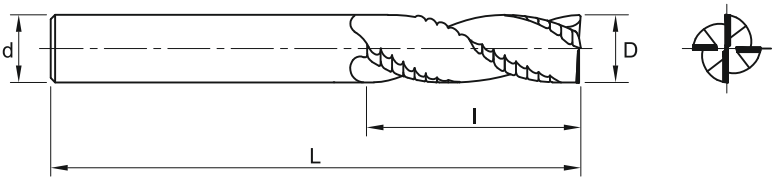
- Coating available on request



SOLID CARBIDE ROUGHER
REGULAR SERIES

Corner Chamfer	Series	Helix	Flutes	HRC
	Regular	 38°	Z = 4	≈35

Coating	Tool Length	Shank Dia	Mill Dia
Duro Coat	R	h6	e8

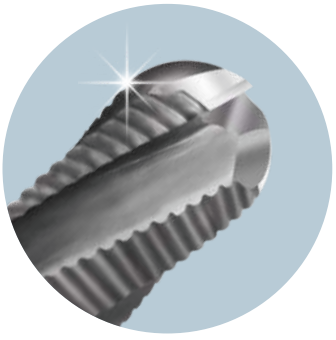


P M K N S H

FSC4 R

ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
FSC4 040 R	4	4	14	50
FSC4 050 R	5	5	16	50
FSC4 060 R	6	6	19	64
FSC4 080 R	8	8	21	64
FSC4 100 R	10	10	25	70
FSC4 120 R	12	12	25	75
FSC4 140 R	14	14	30	80
FSC4 160 R	16	16	32	80
FSC4 180 R	18	18	35	100
FSC4 200 R	20	20	38	100
FSC4 250 R	25	25	40	100

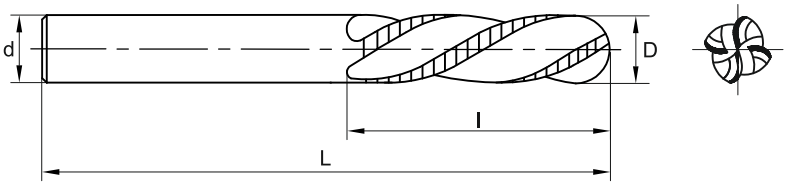
- B+ve Series available on request
- iSeries available on request



SOLID CARBIDE BALLNOSE ROUGHER REGULAR SERIES

Ballnose	Series	Helix	Flutes	HRC
	Regular	20°	Z = 4	≈35

Coating	Tool Length	Shank Dia	Mill Dia
Duro Coat	R	h6	e8



FBB4 R

P M K N S H

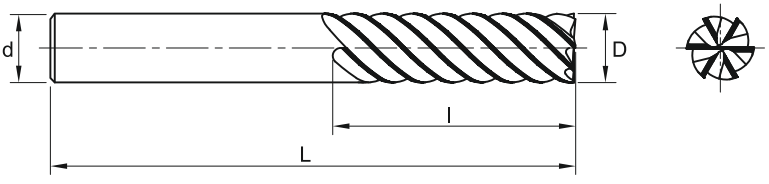
ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
FBB4 040 R	4	4	14	50
FBB4 050 R	5	5	16	50
FBB4 060 R	6	6	19	64
FBB4 080 R	8	8	21	64
FBB4 100 R	10	10	25	70
FBB4 120 R	12	12	25	75
FBB4 140 R	14	14	30	80
FBB4 160 R	16	16	32	80
FBB4 180 R	18	18	35	100
FBB4 200 R	20	20	38	100
FBB4 250 R	25	25	40	100

- B+ve Series available on request
- iSeries available on request

SOLID CARBIDE FINISHER ENDMILL

Corner Chamfer	Series	Helix	Flutes	HRC
	Regular	50°	Z = 6	≈35

Coating	Tool Length	Shank Dia	Mill Dia
Duro Coat	R	h6	e8



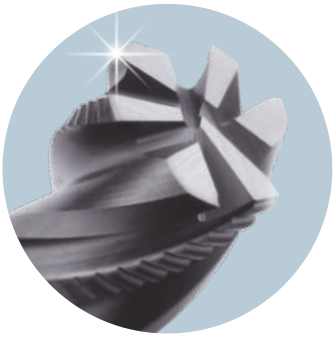
P M K N S H

ESD6 R

ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
ESD6 060 R	6	6	19	64
ESD6 080 R	8	8	21	64
ESD6 100 R	10	10	25	70
ESD6 120 R	12	12	25	75
ESD6 140 R	14	14	30	80
ESD6 160 R	16	16	32	80
ESD6 180 R	18	18	35	100
ESD6 200 R	20	20	38	100

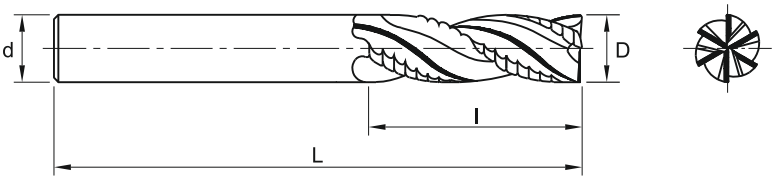
- B+ve Series available on request
- iSeries available on request

SOLID CARBIDE COMBO MILL



Corner Chamfer	Series	Helix	Flutes	HRC
	Regular	 35°	Z = 6	≈35

Coating	Tool Length	Shank Dia	Mill Dia
Duro Coat	R	h6	e8



EFC6

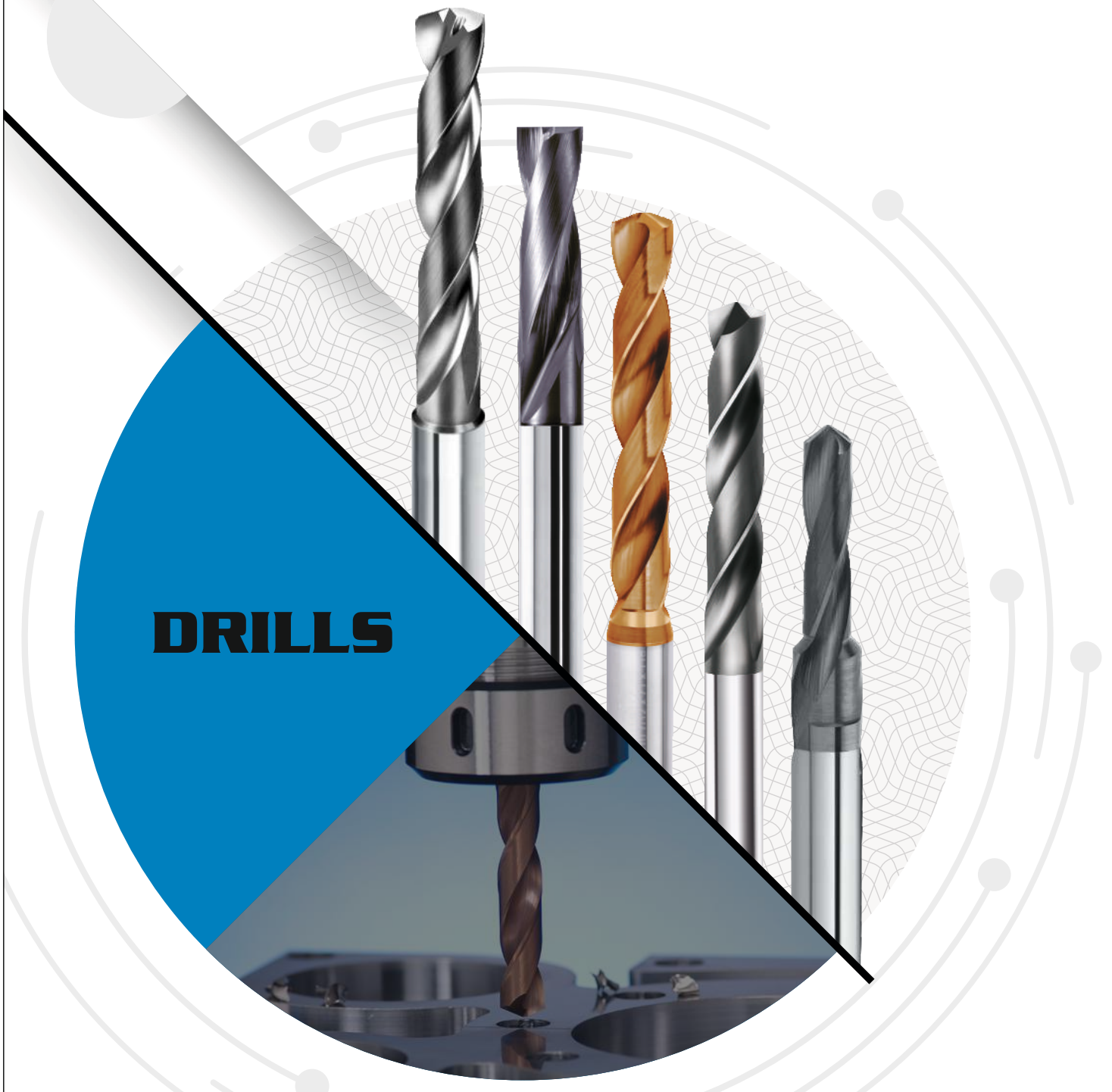
P M K N S H

ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
EFC6 080	8	8	21	64
EFC6 100	10	10	25	70
EFC6 120	12	12	25	75
EFC6 140	14	14	30	80
EFC6 160	16	16	32	80
EFC6 140	14	14	30	80
EFC6 160	16	16	32	80
EFC6 180	18	18	35	100
EFC6 200	20	20	38	100

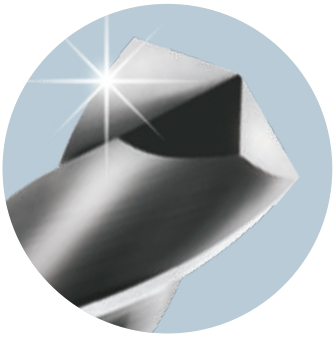
• B+ve Series available on request

BLOOD®
ROTATING GENIUS

DRILLS

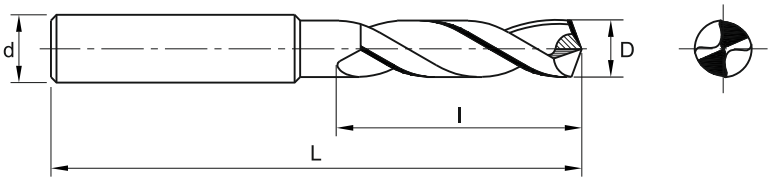


SOLID CARBIDE HIGH PERFORMANCE DRILL



140°	Helix	HRC	Coating
	 30°	≤48	Duro Coat

L x D	Shank Dia	Drill Dia	Standard
3	h6	m7	DIN 6537



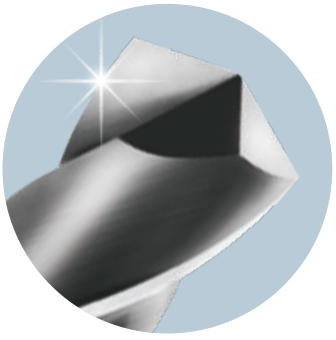
P M K N S H

DYB3

ITEM CODE	DRILL DIA D	SHANK DIA d	FL l	OAL L
DYB3 015 ~ 019	Ø 1.5 ~ 1.9	4	9	58
DYB3 020 ~ 023	Ø 2.0 ~ 2.3	4	13	58
DYB3 024 ~ 029	Ø 2.4 ~ 2.9	4	17	58
DYB3 030 ~ 037	Ø 3.0 ~ 3.7	6	20	62
DYB3 038 ~ 047	Ø 3.8 ~ 4.7	6	24	66
DYB3 048 ~ 060	Ø 4.8 ~ 6.0	6	28	66
DYB3 061 ~ 070	Ø 6.1 ~ 7.0	8	34	79
DYB3 071 ~ 080	Ø 7.1 ~ 8.0	8	41	79
DYB3 081 ~ 090	Ø 8.1 ~ 9.0	10	47	89
DYB3 091 ~ 100	Ø 9.1 ~ 10.0	10	47	89
DYB3 101 ~ 110	Ø 10.1 ~ 11.0	12	55	102
DYB3 111 ~ 120	Ø 11.1 ~ 12.0	12	55	102
DYB3 121 ~ 140	Ø 12.1 ~ 14.0	14	60	107
DYB3 141 ~ 160	Ø 14.1 ~ 16.0	16	65	115
DYB3 161 ~ 180	Ø 16.1 ~ 18.0	18	73	123
DYB3 181 ~ 200	Ø 18.1 ~ 20.0	20	79	131
DYB3 201 ~ 220	Ø 20.1 ~ 22.0	22	79	131

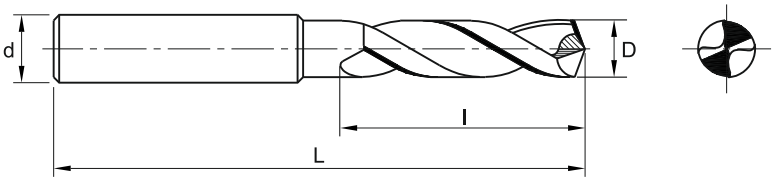
- Every intermediate decimal size drill readily available in stock
- For HRC ≥58, use Duro Coat
- Ordering Code for Dia 6.8 mm 3xD Drill: DYB3 068

SOLID CARBIDE HIGH PERFORMANCE DRILL



140°	Helix	HRC	Coating
	 30°	≤48	Duro Coat

L x D	Shank Dia	Drill Dia	Standard
5	h6	m7	DIN 6537



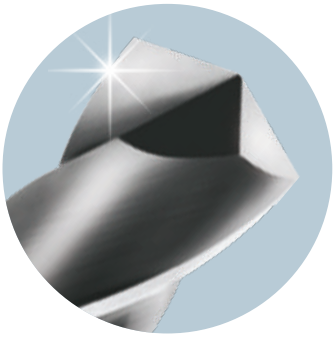
DYB5

P M K N S H

ITEM CODE	DRILL DIA D	SHANK DIA d	FL l	OAL L
DYB5 015 ~ 019	Ø 1.5 ~ 1.9	4	13	58
DYB5 020 ~ 023	Ø 2.0 ~ 2.3	4	20	64
DYB5 024 ~ 029	Ø 2.4 ~ 2.9	4	25	64
DYB5 030 ~ 037	Ø 3.0 ~ 3.7	6	28	66
DYB5 038 ~ 047	Ø 3.8 ~ 4.7	6	36	74
DYB5 048 ~ 060	Ø 4.8 ~ 6.0	6	44	82
DYB5 061 ~ 070	Ø 6.1 ~ 7.0	8	53	91
DYB5 071 ~ 080	Ø 7.1 ~ 8.0	8	53	91
DYB5 081 ~ 090	Ø 8.1 ~ 9.0	10	61	103
DYB5 091 ~ 100	Ø 9.1 ~ 10.0	10	61	103
DYB5 101 ~ 110	Ø 10.1 ~ 11.0	12	71	118
DYB5 111 ~ 120	Ø 11.1 ~ 12.0	12	71	118
DYB5 121 ~ 140	Ø 12.1 ~ 14.0	14	77	124
DYB5 141 ~ 160	Ø 14.1 ~ 16.0	16	83	133
DYB5 161 ~ 180	Ø 16.1 ~ 18.0	18	93	143
DYB5 181 ~ 200	Ø 18.1 ~ 20.0	20	101	153
DYB5 201 ~ 220	Ø 20.1 ~ 22.0	22	101	153

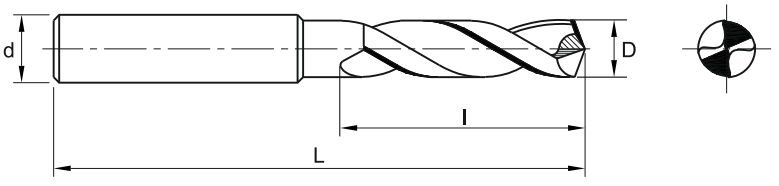
- Every intermediate decimal size drill readily available in stock
- For HRC ≥58, use Duro Coat
- Ordering Code for Dia 6.8 mm 5xD Drill: DYB5 068

SOLID CARBIDE HIGH PERFORMANCE DRILL



140°	Helix	HRC	Coating
	 30°	≤48	Duro Coat

L x D	Shank Dia	Drill Dia	Standard
8	h6	m7	DIN 6537



P M K N S H

DYB8

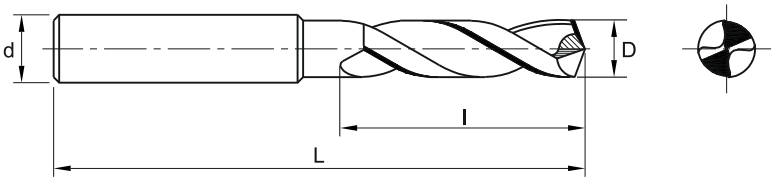
ITEM CODE	DRILL DIA D	SHANK DIA d	FL l	OAL L
DYB8 040 ~ 060	Ø 4.0 ~ 6.0	6	55	95
DYB8 061 ~ 070	Ø 6.1 ~ 7.0	8	75	115
DYB8 071 ~ 080	Ø 7.1 ~ 8.0	8	75	115
DYB8 081 ~ 090	Ø 8.1 ~ 9.0	10	95	140
DYB8 091 ~ 100	Ø 9.1 ~ 10.0	10	95	140
DYB8 101 ~ 110	Ø 10.1 ~ 11.0	12	115	160
DYB8 111 ~ 120	Ø 11.1 ~ 12.0	12	115	160
DYB8 121 ~ 140	Ø 12.1 ~ 14.0	14	130	180
DYB8 141 ~ 160	Ø 14.1 ~ 16.0	16	150	200
DYB8 161 ~ 180	Ø 16.1 ~ 18.0	18	165	225
DYB8 181 ~ 200	Ø 18.1 ~ 20.0	20	180	250
DYB8 201 ~ 220	Ø 20.1 ~ 22.0	22	180	250

- Every intermediate decimal size drill readily available in stock
- For HRC ≥58, use Duro Coat
- Ordering Code for Dia 6.8 mm 8xD Drill: DYB8 068

SOLID CARBIDE HIGH PERFORMANCE DRILL (iSERIES)

140°	Helix	HRC	Coating
	 30°	≤62	Tuff Coat

L x D	Shank Dia	Drill Dia	Standard
3	h6	m7	DIN 6537



P M K N S H

iDYB3

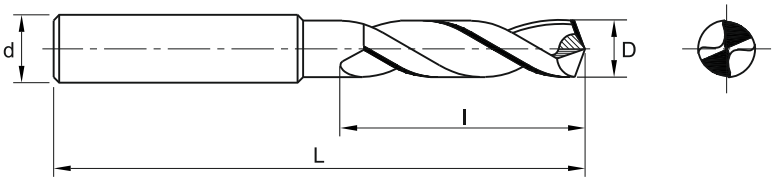
ITEM CODE	DRILL DIA D	SHANK DIA d	FL l	OAL L
iDYB3 015 ~ 019	Ø 1.5 ~ 1.9	4	9	58
iDYB3 020 ~ 023	Ø 2.0 ~ 2.3	4	13	58
iDYB3 024 ~ 029	Ø 2.4 ~ 2.9	4	17	58
iDYB3 030 ~ 037	Ø 3.0 ~ 3.7	6	20	62
iDYB3 038 ~ 047	Ø 3.8 ~ 4.7	6	24	66
iDYB3 048 ~ 060	Ø 4.8 ~ 6.0	6	28	66
iDYB3 061 ~ 070	Ø 6.1 ~ 7.0	8	34	79
iDYB3 071 ~ 080	Ø 7.1 ~ 8.0	8	41	79
iDYB3 081 ~ 090	Ø 8.1 ~ 9.0	10	47	89
iDYB3 091 ~ 100	Ø 9.1 ~ 10.0	10	47	89
iDYB3 101 ~ 110	Ø 10.1 ~ 11.0	12	55	102
iDYB3 111 ~ 120	Ø 11.1 ~ 12.0	12	55	102
iDYB3 121 ~ 140	Ø 12.1 ~ 14.0	14	60	107
iDYB3 141 ~ 160	Ø 14.1 ~ 16.0	16	65	115
iDYB3 161 ~ 180	Ø 16.1 ~ 18.0	18	73	123
iDYB3 181 ~ 200	Ø 18.1 ~ 20.0	20	79	131
iDYB3 201 ~ 220	Ø 20.1 ~ 22.0	22	79	131

- Every intermediate decimal size drill readily available in stock
- Ordering Code for Dia 6.8 mm 3xD Drill: iDYB3 068
- Through Coolant Drills in i-Series availbale on request.

SOLID CARBIDE HIGH PERFORMANCE DRILL (iSERIES)

140°	Helix	HRC	Coating
	 30°	≤62	Tuff Coat

L x D	Shank Dia	Drill Dia	Standard
5	h6	m7	DIN 6537



iDYB5

P	M	K	N	S	H
■	■	◪	□	■	■

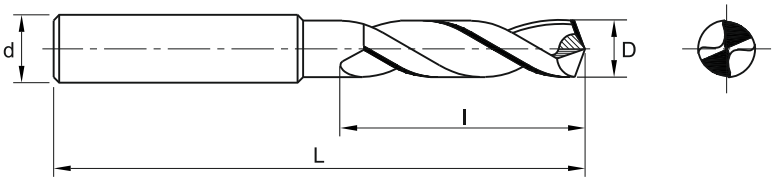
ITEM CODE	DRILL DIA D	SHANK DIA d	FL l	OAL L
iDYB5 015 ~ 019	Ø 1.5 ~ 1.9	4	13	58
iDYB5 020 ~ 023	Ø 2.0 ~ 2.3	4	20	64
iDYB5 030 ~ 037	Ø 2.4 ~ 2.9	4	25	64
iDYB5 030 ~ 037	Ø 3.0 ~ 3.7	6	28	66
iDYB5 038 ~ 047	Ø 3.8 ~ 4.7	6	36	74
iDYB5 048 ~ 060	Ø 4.8 ~ 6.0	6	44	82
iDYB5 061 ~ 070	Ø 6.1 ~ 7.0	8	53	91
iDYB5 071 ~ 080	Ø 7.1 ~ 8.0	8	53	91
iDYB5 081 ~ 090	Ø 8.1 ~ 9.0	10	61	103
iDYB5 091 ~ 100	Ø 9.1 ~ 10.0	10	61	103
iDYB5 101 ~ 110	Ø 10.1 ~ 11.0	12	71	118
iDYB5 111 ~ 120	Ø 11.1 ~ 12.0	12	71	118
iDYB5 121 ~ 140	Ø 12.1 ~ 14.0	14	77	124
iDYB5 141 ~ 160	Ø 14.1 ~ 16.0	16	83	133
iDYB5 161 ~ 180	Ø 16.1 ~ 18.0	18	93	143
iDYB5 181 ~ 200	Ø 18.1 ~ 20.0	20	101	153
iDYB5 201 ~ 220	Ø 20.1 ~ 22.0	22	101	153

- Every intermediate decimal size drill readily available in stock
- Ordering Code for Dia 6.8 mm 5xD Drill: iDYB5 068
- Through Coolant Drills in i-Series availbale on request.

SOLID CARBIDE HIGH PERFORMANCE DRILL (iSERIES)

140°	Helix	HRC	Coating
		≤62	Tuff Coat

L x D	Shank Dia	Drill Dia	Standard
8	h6	m7	DIN 6537



iDYB8

P	M	K	N	S	H
■	■	◪	□	■	■

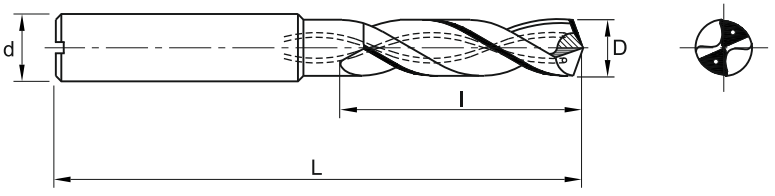
ITEM CODE	DRILL DIA D	SHANK DIA d	FL l	OAL L
iDYB8 040 ~ 060	Ø 4.0 ~ 6.0	6	55	95
iDYB8 061 ~ 070	Ø 6.1 ~ 7.0	8	75	115
iDYB8 071 ~ 080	Ø 7.1 ~ 8.0	8	75	115
iDYB8 081 ~ 090	Ø 8.1 ~ 9.0	10	95	140
iDYB8 091 ~ 100	Ø 9.1 ~ 10.0	10	95	140
iDYB8 101 ~ 110	Ø 10.1 ~ 11.0	12	115	160
iDYB8 111 ~ 120	Ø 11.1 ~ 12.0	12	115	160
iDYB8 121 ~ 140	Ø 12.1 ~ 14.0	14	130	180
iDYB8 141 ~ 160	Ø 14.1 ~ 16.0	16	150	200
iDYB8 161 ~ 180	Ø 16.1 ~ 18.0	18	165	225
iDYB8 181 ~ 200	Ø 18.1 ~ 20.0	20	180	250
iDYB8 201 ~ 220	Ø 20.1 ~ 22.0	22	180	250

- Every intermediate decimal size drill readily available in stock
- Ordering Code for Dia 6.8 mm 8xD Drill: iDYB8 068
- Through Coolant Drills in i-Series availbale on request.

SOLID CARBIDE THROUGH COOLANT HIGH PERFORMANCE DRILL

140°	Helix	HRC	Coating
	 30°	≤48	Duro Coat

L x D	Shank Dia	Drill Dia	Standard
3	h6	m7	DIN 6537



P M K N S H

DYB3 TC

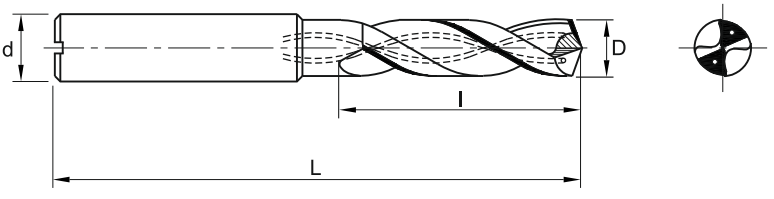
ITEM CODE	DRILL DIA D	SHANK DIA d	FL l	OAL L
DYB3 038 ~ 047 TC	Ø 3.8 ~ 4.7	6	24	66
DYB3 048 ~ 060 TC	Ø 4.8 ~ 6.0	6	28	66
DYB3 061 ~ 070 TC	Ø 6.1 ~ 7.0	8	34	79
DYB3 071 ~ 080 TC	Ø 7.1 ~ 8.0	8	41	79
DYB3 081 ~ 090 TC	Ø 8.1 ~ 9.0	10	47	89
DYB3 091 ~ 100 TC	Ø 9.1 ~ 10.0	10	47	89
DYB3 101 ~ 110 TC	Ø 10.1 ~ 11.0	12	55	102
DYB3 111 ~ 120 TC	Ø 11.1 ~ 12.0	12	55	102
DYB3 121 ~ 140 TC	Ø 12.1 ~ 14.0	14	60	107
DYB3 141 ~ 160 TC	Ø 14.1 ~ 16.0	16	65	115
DYB3 161 ~ 180 TC	Ø 16.1 ~ 18.0	18	73	123
DYB3 181 ~ 200 TC	Ø 18.1 ~ 20.0	20	79	131
DYB3 201 ~ 230 TC	Ø 20.1 ~ 22.0	22	79	131

- Every intermediate decimal size drill readily available in stock
- Ordering Code for Dia 6.8 mm 3xD Through Coolant Drill: DYB3 068 TC

SOLID CARBIDE THROUGH COOLANT HIGH PERFORMANCE DRILL

140°	Helix	HRC	Coating
	 30°	≤48	Duro Coat

L x D	Shank Dia	Drill Dia	Standard
5	h6	m7	DIN 6537

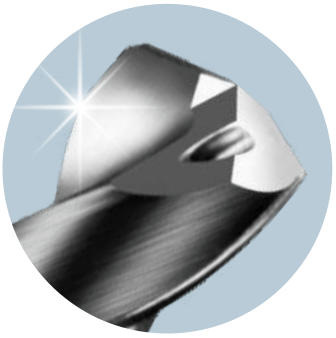


DYB5 TC

P M K N S H

ITEM CODE	DRILL DIA D	SHANK DIA d	FL l	OAL L
DYB5 038 ~ 047 TC	Ø 3.8 ~ 4.7	6	36	74
DYB5 048 ~ 060 TC	Ø 4.8 ~ 6.0	6	44	82
DYB5 061 ~ 070 TC	Ø 6.1 ~ 7.0	8	53	91
DYB5 071 ~ 080 TC	Ø 7.1 ~ 8.0	8	53	91
DYB5 081 ~ 090 TC	Ø 8.1 ~ 9.0	10	61	103
DYB5 091 ~ 100 TC	Ø 9.1 ~ 10.0	10	61	103
DYB5 101 ~ 110 TC	Ø 10.1 ~ 11.0	12	71	118
DYB5 111 ~ 120 TC	Ø 11.1 ~ 12.0	12	71	118
DYB5 121 ~ 140 TC	Ø 12.1 ~ 14.0	14	77	124
DYB5 141 ~ 160 TC	Ø 14.1 ~ 16.0	16	83	133
DYB5 161 ~ 180 TC	Ø 16.1 ~ 18.0	18	93	143
DYB5 181 ~ 200 TC	Ø 18.1 ~ 20.0	20	101	153
DYB5 201 ~ 220 TC	Ø 20.1 ~ 22.0	22	101	153

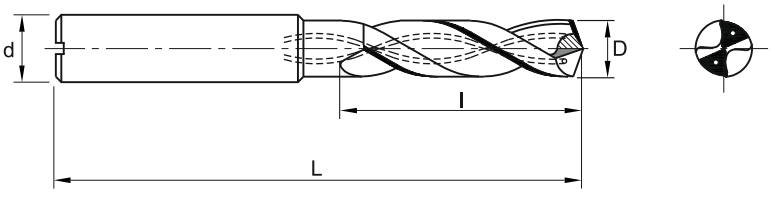
- Every intermediate decimal size drill readily available in stock
- Ordering Code for Dia 6.8 mm 5xD Through Coolant Drill: DYB5 068 TC



SOLID CARBIDE THROUGH COOLANT HIGH PERFORMANCE DRILL

140°	Helix	HRC	Coating
	 30°	≤48	Duro Coat

L x D	Shank Dia	Drill Dia	Standard
8	h6	m7	DIN 6537

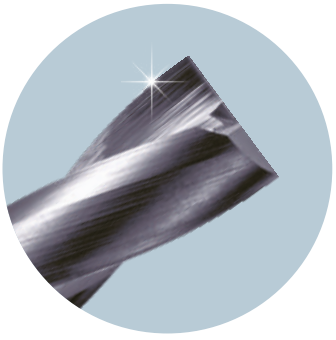


DYB8 TC

P M K N S H

ITEM CODE	DRILL DIA D	SHANK DIA d	FL l	OAL L
DYB8 040 ~ 060 TC	Ø 4.0 ~ 6.0	6	55	95
DYB8 061 ~ 070 TC	Ø 6.1 ~ 7.0	8	75	115
DYB8 071 ~ 080 TC	Ø 7.1 ~ 8.0	8	75	115
DYB8 081 ~ 090 TC	Ø 8.1 ~ 9.0	10	95	140
DYB8 091 ~ 100 TC	Ø 9.1 ~ 10.0	10	95	140
DYB8 101 ~ 110 TC	Ø 10.1 ~ 11.0	12	115	160
DYB8 111 ~ 120 TC	Ø 11.1 ~ 12.0	12	115	160
DYB8 121 ~ 140 TC	Ø 12.1 ~ 14.0	14	130	180
DYB8 141 ~ 160 TC	Ø 14.1 ~ 16.0	16	150	200
DYB8 161 ~ 180 TC	Ø 16.1 ~ 18.0	18	165	225
DYB8 181 ~ 200 TC	Ø 18.1 ~ 20.0	20	180	250
DYB8 201 ~ 220 TC	Ø 20.1 ~ 22.0	22	180	250

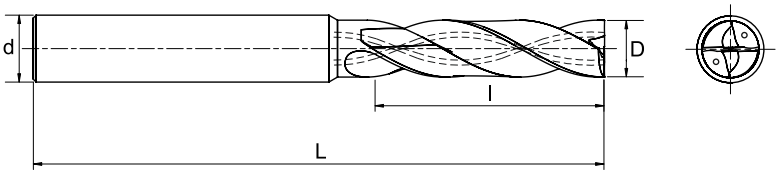
- Every intermediate decimal size drill readily available in stock
- Ordering Code for Dia 6.8 mm 8xD Through Coolant Drill: DYB8 068 TC



SOLID CARBIDE FLAT BOTTOM DRILL AX SERIES

Square End	Helix	HRC	Coating
	 30°	≤48	Duro Coat

L x D	Shank Dia	Drill Dia
3,5 & 8	h6	m7



P M K N S H

LxD 3 TC

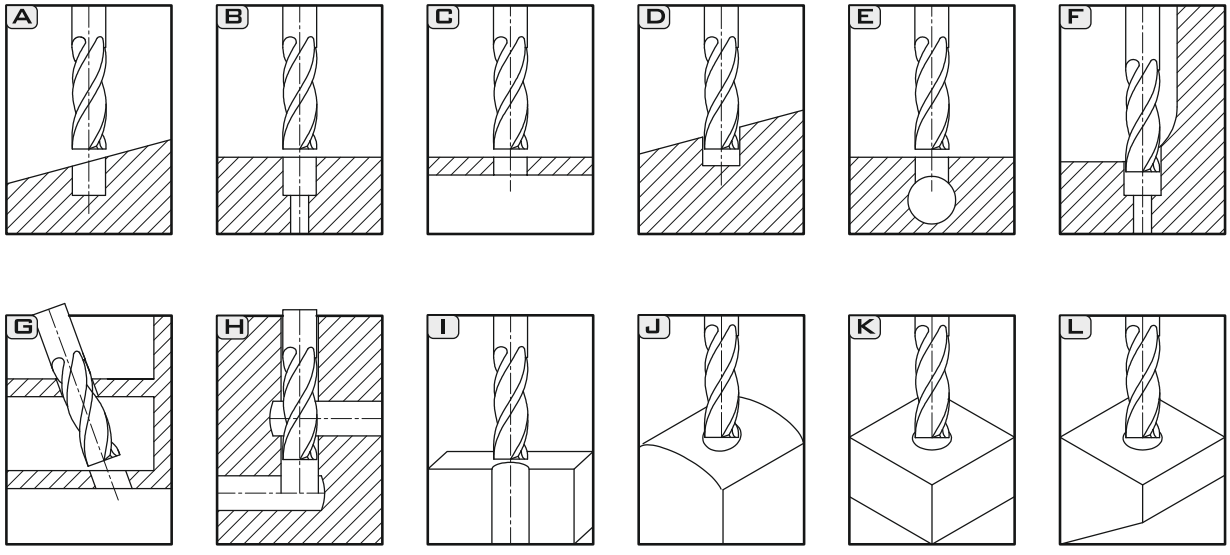
ITEM CODE	MILL DIA D	SHANK DIA d	FL l	OAL L
DZB3 040 TC AX	4	6	24	66
DZB3 050 TC AX	5	6	28	66
DZB3 060 TC AX	6	6	28	66
DZB3 070 TC AX	7	8	34	79
DZB3 080 TC AX	8	8	41	79
DZB3 090 TC AX	9	10	47	89
DZB3 100 TC AX	10	10	47	89
DZB3 110 TC AX	11	12	55	102
DZB3 120 TC AX	12	12	55	102
DZB3 130 TC AX	13	14	60	107
DZB3 140 TC AX	14	14	60	107
DZB3 160 TC AX	16	16	65	115
DZB3 180 TC AX	18	18	73	123
DZB3 200 TC AX	20	20	79	131

LxD 5 TC

ITEM CODE	MILL DIA D	SHANK DIA d	FL l	OAL L
DZB5 040 TC AX	4	6	36	74
DZB5 050 TC AX	5	6	44	82
DZB5 060 TC AX	6	6	44	82
DZB5 070 TC AX	7	8	53	91
DZB5 080 TC AX	8	8	53	91
DZB5 090 TC AX	9	10	61	103
DZB5 100 TC AX	10	10	61	103
DZB5 110 TC AX	11	12	71	118
DZB5 120 TC AX	12	12	71	118
DZB5 130 TC AX	13	14	77	124
DZB5 140 TC AX	14	14	77	124
DZB5 160 TC AX	16	16	83	133
DZB5 180 TC AX	18	18	93	143
DZB5 200 TC AX	20	20	101	153

• Non Through Coolant Flat Drill available on request.

TECHNICAL DATA - AX SERIES



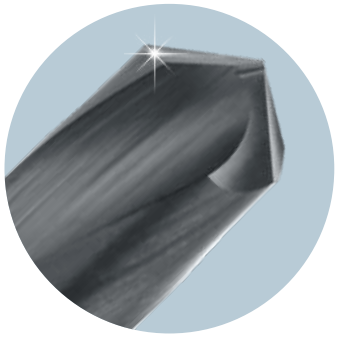
TOOL PARAMETERS

CUTTING SPEED (Vc) TABLE

Material Code	Material Group	HRC	Vc
A	Cast Iron, Aluminium	25~28	60~80
B	EN Series, Mild Steel	30~35	70~90
C	High-hardened Steel	50~60	30~40
D	Stainless Steel	20~25	25~40

Feed per Revolution (f) Chart

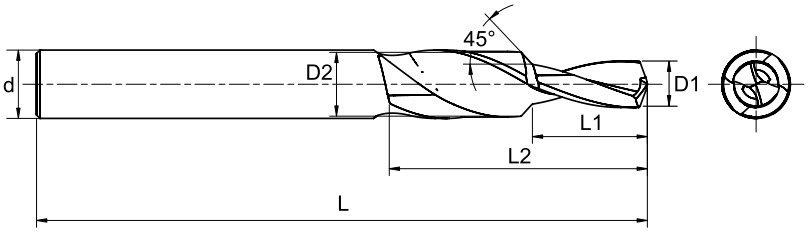
Dia of Drill	f (Feed per Revolution)
Ø4 ~ Ø6	0.030 ~ 0.060
Ø6 ~ Ø8	0.035 ~ 0.070
Ø8 ~ Ø10	0.040 ~ 0.080
Ø10 ~ Ø12	0.050 ~ 0.100
Ø12 ~ Ø16	0.060 ~ 0.120
Ø16 ~ Ø20	0.080 ~ 0.150



SOLID CARBIDE HIGH PERFORMANCE STEP DRILL

140°	Helix	HRC	Coating
	 30°	≤48	Duro Coat

L x D	Shank Dia	Drill Dia
2 & 3	h6	m7



P M K N S H

LxD 2

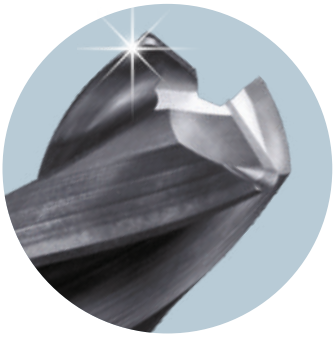
ITEM CODE	THREAD	DRILL DIA D1	DRILL DIA D2	SHANK DIA d	FL L1	FL L2	OAL L	CHAMFER
SD2 042 060	M5	4.2	6	6	12.5	25.0	66	45°
SD2 051 080	M6	5.1	8	8	14.5	30.0	79	45°
SD2 068 100	M8	6.8	10	10	16.5	32.0	89	45°
SD2 086 120	M10	8.6	12	12	20.5	35.0	102	45°
SD2 102 140	M12	10.2	14	14	22.5	40.0	107	45°
SD2 120 160	M14	12.0	16	16	26.5	45.0	115	45°
SD2 140 180	M16	14.0	18	18	30.5	50.0	123	45°

LxD 3

ITEM CODE	THREAD	DRILL DIA D1	DRILL DIA D2	SHANK DIA d	FL L1	FL L2	OAL L	CHAMFER
SD3 042 060	M5	4.2	6	6	16.5	30.0	66	45°
SD3 051 080	M6	5.1	8	8	20.5	40.0	79	45°
SD3 068 100	M8	6.8	10	10	23.5	45.0	89	45°
SD3 086 120	M10	8.6	12	12	29.5	55.0	102	45°
SD3 102 140	M12	10.2	14	14	35.5	65.0	107	45°
SD3 120 160	M14	12.0	16	16	40.5	70.0	115	45°
SD3 140 180	M16	14.0	18	18	45.5	75.0	123	45°

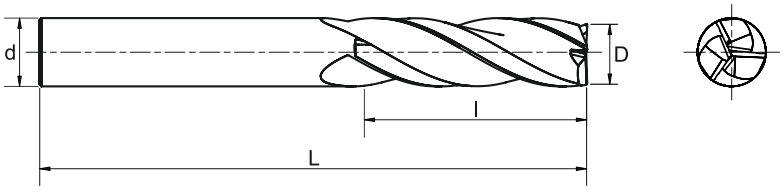
- Through Coolant Step Drill available in Request
- Step Drill iSeries available in Request

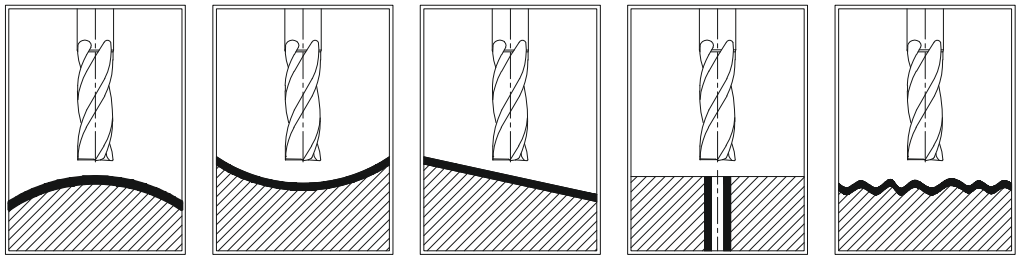
SOLID CARBIDE HOLE MILL



Square End	Series	Helix	Flutes	HRC
	Regular	30°	Z = 3	≈35

Coating	Tool Length	Shank Dia	Drill Dia
Duro Coat	LxD3	h6	m7





HM3

P M K N S H

ITEM CODE	DRILL DIA D	SHANK DIA d	FL l	OAL L
HM3 030	3	6	14	62
HM3 040	4	6	17	62
HM3 050	5	6	20	62
HM3 060	6	6	20	62
HM3 070	7	8	24	75
HM3 080	8	8	29	75
HM3 085	8.5	10	35	80
HM3 100	10	10	35	80
HM3 105	10.5	12	40	102
HM3 120	12	12	40	102
HM3 125	12.5	14	43	107
HM3 140	14	14	43	107
HM3 145	14.5	16	45	110
HM3 160	16	16	45	110

- Intermediate size Hole Mill available on request
- For HRC ≥58, use Duro Coat
- B+ve and iSeries available on request
- For LxD...5 use code HM5 in place of HM3

BLOOD®
ROTATING GENIUS

THREAD MILL

NOMENCLATURE FOR SOLID CARBIDE THREADMILL

TM	I	.	08	.	125	.	3	H	I	.	080	065	.	R	-	ISO
1	2		3		4		5	6	7		8	9		10		11

1. TOOL TYPE

Threadmill

2. COOLANT TYPE

I = Internal Coolant

E = External Coolant

3. STD THREAD

M3	M6
M4	M8
M5	M10

* Only for ISO

4. PITCH

Full Profile - Pitch Range	
mm	tpi
0.25 - 6.0	80 - 4.5

Partial Profile - Pitch Range		
	mm	tpi
TA	0.5 - 0.8	32 - 56
TB	0.5 - 1.0	24 - 56
TC	1.0 - 1.50	16 - 24
TD	1.0 - 1.75	14 - 24
TF	0.5 - 1.25	20 - 48

5. FLUTES

2 = Two Flute

3 = Three Flute

5 = Five Flute

6. HELIX

H = Helical

S = Straight

7. TYPE OF TOOL

I = Internal

E = External

8. SHANK DIA

060 = 6.00 mm

080 = 8.00 mm

100 = 10.0 mm

9. CUTTING DIAMETER

048 = 4.80 mm

065 = 6.50 mm

082 = 8.20 mm

10. OVERALL LENGTH

S = Stub

R = Regular

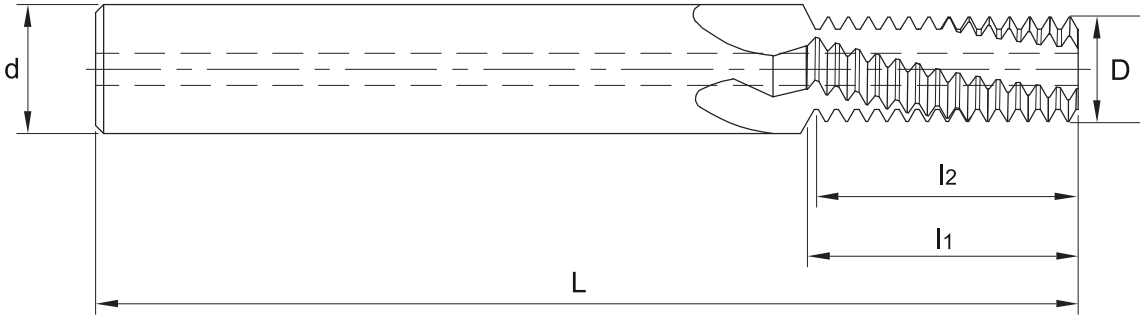
11. THREAD TYPE

ISO = ISO Metric	BSF = Whit. Fine	T55 = Taper 55°
BSP = BSP	UN = American UN	T60 = Taper 60°
BSPT = BSPT	NPT = NPT	NM = Nano Mill
BSW = BSW	NPTF = NPTF	RC = With Chamfer

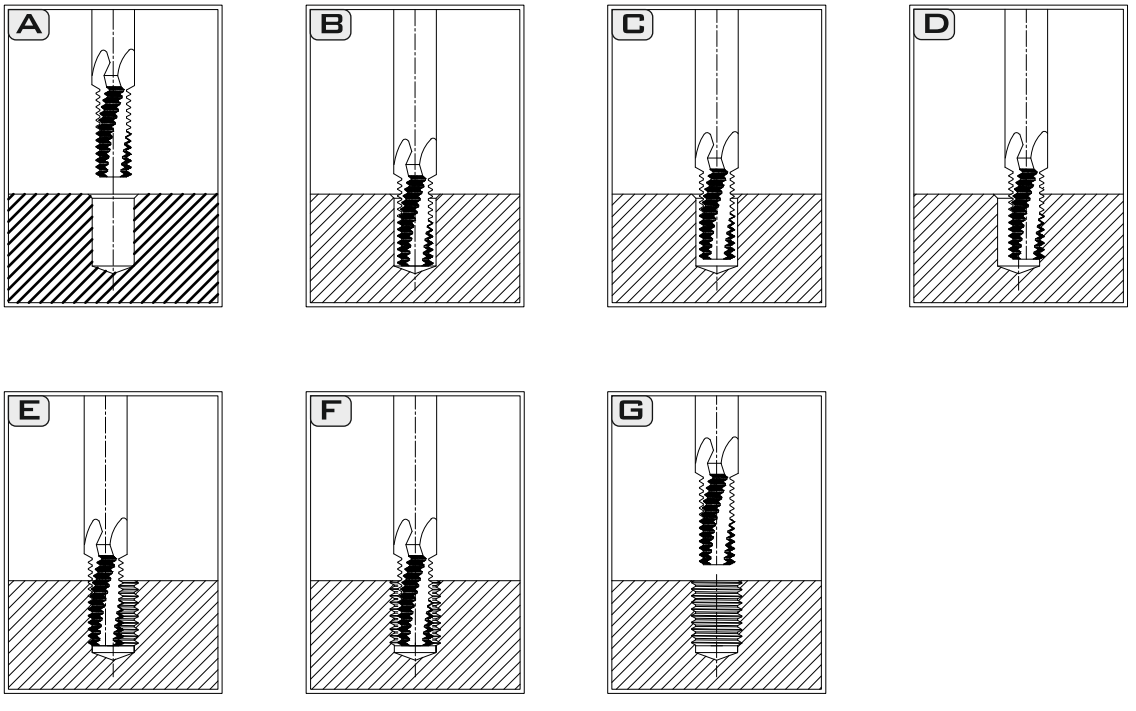
THREAD MILL APPLICATION

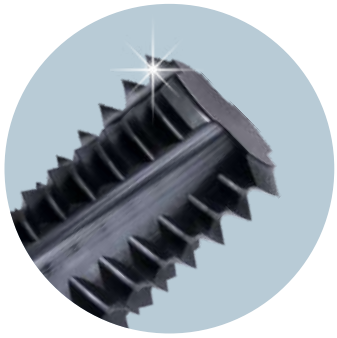
WORK SEQUENCE

A	Approach
B	Drilling and chamfering
C	Withdraw
D	Radial setting to nominal thread diameter through entry loop
E	Forward feed by pitch with simultaneous interpolation of tool around the central thread axis threading cycle
F	Radial movement back to the bore centre through exit loop
G	Exit bore



CALCULATION OF ACTUAL DIAMETER

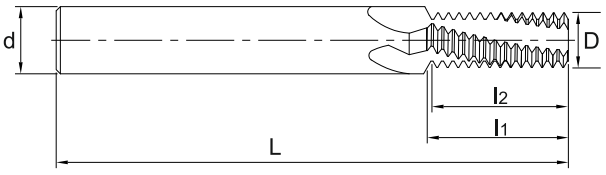


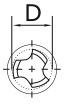


HELICAL THREAD MILL
STUB SERIES

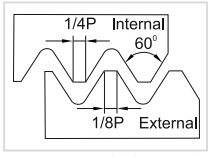
Flutes	Flutes	Helix	HRC
Z = 3	Z = 4	14°	≈35

Coating	Shank Dia	Tool Length
Duro Coat	h6	S





Internal



Defined by: R262 (DIN 13)
Tolerance class: 6H

ISO METRIC

Regular

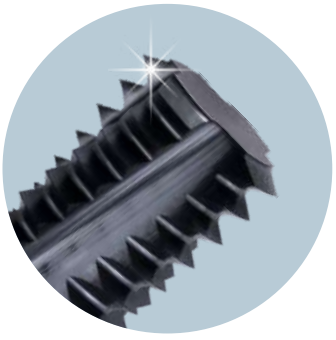
P M K N S H

B+ve

P M K N S H

ITEM CODE	Thread		Pitch	Dimensions (mm)					No. of Flutes	Drill Dia
Internal	M Coarse	M Fine	mm	d	D	l_2	l_1	L	z	mm
TMI/E.03.050.3HI.040024.S-ISO	M3 x 0.5	M3.5- M16 x 0.5	0.5	4	2.4	4.5	4.7	45	3	2.5
TMI/E.04.070.3HI.040314.S-ISO	M4 x 0.7		0.7	4	3.14	6.3	6.6	45	3	3.3
TMI/E.05.080.3HI.040039.S-ISO	M5 x 0.8		0.8	4	3.9	7.2	7.6	45	3	4.2
TMI/E.06.100.3HI.060048.S-ISO	M6 x 1.0	M8- M40 x 1.0	1.0	6	4.8	9.0	9.5	57	3	5.0
TMI/E.08.125.3HI.080065.S-ISO	M8 x 1.25		1.25	8	6.5	12.5	13.1	61	3	6.8
TMI/E.10.150.3HI.100082.S-ISO	M10 x 1.5	M12- M48 x 1.5	1.5	10	8.2	15.0	15.7	73	3	8.5
TMI/E.12.175.4HI.100099.S-ISO	M12 x 1.75		1.75	10	9.9	17.5	18.4	73	4	10.2
TMI/E.14.200.4HI.120116.S-ISO	M14 x 2.0	M17- M80 x 2.0	2.0	12	11.6	20.0	21.0	73	4	12.0
TMI/E.16.200.4HI.140136.S-ISO	M16 x 2.0	M17- M80 x 2.1	2.0	14	13.6	24.0	25.0	92	4	14.0

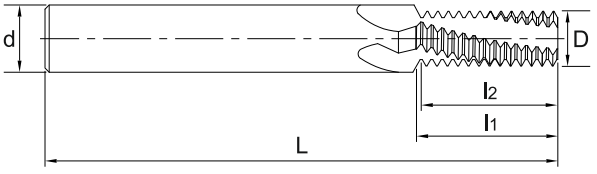
- For HRC ≥58, use Duro Coat
- For Through Coolant Threadmill, Item Code will be TMI
- For Non-Through Coolant Threadmill, Item Code will be TME
- B+ve and iSeries available on request

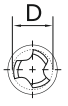


HELICAL THREAD MILL
REGULAR SERIES

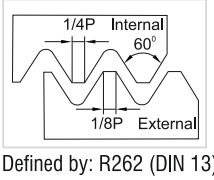
Flutes	Flutes	Helix	HRC
Z = 3	Z = 4	14°	≈35

Coating	Shank Dia	Tool Length
Duro Coat	h6	R





Internal



Defined by: R262 (DIN 13)
Tolerance class: 6H

Regular

P M K N S H

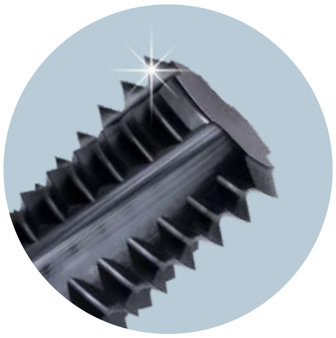
B+ve

P M K N S H

ISO METRIC

ITEM CODE	Thread		Pitch	Dimensions (mm)					No. of Flutes	Drill Dia
Internal	M Coarse	M Fine	mm	d	D	l_2	l_1	L	z	mm
TMI/E.03.050.3HI.040024.R-ISO	M3x0.5	M3.5-M16x0.5	0.5	4	2.4	6.0	6.2	45	3	2.5
TMI/E.04.050.3HI.040032.R-ISO		M4x0.5	0.5	4	3.2	8.0	8.2	45	3	3.5
TMI/E.05.050.3HI.060042.R-ISO		M5x0.5	0.5	6	4.2	10.0	10.2	57	3	4.5
TMI/E.04.070.3HI.040031.R-ISO	M4x0.7		0.7	4	3.15	8.4	8.7	45	3	3.3
TMI/E.06.075.3HI.060050.R-ISO		M6x0.75	0.75	6	5.0	12.0	12.4	57	3	5.3
TMI/E.05.080.3HI.040039.R-ISO	M5x0.8		0.8	4	3.9	10.4	10.8	45	3	4.2
TMI/E.06.100.3HI.060048.R-ISO	M6x1.0	M8-M40x1.0	1.0	6	4.8	12.0	12.5	57	3	5.0
TMI/E.08.100.3HI.080067.R-ISO		M8x1.0	1.0	8	6.7	16.0	16.5	61	3	7.0
TMI/E.10.100.3HI.100087.R-ISO		M10x1.0	1.0	10	8.7	20.0	20.5	73	3	9.0
TMI/E.12.100.4HI.120107.R-ISO		M12x1.0	1.0	12	10.7	24.0	24.5	73	4	11.0
TMI/E.08.125.3HI.080065.R-ISO	M8x1.25		1.25	8	6.5	16.2	16.9	61	3	6.8
TMI/E.10.125.3HI.100085.R-ISO		M10x1.25	1.25	10	8.5	20.0	20.6	73	3	8.8
TMI/E.10.150.3HI.100082.R-ISO	M10x1.5	M12-M48x1.5	1.5	10	8.2	19.5	20.2	73	3	8.5
TMI/E.12.150.4HI.100099.R-ISO		M12x1.5	1.5	10	9.9	24.0	24.7	73	4	10.5
TMI/E.14.150.4HI.120119.R-ISO		M14x1.5	1.5	12	11.9	28.5	29.2	80	4	12.5
TMI/E.16.150.4HI.140139.R-ISO		M16x1.5	1.5	14	13.9	31.5	32.2	92	4	14.5
TMI/E.12.175.4HI.100099.R-ISO	M12x1.75		1.75	10	9.9	24.5	25.4	73	4	10.2
TMI/E.14.200.4HI.120116.R-ISO	M14x2.0	M17-M80x2.0	2.0	12	11.6	28.0	29.0	80	4	12.0
TMI/E.16.200.4HI.140136.R-ISO	M16x2.0	M17-M80x2.0	2.0	14	13.6	32.0	33.0	92	4	14.0
TMI/E.18.250.4HI.160148.R-ISO	M18x2.5		2.5	16	14.8	35.0	36.0	92	4	15.5
TMI/E.20.250.4HI.180171.R-ISO	M20x2.5		2.5	18	17.1	40.0	41.2	100	4	17.5
TMI/E.24.300.4HI.200199.R-ISO	M24x3.0		3.0	20	19.9	48.0	49.5	100	4	21.0

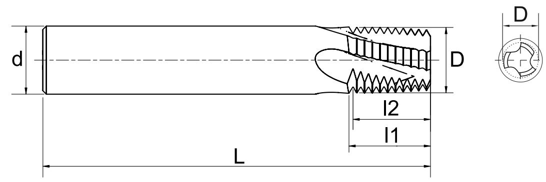
- For HRC ≥58, use Duro Coat
- For Through Coolant Threadmill, Item Code will be TMI
- For Non-Through Coolant Threadmill, Item Code will be TME
- B+ve and iSeries available on request



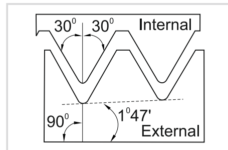
HELICAL THREAD MILL
NPT SERIES

Flutes	Flutes	Helix	HRC
Z = 3	Z = 4	14°	≈35

Coating	Shank Dia
Duro Coat	h6



External - Internal



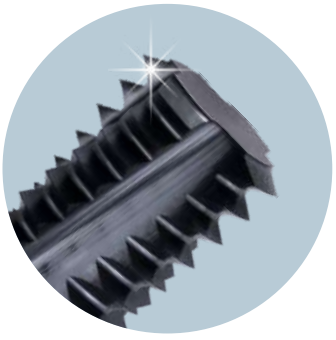
Defined by: USAS B2.1 : 1968
Tolerance class: Standard NPT

NPT

	Regular						B+ve					
	P	M	K	N	S	H	P	M	K	N	S	H
	■	◪	■	◪			■	■	■	◪	◪	◪

ITEM CODE	Thread	Pitch	Dimensions (mm)					No. of Flutes	Drill Dia
Internal / External		mm	d	D	l2	l1	L	z	mm
TMI/E.27.3HI.060059-NPT	1/16"x27	27	6	5.9	9.4	9.9	57	3	6.3
TMI/E.27.3HI.087065-NPT	1/8"x27	27	8	7.65	9.4	9.9	61	3	8.5
TMI/E.18.3HI.100099-NPT	1/4 "x18	18	10	9.9	14.1	14.8	73	3	11.1
TMI/E.18.4HI.1201115-NPT	3/8"x18	18	12	11.15	14.1	14.8	73	4	14.5
TMI/E.14.4HI.1601425-NPT	1/2", 3/4'x14	14	16	14.25	18.1	19.0	92	4	17.7
TMI/E.115.4HI.200196-NPT	1", 1 1/4", 1 1/2", 2"x11.5	11.5	20	19.6	22.1	23.2	100	4	29
TMI/E.08.4HI.200196-NPT	2 1/2", 3"x8	8	20	19.6	31.7	33.3	100	4	66.5

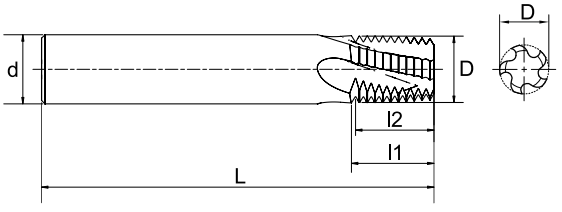
- B+ve and iSeries available on request
- For HRC ≥58, use Duro Coat
- For Through Coolant Threadmill, Item Code will be TMI
- For Non-Through Coolant Threadmill, Item Code will be TME
- For TMI/E.14.4HI.161425-NPT, Drill Dia = 17.7, 23 mm
- For TMI/E.115.4HI.20196-NPT, Drill Dia = 29, 37.7, 44, 56 mm
- For TMI/E.08.4HI.20196-NPT, Drill Dia = 66.5, 82.1 mm



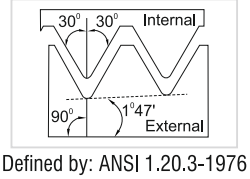
HELICAL THREAD MILL
NPTF SERIES

Flutes	Flutes	Helix
Z = 3	Z = 4	14°

HRC	Coating	Shank Dia
≈35	Duro Coat	h6



External - Internal



Defined by: ANSI 1.20.3-1976
Tolerance class: Standard NPTF

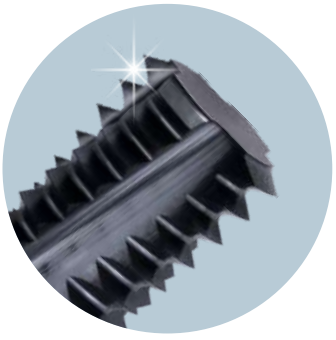
P M K N S H

■ ◪ ■ ◪ □ □

NPTF

ITEM CODE	Thread	Pitch	Dimensions (mm)					No. of Flutes	Drill Dia
Internal / External		mm	d	D	l_2	l_1	L	z	mm
TMI/E.27.3HI.060059-NPTF	1/16"x27	27	6	5.9	9.4	9.9	57	3	6.3
TMI/E.27.3HI.087065-NPTF	1/8"x27	27	8	7.65	9.4	9.9	61	3	8.5
TMI/E.18.3HI.100099-NPTF	1/4"x18	18	10	9.9	14.1	14.8	73	3	11.1
TMI/E.18.4HI.1201115-NPTF	3/8"x18	18	12	11.15	14.1	14.8	73	4	14.5
TMI/E.14.4HI.1601425-NPTF	1/2", 3/4"x14	14	16	14.25	18.1	19.0	92	4	17.7
TMI/E.115.4HI.200196-NPTF	1", 1 1/4", 1 1/2", 2"x11.5	11.5	20	19.6	22.1	23.2	100	4	29
TMI/E.08.4HI.200196-NPTF	2 1/2", 3"x8	8	20	19.6	31.7	33.3	100	4	66.5

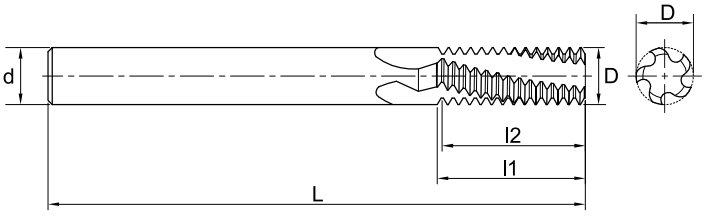
- B+ve and iSeries available on request
- UN, BSP, Whitworth Standards available on request
- For HRC ≥58, use Duro Coat
- For Through Coolant Threadmill, Item Code will be TMI
- For Non-Through Coolant Threadmill, Item Code will be TME
- For TMI/E.14.4HI.161425-NPTF, Drill Dia = 17.7, 23 mm
- For TMI/E.115.4HI.20196-NPTF, Drill Dia = 29, 37.7, 44, 56 mm
- For TMI/E.08.4HI.20196-NPTF, Drill Dia = 66.5, 82.1 mm



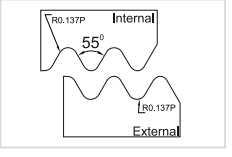
HELICAL THREAD MILL
BSP SERIES

Flutes	Flutes	Flutes	HRC
Z = 3	Z = 4	Z = 5	≈35

Coating	Shank Dia	Helix
Duro Coat	h6	14°



External - Internal



Regular

P M K N S H

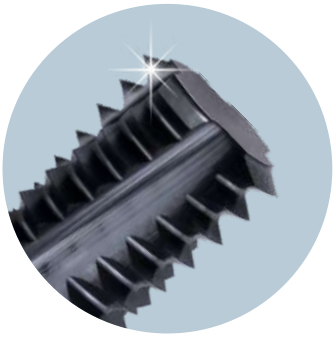
B+ve

P M K N S H

BSP

ITEM CODE	Thread	Pitch	Dimensions (mm)					No. of Flutes	Drill Dia
Internal / External		mm	d	D	l_2	l_1	L	z	mm
TMI/E.28.3HI.060058-BSP	1/16"x28, 1/8"x28	28	6	5.8	16.3	16.8	57	3	6.7
TMI/E.28.3HI.080077-BSP	1/8"x28	28	8	7.7	20	20.5	63	3	8.7
TMI/E.19.4HI.100099-BSP	1/4"x19, 3/8"x19,	19	10	9.9	26.7	27.2	73	4	11.8
TMI/E.19.4HI.160134-BSP	3/8"x19,	19	16	13.4	33.4	33.9	92	4	15.2
TMI/E.14.5HI.160157-BSP	1/2", 3/4"x14	14	16	15.7	43.5	44.0	92	5	19
TMI/E.11.5HI.200199-BSP	1", 1 1/2", 2, 2 1/2" x11	11	20	19.9	41.6	42.1	100	5	30.7

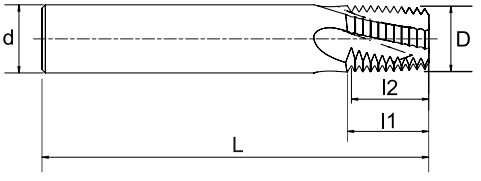
- B+ve and iSeries available on request
- UN, BSP, Whit worth Standards available on request
- For HRC ≥58, use Duro Coat
- For Through Coolant Threadmill, Item Code will be TMI
- For Non-Through Coolant Threadmill, Item Code will be TME

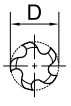


HELICAL THREAD MILL
BSPT SERIES

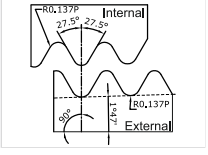
Series	Flutes	Flutes	Flutes
Regular	Z = 3	Z = 4	Z = 5

HRC	Coating	Shank Dia	Helix
≈35	Duro Coat	h6	14°





External - Internal



THREAD MILLS

Regular

P M K N S H

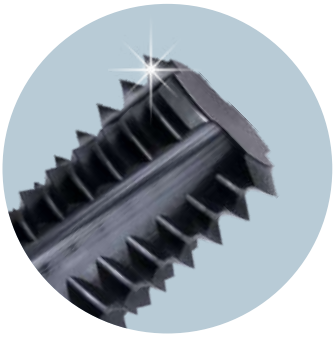
B+ve

P M K N S H

BSPT

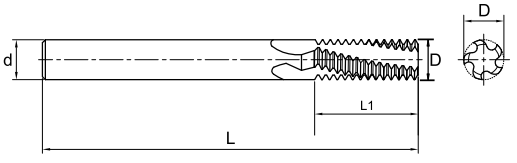
ITEM CODE	Thread	Pitch	Dimensions (mm)					No. of Flutes	Drill Dia
Internal / External		mm	d	D	L_2	L_1	L	z	mm
TMI/E.28.3HI.060058-BSPT	1/16"x28	28	6	5.8	16.3	16.8	57	3	6.7
TMI/E.28.3HI.080077-BSPT	1/8"x28	28	8	7.7	20	20.5	63	3	8.7
TMI/E.19.4HI.100099-BSPT	1/4"x19	19	10	9.9	26.7	27.2	73	4	11.5
TMI/E.19.4HI.160134-BSPT	3/8"x19	19	16	13.4	33.4	33.9	92	4	15.2
TMI/E.14.5HI.160157-BSPT	1/2", 3/4"x14	14	16	15.7	43.5	44.0	92	5	19
TMI/E.11.5HI.200199-BSPT	1", 1 1/2", 2, 2 1/2", x11	11	20	19.9	41.6	42.1	100	5	30.7

- B+ve and iSeries available on request
- UN, BSP, Whit worth Standards available on request
- For HRC ≥58, use Tuff Coat
- For Through Coolant Threadmill, Item Code will be TMI
- For Non-Through Coolant Threadmill, Item Code will be TME

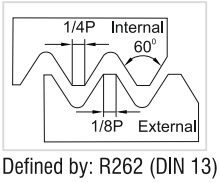


THREAD MILL
AMERICAN UN-R SERIES

Flutes	Flutes	Flutes	HRC	Coating	Shank Dia	Helix
Z = 3	Z = 4	Z = 5	≤48	Duro Coat	h6	14°



Internal



Defined by: R262 (DIN 13)
Tolerance class: 6H

Regular

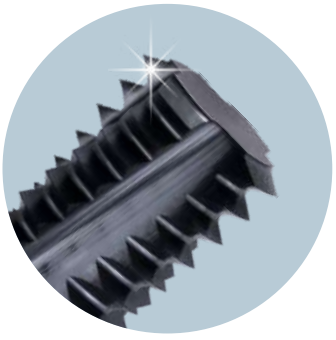
P M K N S H

B+ve

P M K N S H

ITEM CODE Internal / External	UNC - Thread	UNF - Thread	Pitch	Dimensions (mm)					Bore Dia
			mm	d	D	L	L_1	z	mm
TMI/E.32.3HI.040038-R-UN		No.10-32	32	4	3.80	45	9.9	3	4.0
TMI/E.32.3HI.060044-R-UN		No.12-3/8"x32	32	6	4.40	57	11.5	3	4.7
TMI/E.28.3HI.060043-R-UN		No.12, 1/4"x28	28	6	4.30	57	11.3	3	4.6
TMI/E.28.3HI.0600515-R-UN		1/4"x28	28	6	5.15	57	13.1	3	5.5
TMI/E.28.3HI.100099-R-UN			28	10	9.90	73	22.2	3	10.2
TMI/E.24.3HI.0400358-R-UN	No.10-24	5/16", 3/8"x24	24	4	3.58	45	10.0	3	3.8
TMI/E.24.3HI.0600415-R-UN	No.12-24	5/16", 3/8"x24	24	6	4.15	57	11.1	3	4.5
TMI/E.24.3HI.0800668-R-UN		5/16", 3/8"x24	24	8	6.68	61	16.4	3	6.8
TMI/E.24.3HI.100082-R-UN		3/8"x24	24	10	8.20	73	19.6	3	8.5
TMI/E.24.4HI.140129-R-UN			24	14	12.9	92	29.1	4	13.2
TMI/E.20.3HI.0600488-R-UN	1/4"x20	7/16", 1/2"x20	20	6	4.88	57	13.3	3	5.2
TMI/E.20.3HI.100096-R-UN		7/16", 1/2"x20	20	10	9.60	73	22.2	3	9.8
TMI/E.20.4HI.120111-R-UN		1/2"x20	20	12	11.1	80	26.0	4	11.5
TMI/E.20.4HI.180174-R-UN			20	18	17.4	100	38.7	4	17.8
TMI/E.18.3HI.0800615-R-UN	5/16"x18	9/16", 5/8"x18	18	8	6.15	61	16.2	3	6.5
TMI/E.18.4HI.140125-R-UN		9/16", 5/8"x18	18	14	12.5	92	28.9	4	12.8
TMI/E.18.4HI.160141-R-UN		5/8"x18	18	16	14.1	92	31.7	4	14.5
TMI/E.16.3HI.0800765-R-UN	3/8"x16	3/4"x16	16	8	7.65	61	19.8	3	8.0
TMI/E.16.4HI.180170-R-UN		3/4"x16	16	18	17.0	100	38.8	4	17.5
TMI/E.14.3HI.100090-R-UN	7/16"x14	7/8"x14	14	10	9.00	73	22.7	3	9.3
TMI/E.14.4HI.200199-R-UN		7/8"x14	14	20	19.9	100	44.4	4	20.5
TMI/E.13HI.1201035-R-UN	1/2"x13		13	12	10.35	80	26.4	4	10.8
TMI/E.12.4HI.120118-R-UN	9/16"x12	1"-1 1/2"x12	12	12	11.8	80	28.6	4	12.3
TMI/E.12.4HI.200199-R-UN		1"-1 1/2"x12	12	20	19.9	100	51.9	4	23.5
TMI/E.11.4HI.140131-R-UN	5/8"x11		11	14	13.1	92	33.5	4	13.5
TMI/E.10.4HI.160159-R-UN	3/4"x10		10	16	15.9	92	39.4	4	16.5
TMI/E.09.4HI.200190-R-UN	7/8"x9		9	20	19.0	100	46.6	4	19.5
TMI/E.08.4HI.200199-R-UN	1"x8		8	20	19.9	100	52.4	4	22.0

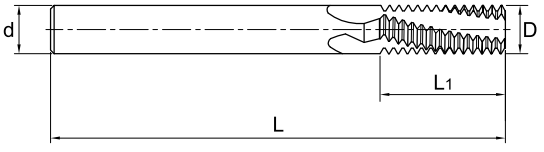
- For Through Coolant Threadmill, Item Code will be TMI
- For Non-Through Coolant Threadmill, Item Code will be TME
- For HRC ≥58, use Duro Coat
- B+ve and iSeries available on request

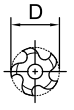


THREAD MILL
WHITWORTH (BSW, BSF) SERIES

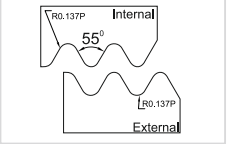
Flutes	Flutes	Flutes	HRC
Z = 3	Z = 4	Z = 5	≈35

Coating	Shank Dia	Helix
Duro Coat	h6	14°





External - Internal



THREAD MILLS

Regular

P	M	K	N	S	H
■	◪	■	◪		

B+ve

P	M	K	N	S	H
■	■	■	◪	◪	◪

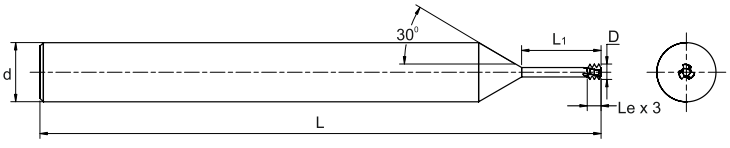
ITEM CODE Internal / External	BSW - Thread	BSF - Thread	Pitch mm	Dimensions (mm) d	D	L	L1	z	Bore Dia mm
TMI/E.26.3HI.060050-R-BS		1/4"x26	26	6	5	57	13.2	3	5.3
TMI/E.22.3HI.0800635-R-BS		5/16"x22	22	8	6.35	61	16.7	3	6.7
TMI/E.20.3HI.0600445-R-BS	1/4"x20	3/8"x20	20	6	4.45	57	13.3	3	5
TMI/E.20.3HI.0800765-R-BS		3/8"x20	20	8	7.65	61	19.7	3	8.2
TMI/E.18.3HI.0600585-R-BS	5/16"x18	7/16"x18	18	6	5.85	57	16.2	3	6.5
TMI/E.18.3HI.100092-R-BS		7/16"x18	18	10	9.2	73	23.3	3	9.7
TMI/E.16.3HI.080072-R-BS	3/8"x16	1/2", 9/16"x16	16	8	7.2	61	19.8	3	7.9
TMI/E.16.4HI.120105-R-BS		1/2", 9/16"x16	16	12	10.5	80	25.2	4	11.1
TMI/E.16.4HI.1401215-R-BS		9/16"x16	16	14	12.15	92	29.4	4	12.6
TMI/E.14.3HI.100085-R-BS	7/16"x14	5/8", 11/16"x14	14	10	8.5	73	22.7	3	9.2
TMI/E.14.4HI.140134-R-BS		5/8", 11/16"x14	14	14	13.4	92	31.7	4	14
TMI/E.14.4HI.160150-R-BS		11/16"x14	14	16	15.0	92	35.4	4	15.6
TMI/E.12.3HI.1000965-R-BS	1/2"x12	3/4"x12	12	10	9.65	73	26.5	3	10.5
TMI/E.12.4HI.1201125-R-BS	9/16"x12	3/4"x12	12	12	11.25	80	28.6	4	12.1
TMI/E.12.4HI.180162-R-BS		3/4"x12	12	18	16.2	100	39.2	4	16.8
TMI/E.11.4HI.140126-R-BS	5/8"x11	7/8"x11	11	14	12.6	92	33.5	4	13.4
TMI/E.11.4HI.160142-R-BS	11/16"x11		11	16	14.2	92	35,8	4	15

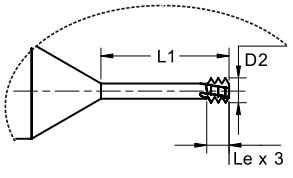
- For Through Coolant Threadmill, Item Code will be TMI
- For Non-Through Coolant Threadmill, Item Code will be TME
- For HRC ≥58, use Duro Coat
- B+ve and iSeries available on request

THREAD MILL
ISO METRIC NANO-MILL SERIES

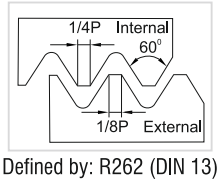
Series	Flutes	Flutes	Flutes
Regular	Z = 3	Z = 4	Z = 5

HRC	Coating	Shank Dia	Helix
≈35	Duro Coat	h6	14°





Internal



Defined by: R262 (DIN 13)
Tolerance class: 6H

Regular

P	M	K	N	S	H
■	◪	■	◪		

B+ve

P	M	K	N	S	H
■	■	■	◪	◪	◪

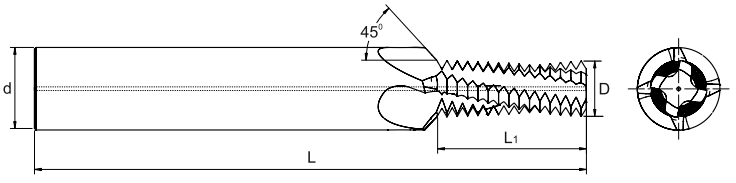
ITEM CODE	M Coarse	M Fine	Pitch	Dimensions (mm)					Bore Dia
Internal / External			mm	d	D	L	L1	z	mm
TME.02.040.3HI.0600155.NM-ISO	M2 x 0.4		0.4	6	1.55	57	4.2	3	1.6
TME.022.045.3HI.0600165.NM-ISO	M2.2 x 0.45		0.45	6	1.65	57	4.6	3	1.75
TME.025.045.3HI.0600195.NM-ISO	M2.5 x 0.45		0.45	6	1.95	57	5.2	3	2.05
TME.03.050.3HI.060024.NM-ISO	M3 x 0.5	M3.5-M16 x 0.5	0.5	6	2.4	57	6.2	3	2.5
TME.035.060.3HI.0600275.NM-ISO	M3.5 x 0.6		0.6	6	2.75	57	7.3	3	2.9
TME.04.070.3HI.0600315.NM-ISO	M4 x 0.7		0.7	6	3.15	57	8.3	3	3.3
TME.05.080.3HI.0600405.NM-ISO	M5 x 0.8		0.8	6	4.05	57	10.4	3	4.2
TME.06.100.3HI.0600480.NM-ISO	M6 x 1.0	M8-M40 x 1.0	1.0	6	4.8	57	12.5	3	5
TME.08.125.3HI.080065.NM-ISO	M8 x 1.25		1.25	8	6.5	63	16.6	3	6.8
TME.10.150.3HI.100082.MP-ISO	M10 x 1.5	M12-M48 x 1.5	1.5	10	8.2	73	20.8	3	8.5
TME.12.175.3HI.100099.NM-ISO	M12 x 1.75		1.75	10	9.9	73	25	3	10.3
TME.16.200.3HI.1200119.NM-ISO	M16 x 2.0		2.0	12	11.9	83	33	3	14
TME.20.250.3HI.1600159.NM-ISO	M20 x 2.5		2.5	16	15.9	92	41.3	3	17.5

• B+ve and iSeries available on request

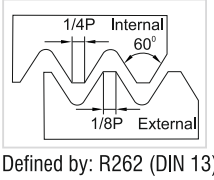
THREAD MILL ISO METRIC SERIES WITH CHAMFER

Series	Flutes	Flutes	Flutes
Regular	Z = 3	Z = 4	Z = 5

HRC	Coating	Shank Dia	Helix
≈35	Tuff Coat	h6	14°



Internal



Defined by: R262 (DIN 13)
Tolerance class: 6H

THREAD MILLS

Regular

P	M	K	N	S	H
■	◪	■	◪		

B+ve

P	M	K	N	S	H
■	■	■	◪	◪	◪

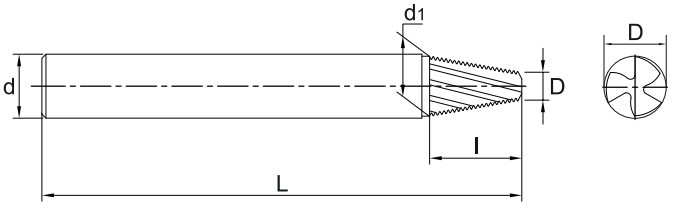
ITEM CODE	M Coarse	M Fine	Pitch	Dimensions (mm)					Bore Dia
Internal / External			mm	d	D	L	L_1	z	mm
TMI/E.06.100.3HI.060048.RC-ISO	M6 x 1.0	M8-M40 x 1.0	1.0	8	4.8	60	13	3	5.0
TMI/E.08.125.3HI.080065.RC-ISO	M8 x 1.25		1.25	10	6.5	65	17	3	6.8
TMI/E.10.150.3HI.100082.RC-ISO	M10 x 1.5	M12 x M48 x 1.5	1.5	12	8.2	80	21	3	8.5
TMI/E.12.175.3HI.100099.RC-ISO	M12 x 1.75		1.75	14	9.9	80	26	4	10.2

• B+ve and iSeries available on request

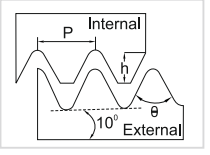
TAPER THREAD MILL
SURGICAL APPLICATION

Series	Flutes	HRC
Regular	Z = 3	≈35

Coating	Shank Dia	Helix
Duro Coat	h6	14°



External - Internal



ISO METRIC

Regular

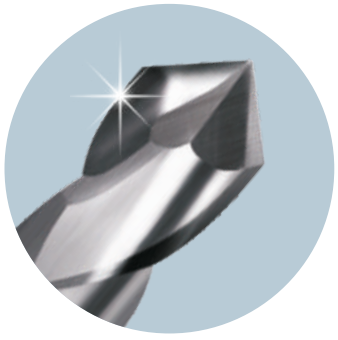
P M K N S H

B+ve

P M K N S H

ITEM CODE	Taper	Pitch	Thread Angle	Dimensions (mm)						No. of Flutes
		P mm		h	d	d1	D	L	l	z
TME.04.3HI.060032.T60	20°	0.4	60°	0.20	6	5.9	3.2	58	8	3
TME.05.3HI.060029.T60	20°	0.5	60°	0.25	6	5.9	2.9	58	9	3
TME.03.3HI.030015.T55	20°	0.3	55°	0.18	3	2.9	1.5	39	4	3
TME.03.3HI.060015.T60	20°	0.3	60°	0.18	6	5.9	2.0	39	4	3
TME.04.3HI.060025.T55	20°	0.4	55°	0.30	6	5.9	2.5	58	10	3
TME.05.3HI.060029.T55	20°	0.5	55°	0.35	6	5.9	2.9	58	9	3
TME.06.3HI.060038.T55	20°	0.6	55°	0.45	6	5.9	3.8	58	6.5	3

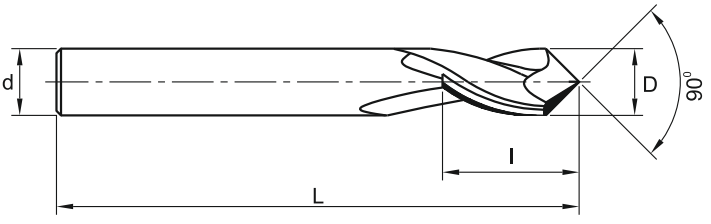
- For HRC ≥58, use Duro Coat
- B+ve and iSeries available on request

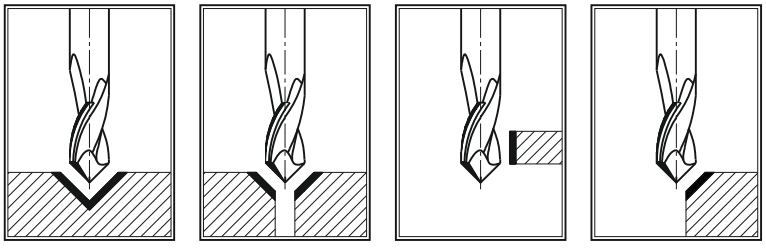


SOLID CARBIDE MULTI FUNCTIONAL DRILL MILL

90°	Helix	Flutes	HRC
	 30°	Z = 2	≈35

Coating	Tool Length	Shank Dia	Mill Dia
Duro Coat	R	h6	e8



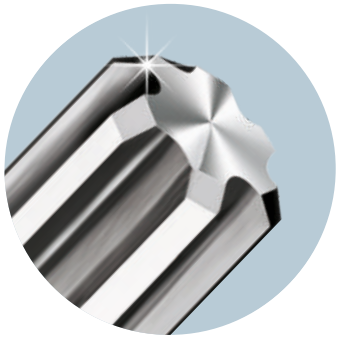


P M K N S H

DMZB

ITEM CODE	MILL DIA D	SHANK DIA d	CEL l	OAL L
DMZB 040	4	4	8	50
DMZB 050	5	5	10	50
DMZB 060	6	6	12	60
DMZB 080	8	8	16	65
DMZB 100	10	10	18	70
DMZB 120	12	12	20	70
DMZB 140	14	14	24	80
DMZB 160	16	16	26	80
DMZB 180	18	18	28	80
DMZB 200	20	20	30	100

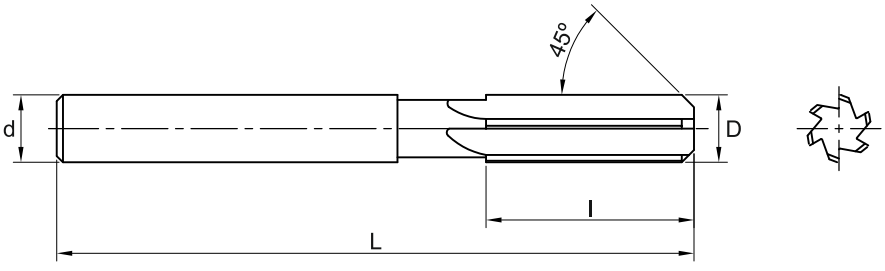
- Intermediate sizes, Weldon Flat available on request
- B+ve and iSeries available on request
- Other than 90° available on request



SOLID CARBIDE REAMERS

Series	Helix	Flutes	Flutes
Regular		Z = 4	Z = 6

HRC	Shank Dia	Reamer Dia
⩽ 28	h6	H7



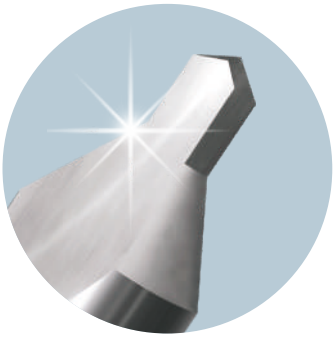
RC

P M K N S H

ITEM CODE	TOOL DIA D	SHANK DIA d	CEL l	OAL L	No. of Flute Z
RC4 030.040	3	4	15	60	4
RC4 040.040	4	4	18	60	4
RC4 050.060	5	6	20	60	4
RC6 060.060	6	6	25	75	6
RC6 070.080	7	8	30	75	6
RC6 080.080	8	8	30	75	6
RC6 090.100	9	10	30	80	6
RC6 100.100	10	10	32	80	6
RC6 110.120	11	12	40	100	6
RC6 120.120	12	12	40	100	6
RC6 140.140	14	14	40	100	6
RC6 160.160	16	16	40	100	6
RC6 180.180	18	18	40	100	6
RC8 200.200	20	20	40	100	8

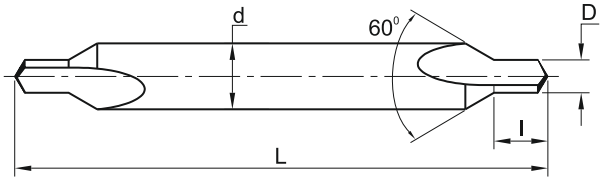
- Intermediate sizes, RH / LH available on request
- B+ve and iSeries available on request
- Coated available on request

SOLID CARBIDE CENTER DRILL



118°	Helix	Flutes	HRC
	 5°	Z = 2	≈35

Shank Dia	Drill Dia	Standard	Standard
h6	m7	DIN 333 A	BS 328



P M K N S H

METRIC — DIN 333 A Standard

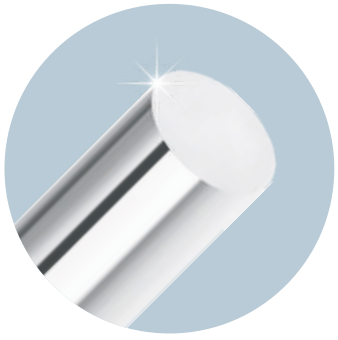
ITEM CODE	PILOT DIA D	BODY DIA d	CEL l	OAL L
CDXA 160 040	1.60	4.00	2.4	35
CDXA 200 050	2.00	5.00	2.9	40
CDXA 250 063	2.50	6.30	3.6	45
CDXA 315 080	3.15	8.00	4.4	50
CDXA 400 100	4.00	10.0	5.6	56
CDXA 500 125	5.00	12.5	6.9	63
CDXA 630 160	6.30	16.0	8.6	71

INCH — BS 328 Standard

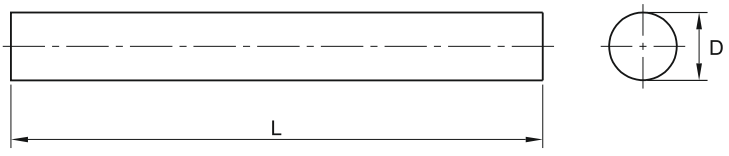
ITEM CODE	PILOT DIA D	BODY DIA d	CEL l	OAL L
CBXA 062 187	1/16"	3/16"	3/32"	1-3/4"
CBXA 093 250	3/32"	1/4"	5/32"	2"
CBXA 125 312	1/8"	5/16"	3/16"	2-1/4"
CBXA 187 437	3/16"	7/16"	9/32"	2-1/2"
CBXA 250 625	1/4"	5/8"	3/8"	3"

- Coated available on request

SOLID CARBIDE GROUND BLANKS



Shank Dia	Series	Series
h6	R	B+ve



P M K N S H

GRB M — METRIC SERIES

ITEM CODE	DIA D	LENGTH L
GRB 030 M	3	100
GRB 040 M	4	100
GRB 050 M	5	100
GRB 060 M	6	100
GRB 080 M	8	100
GRB 100 M	10	100
GRB 120 M	12	100
GRB 140 M	14	100
GRB 160 M	16	100
GRB 180 M	18	100
GRB 200 M	20	100

GRB I — INCH SERIES

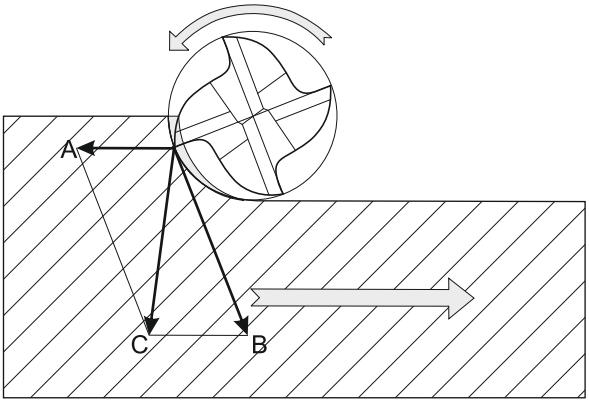
ITEM CODE	DIA D	LENGTH L
GRB 125 I	1/8"	4"
GRB 187 I	3/16"	4"
GRB 250 I	1/4"	4"
GRB 312 I	5/16"	4"
GRB 375 I	3/8"	4"
GRB 500 I	1/2"	4"
GRB 562 I	9/16"	4"
GRB 625 I	5/8"	4"
GRB 750 I	3/4"	4"

- B+ve Series available on request

TECHNICAL DATA

CLIMB MILLING

Cutter rotation and work feed have the same direction. The cutter machines the material at the maximum chip thickness and leaves it at the minimum.

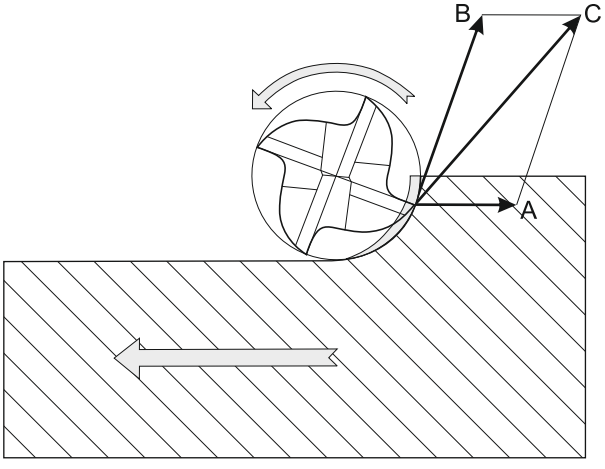


Main Features :

- less vibrations
- good surface quality
- longer life of cutting edges
- higher cutting speed

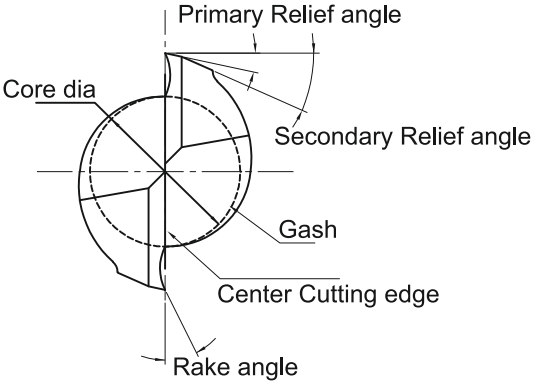
UP MILLING

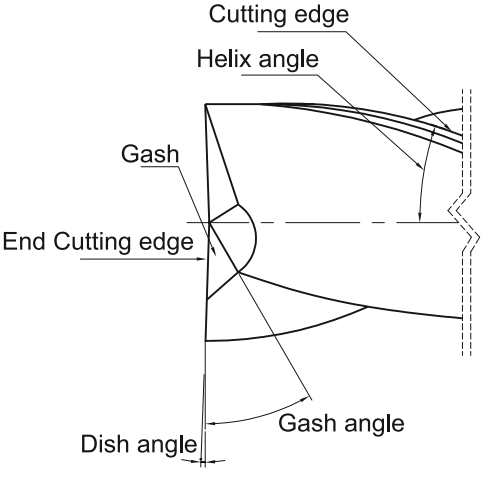
Cutter rotation and work feed have opposite directions. The material is cut at the minimum thickness and left at the maximum.



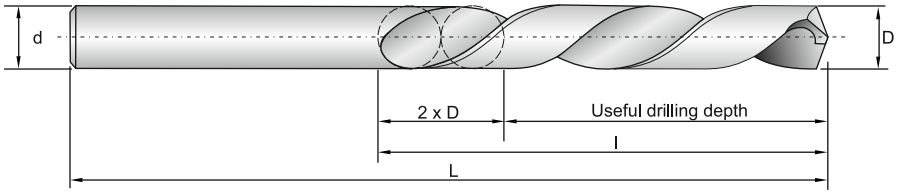
Main Features :

- more vibrations due to increased shear stress
- shorter life of cutter due to higher wear of cutting edges in the first working length
- the vertical shearing stress component tends to detach the work from the table

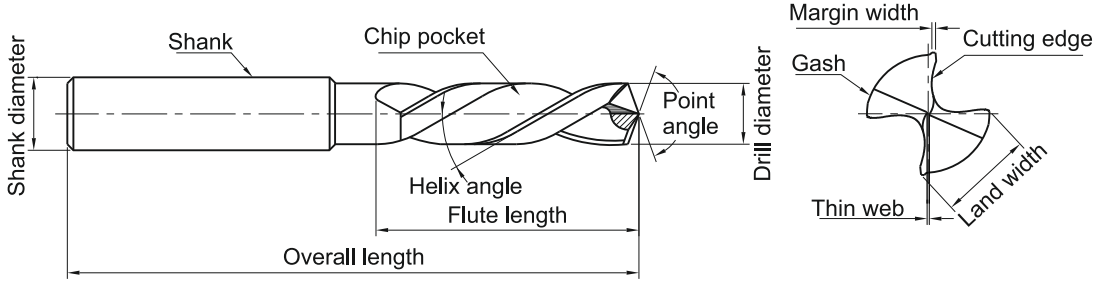




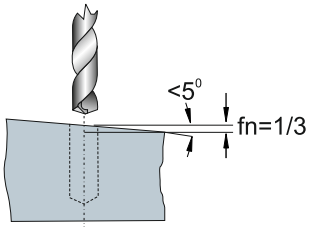
USEFUL DRILLING DEPTH



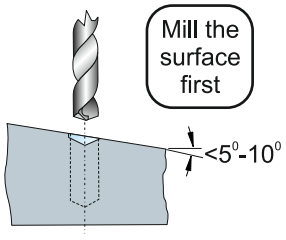
For a good chip evacuation, the best useful drilling depth is calculated by subtracting twice the size of the diameter (D) from the length of the drill flute (l)



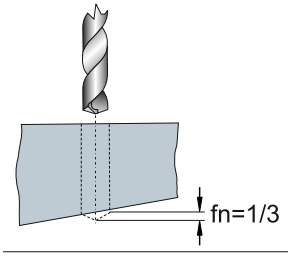
INSTRUCTIONS AND SUGGESTIONS FOR MACHINING WITH CARBIDE DRILLS



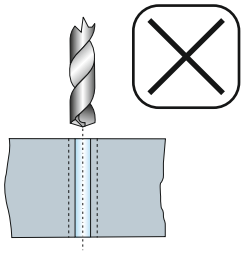
- For drilling surfaces that are tilted up to a maximum of 5^0, reduce the feed rate fn to 1/3 as long as the drill is machining the tilted surface



- For drilling surfaces that are tilted up to 10^0, it is first necessary to perform a centering operation
- Surface tilted by more than 10^0 must first be milled



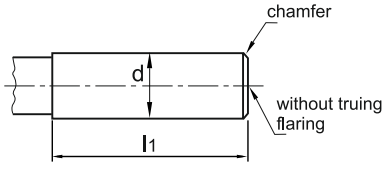
- For through bores on tilted surfaces, reduce the feed rate to 1/3 during the exit phase



- It is not possible to enlarge existing bores

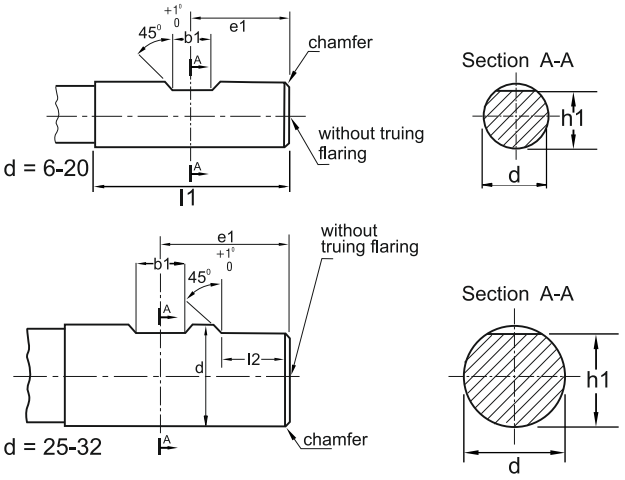
CYLINDRICAL SHANK
DIN 6535

FORM HA



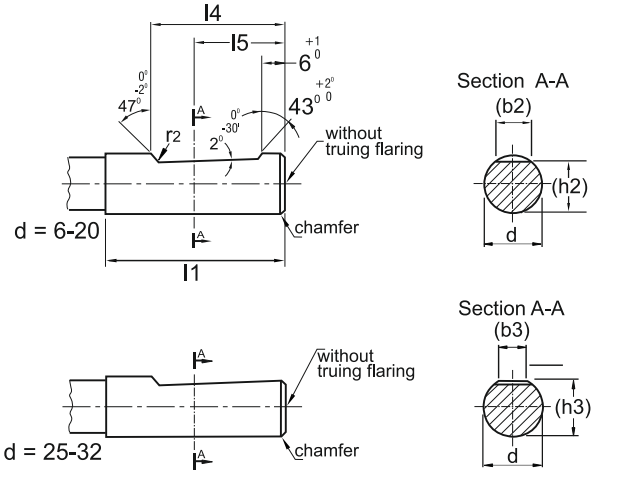
d h6	l1 +2 0	d h6	l1 +2 0
2	28	12	45
3		14	
4		16	48
5		18	
6	36	20	50
8		25	56
10	40	32	60

FORM HB (WELDON)



d h6	b1 +0.05 0	e1 0 -1	h1 h11	l1 +2 0	l2 +1 0
6	4.2	18.0	5.1	36	-
8	5.5		6.9		
10	7.0	20.0	8.5	40	
12	8.0	22.5	10.4	45	
14			12.7		
16	10.0	24.0	14.2	48	
18			16.2		
20	11.0	25.0	18.2	50	
25	12.0	32.0	23.0	56	17
32	14.0	36.0	30.0	60	19

FORM HE (WHISTLE-NOTCH)



d h6	(b2) ≈	(b3)	h2 h11	(h3)	l1 +2 0	l4 0 -1	l5	r2 mm
6	4.3	-	5.1	-	36	25	18	1.2
8	5.5	-	6.9	-				
10	7.1	-	8.5	-	40	28	20	
12	8.2	-	10.4	-	45	33	22.5	
14	8.1	-	12.7	-				
16	10.1	-	14.2	-	48	36	24	1.6
18	10.8	-	16.2	-				
20	11.4	-	18.2	-	50	38	25	
25	13.6	9.3	23.0	24.1	56	44	32	
32	15.5	9.9	30.0	31.2	60	48	35	

FORMULA

Cutting speed	$Vc = \frac{\pi \times D \times n}{1000}$
Spindle speed	$n = \frac{Vc \times 1000}{\pi \times D}$
Feed per tooth	$fz = \frac{Vf}{n \times z}$
Table feed	$Vf = fz \times n \times z$
Feed per revolution	$f = fz \times z$

SYMBOLS

D (mm)	Tool diameter
Vc (m/min)	Cutting speed
fz (mm)	Feed per tooth
n (rpm)	Spindle speed
Vf (mm/min)	Table feed
z	No. of teeth

TOOL PARAMETERS

ENDMILL

Cutting Speed	$Vc = \frac{\pi DN}{1000}$ mt/min
Table Feed	Vf = N x fz x z mm/min

CUTTING SPEED (Vc) TABLE

Material Code	Material Group	HRC	Vc
R	Cast Iron, MS, EN-8	28~30	60~70
B+ve	High Carbon Steel, EN-9, EN-21	40~42	50~60
iSeries	Tool Steel, P20, Die Steel, OHNS, EN-31, Stainless Steel	60~62	35~45
NF	Aluminium, Brass, Copper	NA	70~80

TABLE FEED (Fz) CHART

Dia of Endmill	Fz (Feed per Tooth)
Ø1 ~ Ø2	0.008 ~ 0.010
Ø2 ~ Ø3	0.010 ~ 0.012
Ø3 ~ Ø4	0.012 ~ 0.015
Ø4 ~ Ø6	0.015 ~ 0.025
Ø6 ~ Ø8	0.025 ~ 0.035
Ø8 ~ Ø10	0.035 ~ 0.050
Ø10 ~ Ø12	0.050 ~ 0.060
Ø12 ~ Ø16	0.060 ~ 0.070
Ø16 ~ Ø20	0.070 ~ 0.080
Ø20 ~ Ø25	0.080 ~ 0.100

TOOL PARAMETERS

ROUGHER

Cutting Speed	$Vc = \frac{\pi DN}{1000}$ mt/min
Table Feed	Vf = N x fz x z mm/min

CUTTING SPEED (Vc) TABLE

Material Code	Material Group	HRC	Vc
R	Cast Iron, MS, EN-Series	28~35	130~160
B+ve	Stainless Steel	22~35	40~60
iSeries	High Carbon Steel, Inconel, Hot Die Steel, OHNS, P20, Titanium	35~65	35~70

TABLE FEED (Fz) CHART

Dia of Rougher	Fz (Feed per Tooth)
Ø5 ~ Ø6	0.030 ~ 0.050
Ø6 ~ Ø8	0.035 ~ 0.060
Ø8 ~ Ø10	0.045 ~ 0.075
Ø10 ~ Ø12	0.060 ~ 0.085
Ø12 ~ Ø16	0.080 ~ 0.100
Ø16 ~ Ø20	0.085 ~ 0.110
Ø20 ~ Ø25	0.090 ~ 0.140

TROUBLESHOOTING GUIDE FOR END MILL PROBLEMS

Problem	Cause	Solution
Breakage	Feed too fast	Slow down feed
	Too high stock removal	Decrease feed per tooth
	Too long flute length or overall length	Hold shank deeper, use shorter endmill
	Too much wear	Regrind at earlier stage
Wear	Speed too fast	Slow down speed
	Hard work material	Use higher grade tool material and coating
	Biting chips	Change feed and speed. Change chip size or clear chips with coolant or air pressure
	Improper feed and speed (too slow)	Increase feed and speed. Try down-cut
	Improper cutting angle	Change to correct cutting angle
	Too small primary relief angle	Change to larger relief angle
Short tool life (dull teeth)	Too much cutting friction	Regrind at earlier stage
	Tough work material	Use premium tool material
	Improper cutting angle	Change to correct cutting angle and primary relief angle
Chipping	Feed too fast	Slow down to proper feed
	Feed too fast on first cut	Slow down on first bite
	Not enough rigidity of machine, tool and holder	Change to rigid machine tool or holder
	Loose hold (tool)	Correct to tight hold
	Loose hold (workpiece)	Correct to tight hold
	Lack of rigidity	Use shortest endmill available, hold shank deeper, try down cut
	Teeth too sharp	Decrease primary relief and cutting angle
Chip packing	Too high stock removal rate	Adjust feed or speed
	Not enough chip space	Use less endmill flutes
	Not enough coolant	Use air pressure
Burrs	Too much wear on primary relief	Regrind at earlier stage
	Incorrect condition	Correct milling condition
	Improper cutting angle	Change to correct cutting angle
No perpendicularity on side	Feed too fast	Slow down to correct speed
	Excessive cutting	Decrease depth and width of cut
	Length of flutes or overall length too long	Use proper length of tool, hold shank deeper
	Too less flutes	Use multi flute endmills
No dimensional accuracy	Excessive cutting	Decrease depth and width of cut
	Lack of accuracy (machine and holder)	Repair machine or holder
	Not enough rigidity (machine and holder)	Change machine, holder or cutting conditions
	Too less flutes	Use multi flutes endmills
Chattering	Feed and speed too fast	Correct feed and speed
	Not enough rigidity (machine and holder)	Use better machine or tool holder or change conditions
	Too great relief angle	Decrease relief angle, make margin
	Loose hold of workpiece	Hold workpiece tightly
	Cutting too deep	Decrease depth of cut
	Too long flute or overall length	Hold shank deeper, use shorter endmill or try down cut
Rough surface finish	Feed too fast	Slow down to correct speed
	Slow speed	Apply higher speed
	Too much wear	Regrind at earlier stage
	Chip biting	Decrease stock removal
	No end tooth concavity	Grind concave angle on end teeth

TOOL PARAMETERS

DRILL

Cutting Speed	$Vc = \frac{\pi DN}{1000}$ mt/min
Table Feed	Vf = N x f mm/min

CUTTING SPEED (Vc) TABLE

Material Code	Material Group	HRC	Vc
A	Cast Iron, Aluminium	25~28	80~90
B	EN Series, Mild Steel	30~35	70~80
C	High-hardened Steel	50~60	20~30
D	Stainless Steel	20~25	30~40

Feed per Revolution (f) Chart

Dia of Drill	f (Feed per Revolution)
Ø2 ~ Ø4	0.020 ~ 0.030
Ø4 ~ Ø6	0.030 ~ 0.050
Ø6 ~ Ø8	0.060 ~ 0.080
Ø8 ~ Ø10	0.080 ~ 0.100
Ø10 ~ Ø12	0.100 ~ 0.120
Ø12 ~ Ø16	0.120 ~ 0.150

TOOL PARAMETERS

REAMER

Cutting Speed	$Vc = \frac{\pi DN}{1000}$ mt/min
Table Feed	Vf = N x Fz mm/min

CUTTING SPEED (Vc) TABLE

Material Code	Material Group	Vc
A	Cast Iron	50 ~ 60
B	Mild Steel, EN-8	40 ~ 50
C	Stainless Steel	25 ~ 40
D	Aluminium	90 ~ 110
E	High Hardened Steel	10 ~ 20

Feed per Revolution (f) Chart

Dia of Reamer	f (Feed per Revolution)
Ø2 ~ Ø4	0.060 ~ 0.100
Ø4 ~ Ø6	0.100 ~ 0.120
Ø6 ~ Ø8	0.120 ~ 0.150
Ø8 ~ Ø10	0.150 ~ 0.180
Ø10 ~ Ø12	0.180 ~ 0.200
Ø12 ~ Ø16	0.200 ~ 0.250
Ø16 ~ Ø20	0.250 ~ 0.400

RECOMMENDED PARAMETERS

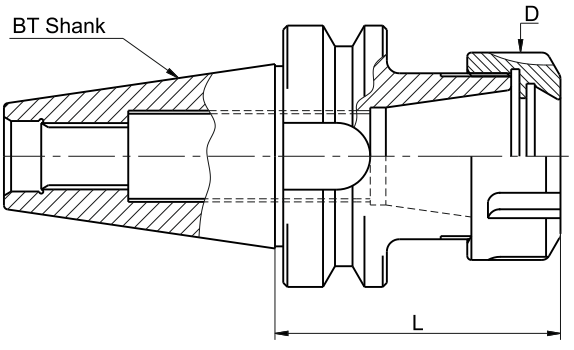
THREAD MILL

Material Group		Material		Hardness Brinell HB	Cutting Speed V_c m/min	Feed f mm/tooth
P	1	Unalloyed steel	Low carbon (C=0.1-0.25%)	125	50 - 200	0.025 - 0.3
	2	Low alloy steel (alloying elements ≤ 5%)	Non hardened	180	50 - 150	0.02 - 0.22
	3		Hardened	275	40 - 150	0.01 - 0.15
M	4	Stainless steel	Non hardened	200	50 - 120	0.01 - 0.13
	5		Austenitic	180	50 - 120	0.01 - 0.12
	6	Stainless steel Cast ferritic	Hardened	330	50 - 90	0.01 - 0.1
K	7	Malleable	Ferritic (short chips)	130	50 - 70	0.01 - 015
	8	Grey cast iron	Low tensile strength	180	60 - 140	0.01 - 0.13
	9		High tensile strength	260	35 - 100	0.01 - 012
	10	Nodular SG iron	Pearlitic	260	35 - 80	0.01 - 0.12
N	11	Aluminium alloys	Cast	75	80 - 160	0.03 - 0.36
	12		Cast & aged	90	100 - 200	0.1 - 0.3
	13	Copper and copper alloys	Brass	90	160 - 250	0.04 - 0.43
	14		Bronze and non leaded copper	10	120 - 200	0.03 - 0.36
S	15	High temperature alloys	Annealed (Nickel or Cobalt based)	250	15 - 35	0.005 - 0.06
	16	Titanium alloys	Pure 99.5 Ti	400 Rm	35 - 70	0.006 - 0.07
H	17	Extra hard steel	Hardened & tempered	45-50 HRc	15 - 45	0.004 - 0.04
	18			51-55 HRc	15 - 30	0.004 - 0.04

BLOOD®
ROTATING GENIUS

CNC TOOLINGS

ER COLLET CHUCK
BT TAPER



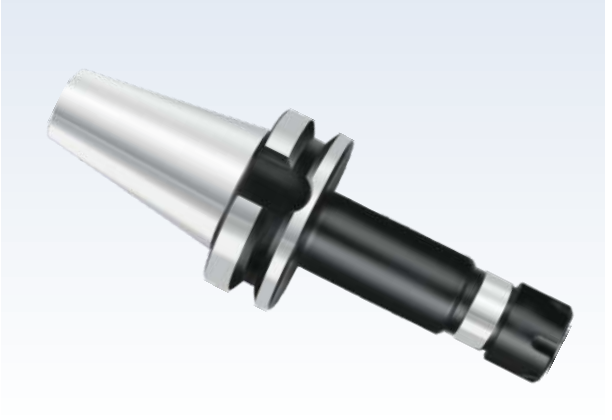
MAS 403 Standard

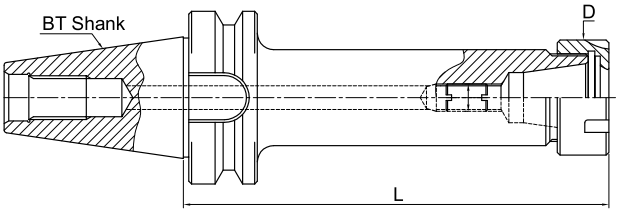
ITEM CODE	COLLET	D	L
CHE/BT30/ER16-060	ER 16	28	60
CHE/BT30/ER20-060	ER 20	34	60
CHE/BT30/ER25-060	ER 25	42	60
CHE/BT30/ER32-060	ER 32	50	60
CHE/BT40/ER16-060	ER 16	28	60
CHE/BT40/ER16-100	ER 16	28	100
CHE/BT40/ER16-150	ER 16	28	150
CHE/BT40/ER20-060	ER 20	34	60
CHE/BT40/ER20-100	ER 20	34	100
CHE/BT40/ER20-150	ER 20	34	150
CHE/BT40/ER25-060	ER 25	42	60
CHE/BT40/ER25-100	ER 25	42	100
CHE/BT40/ER25-150	ER 25	42	150
CHE/BT40/ER32-070	ER 32	50	70
CHE/BT40/ER32-100	ER 32	50	100
CHE/BT40/ER32-150	ER 32	50	150
CHE/BT40/ER32-200	ER 32	50	200
CHE/BT40/ER40-080	ER 40	63	80

ITEM CODE	COLLET	D	L
CHE/BT40/ER40-100	ER 40	63	100
CHE/BT40/ER40-150	ER 40	63	150
CHE/BT40/ER50-100	ER 50	78	100
CHE/BT50/ER16-100	ER 16	28	100
CHE/BT50/ER20-080	ER 20	34	80
CHE/BT50/ER20-100	ER 20	34	100
CHE/BT50/ER20-150	ER 20	34	150
CHE/BT50/ER25-080	ER 25	42	80
CHE/BT50/ER25-100	ER 25	42	100
CHE/BT50/ER25-160	ER 25	42	160
CHE/BT50/ER32-080	ER 32	50	80
CHE/BT50/ER32-100	ER 32	50	100
CHE/BT50/ER32-160	ER 32	50	160
CHE/BT50/ER32-200	ER 32	63	200
CHE/BT50/ER40-080	ER 40	63	80
CHE/BT50/ER40-100	ER 40	63	100
CHE/BT50/ER40-160	ER 40	63	160
CHE/BT50/ER50-100	ER 50	78	100

- Max. Runout of the Internal Taper w.r.t. External Taper: 0.005 mm
- All Holders are in AT-3 Class
- BBT Taper holder available on request

ER COLLET CHUCK - MINI NUT
BT TAPER



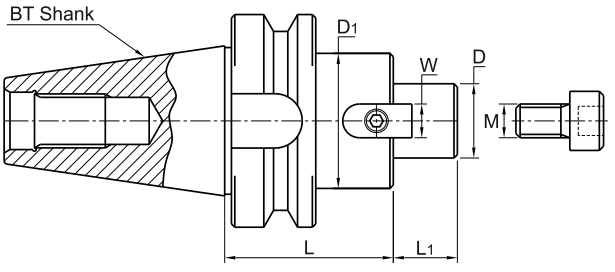


MAS 403 Standard

ITEM CODE	COLLET	D	L
CHE/BT40/ERM16-100	ER 16	22	100
CHE/BT40/ERM16-160	ER 16	22	160
CHE/BT40/ERM20-100	ER 20	28	100
CHE/BT40/ERM20-160	ER 20	28	160
CHE/BT40/ERM25-100	ER 25	35	100
CHE/BT40/ERM25-160	ER 25	35	160

- Max. Runout of the Internal Taper w.r.t. External Taper: 0.005 mm
- All Holders are in AT-3 Class
- BBT Taper holder available on request

FACE MILL ARBOR
BT TAPER



MAS 403 Standard

ITEM CODE	D	D1	L	L1	M	W
FMA/BT30/16-050	16	32	50	17	M 8	08
FMA/BT30/22-050	22	40	50	19	M 10	10
FMA/BT30/27-060	27	48	60	21	M 12	12
FMA/BT40/16-050	16	32	50	17	M 8	08
FMA/BT40/16-100	16	32	100	17	M 8	08
FMA/BT40/16-150	16	40	150	19	M 10	10
FMA/BT40/22-050	22	40	50	19	M 10	10
FMA/BT40/22-100	22	40	100	19	M 10	10
FMA/BT40/22-150	22	40	160	19	M 10	10
FMA/BT40/27-060	27	48	60	21	M 12	12
FMA/BT40/27-100	27	48	100	21	M 12	12
FMA/BT40/27-150	27	48	160	21	M 12	12
FMA/BT40/32-070	32	58	70	24	M 16	14
FMA/BT40/32-100	32	58	100	24	M 16	14
FMA/BT40/32-150	32	58	160	24	M 16	14
FMA/BT40/40-070	40	68	70	27	M 20	16

ITEM CODE	D	D1	L	L1	M	W
FMA/BT50/16-060	16	32	60	17	M 8	08
FMA/BT50/16-100	16	32	100	17	M 8	08
FMA/BT50/16-150	16	32	150	17	M 8	08
FMA/BT50/22-060	22	40	60	19	M 10	10
FMA/BT50/22-100	22	40	100	19	M 10	10
FMA/BT50/22-150	22	40	150	19	M 10	10
FMA/BT50/27-060	27	48	60	21	M 12	12
FMA/BT50/27-100	27	48	100	21	M 12	12
FMA/BT50/27-160	27	48	160	21	M 12	12
FMA/BT50/32-070	32	58	70	24	M 16	14
FMA/BT50/32-100	32	58	100	24	M 16	14
FMA/BT50/32-160	32	58	160	24	M 16	14
FMA/BT50/40-070	40	68	70	27	M 20	16
FMA/BT50/40-100	40	68	100	27	M 20	16
FMA/BT50/40-160	40	68	160	27	M 20	16

- All Holders are in AT-3 Class
- Max. Run out of the Internal Taper w.r.t. External Taper: 0.005 mm
- BBT Taper holder available on request

SIDE LOCK ADAPTOR
BT TAPER

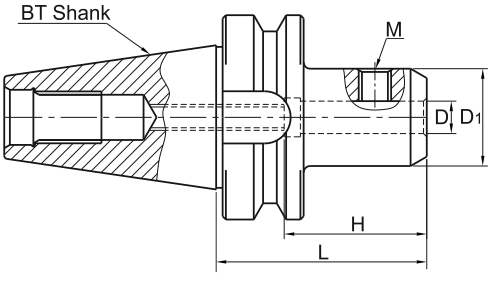


Fig.-1

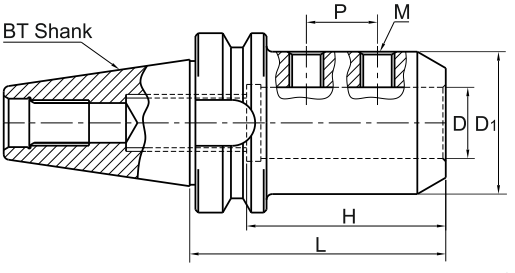


Fig.-2

MAS 403 Standard

ITEM CODE	D1	D	L	H	M	P	Fig.
SLA/BT30/08-65	24	08	65	40	M 8	--	1
SLA/BT30/10-65	30	10	65	44	M 10	--	1
SLA/BT30/12-65	35	12	65	44	M 10	--	1
SLA/BT30/16-65	40	16	65	52	M 10	--	1
SLA/BT30/20-90	50	20	90	70	M 10	20	2
SLA/BT30/25-90	50	25	90	70	M 10	25	2
SLA/BT40/08-65	24	08	65	40	M 8	--	1
SLA/BT40/10-65	30	10	65	44	M 10	--	1
SLA/BT40/12-65	35	12	65	44	M 10	--	1
SLA/BT40/16-65	40	16	65	52	M 10	--	1
SLA/BT40/20-90	50	20	90	70	M 10	20	2
SLA/BT40/25-90	50	25	90	70	M 12	25	2
SLA/BT40/32-90	60	32	90	70	M 12	28	2
SLA/BT40/40-90	70	40	90	70	M 12	28	2
SLA/BT50/08-70	24	08	70	40	M 8	--	1
SLA/BT50/10-70	30	10	70	44	M 10	--	1
SLA/BT50/12-70	35	12	70	44	M 10	--	1
SLA/BT50/16-70	40	16	70	52	M 10	--	1
SLA/BT50/20-100	50	20	100	70	M 10	20	2
SLA/BT50/25-100	50	25	100	70	M 12	25	2
SLA/BT50/32-100	60	32	100	70	M 12	28	2
SLA/BT50/40-100	70	40	100	70	M 12	28	2

- All Holders are in AT-3 Class
- Max. Run out of the Internal Taper w.r.t. External Taper: 0.005 mm
- BBT Taper holder available on request

MORSE TAPER ADAPTOR
BT TAPER

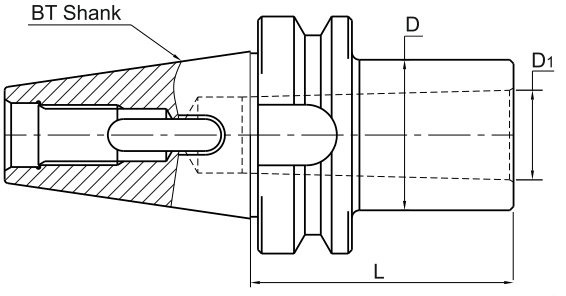


Fig.-1

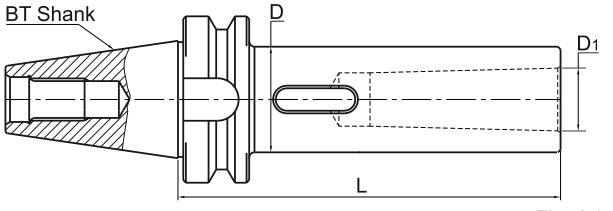


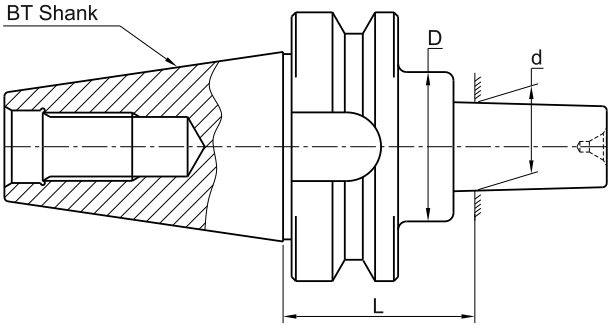
Fig.-2

MAS 403 Standard

ITEM CODE	MORSE TAPER	L	D	D1	Fig. No.
MTA/BT30/1-050	1	50	25	12.065	01
MTA/BT30/1-110	1	110	25	12.065	02
MTA/BT30/2-060	2	60	32	17.780	01
MTA/BT30/2-120	2	120	32	17.780	02
MTA/BT30/3-070	3	70	40	23.825	01
MTA/BT30/3-140	3	140	40	23.825	02
MTA/BT40/1-045	1	45	25	12.065	01
MTA/BT40/1-110	1	110	25	12.065	02
MTA/BT40/2-050	2	50	32	17.780	01
MTA/BT40/2-125	2	125	32	17.780	02
MTA/BT40/3-070	3	70	40	23.825	01
MTA/BT40/3-140	3	140	40	23.825	02
MTA/BT40/4-095	4	95	48	31.267	01
MTA/BT40/4-170	4	170	48	31.267	02
MTA/BT50/1-045	1	45	25	12.065	01
MTA/BT50/1-120	1	120	25	12.065	02
MTA/BT50/2-060	2	60	32	17.780	01
MTA/BT50/2-140	2	140	32	17.780	02
MTA/BT50/3-065	3	65	40	23.825	01
MTA/BT50/3-150	3	150	40	23.825	02
MTA/BT50/4-090	4	90	48	31.267	01
MTA/BT50/4-180	4	180	48	31.267	02

- All Holders are in AT-3 Class
- Max. Runout of the Internal Taper w.r.t. External Taper: 0.005 mm
- BBT Taper holder available on request

DRILL CHUCK ARBOR
BT TAPER

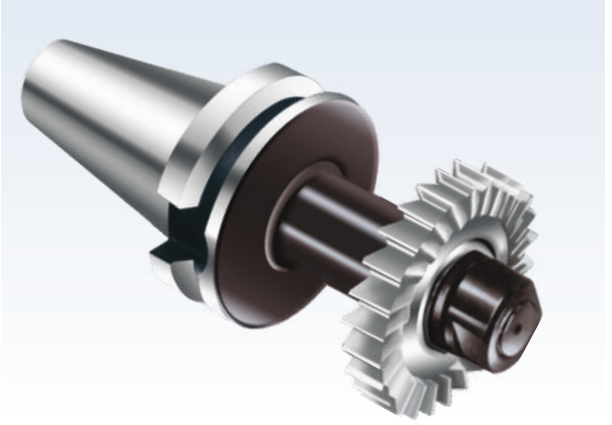


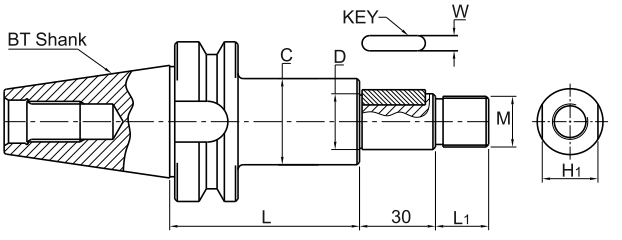
MAS 403 Standard

ITEM CODE	DRILL CHUCK TAPER	D	d	L	DRILL CHUCK SIZE
DCA/BT30/JT2-045	JT 2	30	14.2	45	3/8"
DCA/BT30/JT2-090	JT 2	30	14.2	90	3/8"
DCA/BT30/JT6-045	JT 6	30	17.2	45	1/2"
DCA/BT30/JT6-090	JT 6	30	17.2	90	1/2"
DCA/BT30/B12-045	B 12	30	12.1	45	3/8"
DCA/BT30/B12-090	B 12	30	12.1	90	3/8"
DCA/BT30/B16-045	B 16	30	15.8	45	5/8"
DCA/BT30/B16-090	B 16	30	15.8	90	5/8"
DCA/BT40/JT2-045	JT 2	30	14.2	45	3/8"
DCA/BT40/JT2-090	JT 2	30	14.2	90	3/8"
DCA/BT40/JT3-045	JT 3	30	20.6	45	3/4"
DCA/BT40/JT3-090	JT 3	30	20.6	90	3/4"
DCA/BT40/JT6-045	JT 6	30	17.2	45	1/2"
DCA/BT40/JT6-090	JT 6	30	17.2	90	1/2"
DCA/BT40/B12-045	B 12	30	12.1	45	3/8"
DCA/BT40/B12-090	B 12	30	12.1	90	3/8"
DCA/BT40/B16-045	B 16	30	15.8	45	5/8"
DCA/BT40/B16-090	B 16	30	15.8	90	5/8"
DCA/BT50/JT2-055	JT 2	30	14.2	55	5/8"
DCA/BT50/JT2-090	JT 2	30	14.2	90	3/8"
DCA/BT50/JT3-055	JT 3	30	20.6	55	3/4"
DCA/BT50/JT3-090	JT 3	30	20.6	90	3/4"
DCA/BT50/JT6-055	JT 6	30	17.2	55	1/2"
DCA/BT50/JT6-090	JT 6	30	17.2	90	1/2"
DCA/BT50/B12-055	B 12	30	12.1	55	3/8"
DCA/BT50/B12-090	B 12	30	12.1	90	3/8"
DCA/BT50/B16-055	B 16	30	15.8	55	5/8"
DCA/BT50/B16-090	B 16	30	15.8	90	5/8"

- All Holders are in AT-3 Class
- Max. Runout of the Internal Taper w.r.t. External Taper: 0.005 mm
- BBT Taper holder available on request

SIDE CUTTER ARBOR
BT TAPER



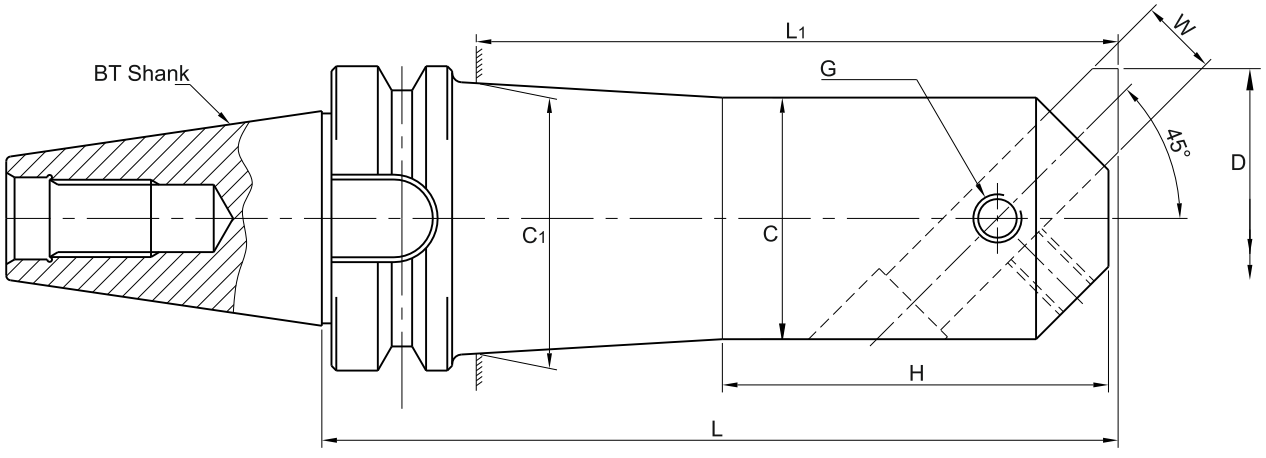


MAS 403 Standard

ITEM CODE	D	L	L1	M	C	W	H1
SCA/BT30/13-060	13	60	15	M 12 x 1.25	20	--	17
SCA/BT30/16-060	16	60	16	M 14 x 1.5	26	4	22
SCA/BT30/22-060	22	60	21	M 20 x 1.5	34	6	30
SCA/BT40/13-060	13	60	15	M 12 x 1.25	20	--	17
SCA/BT40/13-090	13	90	15	M 12 x 1.25	20	--	17
SCA/BT40/16-075	16	75	16	M 14 x 1.5	26	4	22
SCA/BT40/16-105	16	105	16	M 14 x 1.5	26	4	22
SCA/BT40/22-075	22	75	21	M 20 x 1.5	34	6	30
SCA/BT40/22-120	22	120	21	M 20 x 1.5	34	6	30
SCA/BT40/27-075	27	75	25	M 24 x 2.0	40	7	32
SCA/BT40/27-120	27	120	25	M 24 x 2.0	40	7	32
SCA/BT40/32-090	32	90	30	M 30 x 2.0	46	8	41
SCA/BT50/13-075	13	75	15	M 12 x 1.25	20	--	17
SCA/BT50/13-105	13	105	15	M 12 x 1.25	20	--	17
SCA/BT50/16-075	16	75	16	M 14 x 1.5	26	4	22
SCA/BT50/16-110	16	110	16	M 14 x 1.5	26	4	22
SCA/BT50/22-080	22	80	21	M 20 x 1.5	34	6	30
SCA/BT50/22-115	22	115	21	M 20 x 1.5	34	6	30
SCA/BT50/27-080	27	80	25	M 24 x 2.0	40	7	32
SCA/BT50/27-115	27	115	25	M 24 x 2.0	40	7	32
SCA/BT50/32-090	32	90	30	M 30 x 2.0	46	8	41
SCA/BT50/32-125	32	125	30	M 30 x 2.0	46	8	41
SCA/BT50/40-090	40	90	36	M 36 x 3.0	55	10	46
SCA/BT50/40-125	40	125	36	M 36 x 3.0	55	10	46

- All Holders are in AT-3 Class
- Max. Runout of the Internal Taper w.r.t. External Taper: 0.005 mm
- BBT Taper holder available on request

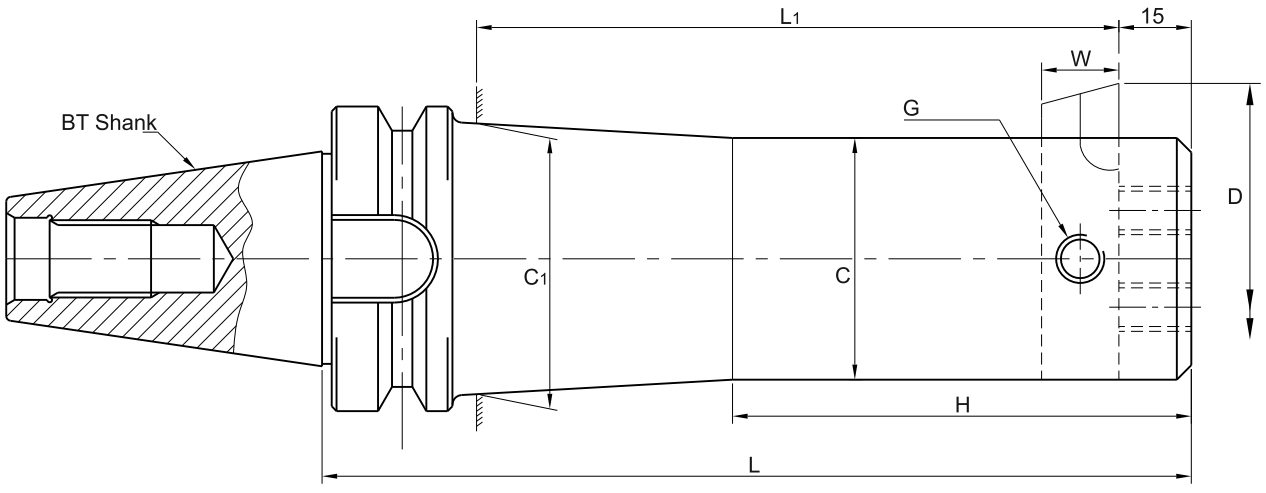
BORING BAR HOLDER - BSA



ITEM CODE	D		L	L1	C	C1	H	W	G
	Min.	Max.							
BT30/BSA25-120	25	38	120	95	20	22	35	8	M 6
BT30/BSA30-135	30	42	135	110	24	26	40	8	M 6
BT30/BSA38-150	38	52	150	125	30	33	50	10	M 8
BT30/BSA42-150	42	56	150	125	34	37	60	10	M 8
BT40/BSA25-135	25	38	135	103	20	22	35	8	M 6
BT40/BSA30-165	30	42	165	133	24	26	40	8	M 6
BT40/BSA38-180	38	52	180	148	30	33	50	10	M 8
BT40/BSA42-210	42	56	210	178	34	37	60	10	M 8
BT40/BSA50-165	50	65	165	133	40	44	65	12	M 10
BT40/BSA50-215	50	65	210	178	40	44	65	12	M 10
BT40/BSA62-165	62	90	165	133	50	56	80	16	M 10
BT40/BSA62-225	62	90	225	193	50	56	80	16	M 10
BT50/BSA25-135	25	38	135	92	20	22	35	8	M 6
BT50/BSA30-165	30	42	165	122	24	26	40	8	M 6
BT50/BSA38-180	38	52	180	137	30	33	50	10	M 8
BT50/BSA42-210	42	56	210	167	34	37	60	10	M 8
BT50/BSA50-180	50	65	180	137	40	44	65	12	M 10
BT50/BSA50-240	50	65	240	197	40	44	65	12	M 10
BT50/BSA62-195	62	90	195	152	50	56	80	16	M 10
BT50/BSA62-270	62	90	270	227	50	56	80	16	M 10
BT50/BSA72-195	72	110	195	152	60	66	95	20	M 10
BT50/BSA72-285	72	110	285	242	60	66	95	20	M 10
BT50/BSA90-210	90	125	210	167	75	80	110	20	M 12
BT50/BSA90-300	90	125	300	257	75	80	110	20	M 12

- All Holders are in AT-3 Class
- Max. Runout of the Internal Taper w.r.t. External Taper: 0.005 mm
- BBT Taper holder available on request

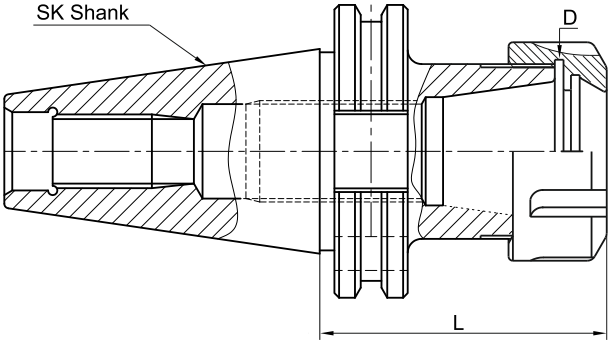
BORING BAR HOLDER - BSB



ITEM CODE	D		L	L1	C	C1	H	W	G
	Min.	Max.							
BT30/BSB25-120	25	52	135	95	20	22	50	8	M 8
BT30/BSB38-150	38	70	165	125	30	32	70	10	M 10
BT30/BSB50-150	50	90	165	--	40	44	85	12	M 12
BT40/BSB25-135	25	52	150	103	20	22	50	8	M 8
BT40/BSB38-180	38	70	195	148	30	3	70	10	M 10
BT40/BSB50-165	50	90	180	133	40	44	85	12	M 10
BT40/BSB50-210	50	90	225	178	40	44	85	12	M 10
BT40/BSB62-165	62	115	180	133	50	56	95	16	M 10
BT40/BSB62-225	62	115	240	193	50	56	95	16	M 10
BT40/BSB72-165	72	135	180	--	60	--	--	20	M 10
BT40/BSB72-225	72	135	240	--	60	--	--	20	M 10
BT50/BSB25-135	25	52	150	92	20	22	50	8	M 8
BT50/BSB38-180	38	70	195	137	30	32	70	10	M 10
BT50/BSB50-180	50	90	195	137	40	44	85	12	M 10
BT50/BSB50-240	50	90	255	197	40	44	85	12	M 10
BT50/BSB62-195	62	115	210	152	50	56	95	16	M 10
BT50/BSB62-270	62	115	285	227	50	56	95	16	M 10
BT50/BSB72-195	72	135	210	152	60	66	110	20	M 10
BT50/BSB72-285	72	135	300	242	60	66	110	20	M 10
BT50/BSB90-210	90	150	225	167	75	80	130	20	M 12
BT50/BSB90-300	90	150	315	257	75	80	130	20	M 12
BT50/BSB105-195	105	190	210	--	90	--	--	25	M 12
BT50/BSB105-285	105	190	300	--	90	94	150	25	M 12

- All Holders are in AT-3 Class
- Max. Runout of the Internal Taper w.r.t. External Taper: 0.005 mm
- BBT Taper holder available on request

ER COLLET CHUCK
SK TAPER



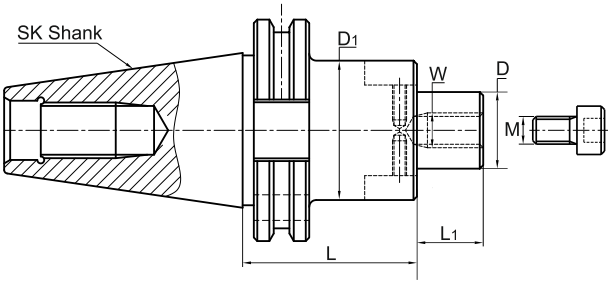
DIN 69871 Standard

ITEM CODE	COLLET	D	L
CHE/SK30/ER16-060	ER 16	28	60
CHE/SK30/ER20-060	ER 20	34	60
CHE/SK30/ER25-060	ER 25	42	60
CHE/SK30/ER32-060	ER 32	50	60
CHE/SK40/ER16-060	ER 16	28	60
CHE/SK40/ER16-100	ER 16	28	100
CHE/SK40/ER20-060	ER 20	34	60
CHE/SK40/ER20-100	ER 20	34	100
CHE/SK40/ER20-150	ER 20	34	150
CHE/SK40/ER25-060	ER 25	42	60
CHE/SK40/ER25-100	ER 25	42	100
CHE/SK40/ER25-150	ER 25	42	150
CHE/SK40/ER32-070	ER 32	50	70
CHE/SK40/ER32-100	ER 32	50	10
CHE/SK40/ER32-150	ER 32	50	150
CHE/SK40/ER40-080	ER 40	63	80
CHE/SK40/ER40-100	ER 40	63	100

ITEM CODE	COLLET	D	L
CHE/SK40/ER40-150	ER 40	63	150
CHE/SK50/ER16-100	ER 16	28	100
CHE/SK50/ER20-080	ER 20	34	80
CHE/SK50/ER20-100	ER 20	34	100
CHE/SK50/ER20-150	ER 20	34	150
CHE/SK50/ER25-080	ER 25	42	80
CHE/SK50/ER25-100	ER 25	42	100
CHE/SK50/ER25-160	ER 25	42	160
CHE/SK50/ER32-080	ER 32	50	80
CHE/SK50/ER32-100	ER 32	50	100
CHE/SK50/ER32-160	ER 32	50	160
CHE/SK50/ER40-080	ER 40	63	80
CHE/SK50/ER40-100	ER 40	63	100
CHE/SK50/ER40-160	ER 40	63	160
CHE/SK50/ER50-100	ER 50	78	100
CHE/SK50/ER50-160	ER 50	78	160

- Max. Runout of the Internal Taper w.r.t. External Taper: 0.005 mm
- All Holders are in AT-3 Class

FACE MILL ARBOR
SK TAPER



DIN 69871 Standard

ITEM CODE	D	D1	L	L1	M	W
FMA/SK30/16-050	16	32	50	17	M 8	08
FMA/SK30/22-050	22	40	50	19	M 10	10
FMA/SK30/27-060	27	48	60	21	M 12	12
FMA/SK40/16-050	16	32	50	17	M 8	08
FMA/SK40/16-100	16	32	100	17	M 8	08
FMA/SK40/16-150	16	40	150	19	M 10	10
FMA/SK40/22-050	22	40	50	19	M 10	10
FMA/SK40/22-100	22	40	100	19	M 10	10
FMA/SK40/22-160	22	40	160	19	M 10	10
FMA/SK40/ 27-060	27	48	60	21	M 12	12
FMA/SK40/27-120	27	48	120	21	M 12	12
FMA/SK40/27-160	27	48	160	21	M 12	12
FMA/SK40/32-070	32	58	70	24	M 16	14
FMA/SK40/32-120	32	58	120	24	M 16	14
FMA/SK40/32-160	32	58	160	24	M 16	14
FMA/SK40/40-070	40	68	70	27	M 20	16

ITEM CODE	D	D1	L	L1	M	W
FMA/SK50/16-060	16	32	60	17	M 8	08
FMA/SK50/16-100	16	32	100	17	M 8	08
FMA/SK50/16-150	16	32	150	17	M 8	08
FMA/SK50/22-060	22	40	60	19	M 10	10
FMA/SK50/22-100	22	40	100	19	M 10	10
FMA/SK50/22-150	22	40	150	19	M 10	10
FMA/SK50/27-060	27	48	60	21	M 12	12
FMA/SK50/27-100	27	48	100	21	M 12	12
FMA/SK50/27-160	27	48	160	21	M 12	12
FMA/SK50/32-070	32	58	70	24	M 16	14
FMA/SK50/32-100	32	58	100	24	M 16	14
FMA/SK50/32-160	32	58	160	24	M 16	14
FMA/SK50/40-070	40	68	70	27	M 20	16
FMA/SK50/40-100	40	68	100	27	M 20	16
FMA/SK50/40-160	40	68	160	27	M 20	16

- All Holders are in AT-3 Class
- Max. Runout of the Internal Taper w.r.t. External Taper: 0.005 mm

SIDE LOCK ADAPTOR
SK TAPER

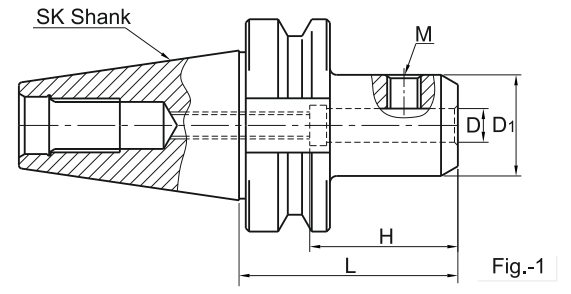


Fig.-1

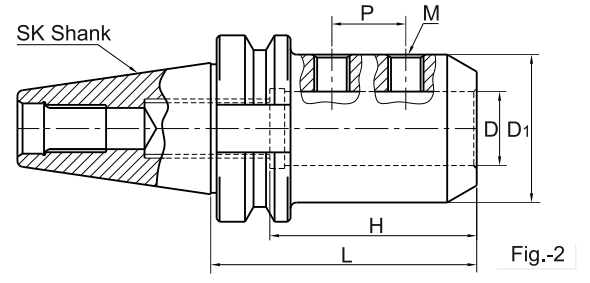


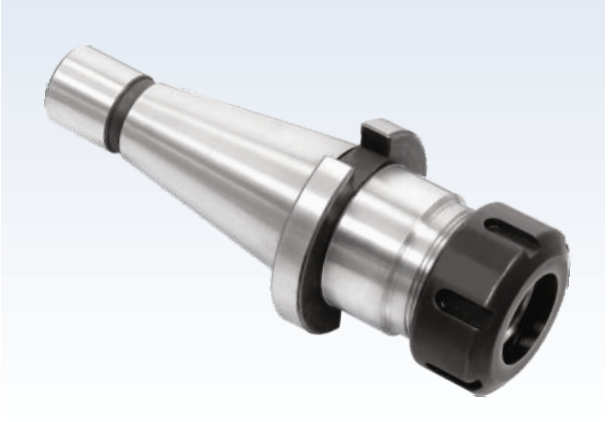
Fig.-2

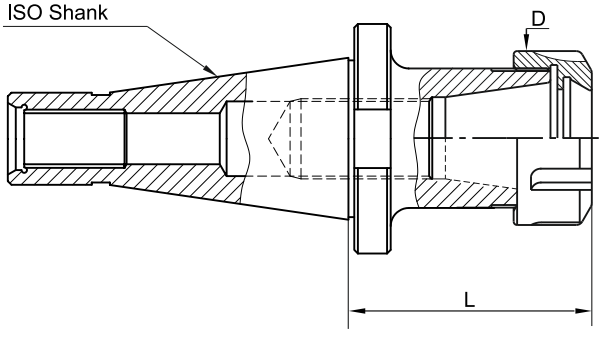
DIN 69871 Standard

ITEM CODE	D1	D	L	H	M	P	Fig. No.
SLA/SK30/10-065	30	10	65	44	M 10	--	1
SLA/SK30/12-065	35	12	65	44	M 10	--	1
SLA/SK30/16-065	40	16	65	52	M 10	--	1
SLA/SK30/20-090	50	20	90	70	M 10	20	2
SLA/SK30/25-090	50	25	90	70	M 10	25	2
SLA/SK40/08-065	24	08	65	40	M 8	--	1
SLA/SK40/10-065	30	10	65	44	M 10	--	1
SLA/SK40/12-065	35	12	65	44	M 10	--	1
SLA/SK40/16-065	40	16	65	52	M 10	--	1
SLA/SK40/20-090	50	20	90	70	M 10	20	2
SLA/SK40/25-090	50	25	90	70	M 12	25	2
SLA/SK40/32-090	60	32	90	70	M 12	28	2
SLA/SK40/40-090	70	40	90	70	M 12	28	2
SLA/SK50/10-070	30	10	70	44	M 10	--	1
SLA/SK50/12-070	35	12	70	44	M 10	--	1
SLA/SK50/16-070	40	16	70	52	M 10	--	1
SLA/SK50/20-100	50	20	100	70	M 10	20	2
SLA/SK50/25-100	50	25	100	70	M 12	25	2
SLA/SK50/32-100	60	32	100	70	M 12	28	2
SLA/SK50/40-100	70	40	100	70	M 12	28	2

- All Holders are in AT-3 Class
- Max. Runout of the Internal Taper w.r.t. External Taper: 0.005 mm

ER COLLET CHUCK
ISO TAPER





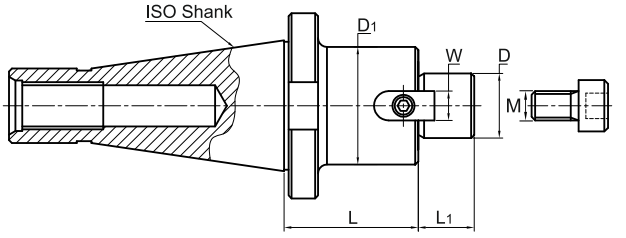
DIN 2080 Standard

ITEM CODE	COLLET	D	L
CHE/ISO30/ER16-060	ER 16	28	60
CHE/ISO30/ER20-060	ER 20	34	60
CHE/ISO30/ER25-060	ER 25	42	60
CHE/ISO30/ER32-060	ER 32	50	60
CHE/ISO40/ER16-060	ER 16	28	60
CHE/ISO40/ER16-100	ER 16	28	100
CHE/ISO40/ER20-060	ER 20	34	60
CHE/ISO40/ER20-100	ER 20	34	100
CHE/ISO40/ER20-150	ER 20	34	150
CHE/ISO40/ER25-060	ER 25	42	60
CHE/ISO40/ER25-100	ER 25	42	100
CHE/ISO40/ER25-150	ER 25	42	150
CHE/ISO40/ER32-070	ER 32	50	70
CHE/ISO40/ER32-100	ER 32	50	100
CHE/ISO40/ER32-150	ER 32	50	150
CHE/ISO40/ER32-200	ER 32	50	200
CHE/ISO40/ER40-080	ER 40	63	80

ITEM CODE	COLLET	D	L
CHE/ISO40/ER40-100	ER 40	63	100
CHE/ISO40/ER40-150	ER 40	63	150
CHE/ISO50/ER16-100	ER 16	28	100
CHE/ISO50/ER20-080	ER 20	34	80
CHE/ISO50/ER20-100	ER 20	34	100
CHE/ISO50/ER20-150	ER 20	34	150
CHE/ISO50/ER25-080	ER 25	42	80
CHE/ISO50/ER25-100	ER 25	42	100
CHE/ISO50/ER25-160	ER 25	42	160
CHE/ISO50/ER32-080	ER 32	50	80
CHE/ISO50/ER32-100	ER 32	50	100
CHE/ISO50/ER32-160	ER 32	50	160
CHE/ISO50/ER40-080	ER 40	63	80
CHE/ISO50/ER40-100	ER 40	63	100
CHE/ISO50/ER40-160	ER 40	63	160
CHE/ISO50/ER50-100	ER 50	78	100

- Max. Runout of the Internal Taper w.r.t. External Taper: 0.005 mm
- All Holders are in AT-3 Class

FACE MILL ARBOR
ISO TAPER



DIN 2080 Standard

ITEM CODE	D	D1	L	L1	M	W
FMA/ISO30/16-050	16	32	50	17	M 8	08
FMA/ISO30/22-050	22	40	50	19	M 10	10
FMA/ISO30/27-060	27	48	60	21	M 12	12
FMA/ISO40/16-050	16	32	50	17	M 8	08
FMA/ISO40/16-100	16	32	100	17	M 8	08
FMA/ISO40/16-150	16	40	150	19	M 10	10
FMA/ISO40/22-050	22	40	50	19	M 10	10
FMA/ISO40/22-100	22	40	100	19	M 10	10
FMA/ISO40/22-160	22	40	160	19	M 10	10
FMA/ISO40/27-060	27	48	60	21	M 12	12
FMA/ISO40/27-120	27	48	120	21	M 12	12
FMA/ISO40/27-160	27	48	160	21	M 12	12
FMA/ISO40/32-070	32	58	70	24	M 16	14
FMA/ISO40/32-120	32	58	120	24	M 16	14
FMA/ISO40/32-160	32	58	160	24	M 16	14
FMA/ISO40/40-070	40	68	70	27	M 20	16

ITEM CODE	D	D1	L	L1	M	W
FMA/ISO50/16-060	16	32	60	17	M 8	08
FMA/ISO50/16-100	16	32	100	17	M 8	08
FMA/ISO50/16-150	16	32	150	17	M 8	08
FMA/ISO50/22-060	22	40	60	19	M 10	10
FMA/ISO50/22-100	22	40	100	19	M 10	10
FMA/ISO50/22-150	22	40	150	19	M 10	10
FMA/ISO50/27-060	27	48	60	21	M 12	12
FMA/ISO50/27-100	27	48	100	21	M 12	12
FMA/ISO50/27-160	27	48	160	21	M 12	12
FMA/ISO50/32-070	32	58	70	24	M 16	14
FMA/ISO50/32-100	32	58	100	24	M 16	14
FMA/ISO50/32-160	32	58	160	24	M 16	14
FMA/ISO50/40-070	40	68	70	27	M 20	16
FMA/ISO50/40-100	40	68	100	27	M 20	16
FMA/ISO50/40-160	40	68	160	27	M 20	16

- All Holders are in AT-3 Class
- Max. Runout of the Internal Taper w.r.t. External Taper: 0.005 mm

SIDE LOCK ADAPTOR
ISO TAPER

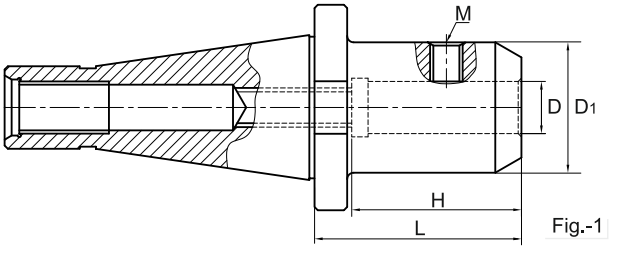


Fig.-1

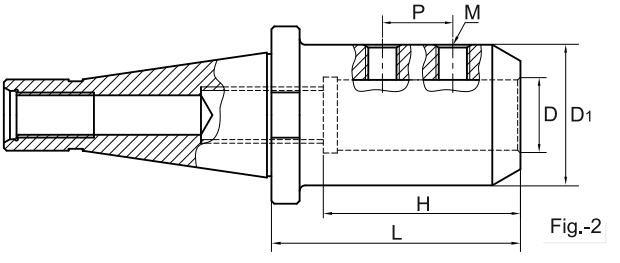


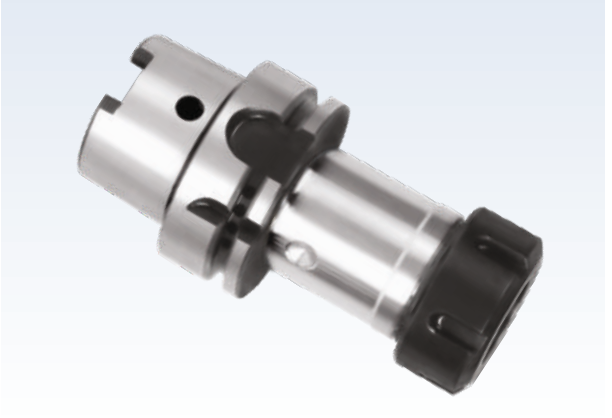
Fig.-2

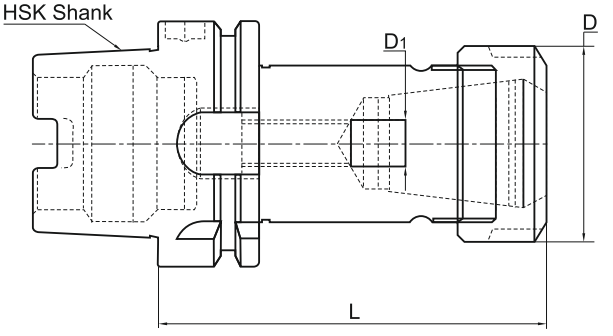
DIN 2080 Standard

ITEM CODE	D1	D	L	H	M	P	Fig.
SLA/ISO30/10-065	30	10	65	44	M 10	--	1
SLA/ISO30/12-065	35	12	65	44	M 10	--	1
SLA/ISO30/16-065	40	16	65	52	M 10	--	1
SLA/ISO30/20-090	50	20	90	70	M 10	20	2
SLA/ISO30/25-090	50	25	90	70	M 10	25	2
SLA/ISO40/08-065	24	08	65	40	M 8	--	1
SLA/ISO40/10-065	30	10	65	44	M 10	--	1
SLA/ISO40/12-065	35	12	65	44	M 10	--	1
SLA/ISO40/16-065	40	16	65	52	M 10	--	1
SLA/ISO40/20-090	50	20	90	70	M 10	20	2
SLA/ISO40/25-090	50	25	90	70	M 12	25	2
SLA/ISO40/32-090	60	32	90	70	M 12	28	2
SLA/ISO40/40-090	70	40	90	70	M 12	28	2
SLA/ISO50/10-070	30	10	70	44	M 10	--	1
SLA/ISO50/12-070	35	12	70	44	M 10	--	1
SLA/ISO50/16-070	40	16	70	52	M 10	--	1
SLA/ISO50/20-100	50	20	100	70	M 10	20	2
SLA/ISO50/25-100	50	25	100	70	M 12	25	2
SLA/ISO50/32-100	60	32	100	70	M 12	28	2
SLA/ISO50/40-100	70	40	100	70	M 12	28	2

- All Holders are in AT-3 Class
- Max. Runout of the Internal Taper w.r.t. External Taper: 0.005 mm

COLLET CHUCK
HSK TAPER



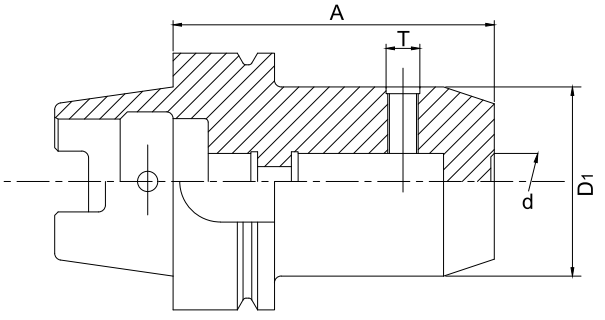


DIN 69893 Standard

ITEM CODE	Clamping Capacity	D	L	D1
CHE/HSK-A50/ER16-060	0.5 - 10	28	60	M10 x 1
CHE/HSK-A50/ER16-100	0.5 - 10	34	70	M10 x 1
CHE/HSK-A50/ER20-100	1.0 - 13	34	100	M10 x 1
CHE/HSK-A50/ER25-070	1.0 - 16	42	70	M18 x 1
CHE/HSK-A50/ER25-100	1.0 - 16	42	100	M18 x 1
CHE/HSK-A50/ER32-080	2.0 - 20	50	80	M22 x 1.5
CHE/HSK-A50/ER32-100	2.0 - 20	50	100	M22 x 1.5
CHE/HSK-A50/ER40-080	3.0 - 26	63	80	M30 x 1.5
CHE/HSK-A63/ER16-100	0.5 - 10	28	100	M10 x 1
CHE/HSK-A63/ER16-160	0.5 - 10	28	160	M10 x 1
CHE/HSK-A63/ER20-100	1.0 - 13	34	100	M10 x 1
CHE/HSK-A63/ER20-160	1.0 - 13	34	160	M10 x 1
CHE/HSK-A63/ER25-100	1.0 - 16	42	100	M18 x 1
CHE/HSK-A63/ER25-160	1.0 - 16	42	160	M22 x 1.5
CHE/HSK-A63/ER32-100	2.0 - 20	50	100	M22 x 1.5
CHE/HSK-A63/ER32-160	2.0 - 20	50	160	M22 x 1.5
CHE/HSK-A63/ER40-120	3.0 - 26	63	120	M30 x 1.5
CHE/HSK-A63/ER40-160	3.0 - 26	63	160	M30 x 1.5
CHE/HSK-A100/ER25-100	1.0 - 16	42	100	M18 x 1
CHE/HSK-A100/ER25-160	1.0 - 16	42	160	M18 x 1
CHE/HSK-A100/ER32-100	2.0 - 20	50	100	M22 x 1.5
CHE/HSK-A100/ER32-160	2.0 - 20	50	160	M22 x 1.5
CHE/HSK-A100/ER40-120	3.0 - 26	63	120	M30 x 1.5
CHE/HSK-A100/ER40-160	3.0 - 26	63	160	M30 x 1.5

- All Holders are in AT-3 Class
- Max. Runout of the Internal Taper w.r.t. External Taper: 0.005 mm

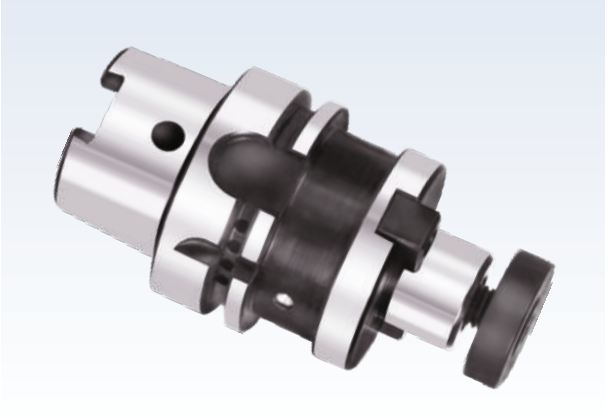
SIDE LOCK ADAPTOR
HSK TAPER

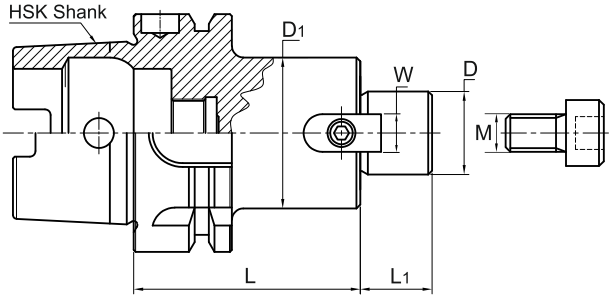


ITEM CODE	HSK-A	d	D1	A	T
SLA/HSK50/10-065	50	10	35	65	M10
SLA/HSK50/12-080	50	12	42	80	M12
SLA/HSK50/16-080	50	16	48	80	M12
SLA/HSK50/20-080	50	20	52	80	M16
SLA/HSK50/25-110	50	25	65	110	M16
SLA/HSK50/32-110	50	32	72	110	M16
SLA/HSK63/10-065	63	10	35	65	M10
SLA/HSK63/12-080	63	12	42	80	M12
SLA/HSK63/16-080	63	16	48	80	M12
SLA/HSK63/20-080	63	20	52	80	M16
SLA/HSK63/25-110	63	25	65	110	M16
SLA/HSK63/32-110	63	32	72	110	M16
SLA/HSK63/40-120	63	40	80	120	M16
SLA/HSK100/10-080	100	10	35	80	M10
SLA/HSK100/12-080	100	12	42	80	M12
SLA/HSK100/16-100	100	16	48	100	M12
SLA/HSK100/20-100	100	20	52	100	M16
SLA/HSK100/25-100	100	25	65	100	M16
SLA/HSK100/32-100	100	32	72	100	M16
SLA/HSK100/40-120	100	40	80	120	M16
SLA/HSK100/50-130	100	50	100	130	M16

- All Holders are in AT-3 Class
- Max. Runout of the Internal Taper w.r.t. External Taper: 0.005 mm

FACE MILL ARBOR
HSK TAPER





DIN 69893 Standard

ITEM CODE	D	D1	L	L1
FMA/HSK/16-050	16	32	50	17
FMA/HSK/22-050	22	40	50	19
FMA/HSK/27-060	27	48	60	21
FMA/HSK/16-050	16	32	50	17
FMA/HSK/16-100	16	32	100	17
FMA/HSK/16-150	16	40	150	19
FMA/HSK/22-050	22	40	50	19
FMA/HSK/22-100	22	40	100	19
FMA/HSK/22-160	22	40	160	19
FMA/HSK/27-060	27	48	60	21
FMA/HSK/27-120	27	48	120	21
FMA/HSK/27-160	27	48	160	21
FMA/HSK/32-070	32	58	70	24
FMA/HSK/32-120	32	58	120	24
FMA/HSK/32-160	32	58	160	24
FMA/HSK/40-070	40	68	70	27

ITEM CODE	D	D1	L	L1
FMA/HSK/16-060	16	32	60	17
FMA/HSK/16-100	16	32	100	17
FMA/HSK/16-150	16	32	150	17
FMA/HSK/22-060	22	40	60	19
FMA/HSK/22-100	22	40	100	19
FMA/HSK/22-150	22	40	150	19
FMA/HSK/27-060	27	48	60	21
FMA/HSK/27-100	27	48	100	21
FMA/HSK/27-160	27	48	160	21
FMA/HSK/32-070	32	58	70	24
FMA/HSK/32-100	32	58	100	24
FMA/HSK/32-160	32	58	160	24
FMA/HSK/40-070	40	68	70	27
FMA/HSK/40-100	40	68	100	27
FMA/HSK/40-160	40	68	160	27

- All Holders are in AT-3 Class
- Max. Runout of the Internal Taper w.r.t. External Taper: 0.005 mm

NOMENCLATURE FOR HYDRAULIC CHUCKS

HYDRAULIC GRIP HOLDER

1. HOLDER TYPE

HG = Hydraulic Grip Holder

3. HOLDER INNER DIAMETER

12 = 12 mm	20 = 20 mm
16 = 16 mm	25 = 25 mm

2. TAPER SIZE

- BT (MAS 403) = 30, 40 , 50
- SK (DIN 69871) = 30, 40, 50
- CAT (ANSI B5.50/ISO7388) = 30, 40, 50
- HSK-A (DIN 69893) = 50, 63, 100

4. GAUGE PLANE LENGTH

- 070 = 70 mm
- 080 = 80 mm
- 100 = 100 mm

HYDRAULIC GRIP COLLET

1. HOLDER TYPE

HGC = Hydraulic Grip Collet

3. COLLET INNER DIAMETER

030 = 3 mm	060 = 6 mm
040 = 4 mm	100 = 10 mm

2. COLLET OUTER DIAMETER

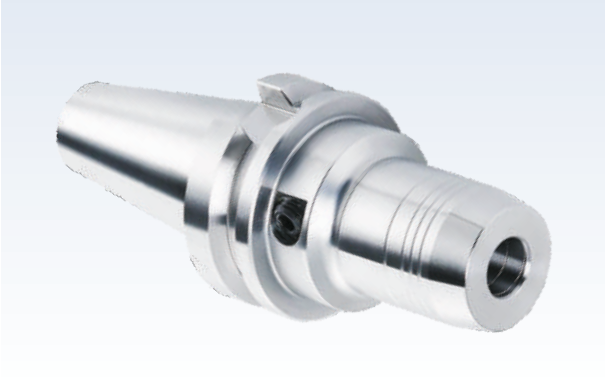
- 12 = 12 mm
- 20 = 20 mm
- 32 = 32 mm

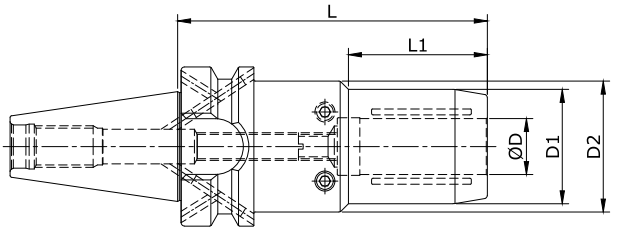
SALIENT FEATURES :

- "Blood" Hydraulic Chuck is a very precision & high technology product.
- Best suitable for drilling, reaming & milling operations.
- The tool runs less than 5 micron on 3D hence the tool life & machinability increases drastically.
- Best operating temperature (20^0 C / 40^0 C)

HYDRAULIC CHUCKS

BT TAPER (MAS 403)

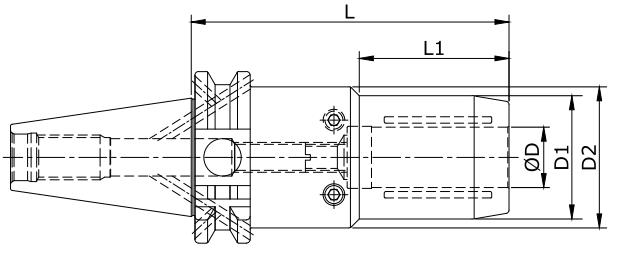




ITEM CODE	D	D1	D2	L	L1
HG/BT30/12-085	12	32	49	85	40
HG/BT30/16-100	16	38	49	100	46
HG/BT30/20-100	20	42	49	100	50
HG/BT40/12-090	12	32	49	90	40
HG/BT40/16-090	16	38	49	90	46
HG/BT40/20-095	20	42	49	95	50
HG/BT40/25-105	25	53	--	105	--
HG/BT40/32-110	32	60	--	110	--
HG/BT50/12-100	12	32	49	100	40
HG/BT50/16-105	16	38	49	105	46
HG/BT50/20-105	20	42	49	105	50
HG/BT50/25-115	25	53	63	115	--
HG/BT50/32-120	32	60	63	120	--

HYDRAULIC CHUCKS

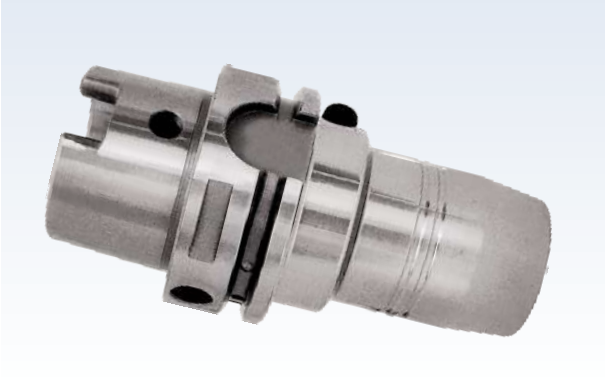
SK TAPER (DİN 69871)

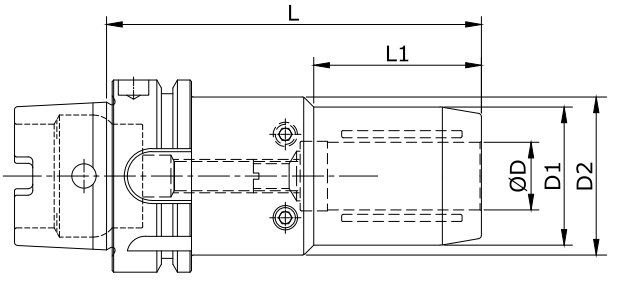


ITEM CODE	D	D1	D2	L	L1
HG/SK40/12-080	12	32	49	80	40
HG/SK40/16-085	16	38	49	85	46
HG/SK40/20-090	20	42	49	90	50
HG/SK40/25-110	25	53	--	110	-
HG/SK40/32-115	32	60	--	115	--
HG/SK50/12-080	12	32	49	80	40
HG/SK50/16-085	16	38	49	85	46
HG/SK50/20-090	20	42	49	90	50
HG/SK50/25-100	25	53	--	100	--
HG/SK50/32-100	32	60	--	100	--

HYDRAULIC CHUCKS

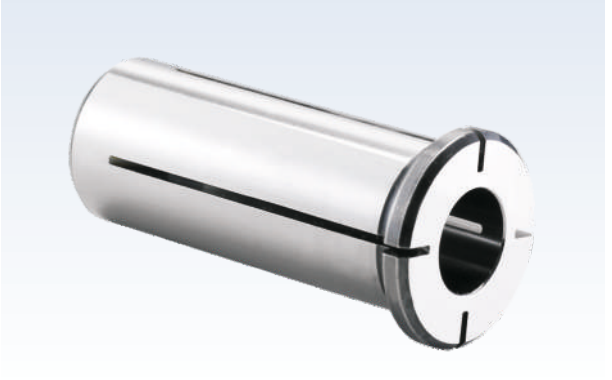
HSK TAPER (DIN 69893)

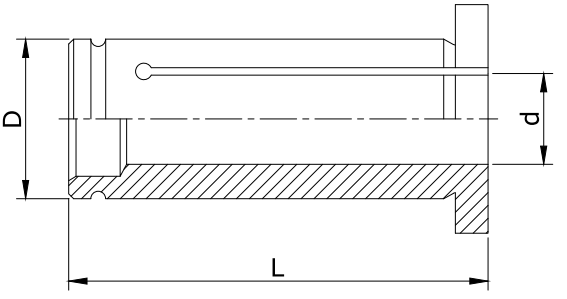




ITEM CODE	D	D1	D2	L	L1
HG/HSK50A/12-090	12	32	49	90	40
HG/HSK50A/20-090	20	42	49	90	50
HG/HSK63A/12-090	12	32	49	90	40
HG/HSK63A/16-095	16	38	49	95	46
HG/HSK63A/20-100	20	42	49	100	50
HG/HSK63A/25-105	25	53	--	105	--
HG/HSK100A/12-095	12	32	49	90	40
HG/HSK100A/16-100	16	38	49	100	46
HG/HSK100A/20-105	20	42	49	105	50
HG/HSK100A/25-115	25	53	--	115	--
HG/HSK100A/32-120	32	60	--	120	--

HYDRAULIC GRIP COLLECT





ITEM CODE	D	d	L
HGC/12/030	12	3	42
HGC/12/040	12	4	
HGC/12/050	12	5	
HGC/12/060	12	6	
HGC/12/080	12	8	
HGC/12/100	12	10	
HGC/20/030	20	3	57
HGC/20/040	20	4	
HGC/20/050	20	5	
HGC/20/060	20	6	
HGC/20/080	20	8	
HGC/20/100	20	10	
HGC/20/120	20	12	
HGC/20/140	20	14	
HGC/20/160	20	16	
HGC/32/030	32	3	65
HGC/32/040	32	4	
HGC/32/050	32	5	
HGC/32/060	32	6	
HGC/32/080	32	8	
HGC/32/100	32	10	
HGC/32/120	32	12	
HGC/32/140	32	14	
HGC/32/160	32	16	
HGC/32/180	32	18	
HGC/32/200	32	20	
HGC/32/250	32	25	

NOMENCLATURE FOR TAPPING CHUCK / ADAPTOR

TC (1) . BT40 (2) . A/M1-M14 (3) . 70 (4)

TAPPING CHUCK

1. HOLDER TYPE

TC = TAPPING CHUCK

3. TAP RANGE

A = M1 ~ M14 | B = M5 ~ M24 | C = M14 ~ M36

2. TAPER SIZE

- BT (MAS 403) = 30, 40 , 50
- SK (DIN 69871) = 30, 40, 50
- CAT (ANSI B5.50/ISO7388) = 30, 40, 50
- HSK-A (DIN 69893) = 50, 63, 100

4. GAUGE PLANE LENGTH

- 070 = 70 mm
- 080 = 080 mm
- 100 = 100 mm

TAPPING ADAPTOR

TA (1) . A (2) . M6 (3) . 060 (4) . 049 (5)

1. ADAPTOR / COLLET TYPE

TA = Tapping Adaptor

2. TAP RANGE

- A = M1 ~ M14
- B = M5 ~ M24
- C = M14 ~ M36

3. TAP SIZE

M6 | M8 | M10

4. TAP SHANK

Ø 6 = 060 | Ø 8 = 080 | Ø 10 = 100

5. TAP SQUARE

- □ 4.9 = 049
- □ 6.2 = 062
- □ 8.0 = 080

SALIENT FEATURES :

Tapping Chucks

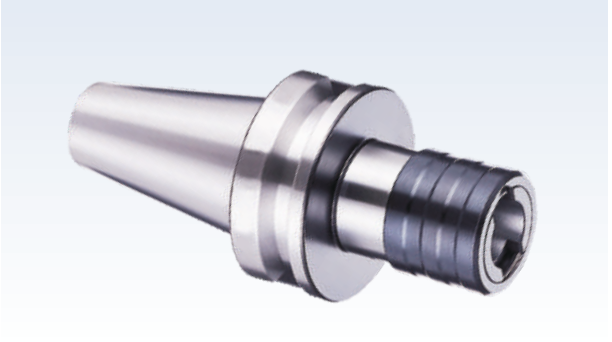
- Tension & Compression type tapping chucks with clutch.
- BLOOD make tapping chucks has integrated length compensation to compensate for differences between tap pitch and machine feed.
- High radial rigidity due to multiple bearing technology.

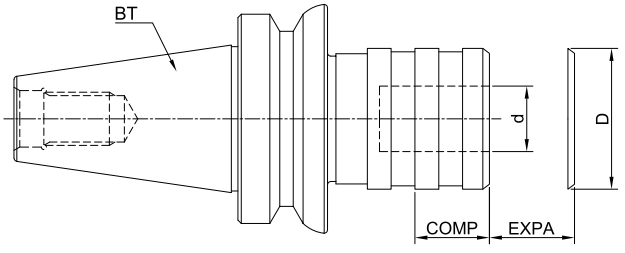
Tapping Adaptors

- BLOOD make tapping adaptors are by default equiped with overload clutch.
- Due to internal square drive, it generates high clamping force resulting into better quality threads, longer tap life and prevention of Tap Breakage.

TENSION & COMPRESSION TAPPING CHUCKS

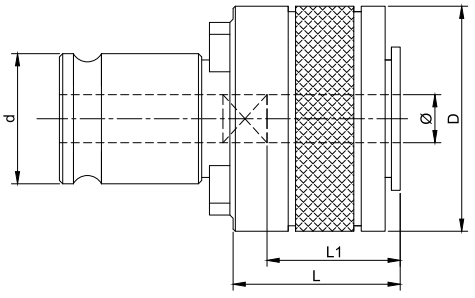
(with Clutch)





ITEM CODE	Range / Size	Compatible Adaptor	L	D	d	Compression	Expansion
TC/BT30-A/M1-M14/060	M1 ~ M14	TA/A	60	36	19	7.50	7.50
TC/BT40-A/M1-M14/070	M1 ~ M14	TA/A	70	36	19	7.50	7.50
TC/BT40-B/M5-M24/090	M5 ~ M24	TA/B	90	53	31	12.50	12.50
TC/BT40-C/M14-M36/160	M14 ~ M36	TA/C	160	78	48	20.00	20.00
TC/BT50-A/M1-M14/080	M1 ~ M14	TA/A	80	36	19	7.50	7.50
TC/BT50-B/M5-M24/100	M5 ~ M24	TA/B	100	53	31	12.50	12.50
TC/BT50-C/M14-M36/140	M14 ~ M36	TA/C	140	78	48	20.00	20.00
TC/SK30-A/M1-M14/060	M1 ~ M14	TA/A	60	36	19	7.50	7.50
TC/SK40-A/M1-M14/060	M1 ~ M14	TA/A	60	36	19	7.50	7.50
TC/SK40-B/M5-M24/100	M5 ~ M24	TA/B	100	53	31	12.50	12.50
TC/SK40-C/M14-M36/150	M14 ~ M36	TA/C	150	78	48	20.00	20.00
TC/SK50-A/M1-M14/060	M1 ~ M14	TA/A	60	36	19	7.50	7.50
TC/SK50-B/M5-M24/080	M5 ~ M24	TA/B	80	53	31	12.50	12.50
TC/SK50-C/M14-M36/140	M14 ~ M36	TA/C	140	78	48	20.00	20.00
TC/HSK63A-A/M1-M14/105	M1 ~ M14	TA/A	105	39	19	7.50	7.50
TC/HSK63A-B/M5-M24/140	M5 ~ M24	TA/B	140	60	31	10.00	10.00
TC/HSK63A-C/M14-M36/200	M14 ~ M36	TA/C	200	86	48	17.50	17.50
TC/HSK100A-A/M1-M14/110	M1 ~ M14	TA/A	110	39	19	7.50	7.50
TC/HSK100A-B/M5-M24/145	M5 ~ M24	TA/B	145	60	31	10.00	10.00
TC/HSK100A-C/M14-M36/210	M14 ~ M36	TA/C	210	86	48	17.50	17.50

TAPPING ADAPTOR



ITEM CODE	Adaptor Type	DIN 371 / 374 / 376			d	D	L1	L
		Tap Size	Ø	□				
TA/A/M1-025.021	A	M1	2.50	2.10	19.00	32.50	17.00	25.00
TA/A/M2-028.021	A	M2	2.80	2.10	19.00	32.50	17.00	25.00
TA/A/M3-035.027	A	M3	3.50	2.70	19.00	32.50	17.00	25.00
TA/A/M4-045.035	A	M4	4.50	3.50	19.00	32.50	17.00	25.00
TA/A/M5-035.027	A	M5	3.50	2.70	19.00	32.50	17.00	25.00
TA/A/M6-060.049	A	M6	6.00	4.90	19.00	32.50	17.00	25.00
TA/A/M8-080.062	A	M8	8.00	6.20	19.00	32.50	17.00	25.00
TA/A/M10-100.080	A	M10	10.00	8.00	19.00	32.50	17.00	25.00
TA/A/M12-090.070	A	M12	9.00	7.00	19.00	32.50	17.00	25.00
TA/A/M14-110.090	A	M14	11.00	9.00	19.00	32.50	17.00	25.00
TA/B/M5-060.049	B	M5	6.00	4.90	31.00	50.50	30.00	34.00
TA/B/M6-060.049	B	M6	6.00	4.90	31.00	50.50	30.00	34.00
TA/B/M8-080.062	B	M8	8.00	6.20	31.00	50.50	30.00	34.00
TA/B/M10-100.080	B	M10	10.00	8.00	31.00	50.50	30.00	34.00
TA/B/M12-090.070	B	M12	9.00	7.00	31.00	50.50	30.00	34.00
TA/B/M14-110.090	B	M14	11.00	9.00	31.00	50.50	30.00	34.00
TA/B/M16-120.090	B	M16	12.00	9.00	31.00	50.50	30.00	34.00
TA/B/M18-140.110	B	M18	14.00	11.00	31.00	50.50	30.00	34.00
TA/B/M20-160.120	B	M20	16.00	12.00	31.00	50.50	30.00	34.00
TA/B/M22-180.145	B	M22	18.00	14.50	31.00	50.50	30.00	34.00
TA/B/M24-180.145	B	M24	18.00	14.50	31.00	50.50	30.00	34.00
TA/C/M14-110.090	C	M14	11.00	9.00	48.00	72.00	44.00	45.00
TA/C/M16-120.090	C	M16	12.00	9.00	48.00	72.00	44.00	45.00
TA/C/M18-140.110	C	M18	14.00	11.00	48.00	72.00	44.00	45.00
TA/C/M20-160.120	C	M20	16.00	12.00	48.00	72.00	44.00	45.00
TA/C/M22-180.145	C	M22	18.00	14.50	48.00	72.00	44.00	45.00
TA/C/M24-180.145	C	M24	18.00	14.50	48.00	72.00	44.00	45.00
TA/C/M30-220.180	C	M30	22.00	18.00	48.00	72.00	44.00	45.00
TA/C/M33-250.200	C	M33	25.00	20.00	48.00	72.00	44.00	45.00
TA/C/M36-280.220	C	M36	28.00	22.00	48.00	72.00	44.00	45.00

NOMENCLATURE FOR DIE & MOULD CHUCK

DMC HOLDER

1. HOLDER TYPE

DMC = Die & Mould Chuck

2. TAPER SIZE

BT (MAS 403) = 30, 40 , 50

SK (DIN 69871) = 30, 40, 50

CAT (ANSI B5.50/ISO7388) = 30, 40, 50

HSK-A (DIN 69893) = 50, 63, 100

3. CLAMPING RANGE

04 : 3,4 mm

06 : 3,4,5,6 mm

08 : 3,4,5,6,8,10 mm

12 : 3,4,5,6,8,10,12 mm

4. GAUGE PLANE LENGTH

090 = 90 mm

120 = 120 mm

150 = 150 mm

DMC COLLET

DMCC . 06 . 060
1 2 3

1. ADAPTOR / COLLET TYPE

DMCC = Die & Mould Collet

DMCE = Die & Mould Extension

2. CLAMPING RANGE

04 : 3,4 mm

06 : 3,4,5,6 mm

08 : 3,4,5,6,8,10 mm

12 : 3,4,5,6,8,10,12 mm

3. INNER DIA / OUTER DIA

For DMCC = Inner Dia

For DMCE = Outer Dia

DMC EXTENSION

DMCE . 06 . 12 . 150
1 2 3 4

4. GAUGE PLANE LENGTH

090 = 90 mm

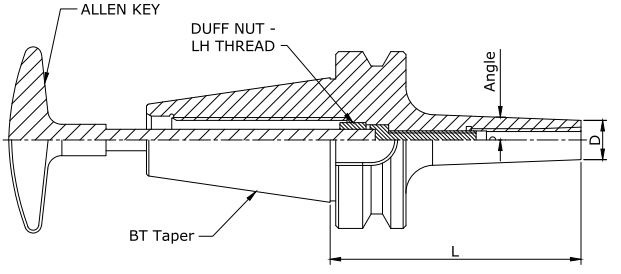
120 = 120 mm

150 = 150 mm

SALIENT FEATURES :

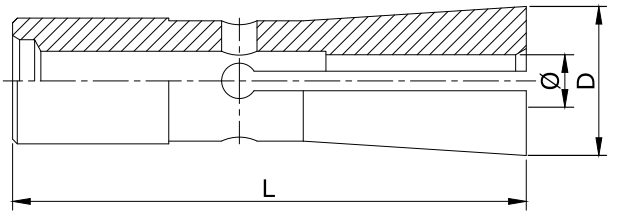
- Best suitable for die & mould industry.
- Most suitable for machining of cavities difficult to reach
- High precision runout < 0.005 mm (4xd).
- All "BLOOD" die & mould chucks are subjected to sub zero treatment. This treatment helps to prevent the holders from deformation for many years & hence increases the life.

DIE & MOULD CHUCKS
DMC HOLDER
BT TAPER (MAS 403)



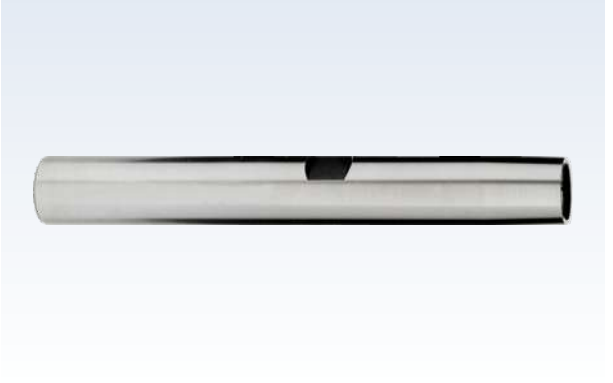
ITEM CODE	Clamping Range	D	L	Screw Size	Allen Key	Angle	Applicable Collet	Applicable Spanner
DMC/BT30/04-090	3 ~ 4 mm	10	90	M4	3 mm	3°	DMCC/04/***	SP/DMC/04-M3
DMC/BT30/04-120			120					
DMC/BT30/06-090	3 ~ 6 mm	14	90	M5	4 mm	3°	DMCC/06/***	SP/DMC/06-M4
DMC/BT30/06-120			120					
DMC/BT30/08-090	3 ~ 10 mm	22	90	M6	5 mm	3°	DMCC/08/***	SP/DMC/08-M5
DMC/BT30/08-120			120					
DMC/BT40/04-090	3 ~ 4 mm	10	90	M4	3 mm	3°	DMCC/04/***	SP/DMC/04-M3
DMC/BT40/04-120			120					
DMC/BT40/04-150			150					
DMC/BT40/06-090	3 ~ 6 mm	14	90	M5	4 mm	3°	DMCC/06/***	SP/DMC/06-M4
DMC/BT40/06-120			120					
DMC/BT40/06-150			150					
DMC/BT40/08-090	3 ~ 10 mm	22	90	M6	5 mm	3°	DMCC/08/***	SP/DMC/08-M5
DMC/BT40/08-120			120					
DMC/BT40/08-150			150					
DMC/BT40/12-090	3 ~ 12 mm	34	90	M10	8 mm	3°	DMCC/12/***	SP/DMC/12-M8
DMC/BT40/12-120			120					
DMC/BT40/12-150			150					

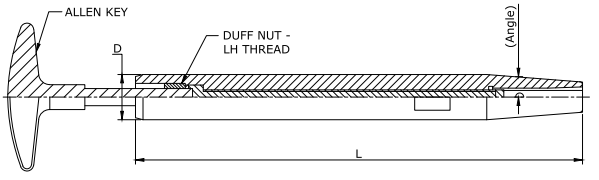
DMC COLLET



ITEM CODE	Ø	D	L	Applicable Holder
DMCC/04/030	3 mm	7	31	DMC/BT40/04- ***
DMCC/04/040	4 mm			
DMCC/06/030	3 mm	9.6	36	DMC/BT40/06- ***
DMCC/06/040	4 mm			
DMCC/06/050	5 mm			
DMCC/06/060	6 mm			
DMCC/08/030	3 mm	15	45	DMC/BT40/08- ***
DMCC/08/040	4 mm			
DMCC/08/050	5 mm			
DMCC/08/060	6 mm			
DMCC/08/080	8 mm			
DMCC/08/100	10 mm			
DMCC/12/030	3 mm	22	60	DMC/BT40/12- ***
DMCC/12/040	4 mm			
DMCC/12/050	5 mm			
DMCC/12/060	6 mm			
DMCC/12/080	8 mm			
DMCC/12/100	10 mm			
DMCC/12/120	12 mm			

DMC EXTENSION





ITEM CODE	Clamping Range	D	L	Allen Key
DMCE/04/08- 120	3 ~ 4 mm	8	120	3 mm
DMCE/06/10- 100	3 ~ 6 mm	10	100	4 mm
DMCE/06/10- 120			120	
DMCE/06/10- 150			150	
DMCE/06/12- 100		12	100	
DMCE/06/12- 120			120	
DMCE/06/12- 150			150	
DMCE/06/16- 150		16		
DMCE/08/16- 150	3 ~ 10 mm	16	150	5 mm
DMCE/08/16- 200			200	

NOMENCLATURE FOR SHRINK FIT HOLDERS

SF (1) . BT40 (2) . 06 (3) . 075 (4)

1. HOLDER TYPE

SF = Shrink Fit Holders

2. TAPER SIZE

BT (MAS 403) = 30, 40 , 50

SK (DIN 69871) = 30, 40, 50

CAT (ANSI B5.50/ISO7388) = 30, 40, 50

HSK-A (DIN 69893) = 50, 63, 100

3. HOLDER INNER DIAMETER

06 = 6 mm

08 = 8 mm

10 = 10 mm

4. GAUGE PLANE LENGTH

075 = 75 mm

090 = 90 mm

130 = 130 mm

SALIENT FEATURES

- TIR within 0.003 mm at the nose
- Flange through coolant form B/AD available on request
- Dynamically balanced to G6.3@ 15,000 rpm
- CAT taper shrink fit holders available on request
- Shrink Fit holders are available in both Metric & Inch sizes

SHRINK FIT HOLDERS

BT TAPER (MAS 403)

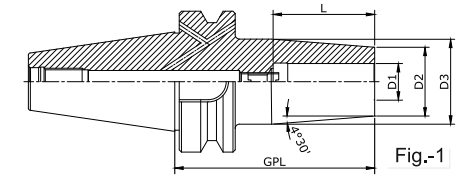


Fig.-1

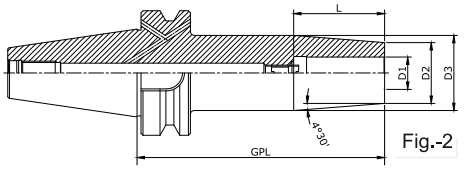


Fig.-2

ITEM CODE	Fig.	D1	D2	D3	L	GPL	WRENCH SIZE
SF/BT30/06-075	1	6	20	27	36	75	2.5 mm
SF/BT30/08-075	1	8	20	27	36	75	3.0 mm
SF/BT30/10-075	1	10	24	32	42	75	4.0 mm
SF/BT30/12-075	1	12	24	32	47	75	5.0 mm
SF/BT40/06-090	1	6	20	27	36	90	2.5 mm
SF/BT40/06-130	2	6	20	27	36	130	
SF/BT40/08-090	1	8	20	27	36	90	3.0 mm
SF/BT40/08-130	2	8	20	27	36	130	
SF/BT40/10-090	1	10	24	32	42	90	4.0 mm
SF/BT40/10-130	2	10	24	32	42	130	
SF/BT40/12-090	1	12	24	32	47	90	5.0 mm
SF/BT40/12-130	2	12	24	32	47	130	
SF/BT40/14-090	1	14	27	34	47	90	
SF/BT40/14-130	2	14	27	34	47	130	
SF/BT40/16-090	1	16	27	34	50	90	6.0 mm
SF/BT40/16-130	2	16	27	34	50	130	
SF/BT40/18-090	1	18	33	42	50	90	
SF/BT40/18-130	2	18	33	42	50	130	
SF/BT40/20-090	1	20	33	42	52	90	8.0 mm
SF/BT40/20-130	2	20	33	42	52	130	
SF/BT50/06-090	1	6	21	27	36	90	2.5 mm
SF/BT50/06-130	2	6	21	27	36	130	
SF/BT50/08-090	1	8	21	27	36	90	3.0 mm
SF/BT50/08-130	2	8	21	27	36	130	
SF/BT50/10-090	1	10	24	32	42	90	4.0 mm
SF/BT50/10-130	2	10	24	32	42	130	
SF/BT50/12-090	1	12	24	32	47	90	5.0 mm
SF/BT50/12-130	2	12	24	32	47	130	
SF/BT50/14-090	1	14	27	34	47	90	
SF/BT50/14-130	2	14	27	34	47	130	
SF/BT50/16-090	1	16	27	34	50	90	6.0 mm
SF/BT50/16-130	2	16	27	34	50	130	
SF/BT50/18-090	1	18	33	42	50	90	
SF/BT50/18-130	2	18	33	42	50	130	
SF/BT50/20-090	1	20	33	42	52	90	8.0 mm
SF/BT50/20-130	2	20	33	42	52	130	
SF/BT50/25-100	1	25	44	53	58	100	10.0 mm
SF/BT50/25-130	2	25	44	53	58	130	

SHRINK FIT HOLDERS

SK TAPER (DIN 69871)

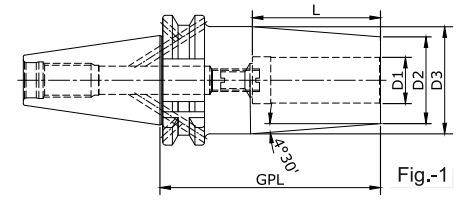


Fig.-1

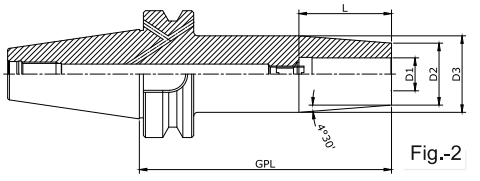


Fig.-2

ITEM CODE	Fig.	D1	D2	D3	L	GPL	WRENCH SIZE
SF/SK40/06-080	1	6	20	27	27	80	2.5 mm
SF/SK40/06-130	2	6	20	27	27	130	
SF/SK40/08-080	1	8	20	27	27	80	3.0 mm
SF/SK40/08-130	2	8	20	27	27	130	
SF/SK40/10-080	1	10	24	32	32	80	4.0 mm
SF/SK40/10-130	2	10	24	32	32	130	
SF/SK40/12-080	1	12	24	32	32	80	5.0 mm
SF/SK40/12-130	2	12	24	32	32	130	
SF/SK40/14-080	1	14	27	34	34	80	
SF/SK40/14-130	2	14	27	34	34	130	
SF/SK40/16-080	1	16	27	34	34	80	6.0 mm
SF/SK40/16-130	2	16	27	34	34	130	
SF/SK40/18-080	1	18	33	42	42	80	
SF/SK40/18-130	2	18	33	42	42	130	
SF/SK40/20-080	1	20	33	42	42	80	8.0 mm
SF/SK40/20-130	2	20	33	42	42	130	
SF/SK50/06-080	1	6	21	27	36	80	2.5 mm
SF/SK50/06-130	2	6	21	27	36	130	
SF/SK50/08-080	1	8	21	27	36	80	3.0 mm
SF/SK50/08-130	2	8	21	27	36	130	
SF/SK50/10-080	1	10	24	32	42	80	4.0 mm
SF/SK50/10-130	2	10	24	32	42	130	
SF/SK50/12-080	1	12	24	32	47	80	5.0 mm
SF/SK50/12-130	2	12	24	32	47	130	
SF/SK50/14-080	1	14	27	34	47	80	
SF/SK50/14-130	2	14	27	34	47	130	
SF/SK50/16-080	1	16	27	34	50	80	6.0 mm
SF/SK50/16-130	2	16	27	34	50	130	
SF/SK50/18-080	1	18	33	42	50	80	
SF/SK50/18-130	2	18	33	42	50	130	
SF/SK50/20-080	1	20	33	42	52	80	8.0 mm
SF/SK50/20-130	2	20	33	42	52	130	

SHRINK FIT HOLDERS

HSK TAPER (DIN 69893)

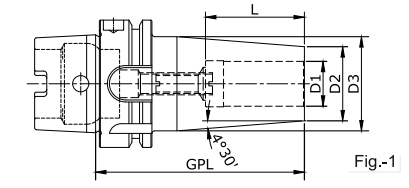


Fig.-1

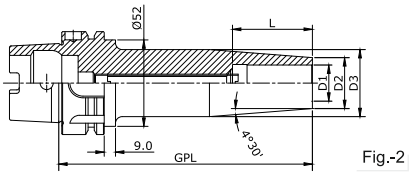


Fig.-2

ITEM CODE	Fig.	D1	D2	D3	L	GPL	WRENCH SIZE
SF/HSK50A/060-080	1	6	20	27	36	80	2.5 mm
SF/HSK50A/060-130	2	6	20	27	36	130	
SF/HSK50A/080-080	1	8	20	27	36	80	3.0 mm
SF/HSK50A/080-130	2	8	20	27	36	130	
SF/HSK50A/100-080	1	10	24	32	42	80	4.0 mm
SF/HSK50A/100-130	2	10	24	32	42	130	
SF/HSK50A/120-080	1	12	24	32	42	80	5.0 mm
SF/HSK50A/120-130	2	12	24	32	42	130	
SF/HSK63A/060-080	1	6	21	27	36	80	2.5 mm
SF/HSK63A/060-130	2	6	21	27	36	130	
SF/HSK63A/080-080	1	8	21	27	36	80	3.0 mm
SF/HSK63A/080-130	2	8	21	27	36	130	
SF/HSK63A/100-080	1	10	24	32	42	80	4.0 mm
SF/HSK63A/100-130	2	10	24	32	42	130	
SF/HSK63A/120-080	1	12	24	32	42	80	5.0 mm
SF/HSK63A/120-130	2	12	24	32	42	130	
SF/HSK63A/140-080	1	14	27	34	47	80	
SF/HSK63A/140-130	2	14	27	34	47	130	
SF/HSK63A/160-080	1	16	27	34	47	80	6.0 mm
SF/HSK63A/160-130	2	16	27	34	47	130	
SF/HSK63A/180-080	1	18	33	42	50	80	
SF/HSK63A/180-130	2	18	33	42	50	130	
SF/HSK63A/200-080	1	20	33	42	52	80	8.0 mm
SF/HSK63A/200-130	2	20	33	42	52	130	
SF/HSK100A/060-085	1	6	21	27	36	85	2.5 mm
SF/HSK100A/060-130	2	6	21	27	36	130	
SF/HSK100A/080-085	1	8	21	27	36	85	3.0 mm
SF/HSK100A/080-130	2	8	21	27	36	130	
SF/HSK100A/100-090	1	10	24	32	42	90	4.0 mm
SF/HSK100A/100-130	2	10	24	32	42	130	
SF/HSK100A/120-095	1	12	24	32	42	95	5.0 mm
SF/HSK100A/120-130	2	12	24	32	42	130	
SF/HSK100A/140-095	1	14	27	34	47	95	
SF/HSK100A/140-130	2	14	27	34	47	130	
SF/HSK100A/160-100	1	16	27	34	47	100	6.0 mm
SF/HSK100A/160-130	2	16	27	34	47	130	
SF/HSK100A/180-100	1	18	33	42	50	100	
SF/HSK100A/180-130	2	18	33	42	50	130	
SF/HSK100A/200-105	1	20	33	42	52	105	8.0 mm
SF/HSK100A/200-130	2	20	33	42	52	130	

NOMENCLATURE FOR POWER MILL CHUCK

PMC (1) . BT40 (2) . 20 (3) . 090 (4)

POWER MILL CHUCK

1. HOLDER TYPE

PMC = Power Mill Chuck

3. HOLDER INNER DIAMETER

20 = 20 mm

32 = 32 mm

2. TAPER SIZE

BT (MAS 403) = 40 , 50

SK (DIN 69871) = 40, 50

4. GAUGE PLANE LENGTH

090 = 90 mm

POWER MILL COLLET

PMCC (1) . 20 (2) . 040 (3)

1. HOLDER TYPE

PMC = Power Mill Chuck

3. COLLET INNER DIAMETER

040 = 04 mm

060 = 06 mm

080 = 08 mm

100 = 10 mm

120 = 12 mm

160 = 16 mm

2. COLLET OUTER DIAMETER

20 = 20 mm

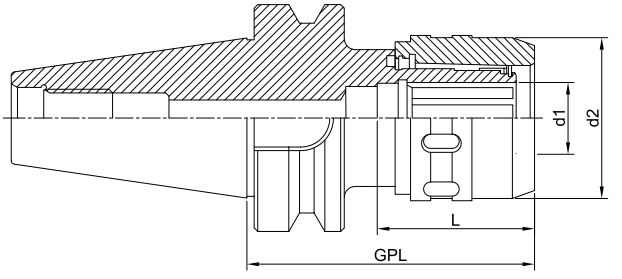
32 = 32 mm

SALIENT FEATURES :

- "Blood" Power Mill Chuck is a very precision & high technology product.
- Best suitable for drilling, reaming & milling operations.
- The tool runs less than 5 micron on 3D hence the tool life & machinability increases drastically.
- Best operating temperature (20^0 C / 40^0 C)

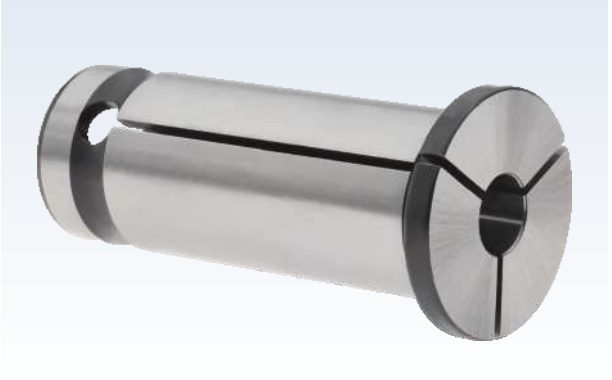
POWER MILL CHUCK

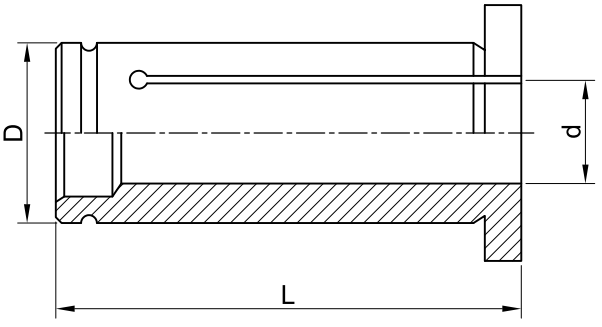
BT TAPER (MAS 403)



ITEM CODE	D1	D2	L	GPL
PMC/BT40/20-90	20	63	70	90
PMC/BT40/32-90	32	73	73	90
PMC/BT50/32-90	32	73	73	90
PMC/SK40/20-90	20	63	70	90
PMC/SK40/32-90	32	73	73	90
PMC/SK50/32-90	32	73	73	90

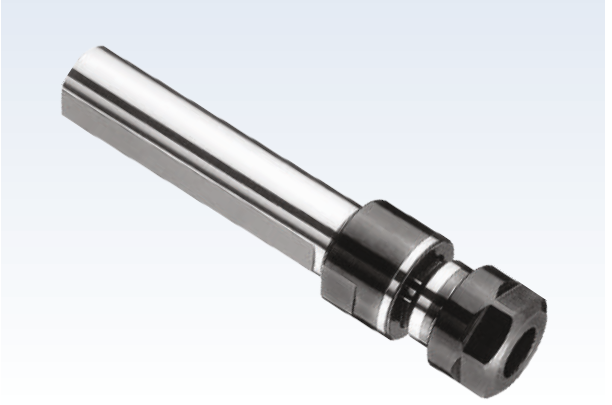
POWER MILL CHUCK COLLET
BT TAPER (MAS 403)

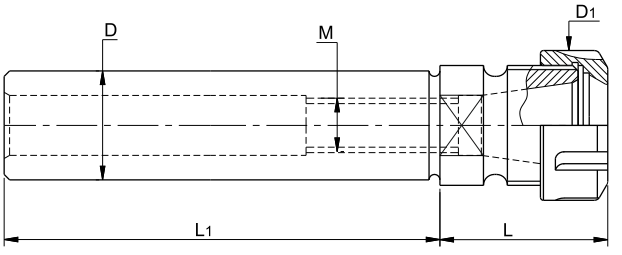




ITEM CODE	d	D	L
PMCC/20 - 040	4	20	51
PMCC/20 - 060	6	20	51
PMCC/20 - 080	8	20	51
PMCC/20 - 100	10	20	51
PMCC/20 - 120	12	20	51
PMCC/20 - 160	16	20	51
PMCC/32 - 060	6	32	63
PMCC/32 - 080	8	32	63
PMCC/32 - 100	10	32	63
PMCC/32 - 120	12	32	63
PMCC/32 - 160	16	32	63
PMCC/32 - 200	20	32	63
PMCC/32 - 250	25	32	63

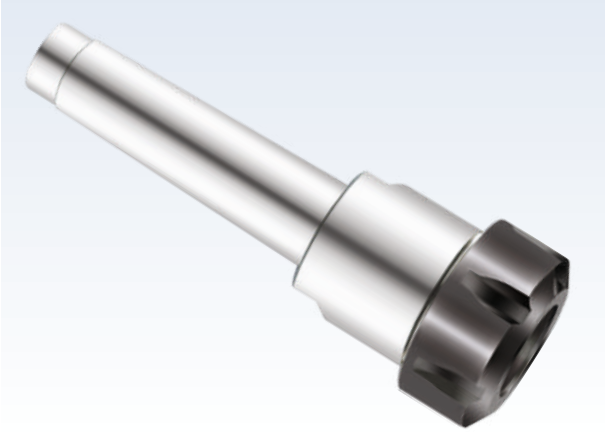
BABY COLLET CHUCK

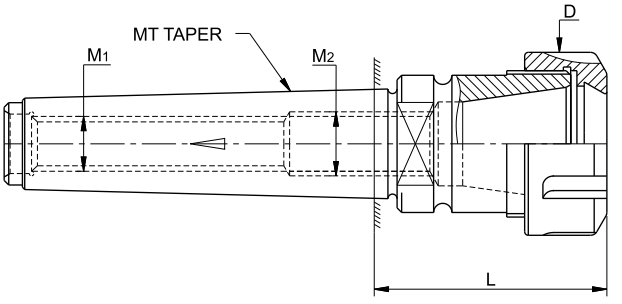




ITEM CODE	D	L	L1	D1	M	CLAMPING RANGE
CYL16/ER11-060	16	30	60	19	M6 x 1	2.0-7.0
CYL16/ER11-100	16	30	100	19	M6 x 1	2.0-7.0
CYL20/ER11-060	20	30	60	19	M6 x 1	2.0-7.0
CYL20/ER11-100	20	30	100	19	M6 x 1	2.0-7.0
CYL10/ER16-060	10	35	60	28	-	2.0-10.0
CYL12/ER16-060	12	35	60	28	-	2.0-10.0
CYL16/ER16-060	16	35	60	28	M8 x 1.25	2.0-10.0
CYL20/ER16-060	20	35	60	28	M10 x 1.5	2.0-10.0
CYL20/ER16-100	20	35	100	28	M10 x 1.5	2.0-10.0
CYL20/ER16-150	20	35	150	28	M10 x 1.5	2.0-10.0
CYL16/ER20-060	16	45	60	34	M10 x 1.5	2.0-13.0
CYL16/ER20-100	16	45	100	34	M10 x 1.5	2.0-13.0
CYL20/ER20-060	20	45	60	34	M12 x 1.75	2.0-13.0
CYL20/ER20-100	20	45	100	34	M12 x 1.75	2.0-13.0
CYL16/ER25-060	16	50	60	42	M10 x 1.5	2.0-16.0
CYL16/ER25-100	16	50	100	42	M10 x 1.5	2.0-16.0
CYL20/ER25-060	20	50	60	42	M12 x 1.75	2.0-16.0
CYL20/ER25-100	20	50	100	42	M12 x 1.75	2.0-16.0
CYL25/ER25-060	25	50	60	42	M18 x 1.5	2.0-16.0
CYL25/ER25-100	25	50	100	42	M18 x 1.5	2.0-16.0
CYL32/ER25-060	32	50	60	42	M18 x 1.5	2.0-16.0
CYL32/ER25-100	32	50	100	42	M18 x 1.5	2.0-16.0
CYL20/ER32-060	20	60	60	50	M12 x 1.75	2.0-20.0
CYL20/ER32-100	20	60	100	50	M12 x 1.75	2.0-20.0
CYL25/ER32-060	25	60	60	50	M18 x 1.5	2.0-20.0
CYL25/ER32-100	25	60	100	50	M18 x 1.5	2.0-20.0
CYL32/ER32-060	32	60	60	50	M22 x 1.5	2.0-20.0
CYL32/ER32-100	32	60	100	50	M22 x 1.5	2.0-20.0
CYL25/ER40-100	25	60	100	63	M18 x 1.5	3.0-25.0
CYL32/ER40-100	32	60	100	63	M22 X 1.5	3.0-25.0
CYL40/ER40-100	40	60	100	63	M28 X 1.5	3.0-25.0

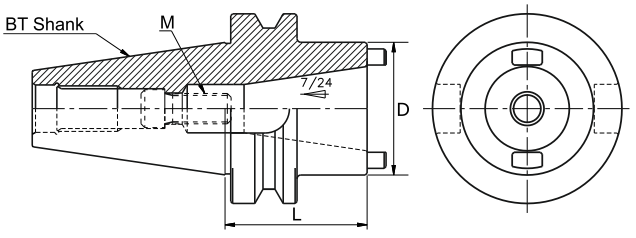
MT - ER COLLET CHUCK





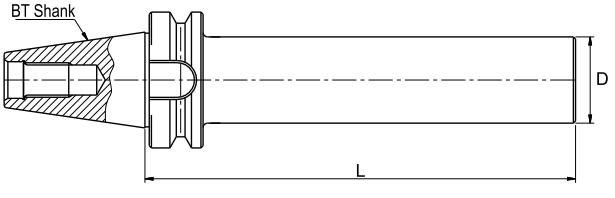
ITEM CODE	MORSE TAPER	D	L	M_1	M_2	CLAMPING RANGE
MT1/ER11-025	1	19	25	M6	M 6 x 1.0	2.0-7.0
MT1/ER16-045	1	28	45	M6	M 6 x 1.0	2.0-10.0
MT2/ER16-045	2	28	45	M10	M10 x 1.5	2.0-10.0
MT2/ER20-050	2	34	50	M10	M10 x 1.5	2.0-13.0
MT2/ER25-055	2	42	55	M10	M10 x 1.5	2.0-16.0
MT2/ER32-060	2	50	60	M10	M12 x 1.75	2.0-20.0
MT3/ER16-045	3	28	45	M12	M10 x 1.5	2.0-10.0
MT3/ER20-050	3	34	50	M12	M12 x 1.75	2.0-13.0
MT3/ER25-055	3	42	55	M12	M12 x 1.75	2.0-16.0
MT3/ER32-070	3	50	70	M12	M12 x 1.75	2.0-20.0
MT3/ER40-080	3	63	80	M12	M12 x 1.75	3.0-26.0
MT4/ER25-055	4	42	55	M16	M16 x 2.0	2.0-16.0
MT4/ER32-060	4	50	60	M16	M16 x 2.0	2.0-20.0
MT4/ER40-080	4	63	80	M16	M16 x 2.0	3.0-26.0
MT4/ER50-105	4	78	105	M16	M16 x 2.0	10.0-34.0
MT5/ER40-080	5	63	80	M20	M20 x 2.5	3.0-26.0
MT5/ER50-100	5	78	100	M20	M20 x 2.5	10.0-34.0

REDUCTION SLEEVE



ITEM CODE	OUTER	INNER	D	L	M
RS/BT40/ISO30-50	BT 40	BT/ISO 30	48	50	M 12
RS/BT50/ISO40-75	BT 50	BT/ISO 40	70	75	M 16

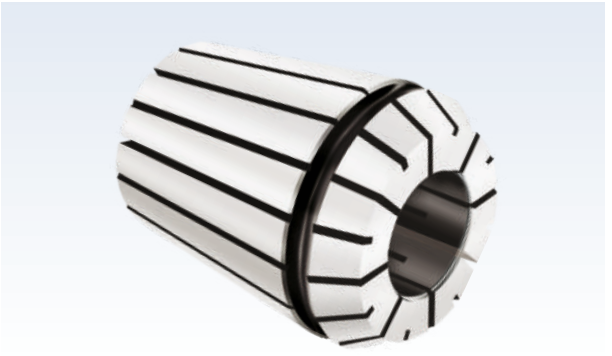
TEST MANDREL



ITEM CODE	D	L
TM/BT30/30-250	30	250
TM/BT40/40-300	40	300
TM/BT50/50-350	50	350

- SK and HSK taper available on request.

ER COLLET



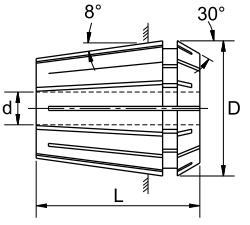


Fig.-1

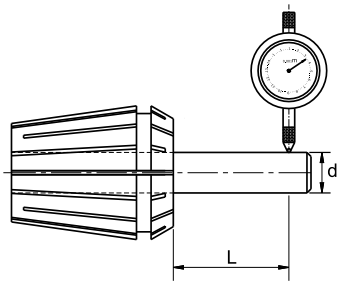
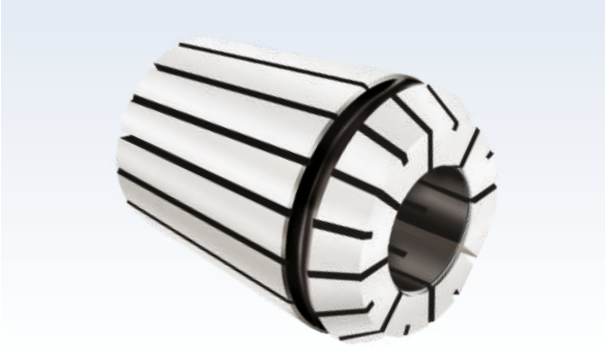


Fig.-2

ITEM CODE	Bore d		EXPANSION RANGE	TOTAL PCS./SET	D	L	AS PER DIN 6499		
	From	To					L	d	R/O (mm)
ER 08	0.5	5.0	0.5	09	9	13.5	10	1.5-3.0	0.015
ER 11	0.5	7.0	0.5	13	12	18	16	3.0-6.0	0.015
ER 16	1.0	10.0	1.0	10	17	27	25	6.0-10.0	0.015
ER 20	1.0	13.0	1.0	12	21	31	40	10.0-18.0	0.020
ER 25	1.0	16.0	1.0	15	26	35	50	18.0-26.0	0.020
ER 32	2.0	20.0	1.0	18	33	40	60	26.0-34.0	0.020
ER 40	3.0	26.0	1.0	23	41	46			
ER 50	10.0	34.0	2.0	12	51	60			

ERP COLLET



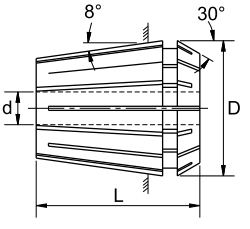


Fig.-1

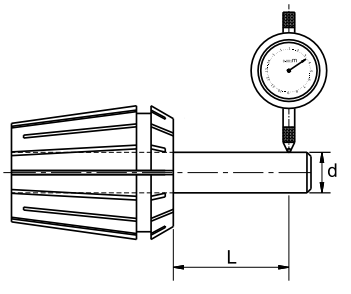
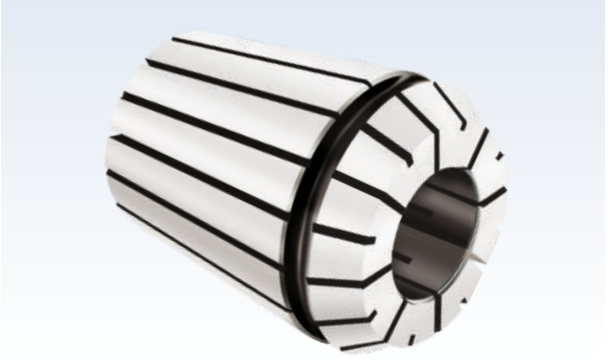


Fig.-2

ITEM CODE	Bore d		EXPANSION RANGE	TOTAL PCS./SET	D	L	AS PER DIN 6499		
	From	To					L	d	R/O (mm)
ERP 08	0.5	5.0	0.5	09	9	13.5	10	1.5-3.0	0.008
ERP 11	0.5	7.0	0.5	13	12	18	16	3.0-6.0	0.008
ERP 16	1.0	10.0	1.0	10	17	27	25	6.0-10.0	0.008
ERP 20	1.0	13.0	1.0	12	21	31	40	10.0-18.0	0.010
ERP 25	1.0	16.0	1.0	15	26	35	50	18.0-26.0	0.010
ERP 32	2.0	20.0	1.0	18	33	40	60	26.0-34.0	0.010
ERP 40	3.0	26.0	1.0	23	41	46			
ERP 50	10.0	34.0	2.0	12	51	60			

ER SEALED COLLET



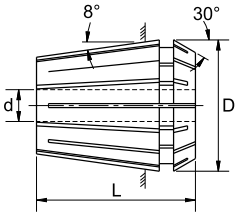


Fig.-1

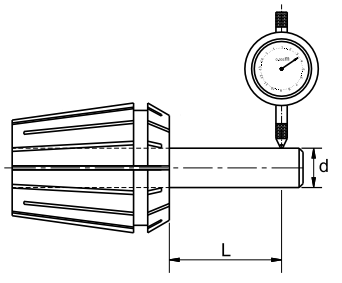
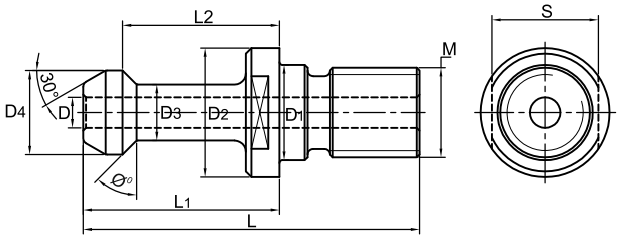


Fig.-2

ITEM CODE	Bore d		EXPANSION RANGE	TOTAL PCS./SET	D	L	AS PER DIN 6499		
	From	To					L	d	R/O (mm)
ERS 11	0.5	7.0	0.5	13	12	18	10	1.5~3.0	0.015
ERS 16	1.0	10.0	1.0	10	17	27	16	3.0~6.0	0.015
ERS 20	1.0	13.0	1.0	12	21	31	25	6.0~10.0	0.015
ERS 25	1.0	16.0	1.0	15	26	35	40	10.0~18.0	0.02
ERS 32	2.0	20.0	1.0	18	33	40	50	18.0~26.0	0.02
ERS 40	3.0	26.0	1.0	23	41	46	60	26.0~34.0	0.02

- ER coolant collets are designed for use with shank tools with no flats. Use of coolant collets with tools that are not cylindrical will result in coolant leakage.
- Tested to 1000 PSI
- Only nominal size can be clamped
- Superior clamping strength
- Metric & Inch sizes

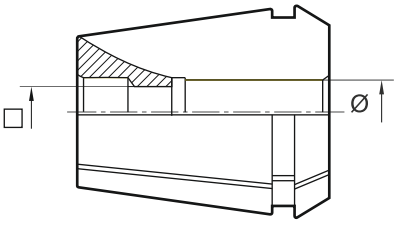
PULL STUD



ITEM CODE	TAPER	D_1	D_2	D_3	D_4	L	L_1	L_2	S	M	Ø	D
PS/BT30/30	BT 30	12.5	16.5	7	11	43	23	18	13	M12 x 1.75	30°	3
PS/BT30/45	BT 30	12.5	16.5	7	11	43	23	18	13	M12 x 1.75	45°	3
PS/BT40/30	BT 40	17	23	10	15	60	35	28	19	M16 x 2	30°	7
PS/BT40/45	BT 40	17	23	10	15	60	35	28	19	M16 x 2	45°	7
PS/BT50/30	BT 50	25	38	17	23	85	45	35	30	M24 x 3	30°	11.5
PS/BT50/45	BT 50	25	38	17	23	85	45	35	30	M24 x 3	45°	11.5

- SK & Special Pull Stud available on request.

ER TAP COLLET



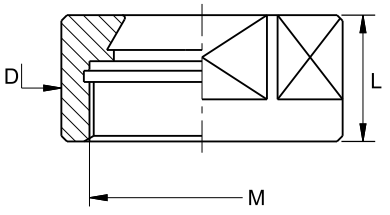
Salient Features:

- Unique design that incorporates an internal square drive with popular ER series collets.
- Square drives match the tap square providing a tight fit for all rigid tapping applications.
- For synchronous tapping operation using standard ER collet chuck.
- Collet bore is exactly to the Tap shank diameter with square drive for accuracy and rigidity.

Shank Size	Square Size	ERT 16	ERT 20	ERT 25	ERT 32	ERT 40
3	2.5	ERT16/3.0-2.5	ERT20/3.0-2.5	ERT25/3.0-2.5	ERT32/3.0-2.5	ERT40/3.0-2.5
3.15	2.5	ERT16/3.15-2.5	ERT20/3.15-2.5	ERT25/3.15-2.5	ERT32/3.15-2.5	ERT40/3.15-2.5
3.5	2.7	ERT16/3.5-2.7	ERT20/3.5-2.7	ERT25/3.5-2.7	ERT32/3.5-2.7	ERT40/3.5-2.7
3.55	2.8	ERT16/3.55-2.8	ERT20/3.55-2.8	ERT25/3.55-2.8	ERT32/3.55-2.8	ERT40/3.55-2.8
4	3	ERT16/4.0-3.0	ERT20/4.0-3.0	ERT25/4.0-3.0	ERT32/4.0-3.0	ERT40/4.0-3.0
4	3.2	ERT16/4.0-3.2	ERT20/4.0-3.2	ERT25/4.0-3.2	ERT32/4.0-3.2	ERT40/4.0-3.2
4.5	3.4	ERT16/4.5-3.4	ERT20/4.5-3.4	ERT25/4.5-3.4	ERT32/4.5-3.4	ERT40/4.5-3.4
5	4	ERT16/5.0-4.0	ERT20/5.0-4.0	ERT25/5.0-4.0	ERT32/5.0-4.0	ERT40/5.0-4.0
5.5	4.3	ERT16/5.5-4.3	ERT20/5.5-4.3	ERT25/5.5-4.3	ERT32/5.5-4.3	ERT40/5.5-4.3
5.6	4.5	ERT16/5.6-4.5	ERT20/5.6-4.5	ERT25/5.6-4.5	ERT32/5.6-4.5	ERT40/5.6-4.5
6	4.5	ERT16/6.0-4.5	ERT20/6.0-4.5	ERT25/6.0-4.5	ERT32/6.0-4.5	ERT40/6.0-4.5
6	4.9	ERT16/6.0-4.9	ERT20/6.0-4.9	ERT25/6.0-4.9	ERT32/6.0-4.9	ERT40/6.0-4.9
6.3	5	ERT16/6.3-5.0	ERT20/6.3-5.0	ERT25/6.3-5.0	ERT32/6.3-5.0	ERT40/6.3-5.0
7	5	ERT16/7.0-5.0	ERT20/7.0-5.0	ERT25/7.0-5.0	ERT32/7.0-5.0	ERT40/7.0-5.0
7	5.5	ERT16/7.0-5.5	ERT20/7.0-5.5	ERT25/7.0-5.5	ERT32/7.0-5.5	ERT40/7.0-5.5
7.1	5.6	ERT16/7.1-5.6	ERT20/7.1-5.6	ERT25/7.1-5.6	ERT32/7.1-5.6	ERT40/7.1-5.6
8	6		ERT20/8.0-6.0	ERT25/8.0-6.0	ERT32/8.0-6.0	ERT40/8.0-6.0
8	6.2		ERT20/8.0-6.2	ERT25/8.0-6.2	ERT32/8.0-6.2	ERT40/8.0-6.2
8	6.3		ERT20/8.0-6.3	ERT25/8.0-6.3	ERT32/8.0-6.3	ERT40/8.0-6.3
8.5	6.5		ERT20/8.5-6.5	ERT25/8.5-6.5	ERT32/8.5-6.5	ERT40/8.5-6.5
9	7		ERT20/9.0-7.0	ERT25/9.0-7.0	ERT32/9.0-7.0	ERT40/9.0-7.0
10	8		ERT20/10.0-8.0	ERT25/10.0-8.0	ERT32/10.0-8.0	ERT40/10.0-8.0
10.5	8		ERT20/10.5-8.0	ERT25/10.5-8.0	ERT32/10.5-8.0	ERT40/10.5-8.0
11	9			ERT25/11.0-9.0	ERT32/11.0-9.0	ERT40/11.0-9.0
11.2	9			ERT25/11.2-9.0	ERT32/11.2-9.0	ERT40/11.2-9.0
12	9			ERT25/12.0-9.0	ERT32/12.0-9.0	ERT40/12.0-9.0
12.5	10			ERT25/12.5-10.0	ERT32/12.5-10.0	ERT40/12.5-10.0
14	11				ERT32/14.0-11.0	ERT40/14.0-11.0
14	11.2				ERT32/14.0-11.2	ERT40/14.0-11.2
15	12				ERT32/15.0-12.0	ERT40/15.0-12.0
16	12				ERT32/16.0-12.0	ERT40/16.0-12.0
16	12.5				ERT32/16.0-12.5	ERT40/16.0-12.5
17	13					ERT40/17.0-13.0
18	14.5					ERT40/18.0-14.5
18	14					ERT40/18.0-14.0
19	15					ERT40/19.0-15.0
20	16					ERT40/20.0-16.0
20	15					ERT40/20.0-15.0
22	18					ERT40/22.0-18.0
22.4	18					ERT40/22.4-18.0
25	20					ERT40/25.0-20.0

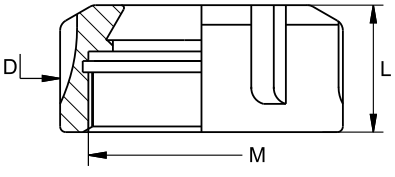
ER NUT

HEXAGONAL NUT



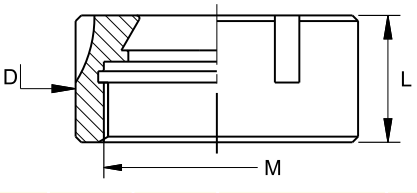
ITEM CODE	D	L	M	SUITABLE SPANNER
ERN/11H	19	11.3	M 14 x 0.75	ERUM/11
ERN/16H	28	17.5	M 22 x 1.5	ERUM/16
ERN/20H	34	19.0	M 25 x 1.5	ERUM/20

STANDARD ER NUT



ITEM CODE	D	L	M	SUITABLE SPANNER
ERN/20S	34	19.0	M 25 x 1.5	E 20
ERN/25S	42	20.0	M 32 x 1.5	E 25
ERN/32S	50	22.5	M 40 x 1.5	E 32
ERN/40S	63	25.5	M 50 x 1.5	E 40
ERN/50S	78	35.5	M 64 x 2.0	E 50

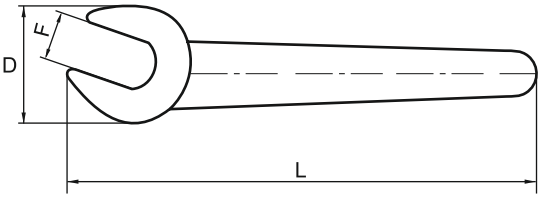
MINI ER NUT



ITEM CODE	D	L	M	SUITABLE SPANNER
ERN/08M	12	10.8	M10 x 0.75	ERM 8
ERN/11M	16	11.3	M13 x 0.75	ERM 11
ERN/16M	22	17.0	M19 x 1.0	ERM 16
ERN/20M	28	19.0	M24 x 1.0	ERM 20
ERN/25M	35	20.0	M30 x 1.0	ERM 25

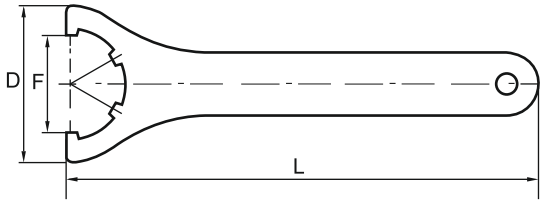
SPANNER

TYPE : ERUM



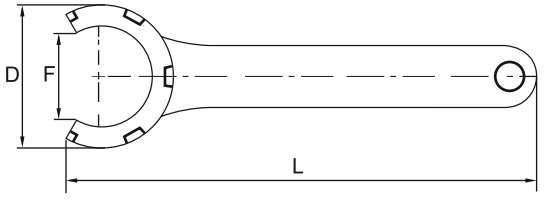
ITEM CODE	D	L	F	SUITABLE FOR NUT
ERUM/11	40	120	17	ERN/11H
ERUM/16	53	140	25	ERN/16H
ERUM/20	60	160	30	ERN/20H

TYPE : E



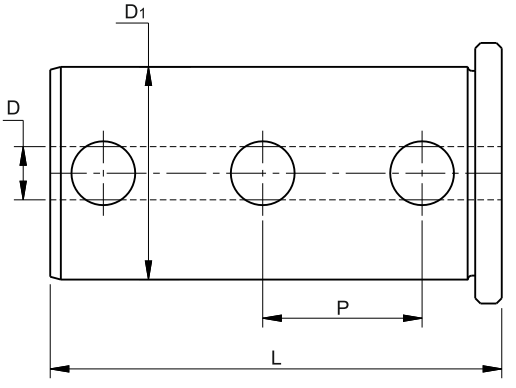
ITEM CODE	D	L	F	SUITABLE FOR NUT
E 20	55	180	30	ERN/20S
E 25	65	206	37	ERN/25S
E 32	75	253	46.5	ERN/32S
E 40	90	289	58	ERN/40S
E 50	110	351	74	ERN/50S

TYPE : ERM



ITEM CODE	D	L	F	SUITABLE FOR NUT
ERM 08	13	75	8	ERN/08M
ERM 11	17	95	11.5	ERN/11M
ERM 16	22.5	117	15	ERN/16M
ERM 20	28.5	129	19.5	ERN/20M
ERM 25	36	143	25	ERN/25M

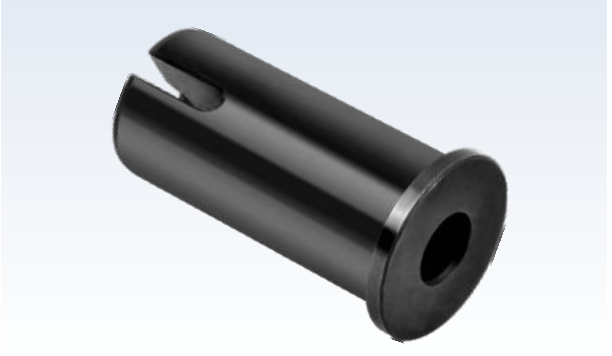
TURRET SLEEVE

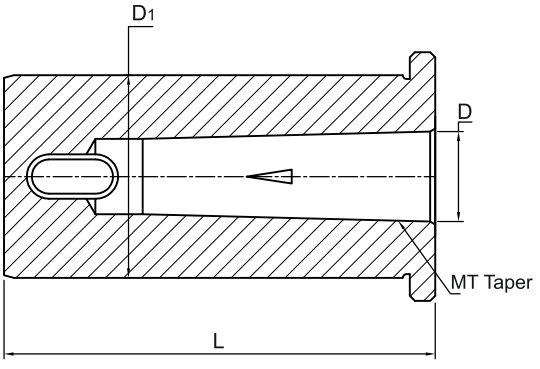


ITEM CODE	D	P	D1	L
TS/JYT40-06	06	30	40	85
TS/JYT40-08	08	30	40	85
TS/JYT40-10	10	30	40	85
TS/JYT40-12	12	30	40	85
TS/JYT40-16	16	30	40	85
TS/JYT40-20	20	30	40	85
TS/JYT40-25	25	30	40	85
TS/JYT40-32	32	30	40	85
TS/PGT40-06	06	32	40	90
TS/PGT40-08	08	32	40	90
TS/PGT40-10	10	32	40	90
TS/PGT40-12	12	32	40	90
TS/PGT40-16	16	32	40	90
TS/PGT40-20	20	32	40	90
TS/PGT40-25	25	32	40	90
TS/PGT40-32	32	32	40	90

• Ø32 mm (OD) TS available on request.

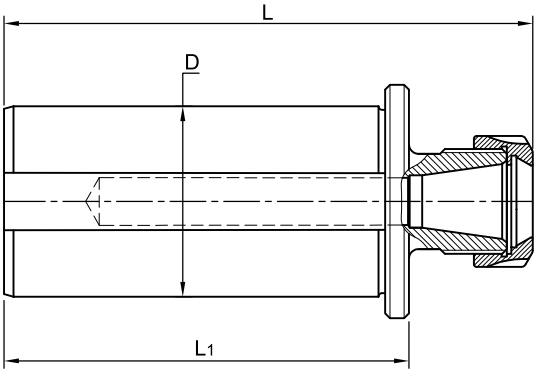
MT TURRET SLEEVE





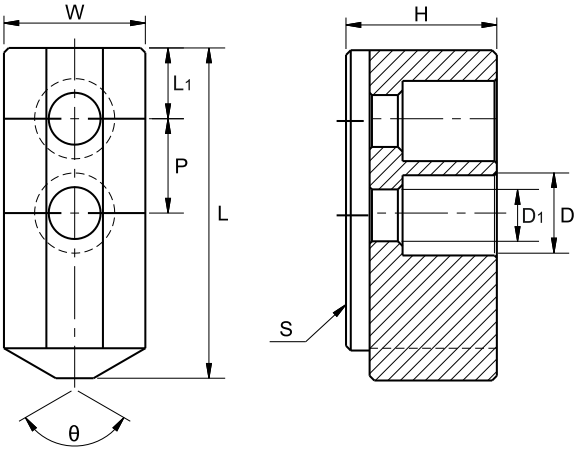
ITEM CODE	D	D1	L
TS/JYT/40 MT-1	12.065	40	80
TS/JYT/40 MT-2	17.780	40	80
TS/JYT/40 MT-3	23.825	40	80
TS/PGT/40 MT-1	12.065	40	80
TS/PGT/40 MT-2	17.780	40	80
TS/PGT/40 MT-3	23.825	40	80

TS ER TURRET SLEEVE



ITEM CODE	D	ER	L1	L
TS32/ER11	32	11	75	100
TS32/ER16	32	16	75	100
TS32/ER20	32	20	75	105
TS32/ER25	32	25	75	105
TS32/ER32	32	32	75	105
TS40/ER11	40	11	85	110
TS40/ER16	40	16	85	110
TS40/ER20	40	20	85	115
TS40/ER25	40	25	85	115
TS40/ER32	40	32	85	115

SOFT JAW



ITEM CODE	L	L1	D1	D	P	W	H	S	θ
SJ/G/135-090	55	12.5	11	17.0	18.5	28	30	1/16" x 90°	90°
SJ/G/135-120	55	12.5	11	17.0	18.5	28	30	1/16" x 90 °	120°
SJ/G/165-090	75	20	11	17.5	19	35	30	1/16" x 90°	90°
SJ/G/165-120	75	20	11	17.5	19	35	30	1/16" x 90°	120°
SJ/G/200-090	70	15	14	20	19	35	40	1/16" x 90°	90°
SJ/G/200-120	70	15	14	20	19	35	40	1/16" x 90°	120°
SJ/G/250-090	120	35	18	26	25	45	50	1/16" x 90°	90°
SJ/G/250-120	120	35	18	26	25	45	50	1/16" x 90°	120°
SJ/G/315-090	120	35	18	26	25	50	50	1/16" x 90°	90°
SJ/G/315-120	120	35	18	26	25	50	50	1/16" x 90°	120°
SJ/A/135-090	55	10	8.5	13.5	15	25	30	1/16" x 90°	90°
SJ/A/135-120	55	10	8.5	13.5	15	25	30	1/16" x 90°	90°
SJ/A/165-090	70	15	11	17	20	30	32	1/16" x 90°	90°
SJ/A/165-120	70	15	11	17	20	30	32	1/16" x 90°	120°
SJ/A/200-090	95	24	13	19	25	35	38	1/16" x 90°	90°
SJ/A/200-120	95	24	13	19	25	35	38	1/16" x 90°	120°
SJ/A/250-090	110	30	13	19	30	40	42	1/16" x 90°	90°
SJ/A/250-120	110	30	13	19	30	40	42	1/16" x 90°	120°
SJ/A/315-090	129	38	15	23	30	50	50	1/16" x 90°	90°
SJ/A/315-120	129	38	15	23	30	50	50	1/16" x 90°	120°

- Serration 1.5 x 60° available on request.

KEYLESS DRILL CHUCK (KLD)

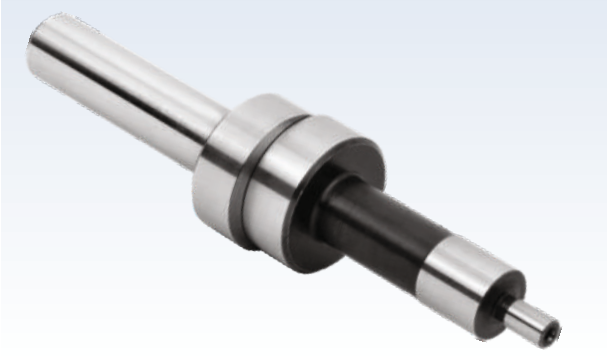
ITEM CODE	RANGE	TAPER
KLD/06/H-B	0.5 ~ 6	B12
KLD/06/H-J	0.5 ~ 6	JT1
KLD/10/H-J	1 ~ 10	JT2
KLD/13/L-J	1 ~ 13	JT6
KLD/13/H-B	1 ~ 13	B16
KLD/13/H-J	1 ~ 13	JT6
KLD/16/H-J	1 ~ 16	JT6

- Attractive spanners available for 0 ~ 13 KLD.

KEY TYPE DRILL CHUCK (KD)

ITEM CODE	D	TAPER
KD/10	1 ~ 10	JT2
KD/13	1 ~ 13	JT6

EDGE FINDER



ITEM CODE	TIP DIA
EF/M-04.090	Ø4
EF/M-10.090	Ø10
EF/E-120	Ø10

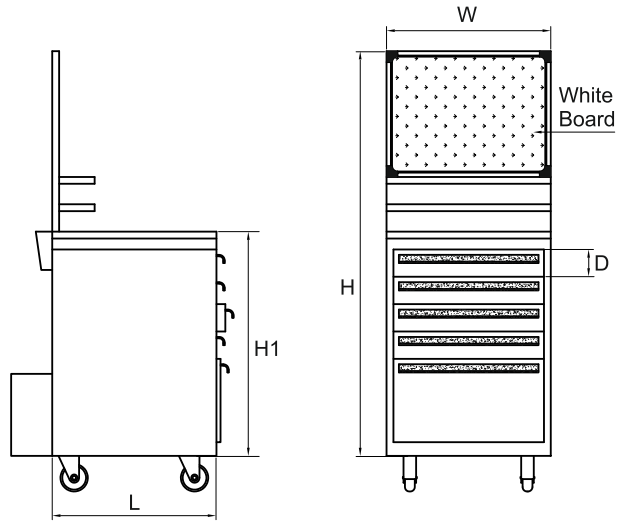
- Electronic Edge Finder available on request

LOCKING DEVICE

ITEM CODE	TAPER
LD/BT 30	BT 30
LD/BT 40	BT 40
LD/BT 50	BT 50

- SK / HSK Taper available on request.

TOOL TROLLEY



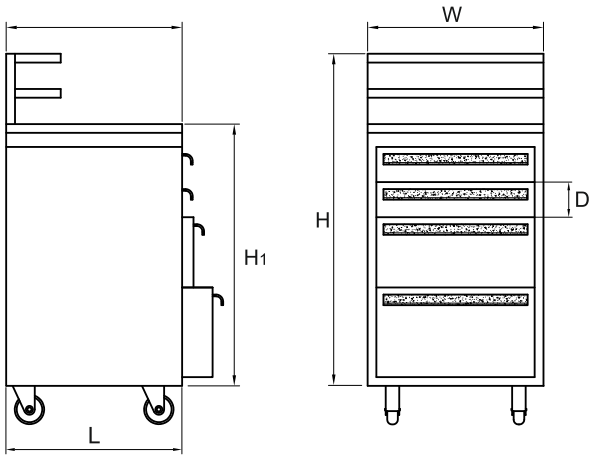
Item Code : TT/BT40/25-1566

DIMENSIONS (mm)	H	H_1	W	D
Overall	1480	820	600	600

DIMENSIONS (mm)	L	W	D
Drawer 1	520	520	82
Drawer 2	520	520	82
Drawer 3	520	520	82
Drawer 4	520	520	82
Drawer 5	520	520	254
Top Surface	600	600	25
Rear Pocket 1	560	150	300
Rear Pocket 2	560	60	120
Whiteboard Trays x 2	600	150	25

FEATURES :	
Whiteboard: 600 x 540 mm	
No. of Drawers	5 nos.
Bottom Drawers for BT-40 Holders	25 nos.
Rear Pockets	2 nos.
* Table-top with Rubber-mat surface	
* Casters with brakes	
* All 5 drawers with common Lock & Key	
Heavy-duty Casters: Ø100 x 35 mm with brakes	
Sheet Thickness: 18 SWG (1.22 mm)	
* Overall Height is without Casters	

TOOL TROLLEY



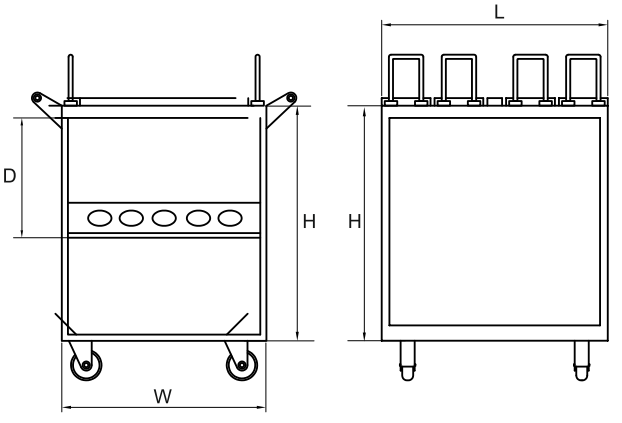
Item Code : TT/SC/1055

DIMENSIONS (mm)	H	H1	W	D
Overall	1010	810	500	500

DIMENSIONS (mm)	L	W	D
Drawer 1	406	406	76
Drawer 2	406	406	76
Drawer 3	406	406	171
Drawer 4	406	406	254
Top Surface	500	500	25
Top Trays x 2	500	100	25

FEATURES :	
No. of drawers (2 small + 2 large)	4 nos.
Top 2 drawers with adjustable pockets	
Table-top with Rubber-mat surface	
Heavy-duty Casters: Ø100 x 35 mm with brakes	
Sheet Thickness: 18 SWG (1.22 mm)	
* All 5 drawers with common Lock & Key	
*Overall Height is without Casters	

TOOL TROLLEY

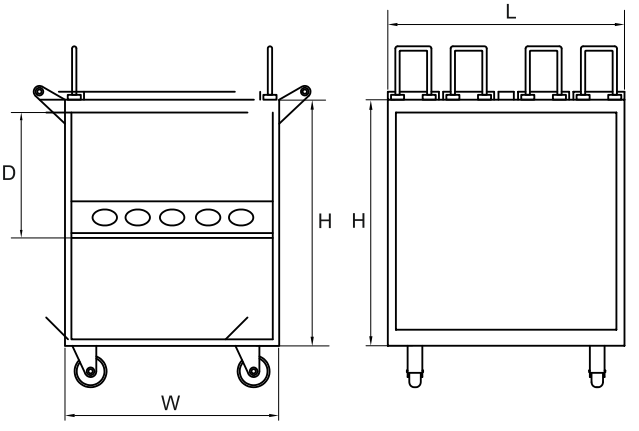


Item Code : TT/BT40/40-875

DIMENSIONS (mm)	L	W	D
Overall	760	670	470

FEATURES :	
No. of BT-40 Holder's stand	
First Level Stand (5x4)	20 nos.
Second Level Stand (5x4)	20 nos.
Heavy-duty Casters: Ø125 x 30 mm with brakes	
Sheet Thickness: 14 SWG (2.03 mm)	
* Overall Height is without Casters	

TOOL TROLLEY



Item Code : TT/BT50/40-877

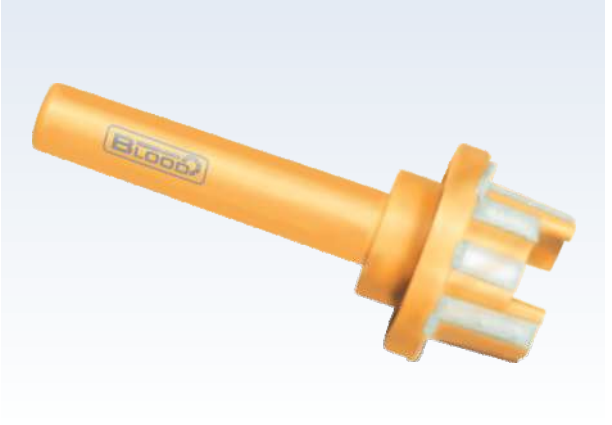
DIMENSIONS (mm)	L	W	D
Overall	760	670	670

FEATURES :	
No. of BT-50 Holder's stand	
First Level Stand (5x4)	20 nos.
Second Level Stand (5x4)	20 nos.
Heavy-duty Casters: Ø125 x 30 mm with brakes	
Sheet Thickness: 14 SWG (2.03 mm)	
* Overall Height is without Casters	

SPINDLE TAPER CLEANER

BT Series

ITEM CODE	SPINDLE TAPER
STC/BT30	BT 30
STC/BT40	BT 40
STC/BT50	BT 50



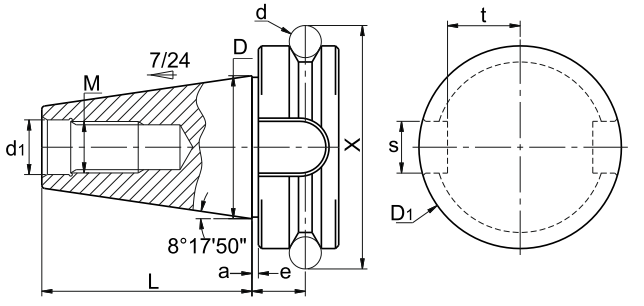
HSK Series

ITEM CODE	SPINDLE TAPER
STC/HSK050	HSK 50
STC/HSK063	HSK 63
STC/HSK100	HSK 100

FEATURES

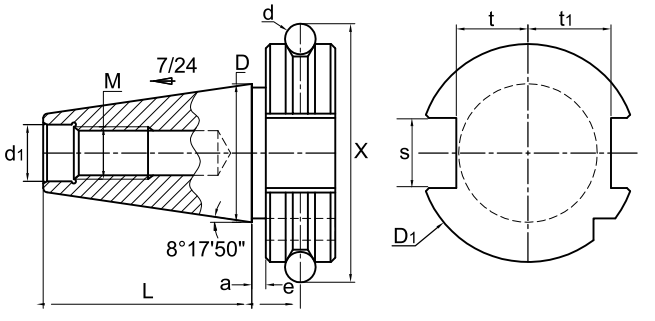
- Quick & easy cleaning.
- Taper cleaning pads are made of special grade cotton material and body is made of durable plastic.
- Remove contaminants to improve T.I.R. (Total Indicated Runout)
- Cleans metal chips & lub-oil in no time.

BT SHANK
MAS 403



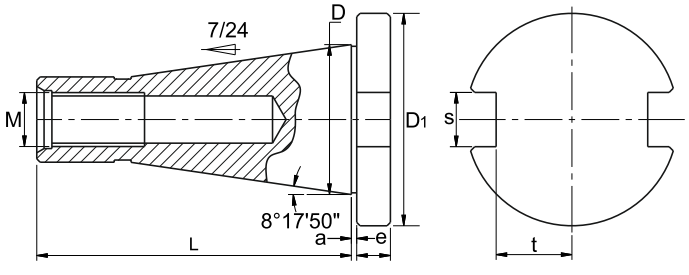
TAPER	D	L	D1	d1	a	e	d	t	S	X	M
BT 30	31.75	48.4	46	12.5	2	13.6	08	16.3	16.1	56.14	M 12
BT 35	38.1	56.5	53	13	2	13	10	19.3	14.1	65.679	M 12
BT 40	44.45	65.4	63	17	2	16.6	10	22.6	16.1	75.679	M 16
BT 45	57.15	82.8	85	21	3	21.2	12	29.1	19.3	100.215	M 20
BT 50	69.85	101.8	100	25	3	23.2	15	35.4	25.7	119.02	M 24

SK SHANK
DIN 69871



TAPER	D	L	D1	d1	a	e	d	t	t1	S	X	M
SK 30	31.75	47.8	50	13	3.2	11.1	7	16.4	19	16.1	59.3	M12
SK 40	44.45	68.4	63.55	17	3.2	11.1	7	22.8	25	16.1	72.43	M16
SK 45	57.15	82.7	82.55	21	3.2	11.1	7	29.1	31.3	19.3	91.35	M20
SK 50	69.85	101.75	97.5	25	3.2	11.1	7	35.5	37.7	25.7	107.25	M 24

ISO SHANK
DIN 2080



TAPER	D	L	D1	a	e	t	S	M
ISO 30	31.75	68.4	50	1.6	8	16.2	16.1	M 12
ISO 40	44.45	93.4	63	1.6	10	22.5	16.1	M 16
ISO 45	57.15	106.8	80	3.2	12	29	19.3	M 20

BLOOD®
ROTATING GENIUS

INDEXABLE PRODUCTS

TECHNICAL DATA

Conversion Chart For Insert

Cutting Speed (Vc) - RPM

Component / cutter	Cutting speed (V_C) - m/min										
Ø mm	30	40	50	100	150	200	300	400	500	600	700
12	795	1060	1326	2652	3979	5305	7957	10610	13262	0	0
16	297	795	995	1989	2984	3978	5968	7957	9947	11936	0
20	477	637	796	1691	2387	3183	4774	6366	7957	9549	11140
25	382	509	637	1273	1910	2546	3819	5092	6366	7639	8912
32	298	398	497	994	1492	1989	2984	3978	4973	5968	6963
40	239	318	398	795	1194	1591	2387	3183	3978	4774	5570
50	191	255	318	636	955	1272	1909	2546	3183	3819	4456
63	151	202	253	505	758	1010	1515	2021	2526	3031	3536
80	119	159	199	397	597	795	1193	1591	1989	2387	2785
100	95	127	159	318	477	636	952	1273	1591	1909	2228
125	76	109	124	255	382	509	764	1018	1237	1527	1782
160	60	80	99	198	298	397	596	795	994	1193	1392
175	55	71	91	182	273	363	544	727	909	1091	1273
200	48	64	80	160	239	318	476	636	795	954	1114

Example: You are using an 80 mm diameter cutter. The cutting speed start value (Vc) on the insert box is 200 m/min. find the cutter size in the left column, and cutting speed in the top row and read the spindle RPM at the intersection: 795 revolution per minute.

Formula:

Cutting speed, m/min

$$V_C = \frac{\pi \times D_C \times n}{1000}$$

V_C = cutting speed, m/min
n = revolution/min
D_C = diameter, mm

Spindle speed, rpm

$$n = \frac{V_C \times 1000}{\pi \times D_C}$$

n = revolution/min
V_C = cutting speed, m/min
D_C = diameter, mm

Table feed, mm/mim

$$V_f = n \times z \times f_z$$

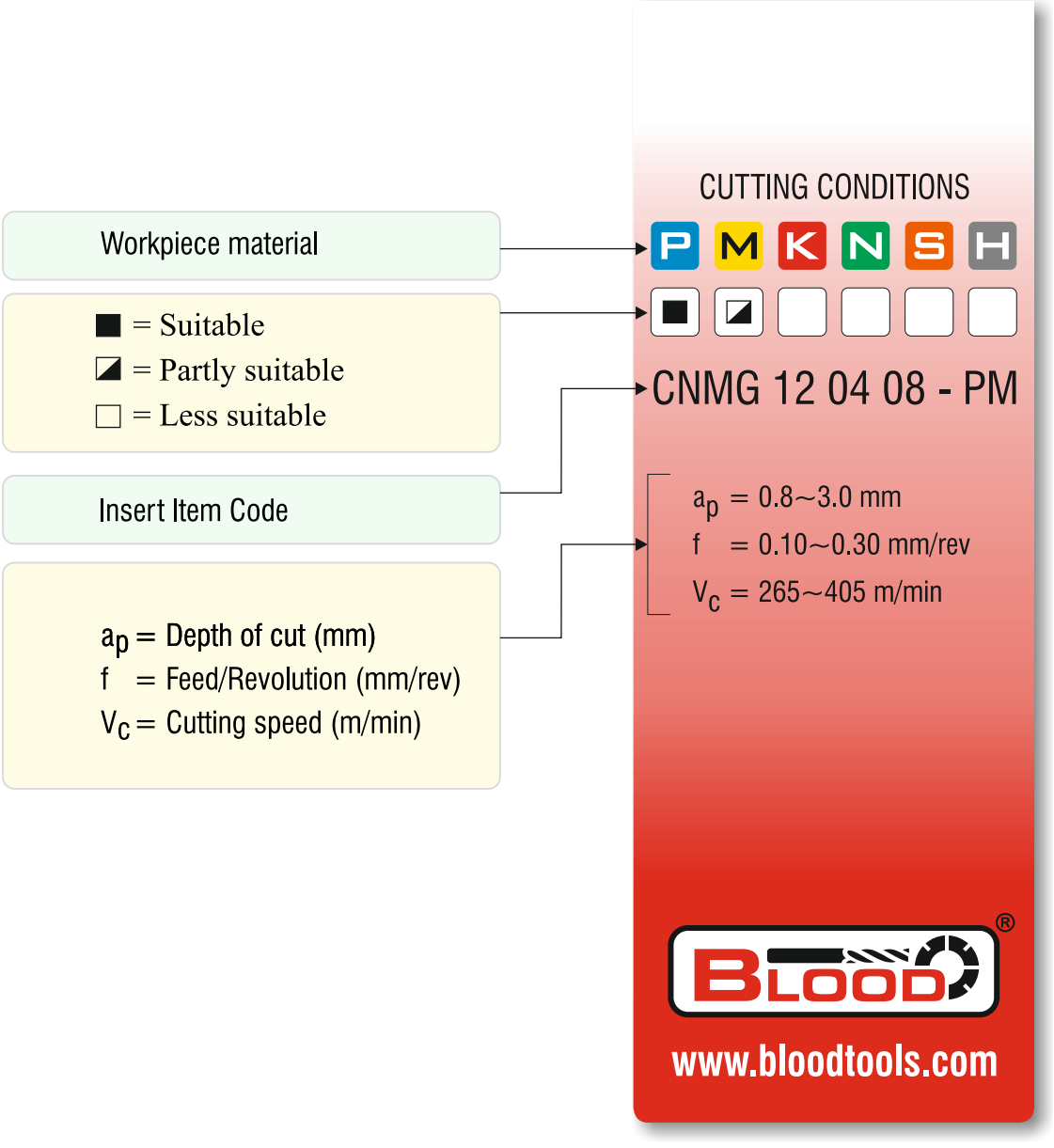
V_f = table feed, mm/min
n = revolution/min
z = number of teeth
f_z = feed, mm/tooth

Recommended Grades

ISO Material Group	Turning	Milling	Theading	Grooving	Drilling
Steel P	BPC101 BPC201 BPC202	132 819 1019 21019 JT7370 451 2014 G753 MX MX22 MX33	ER ERM^2	B RG RR2043 TX	CM1904 CM0407
Stainless Steel M	BMP201 BMP203 BMP301 BMP303	303 G753 MX MX29 MX33	ERM^2	RR2043 RG TX	CM1904 CM0407
Cast Iron K	BKC201 BKC205	819 JT7370 451 2014 MX MX22 MX33	ER ERM^2	B RG TX	CM1904
Non-Ferrous Metal N	BNU101 BNU201	1110 164 128 SA MX22 MX33	ER ERM^2	B RG TX N	CM1904
Heat Resistant Alloy S	BSP201	819 303 MX MX33	ERM^2	RR2043 TX	CM1904
Hardened Steel H	BHP201	819 303 G753 MX33	ERM^2	RR2043 TX	CM1904

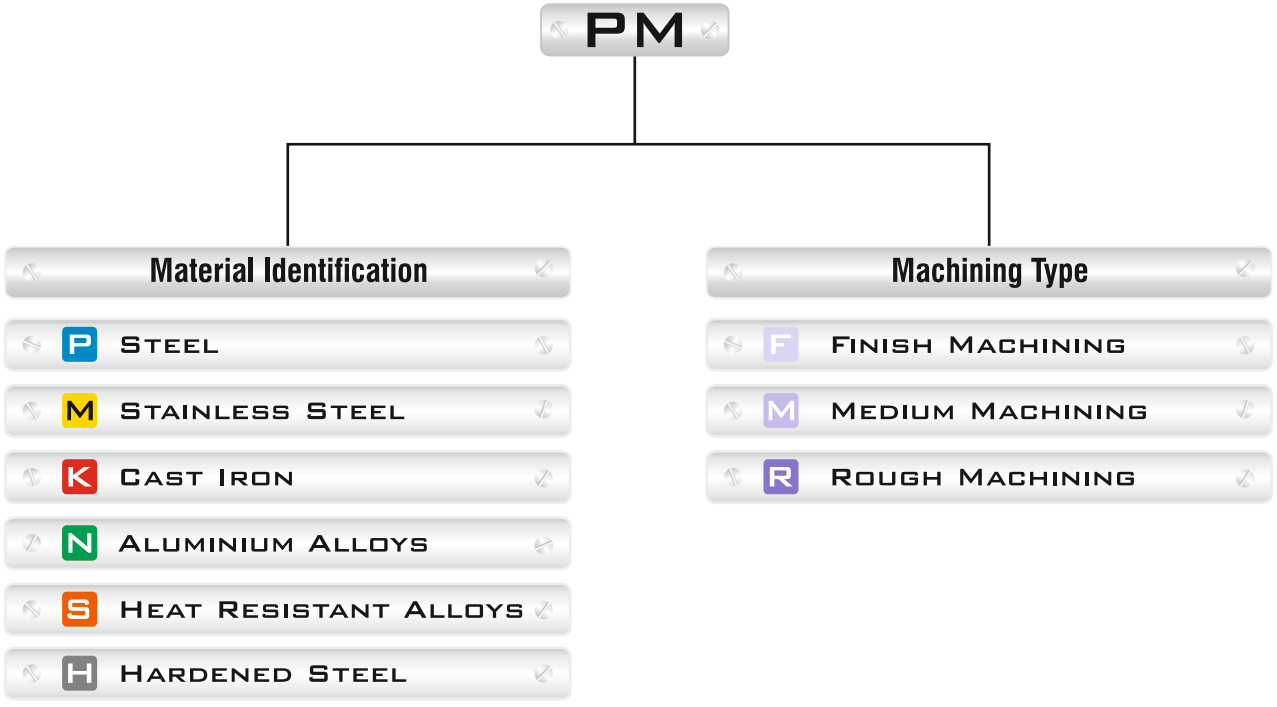
INSERT STICKER DISCRIPTION

The starting values of speed and feed, together with the working range (min. - max.) are given on the insert sticker which makes it quick and easy to start machining.



Chip Breaker Identification

T	N	M	G	16	04	08	-	PM



Note: If you want to use TNMG 16 04 08 insert on Steel material for roughing purpose, the CHIP BREAKER code will be P (for Steel) & Rough Machining Operation = R. i.e. PR (Full Code **TNMG 16 04 08 - PR**)

- ## Chip Breaking Theory

  A chip breaker is the mechanical means used to force a ductile material to bend to the breaking point. The extensive use of CNC turning machinery has increased the need for reliable chip control to maintain efficient production. In those cases where highly ductile work pieces are machined and poor chip control exists, long continuous strands of metal are created which wrap around tools and the part. This leads to premature failure due to chipping of the tool and excessive number of times to change parts, ultimately reducing the capacity of the machine tool by wasting precious production hours. Most of the turning inserts used in production situations have pressed and sintered or ground chip grooves.

Negative Inserts

For Finish Machining	P	F	• For finish machining • Steel • Optimal chip control
	M	F	• For finish machining • Stainless Steel • Performs well in high-speed finishing of Stainless Steel
	K	F	• For finish machining • Cast iron • Effectively used for machining non-ferrous metals such as aluminum alloys and copper alloys
	N	F	• For finish machining • Non-ferrous metal • Effectively used for machining non-ferrous metals such as aluminum alloys and copper alloys
For Medium Machining	P	M	• For medium machining • Steel • Reduce the contact-area between tool and chip, prevent the insert from raising temperature during cutting
	M	M	• For medium machining • Stainless steel, Steel • Provides excellent chip evacuation
	K	M	• For medium machining • Cast iron, Steel • Excellent chip control on medium turning applications
	N	M	• For medium machining • Aluminum • Very high positive rake geometry to minimize built-up-edge and cutting force
	S	M	• For medium machining • Heat resistant alloys • Optimal chip control
	H	M	• For medium machining • Hardened steel • Perform well in medium finishing of hardened steel
For Rough Machining	P	R	• For rough machining • Steel, Stainless steel, Cast iron • Very strong rake geometry
	M	R	• For rough machining • Stainless steel • Stable cutting and low cutting forces with high feed rate
	K	R	• For rough machining • Cast iron • Strong rake geometry

Positive Inserts

For Finish Machining	P	F	• For finish machining • Steel • Designed to control the direction of chip flow and used for precision-finish turning
	M	F	• For finish machining • Stainless steel • Optimal chip control due to pre-positioned chipbreaker element
	K	F	• For finish machining • Cast iron, Steel • Performs well in high-speed finishing of cast iron
	N	F	• For finish machining • Non-ferrous metal • A strong but free cutting chip breaker for non-ferrous metal
For Medium Machining	P	M	• For medium machining • Steel • Smooth and easy chip flow on finishing steel
	M	M	• For medium machining • Stainless steel, Steel • Chip breaker with strong rake angle reduces cutting forces, which gives a very high edge strength
	K	M	• For medium machining • Cast iron, Steel • Excellent chip control on medium turning applications
	N	M	• For medium machining • Aluminum • Very high positive rake geometry to minimize built-up-edge and cutting force
	S	M	• For medium machining • Heat resistant alloys • Optimal chip control
	H	M	• For medium machining • Hardened steel • Perform well in medium finishing of hardened steel
For Rough Machining	P	R	• For rough machining • Steel, Stainless steel, Cast iron • Very strong rake geometry
	M	R	• For rough machining • Stainless steel • Stable cutting and low cutting forces with high feed rate
	K	R	• For rough machining • Cast iron • Strong rake geometry

BLOOD®
ROTATING GENIUS

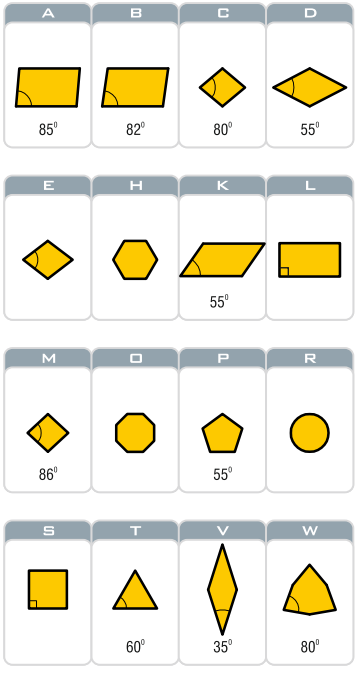
TURNING INSERT

NOMENCLATURE

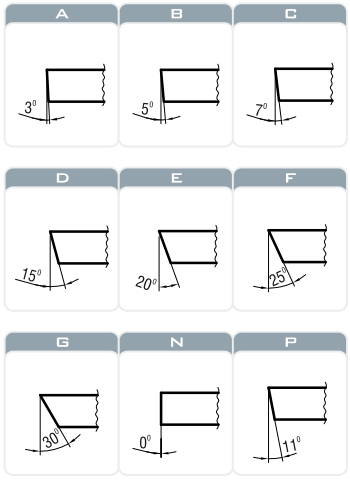
TURNING INSERT

C	N	M	G	12	04	08	-	PM
1	2	3	4	5	6	7		8

1. INSERT SHAPE



2. CLEARANCE ANGLE

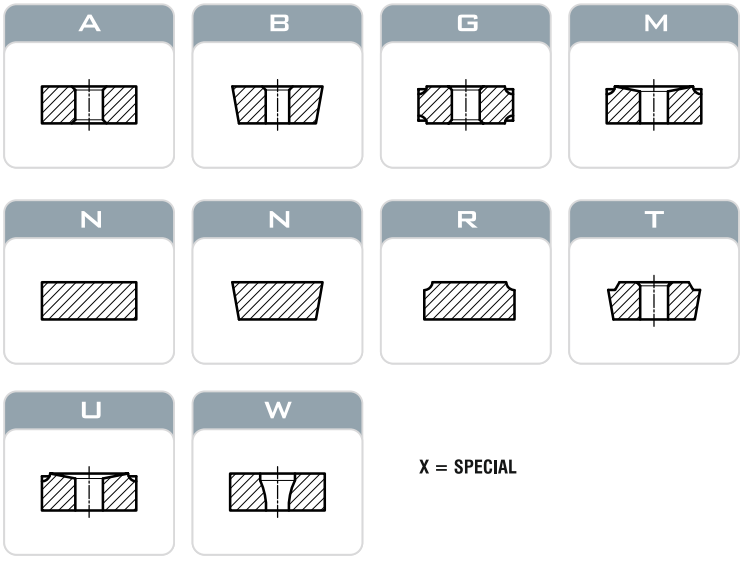


O = SPECIAL

3. TOLERANCES

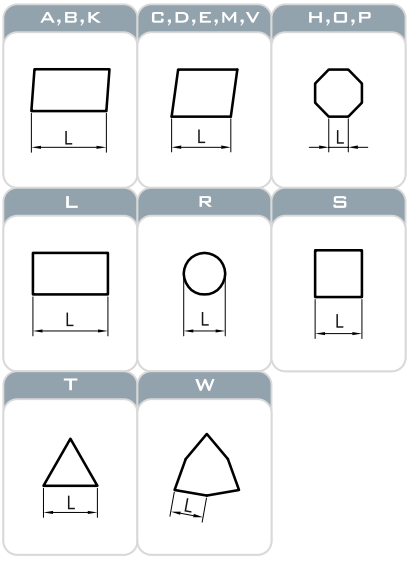
Tol. class	Tolerance +/- m	Tolerance +/- s	Tolerance +/- d	For d, Dimension mm 3.175	3.369	4.064	4.670	6.350	9.525	12.700	15.875	19.050	25.400	31.750	38.100
A	0.005	0.025	0.025	●		●	●	●	●	●	●	●	●	●	●
C	0.013	0.025	0.025	●	●	●	●	●	●	●	●	●	●	●	●
E	0.025	0.025	0.025	●			●	●	●	●	●	●	●	●	●
F	0.005	0.025	0.013	●			●	●	●	●	●	●	●	●	●
G	0.025	0.130	0.025	●			●	●	●	●	●	●	●	●	●
H	0.013	0.025	0.013	●			●	●	●	●	●	●	●	●	●
J	0.005	0.025	0.050	●			●	●	●						
	0.005	0.025	0.080							●					
	0.005	0.025	0.100								●	●			
	0.005	0.025	0.130										●		
	0.005	0.025	0.150											●	●
K	0.013	0.025	0.050	●			●	●	●						
	0.013	0.025	0.080							●					
	0.013	0.025	0.100								●	●			
	0.013	0.025	0.130										●		
	0.013	0.025	0.150											●	●
M	0.080	0.130	0.050	●			●	●	●						
	0.130	0.130	0.080							●					
	0.150	0.130	0.100								●	●			
	0.180	0.130	0.130										●		
	0.200	0.130	0.150											●	●
U	0.130	0.130	0.080	●			●	●	●						
	0.200	0.130	0.130							●					
	0.270	0.130	0.180								●	●			
	0.380	0.130	0.250										●	●	●

4. CLAMPING TYPE

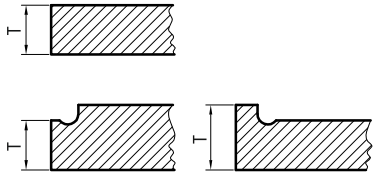


X = SPECIAL

5. CUTTING EDGE LENGTH

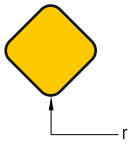


6. THICKNESS



01	= 1.59 mm	04	= 4.76 mm
T1	= 1.98 mm	05	= 5.56 mm
02	= 2.38 mm	06	= 6.35 mm
03	= 3.18 mm	07	= 7.94 mm
T3	= 3.97 mm	08	= 8.00 mm

7. CORNER RADIUS



Nose Radius
*Metric Version

MO*	= Round Inserts	04	= 0.4 mm
00	= Sharp	08	= 0.8 mm
01	= 0.1 mm	12	= 1.2 mm
02	= 0.2 mm		

8. CHIP BREAKER CODE

1st Letter

- P = STEEL
- M = STAINLESS STEEL
- K = CAST IRON
- N = ALUMINIUM ALLOYS
- S = HEAT RESISTANT ALLOYS
- H = HARDENED STEEL

2nd Letter

- F = FINISH MACHINING
- M = MEDIUM MACHINING
- R = ROUGH MACHINING
- X = SPECIAL GRADE

NEGATIVE INSERT

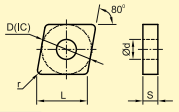
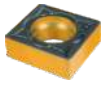
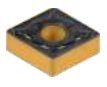
P	Work Material: Steel
F	Finish Machining of Steel

ORDERING CODE		DIMENSIONS					CUTTING DATA		
		L	D (IC)	S	d	r	Cutting depth	Feed	Cutting speed
							a_p mm	mm / Rev.	V_c m/min
CNMG	09 03 04 - PF	9.7	9.52	3.18	3.81	0.4	0.36 (0.25-1.5)	0.14 (0.07-0.3)	464
	09 03 08 - PF	9.7	9.52	3.18	3.81	0.8	0.36 (0.3-1.5)	0.14 (0.1-0.3)	464
	12 04 04 - PF	12.9	12.7	4.76	5.16	0.4	0.36 (0.25-1.5)	0.14 (0.07-0.3)	464
	12 04 08 - PF	12.9	12.7	4.76	5.16	0.8	0.36 (0.3-1.5)	0.18 (0.1-0.4)	428
TNMG	16 04 04 - PF	16.5	9.52	4.76	3.81	0.4	0.36 (0.35-1.5)	0.14 (0.07-0.3)	464
	16 04 08 - PF	16.5	9.52	4.76	3.81	0.8	0.36 (0.3-1.5)	0.18 (0.1-0.4)	428
	22 04 04 - PF	22	12.7	4.76	5.16	0.4	0.36 (0.3-1.5)	0.18 (0.1-0.4)	428
	22 04 08 - PF	22	12.7	4.76	5.16	0.8	0.36 (0.3-1.5)	0.18 (0.1-0.4)	428
	22 04 12 - PF	22	12.7	4.76	5.16	1.2	0.72 (0.35-1.5)	0.23 (0.15-0.5)	401
WNMG	06 04 04 - PF	6.5	9.52	4.76	3.81	0.4	0.36 (0.25-1.5)	0.14 (0.07-0.3)	464
	06 04 08 - PF	6.5	9.52	4.76	3.81	0.8	0.36 (0.3-1.5)	0.18 (0.1-0.4)	428
	08 04 04 - PF	8.7	12.7	4.76	5.16	0.4	0.36 (0.25-1.5)	0.14 (0.07-0.3)	464
	08 04 08 - PF	8.7	12.7	4.76	5.16	0.8	0.36 (0.3-1.5)	0.18 (0.1-0.4)	428
DNMG	11 04 04 - PF	11.6	9.52	4.76	3.81	0.4	0.36 (0.25-1.5)	0.14 (0.07-0.3)	464
	11 04 08 - PF	11.6	9.52	4.76	3.81	0.8	0.36 (0.3-1.5)	0.18 (0.1-0.4)	428
	15 04 04 - PF	15.5	12.7	4.76	5.16	0.4	0.36 (0.25-1.5)	0.14 (0.07-0.3)	464
	15 04 08 - PF	15.5	12.7	4.76	5.16	0.8	0.36 (0.3-1.5)	0.18 (0.1-0.4)	428
	15 06 04 - PF	15.5	12.7	6.35	5.16	0.4	0.36 (0.25-1.5)	0.14 (0.07-0.3)	464
	15 06 08 - PF	15.5	12.7	6.35	5.16	0.8	0.36 (0.3-1.5)	0.18 (0.1-0.4)	428
SNMG	12 04 04 - PF	12.7	12.7	4.76	5.16	0.4	0.36 (0.3-1.5)	0.18 (0.1-0.4)	428
	12 04 08 - PF	12.7	12.7	4.76	5.16	0.8	0.36 (0.3-1.5)	0.18 (0.1-0.4)	428
	12 04 12 - PF	12.7	12.7	4.76	5.16	1.2	0.72 (0.35-1.5)	0.23 (0.15-0.5)	401
VNMG	16 04 04 - PF	16.6	9.52	4.76	3.81	0.4	0.36 (0.25-1.5)	0.14 (0.07-0.3)	464
	16 04 08 - PF	16.6	9.52	4.76	3.81	0.8	0.36 (0.3-1.5)	0.18 (0.1-0.4)	428

TURNING

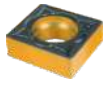
NEGATIVE INSERT

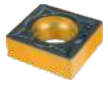
P	Work Material: Steel	P M K N S H
M	Medium Machining of Steel	■ ◪ ◪ ◪ □ □

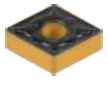
	ORDERING CODE		DIMENSIONS					CUTTING DATA		
			L	D (IC)	S	d	r	Cutting depth	Feed	Cutting speed
								a_p mm	mm / Rev.	V_c m/min
	CNMG	09 03 04 - PM	9.7	9.52	3.18	3.81	0.4	1.80 (0.4-4)	0.18 (0.1-0.3)	356
		09 03 08 - PM	9.7	9.52	3.18	3.81	0.8	1.80 (0.5-4)	0.27 (0.15-0.5)	311
		12 04 04 - PM	12.9	12.7	4.76	5.16	0.4	2.70 (0.4-5.5)	0.18 (0.1-0.3)	356
		12 04 08 - PM	12.9	12.7	4.76	5.16	0.8	2.70 (0.5-5.5)	0.27 (0.15-0.5)	311
		12 04 12 - PM	12.9	12.7	4.76	5.16	1.2	2.70 (0.8-5.5)	0.32 (0.18-0.6)	293
	TNMG	16 04 04 - PM	16.5	9.52	4.76	3.81	0.4	2.70 (0.4-5)	0.27 (0.4-0.5)	356
		16 04 08 - PM	16.5	9.52	4.76	3.81	0.8	2.70 (0.5-5)	0.27 (0.15-0.5)	311
		16 04 12 - PM	16.5	9.52	4.76	3.81	1.2	2.70 (0.8-5)	0.32 (0.18-0.6)	293
		22 04 04 - PM	22	12.7	4.76	5.16	0.4	3.60 (0.4-6.6)	0.18 (0.1-0.3)	356
		22 04 08 - PM	22	12.7	4.76	5.16	0.8	3.60 (0.5-6.6)	0.27 (0.15-0.5)	311
		22 04 12 - PM	22	12.7	4.76	5.16	1.2	3.60 (0.8-6.6)	0.32 (0.18-0.6)	293
	WNMG	06 04 08 - PM	6.5	9.52	4.76	3.81	0.8	1.80 (0.5-3)	0.27 (0.15-0.5)	311
		06 04 12 - PM	6.5	9.52	4.76	3.81	1.2	1.80 (0.8-3)	0.32 (0.18-0.6)	293
		08 04 08 - PM	8.7	12.7	4.76	5.16	0.8	2.25 (0.5-4)	0.27 (0.15-0.5)	311
		08 04 12 - PM	8.7	12.7	4.76	5.16	1.2	2.25 (0.8-4)	0.32 (0.18-0.6)	293
	DNMG	11 04 08 - PM	11.6	9.52	4.76	3.81	0.8	1.8 (0.5-5)	0.27 (0.15-0.5)	311
		11 04 12 - PM	11.6	9.52	4.76	3.81	1.2	1.8 (0.8-5)	0.32 (0.18-0.5)	293
		15 04 04 - PM	15.5	12.7	4.76	5.16	0.4	2.70 (0.4-6)	0.36 (0.1-0.8)	275
		15 04 08 - PM	15.5	12.7	4.76	5.16	0.8	2.70 (0.5-6)	0.27 (0.15-0.5)	275
		15 04 12 - PM	15.5	12.7	4.76	5.16	1.2	2.70 (0.8-6)	0.32 (0.18-0.6)	275
		15 06 04 - PM	15.5	12.7	6.35	5.16	0.4	2.70 (0.4-6)	0.18 (0.1-0.3)	356
		15 06 08 - PM	15.5	12.7	6.35	5.16	0.8	2.70 (0.5-6)	0.27 (0.15-0.5)	311
		15 06 12 - PM	15.5	12.7	6.35	5.16	1.2	2.70 (0.8-6)	0.32 (0.18-0.6)	293
	SNMG	09 03 04 - PM	9.52	9.52	3.18	3.81	0.4	1.80 (0.4-4.5)	0.18 (0.1-0.3)	356
		09 03 08 - PM	9.52	9.52	3.18	3.81	0.8	1.80 (0.5-4.5)	0.27 (0.15-0.5)	311
		12 04 04 - PM	12.7	12.7	4.76	5.16	0.4	2.70 (0.4-6)	0.18 (0.1-0.3)	356
		12 04 08 - PM	12.7	12.7	4.76	5.16	0.8	2.70 (0.5-6)	0.27 (0.15-0.5)	311
		12 04 12 - PM	12.7	12.7	4.76	5.16	1.2	2.70 (0.8-6)	0.32 (0.18-0.6)	293
		15 04 08 - PM	15.87	15.87	4.76	5.16	0.8	3.5 (0.7-4)	0.36 (0.25-0.7)	293
		15 04 12 - PM	15.87	15.87	4.76	5.16	1.2	3.5 (0.7-4)	0.36 (0.25-0.7)	293
	VNMG	16 04 08 - PM	16.6	9.52	4.76	3.81	0.8	1.80 (0.5-4)	0.27 (0.15-0.5)	311
		16 04 12 - PM	16.6	9.52	4.76	3.81	1.2	1.80 (0.8-4)	0.32 (0.18-0.6)	293

NEGATIVE INSERT

P	Work Material: Steel
R	Rough Machining of Steel



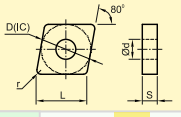
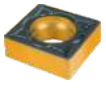
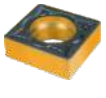
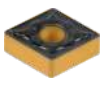




ORDERING CODE		DIMENSIONS					CUTTING DATA		
		L	D (IC)	S	d	r	Cutting depth a_p mm	Feed mm / Rev.	Cutting speed V_c m/min
CNMG	12 04 08 - PR	12.9	12.7	4.76	5.16	0.8	3.60 (0.7-7)	0.32 (0.2-0.5)	293
	12 04 12 - PR	12.9	12.7	4.76	5.16	1.2	3.60 (1-7)	0.36 (0.25-0.7)	275
	12 04 16 - PR	12.9	12.7	4.76	5.16	1.6	3.60 (1.5-7)	0.45 (0.32-0.75)	248
	16 06 12 - PR	16.1	15.87	6.35	6.35	1.2	4.50 (1-8)	0.36 (0.25-0.7)	275
	16 06 16 - PR	16.1	15.87	6.35	6.35	1.6	4.50 (1.5-8)	0.45 (0.3-0.8)	248
	19 06 12 - PR	19.3	19.05	6.35	7.94	1.2	4.50 (1-10)	0.36 (0.25-0.7)	275
	19 06 16 - PR	19.3	19.05	6.35	7.94	1.6	4.50 (1.5-10)	0.45 (0.3-0.8)	248
TNMG	16 04 08 - PR	16.5	9.52	4.76	3.81	0.8	2.70 (0.7-6)	0.32 (0.2-0.55)	293
	16 04 12 - PR	16.5	9.52	4.76	3.81	1.2	2.70 (1-6)	0.36 (0.25-0.65)	275
	22 04 08 - PR	22	12.7	4.76	5.16	0.8	3.60 (0.7-7)	0.32 (0.2-0.55)	293
	22 04 12 - PR	22	12.7	4.76	5.16	1.2	3.60 (1-7)	0.36 (0.25-0.65)	275
	22 04 16 - PR	22	12.7	4.76	5.16	1.6	3.60 (1.5-7)	0.45 (0.32-0.75)	248
WNMG	06 04 08 - PR	6.5	9.52	4.76	3.81	0.8	2.70 (0.7-3.5)	0.27 (0.2-0.45)	311
	06 04 12 - PR	6.5	9.52	4.76	3.81	1.2	2.70 (0.8-3.5)	0.32 (0.25-0.55)	293
	08 04 08 - PR	8.7	12.7	4.76	5.16	0.8	3.60 (0.7-5)	0.32 (0.2-0.55)	293
	08 04 12 - PR	8.7	12.7	4.76	5.16	1.2	3.60 (1-5)	0.36 (0.25-0.7)	275
	08 04 16 - PR	8.7	12.7	4.76	5.16	1.6	3.60 (1.5-5)	0.45 (0.32-0.75)	248
DNMG	15 04 08 - PR	15.5	12.7	4.76	5.16	0.8	3.60 (0.7-6)	0.36 (0.1-0.8)	275
	15 04 12 - PR	15.5	12.7	4.76	5.16	1.2	3.60 (1-6)	0.36 (0.1-0.8)	275
	15 04 16 - PR	15.5	12.7	4.76	5.16	1.6	3.60 (1.5-6)	0.36 (0.1-0.8)	275
	15 06 08 - PR	15.5	12.7	6.35	5.16	0.8	3.60 (0.7-6)	0.32 (0.2-0.5)	293
	15 06 12 - PR	15.5	12.7	6.35	5.16	1.2	3.60 (1-6)	0.36 (0.25-0.7)	275
	15 06 16 - PR	15.5	12.7	6.35	5.16	1.6	3.60 (1.5-6)	0.45 (0.32-0.75)	248
SNMG	12 04 08 - PR	12.7	12.7	4.76	5.16	0.8	3.60 (0.7-7)	0.32 (0.2-0.5)	293
	12 04 12 - PR	12.7	12.7	4.76	5.16	1.2	3.60 (1-7)	0.36 (0.25-0.7)	275
	12 04 16 - PR	12.7	12.7	4.76	5.16	1.6	3.60 (1.5-7)	0.36 (0.1-0.8)	275
	15 06 08 - PR	15.87	15.87	6.35	6.35	0.8	4.50 (1.5-8)	0.32 (0.2-0.5)	293
	15 06 12 - PR	15.87	15.87	6.35	6.35	1.2	4.50 (1-8)	0.36 (0.25-0.7)	275
	15 06 16 - PR	15.87	15.87	6.35	6.35	1.6	4.50 (1.5-8)	0.45 (0.3-0.8)	248
	19 06 08 - PR	19.05	19.05	6.35	7.94	0.8	4.50 (7-10)	0.36 (0.1-0.8)	275
	19 06 12 - PR	19.05	19.05	6.35	7.94	1.2	4.50 (1-10)	0.36 (0.25-0.7)	275
	19 06 16 - PR	19.05	19.05	6.35	7.94	1.6	4.50 (1.5-10)	0.45 (0.3-0.8)	248

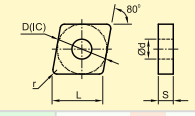
NEGATIVE INSERT

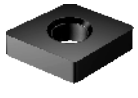
M	Work Material: Stainless Steel	P M K N S H
M	Medium Machining of Stainless Steel	■ ■ ◪ ◪ □ □

	ORDERING CODE				DIMENSIONS					CUTTING DATA		
					L	D (IC)	S	d	r	Cutting depth	Feed	Cutting speed
										a_p mm	mm / Rev.	V_c m/min
	CNMG	12 04	08	- MM	12.9	12.7	4.76	5.16	0.8	2.70 (0.5-5.7)	0.23 (0.12-0.45)	203
		12 04	12	- MM	12.9	12.7	4.76	5.16	1.2	2.70 (0.5-5.7)	0.27 (0.15-0.6)	185
		16 06	08	- MM	16.1	15.87	6.35	6.35	0.8	3.60 (0.5-7.2)	0.23 (0.12-0.45)	203
		16 06	12	- MM	16.1	15.87	6.35	6.35	1.2	3.60(0.5-7.2)	0.27 (0.15-0.6)	185
		19 06	08	- MM	19.3	19.05	7.94	6.35	0.8	3.60 (0.5-8.5)	0.36 (0.2-0.6)	158
		19 06	12	- MM	19.3	19.05	7.94	6.35	1.2	3.60 (0.5-8.5)	0.36 (0.2-0.6)	158
	TNMG	16 04	08	- MM	16.5	9.52	4.76	3.81	0.8	2.70 (0.5-4.8)	0.23 (0.12-0.45)	203
		16 04	12	- MM	16.5	9.52	4.76	3.81	1.2	2.70 (0.5-4.8)	0.27 (0.15-0.6)	185
		22 04	08	- MM	22	12.7	4.76	5.16	0.8	3.60 (0.5-6.6)	0.23 (0.12-0.45)	203
		22 04	12	- MM	22	12.7	4.76	5.16	1.2	3.60 (0.5-6.6)	0.27 (0.15-0.6)	185
		22 04	16	- MM	22	12.7	4.76	5.16	1.6	3.60 (0.5-6.6)	0.33 (0.18-0.65)	167
	WNMG	06 04	08	- MM	6.5	9.52	4.76	3.81	0.8	1.80 (0.5-3)	0.36 (0.2-0.6)	158
		06 04	12	- MM	6.5	9.52	4.76	3.81	1.2	1.80 (0.5-3)	0.36 (0.2-0.6)	158
		08 04	08	- MM	8.7	12.7	4.76	5.16	0.8	2.25 (0.5-4)	0.36 (0.2-0.6)	158
		08 04	12	- MM	8.7	12.7	4.76	5.16	1.2	2.25 (0.5-4)	0.36 (0.2-0.6)	158
	DNMG	11 04	08	- MM	11.6	9.52	4.76	3.81	0.8	1.80 (0.5-4.4)	0.23 (0.12-0.45)	203
		11 04	12	- MM	11.6	9.52	4.76	3.81	1.2	1.80 (0.5-4.4)	0.27 (0.15-0.6)	185
		15 04	08	- MM	15.5	12.7	4.76	5.16	0.8	2.70 (0.5-6.4)	0.36 (0.2-0.6)	158
		15 04	12	- MM	15.5	12.7	4.76	5.16	1.2	2.70 (0.5-6.4)	0.36 (0.2-0.6)	158
		15 06	08	- MM	15.5	12.7	6.35	5.16	0.8	2.70 (0.5-6.4)	0.23 (0.12-0.45)	203
		15 06	12	- MM	15.5	12.7	6.35	5.16	1.2	2.70 (0.5-6.4)	0.27 (0.15-0.6)	185
	SNMG	12 04	08	- MM	12.7	12.7	4.76	5.16	0.8	2.70 (0.5-6.4)	0.23 (0.12-0.45)	203
		12 04	12	- MM	12.7	12.7	4.76	5.16	1.2	2.70 (0.5-6.4)	0.27 (0.15-0.6)	185
		15 06	12	- MM	15.87	15.87	6.35	6.35	1.2	3.60 (0.5-8)	0.27 (0.15-0.6)	185
		15 06	16	- MM	15.87	15.87	6.35	6.35	1.6	3.60 (0.5-8)	0.33 (0.18-0.65)	167
	VNMG	16 04	08	- MM	16.6	9.52	4.76	3.81	0.8	1.80 (0.5-4)	0.23 (0.12-0.45)	203
		16 04	12	- MM	16.6	9.52	4.76	3.81	1.2	1.80 (0.5-4)	0.23 (0.12-0.45)	203

NEGATIVE INSERT

K	Work Material: Cast iron	P M K N S H
X	Machining of Cast iron	◪ ☐ ■ ◪ ☐ ☐

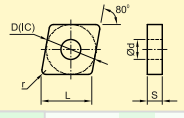
ORDERING CODE		DIMENSIONS					CUTTING DATA		
		L	D (IC)	S	d	r	Cutting depth	Feed	Cutting speed
							a_p mm	mm / Rev.	V_c m/min
CNMA	12 04 08 - KX	12.9	12.7	4.76	5.16	0.8	3.15 (0.38-7)	0.34 (0.19-0.53)	234
	12 04 12 - KX	12.9	12.7	4.76	5.16	1.2	3.15 (0.5-7)	0.45 (0.25-0.7)	212
	12 04 16 - KX	12.9	12.7	4.76	5.16	1.6	3.15 (0.75-7)	0.55 (0.28-0.85)	194
	16 06 08 - KX	16.1	15.87	6.35	6.35	0.8	4.23 (0.8-9.3)	0.50 (0.28-0.77)	203
	16 06 12 - KX	16.1	15.87	6.35	6.35	1.2	4.23 (0.8-9.3)	0.50 (0.28-0.77)	203
	16 06 16 - KX	16.1	15.87	6.35	6.35	1.6	4.23 (1-9.3)	0.55 (0.3-0.85)	194
	19 06 12 - KX	19.3	19.05	6.35	7.94	1.2	6.30 (1-14)	0.50 (0.28-0.77)	203
	19 06 16 - KX	19.3	19.05	6.35	7.94	1.6	6.30 (1.5-14)	0.55 (0.3-0.85)	194
TNMA	16 04 04 - KX	16.5	9.52	4.76	3.81	0.4	2.88 (0.34-6.2)	0.27 (0.17-0.42)	257
	16 04 08 - KX	16.5	9.52	4.76	3.81	0.8	2.88 (0.34-6.2)	0.27 (0.17-0.42)	257
	16 04 12 - KX	16.5	9.52	4.76	3.81	1.2	2.88 (0.45-6.3)	0.36 (0.2-0.56)	230
	16 04 16 - KX	16.5	9.52	4.76	3.81	1.6	2.88 (0.68-6.2)	0.40 (0.22-0.62)	221
	22 04 04 - KX	22	12.7	4.76	5.16	0.4	3.15 (0.38-7)	0.34 (0.19-0.53)	234
	22 04 08 - KX	22	12.7	4.76	5.16	0.8	3.15 (0.38-7)	0.34 (0.19-0.53)	234
	22 04 12 - KX	22	12.7	4.76	5.16	1.2	3.15 (0.5-7)	0.45 (0.25-0.7)	212
	22 04 16 - KX	22	12.7	4.76	5.16	1.6	3.15 (0.75-7)	0.50 (0.28-0.77)	140
WNMA	06 04 08 - KX	6.5	9.52	4.76	3.81	0.8	1.98 (0.24-4.5)	0.27 (0.17-0.42)	167
	06 04 12 - KX	6.5	9.52	4.76	3.81	1.2	1.98 (0.32-4.5)	0.36 (0.2-0.56)	158
	08 04 08 - KX	8.7	12.7	4.76	5.16	0.8	2.43 (0.29-5.5)	0.31 (0.17-0.47)	243
	08 04 12 - KX	8.7	12.7	4.76	5.16	1.2	2.43 (0.39-5.5)	0.41 (0.23-0.63)	221
	08 04 16 - KX	8.7	12.7	4.76	5.16	1.6	3.60 (0.7-6)	0.36 (0.1-0.8)	221



TURNING

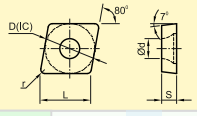
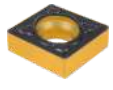
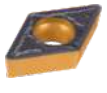
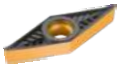
NEGATIVE INSERT

N	Work Material: Aluminium Alloys	P	M	K	N	S	H
M	Medium Machining of Aluminium Alloys	☐	☐	☐	■	☐	☐

ORDERING CODE						DIMENSIONS					CUTTING DATA		
						L	D (IC)	S	d	r	Cutting depth	Feed	Cutting speed
											a_p mm	mm / Rev.	V_c m/min
	CNMG	12	04	04	- NM	12.9	12.7	4.76	5.16	0.4	2.70 (0.4-5.5)	0.27 (0.1-0.3)	535
		12	04	08	- NM	12.9	12.7	4.76	5.16	0.8	2.70 (0.5-5.5)	0.40 (0.15-0.5)	465
		12	04	12	- NM	12.9	12.7	4.76	5.16	1.2	2.70 (0.8-5.5)	0.48 (0.18-0.6)	440
	TNMG	16	04	04	- NM	16.5	9.52	4.76	3.81	0.4	2.70 (0.4-5)	0.40 (0.4-0.5)	530
		16	04	08	- NM	16.5	9.52	4.76	3.81	0.8	2.70 (0.5-5)	0.40 (0.15-0.5)	465
		16	04	12	- NM	16.5	9.52	4.76	3.81	1.2	2.70 (0.8-5)	0.48 (0.18-0.6)	440
		22	04	08	- NM	22	12.7	4.76	5.16	0.8	3.60 (0.5-6.6)	0.40 (0.15-0.5)	465
		22	04	12	- NM	22	12.7	4.76	5.16	1.2	3.60 (0.8-6.6)	0.48 (0.18-0.6)	440
	WNMG	06	04	04	- NM	6.5	9.52	4.76	3.81	0.4	1.80 (0.5-3)	0.40 (0.15-0.5)	465
		06	04	08	- NM	6.5	9.52	4.76	3.81	0.8	1.80 (0.5-3)	0.40 (0.15-0.5)	465
		08	04	04	- NM	8.7	12.7	4.76	5.16	0.4	2.25 (0.5-4)	0.40 (0.15-0.5)	465
		08	04	08	- NM	8.7	12.7	4.76	5.16	0.8	2.25 (0.5-4)	0.40 (0.15-0.5)	465
	DNMG	15	04	04	- NM	15.5	12.7	4.76	5.16	0.4	2.70 (0.4-6)	0.54 (0.1-0.8)	410
		15	04	08	- NM	15.5	12.7	4.76	5.16	0.8	2.70 (0.5-6)	0.54 (0.1-0.8)	410
		15	06	04	- NM	15.5	12.7	6.35	5.16	0.4	2.70 (0.4-6)	0.27 (0.1-0.3)	530
		15	06	08	- NM	15.5	12.7	6.35	5.16	0.8	2.70 (0.5-6)	0.40 (0.15-0.5)	465
	SNMG	12	04	04	- NM	12.7	12.7	4.76	5.16	0.4	2.70 (0.4-6)	0.27 (0.1-0.3)	530
		12	04	08	- NM	12.7	12.7	4.76	5.16	0.8	2.70 (0.5-6)	0.40 (0.15-0.5)	465
		12	04	12	- NM	12.7	12.7	4.76	5.16	1.2	2.70 (0.8-6)	0.48 (0.18-0.6)	440
	VNMG	16	04	04	- NM	16.6	9.52	4.76	3.81	0.4	1.8 (0.5-4)	0.40 (0.15-0.5)	465
		16	04	08	- NM	16.6	9.52	4.76	3.81	0.8	1.8 (0.5-4)	0.40 (0.15-0.5)	465

POSITIVE INSERT

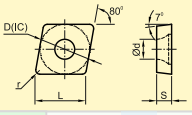
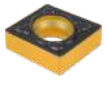
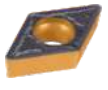
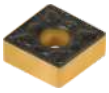
P	Work Material: Steel
F	Finish Machining of Steel

ORDERING CODE		DIMENSIONS					CUTTING DATA		
		L	D (IC)	S	d	r	Cutting depth	Feed	Cutting speed
							a_p mm	mm / Rev.	V_c m/min
	CCMT 06 02 02 - PF	6.4	6.35	2.38	2.8	0.2	0.27 (0.06-1.7)	0.05 (0.03-0.11)	432
	CCMT 06 02 04 - PF	6.4	6.35	2.38	2.8	0.4	0.27 (0.1-1.7)	0.07 (0.05-0.17)	513
	CCMT 09 T3 02 - PF	9.7	9.52	3.97	4.4	0.2	0.32 (0.08-2)	0.07 (0.04-0.15)	423
	CCMT 09 T3 04 - PF	9.7	9.52	3.97	4.4	0.4	0.32 (0.11-2)	0.10 (0.06-0.23)	491
	CCMT 09 T3 08 - PF	9.7	9.52	3.97	4.4	0.8	0.32 (0.15-2)	0.14 (0.08-0.3)	464
	CCMT 12 04 04 - PF	12.9	12.7	4.76	5.5	0.4	0.38 (0.14-2.4)	0.36 (0.1-0.8)	333
	DCMT 07 02 02 - PF	7.8	6.35	2.38	2.8	0.2	0.23 (0.06-1.5)	0.05 (0.03-0.11)	432
	DCMT 07 02 04 - PF	7.8	6.35	2.38	2.8	0.4	0.23 (0.08-1.5)	0.07 (0.05-0.17)	513
	DCMT 11 T3 02 - PF	11.6	9.52	3.97	4.4	0.2	0.32 (0.8-2)	0.07 (0.04-0.15)	423
	DCMT 11 T3 04 - PF	11.6	9.52	3.97	4.4	0.4	0.32 (0.11-2)	0.10 (0.06-0.23)	491
	DCMT 11 T3 08 - PF	11.6	9.52	3.97	4.4	0.8	0.32 (0.15-2)	0.14 (0.08-0.3)	464
	SCMT 09 T3 04 - PF	9.52	9.52	3.97	4.4	0.4	0.32 (0.11-2)	0.10 (0.06-0.23)	491
	SCMT 09 T3 08 - PF	9.52	9.52	3.97	4.4	0.8	0.32 (0.15-2)	0.14 (0.08-0.3)	464
	TCMT 09 02 02 - PF	9.6	5.56	2.38	2.5	0.2	0.27 (0.06-1.7)	0.05 (0.03-0.13)	432
	TCMT 09 02 04 - PF	9.6	5.56	2.38	2.5	0.4	0.27 (0.1-1.7)	0.09 (0.05-0.19)	495
	TCMT 11 03 02 - PF	11	6.35	3.18	3.4	0.2	0.27 (0.06-1.7)	0.05 (0.03-0.13)	432
	TCMT 11 03 04 - PF	11	6.35	3.18	3.4	0.4	0.27 (0.1-1.7)	0.09 (0.05-0.19)	495
	TCMT 11 03 08 - PF	11	6.35	3.18	3.4	0.8	0.27 (0.13-1.7)	0.12 (0.07-0.26)	477
	TCMT 16 T3 04 - PF	16.5	9.52	3.97	4.4	0.4	0.32 (0.11-2)	0.10 (0.06-0.23)	491
	VBMT 11 03 02 - PF	11	6.35	3.18	2.8	0.2	0.27 (0.06-1.7)	0.05 (0.03-0.13)	432
	VBMT 11 03 04 - PF	11	6.35	3.18	2.8	0.4	0.27 (0.1-1.7)	0.09 (0.05-0.19)	495
	VBMT 11 03 08 - PF	11	6.35	3.18	2.8	0.8	0.27 (0.13-1.7)	0.12 (0.07-0.26)	477

TURNING

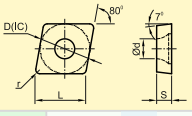
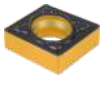
POSITIVE INSERT

P	Work Material: Steel	P M K N S H
M	Medium Machining of Steel	■ ◪ ◪ ◪ □ □

	ORDERING CODE		DIMENSIONS					CUTTING DATA		
			L	D (IC)	S	d	r	Cutting depth	Feed	Cutting speed
								a_p mm	mm / Rev.	V_c m/min
	CCMT	06 02 04 - PM	6.4	6.35	2.38	2.8	0.4	0.58 (0.2-2.4)	0.10 (0.06-0.17)	491
		06 02 08 - PM	6.4	6.35	2.38	2.8	0.8	0.58 (0.2-2.4)	0.14 (0.08-0.23)	464
		09 T3 04 - PM	9.7	9.52	3.97	4.4	0.4	0.58 (0.25-3)	0.14 (0.08-0.23)	383
		09 T3 08 - PM	9.7	9.52	3.97	4.4	0.8	0.72 (0.5-3)	0.18 (0.1-0.3)	356
		12 04 04 - PM	12.9	12.7	4.76	5.5	0.4	0.86 (0.3-3.6)	0.36 (0.1-0.8)	275
		12 04 08 - PM	12.9	12.7	4.76	5.5	0.8	0.86 (0.6-3.6)	0.36 (0.1-0.8)	275
		12 04 12 - PM	12.9	12.7	4.76	5.5	1.2	0.86 (0.72-3.6)	0.36 (0.1-0.8)	275
	DCMT	07 02 04 - PM	7.8	6.35	2.38	2.8	0.4	0.54 (0.19-2.3)	0.10 (0.06-0.17)	405
		07 02 08 - PM	7.8	6.35	2.38	2.8	0.8	0.54 (0.38-2.3)	0.14 (0.08-0.23)	383
		11 T3 04 - PM	11.6	9.52	3.97	4.4	0.4	0.72 (0.25-3)	0.14 (0.08-0.23)	383
		11 T3 08 - PM	11.6	9.52	3.97	4.4	0.8	0.72 (0.5-3)	0.18 (0.1-0.3)	356
		11 T3 12 - PM	11.6	9.52	3.97	4.4	1.2	0.72 (0.6-3)	0.22 (0.12-0.36)	333
	SCMT	09 T3 04 - PM	9.52	9.52	3.97	4.4	0.4	0.72 (0.25-3)	0.14 (0.08-0.23)	383
		09 T3 08 - PM	9.52	9.52	3.97	4.4	0.8	0.72 (0.5-3)	0.18 (0.1-0.3)	356
		12 04 04 - PM	12.7	12.7	4.76	5.5	0.4	0.86 (0.3-3.6)	0.36 (0.1-0.8)	275
		12 04 08 - PM	12.7	12.7	4.76	5.5	0.8	0.86 (0.6-3.6)	0.36 (0.1-0.8)	275
		12 04 12 - PM	12.7	12.7	4.76	5.5	1.2	0.86 (0.72-3.6)	0.36 (0.1-0.8)	275
	TCMT	09 02 04 - MF	9.6	5.56	2.38	2.5	0.4	0.54 (0.19-2.3)	0.10 (0.06-0.17)	405
		09 02 08 - PM	9.6	5.56	2.38	2.5	0.8	0.54 (0.38-2.3)	0.14 (0.08-0.23)	383
		11 03 04 - PM	11	6.35	3.18	3.4	0.4	0.60 (0.21-2.5)	0.12 (0.06-0.19)	396
		11 03 08 - PM	11	6.35	3.18	3.4	0.8	0.60 (0.42-2.5)	0.15 (0.09-0.26)	369
		11 03 12 - PM	11	6.35	3.18	3.4	1.2	0.60 (0.5-2.5)	0.18 (0.1-0.31)	356
		16 T3 04 - PM	16.5	9.52	3.97	4.4	0.4	0.72 (0.25-3)	0.14 (0.08-0.23)	383
		16 T3 08 - PM	16.5	9.52	3.97	4.4	0.8	0.72 (0.5-3)	1.80 (0.1-0.3)	356
		16 T3 12 - PM	16.5	9.52	3.97	4.4	1.2	0.72 (0.6-3)	0.22 (0.12-0.36)	333
	VBMT	16 03 04 - PM	16.5	9.52	3.18	3.4	0.4	0.80 (0.6-3)	0.22 (0.12-0.36)	324
		16 03 08 - PM	16.5	9.52	3.18	3.4	0.8	0.80 (0.6-3)	0.22 (0.12-0.36)	324

POSITIVE INSERT

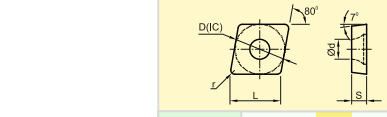
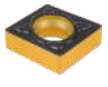
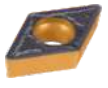
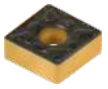
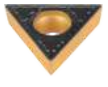
P	Work Material: Steel	P M K N S H
R	Rough Machining of Steel	■ ◪ ◪ ◪ □ □

ORDERING CODE		DIMENSIONS					CUTTING DATA		
		L	D (IC)	S	d	r	Cutting depth	Feed	Cutting speed
							a_p mm	mm / Rev.	V_c m/min
	CCMT 06 02 04 - PR	6.4	6.35	2.38	2.8	0.4	1.44 (0.8-3.2)	0.17 (0.09-0.26)	221
	CCMT 06 02 08 - PR	6.4	6.35	2.38	2.8	0.8	1.44 (0.8-3.2)	0.17 (0.09-0.26)	221
	CCMT 09 T3 08 - PR	9.7	9.52	3.97	4.4	0.8	1.80 (1-4)	0.23 (0.12-0.35)	329
	CCMT 09 T3 12 - PR	9.7	9.52	3.97	4.4	1.2	1.80 (1.2-4)	0.27 (0.14-0.42)	311
	CCMT 12 04 08 - PR	12.9	12.7	4.76	5.5	0.8	2.16 (1.2-4.8)	0.36 (0.1-0.8)	275
	CCMT 12 04 12 - PR	12.9	12.7	4.76	5.5	1.2	2.16 (1.44-4.8)	0.36 (0.1-0.8)	275
	DCMT 11 T3 08 - PR	11.6	9.52	3.97	4.4	0.8	1.80 (1-4)	0.23 (0.12-0.35)	329
	DCMT 11 T3 12 - PR	11.6	9.52	3.97	4.4	1.2	1.80 (1.2-4)	0.27 (0.14-0.42)	311
	SCMT 09 T3 08 - PR	9.52	9.52	3.97	4.4	0.8	1.80 (1-4)	0.23 (0.12-0.35)	329
	SCMT 12 04 08 - PR	12.7	12.7	4.76	5.5	0.8	1.80 (1.2-4)	0.27 (0.14-0.42)	311
	SCMT 12 04 12 - PR	12.7	12.7	4.76	5.5	1.2	2.16 (1.44-4.8)	0.36 (0.1-0.8)	275
	TCMT 11 03 08 - PR	11	6.35	3.18	3.4	0.8	1.35 (0.75-3)	0.19 (0.1-0.3)	351
	TCMT 11 03 12 - PR	11	6.35	3.18	3.4	1.2	1.35 (0.9-3)	0.23 (0.12-0.35)	324
	TCMT 16 T3 08 - PR	16.5	9.52	3.97	4.4	0.8	1.80 (1-4)	0.23 (0.12-0.35)	329
	TCMT 16 T3 12 - PR	16.5	9.52	3.97	4.4	1.2	1.80 (1.2-4)	0.27 (0.14-0.42)	311
	VBMT 16 04 04 - PR	16.5	9.52	4.76	4.4	0.4	1.62 (0.9-3.6)	0.21 (0.11-0.32)	342
	VBMT 16 04 08 - PR	16.5	9.52	4.76	4.4	0.8	1.62 (0.9-3.6)	0.21 (0.11-0.32)	342
	VBMT 16 04 12 - PR	16.5	9.52	4.76	4.4	1.2	1.62 (1.1-3.6)	0.24 (0.13-0.38)	324

TURNING

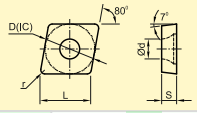
POSITIVE INSERT

M	Work Material: Stainless Steel	P M K N S H
M	Medium Machining of Stainless Steel	■ ■ ◪ ◪ ☐ ☐

	ORDERING CODE			DIMENSIONS					CUTTING DATA		
				L	D (IC)	S	d	r	Cutting depth	Feed	Cutting speed
									a_p mm	mm / Rev.	V_c m/min
	CCMT	06 02	04 - MM	6.4	6.35	2.38	2.8	0.4	0.58 (0.2-2.4)	0.10 (0.06-0.17)	261
		09 T3	02 - MM	9.7	9.52	3.97	4.4	0.2	0.58 (0.25-3)	0.36 (0.2-0.6)	158
		09 T3	04 - MM	9.7	9.52	3.97	4.4	0.4	0.58 (0.25-3)	0.14 (0.08-0.23)	234
		09 T3	08 - MM	9.7	9.52	3.97	4.4	0.8	0.72 (0.5-3)	0.18 (0.1-0.3)	216
		12 04	04 - MM	12.9	12.7	4.76	5.5	0.4	0.86 (0.3-3.6)	0.36 (0.2-0.6)	158
	DCMT	07 02	04 - MM	7.8	6.35	2.38	2.8	0.4	0.54 (0.19-2.3)	0.10 (0.06-0.17)	239
		07 02	08 - MM	7.8	6.35	2.38	2.8	0.8	0.54 (0.38-2.3)	0.14 (0.08-0.23)	234
		11 T3	04 - MM	11.6	9.52	3.97	4.4	0.4	0.72 (0.25-3)	0.14 (0.08-0.23)	234
		11 T3	08 - MM	11.6	9.52	3.97	4.4	0.8	0.72 (0.5-3)	0.18 (0.1-0.3)	216
	SCMT	09 T3	04 - MM	9.52	9.52	3.97	4.4	0.4	0.72 (0.25-3)	0.14 (0.08-0.23)	234
		09 T3	08 - MM	9.52	9.52	3.97	4.4	0.8	0.72 (0.5-3)	0.18 (0.1-0.3)	216
		09 T3	12 - MM	9.52	9.52	3.97	4.4	1.2	0.72 (0.5-3)	0.18 (0.1-0.3)	216
		12 04	04 - MM	12.7	12.7	4.76	5.5	0.4	0.86 (0.3-3.6)	0.36 (0.2-0.6)	158
		12 04	08 - MM	12.7	12.7	4.76	5.5	0.8	0.86 (0.6-3.6)	0.36 (0.2-0.6)	158
		12 04	12 - MM	12.7	12.7	4.76	5.5	1.2	0.86 (0.72-3.6)	0.36 (0.2-0.6)	158
	TCMT	09 02	04 - MM	9.6	5.56	2.38	2.5	0.4	0.54 (0.19-2.3)	0.10 (0.06-0.17)	239
		09 02	08 - MM	9.6	5.56	2.38	2.5	0.8	0.54 (0.38-2.3)	0.14 (0.08-0.23)	234
		11 03	04 - MM	11	6.35	3.18	3.4	0.4	0.60 (0.21-2.5)	0.12 (0.06-0.19)	239
		11 03	08 - MM	11	6.35	3.18	3.4	0.8	0.60 (0.42-2.5)	0.15 (0.09-0.26)	225
		11 03	12 - MM	11	6.35	3.18	3.4	1.2	0.60 (0.42-2.5)	0.15 (0.09-0.26)	225
		16 T3	04 - MM	16.5	9.52	3.97	4.4	0.4	0.72 (0.25-3)	0.14 (0.08-0.23)	234
		16 T3	08 - MM	16.5	9.52	3.97	4.4	0.8	0.72 (0.5-3)	0.18 (0.1-0.3)	216
		16 T3	12 - MM	16.5	9.52	3.97	4.4	1.2	0.72 (0.6-3)	0.22 (0.12-0.36)	203
	VCMT	11 03	04 - MM	11	6.35	3.18	2.8	0.4	0.65 (0.23-2.7)	0.36 (0.2-0.6)	158
		11 03	08 - MM	11	6.35	3.18	2.8	0.8	0.65 (0.23-2.7)	0.36 (0.2-0.6)	158
	VBMT	16 04	04 - MM	16.5	9.52	4.76	4.4	0.4	0.65 (0.23-2.7)	0.13 (0.07-0.2)	234
		16 04	08 - MM	16.5	9.52	4.76	4.4	0.8	0.65 (0.45-2.7)	0.16 (0.09-0.27)	225

POSITIVE INSERT

N	Work Material: Aluminium Alloys	P M K N S H
M	Medium Machining of Aluminium Alloys	■

ORDERING CODE		DIMENSIONS					CUTTING DATA		
		L	D (IC)	S	d	r	Cutting depth	Feed	Cutting speed
							a_p mm	mm / Rev.	V_c m/min
	CCGT 06 02 02 - NM	6.4	6.35	2.38	2.8	0.2	0.58 (0.2-2.4)	0.15 (0.06-0.17)	735
	CCGT 06 02 04 - NM	6.4	6.35	2.38	2.8	0.4	0.58 (0.2-2.4)	0.15 (0.06-0.17)	735
	CCGT 06 02 08 - NM	6.4	6.35	2.38	2.8	0.8	0.58 (0.2-2.4)	0.21 (0.08-0.23)	695
	CCGT 09 T3 02 - NM	9.7	9.52	3.97	4.4	0.2	0.58 (0.2-3)	0.21 (0.08-0.23)	575
	CCGT 09 T3 04 - NM	9.7	9.52	3.97	4.4	0.4	0.58 (0.2-3)	0.21 (0.08-0.23)	575
	CCGT 09 T3 08 - NM	9.7	9.52	3.97	4.4	0.8	0.72 (0.5-3)	0.27 (0.1-0.3)	530
	CCGT 12 04 02 - NM	12.9	12.7	4.76	5.5	0.2	0.86 (0.3-3.6)	0.54 (0.10-0.80)	410
	CCGT 12 04 04 - NM	12.9	12.7	4.76	5.5	0.4	0.86 (0.3-3.6)	0.54 (0.10-0.80)	410
	CCGT 12 04 08 - NM	12.9	12.7	4.76	5.5	0.8	0.86 (0.3-3.6)	0.54 (0.10-0.80)	410
	DCGT 07 02 02 - NM	7.8	6.35	2.38	2.8	0.2	0.54 (0.19-2.3)	0.15 (0.06-0.17)	605
	DCGT 07 02 04 - NM	7.8	6.35	2.38	2.8	0.4	0.54 (0.19-2.3)	0.15 (0.06-0.17)	605
	DCGT 07 02 08 - NM	7.8	6.35	2.38	2.8	0.8	0.54 (0.38-2.3)	0.21 (0.8-0.23)	575
	DCGT 11 T3 02 - NM	11.6	9.52	3.97	4.4	0.2	0.72 (0.25-3)	0.21 (0.8-0.23)	575
	DCGT 11 T3 04 - NM	11.6	9.52	3.97	4.4	0.4	0.72 (0.25-3)	0.21 (0.8-0.23)	575
	DCGT 11 T3 08 - NM	11.6	9.52	3.97	4.4	0.8	0.72 (0.5-3)	0.27 (0.1-0.3)	530
	SCGT 09 T3 02 - NM	9.52	9.52	3.97	4.4	0.2	0.72 (0.25-3)	0.21 (0.08-0.23)	575
	SCGT 09 T3 04 - NM	9.52	9.52	3.97	4.4	0.4	0.72 (0.25-3)	0.21 (0.08-0.23)	575
	SCGT 09 T3 08 - NM	9.52	9.52	3.97	4.4	0.8	0.72 (0.5-3)	0.27 (0.1-0.3)	530
	SCGT 12 04 04 - NM	12.7	12.7	4.76	5.5	0.4	0.86 (0.3-3.6)	0.54 (0.10-0.80)	410
	SCGT 12 04 08 - NM	12.7	12.7	4.76	5.5	0.8	0.86 (0.3-3.6)	0.54 (0.10-0.80)	410
	SCGT 12 04 12 - NM	12.7	12.7	4.76	5.5	1.2	0.86 (0.72-3.6)	0.54 (0.10-0.80)	410
	TCGT 09 02 02 - NM	9.6	5.56	2.38	2.5	0.2	0.54 (0.19-2.3)	0.15 (0.06-0.17)	605
	TCGT 09 02 04 - NM	9.6	5.56	2.38	2.5	0.4	0.54 (0.19-2.3)	0.15 (0.06-0.17)	605
	TCGT 11 02 02 - NM	11	6.35	3.18	2.8	0.2	0.60 (0.21-2.5)	0.18 (0.06-0.19)	590
	TCGT 11 02 04 - NM	11	6.35	3.18	2.8	0.4	0.60 (0.21-2.5)	0.18 (0.06-0.19)	590
	TCGT 11 02 08 - NM	11	6.35	3.18	2.8	0.8	0.60 (0.42-2.5)	0.22 (0.09-0.26)	555
	TCGT 16 T3 02 - NM	16.5	9.52	3.97	4.4	0.2	0.72 (0.25-3)	0.21 (0.08-0.23)	570
	TCGT 16 T3 04 - NM	16.5	9.52	3.97	4.4	0.4	0.72 (0.25-3)	0.21 (0.08-0.23)	570
	TCGT 16 T3 08 - NM	16.5	9.52	3.97	4.4	0.8	0.72 (0.5-3)	0.27 (0.1-0.3)	530
	VCGT 11 03 02 - NM	11	6.35	3.18	2.8	0.2	0.90 (0.05-2)	0.18 (0.05-0.3)	500
	VCGT 11 03 04 - NM	11	6.35	3.18	2.8	0.4	0.90 (0.05-2)	0.18 (0.05-0.3)	500
	VCGT 16 04 02 - NM	16.5	9.52	4.76	2.8	0.2	0.90 (0.05-2)	0.18 (0.05-0.3)	500
	VCGT 16 04 04 - NM	16.5	9.52	4.76	2.8	0.4	0.90 (0.05-2)	0.18 (0.05-0.3)	500
	VCGT 16 04 08 - NM	16.5	9.52	4.76	2.8	0.8	0.90 (0.05-2)	0.18 (0.05-0.3)	500

BLOOD®
ROTATING GENIUS

TURNING HOLDER

EXTERNAL

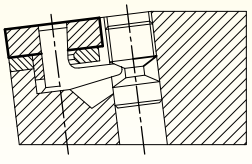
NOMENCLATURE

TURNING HOLDER - EXTERNAL

M	T	J	N	L	25	25	M	16
1	2	3	4	5	6	7	8	9

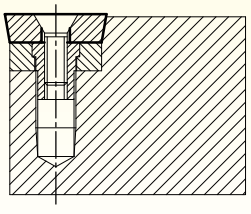
1. INSERT CLAMPING

P



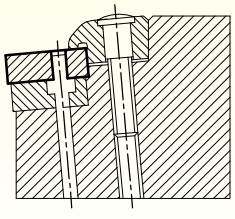
P/ Lever Lock

S



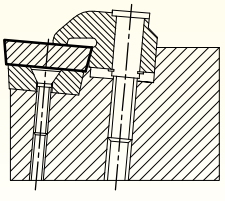
S/ Screw Clamp

M



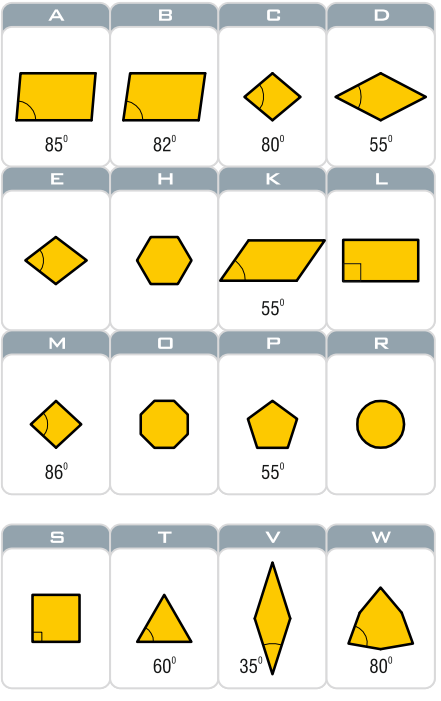
M/ Multi Lock

C

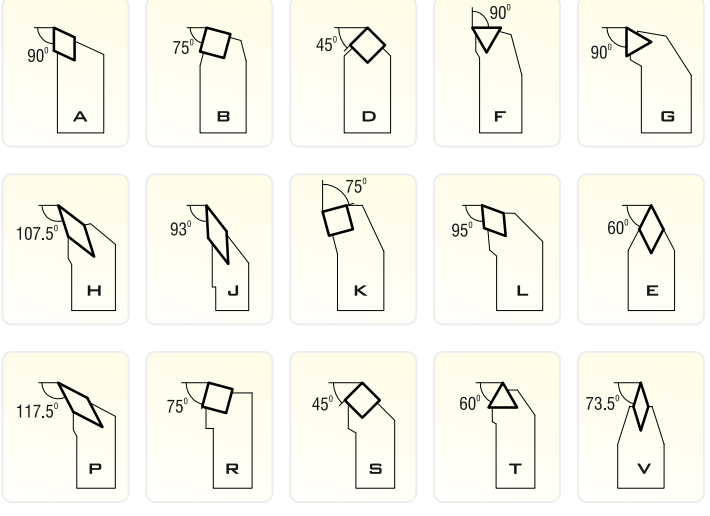


C/ Top Clamp

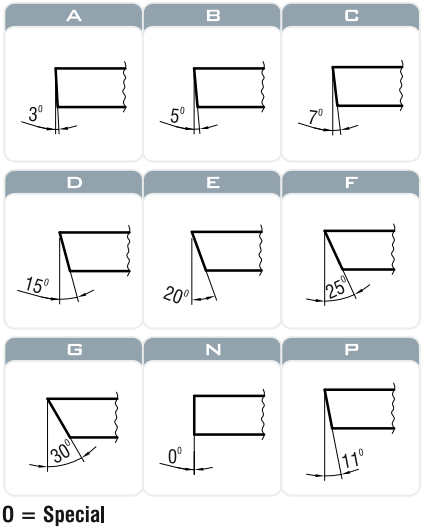
2. INSERT SHAPE



3. APPROACH ANGLE

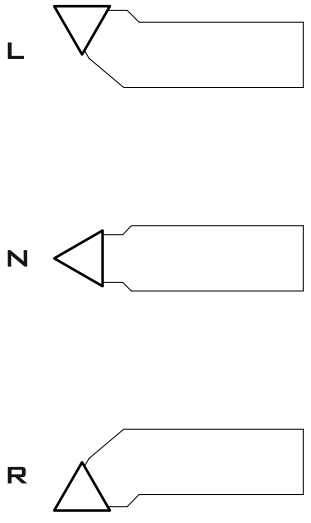


4. INSERT CLEARANCE ANGLE

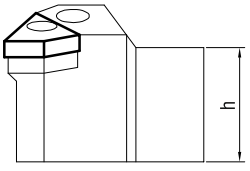


O = Special

5. CUTTING DIRECTION

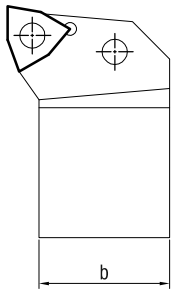


6. SHANK HEIGHT



12 = 12 mm
25 = 25 mm
32 = 32 mm

7. SHANK WIDTH



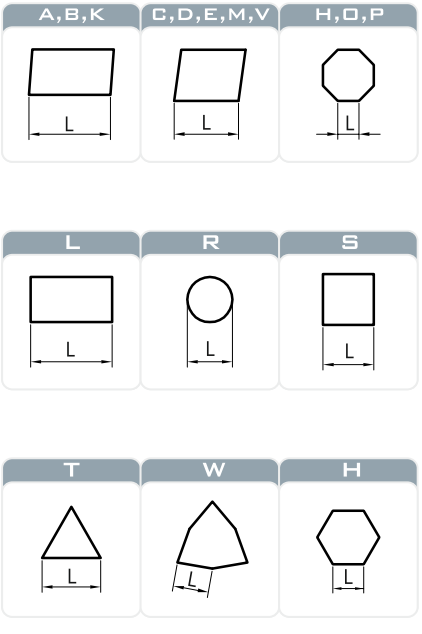
12 = 12 mm
25 = 25 mm
32 = 32 mm

8. TOOL LENGTH

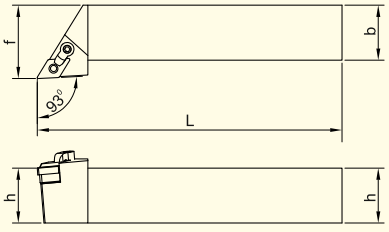
A	= 32 mm	M	= 150 mm
C	= 50 mm	P	= 170 mm
D	= 60 mm	R	= 200 mm
E	= 70 mm	S	= 250 mm
F	= 80 mm	T	= 300 mm
H	= 100 mm	V	= 400 mm
K	= 125 mm		

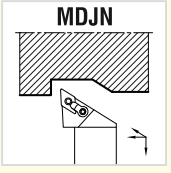
STANDARD LENGTH AS ABOVE

9. CUTTING EDGE LENGTH

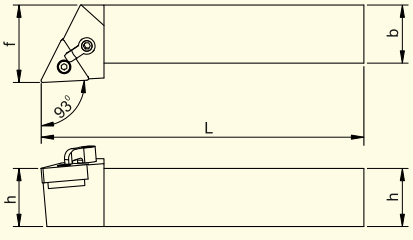


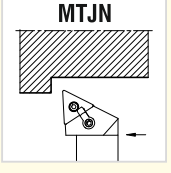
TURNING HOLDER
(EXTERNAL)
M Series



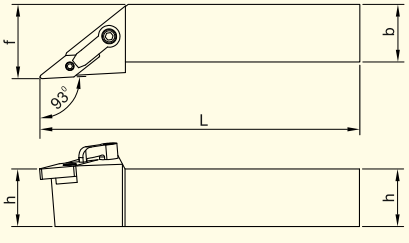


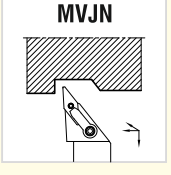
ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
MDJN R/L 2020 K15	20	20	125	25	DN □□ 15 04 □□
MDJN R/L 2525 M15	25	25	150	32	DN □□ 15 06 □□
MDJN R/L 3232 P15	32	32	170	40	





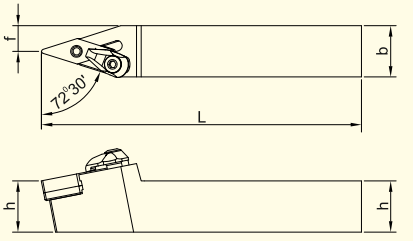
ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
MTJN R/L 2020 K16	20	20	125	25	TN □□ 16 04 □□
MTJN R/L 2525 M16	25	25	150	32	
MTJN R/L 3232 P16	32	32	170	32	

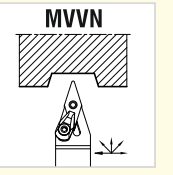




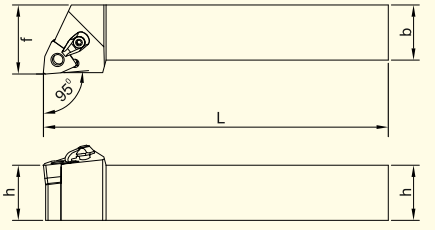
ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
MVJN R/L 2020 K16	20	20	125	25	VN □□ 16 04 □□
MVJN R/L 2525 M16	25	25	150	32	
MVJN R/L 3232 P16	32	32	170	40	

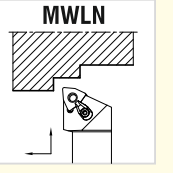
TURNING HOLDER
(EXTERNAL)
M Series



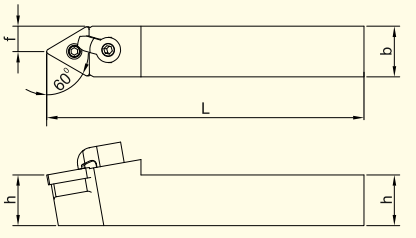


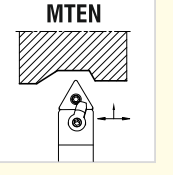
ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
MVVN N 2020 K16	20	20	125	10	VN □□ 16 04 □□
MVVN N 2525 M16	25	25	150	12.5	





ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
MWLN R/L 1616 H06	16	16	100	16	WN □□ 06 04 □□
MWLN R/L 2020 K08	20	20	125	25	WN □□ 08 04 □□
MWLN R/L 2525 M08	25	25	150	32	
MWLN R/L 3232 P08	32	32	170	40	WN □□ 08 04 □□

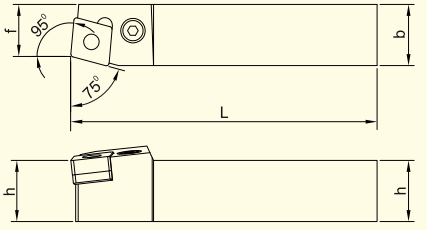


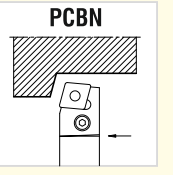


ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
MTEN R/L 2020 K16	20	20	125	10	TN □□ 16 04 □□
MTEN R/L 2525 M16	25	25	150	12.5	
MTEN R/L 3232 P16	32	32	170	16	
MTEN R/L 2525 M22	25	25	150	12.5	TN □□ 22 04 □□
MTEN R/L 3232 P22	32	32	170	16	

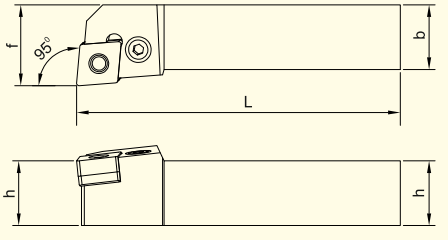
TURNING HOLDER
(EXTERNAL)

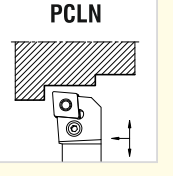
P Series





ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
PCBN R/L 2020 K12	20	20	125	17.5	CN □□ 12 04 □□
PCBN R/L 2525 M12	25	25	150	22.5	
PCBN R/L 3232 P12	32	32	170	22.5	
PCBN R/L 2525 M16	25	25	150	22	CN □□ 16 06 □□
PCBN R/L 3232 P16	32	32	170	27	
PCBN R/L 3232 P19	32	32	170	27	CN □□ 19 06 □□
PCBN R/L 4040 S19	40	40	250	37	
PCBN R/L 4040 S25	40	40	250	37	CN □□ 25 09 □□

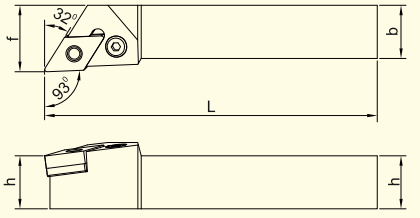


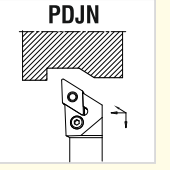


ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
PCLN R/L 1616 H9	16	16	100	20	CN □□ 09 03 □□
PCLN R/L 2020 K9	20	20	125	25	
PCLN R/L 2525 M9	25	25	150	32	
PCLN R/L 2020 K12	20	20	125	25	CN □□ 12 04 □□
PCLN R/L 2525 M12	25	25	150	32	
PCLN R/L 3232 P12	32	32	170	40	
PCLN R/L 2525 M16	25	25	150	32	CN □□ 16 06 □□
PCLN R/L 3232 P16	32	32	170	40	
PCLN R/L 3232 P19	32	32	170	40	CN □□ 19 06 □□
PCLN R/L 4040 S19	40	40	250	50	
PCLN R/L 4040 S25	40	40	250	50	CN □□ 25 09 □□

TURNING HOLDER
(EXTERNAL)

P Series





ITEM CODE	Dimension (mm)				Suitable Insert Code
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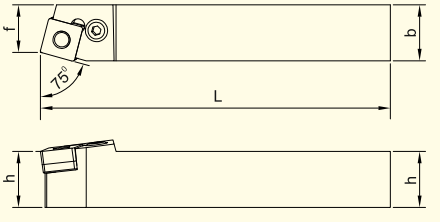
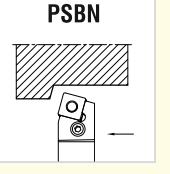
PDJN R/L 1616 H11	16	16	100	20	DN □□ 11 04 □□
PDJN R/L 2020 K11	20	20	125	25	
PDJN R/L 2525 M11	25	25	150	32	
PDJN R/L 2020 K15	20	20	125	25	DN □□ 15 06 □□
PDJN R/L 2525 M15	25	25	150	32	
PDJN R/L 3232 P15	32	32	170	40	

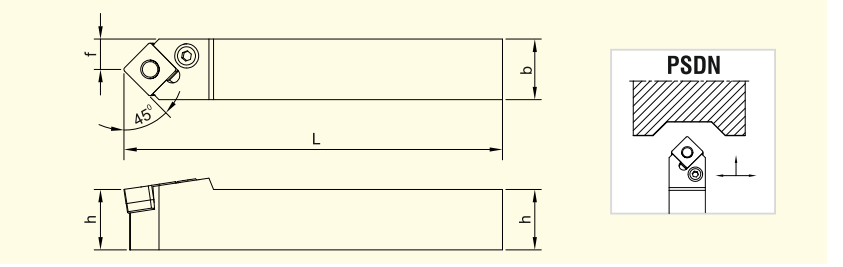




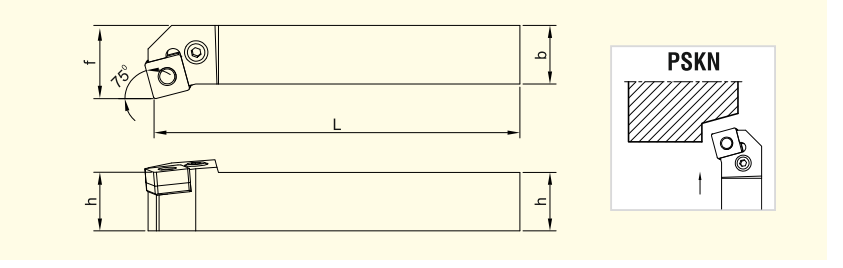
ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
PSBN R/L 1616 H9	16	16	100	13	SN □□ 09 03 □□
PSBN R/L 2020 K9	20	20	125	17	
PSBN R/L 2020 K12	20	20	125	17	SN □□ 12 04 □□
PSBN R/L 2525 M12	25	25	150	22	
PSBN R/L 3232 P12	32	32	170	22	
PSBN R/L 2525 M15	25	25	150	22	SN □□ 15 06 □□
PSBN R/L 3232 P19	32	32	170	27	SN □□ 19 06 □□
PSBN R/L 4040 S25	40	40	250	35	SN □□ 25 07 □□

TURNING HOLDER
(EXTERNAL)

P Series



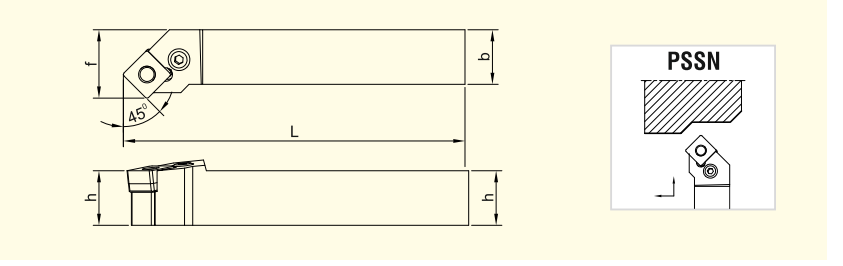
ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
PSDN N 1616 H09	16	16	100	8	SN □□ 09 03 □□
PSDN N 2020 K12	20	20	125	10	SN □□ 12 04 □□
PSDN N 2525 M12	25	25	150	12.5	
PSDN N 3232 P12	32	32	170	12.5	
PSDN N 2525 M15	25	25	150	12.5	SN □□ 15 06 □□
PSDN N 3232 P19	32	32	170	16	SN □□ 19 06 □□
PSDN N 4040 S19	40	40	250	20	
PSDN N 5050 S19	50	50	250	25	



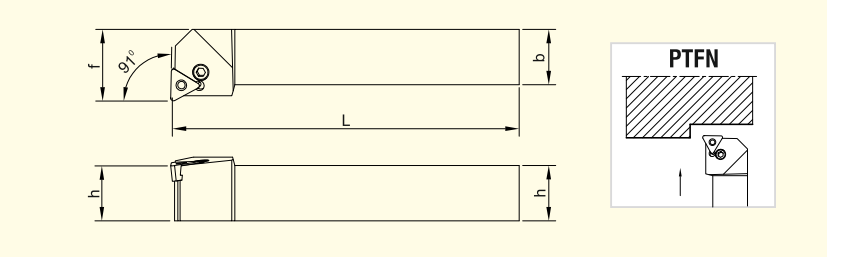
ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
PSKN R/L 2020 K9	20	20	125	25	SN □□ 09 03 □□
PSKN R/L 2020 K12	20	20	125	25	SN □□ 12 04 □□
PSKN R/L 2525 M12	25	25	150	32	
PSKN R/L 3232 P12	32	32	170	32	SN □□ 15 06 □□
PSKN R/L 2525 M15	25	25	150	32	
PSKN R/L 3232 P15	32	32	170	40	
PSKN R/L 3232 P19	32	32	170	40	SN □□ 19 06 □□
PSKN R/L 4040 S19	40	40	250	50	

TURNING HOLDER
(EXTERNAL)

P Series



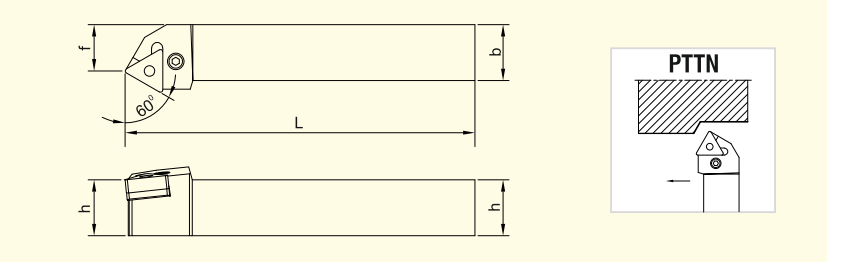
ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
PSSN R/L 1616 H09	16	16	100	20	SN □□ 09 03 □□
PSSN R/L 2020 K12	20	20	125	25	SN □□ 12 04 □□
PSSN R/L 2525 M12	25	25	150	32	
PSSN R/L 3232 P12	32	32	170	40	
PSSN R/L 3232 P15	32	32	170	40	SN □□ 15 06 □□
PSSN R/L 3232 P19	32	32	170	40	SN □□ 19 06 □□
PSSN R/L 4040 S25	40	40	250	50	SN □□ 25 07 □□



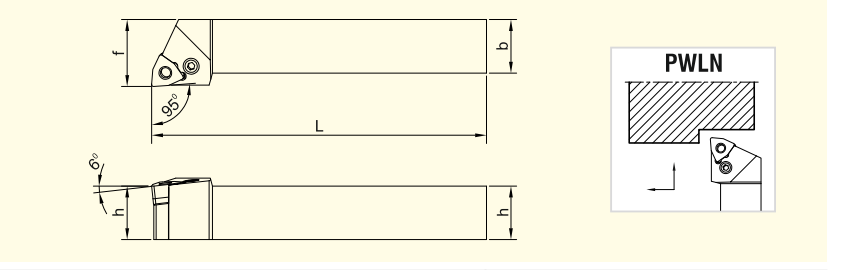
ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
PTFN R/L 1616 H16	16	16	100	20	TN □□ 16 04 □□
PTFN R/L 2020 K16	20	20	125	25	
PTFN R/L 2525 M16	25	25	150	32	
PTFN R/L 2525 M22	32	32	150	32	TN □□ 22 04 □□
PTFN R/L 3232 P22	32	32	170	40	
PTFN R/L 4040 S27	40	40	250	50	TN □□ 27 06 □□

TURNING HOLDER
(EXTERNAL)

P Series



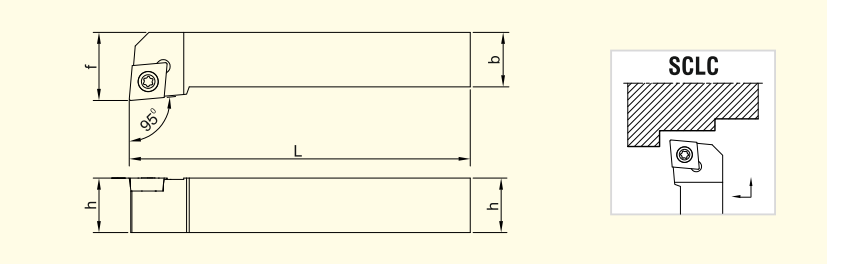
ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
PTTN R/L 1616 H16	16	16	100	13	TN □□ 16 04 □□
PTTN R/L 2020 K16	20	20	125	17	
PTTN R/L 2525 M22	25	25	150	22	TN □□ 22 04 □□



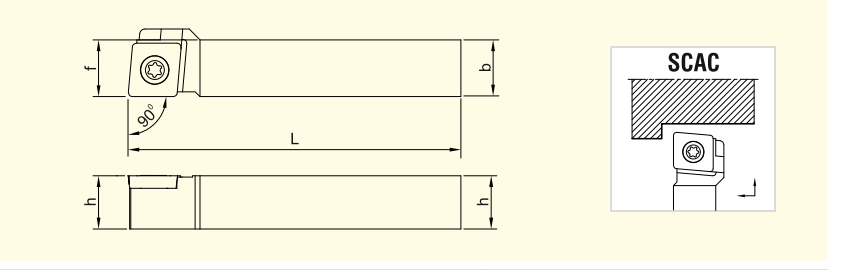
ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
PWLN R/L 1616 H06	16	16	100	20	WN □□ 06 04 □□
PWLN R/L 2020 K06	20	20	125	25	
PWLN R/L 2525 M06	25	25	150	32	
PWLN R/L 2020 K08	20	20	125	25	WN □□ 08 04 □□
PWLN R/L 2525 M08	25	25	150	32	

TURNING HOLDER
(EXTERNAL)

S Series



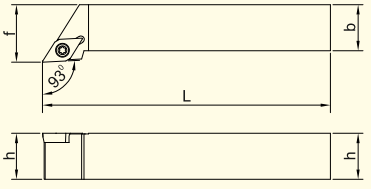
ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
SCLC R/L 1010 E06	10	10	70	12	CC □□ 06 02 □□
SCLC R/L 1212 F09	12	12	80	16	CC □□ 09 T3 □□
SCLC R/L 1616 H09	16	16	100	20	
SCLC R/L 2020 K12	20	20	125	25	CC □□ 12 04 □□
SCLC R/L 2525 M12	25	25	150	32	

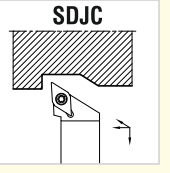


ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
SCAC R/L 1010 E06	10	10	70	10	CC □□ 06 02 □□
SCAC R/L 1212 F09	12	12	80	12	CC □□ 09 T3 □□
SCAC R/L 1616 H09	16	16	100	16	
SCAC R/L 2525 M12	25	25	150	25	CC □□ 12 04 □□

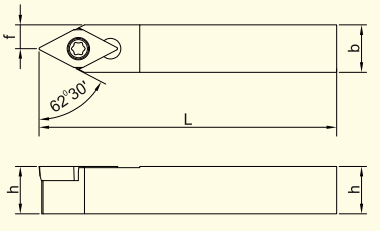
TURNING HOLDER
(EXTERNAL)

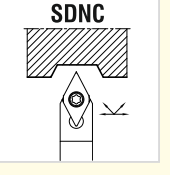
S Series





ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
SDJC R/L 0808 E07	8	8	70	10	DC □□ 07 02 □□
SDJC R/L 1212 F07	12	12	80	16	
SDJC R/L 1616 H07	16	16	100	20	
SDJC R/L 1616 H11	16	16	100	20	DC □□ 11 T3 □□
SDJC R/L 2020 K11	20	20	125	25	
SDJC R/L 2525 M11	25	25	150	32	

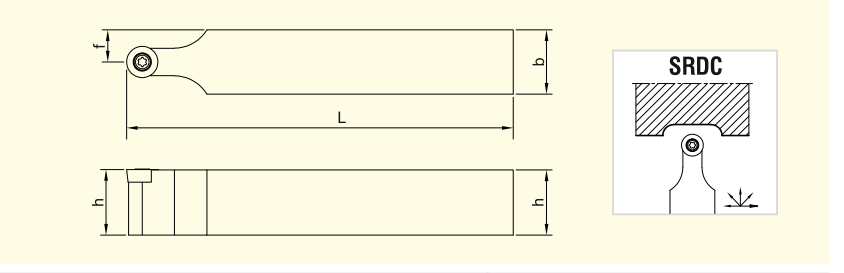




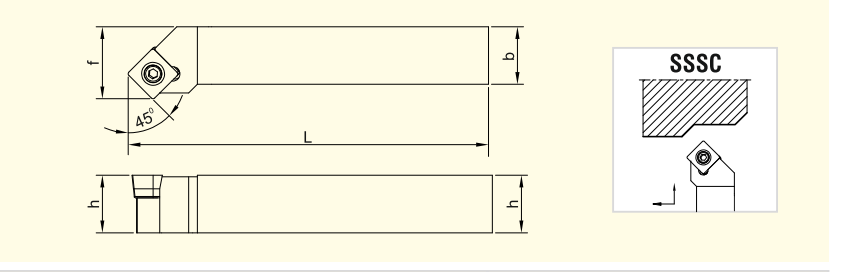
ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
SDNC N 1010 E07	10	10	70	5	DC □□ 07 02 □□
SDNC N 1616 H11	16	16	100	8	DC □□ 11 T3 □□
SDNC N 2020 K11	20	20	125	10	DC □□ 11 T3 □□
SDNC N 2525 M11	25	25	150	12.5	DC □□ 11 T3 □□

TURNING HOLDER
(EXTERNAL)

S Series



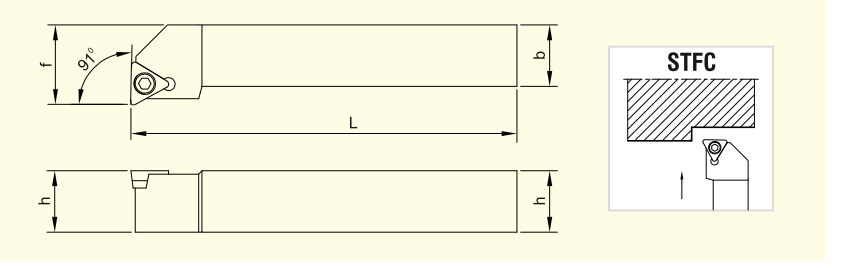
ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
SRDC N 1616 H10	16	16	100	8	RP □□ 10 03 □□
SRDC N 2020 K10	20	20	125	10	
SRDC N 2525 M10	25	25	150	12.5	
SRDC N 2020 K12	20	20	125	10	RP □□ 12 04 □□
SRDC N 2525 M12	25	25	150	12.5	RP □□ 12 04 □□



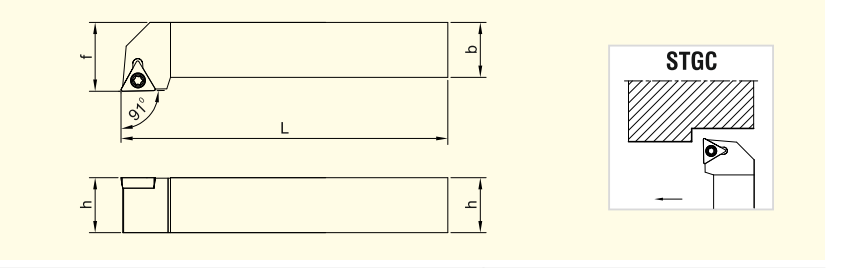
ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
SSSC R/L 1616 H09	16	16	100	17	SC □□ 09 T3 □□
SSSC R/L 2020 K12	20	20	125	22	SC □□ 12 04 □□
SSSC R/L 2525 M12	25	25	150	27	

TURNING HOLDER
(EXTERNAL)

S Series



ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
STFC R/L 1212 F11	12	12	80	16	TC □□ 11 02 □□
STFC R/L 1616 H11	16	16	100	20	
STFC R/L 1616 H16	16	16	100	20	TC □□ 16 T3 □□
STFC R/L 2020 K16L	20	20	125	25	



ITEM CODE	Dimension (mm)				Suitable Insert Code
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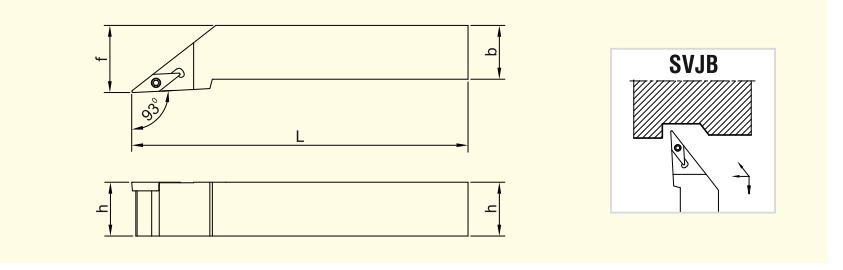
STGC R/L 1212 F11	12	12	80	16	TC □□ 11 02 □□
STGC R/L 1616 H11	16	16	100	20	
STGC R/L 2020 K16	20	20	125	25	TC □□ 16 T3 □□
STGC R/L 2525 M16	25	25	150	32	

TURNING HOLDER
(EXTERNAL)

S Series



ITEM CODE	Dimension (mm)				Suitable Insert Code
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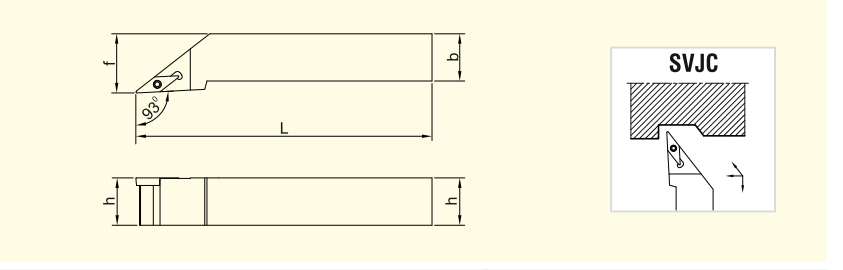
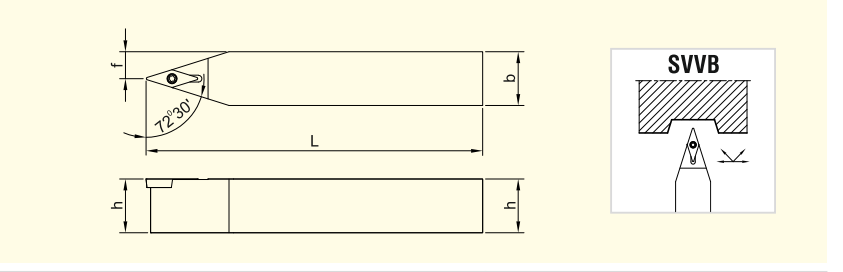
SVJB R/L 1616 H11	16	16	100	20	VB □□ 11 02 □□
SVJB R/L 2020 K16	20	20	125	25	VB □□ 16 04 □□
SVJB R/L 2525 M16	25	25	150	32	
SVJB R/L 3225 P16	32	25	170	32	



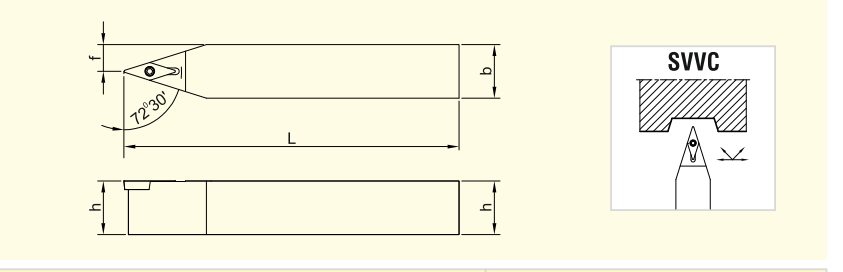
ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
SVJC R/L 2020 K11	20	20	125	25	VC □□ 11 03 □□
SVJC R/L 1616 H16	16	16	100	20	VC □□ 16 04 □□
SVJC R/L 2020 K16	20	20	125	25	VC □□ 16 04 □□
SVJC R/L 2525 M16	25	25	150	32	
SVJC R/L 3232 P16	32	32	170	40	

TURNING HOLDER
(EXTERNAL)

S Series



ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
SVVB N 1616 H11	16	16	100	8	VB □□ 11 02 □□
SVVB N 2020 K11	20	20	125	10	
SVVB N 2020 K16	20	20	125	10	VB □□ 16 04 □□
SVVB N 2525 M16	25	25	150	12.5	



ITEM CODE	Dimension (mm)				Suitable Insert Code
	h	b	L	f	
SVVC N 1212 F11	12	12	80	6	VC □□ 11 03 □□
SVVC N 1616 H11	16	16	100	8	
SVVC N 2020 K16	20	20	125	10	VC □□ 16 04 □□
SVVC N 2525 M16	25	25	150	12.5	

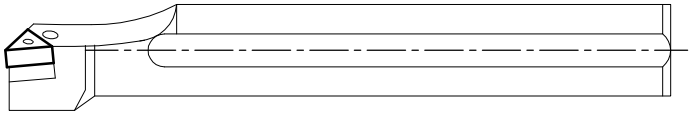
BLOOD®
ROTATING GENIUS

TURNING HOLDER

INTERNAL

NOMENCLATURE

TURNING HOLDER - INTERNAL



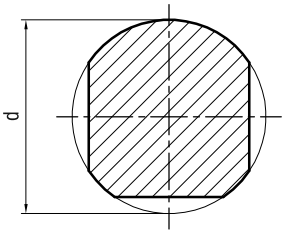
S	12	M	S	C	L	C	R	06
1	2	3	4	5	6	7	8	9

1. TOOL HOLDER TYPE

A = Steel with coolant passage
S = Solid Steel
E = Solid carbide with brazed*

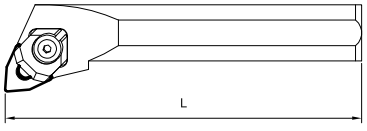
* Brazed or equivalent

2. SHANK DIAMETER



12	= 12 mm
20	= 20 mm

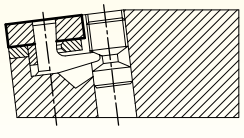
3. TOOL LENGTH



K	= 125 mm	R	= 200 mm
L	= 140 mm	S	= 250 mm
M	= 150 mm	T	= 300 mm
N	= 160 mm	U	= 350 mm
P	= 170 mm	V	= 400 mm

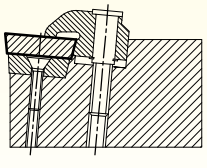
4. INSERT CLAMPING

P



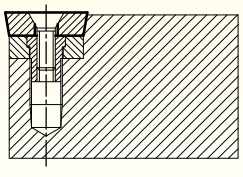
Pin / Wedge

C/D



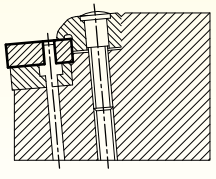
Double Clamp

S



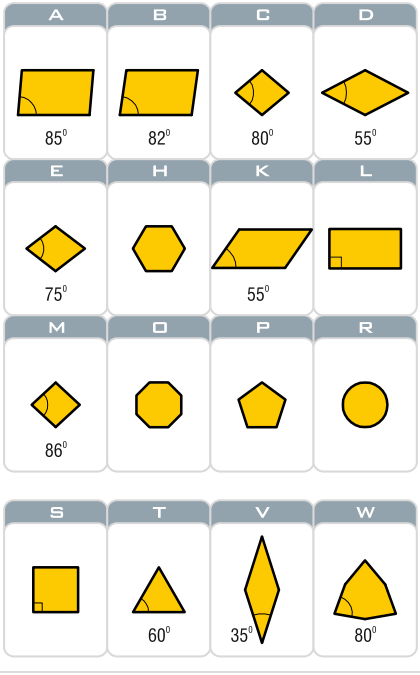
Screw

M



Pin / Clamp

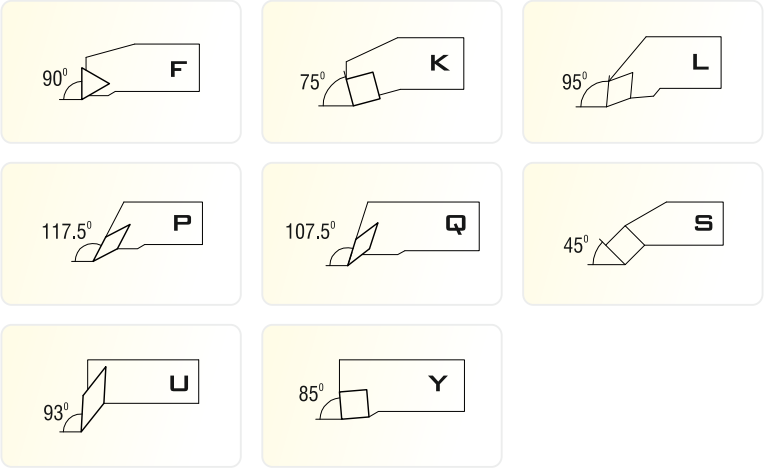
5. INSERT SHAPE



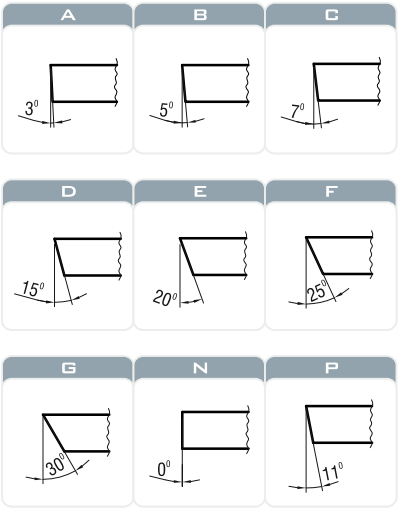
NOMENCLATURE

TURNING HOLDER - INTERNAL

6. TOOL TYPE

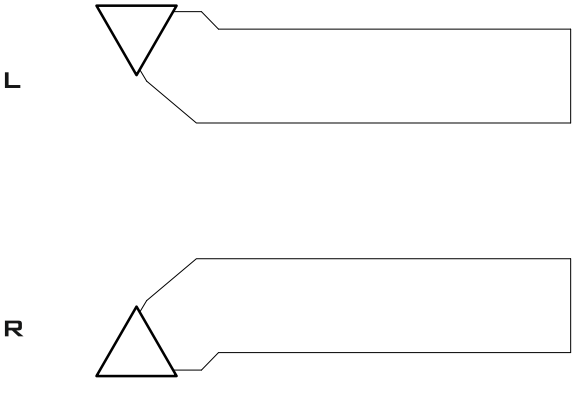


7. INSERT CLEARANCE ANGLE

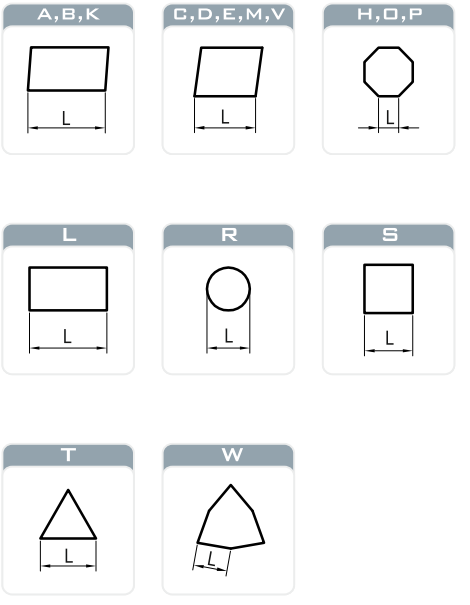


0 = SPECIAL

8. CUTTING DIRECTION

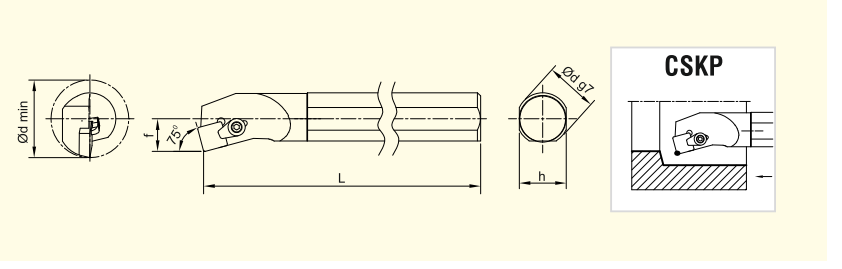


9. CUTTING EDGE LENGTH

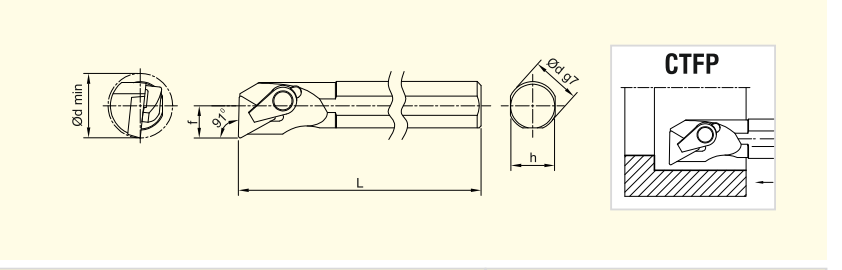


TURNING HOLDER
(INTERNAL)

C Series



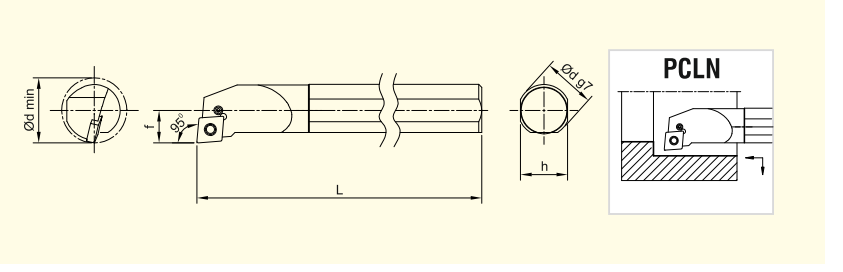
ITEM CODE	Dimension (mm)					Suitable Insert Code
	h	D min	d	L	f	
S16Q CSKPR/L09	15	20	16	180	11	SP □□ 09 03 □□
S20R CSKPR/L09	18	25	20	200	13	
S25S CSKPR/L12	23	32	25	250	17	SP □□ 12 03 □□
S32T CKSP R/L12	30	40	32	300	22	



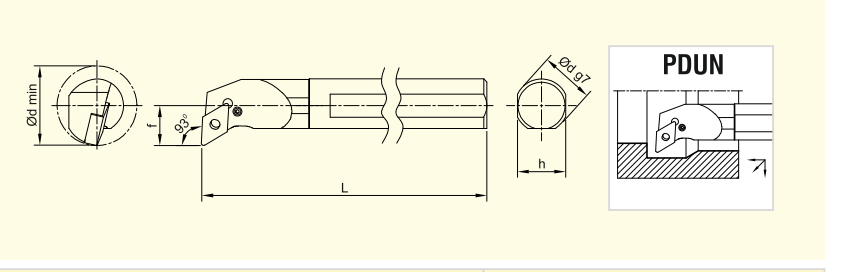
ITEM CODE	Dimension (mm)					Suitable Insert Code
	h	D min	d	L	f	
S12M CTFPR/L11	11	16	12	150	9	TP □□ 11 03 □□
S16Q CTFPR/L11	15	20	16	180	11	
S20R CTFPR/L16	18	25	20	200	13	TP □□ 16 03 □□
S25S CTFPR/L16	23	32	25	250	17	
S32T CTFPR/L16	30	40	32	300	22	

TURNING HOLDER
(INTERNAL)

P Series

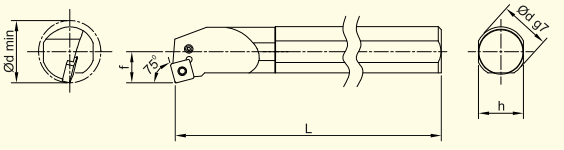


ITEM CODE	Dimension (mm)					Suitable Insert Code
	h	D min	d	L	f	
S16R PCLNR/L09	15	20	16	200	11	CN □□ 09 03 □□
S20S PCLNR/L09	18	25	20	250	13	
S20T PCLNR/L09	18	25	20	300	13	
S25T PCLNR/L09	23	32	25	300	17	
S25T PCLNR/L12	23	32	25	300	17	CN □□ 12 04 □□
S32S PCLNR/L12	30	40	32	250	22	
S40V PCLNR/L12	37	50	40	400	27	
S50W PCLNR/L12	47	63	50	450	35	

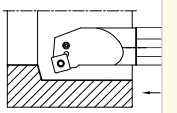


ITEM CODE	Dimension (mm)					Suitable Insert Code
	h	D min	d	L	f	
S25Q PDUNR/L11	23	32	25	180	17	DN □□ 11 04 □□
S32U PDUNR/L15	30	40	32	350	22	DN □□ 15 06 □□
S40V PDUNR/L15	37	50	40	400	27	
S32R PDUNR/L11	30	40	30	200	22	DN □□ 11 04 □□
S32U PDUNR/L11	30	40	32	350	22	
S40S PDUNR/L15	37	50	40	250	27	DN □□ 15 06 □□

TURNING HOLDER
(INTERNAL)
P Series



PSKN



ITEM CODE	Dimension (mm)					Suitable Insert Code
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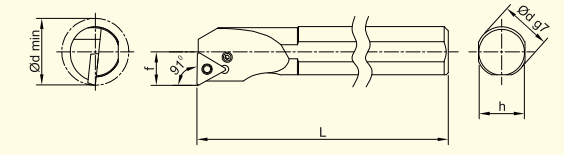
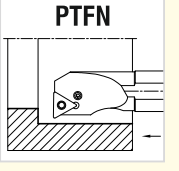
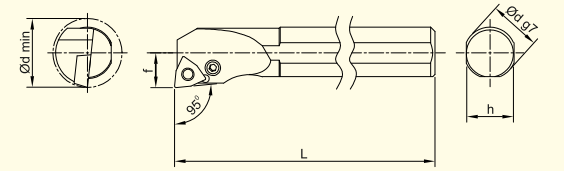
S25T PSKNR/L12	23	32	25	300	17	SN □□ 12 04 □□
S32U PSKNR/L12	30	44	32	350	22	
S40V PSKNR/L12	37	54	40	400	27	



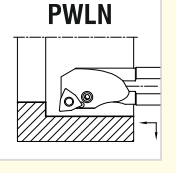
PTFN



ITEM CODE	Dimension (mm)					Suitable Insert Code
	h	D min	d	L	f	
S20Q PTFNR/L11	18	25	20	180	13	TN □□ 11 03 □□
S25T PTFNR/L16	23	32	25	300	17	TN □□ 16 04 □□
S32U PTFNR/L16	30	44	32	350	22	
S40V PTFNR/L16	37	54	40	400	27	



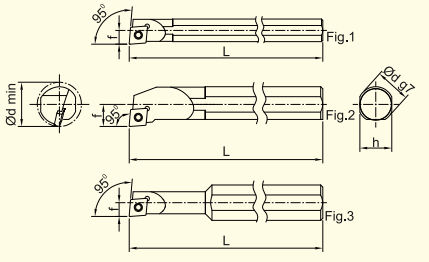
PWLN

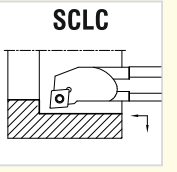


ITEM CODE	Dimension (mm)					Suitable Insert Code
	h	D min	d	L	f	
S16R PWLNR/L06	15	20	16	200	11	WN □□ 06 04 □□
S20R PWLNR/L06	18	25	20	200	13	
S25T PWLNR/L06	23	32	25	300	17	
S20Q PWLNR/L08	18	25	20	180	13	WN □□ 08 04 □□
S25Q PWLNR/L08	23	32	25	180	17	
S32R PWLNR/L08	30	40	32	200	22	

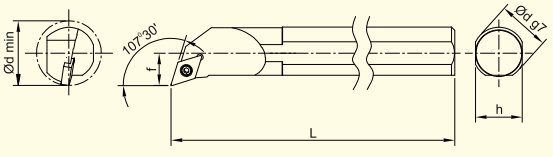
TURNING HOLDER (INTERNAL)

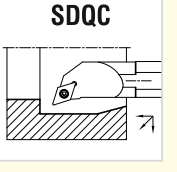
S Series



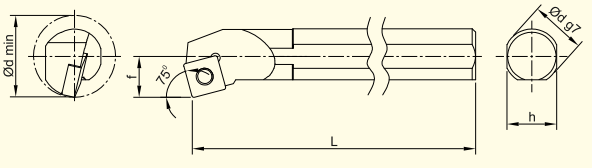


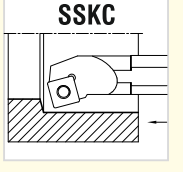
ITEM CODE	Dimension (mm)					Suitable Insert Code
	h	D min	d	L	f	
S08K SCLCR/L06	7	10	8	125	5	CC □□ 06 02 □□
S10M SCLCR/L06	9	12	10	150	6	
S12M SCLCR/L06	11	16	12	150	9	
S12M SCLCR/L09	11	16	12	150	9	CC □□ 09 T3 □□
S16M SCLCR/L09	15	20	16	150	11	
S20M SCLCR/L09	18	25	20	150	13	
S32S SCLCR/L12	30	40	32	250	22	CC □□ 12 04 □□





ITEM CODE	Dimension (mm)					Suitable Insert Code
	h	D min	d	L	f	
S10M SDQCR/L07	9	13	10	150	7	DC □□ 07 02 □□
S12M SDQCR/L07	11	16	12	150	9	
S16R SDQCR/L07	15	20	16	200	11	
S20Q SDQCR/L11	18	25	20	180	1	DC □□ 11 T3 □□
S25Q SDQCR/L11	23	32	25	180	17	

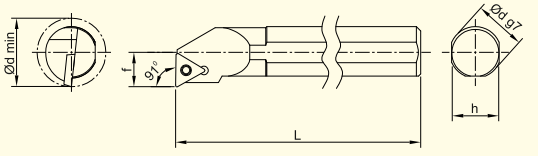




ITEM CODE	Dimension (mm)					Suitable Insert Code
	h	D min	d	L	f	
S16R SSKCR/L09	15	20	16	200	11	SC □□ 09 T3 □□
S20S SSKCR/L09	18	15	20	250	13	
S25T SSKCR/L12	23	32	25	300	17	SC □□ 12 04 □□

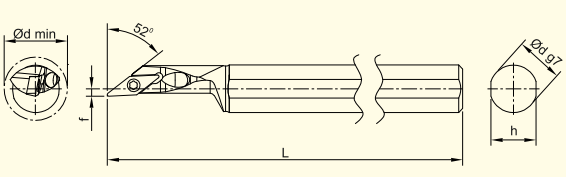
TURNING HOLDER (INTERNAL)

S Series



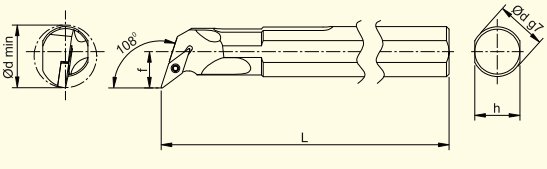
STFC

ITEM CODE	Dimension (mm)					Suitable Insert Code
	h	D min	d	L	f	
S12M STFCR/L11	11	16	12	150	9	TC □□ 11 02 □□
S16M STFCR/L11	15	20	16	150	11	
S16R STFCR/L11	15	20	16	200	11	
S20S STFCR/L11	18	25	20	250	13	
S20S STFCR/L16	18	25	20	250	13	TC □□ 16 T3 □□
S25T STFCR/L16	23	32	25	300	17	
S32U STFCR/L16	30	40	32	350	22	



SVJC

ITEM CODE	Dimension (mm)					Suitable Insert Code
	h	D min	d	L	f	
S12M SVJCR/L11	11	16	12	150	7	VC □□ 11 04 □□
S16Q SVJCR/L11	15	20	16	180	9	
S16Q SVJCR/L16	15	20	16	180	9	VC □□ 16 04 □□
S20R SVJCR/L16	18	24	20	200	10.5	
S25R SVJCR/L16	23	31	25	200	13.5	
S32S SVJCR/L16	30	40	32	250	17	

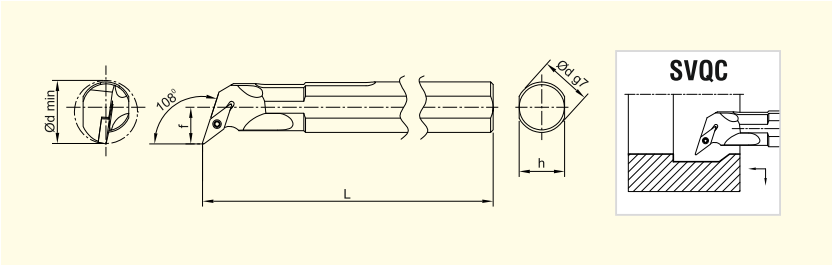


SVQB

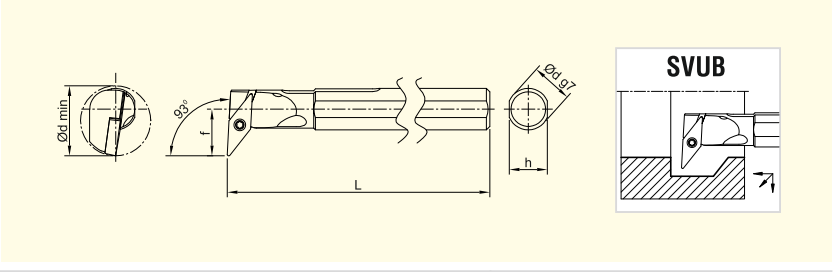
ITEM CODE	Dimension (mm)					Suitable Insert Code
	h	D min	d	L	f	
S25S SVQBR/L16	23	32	25	250	17	VB □□ 16 04 □□
S32T SVQBR/L16	30	40	32	300	22	
S40U SVQBR/L16	37	50	40	350	27	

TURNING HOLDER (INTERNAL)

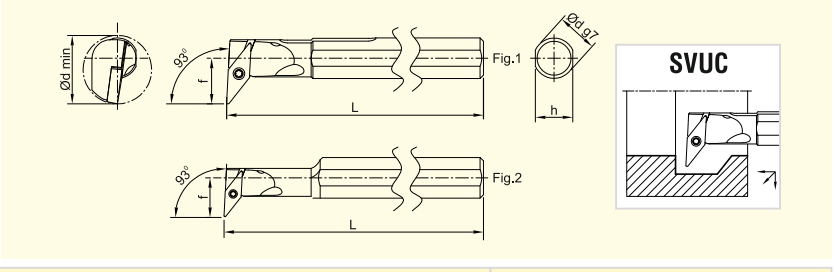
S Series



ITEM CODE	Dimension (mm)					Suitable Insert Code
	h	D min	d	L	f	
S25S SVQCR/L16	23	32	25	250	17	VC □□ 16 04 □□
S32T SVQCR/L16	30	40	32	300	22	
S40U SVQCR/L16	37	50	40	350	27	

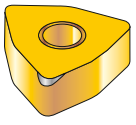
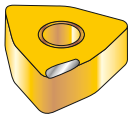
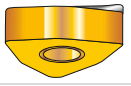
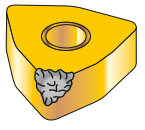
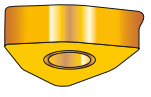
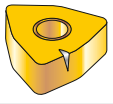


ITEM CODE	Dimension (mm)					Suitable Insert Code
	h	D min	d	L	f	
S32U SVUBR/L16	30	40	32	350	22	VB □□ 16 04 □□
S40V SVUBR/L16	37	50	40	400	27	



ITEM CODE	Dimension (mm)					Suitable Insert Code
	h	D min	d	L	f	
S25S SVUCR/L16	23	32	25	250	19	VC □□ 16 04 □□
S32T SVUCR/L16	30	40	32	300	22	
S40U SVUCR/L16	37	50	40	350	27	

TROUBLESHOOTING - TURNING

	Problem	Cause	Remedy
	**Flank wear in insert**	improper insert grade	select suitable / harder insert grade
		improper cutting edge geometry	select appropriate chip breaker
			select insert with bigger nose radius
		improper cutting parameters	decrease cutting speed
			increase feed rate
			use appropriate coolant grade
	**Crater wear in insert**	improper cutting edge geometry	select appropriate chip breaker
		improper cutting conditions	decrease cutting speed
			decrease feed rate
			increase coolant flow pressure
	**Chip welding / Edge built-up**	improper cutting edge geometry	use positive insert geometry
		improper cutting parameters	increase cutting speed
	**Insert fracture or Insert chipping**	improper insert grade	select suitable / harder insert grade
		improper cutting parameters	decrease feed rate
			decrease depth of cut
		weak cutting edge	select appropriate chip breaker
			select insert with bigger nose radius
		thermal crack occurance	decrease cutting speed
			decrease feed rate
			decrease depth of cut
			use appropriate coolant grade
	**Plastic deformation in insert**	improper cutting edge geometry	select appropriate chip breaker
		improper cutting conditions	decrease cutting speed
			decrease feed rate
			increase coolant flow pressure
	**Notch wear in insert**	improper cutting conditions	decrease cutting speed
			decrease feed rate
			increase coolant flow pressure
	Poor surface finish	chip welding	increase cutting speed
			use appropriate coolant grade
		improper cutting edge geometry	select appropriate chip breaker
			use insert with bigger nose radius
		chattering	decrease cutting speed
			decrease feed rate
			decrease depth of cut
			improve tool holder rigidity
			increase clamping rigidity of tool & workpiece
			minimize holder overhang
		run-out in work-piece	eliminate workpiece run-out
	Dimensional inaccuracy	poor insert accuracy	select suitable insert grade
		large cutting edge wear	select appropriate chip breaker
			select insert with smaller nose radius
			improve tool holder rigidity
			increase clamping rigidity of tool & workpiece
			minimize holder overhang
	Long chips	improper cutting parameters	decrease cutting speed
			increase feed rate
			increase depth of cut
		improper cutting edge geometry	use positive insert geometry
			select insert with smaller nose radius

BLOOD®
ROTATING GENIUS

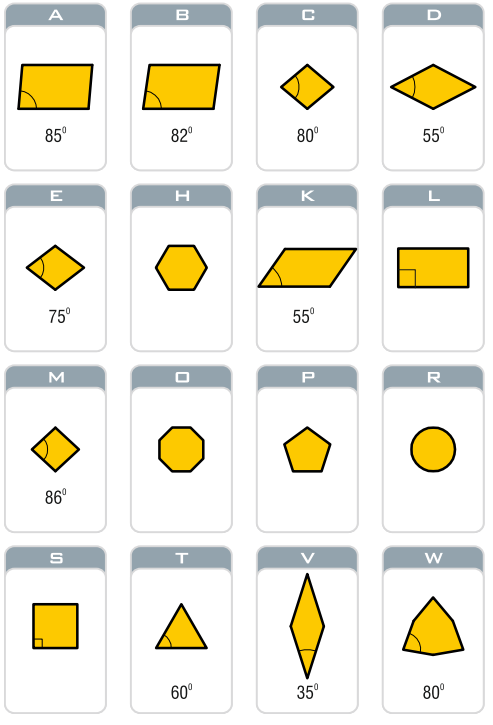
MILLING INSERT

NOMENCLATURE

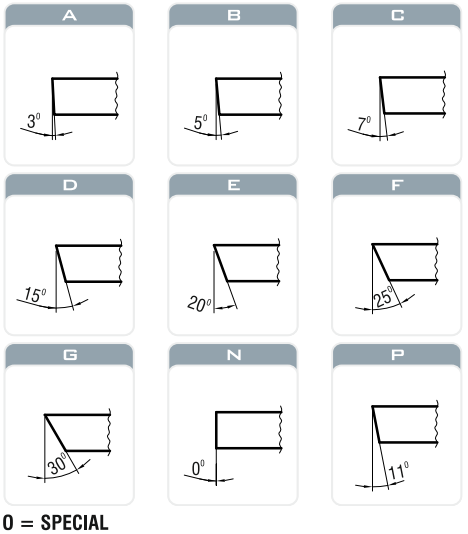
MILLING INSERT

A	P	K	T	16	04	P	D	F	R	-	303
1	2	3	4	5	6	7	8	9	10		11

1. INSERT SHAPE



2. CLEARANCE ANGLE

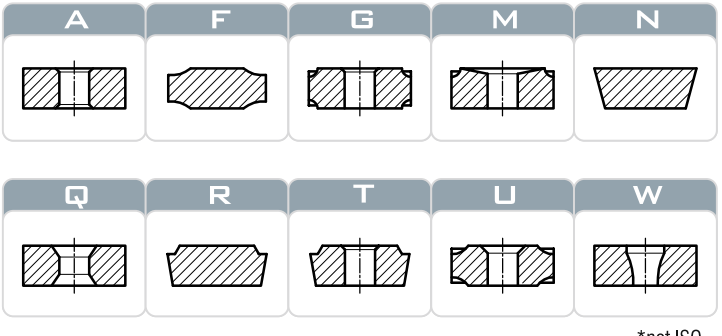


O = SPECIAL

3. TOLERANCES

Tol. class	Tolerance +/- m	Tolerance +/- s	Tolerance +/- d	For d, Dimension mm 3.175*	4.76	6.35	9.525	12.70	15.875	19.05	25.4	31.75	38.1
A	0.005	0.025	0.025	●	●	●	●	●	●	●	●	●	●
E	0.005	0.025	0.025	●	●	●	●	●	●	●	●	●	●
F	0.005	0.025	0.013	●	●	●	●	●	●	●	●	●	●
G	0.005	0.130	0.025	●	●	●	●	●	●	●	●	●	●
H	0.013	0.025	0.013	●	●	●	●	●	●	●	●	●	●
K	0.013	0.025	0.050				●						
	0.013	0.025	0.080					●					
	0.013	0.025	0.100						●	●			
	0.013	0.025	0.130							●			
	0.013	0.025	0.150								●	●	
M	0.080	0.130	0.050	●	●	●	●						
	0.130	0.130	0.080					●					
	0.150	0.130	0.100						●	●			
	0.180	0.130	0.130							●			
	0.200	0.130	0.150								●	●	

4. CLAMPING TYPE



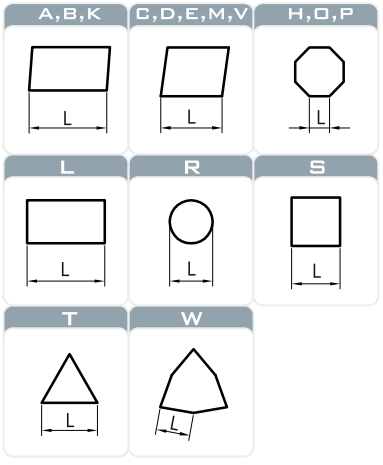
*not ISO

X = SPECIAL

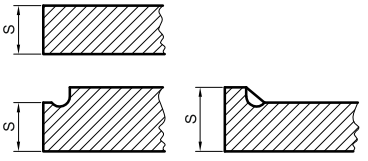
NOMENCLATURE

MILLING INSERT

5. CUTTING EDGE LENGTH

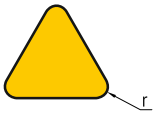


6. THICKNESS



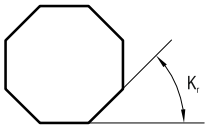
01	= 1.59 mm	04	= 4.76 mm
T1	= 1.98 mm	05	= 5.56 mm
02	= 2.38 mm	06	= 6.35 mm
03	= 3.18 mm	07	= 7.94 mm
T3	= 3.97 mm	08	= 8.00 mm

7,8. NOSE RADIUS



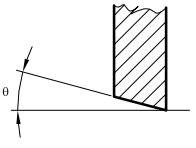
MO*	= Round Inserts
00	= Sharp
02	= 0.2
04	= 0.4
08	= 0.8
12	= 1.2
16	= 1.6

7. APPROACH ANGLE



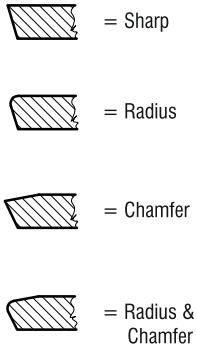
A	= 15°
D	= 60°
E	= 75°
F	= 85°
P	= 90°
Z	= Others

8. CLEARANCE ANGLE OF LAND

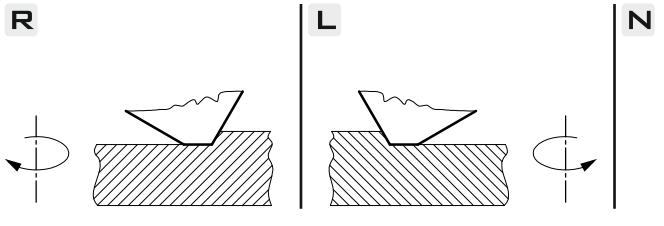


A	= 3°	F	= 25°
B	= 5°	G	= 30°
C	= 7°	N	= 0°
D	= 15°	P	= 11°
E	= 20°	Z	= Others

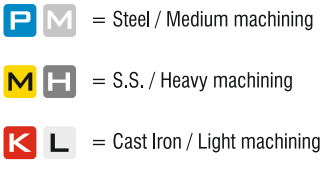
9. CUTTING EDGE TYPE



10. CUTTING DIRECTION

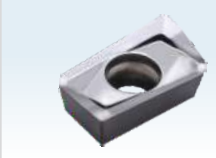


11. CHIP BREAKER CODE

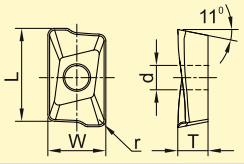


MILLING INSERT

A Series

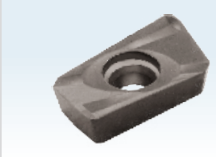


APKT

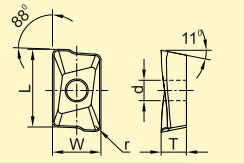


P M K N S H

ITEM CODE	DIMENSIONS					CUTTING DATA			GRADE	
	L	T	W	d	r	Cutting Depth a_p mm	Feed F_z mm / Rev.	Cutting Speed m/min	1110	HOT 164
APKT 11 35 04 PD FR	12.24	3.97	6.5	2.8	0.4	max. 10.5	0.18 (0.1-0.3)	290	★	
APKT 11 35 08 PD FR	12.24	3.97	6.5	2.8	0.8	max. 10.5	0.18 (0.1-0.3)	290	★	
APKT 16 04 04 PD FR	16.88	4.76	9.8	4.4	0.4	max. 15.5	0.18 (0.1-0.3)	290	★	★
APKT 16 04 08 PD FR	16.88	4.76	9.8	4.4	0.8	max. 15.5	0.18 (0.1-0.3)	290	★	★
APKT 16 T4 08 HFR	16.88	4.76	9.8	4.4	0.8	max. 15.5	0.18 (0.1-0.3)	290	★	



APMT



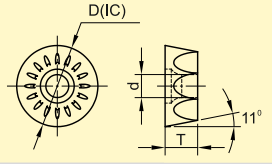
P M K N S H

ITEM CODE	DIMENSIONS					CUTTING DATA			GRADE		
	L	T	W	d	r	Cutting Depth a_p mm	Feed F_z mm / Rev.	Cutting Speed m/min	132	819	HOT 303
APMT 11 35 04 PD ER	11.21	3.97	6.2	2.8	0.4	max. 10.5	0.10 (0.08-0.20)	130	★		
APMT 11 35 08 PD ER	11.21	3.97	6.2	2.8	0.8	max. 10.5	0.10 (0.08-0.20)	130	★		★
APMT 11 35 16 PD ER	11.21	3.97	6.2	2.8	0.8	max. 10.5	0.10 (0.08-0.20)	130		★	
APMT 16 04 08 PD ER	17.15	4.76	9.28	4.4	0.8	max. 15.5	0.18 (0.1-0.25)	140	★		★
APMT 16 04 12 PD ER	17.15	4.76	9.28	4.4	1.2	max. 15.5	0.18 (0.1-0.25)	140	★		
APMT 16 04 16 PD ER	17.15	4.76	9.28	4.4	1.6	max. 15.5	0.18 (0.1-0.25)	140	★		
APMT 16 04 30 PD ER	17.15	4.76	9.28	4.4	3.0	max. 15.5	0.18 (0.1-0.25)	140			
APMT 16 05 08 PD ER	17.15	5.56	9.28	4.4	0.8	max. 15.5	0.18 (0.1-0.25)	140		★	

MILLING INSERT

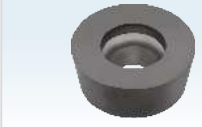
R Series

RPMT

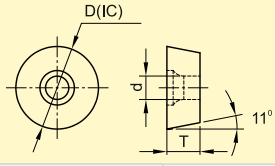


P M K N S H

ITEM CODE	DIMENSIONS			CUTTING DATA			GRADE		
	T	D (IC)	θ	Cutting Depth a_p mm	Feed F_z mm / Rev.	Cutting Speed m/min	21019	1019	819 HOT
RPMT 08 03 M0 E	3.18	8	11°	max. 4	0.25 (0.20-0.35)	220	★	★	
RPMT 10 T3 M0 E	3.97	10	11°	max. 5	0.25 (0.20-0.35)	220	★	★	★
RPMT 12 04 M0 E	4.76	12	11°	max. 6	0.27 (0.21-0.35)	220	★	★	★



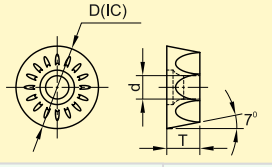
RPMW



P M K N S H

ITEM CODE	DIMENSIONS			CUTTING DATA			GRADE		
	T	D (IC)	θ	Cutting Depth a_p mm	Feed F_z mm / Rev.	Cutting Speed m/min	21019 HOT	1019	
RPMW 08 03 M0 E	3.18	8	11°	max. 4	0.25 (0.20-0.35)	220	★	★	
RPMW 10 T3 M0 E	3.97	10	11°	max. 5	0.25 (0.20-0.35)	220	★	★	
RPMW 12 04 M0 E	4.76	12	11°	max. 6	0.27 (0.21-0.35)	220	★	★	

RCGT

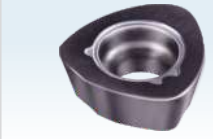


P M K N S H

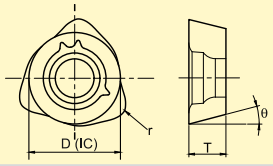
ITEM CODE	DIMENSIONS			CUTTING DATA			GRADE		
	T	D (IC)	θ	Cutting Depth a_p mm	Feed F_z mm / Rev.	Cutting Speed m/min	128		
RCGT 08 03 M0 E	3.18	8	7°	max. 4	0.25 (0.20-0.35)	220	★		
RCGT 10 T3 M0 E	3.97	10	7°	max. 5	0.25 (0.20-0.35)	220	★		
RCGT 12 04 M0 E	3.97	12	7°	max. 6	0.27 (0.21-0.35)	220	★		

MILLING INSERT

J Series

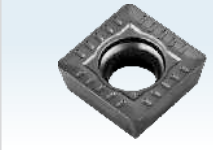


JOMW

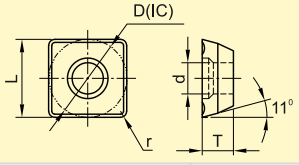


ITEM CODE	DIMENSIONS					GRADE		
	T	D (IC)	θ	L	r	HOT JT7370		
JOMW 06 T2 15	2.78	6.35	13°	06	1.5	★		
JOMW 08 03 20	3.18	8.00	13°	08	2.0	★		
JDMW 09 T3 20	3.97	9.52	15°	09	2.0	★		

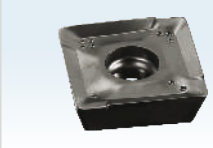
S Series



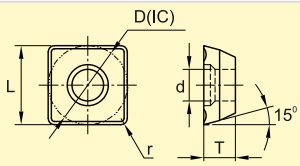
SPMT



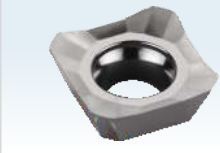
ITEM CODE	DIMENSIONS					CUTTING DATA			GRADE		
	L	T	D (IC)	r	θ	Cutting Depth a_p mm	Feed F_z mm / Rev.	Cutting Speed m/min	HOT 451		
SPMT 09 T3 08	9.52	3.97	9.52	0.8	11°	2.5 (0.50-6)	0.28 (0.15-0.43)	250	★		
SPMT 12 04 08	12.70	4.76	12.70	0.8	11°	3.5 (0.50-7)	0.28 (0.20-0.48)	250	★		



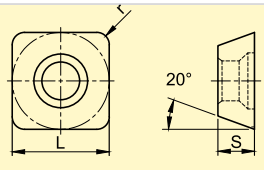
SDMT



ITEM CODE	DIMENSIONS					CUTTING DATA			GRADE		
	L	T	D (IC)	r	θ	Cutting Depth a_p mm	Feed F_z mm / Rev.	Cutting Speed m/min	HOT 2014	G753	164
SDMT 09 T3 12	9.52	3.97	9.52	1.2	15°	2.5 (0.50-6)	0.28 (0.15-0.43)	250		★	
SDMT 12 04 08	12.70	4.76	12.70	0.8	15°	3.5 (0.50-7)	0.35 (0.20-0.48)	250	★		
SDMT 12 05 12	12.70	4.76	12.70	1.2	15°	3.5 (0.50-7)	0.35 (0.20-0.48)	250			★

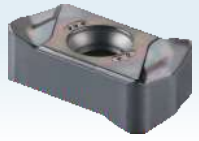


SEKT

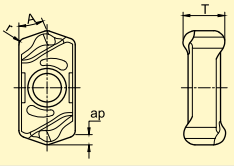


ITEM CODE	DIMENSIONS			CUTTING DATA			GRADE
	L	S	r	Cutting Depth a_p mm	Feed F_z mm / Rev.	Cutting Speed m/min	HOT
SEKT 12 04 AFN	12.7	4.76	Chf.	5.0 (0.5-11.5)	0.40 (0.10-0.50)	400	SA

HEAVY MILLING INSERTS



LNMU

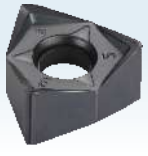


P M K N S H

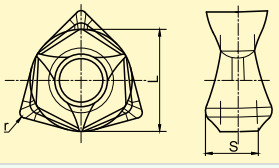
MX 22 ■ ◪ ■ ◪ □ □

MX 29 ■ ■ ■ ◪ ◪ ◪

ITEM CODE	DIMENSIONS				GRADE
	L	S	r	No. of Corners	HOT
LNMU 03 03 - **MX 22**	6	4.29	1.2	4	MX 22
LNMU 03 03 - **MX 29**	6	4.29	1.2	4	MX 29



WNMX

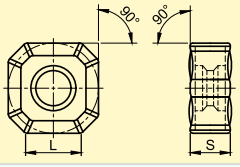


P M K N S H

■ ◪ ■ ◪ ◪ ◪

ITEM CODE	DIMENSIONS				GRADE
	L	S	r	No. of Corners	HOT
WNMX 08 06 08 - MX	14.02	6.65	0.8	6	MX

SNMU

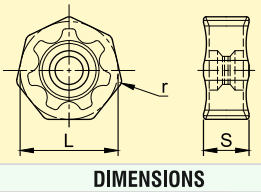


P M K N S H

■ ◪ ■ ◪ ◪ ◪

ITEM CODE	DIMENSIONS				GRADE
	L	S	r	No. of Corners	HOT
SNMU 15 05 15 - MX	8	6.2	0.5	8	MX

HNMX



P M K N S H

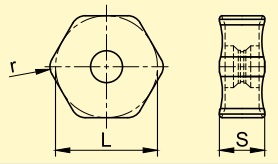
MX-22 ■ ◪ ■ ◪ □ □

MX-33 ■ ■ ■ ◪ ◪ ◪

ITEM CODE	DIMENSIONS				GRADE
	L	S	r	No. of Corners	HOT
HNMX 09 06 12 - MX 22	16.5	6.35	1.2	12	MX-22
HNMX 09 06 12 - MX 33	16.5	6.35	1.2	12	MX-33

HEAVY MILLING INSERTS

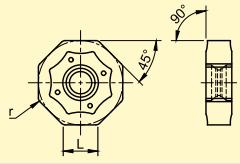
NNMU



P M K N S H

ITEM CODE	DIMENSIONS				GRADE
	L	S	r	No. of Corners	HOT
NNMU 20 07 08 - MX	20	7.28	0.8	14	MX

ONMU



P M K N S H

ITEM CODE	DIMENSIONS				GRADE
	L	S	r	No. of Corners	HOT
ONMU 06 05 06 - MX	6	5.56	0.6	16	MX
ONMU 08 06 08 - MX	8	6.35	0.8	16	MX

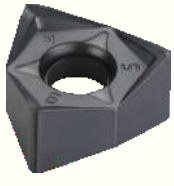
- Both ONMU 06 & SNMU 15 Inserts Fit on the same cutter body for Kr=45^0

RECOMMENDED PARAMETERS

LNMU 03 03 - MX □□

Material Group	Workpiece Material	Hardness	Cutting Speed	Feed per tooth fz (mm)		Depth of Cut	Insert Photo
			Vc m/min	Ø16~Ø32	Ø50~Ø100	ap (mm)	
P	Alloy Steel, MS, Carbon Steel etc.	30~40 HRc	120~350	0.5 ~ 1.2	0.5 ~ 1.5	0.5 ~ 1	
M	Stainless Steel	200~300 HB	70~150	0.1 ~ 0.5	0.2 ~ 0.7	0.5 ~ 1	
K	Cast Iron	150~250 HB	80~300	0.4 ~ 1.1	0.5 ~ 1.4	0.5 ~ 1	
N	Non Ferrous	30~300 HB	550~1000	0.2 ~ 0.5	0.3 ~ 0.8	0.5 ~ 1	
S	Heat Resistant Alloys	40 HRc	20~60	0.1 ~ 0.4	0.1 ~ 0.6	0.5 ~ 1	
H	Hardened Steel	40~60 HRc	40~150	0.03 ~ 0.35	0.05 ~ 0.5	0.5 ~ 1	

WNMX 08 06 08 - MX

Material Group	Workpiece Material	Hardness	Cutting Speed	Feed per tooth	Depth of Cut	Insert Photo
			Vc m/min	fz (mm)	ap (mm)	
P	Alloy Steel, MS, Carbon Steel etc.	30~40 HRc	120 ~ 250	0.1 ~ 0.3	≤4	
M	Stainless Steel	200~300 HB	80 ~ 220	0.09 ~ 0.24	≤4	
K	Cast Iron	150~250 HB	100 ~ 250	0.1 ~ 0.26	≤4	
N	Non Ferrous	30~300 HB	200~900	0.1 ~ 0.3	≤4	
S	Heat Resistant Alloys	40 HRc	20 ~ 50	0.06 ~ 0.2	≤4	
H	Hardened Steel	40~60 HRc	30 ~ 90	0.05 ~ 0.2	≤4	

SNMU 15 05 15 - MX

Material Group	Workpiece Material	Hardness	Cutting Speed	Feed per tooth	Depth of Cut	Insert Photo
			Vc m/min	fz (mm)	ap (mm)	
P	Alloy Steel, MS, Carbon Steel etc.	30~40 HRc	120 ~ 250	0.08 ~ 0.35	≤5	
M	Stainless Steel	200~300 HB	80 ~ 230	0.06 ~ 0.3	≤5	
K	Cast Iron	150~250 HB	100 ~ 250	0.07 ~ 0.35	≤5	
N	Non Ferrous	30~300 HB	300 ~ 900	0.15 ~ 0.4	≤5	
S	Heat Resistant Alloys	40 HRc	40 ~ 100	0.05 ~ 0.3	≤5	
H	Hardened Steel	40~60 HRc	60 ~ 150	0.03 ~ 0.25	≤5	

RECOMMENDED PARAMETERS

HNMX 09 06 12 - MX □□

Material Group	Workpiece Material	Hardness	Cutting Speed	Feed per tooth	Depth of Cut	Depth of Cut	Insert Photo
			V_c m/min	fz (mm)	a_p (mm)	a_e (mm)	
P	Alloy Steel, MS, Carbon Steel etc.	30~40 HRc	70 ~ 260	0.1 ~ 0.35	≤5	≤0.8	
M	Stainless Steel	200~300 HB	60 ~ 150	0.06 ~ 0.3	≤4	≤0.8	
K	Cast Iron	150~250 HB	60 ~ 160	0.07 ~ 0.35	≤5	≤0.8	
N	Non Ferrous	30~300 HB	300 ~ 900	0.2 ~ 0.5	≤4	≤0.8	
S	Heat Resistant Alloys	40 HRc	40 ~ 100	0.05 ~ 0.28	≤3	≤0.6	
H	Hardened Steel	40~60 HRc	60 ~ 150	0.04 ~ 0.28	≤3	≤0.8	

NNMU 20 07 08 - MX

Material Group	Workpiece Material	Hardness	Cutting Speed	Feed per tooth	Depth of Cut	Depth of Cut	Insert Photo
			V_c m/min	fz (mm)	a_p (mm)	a_e (mm)	
P	Alloy Steel, MS, Carbon Steel etc.	30~40 HRc	110 ~ 250	0.09 ~ 0.33	≤5	≤0.8	
M	Stainless Steel	200~300 HB	60 ~ 180	0.07 ~ 0.2	≤4	≤0.8	
K	Cast Iron	150~250 HB	100 ~ 260	0.09 ~ 0.3	≤4	≤0.8	
N	Non Ferrous	30~300 HB	300 ~ 900	0.15 ~ 0.4	≤4	≤0.8	
S	Heat Resistant Alloys	40 HRc	20 ~ 70	0.05 ~ 0.18	≤3	≤0.6	
H	Hardened Steel	40~60 HRc	60 ~ 120	0.05 ~ 0.2	≤3	≤0.8	

ONMU 06 05 06 - MX
ONMU 08 06 08 - MX

Material Group	Workpiece Material	Hardness	Cutting Speed	Feed per tooth	Depth of Cut	Insert Photo
			V_c m/min	fz (mm)	a_p (mm)	
P	Alloy Steel, MS, Carbon Steel etc.	30~40 HRc	120 ~ 250	0.08 ~ 0.45	≤2.5	
M	Stainless Steel	200~300 HB	80 ~ 230	0.06 ~ 0.3	≤2.5	
K	Cast Iron	150~250 HB	100 ~ 250	0.07 ~ 0.45	≤2.5	
N	Non Ferrous	30~300 HB	300 ~ 900	0.2 ~ 0.5	≤2.5	
S	Heat Resistant Alloys	40 HRc	40 ~ 100	0.06 ~ 0.35	≤2.5	
H	Hardened Steel	40~60 HRc	60 ~ 150	0.04 ~ 0.3	≤2.5	

BLOOD®
ROTATING GENIUS

MILLING HOLDER

NOMENCLATURE

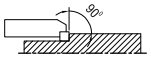
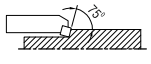
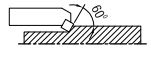
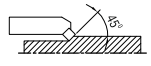
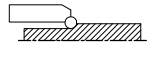
MILLING HOLDER

FM	A	-	S	D	12	-	01	.	080
1	2		3	4	5		6		7

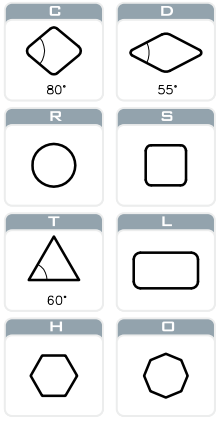
1. CUTTER TYPE

FM	Face Milling
EM	Shoulder Milling
HM	Helical Milling
BM	Profile Milling
CM	Chamfer Milling
XM	Special Milling

2. APPROACH ANGLE

P	90°	
E	75°	
D	60°	
A	45°	
R		

3. INSERT SHAPE



4. INSERT CLEARANCE ANGLE

N	= 0°
B	= 5°
C	= 7°
P	= 11°
D	= 15°
E	= 20°
F	= 25°

5. LENGTH OF CUTTING EDGE

Inscribed Circle Diameter	Insert Shape					
	C	D	R	S	T	L
5.556	---	---	---	---	09	---
6.350	06	07	---	---	11	---
9.525	09	11	09	09	16	---
12.700	12	15	12	12	22	---
15.875	16	19	15	15	27	---
19.050	19	---	19	19	33	---
25.400	25	---	25	25	44	2

6. SERIES CODE

(Refer Page no. 212 & 213)

7. EFFECTIVE CUTTING DIAMETER ØD

063	= Ø63 mm
080	= Ø80 mm
100	= Ø100 mm

NOMENCLATURE

MILLING HOLDER

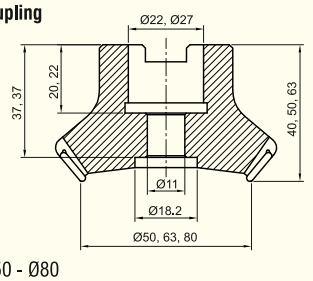
A	27	.	6	R*
8	9		10	11

8. COUPLING TYPE

A	A - Type Coupling
B	B - Type Coupling
B	C - Type Coupling
D	D - Type Coupling
S	Straight Shank Holder

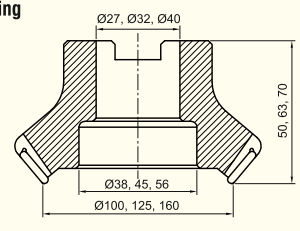
9. COUPLING STRUCTURE OF ARBOR

A - Type Coupling



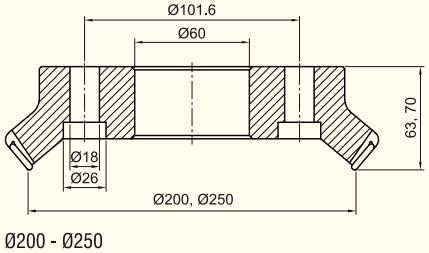
For Cutter: Ø50 - Ø80

B - Type Coupling



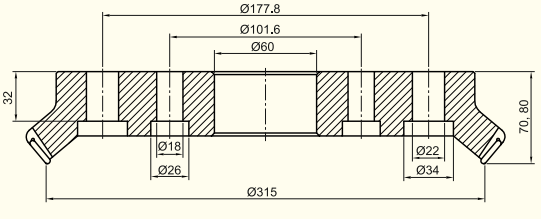
For Cutter: Ø100 - Ø160

C - Type Coupling



For Cutter: Ø200 - Ø250

D - Type Coupling



For Cutter ≥ Ø250

10. NUMBER OF TEETH / INSERT

(Number of flute in case of helical end mills)

11. CUTTING DIRECTION

R: Right L: Left N: Neutral

*** R = Standard**

MILLING HOLDER SERIES CODE

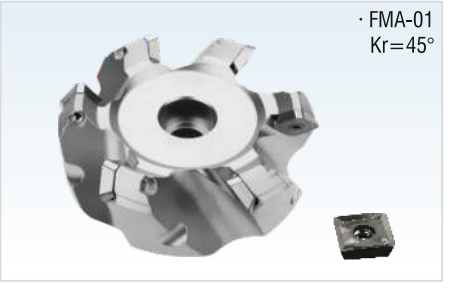
Cutting Mode	Image	Approach Angle Max. Depth of Cut	Features	Cutter Dia	Suitable Insert Code
Face Milling	 FMA-01 P/214	K_r=45° a_p max=10.5	• 15° Positive Insert • For general purpose face milling • For Steel, Stainless Steel, Cast iron • Screw Clamping	Dia Range: Ø50~Ø315	SDMT 12 04 ☐☐ SDMT 12 05 ☐☐
	 FMP-02 P/214	K_r=90° a_p max=6.5	• 15° Positive Insert • For general purpose face milling • For Steel, Stainless Steel • Screw Clamping	Dia Range: Ø50~Ø315	SDMT 09 T3 ☐☐
		K_r=90° a_p max=10.5			SDMT 12 04 ☐☐ SDMT 12 05 ☐☐
	 FMA-02 P/215	K_r=45° a_p max=10.5	• 11° Positive Insert • For general purpose face milling • For Steel, Stainless Steel, Cast iron • Screw Clamping	Dia Range: Ø50~Ø315	SPMT 12 04 ☐☐
	 FMP-03 P/215	K_r=90° a_p max=10.5	• 11° Positive Insert • For general purpose face milling • For Steel, Stainless Steel, Cast iron • Screw Clamping	Dia Range: Ø50~Ø100	SPMT 12 04 ☐☐
	 FMR-01 P/216	a_p max=4.0	• General purpose rough milling for profiling • Shank type: Weldon & Straight shank • For Steel, Stainless Steel • For curved surface & profile milling • Screw Clamping	Dia Range: Ø16~Ø40	RPMT 08 03 MO
		a_p max=5.0			RPMT 10 T3 MO
		a_p max=6.0			RPMT 12 04 MO
	 FMR-02 P/216	a_p max=4.0	• General purpose rough milling for profiling • Face mill cutter • For Steel, Stainless Steel • For curved surface & profile milling • Screw Clamping	Dia Range: Ø50~Ø160	RPMT 08 03 MO
		a_p max=5.0			RPMT 10 T3 MO
		a_p max=6.0			RPMT 12 04 MO
	 FMR-03 P/217	a_p max=4.0	• General purpose rough milling for profiling • Shank type: Weldon & Straight shank • For Steel, Stainless Steel • For curved surface & profile milling • Screw Clamping	Dia Range: Ø16~Ø40	RPMW 08 03 MO
		a_p max=5.0			RPMW 10 T3 MO
		a_p max=6.0			RPMW 12 04 MO
	 FMR-04 P/217	a_p max=4.0	• General purpose rough milling for profiling • Face mill cutter • For Steel, Stainless Steel • For curved surface & profile milling • Screw Clamping	Dia Range: Ø50~Ø160	RPMW 08 03 MO
		a_p max=5.0			RPMW 10 T3 MO
		a_p max=6.0			RPMW 12 04 MO
	 FMR06 P/218	a_p max=4.0	• General purpose rough milling for profiling • Shank type: Weldon & Straight shank • For Aluminium & Non Ferrous material • For curved surface & profile milling • Screw Clamping	Dia Range: Ø16~Ø40	RCGT 08 03 MO
		a_p max=5.0			RCGT 10 T3 MO
		a_p max=6.0			RCGT 12 04 MO
	 FMR-07 P/218	a_p max=4.0	• General purpose rough milling for profiling • Face mill cutter • For Aluminium & Non Ferrous material • For curved surface & profile milling • Screw Clamping	Dia Range: Ø50~Ø160	RCGT 08 03 MO
		a_p max=5.0			RCGT 10 T3 MO
		a_p max=6.0			RCGT 12 04 MO
	 EMP-07 P/222	K_r=90°	• Multi purpose tool • For Steel, Stainless Steel, Aluminium • Screw Clamping	Dia Range: Ø20~Ø40	SPMT 09 T3 ☐☐
	 HFR-01 P/223	a_p max=1.0	• General purpose rough milling for profiling • Face mill cutter • For Steel, Stainless Steel • For curved surface & profile milling • Screw Clamping	Dia Range: Ø16~Ø32	JOMW 06 T2 15
		a_p max=1.5			JOMW 08 03 20
		a_p max=2.0			JDMW 09 T3 20
	 HFR-03 P/223	a_p max=1.0	• General purpose rough milling for profiling • Face mill cutter • For Steel, Stainless Steel • For curved surface & profile milling • Screw Clamping	Dia Range: Ø50~Ø100	JOMW 06 T2 15
		a_p max=1.5			JOMW 08 03 20
		a_p max=2.0			JDMW 09 T3 20

MILLING HOLDER SERIES CODE

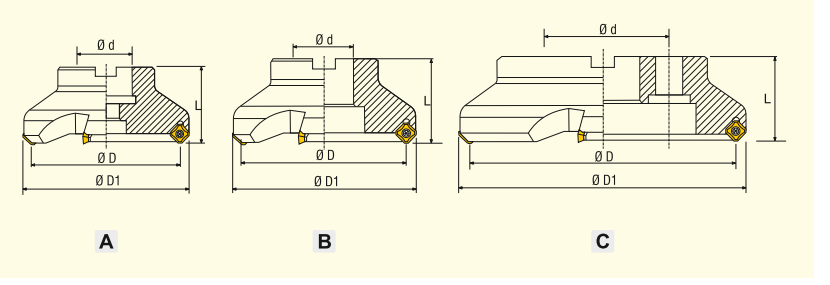
Cutting Mode	Image	Approach Angle Max. Depth of Cut	Features	Cutter Dia	Suitable Insert Code
Shoulder Milling	EMP-01  P/219	K_r=90° a_p max=10.5	• General purpose end mill for shouldering, slotting, contouring and ramping operations • For Steel, Stainless Steel • Screw Clamping • Shank type	Dia Range: Ø10~Ø40	APMT 11 35 ☐☐
		K_r=90° a_p max=15.5			APMT 16 04 ☐☐
	EMP-02  P/219	K_r=90° a_p max=10.5	• General purpose face mill operation • For Steel, Stainless Steel • Screw Clamping • Face mill type, low cutting force	Dia Range: Ø50~Ø160	APMT 11 35 ☐☐
		K_r=90° a_p max=15.5			APMT 16 04 ☐☐
	EMP-03  P/220	K_r=90° a_p max=48~68	• General purpose end mill for shouldering, slotting, contouring and ramping operations • For Steel, Stainless Steel, Aluminium • Screw Clamping • Shank type	Dia Range: Ø20~Ø40	APMT 11 35 ☐☐ APKT 11 35 ☐☐
		K_r=90° a_p max=55~100			APMT 16 04 ☐☐ APKT 16 04 ☐☐
	EMP-04  P/220	K_r=90° a_p max=42~72	• General purpose face mill operation • For Steel, Stainless Steel, Aluminium • Screw Clamping	Dia Range: Ø50~Ø100	APMT 11 35 ☐☐ APKT 11 35 ☐☐
	EMP-05  P/221	K_r=90° a_p max=10.5	• General purpose end mill for shouldering, slotting, contouring and ramping operations • For Aluminium & Non Ferrous material • Screw Clamping • Shank type	Dia Range: Ø10~Ø40	APKT 11 35 ☐☐
		K_r=90° a_p max=15.5			APKT 16 04 ☐☐
	EMP-06  P/221	K_r=90° a_p max=10.5	• General purpose face mill operation • For Aluminium & Non Ferrous material • Screw Clamping • Face mill type, low cutting force	Dia Range: Ø50~Ø160	APKT 11 35 ☐☐
		K_r=90° a_p max=15.5			APKT 16 04 ☐☐
Aluminister	EMA-06  P/225	K_r=90° a_p max=11.5	• Multi purpose tool • For Steel, Stainless Steel, Aluminium • Screw Clamping	Dia Range: Ø50~Ø100	SEKT 12 04 ☐☐
	EMP-06 A  P/225	K_r=45° a_p max=15.5	• Multi purpose tool • For Steel, Stainless Steel, Aluminium • Screw Clamping	Dia Range: Ø50~Ø100	APKT 16 04 ☐☐
Heavy Milling	EMP-16  P/226	K_r=90°	• Multi purpose tool • Milling cutter for heavy milling • It can be worked on any material	Dia Range: Ø16~Ø100	LNMU 03 03 ☐☐
	EMP-19 FMA-15 FMX-22 FMA-23  P/226	K_r=45°	• Multi purpose tool • Milling cutter for heavy milling • It can be worked on any material	Dia Range: Ø50~Ø160	WNMX 08 06 ☐☐ SNMU 15 05 ☐☐ ONMU 06 05 ☐☐ HNMX 09 06 ☐☐ NNMU 20 07 ☐☐
		K_r=50° / 90°			
	FMA-15 A  P/228	K_r=45°	• Multi purpose tool • Milling cutter for heavy milling • It can be worked on any material	Dia Range: Ø50~Ø160	ONMU 08 06 ☐☐
Chamfer Milling	CMA-01  P/224	K_r=45°	• Multi purpose tool • Milling cutter for Chamfering and Deburring • It can be worked on any material	Dia Range: Ø12~Ø40	TCMT 09 02 ☐☐ TCMT 11 02 ☐☐ TCMT 16 T3 ☐☐
		K_r=60°			

MILLING HOLDER

FACE MILLING



· FMA-01
Kr=45°

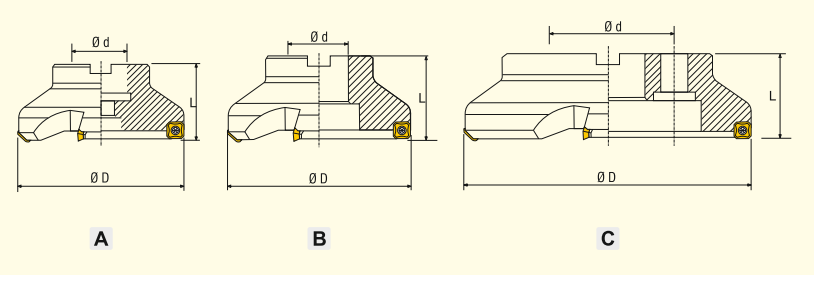


SERIES CODE: FMA 01

ITEM CODE	DIMENSIONS (mm)							
	D	D_1	d	L	a_p max	Z	Type of coupling	Suitable Insert Code
FMA- SD12- 01. 050- A 22.4	50	61	22	40	10.5	4	A	SDMT 12 04 ☐☐
FMA- SD12- 01. 063- A 22.5	63	74	22	40	10.5	5	A	SDMT 12 04 ☐☐
FMA- SD12-01. 080- A 27.6	80	91	27	50	10.5	6	A	SDMT 12 04 ☐☐
FMA- SD12-01. 100- B 32.7	100	107	32	50	10.5	7	B	SDMT 12 04 ☐☐
FMA- SD12-01. 125- B 40.8	125	136	40	63	10.5	8	B	SDMT 12 04 ☐☐
FMA- SD12-01. 160- B 40.10	160	170	40	63	10.5	10	B	SDMT 12 04 ☐☐

- Cutter bodies also available in SDMT 12 05 insert

· FMP-02
Kr=90°



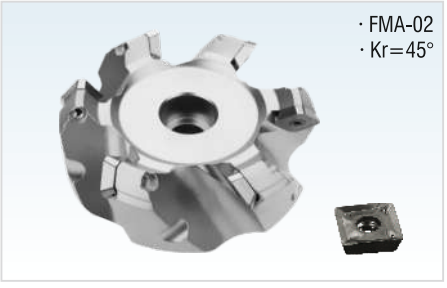
SERIES CODE: FMP 02

ITEM CODE	DIMENSIONS (mm)						
	D	d	L	a_p max	Z	Type of coupling	Suitable Insert Code
FMP- SD09- 02. 050- A 22.4	50	22	40	6.5	4	A	SDMT 09 T3 ☐☐
FMP- SD09- 02. 063- A 22.4	63	22	40	6.5	4	A	SDMT 09 T3 ☐☐
FMP- SD12- 02. 050- A 22.4	50	22	40	10.5	4	A	SDMT 12 04 ☐☐
FMP- SD12- 02. 063- A 22.4	63	22	40	10.5	4	A	SDMT 12 04 ☐☐
FMP- SD12- 02. 080- A 27.4	80	27	50	10.5	4	A	SDMT 12 04 ☐☐
FMP- SD12- 02. 100- B 32.6	100	32	63	10.5	6	B	SDMT 12 04 ☐☐
FMP- SD12- 02. 125- B 40.8	125	40	63	10.5	8	B	SDMT 12 04 ☐☐
FMP- SD15- 02. 160- B 40.10	160	40	63	10.5	10	B	SDMT 15 04 ☐☐

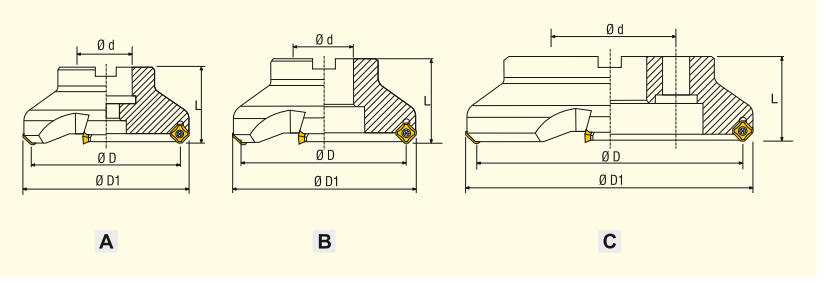
- Cutter bodies also available in SDMT 12 05 insert

MILLING HOLDER

FACE MILLING



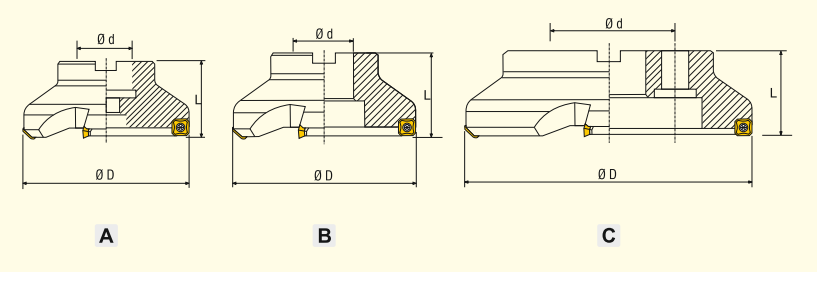
· FMA-02
· Kr=45°



SERIES CODE: FMA 02

ITEM CODE	DIMENSIONS (mm)							
	D	D_1	d	L	a_p max	Z	Type of coupling	Suitable Insert Code
FMA- SP12- 02. 050- A 22.4	50	61	22	40	10.5	4	A	SPMT 12 04 □□
FMA- SP12- 02. 063- A 22.5	63	74	22	40	10.5	5	A	SPMT 12 04 □□
FMA- SP12- 02. 080- A 27.6	80	91	27	50	10.5	6	A	SPMT 12 04 □□
FMA- SP12- 02. 100- B 32.7	100	107	32	50	10.5	7	B	SPMT 12 04 □□
FMA- SP12- 02. 125- B 40.8	125	136	40	63	10.5	8	B	SPMT 12 04 □□
FMA- SP12- 02. 160- B 40.10	160	170	40	63	10.5	10	B	SPMT 12 04 □□

· FMP-03
· Kr=90°

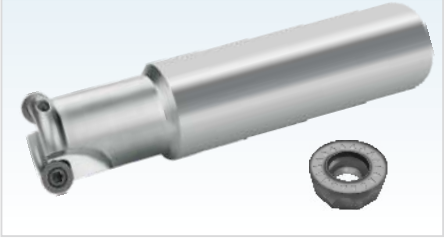


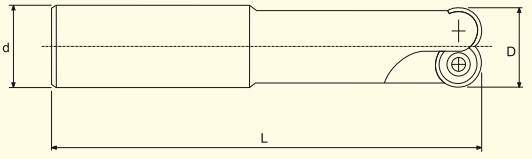
SERIES CODE: FMP 03

ITEM CODE	DIMENSIONS (mm)						
	D	d	L	a_p max	Z	Type of coupling	Suitable Insert Code
FMP- SP12- 03. 050- A 22.4	50	22	40	10.5	4	A	SPMT 12 04 □□
FMP- SP12- 03. 063- A 22.5	63	22	40	10.5	5	A	SPMT 12 04 □□
FMP- SP12- 03. 080- A 27.6	80	27	50	10.5	6	A	SPMT 12 04 □□
FMP- SP12- 03. 100- B 32.7	100	32	50	10.5	7	B	SPMT 12 04 □□
FMP- SP12- 03. 125- B 40.8	125	40	63	10.5	8	B	SPMT 12 04 □□
FMP- SP12- 03. 160- B 40.10	160	40	63	10.5	10	B	SPMT 12 04 □□

MILLING HOLDER

· FMR-01



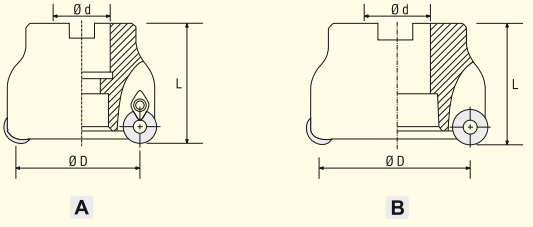


SERIES CODE: FMR 01

ITEM CODE	DIMENSIONS (mm)						
	D	d	L	r	a_p max	Z	Suitable Insert Code
FMR- RP08- 01. 016- S 16.2- R*	16	16	120	4	4	2	RPMT 08 03 MO
FMR- RP08- 01. 020- S 20.2- R	20	20	120	4	4	2	RPMT 08 03 MO
FMR- RP10- 01. 020- S 20.2- R	20	20	120	5	5	2	RPMT 10 T3 MO
FMR- RP10- 01. 025- S 25.3- R	25	25	120	5	5	3	RPMT 10 T3 MO
FMR- RP12- 01. 020- S 20.2- R	20	20	120	6	6	2	RPMT 12 04 MO
FMR- RP12- 01. 025- S 25.2- R	25	25	120	6	6	2	RPMT 12 04 MO
FMR- RP12- 01. 032- S 32.2- R	32	32	120	6	6	2	RPMT 12 04 MO
FMR- RP12- 01. 040- S 40.3- R	40	40	120	6	6	3	RPMT 12 04 MO

*Regular(R)=120 mm *Long(L)=150 mm *Extra Long(X)=200 mm

· FMR-02

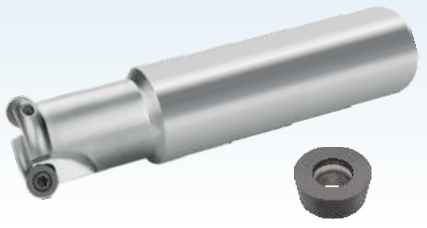


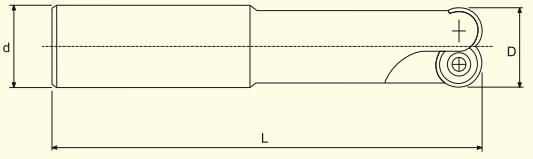
SERIES CODE: FMR 02

ITEM CODE	DIMENSIONS (mm)							
	D	d	L	r	a_p max	Z	Type of coupling	Suitable Insert Code
FMR- RP12- 02. 050- A 22.4	50	22	40	6	6	4	A	RPMT 12 04 MO
FMR- RP12- 02. 063- B 22.4	63	22	50	6	6	4	B	RPMT 12 04 MO
FMR- RP12- 02. 080- B 27.6	80	27	50	6	6	6	B	RPMT 12 04 MO
FMR- RP12- 02. 100- B 32.6	100	32	50	6	6	6	B	RPMT 12 04 MO
FMR- RP12- 02. 125- B 40.7	125	40	63	6	6	7	B	RPMT 12 04 MO
FMR- RP12- 02. 160- B 40.8	160	40	63	6	8	8	B	RPMT 12 04 MO

MILLING HOLDER

· FMR-03



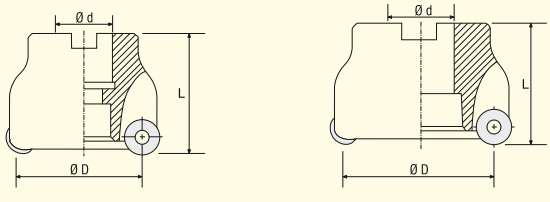


SERIES CODE: FMR 03

ITEM CODE	DIMENSIONS (mm)						
	D	d	L	r	a_p max	Z	Suitable Insert Code
FMR- RP08- 03. 016- S 16.2- R*	16	16	120	4	4	2	RPMW 08 03 MO
FMR- RP08- 03. 020- S 20.2- R	20	20	120	4	4	2	RPMW 08 03 MO
FMR- RP10- 03. 020- S 20.2- R	20	20	120	5	5	2	RPMW 10 T3 MO
FMR- RP10- 03. 025- S 25.3- R	25	25	120	5	5	3	RPMW 10 T3 MO
FMR- RP12- 03. 020- S 20.2- R	20	20	120	6	6	2	RPMW 12 04 MO
FMR- RP12- 03. 025- S 25.2- R	25	25	120	6	6	2	RPMW 12 04 MO
FMR- RP12- 03. 032- S 32.2- R	32	32	120	6	6	2	RPMW 12 04 MO
FMR- RP12- 03. 040- S 40.3- R	40	40	120	6	6	3	RPMW 12 04 MO

*Regular (R) = 120 mm *Long (L) = 150 mm *Extra Long (X) = 200 mm

· FMR-04

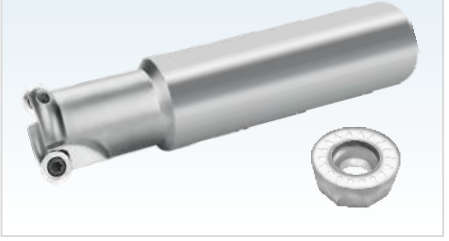


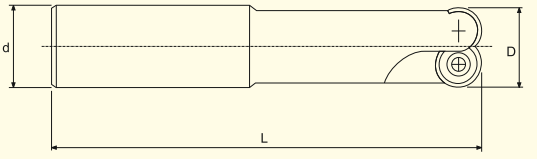
SERIES CODE: FMR 04

ITEM CODE	DIMENSIONS (mm)							
	D	d	L	r	a_p max	Z	Type of coupling	Suitable Insert Code
FMR- RP12- 04. 050- A 22.4	50	22	40	6	6	4	A	RPMW 12 04 MO
FMR- RP12- 04. 063- B 22.4	63	22	50	6	6	4	B	RPMW 12 04 MO
FMR- RP12- 04. 080- B 27.6	80	27	50	6	6	6	B	RPMW 12 04 MO
FMR- RP12- 04. 100- B 32.6	100	32	63	6	6	6	B	RPMW 12 04 MO
FMR- RP12- 04. 125- B 40.7	125	40	63	6	6	7	B	RPMW 12 04 MO
FMR- RP12- 04. 160- B 40.8	160	40	63	6	8	8	B	RPMW 12 04 MO

MILLING HOLDER

· FMR-06



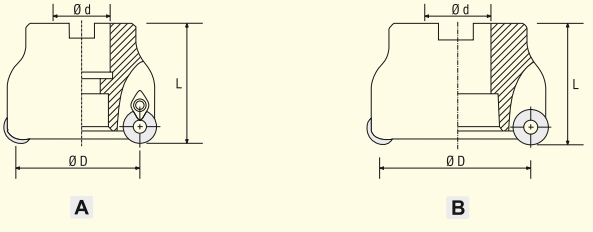


SERIES CODE: FMR 06

ITEM CODE	DIMENSIONS (mm)						
	D	d	L	r	a_p max	Z	Suitable Insert Code
FMR- RC08- 06. 016- S 16.2- L*	16	16	150	4	4	2	RCGT 08 03 MO
FMR- RC08- 06. 020- S 20.2- L	20	20	150	4	4	2	RCGT 08 03 MO
FMR- RC10- 06. 020- S 20.2- L	20	20	150	5	5	2	RCGT 10 T3 MO
FMR- RC10- 06. 025- S 25.3- L	25	25	150	5	5	3	RCGT 10 T3 MO
FMR- RC12- 06. 020- S 20.2- L	20	20	150	6	6	2	RCGT 12 04 MO
FMR- RC12- 06. 025- S 25.2- L	25	25	150	6	6	2	RCGT 12 04 MO
FMR- RC12- 06. 032- S 32.2- L	32	32	150	6	6	2	RCGT 12 04 MO
FMR- RC12- 06. 040- S 40.3- L	40	40	150	6	6	3	RCGT 12 04 MO

*Regular (R) = 120 mm *Long (L) = 150 mm *Extra Long (X) = 200 mm

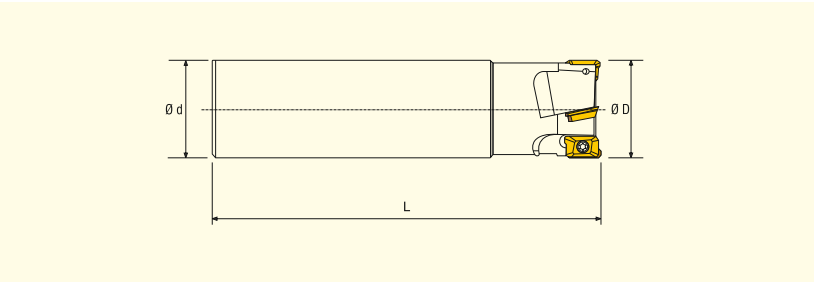
· FMR-07



SERIES CODE: FMR 07

ITEM CODE	DIMENSIONS (mm)							
	D	d	L	r	a_p max	Z	Type of coupling	Suitable Insert Code
FMR- RC12- 07. 050- A 22.4	50	22	40	6	6	4	A	RCGT 12 04 MO
FMR- RC12- 07. 063- B 22.4	63	22	50	6	6	4	B	RCGT 12 04 MO
FMR- RC12- 07. 080- B 27.6	80	27	50	6	6	6	B	RCGT 12 04 MO
FMR- RC12- 07. 100- B 32.6	100	32	50	6	6	6	B	RCGT 12 04 MO
FMR- RC12- 07. 125- B 40.7	125	40	63	6	6	7	B	RCGT 12 04 MO
FMR- RC12- 07. 160- B 40.8	160	40	63	6	8	8	B	RCGT 12 04 MO

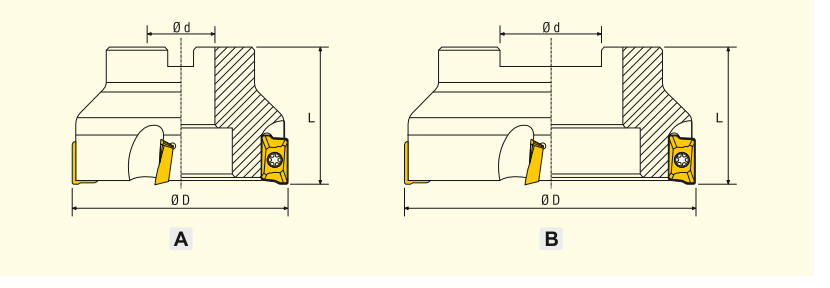
MILLING HOLDER



SERIES CODE: EMP 01

ITEM CODE	DIMENSIONS (mm)					
	D	d	L	a_p max	Z	Suitable Insert Code
EMP- AP11- 01. 010- S 10.1- R*	10	10	120	10.5	1	APMT 11 35 ☐☐
EMP- AP11- 01. 012- S 12.1- R	12	12	120	10.5	1	APMT 11 35 ☐☐
EMP- AP11- 01. 014- S 14.1- L	14	14	150	10.5	1	APMT 11 35 ☐☐
EMP- AP11- 01. 016- S 16.2- R	16	16	120	10.5	2	APMT 11 35 ☐☐
EMP- AP11- 01. 020- S 20.2- R	20	20	120	10.5	2	APMT 11 35 ☐☐
EMP- AP16- 01. 025- S 25.2- R	25	25	120	15.5	2	APMT 16 04 ☐☐
EMP- AP16- 01. 032- S 32.3- R	32	32	120	15.5	3	APMT 16 04 ☐☐
EMP- AP16- 01. 040- S 32.4- R	40	32	120	15.5	4	APMT 16 04 ☐☐

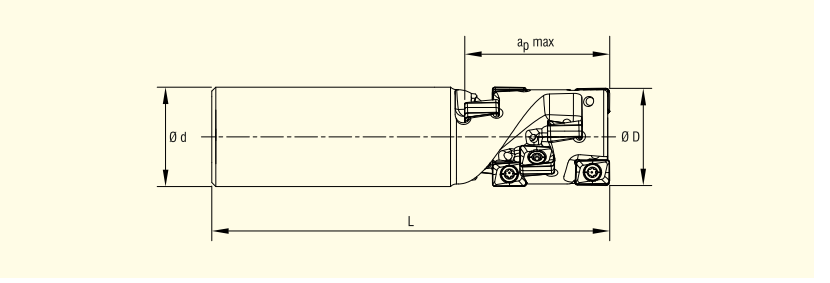
*Regular (R) = 120 mm *Long (L) = 150 mm *Extra Long (X) = 200 mm



SERIES CODE: EMP 02

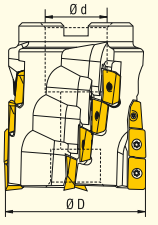
ITEM CODE	DIMENSIONS (mm)						
	D	d	L	a_p max	Z	Type of coupling	Suitable Insert Code
EMP- AP11- 02. 050- A 22.4	50	22	63	10.5	4	A	APMT 11 35 ☐☐
EMP- AP11- 02. 063- A 22.5	63	22	63	10.5	5	A	APMT 11 35 ☐☐
EMP- AP16- 02. 050- A 22.4	50	22	80	15.5	4	A	APMT 16 04 ☐☐
EMP- AP16- 02. 063- A 22.5	63	22	63	15.5	5	A	APMT 16 04 ☐☐
EMP- AP16- 02. 080- A 27.6	80	27	63	15.5	6	A	APMT 16 04 ☐☐
EMP- AP16- 02. 100- B 32.6	100	32	70	15.5	6	B	APMT 16 04 ☐☐
EMP- AP16- 02. 125- B 40.8	125	40	70	15.5	8	B	APMT 16 04 ☐☐
EMP- AP16- 02. 160- B 40.10	160	40	80	15.5	10	B	APMT 16 04 ☐☐

MILLING HOLDER



SERIES CODE: EMP 03

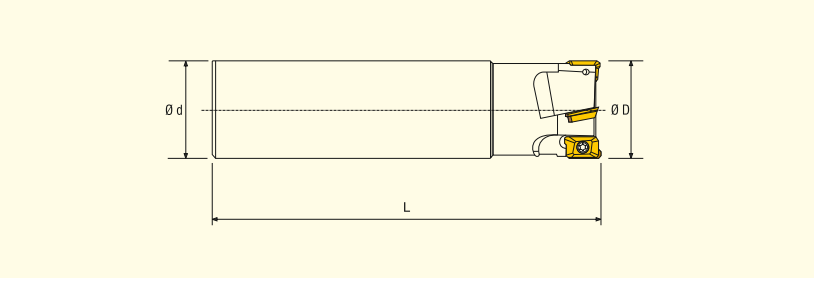
ITEM CODE	DIMENSIONS (mm)						
	D	d	L	a_p max	Z	Number of insert	Suitable Insert Code
EMP- AP11- 03. 020- A 20 - 12R (48)	20	20	130	48	2	2 x 6	APMT 11 35 ☐☐
EMP- AP11- 03. 020- A 20 - 16R (68)	20	20	200	68	2	2 x 8	APMT 11 35 ☐☐
EMP- AP11- 03. 025- A 25 - 12R (48)	25	25	130	48	2	2 x 6	APMT 11 35 ☐☐
EMP- AP11- 03. 025- A 25 - 16R (68)	25	25	200	68	2	2 x 8	APMT 11 35 ☐☐
EMP- AP16- 03. 032- A 32 - 8R (55)	32	32	150	55	2	2 x 4	APMT 16 04 ☐☐
EMP- AP16- 03. 032- A 32 - 16R (100)	32	32	200	100	2	2 x 8	APMT 16 04 ☐☐
EMP- AP16- 03. 040- A 32 - 10R (70)	40	32	150	70	2	2 x 5	APMT 16 04 ☐☐
EMP- AP16- 03. 040- A 32 - 24R (100)	40	32	200	100	3	3 x 12	APMT 16 04 ☐☐



SERIES CODE: EMP 04

ITEM CODE	DIMENSIONS (mm)					
	D	d	a_p max	Z	Number of insert	Suitable Insert Code
EMP- AP16- 04. 050- A 22.9R (42)	50	22	42	3	3 x 3	APMT 16 04 ☐☐
EMP- AP16- 04. 050- A 22.15R (60)	50	22	60	3	3 x 5	APMT 16 04 ☐☐
EMP- AP16- 04. 063- A 27.12R (42)	63	27	42	4	4 x 3	APMT 16 04 ☐☐
EMP- AP16- 04. 063- A 27.20R (60)	63	27	60	4	4 x 5	APMT 16 04 ☐☐
EMP- AP16- 04. 080- A 27.25R (72)	80	27	72	5	5 x 5	APMT 16 04 ☐☐
EMP- AP16- 04. 100- A 40.30R (72)	100	40	72	6	6 x 5	APMT 16 04 ☐☐

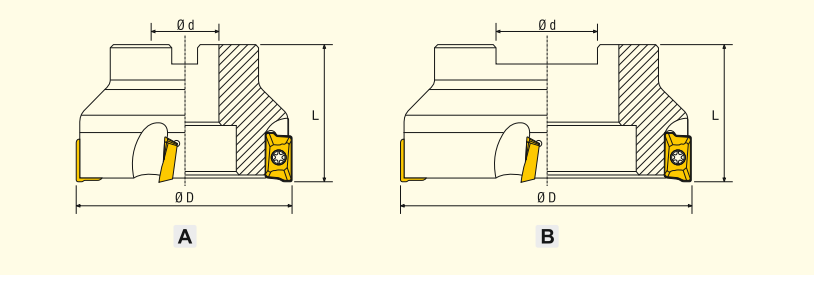
MILLING HOLDER



SERIES CODE: EMP 05

ITEM CODE	DIMENSIONS (mm)					
	D	d	L	a_p max	Z	Suitable Insert Code
EMP- AP11- 05. 010- S 10.1- R*	10	10	120	10.5	1	APKT 11 35 ☐☐
EMP- AP11- 05. 012- S 12.1- R	12	12	120	10.5	1	APKT 11 35 ☐☐
EMP- AP11- 05. 014- S 14.1- L	14	14	150	10.5	1	APKT 11 35 ☐☐
EMP- AP11- 05. 016- S 16.2- R	16	16	120	10.5	2	APKT 11 35 ☐☐
EMP- AP11- 05. 020- S 20.2- R	20	20	120	10.5	2	APKT 11 35 ☐☐
EMP- AP16- 05. 025- S 25.2- R	25	25	120	15.5	2	APKT 16 04 ☐☐
EMP- AP16- 05. 032- S 32.3- R	32	32	120	15.5	3	APKT 16 04 ☐☐
EMP- AP16- 05. 040- S 32.4- R	40	32	120	15.5	4	APKT 16 04 ☐☐

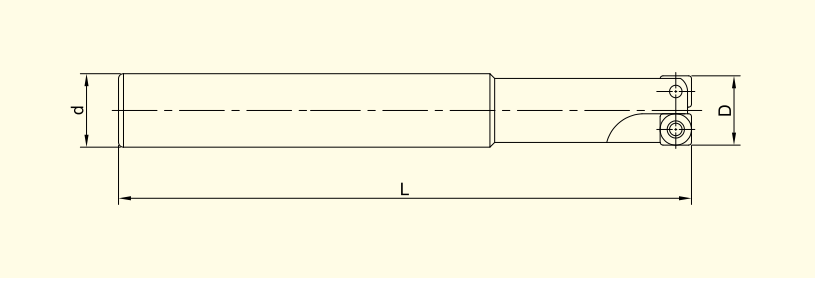
*Regular (R) = 120 mm *Long (L) = 150 mm *Extra Long (X) = 200 mm



SERIES CODE: EMP 06

ITEM CODE	DIMENSIONS (mm)						
	D	d	L	a_p max	Z	Type of coupling	Suitable Insert Code
EMP- AP11- 06. 050- A 22.4	50	22	63	10.5	4	A	APKT 11 35 ☐☐
EMP- AP11- 06. 063- A 22.5	63	22	63	10.5	5	A	APKT 11 35 ☐☐
EMP- AP16- 06. 050- A 22.4	50	22	80	15.5	4	A	APKT 16 04 ☐☐
EMP- AP16- 06. 063- A 22.5	63	22	63	15.5	5	A	APKT 16 04 ☐☐
EMP- AP16- 06. 080- A 27.6	80	27	63	15.5	6	A	APKT 16 04 ☐☐
EMP- AP16- 06. 100- B 32.6	100	32	70	15.5	6	B	APKT 16 04 ☐☐
EMP- AP16- 06. 125- B 40.8	125	40	70	15.5	8	B	APKT 16 04 ☐☐
EMP- AP16- 06. 160- B 40.10	160	40	80	15.5	10	B	APKT 16 04 ☐☐

MILLING HOLDER



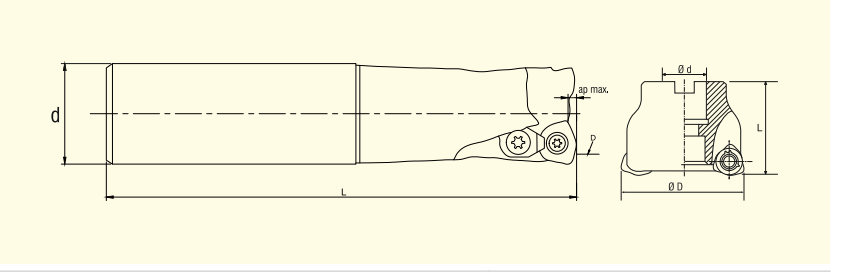
SERIES CODE: EMP 07

ITEM CODE	DIMENSIONS (mm)					
	D	d	L	a_p max	Z	Suitable Insert Code
EMP- SP09- 07. 020- S 20.2- L	20	20	150	8.5	2	SPMT 09 T3 □□
EMP- SP09- 07. 025- S 25.2- L	25	25	150	8.5	2	SPMT 09 T3 □□
EMP- SP12- 07. 032- S 32.3- L	32	32	150	11.6	3	SPMT 12 04 □□
EMP- SP12- 07. 040- S 40.4- L	40	40	150	11.6	4	SPMT 12 04 □□

*Regular (R) = 120 mm *Long (L) = 150 mm *Extra Long (X) = 200 mm

HIGH FEED MILLING HOLDER

SERIES CODE: HFR 01



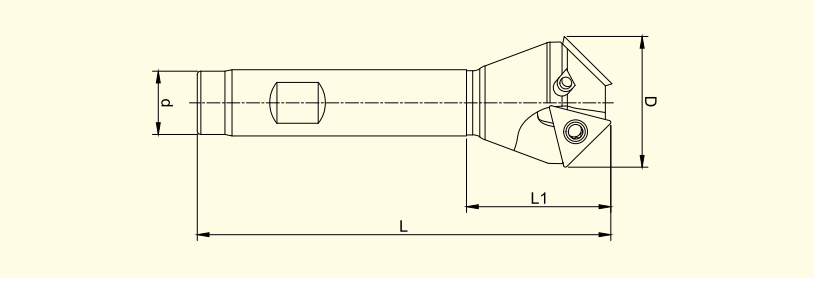
ITEM CODE	Dimension					Suitable Insert Code
	D	d	L	ap max.	Z	
HFR- JO06- 01. 016- S 16.2- R	16	16	70	1.0	2	JOMW 06 T2 15 - JT 7370
HFR- JO06- 01. 016- S 16.2- L	16	16	110	1.0	2	
HFR- JO06- 01. 016- S 16.2- X	16	16	150	1.0	2	
HFR- JO06- 01. 020- S 20.2- R	20	20	130	1.0	2	
HFR- JO06- 01. 020- S 20.2- L	20	20	180	1.0	2	
HFR- JO08- 01. 016- S 16.2- R	16	16	70	1.5	2	JOMW 08 03 20 - JT 7370
HFR- JO08- 01. 016- S 16.2- L	16	16	110	1.5	2	
HFR- JO08- 01. 020- S 20.2- R	20	20	130	1.5	2	
HFR- JO08- 01. 020- S 20.2- L	20	20	180	1.5	2	
HFR- JO08- 01. 025- S 25.2- R	25	25	140	1.5	2	
HFR- JO08- 01. 025- S 25.2- L	25	25	200	1.5	2	
HFR- JO08- 01. 032- S 32.3- L	32	32	200	1.5	3	
HFR- JD09- 01. 025- S 25.2- R	25	25	140	2.0	2	JDMW 09 T3 20 - JT 7370
HFR- JD09- 01. 025- S 25.2- L	25	25	200	2.0	2	
HFR- JD09- 01. 032- S 32.3- R	32	32	150	2.0	3	
HFR- JD09- 01. 032- S 32.3- L	32	32	200	2.0	3	

*Extra Long (X) = 200 mm available on request

SERIES CODE: HFR 03

ITEM CODE	Dimension					Suitable Insert Code
	D	d	L	ap max.	Z	
HFR- JO08- 03. 050 A 22.5	50	22	50	1.00	5	JOMW 08 03 20 JT 7370
HFR- JD09- 03. 050 A 22.5	50	22	50	1.00	5	
HFR- JD12- 03. 050 A 22.4	50	22	50	1.50	4	JDMW 12 04 20 JT 7370
HFR- JD12- 03. 063 A 22.5	63	22	50	1.50	5	
HFR- JD12- 03. 080 A 27.6	80	27	50	1.50	6	
HFR- JD12- 03. 100 A 32.7	100	32	63	1.50	7	

INSERTED CHAMFER ENDMILL



SERIES CODE: CMA 01

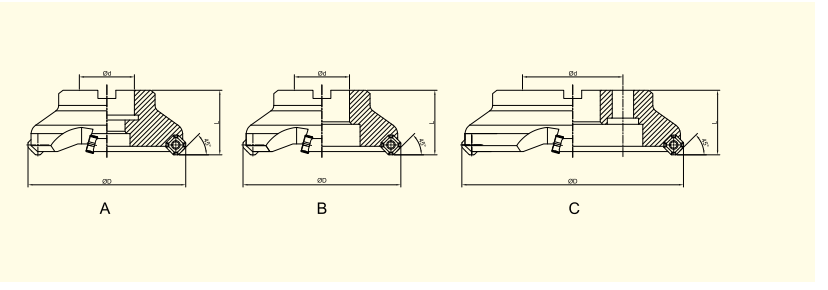
ITEM CODE	DIMENSIONS (mm)					
	D	d	L	L_1	Z	Suitable Insert Code
CMA-TC09-01 12-S16.1-R	12	16	100	40	1	TCMT 09 02 ☐☐
CMA-TC11-01 16-S16.1-R	16	16	100	40	1	TCMT 11 02 ☐☐
CMA-TC16-01 20-S16.1-R	20	16	100	40	1	TCMT 16 T3 ☐☐
CMA-TC11-01 25-S20.2-R	25	20	120	50	2	TCMT 11 02 ☐☐
CMA-TC11-01 32-S25.2-R	32	25	120	50	2	TCMT 11 02 ☐☐
CMA-TC16-01 40-S32.2-R	40	32	120	50	3	TCMT 16 T3 ☐☐

*Kr = 60° also available on request.

ALUMINISTER MILLING CUTTER BODY

*Cutter Bodies made of Aluminium Material

· EMA-06
· Kr=45°



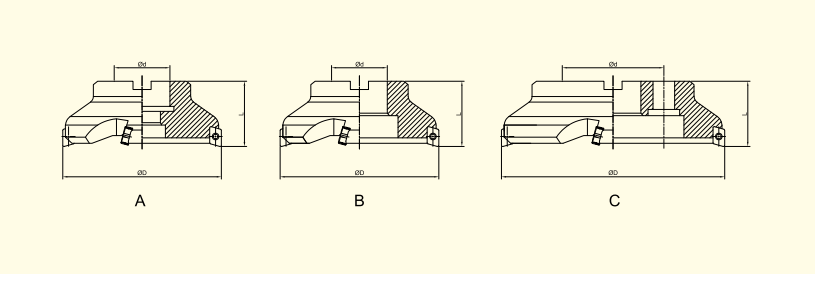
SERIES CODE: EMA-06

ITEM CODE	DIMENSIONS						Spares
	D	d	h	Z	No. of Corners	Approach Angle	
EMA-SE12-06.050-A 22-4-SA	50	22	45°	4	4	45°	Insert Screw Screw M5.0
EMA-SE12-06.063-A 22-4-SA	63	22	45°	4	4	45°	
EMA-SE12-06.080-A 22-5-SA	80	22	45°	5	4	45°	Torx Key TK/T15
EMA-SE12-06.100-A 22-5-SA	100	22	45°	5	4	45°	

RECOMMENDED PARAMETERS - SEKT 12 04 AFN - SA

Material Group	Workpiece Material	Hardness	Cutting Speed	Feed per Tooth	Depth of Cut	
			Vc (m/min)	fz (mm)	a_p(mm)	
N	Non Ferrous	30~300 HB	200~1000	0.05 ~ 0.3	0.5 ~ 11.5	

· EMP-06A
· Kr=90°



SERIES CODE: EMP-06A

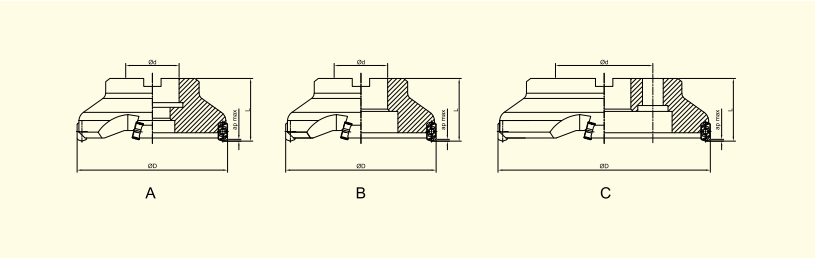
ITEM CODE	DIMENSIONS (mm)						Spares
	D	d	H	Z	No. of Corners	Approach Angle	
EMP-AP16-06A.050-A 22-4-SA	50	22	45°	4	2	90°	Insert Screw Screw M4.0
EMP-AP16-06A.063-A 22-4-SA	63	22	45°	4	2	90°	
EMP-AP16-06A.080-A 22-6-SA	80	22	45°	6	2	90°	Torx Key TK/T15
EMP-AP16-06A.100-A 22-6-SA	100	22	45°	6	2	90°	

RECOMMENDED PARAMETERS - APKT 16 04 08 PD FR - 164

Material Group	Workpiece Material	Hardness	Cutting Speed	Feed per Tooth	Depth of Cut	
			Vc (m/min)	fz (mm)	a_p(mm)	
N	Non Ferrous	30~300 HB	100~600	0.03 ~ 0.4	0.5 ~ 15.5	

HEAVY MILLING CUTTER BODY

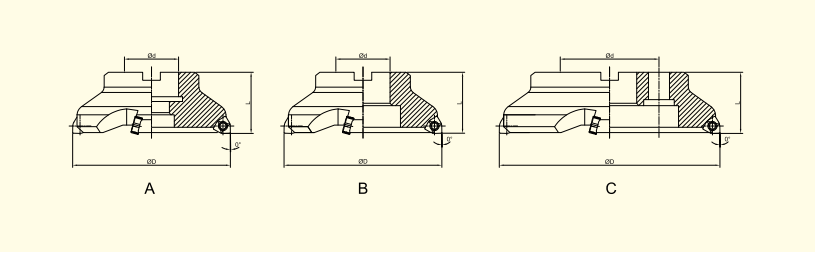
· EMP-16
· Kr=90°



SERIES CODE: EMP-16

ITEM CODE	DIMENSIONS					Suitable Insert Code
	D	d	a_p max	Z	OAL	
EMP-LN03-16 016-S 16-2L	16	16	1.0	2	160	LNMU 03 03 MX □□
EMP-LN03-16 020-S 20-3L	20	20	1.0	3	160	
EMP-LN03-16 025-S 25-4L	25	25	1.0	4	160	
EMP-LN03-16 032-S 32-5L	32	32	1.0	5	160	
EMP-LN03-17 050-A 22-8	50	-	1.0	8	-	
EMP-LN03-17 063-A 22-8	63	-	1.0	8	-	
EMP-LN03-17 080-A 27-8	80	-	1.0	8	-	
EMP-LN03-17 100-A 32-10	100	-	1.0	10	-	

· FMP-19
· Kr=90°

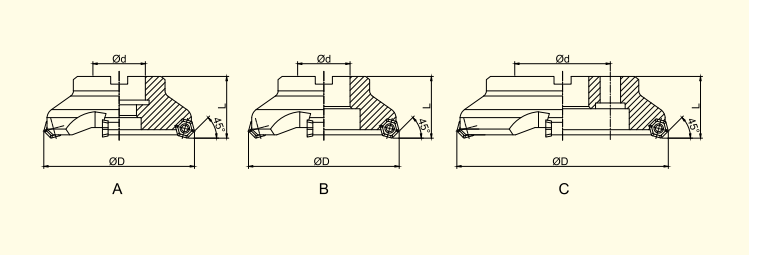


SERIES CODE: FMP-19

ITEM CODE	DIMENSIONS				Suitable Insert Code
	D	d	a_p max (WNMX)	Z	
FMP-WN08-19 050-A 22-4	50	22	4	4	WNMX 08 06 08 - MX
FMP-WN08-19 063-A 22-4	63	22	4	4	
FMP-WN08-19 080-A 27-5	80	27	4	5	
FMP-WN08-19 100-A 32-6	100	32	4	6	

HEAVY MILLING CUTTER BODY

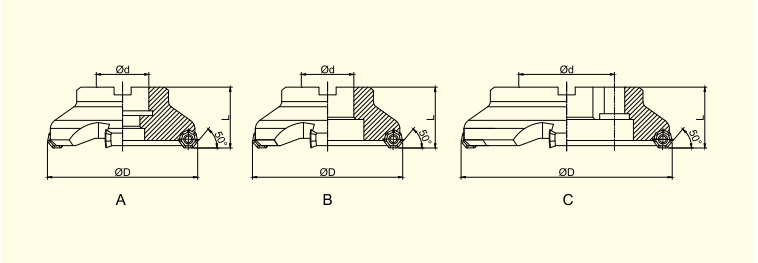
· FMA-23
· Kr=45°



SERIES CODE: FMA-23

ITEM CODE	DIMENSIONS				Suitable Insert Code
	D	d	a_p max	Z	
FMA-HN09-23-050-A 22-4	50	22	3.0	4	HNMX 09 06 12 - MX 22 HNMX 09 06 12 - MX 33
FMA-HN09-23-063-A 22-4	63	22	3.0	4	
FMA-HN09-23-080-A 27-5	80	27	3.0	5	
FMA-HN09-23-100-A 32-7	100	32	3.0	7	
FMA-HN09-23-125-B 40-8	125	40	3.0	8	
FMA-HN09-23-160-B 40-10	160	40	3.0	10	

· FMX-22
· Kr=50°

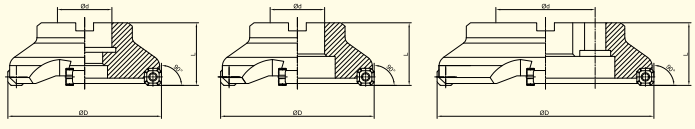


SERIES CODE: FMX-22

ITEM CODE	DIMENSIONS				Suitable Insert Code
	D	d	a_p max	Z	
FMX-NN20-22 063-A 22-4	63	22	6.0	4	NNMU 20 07 08 - MX
FMX-NN20-22 080-A 27-5	80	27	6.0	5	
FMX-NN20-22 100-A 32-7	100	32	6.0	7	
FMX-NN20-22 125-B 40-8	125	40	6.0	8	
FMX-NN20-22 160-B 40-10	160	40	6.0	10	

HEAVY MILLING CUTTER BODY

· FMA-15
· Kr=45°

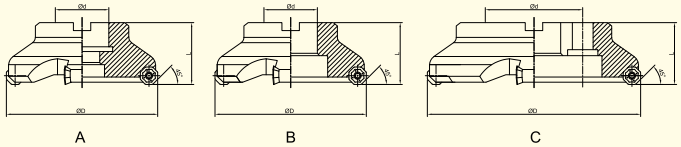


- Both ONMU & SNMU inserts fit on the same Cutter Body for Kr=45^0

SERIES CODE: FMA-15

ITEM CODE	DIMENSIONS					Suitable Insert Code
	D	d	a_p max (ONMU)	a_p max (SNMU)	Z	
FMA-ON06/SN15-15 050-A 22-4	50	22	2.5	5	4	SNMU 15 05 15 - MX ONMU 06 05 06 - MX
FMA-ON06/SN15-15 063-A 22-5	63	22	2.5	5	5	
FMA-ON06/SN15-15 080-A 27-6	80	27	2.5	5	6	
FMA-ON06/SN15-15 100-A 32-8	100	32	2.5	5	8	
FMA-ON06/SN15-15 125-B 40-8	125	40	2.5	5	8	
FMA-ON06/SN15-15 160-B 40-10	160	40	2.5	5	10	

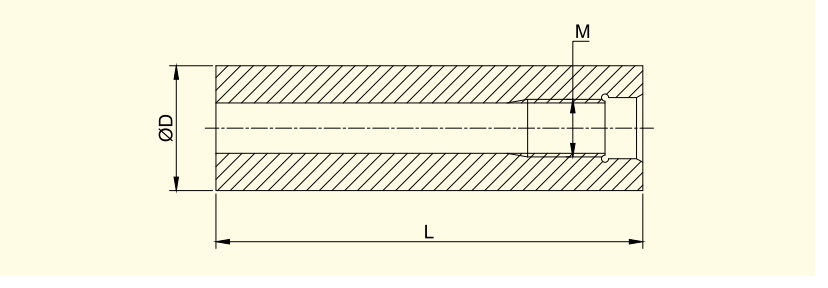
· FMA-15A
· Kr=45°



SERIES CODE: FMA-15A

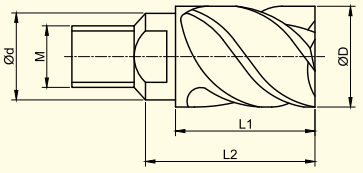
ITEM CODE	DIMENSIONS				Suitable Insert Code
	D	d	a_p max	Z	
FMA-ON08-15A 050-A 22-4	50	22	3.0	4	ONMU 08 06 08 - MX
FMA-ON08-15A 063-A 22-5	63	22	3.0	5	
FMA-ON08-15A 080-A 27-6	80	27	3.0	6	
FMA-ON08-15A 100-A 32-7	100	32	3.0	7	
FMA-ON08-15A 125-B 40-8	125	40	3.0	8	
FMA-ON08-15A 160-B 40-9	160	40	3.0	9	

SOLID MODULAR SHANKS

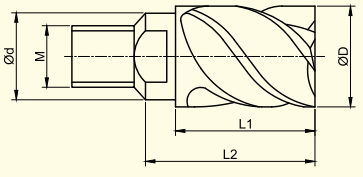


ITEM CODE	DIMENSIONS (mm)		
	D	L	M
SMS/08-100/M6	8	100	M6
SMS/10-100/M6	10	100	M6
SMS/10-150/M6	10	150	M6
SMS/12-100/M6	12	100	M6
SMS/12-150/M6	12	150	M6
SMS/16-100/M8	16	100	M8
SMS/16-150/M8	16	150	M8
SMS/16-200/M8	16	200	M8
SMS/20-100/M10	20	100	M10
SMS/20-150/M10	20	150	M10
SMS/20-200/M10	20	200	M10
SMS/20-250/M10	20	250	M10
SMS/25-150/M12	25	150	M12
SMS/25-200/M12	25	200	M12
SMS/25-250/M12	25	250	M12
SMS/25-300/M12	25	300	M12

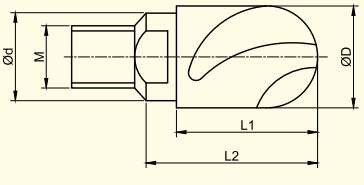
SOLID MODULAR HEADS



ITEM CODE	DIMENSIONS (mm)					
	D	d	L_1	L_2	M	Applicable Spanner
SMH.ESC4 080.M6 B+ve	8	7.8	8	12.1	M6	K08
SMH.ESC4 100.M6 B+ve	10	9.8	10	16.1	M6	K10
SMH.ESC4 120.M6 B+ve	12	11.7	12	20.3	M6	K12
SMH.ESC4 160.M8 B+ve	16	15.6	16	26.2	M8	K16
SMH.ESC4 200.M10 B+ve	20	19.5	20	31.1	M10	K20
SMH.ESC4 250.M16 B+ve	25	24.4	25	39.3	M16	K25

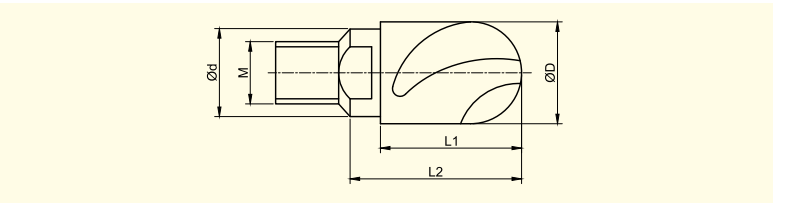


ITEM CODE	DIMENSIONS (mm)					
	D	d	L_1	L_2	M	Applicable Spanner
SMH.ESC6 080.M6 B+ve	8	7.8	8	12.1	M6	K08
SMH.ESC6 100.M6 B+ve	10	9.8	10	16.1	M6	K10
SMH.ESC6 120.M6 B+ve	12	11.7	12	20.3	M6	K12
SMH.ESC6 160.M8 B+ve	16	15.6	16	26.2	M8	K16
SMH.ESC6 200.M10 B+ve	20	19.5	20	31.1	M10	K20
SMH.ESC6 250.M16 B+ve	25	24.4	25	39.3	M16	K25

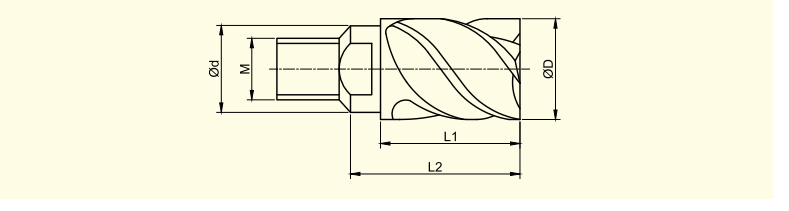


ITEM CODE	DIMENSIONS (mm)					
	D	d	L_1	L_2	M	Applicable Spanner
SMH.EBB2 080.M6 B+ve	8	7.8	8	12.1	M6	K08
SMH.EBB2 100.M6 B+ve	10	9.8	10	16.1	M6	K10
SMH.EBB2 120.M6 B+ve	12	11.7	12	20.3	M6	K12
SMH.EBB2 160.M8 B+ve	16	15.6	16	26.2	M8	K16
SMH.EBB2 200.M10 B+ve	20	19.5	20	31.1	M10	K20
SMH.EBB2 250.M16 B+ve	25	24.4	25	39.3	M16	K25

SOLID MODULAR HEADS

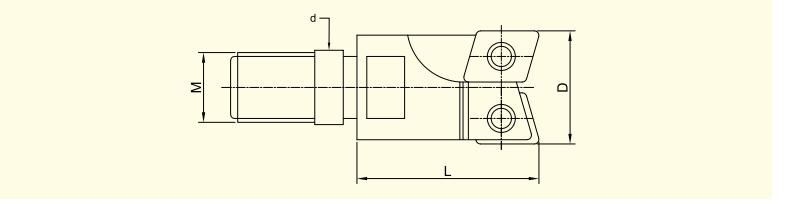


ITEM CODE	DIMENSIONS (mm)					
	D	d	L_1	L_2	M	Applicable Spanner
SMH.EBB4 080.M6 B+ve	8	7.8	8	12.1	M6	K08
SMH.EBB4 100.M6 B+ve	10	9.8	10	16.1	M6	K10
SMH.EBB4 120.M6 B+ve	12	11.7	12	20.3	M6	K12
SMH.EBB4 160.M8 B+ve	16	15.6	16	26.2	M8	K16
SMH.EBB4 200.M10 B+ve	20	19.5	20	31.1	M10	K20
SMH.EBB4 250.M16 B+ve	25	24.4	25	39.3	M16	K25

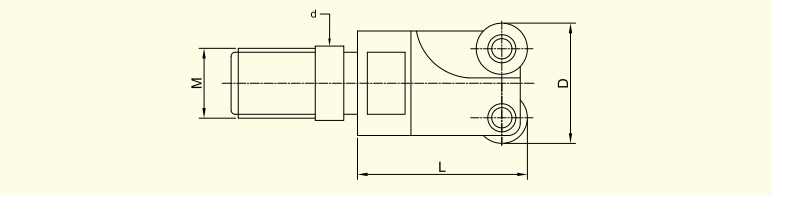


ITEM CODE	DIMENSIONS (mm)					
	D	d	L_1	L_2	M	Applicable Spanner
SMH.ER05B4 080.M6 B+ve	8	0.5	7.8	8	12.1	M6
SMH.ER10B4 080.M6 B+ve	8	1.0	7.8	8	12.1	M6
SMH.ER05B4 100.M6 B+ve	10	0.5	9.8	10	16.1	M6
SMH.ER10B4 100.M6 B+ve	10	1.0	9.8	10	16.1	M6
SMH.ER05B4 120.M8 B+ve	12	0.5	11.7	12	20.3	M8
SMH.ER10B4 120.M8 B+ve	12	1.0	11.7	12	20.3	M8
SMH.ER10B4 160.M8 B+ve	16	1.0	15.6	16	26.2	M8
SMH.ER20B4 160.M8 B+ve	16	2.0	15.6	16	26.2	M8
SMH.ER30B4 160.M8 B+ve	16	3.0	15.6	16	26.2	M8
SMH.ER10B4 200.M10 B+ve	20	1.0	19.5	20	31.1	M10
SMH.ER20B4 200.M10 B+ve	20	2.0	19.5	20	31.1	M10
SMH.ER30B4 200.M10 B+ve	20	3.0	19.5	20	31.1	M10
SMH.ER10B4 250.M16 B+ve	25	1.0	24.4	25	39.3	M16
SMH.ER30B4 250.M16 B+ve	25	3.0	24.4	25	39.3	M16

INSERTED MODULAR HEADS

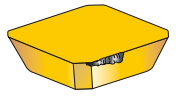
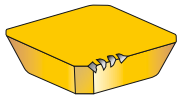
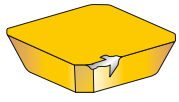


ITEM CODE	DIMENSIONS (mm)							
	D	d	L	z	Insert Code	M	Screw	Key Size
IMH.EMP-AP11-01.010-Z1-M5	10	5.5	20	1	APMT 11 35 ***	M5	M2.5 x 6	T8
IMH.EMP-AP11-01.012-Z1-M6	12	6.5	20	1		M6		
IMH.EMP-AP11-01.016-Z2-M8	16	8.5	25	2		M8		
IMH.EMP-AP11-01.020-Z3-M10	20	10.5	30	3		M10		
IMH.EMP-AP11-01.025-Z3-M12	25	12.5	35	3		M12		
IMH.EMP-AP16-01.025-Z2-M12	25	12.5	35	2	APMT 16 04 ***	M12	M4.0 x 9	T15
IMH.EMP-AP16-01.032-Z2-M12	32	17.0	40	2		M12		
IMH.EMP-AP16-01.040-Z3-M12	40	17.0	40	3		M12		



ITEM CODE	DIMENSIONS (mm)							
	D	d	L	z	Insert Code	M	Screw	Key Size
IMH.FMR-RP08-01.016-Z2-M8	16	8.5	25	2	RP 08 02 ***	M8	M3 x 7	T8
IMH.FMR-RP08-01.020-Z2-M10	20	10.5	30	2		M10		
IMH.FMR-RP10-01.020-Z2-M10	20	10.5	30	2	RP 10 T3 ***	M10	M4.0 x 9	T15
IMH.FMR-RP10-01.025-Z2-M12	25	12.5	35	2		M12		
IMH.FMR-RP10-01.032-Z3-M12	32	17.0	40	3		M12		
IMH.FMR-RP10-01.040-Z4-M12	40	17.0	40	4		M12		
IMH.FMR-RP12-01.040-Z3-M12	40	17.0	40	3	RP12 04 ***	M12	M4.0 x 10	T15

TROUBLESHOOTING - MILLING

	Problem	Cause	Remedy
	**Flank wear in insert**	improper cutting conditions	decrease cutting speed
			use appropriate coolant grade
		improper cutting edge geometry	select suitable / harder insert grade
			select appropriate chip breaker
	**Chip welding / Edge built-up**	improper cutting edge geometry	select appropriate chip breaker
		improper cutting conditions	increase cutting speed
			increase feed rate
			use appropriate coolant grade
	**Chipping or Fracturing of cutting edge**	improper cutting edge geometry	select appropriate chip breaker
		run-out in work-piece	eliminate workpiece run-out
		improper cutting conditions	decrease feed rate
			decrease depth of cut
			increase clamping rigidity of tool & workpiece
			minimize holder overhang
	**Notch wear in insert**	improper cutting conditions	decrease cutting speed
			increase feed rate
			increase depth of cut
			use climb milling
	Poor surface finish	run-out in work-piece	eliminate workpiece run-out
		improper cutting parameters	increase cutting speed
			decrease feed rate
			decrease depth of cut
			use appropriate coolant grade
			use insert with bigger nose radius
	Irregular or non-parallel surface	low rigidity of tool or workpiece	decrease feed rate
			decrease depth of cut
			decrease no of teeth / inserts
			eliminate workpiece run-out
			increase clamping rigidity of tool & workpiece
	Vibration and/ or Chattering	improper cutting conditions	decrease cutting speed
			decrease feed rate
			decrease depth of cut
			decrease no of teeth / inserts
		tool / workpiece not rigid	eliminate workpiece run-out
			increase clamping rigidity of tool & workpiece
			minimize holder overhang
	Chip jamming / Poor chip disposal	improper cutting edge geometry	select appropriate chip breaker
		improper cutting conditions	increase cutting speed
			use appropriate coolant grade
			decrease no of teeth / inserts

RECOMMENDED PARAMETERS
JOMW INSERT (HFR SERIES)

Material Group		Material	Hardness Brinell HB	Cutting Speed V_c m/min	Feed per Tooth (f) (mm / tooth)			
					Ø16	Ø20	Ø25	Ø32
P	1	Mild Steel	≤ 180 HB	170	0.6	0.8	1.0	1.2
	2	Carbon Steel, Alloy Steel	180-280 HB	150	0.6	0.8	1.0	1.4
	3	Carbon Steel, Alloy Steel	280-350 HB	130	0.6	0.8	1.0	1.4
	4	Alloy Tool Steel	≤ 350 HB	130	0.6	0.8	1.0	1.4
	5	Pre-hardened Steel	35-45 HRC	130	0.5	0.6	0.8	1.2
M	6	Stainless Steel	≤ 270 HB	140	0.5	0.6	0.8	1.0
K	7	Cast Iron	Tensile Strength ≤ 350 MPa	150	0.8	1.0	1.2	1.4
	8	Ductile Cast Iron	Tensile Strength ≤ 800 MPa	150	0.6	0.8	1.0	1.2
S	9	Heat Resistant Alloys	≤ 350 HB	30	0.2	0.3	0.4	0.6
	10	Titanium Alloy		50	0.1	0.2	0.3	0.3
H	11	Hardened Steel	≤ 60 HRc	70	0.3	0.4	0.6	0.8

BLOOD®
ROTATING GENIUS

U-DRILL

NOMENCLATURE

U-DRILL

UD	3	160	200	SP	06	TC
1	2	3	4	5	6	7

1. TOOL TYPE

UD = U-Drill

2. FLUTE LENGTH

2 = 2 x D
3 = 3 x D
4 = 4 x D
5 = 5 x D
8 = 8 x D

3. EFFECTIVE DRILL DIAMETER

160 = Ø16.0 mm
185 = Ø18.5 mm
250 = Ø25.0 mm

4. SHANK DIAMETER

200 = Ø20.0 mm
250 = Ø25.0 mm
320 = Ø32.0 mm

5. INSERT TYPE

SP = SPMG
WC = WCGX

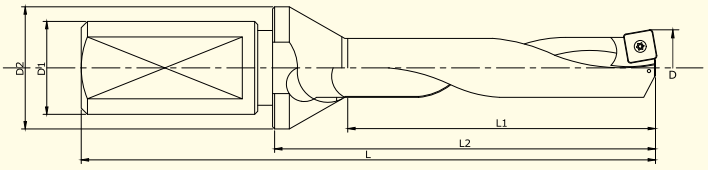
6. CUTTING EDGE LENGTH

03 = 3 mm
06 = 6 mm
09 = 9 mm

7. COOLANT TYPE

TC = THROUGH COOLANT

U-DRILL



ITEM CODE	Dimension (mm)							Suitable Insert Code
	D	L x D	D1	D2	L1	L2	L	
UD2 160.200 SP 05 TC	16.0	2	20	25	37	62	118	SPMG 05 02 04 WCGX 03 02 08
UD3 160.200 SP 05 TC		3	20	25	53	78	134	
UD2 165.200 SP 05 TC	16.5	2	20	25	38	63	119	SPMG 05 02 04 WCGX 03 02 08
UD3 165.200 SP 05 TC		3	20	25	55	80	136	
UD3 170.200 SP 05 TC	17.0	3	20	25	56	81	137	
UD2 175.250 SP 06 TC	17.5	2	25	32	40	65	121	SPMG 06 02 04 WCGX 03 02 08
UD3 175.250 SP 06 TC		3	25	32	58	83	139	
UD4 175.250 SP 06 TC		4	25	32	72	93	149	
UD2 180.250 SP 06 TC	18.0	2	25	32	41	66	122	SPMG 06 02 04 WCGX 03 02 08
UD3 180.250 SP 06 TC		3	25	32	59	84	140	
UD4 180.250 SP 06 TC		4	25	32	72	93	149	
UD2 185.250 SP 06 TC	18.5	2	25	32	42	67	123	SPMG 06 02 04 WCGX 03 02 08
UD3 185.250 SP 06 TC		3	25	32	61	86	142	
UD4 185.250 SP 06 TC		4	25	32	76	97	153	
UD2 190.250 SP 06 TC	19.0	2	25	32	43	68	124	SPMG 06 02 04 WCGX 03 02 08
UD3 190.250 SP 06 TC		3	25	32	62	87	143	
UD4 190.250 SP 06 TC		4	25	32	76	97	153	
UD5 190.250 SP 06 TC		5	25	32	100	125	181	
UD2 200.250 SP 06 TC	20.0	2	25	32	45	70	126	SPMG 06 02 04 WCGX 04 02 08
UD3 200.250 SP 06 TC		3	25	32	65	90	146	
UD4 200.250 SP 06 TC		4	25	32	80	103	159	
UD5 200.250 SP 06 TC		5	25	32	105	130	186	
UD2 210.250 SP 06 TC	21.0	2	25	32	47	72	128	SPMG 06 02 04 WCGX 04 02 08
UD3 210.250 SP 06 TC		3	25	32	68	93	149	
UD4 210.250 SP 06 TC		4	25	32	84	107	163	
UD5 210.250 SP 06 TC		5	25	32	110	135	191	
UD2 220.250 SP 07 TC	22.0	2	25	32	49	74	130	SPMG 07 T3 08 WCGX 04 02 08
UD3 220.250 SP 07 TC		3	25	32	71	96	152	
UD4 220.250 SP 07 TC		4	25	32	88	111	167	
UD5 220.250 SP 07 TC		5	25	32	115	140	196	
UD2 230.250 SP 07 TC	23.0	2	25	32	51	76	132	SPMG 07 T3 08 WCGX 04 02 08
UD3 230.250 SP 07 TC		3	25	32	74	99	155	
UD4 230.250 SP 07 TC		4	25	32	92	117	173	
UD5 230.250 SP 07 TC		5	25	32	120	145	201	
UD2 240.250 SP 07 TC	24.0	2	25	32	53	78	134	SPMG 07 T3 08 WCGX 05 03 08
UD3 240.250 SP 07 TC		3	25	32	77	102	158	
UD4 240.250 SP 07 TC		4	25	32	96	112	178	
UD5 240.250 SP 07 TC		5	25	32	125	150	206	
UD2 250.250 SP 07 TC	25.0	2	25	32	55	80	140	SPMG 07 T3 08 WCGX 05 03 08
UD3 250.250 SP 07 TC		3	25	32	80	105	165	
UD4 250.250 SP 07 TC		4	25	32	100	127	183	
UD5 250.250 SP 07 TC		5	25	32	130	155	215	

*Ordering code for U-Drill with WCGX insert : UD3 200.250 WC 04 TC

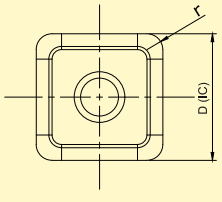
U-DRILL

ITEM CODE	Dimension (mm)							Suitable Insert Code
	D	L x D	D1	D2	L1	L2	L	
UD2 260.320 SP 09 TC	26.0	2	32	42	57	82	142	SPMG 09 04 08 WCGX 05 03 08
UD3 260.320 SP 09 TC		3	32	42	83	108	168	
UD4 260.320 SP 09 TC		4	32	42	104	131	187	
UD5 260.320 SP 09 TC		5	32	42	135	160	220	
UD8 260.320 SP 09 TC		8	32	42	213	238	298	
UD2 270.320 SP 09 TC	27.0	2	32	42	59	84	144	SPMG 09 04 08 WCGX 05 03 08
UD3 270.320 SP 09 TC		3	32	42	86	111	171	
UD4 270.320 SP 09 TC		4	32	42	108	135	191	
UD5 270.320 SP 09 TC		5	32	42	140	165	225	
UD8 270.320 SP 09 TC		8	32	42	221	246	306	
UD2 280.320 SP 09 TC	28.0	2	32	42	61	86	146	SPMG 09 04 08 WCGX 05 03 08
UD3 280.320 SP 09 TC		3	32	42	89	114	174	
UD4 280.320 SP 09 TC		4	32	42	112	140	196	
UD5 280.320 SP 09 TC		5	32	42	145	170	230	
UD8 280.320 SP 09 TC		8	32	42	229	254	314	
UD2 290.320 SP 09 TC	29.0	2	32	42	63	88	148	SPMG 09 04 08 WCGX 05 03 08
UD3 290.320 SP 09 TC		3	32	42	92	117	177	
UD4 290.320 SP 09 TC		4	32	42	116	114	200	
UD5 290.320 SP 09 TC		5	32	42	150	175	235	
UD8 290.320 SP 09 TC		8	32	42	237	262	322	
UD2 300.320 SP 09 TC	30.0	2	32	42	65	90	150	SPMG 09 04 08 WCGX 06 T3 08
UD3 300.320 SP 09 TC		3	32	42	95	120	180	
UD4 300.320 SP 09 TC		4	32	42	120	151	211	
UD5 300.320 SP 09 TC		5	32	42	155	180	240	
UD8 300.320 SP 09 TC		8	32	42	245	270	330	
UD2 310.400 SP 09 TC	31.0	2	40	50	67	92	152	SPMG 09 04 08 WCGX 06 T3 08
UD3 310.400 SP 09 TC		3	40	50	98	123	183	
UD4 310.400 SP 09 TC		4	40	50	124	156	216	
UD5 310.400 SP 09 TC		5	40	50	160	185	245	
UD8 310.400 SP 09 TC		8	40	50	253	278	338	
UD2 320.400 SP 11 TC	32.0	2	40	50	69	94	162	SPMG 11 04 08 WCGX 06 T3 08
UD3 320.400 SP 11 TC		3	40	50	101	126	194	
UD4 320.400 SP 11 TC		4	40	50	128	160	220	
UD5 320.400 SP 11 TC		5	40	50	165	190	258	
UD8 320.400 SP 11 TC		8	40	50	261	286	346	
UD2 330.400 SP 11 TC	33.0	2	40	50	71	96	164	SPMG 11 04 08 WCGX 06 T3 08
UD3 330.400 SP 11 TC		3	40	50	104	129	197	
UD4 330.400 SP 11 TC		4	40	50	132	165	225	
UD5 330.400 SP 11 TC		5	40	50	170	195	263	
UD8 330.400 SP 11 TC		8	40	50	269	294	354	
UD2 340.400 SP 11 TC	34.0	2	40	50	73	98	166	SPMG 11 04 08 WCGX 06 T3 08
UD3 340.400 SP 11 TC		3	40	50	107	132	200	
UD4 340.400 SP 11 TC		4	40	50	136	169	229	
UD5 340.400 SP 11 TC		5	40	50	175	200	268	
UD8 340.400 SP 11 TC		8	40	50	277	302	362	
UD2 350.400 SP 11 TC	35.0	2	40	50	75	100	168	SPMG 11 04 08 WCGX 06 T3 08
UD3 350.400 SP 11 TC		3	40	50	110	135	203	
UD4 350.400 SP 11 TC		4	40	50	140	174	234	
UD5 350.400 SP 11 TC		5	40	50	180	205	273	
UD8 350.400 SP 11 TC		8	40	50	285	310	370	

*Ordering code for U-Drill with WCGX insert : UD3 200.250 WC 04 TC

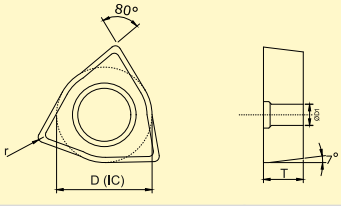
U-DRILL INSERT

SPMG



ITEM CODE	DIMENSIONS				GRADE	
	D (IC)	T	D1	r	HOT CM 1904	CM 0407
SPMG 05 02 04	5.56	2.38	2.5	0.4	★	★
SPMG 06 02 04	6.35	2.38	2.8	0.4	★	★
SPMG 07 T3 08	7.94	3.97	2.8	0.8	★	★
SPMG 09 04 08	9.8	4.3	4.1	0.8	★	★
SPMG 11 04 08	11.5	4.76	4.4	0.8	★	★
SPMG 14 05 12	14.3	5.56	5.5	1.2	★	★

WCGX

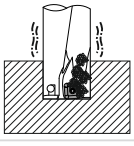
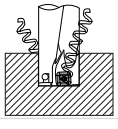
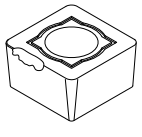
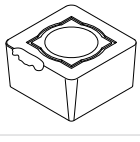


ITEM CODE	DIMENSIONS				GRADE	
	D (IC)	T	D1	r	HOT CM 1904	CM 0407
WCGX 03 02 04	5.56	2.38	2.5	0.4	★	★
WCGX 03 02 08	5.56	2.38	2.5	0.8	★	
WCGX 04 02 04	6.35	2.38	2.8	0.4	★	★
WCGX 04 02 08	6.35	2.38	2.8	0.8	★	
WCGX 05 03 08	7.94	3.18	3.4	0.8	★	
WCGX 06 T3 08	9.525	3.97	4.4	0.8	★	
WCGX 08 04 08	12.8	4.76	5.5	0.8	★	

RECOMMENDED PARAMETERS - U-DRILL

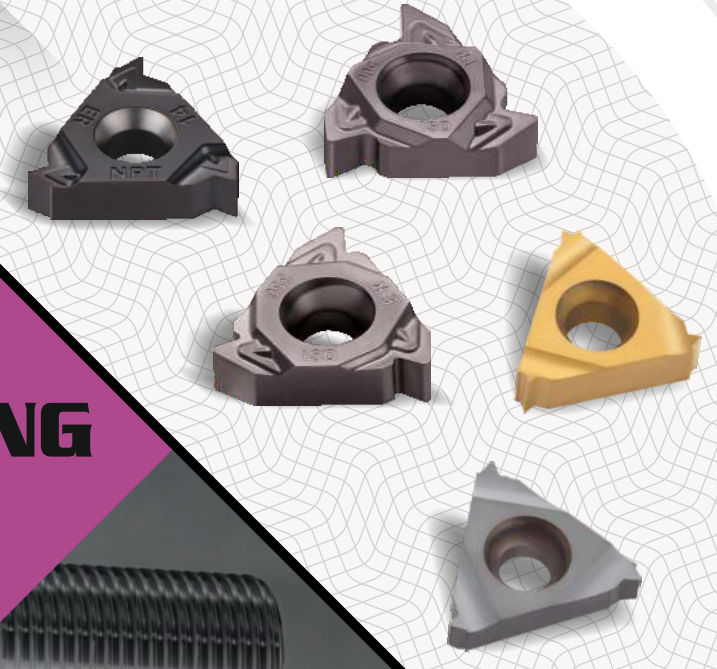
Material Group		Material	Hardness Brinell HB	Cutting Speed V_c m/min	Feed Rate f per Revolution (mm / r)		
					Ø14~Ø20	Ø20.1~Ø25	Ø25.1~Ø30
P	1	Mild Steel	≤ 180 HB	200 (150~300)	0.06 (0.03~0.09)	0.07 (0.04~0.10)	0.08 (0.06~0.10)
	2	Alloy Steel	180-280 HB	150 (120~180)	0.07 (0.04~0.09)	0.08 (0.06~0.11)	0.10 (0.07~0.14)
M	3	Stainless Steel	≤ 200 HB	120 (90~140)	0.04 (0.02~0.07)	0.05 (0.03~0.08)	0.07 (0.04~0.09)
K	4	Cast Iron	Tensile Strength ≤ 350 MPa	150 (120~180)	0.12 (0.09~0.15)	0.15 (0.10~0.18)	0.18 (0.14~0.23)
N	5	Aluminium Alloy	≤ 90 HB	210 (170~250)	0.11 (0.06~0.14)	0.13 (0.09~0.18)	0.15 (0.11~0.20)
S	6	Heat Resistant Alloys	≤ 250 HB	30 (20~45)	0.04 (0.02~0.07)	0.05 (0.03~0.08)	0.07 (0.04~0.09)
H	7	Hardened Steel	≤ 60 HRc	45 (30~60)	0.04 (0.02~0.07)	0.05 (0.03~0.08)	0.07 (0.04~0.09)

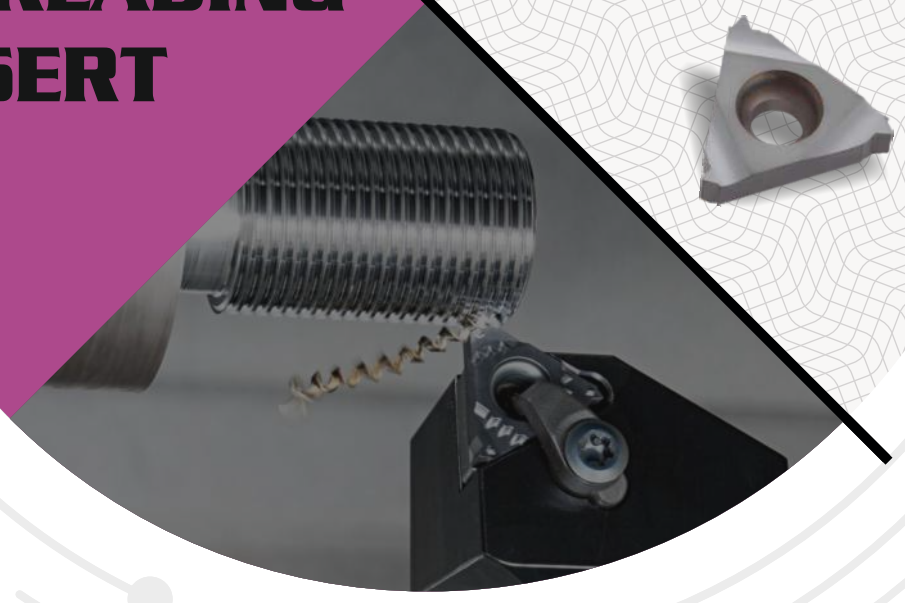
TROUBLESHOOTING - U-DRILL

	Problem	Cause	Remedy
	Vibration	improper clamping of drill	check clamping of drill
		improper clamping of work-piece	check clamping of work-piece
		improper cutting conditions	Increase feed. In case of very soft material, reduce feed and increase speed.
			reduce cutting speed
	Chip jamming due to long chips	improper cutting conditions	Increase feed. In case of very soft material, reduce feed and increase speed.
		improper cutting edge geometry	choose a geometry with harder chipbreaking for lower feeds
	Chip jamming due to short chips	insufficient coolant volume and/or pressure	increase coolant volume / pressure
		improper cutting conditions	reduce cutting speed
	Chipping or Fracture of Peripheral Insert	improper insert grade	choose a tougher grade
			choose a geometry with softer chipbreaking for higher feeds
		improper cutting conditions	reduce entrance feed
			reduce feed
			reduce cutting speed
		use of insert even after corner wear	change the corner of the insert before excess corner-wear
	Chipping or Fracture of Center Insert	improper clamping of drill	check clamping of drill
		improper clamping of work-piece	check clamping of work-piece
		improper cutting conditions	reduce entrance feed
			increase feed
			reduce cutting speed
		use of insert even after corner wear	change the corner of the insert before excess corner-wear
	Flank Wear on Peripheral Insert	improper cutting conditions	reduce cutting speed
		insufficient coolant pressure	increase coolant pressure
		improper insert grade	choose a more wear resistant grade

BLOOD®
ROTATING GENIUS

THREADING INSERT





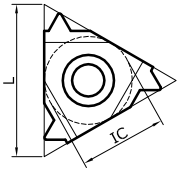
NOMENCLATURE

THREADING INSERT

16	E	R	150	ISO	S*
1	2	3	4	5	6

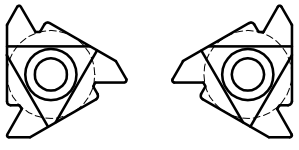
1. INSERT SIZE

L (mm)	IC
06	3.968 mm = 5/32"
08	4.762 mm = 3/16"
11	6.350 mm = 1/4"
16	9.525 mm = 3/8"
22	12.700 mm = 1/2"
27	15.875 mm = 5/8"



2. APPLICATION

E - External
I - Internal



E I

3. CUTTING DIRECTION

R - Right hand
L - Left hand
RL - Right / Left hand

4. PITCH

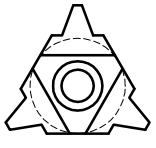
Full Profile (value by number)	
0.35 - 9.0	mm
72 - 2	tpi

Partial Profile (range by letter)		
	mm	tpi
A	0.5 - 1.5	48 - 16
AG	0.5 - 3.0	48 - 8
G	1.75 - 3.0	14 - 8
N	3.5 - 5.0	7 - 5
U	5.5 - 9.0	4.5 - 2.75
Q	5.5 - 6.0	4.5 - 4

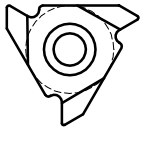
5. THREAD STANDARD

60°	Partial Profile 60°
55°	Partial Profile 55°
ISO	ISO Metric
UN	American UN
W	Withworth
BSPT	British BSPT
RD	Round DIN 405
TR	Taper DIN 103
ACME	ACME
ABOUT	American Buttress
NPT	NPT
BUT	API Buttress Casing

6. INSERT STYLE



U



S

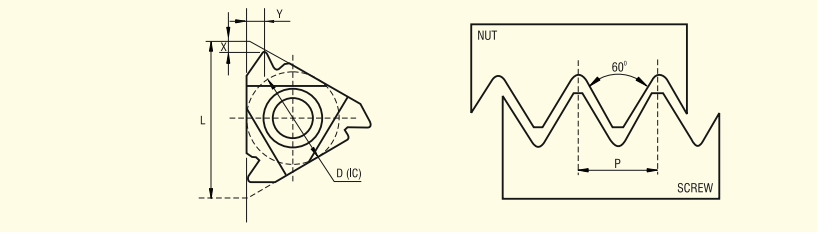
*S = Standard

*ERM² / IRM² = High Performance Grade

THREADING INSERT

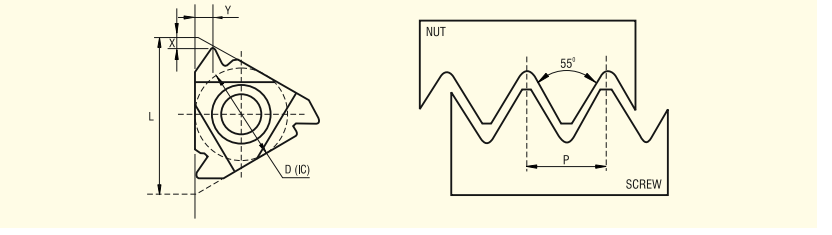
P M K N S H

PARTIAL PROFILE 60°



	ITEM CODE RH	ITEM CODE LH	mm	TPI	D (IC) inch	L	X	Y
EXTERNAL	11 ER A60	11 EL A60	0.5~1.5	48~16	1/4"	11	0.8	0.9
	16 ER A60	16 EL A60	0.5~1.5	48~16	3/8"	16	0.8	0.9
	16 ER AG60	16 EL AG60	0.5~3.0	48~8			1.2	1.7
	16 ER G60	16 EL G60	1.75~3.0	14~8			1.2	1.7
	22 ER N60	22 EL N60	3.5~5.0	7~5	1/2"	22	1.7	2.5
	27 ER Q60	27 EL Q60	5.5~6.0	4.5~4	5/8"	27	2.1	3.1
INTERNAL	11 IR A60	11 IL A60	0.5~1.5	48~16	1/4"	11	0.8	0.9
	16 IR A60	16 IL A60	0.5~1.5	48~16	3/8"	16	0.8	0.9
	16 IR AG60	16 IL AG60	0.5~3.0	48~8			1.2	1.7
	16 IR G60	16 IL G60	1.75~3.0	14~8			1.2	1.7
	22 IR N60	22 IL N60	3.5~5.0	7~5	1/2"	22	1.7	2.5
	27 IR Q60	27 IL Q60	5.5~6.0	4.5~4	5/8"	27	1.8	2.7

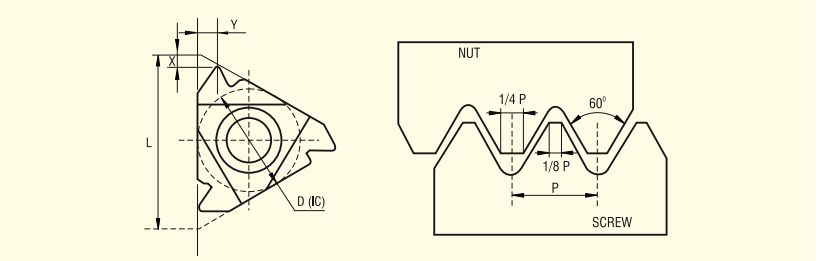
PARTIAL PROFILE 55°



	ITEM CODE RH	ITEM CODE LH	mm	TPI	D (IC) inch	L	X	Y
EXTERNAL	11 ER A55	11 EL A55	0.5~1.5	48~16	1/4"	11	0.8	0.9
	16 ER A55	16 EL A55	0.5~1.5	48~16	3/8"	16	0.8	0.9
	16 ER AG55	16 EL AG55	0.5~3.0	48~8			1.2	1.7
	16 ER G55	16 EL G55	1.75~3.0	14~8			1.2	1.7
	22 ER N55	22 EL N55	3.5~5.0	7~5	1/2"	22	1.7	2.5
	27 ER Q55	27 EL Q55	5.5~6.0	4.5~4	5/8"	27	2.1	3.1
INTERNAL	11 IR A55	11 IL A55	0.5~1.5	48~16	1/4"	11	0.8	0.9
	16 IR A55	16 IL A55	0.5~1.5	48~16	3/8"	16	0.8	0.9
	16 IR AG55	16 IL AG55	0.5~3.0	48~8			1.2	1.7
	16 IR G55	16 IL G55	1.75~3.0	14~8			1.2	1.7
	22 IR N55	22 IL N55	3.5~5.0	7~5	1/2"	22	1.7	2.5
	27 IR Q55	27 IL Q55	5.5~6.0	4.5~4	5/8"	27	1.8	2.7

THREADING INSERT

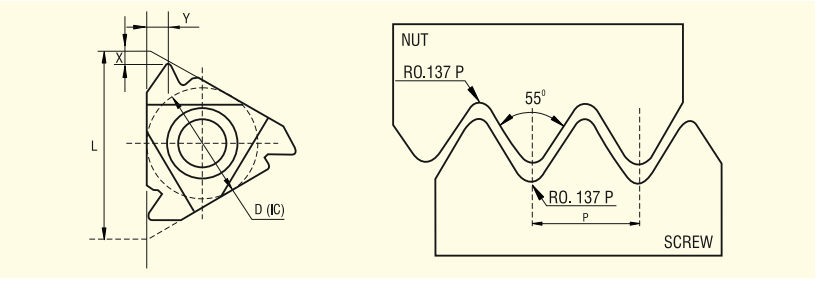
ISO METRIC FULL PROFILE



	ITEM CODE		Pitch mm	D (IC) inch	L	X	Y
	RH	LH					
EXTERNAL	11 ER 050 ISO	11 EL 050 ISO	0.5	1/4"	11	0.6	0.6
	11 ER 075 ISO	11 EL 075 ISO	0.75			0.6	0.6
	11 ER 100 ISO	11 EL 100 ISO	1.0			0.7	0.7
	11 ER 125 ISO	11 EL 125 ISO	1.25			0.8	0.9
	11 ER 150 ISO	11 EL 150 ISO	1.5			0.8	1.0
	16 ER 050 ISO	16 EL 050 ISO	0.5	3/8"	16	0.6	0.6
	16 ER 075 ISO	16 EL 075 ISO	0.75			0.6	0.7
	16 ER 100 ISO	16 EL 100 ISO	1.0			0.7	0.8
	16 ER 125 ISO	16 EL 125 ISO	1.25			0.8	0.9
	16 ER 150 ISO	16 EL 150 ISO	1.5			0.8	1.0
	16 ER 175 ISO	16 EL 175 ISO	1.75			0.9	1.2
	16 ER 200 ISO	16 EL 200 ISO	2.0			1.0	1.3
	16 ER 250 ISO	16 EL 250 ISO	2.5			1.1	1.5
	16 ER 300 ISO	16 EL 300 ISO	3.0			1.2	1.6
	22 ER 350 ISO	22 EL 350 ISO	3.5	1/2"	22	1.6	2.3
	22 ER 400 ISO	22 EL 400 ISO	4.0			1.6	2.3
	22 ER 450 ISO	22 EL 450 ISO	4.5			1.7	2.4
	22 ER 500 ISO	22 EL 500 ISO	5.0			1.7	2.5
INTERNAL	11 IR 050 ISO	11 IL050 ISO	0.5	1/4"	11	0.6	0.6
	11 IR 075 ISO	11 IL075 ISO	0.75			0.6	0.6
	11 IR 100 ISO	11 IL100 ISO	1.0			0.6	0.7
	11 IR 125 ISO	11 IL125 ISO	1.25			0.8	0.9
	11 IR 150 ISO	11 IL150 ISO	1.5			0.8	1.0
	16 IR 050 ISO	16 IL 050 ISO	0.5	3/8"	16	0.6	0.6
	16 IR 075 ISO	16 IL 075 ISO	0.75			0.6	0.6
	16 IR 100 ISO	16 IL 100 ISO	1.0			0.6	0.7
	16 IR 125 ISO	16 IL 125 ISO	1.25			0.8	0.9
	16 IR 150 ISO	16 IL 150 ISO	1.5			0.8	1.0
	16 IR 175 ISO	16 IL 175 ISO	1.75			0.9	1.2
	16 IR 200 ISO	16 IL 200 ISO	2.0			1.0	1.3
	16 IR 250 ISO	16 IL 250 ISO	2.5			1.1	1.5
	16 IR 300 ISO	16 IL 300 ISO	3.0			1.1	1.5
	22 IR 350 ISO	22 IL 350 ISO	3.5	1/2"	22	1.6	2.3
	22 IR 400 ISO	22 IL 400 ISO	4.0			1.6	2.3
	22 IR 450 ISO	22 IL 450 ISO	4.5			1.7	2.4
	22 IR 500 ISO	22 IL 500 ISO	5.0			1.7	2.5

THREADING INSERT

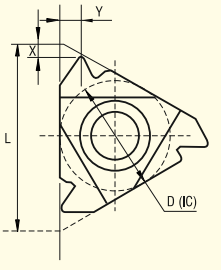
WHITWORTH FULL PROFILE

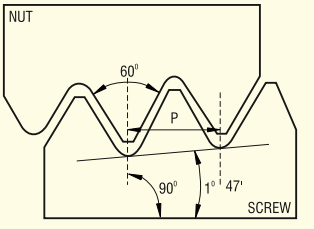


	ITEM CODE		Pitch mm	D (IC) inch	L	X	Y
	RH	LH					
EXTERNAL	11 ER 28 W	11 EL 28 W	28	1/4"	11	0.6	0.7
	11 ER 26 W	11 EL 26 W	26			0.7	0.8
	11 ER 20 W	11 EL 20 W	20			0.8	0.9
	11 ER 19 W	11 EL 19 W	19			0.8	1.0
	11 ER 18 W	11 EL 18 W	18			0.8	1.0
	11 ER 16 W	11 EL 16 W	16			0.9	1.1
	11 ER 14 W	11 EL 14 W	14			1.0	1.2
	16 ER 28 W	16 EL 28 W	28	3/8"	16	0.6	0.7
	16 ER 26 W	16 EL 26 W	26			0.7	0.8
	16 ER 20 W	16 EL 20 W	20			0.8	0.9
	16 ER 19 W	16 EL19 W	19			0.8	1.0
	16 ER 18 W	16 EL18 W	18			0.8	0.9
	16 ER 16 W	16 EL 16 W	16			0.9	1.1
	16 ER 14 W	16 EL 14 W	14			1.0	1.2
	16 ER 12 W	16 EL 12 W	12			1.1	1.4
	16 ER 11 W	16 EL 11 W	11			1.1	1.5
	16 ER 10 W	16 EL 10 W	10			1.1	1.5
	16 ER 9 W	16 EL 9 W	9			1.2	1.5
	16 ER 8 W	16 EL 8 W	8			1.2	1.7
	22 ER 7 W	22 EL 7 W	7	1/2"	22	1.6	2.3
	22 ER 6 W	22 EL 6 W	6			1.6	2.3
	22 ER 5 W	22 EL 5 W	5			1.7	2.4
	27 ER 4.5 W	27 EL 4.5 W	4.5	5/8"	27	1.8	2.6
	27 ER 4 W	27 EL 4 W	4			2.0	2.9

THREADING INSERT

NPT



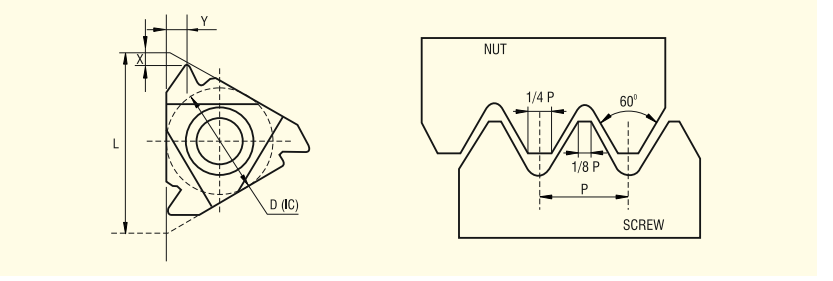


	ORDERING CODE		Pitch mm	D (IC) inch	L	X	Y
	RH	LH					
EXTERNAL	11 ER 27 NPT	11 EL 27 NPT	27	1/4"	11	0.7	0.8
	11 ER 18 NPT	11 EL 18 NPT	18			0.8	1.0
	11 ER 14 NPT	11 EL 14 NPT	14			0.8	1.0
	16 ER 27 NPT	16 EL 27 NPT	27	3/8"	16	0.7	8.0
	16 ER 18 NPT	16 EL 18 NPT	18			0.8	1.0
	16 ER 14 NPT	16 EL 14 NPT	14			0.9	1.2
	16 ER 11.5 NPT	16 EL 11.5 NPT	11.5			1.1	1.5
	16 ER 8 NPT	16 EL 8 NPT	8			1.2	1.8
INTERNAL	11 IR 27 NPT	11 IL 27 NPT	27	1/4"	11	0.7	0.8
	11 IR 18 NPT	11 IL 18 NPT	18			0.8	1.0
	11 IR 14 NPT	11 IL 14 NPT	14			0.8	1.0
	11 IR 27 NPT	11 IL 27 NPT	27	3/8"	16	0.7	0.8
	16 IR 18 NPT	16 IL 18 NPT	18			0.8	1.0
	16 IR 14 NPT	16 IL 14 NPT	14			0.9	1.2
	16 IR 11.5 NPT	16 IL 11.5 NPT	11.5			1.1	1.5
	16 IR 8 NPT	16 IL 8 NPT	8			1.2	1.8

THREADING INSERT

AMERICAN UN (UNC, UNF, UNEF)

P M K N S H



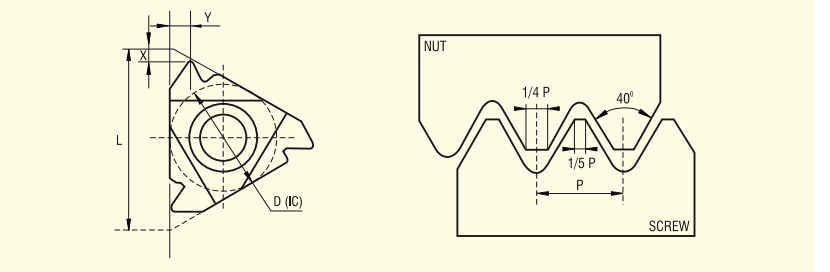
	ORDERING CODE		Pitch mm	D (IC) inch	L	X	Y
	RH	LH					
EXTERNAL	11 ER 20 UN	11 EL 20 UN	20	1/4"	11	0.8	0.9
	11 ER 18 UN	11 EL 18 UN	18			0.8	1.0
	11 ER 16 UN	11 EL 16 UN	16			0.9	1.1
	11 ER 14 UN	11 EL 14 UN	14			0.9	1.1
	11 ER 12 UN	11 EL 12 UN	12			0.8	1.1
	16 ER 24 UN	16 EL 24 UN	24	3/8"	16	0.7	0.8
	16 ER 20 UN	16 EL 20 UN	20			0.8	0.9
	16 ER 18 UN	16 EL 18 UN	18			0.8	1.0
	16 ER 16 UN	16 EL 16 UN	16			0.9	1.1
	16 ER 14 UN	16 EL 14 UN	14			0.9	1.2
	16 ER 12 UN	16 EL 12 UN	12			1.1	1.4
	16 ER 10 UN	16 EL 10 UN	10			1.1	1.5
	16 ER 08 UN	16 EL 08 UN	8			1.1	1.5
	22 ER 07 UN	22 EL 07 UN	7	1/2"	22	1.6	2.3
	22 ER 06 UN	22 EL 06 UN	6			1.6	2.3
	22 ER 05 UN	22 EL 05 UN	5			1.6	2.3
INTERNAL	11 IR 20 UN	11 IL 20 UN	20	1/4"	11	0.8	0.9
	11 IR 18 UN	11 IL 18 UN	18			0.8	1.0
	11 IR 16 UN	11 IL 16 UN	16			0.9	1.1
	11 IR 14 UN	11 IL 14 UN	14			0.9	1.1
	11 IR 12 UN	11 IL 12 UN	12			0.8	1.1
	16 IR 24 UN	16 IL 24 UN	24	3/8"	16	0.7	0.8
	16 IR 20 UN	16 IL 20 UN	20			0.8	0.9
	16 IR 18 UN	16 IL 18 UN	18			0.8	1.0
	16 IR 16 UN	16 IL 16 UN	16			0.9	1.1
	16 IR 14 UN	16 IL 14 UN	14			0.9	1.2
	16 IR 12 UN	16 IL 12 UN	12			1.1	1.4
	16 IR 10 UN	16 IL 10 UN	10			1.1	1.5
	16 IR 08 UN	16 IL 08 UN	8			1.1	1.5
	22 IR 07 UN	22 IL 07 UN	7	1/2"	22	1.6	2.3
	22 IR 06 UN	22 IL 06 UN	6			1.6	2.3
	22 IR 05 UN	22 IL 05 UN	5			1.6	2.3

THREADING INSERT

ERM²

ISO METRIC FULL PROFILE

P M K N S H



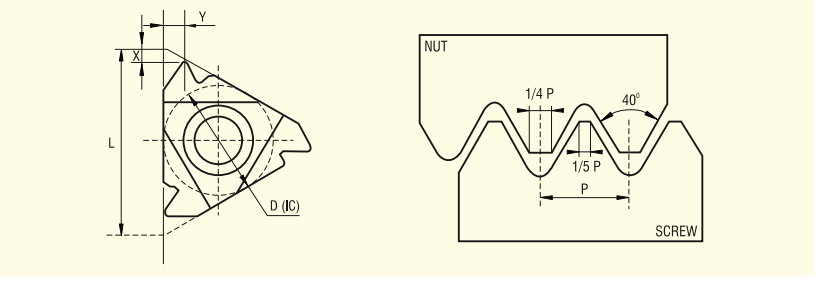
	ITEM CODE RH	Pitch mm	D (IC) inch	L	X	Y
EXTERNAL	11 ERM² 050 ISO	0.5	1/4"	11	0.6	0.6
	11 ERM² 075 ISO	0.75			0.6	0.6
	11 ERM² 100 ISO	1.0			0.7	0.7
	11 ERM² 125 ISO	1.25			0.8	0.9
	11 ERM² 150 ISO	1.5			0.8	1
	11 ERM² 175 ISO	1.75			0.8	1.1
	16 ERM² 050 ISO	0.5	3/8"	16	0.6	0.6
	16 ERM² 075 ISO	0.75			0.6	0.7
	16 ERM² 100 ISO	1.0			0.7	0.8
	16 ERM² 125 ISO	1.25			0.8	0.9
	16 ERM² 150 ISO	1.5			0.8	1
	16 ERM² 175 ISO	1.75			0.9	1.2
	16 ERM² 200 ISO	2.0			1.0	1.3
	16 ERM² 250 ISO	2.5			1.1	1.5
	16 ERM² 300 ISO	3.0			1.2	1.6
	22 ERM² 350 ISO	3.5	1/2"	22	1.6	2.3
	22 ERM² 400 ISO	4.0			1.6	2.3
	22 ERM² 450 ISO	4.5			1.7	2.4
	22 ERM² 500 ISO	5.0			1.7	2.5

THREADING INSERT

IRM²

ISO METRIC FULL PROFILE

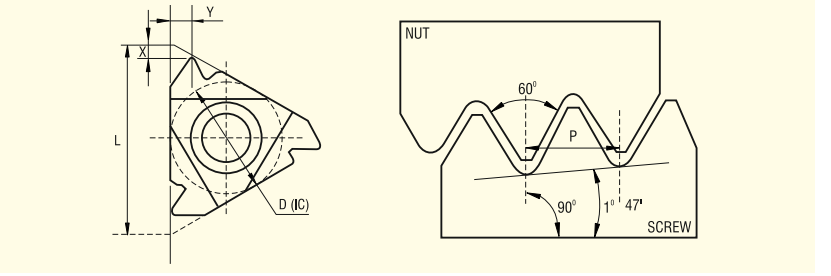
P M K N S H



ITEM CODE RH		Pitch mm	D (IC) inch	L	X	Y
INTERNAL	11 IRM² 050 ISO	0.5	1/4"	11	0.6	0.6
	11 IRM² 075 ISO	0.75			0.6	0.6
	11 IRM² 100 ISO	1.0			0.6	0.7
	11 IRM² 125 ISO	1.25			0.8	0.9
	11 IRM² 150 ISO	1.5			0.8	1.0
	11 IRM² 175 ISO	1.75			0.9	1.1
	16 IRM² 050 ISO	0.5	3/8"	16	0.6	0.6
	16 IRM² 075 ISO	0.75			0.6	0.6
	16 IRM² 100 ISO	1.0			0.6	0.7
	16 IRM² 125 ISO	1.25			0.8	0.9
	16 IRM² 150 ISO	1.5			0.8	1.0
	16 IRM² 175 ISO	1.75			0.9	1.2
	16 IRM² 200 ISO	2.0			1.0	1.3
	16 IRM² 250 ISO	2.5			1.1	1.5
	16 IRM² 300 ISO	3.0			1.1	1.5
	22 IRM² 350 ISO	3.5	1/2"	22	1.6	2.3
	22 IRM² 400 ISO	4.0			1.6	2.3
	22 IRM² 450 ISO	4.5			1.7	2.4
	22 IRM² 500 ISO	5.0			1.7	2.5

THREADING INSERT

ERM² / IRM²
NPT



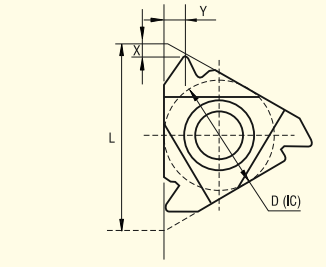
	ITEM CODE RH	Pitch mm	D (IC) inch	L	X	Y
EXTERNAL	11 ERM² 27 NPT	27	1/4"	11	0.7	0.8
	11 ERM² 18 NPT	18			0.8	1.0
	11 ERM² 14 NPT	14.0			0.8	1.0
	16 ERM² 27 NPT	27			0.7	0.8
	16 ERM² 18 NPT	18	3/8"	16	0.8	1.0
	16 ERM² 14 NPT	14.0			0.9	1.2
	16 ERM² 11.5 NPT	11.5			1.1	1.5
	16 ERM² 8 NPT	8			1.2	1.8
INTERNAL	11 IRM² 27 NPT	27	1/4"	11	0.7	0.8
	11 IRM² 18 NPT	18			0.8	1.0
	11 IRM² 14 NPT	14.0			0.8	1.0
	16 IRM² 27 NPT	27	3/8"	16	0.7	0.8
	16 IRM² 18 NPT	18			0.8	1.0
	16 IRM² 14 NPT	14.0			0.9	1.2
	16 IRM² 11.5 NPT	11.5			1.1	1.5
	16 IRM² 8 NPT	8			1.2	1.8

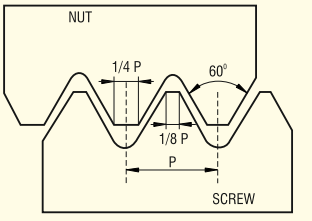
THREADING INSERT

ERM² / IRM²

AMERICAN UN (UNC, UNF, UNEF)

P M K N S H





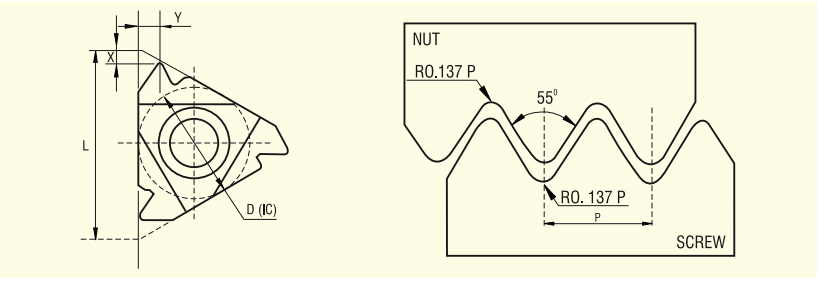
	ORDERING CODE RH	Pitch mm	D (IC) inch	L	X	Y
EXTERNAL	11 ERM² 20 UN	20	1/4"	11	0.8	0.9
	11 ERM² 18 UN	18			0.8	1.0
	11 ERM² 16 UN	16			0.9	1.1
	11 ERM² 14 UN	14			0.9	1.1
	11 ERM² 12 UN	12			0.8	1.1
	16 ERM² 24 UN	24	3/8"	16	0.7	0.8
	16 ERM² 20 UN	20			0.8	0.9
	16 ERM² 18 UN	18			0.8	1.0
	16 ERM² 16 UN	16			0.9	1.1
	16 ERM² 14 UN	14			0.9	1.2
	16 ERM² 12 UN	12			1.1	1.4
	16 ERM² 10 UN	10			1.1	1.5
	16 ERM² 08 UN	8			1.1	1.5
	22 ERM² 07 UN	7	1/2"	22	1.6	2.3
	22 ERM² 06 UN	6			1.6	2.3
	22 ERM² 05 UN	5			1.6	2.3
INTERNAL	11 IRM² 20 UN	20	1/4"	11	0.8	0.9
	11 IRM² 18 UN	18			0.8	1.0
	11 IRM² 16 UN	16			0.9	1.1
	11 IRM² 14 UN	14			0.9	1.1
	11 IRM² 12 UN	12			0.8	1.1
	16 IRM² 24 UN	24	3/8"	16	0.7	0.8
	16 IRM² 20 UN	20			0.8	0.9
	16 IRM² 18 UN	18			0.8	1.0
	16 IRM² 16 UN	16			0.9	1.1
	16 IRM² 14 UN	14			0.9	1.2
	16 IRM² 12 UN	12			1.1	1.4
	16 IRM² 10 UN	10			1.1	1.5
	16 IRM² 08 UN	8			1.1	1.5
	22 IRM² 07 UN	7	1/2"	22	1.6	2.3
	22 IRM² 06 UN	6			1.6	2.3
	22 IRM² 05 UN	5			1.6	2.3

THREADING INSERT

ERM²

WHITWORTH FULL PROFILE

P M K N S H



ITEM CODE RH		Pitch mm	D (IC) inch	L	X	Y
EXTERNAL	11 ERM² 28 W	28	1/4"	11	0.6	0.7
	11 ERM² 26 W	26			0.7	0.8
	11 ERM² 20 W	20			0.8	0.9
	11 ERM² 19 W	19			0.8	1.0
	11 ERM² 18 W	18			0.8	1.0
	11 ERM² 16 W	16			0.9	1.1
	11 ERM² 14 W	14			1	1.2
	16 ERM² 28 W	28	3/8"	16	0.6	0.7
	16 ERM² 26 W	26			0.7	0.8
	16 ERM² 20 W	20			0.8	0.9
	16 ERM² 19 W	19			0.8	1.0
	16 ERM² 18 W	18			0.8	0.9
	16 ERM² 16 W	16			0.9	1.1
	16 ERM² 14 W	14			1.0	1.2
	16 ERM² 12 W	12			1.1	1.4
	16 ERM² 11 W	11			1.1	1.5
	16 ERM² 10 W	10			1.1	1.5
	16 ERM² 9 W	9			1.2	1.5
	16 ERM² 8 W	8			1.2	1.7

BLOOD®
ROTATING GENIUS

THREADING HOLDER

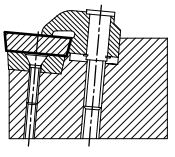
NOMENCLATURE

THREADING HOLDER

S	E	R	20	20	K	16
1	2	3	4	5	6	7

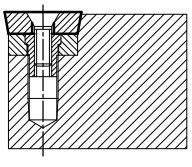
1. CLAMPING SYSTEM

C



C / Top Clamp

S



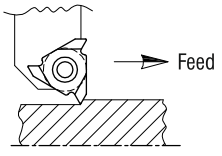
S / Screw Clamp

2. APPLICATION

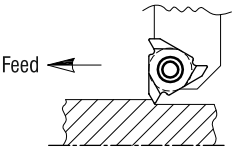
- E - External Thread
- I - Internal Thread
- N - Nutral

3. CUTTING DIRECTION

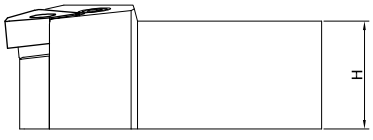
R



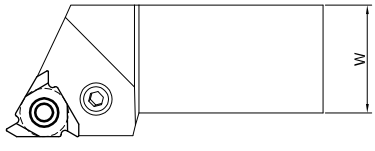
L



4. SHANK HEIGHT



5. SHANK WIDTH



6. TOOL LENGTH

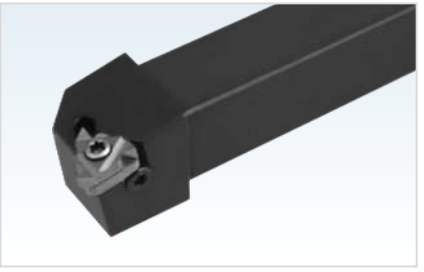
CODE	H	K	M	P	Q	R	S	T	U
LENGTH	100	125	150	170	180	200	250	300	350

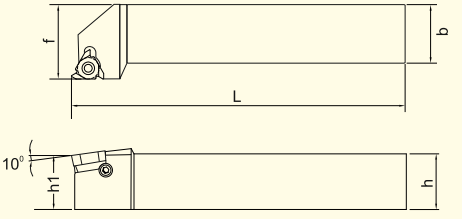
7. INSERT SIZE

CODE	11	16	22
TRIANGLE SIDE LENGTH	11	16	22
INSCRIBED CIRCLE	6.35	9.525	12.70

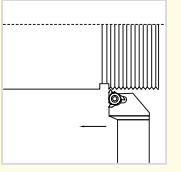
THREADING HOLDER

EXTERNAL



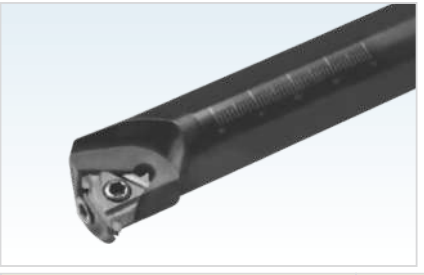


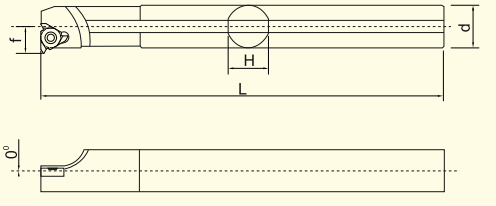
SER/L



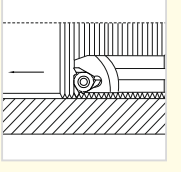
ITEM CODE	Dimension (mm)						Suitable Insert Code
	h	b	L	f	h1	L1	
SER/L 1212 H16	12	12	100	16	12	20	16 ER/L 16 CGE
SER/L 1616 H16	16	16	100	20	16	22	
SER/L 2020 K16	20	20	125	25	20	22	
SER/L 2525 M16	25	25	150	32	25	22	
SER/L 3232 P16	32	32	170	40	32	22	

INTERNAL





SNR/L

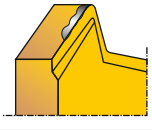
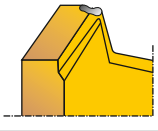
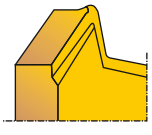
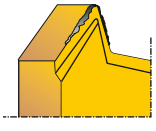


ITEM CODE	Dimension (mm)					Suitable Insert Code
	D min	D	H	L	f	
SNR/L 0008 K08	08	08	07	125	4.3	01 IR / L, 08 CGI
SNR/L 0010 K11	13	10	09	125	7.2	11CGI 11 IR/L
SNR/L 0012 M11	15	12	11	150	8.5	
SNR/L 0013 M16	16	16	15	150	10.2	16 IR/L 16 CGI
SNR/L 0016 M16	19	16	15	150	11.7	
SNR/L 0020 Q16	24	20	19	180	13.7	
SNR/L 0025 R16	29	25	24	200	16.2	
SNR/L 0032 S16	36	32	30	250	19.7	
SNR/L 0040 T16	44	40	38	300	23.7	
SNR/L 0050 U16	54	50	48	350	28.7	

RECOMMENDED PARAMETERS THREADING INSERT

Material Group		Material		Hardness Brinell HB	Cutting Speed V_c m/min	Feed f mm/tooth
P	1	Unalloyed steel	Medium carbon (C=0.25-0.55%)	150	80 - 140	0.03 - 0.07
	2	Low alloy steel	Non hardened	180	65 - 120	0.05 - 0.09
	3	(alloying elements ≤ 5%)	Hardened	275	55 - 110	0.03 - 0.07
M	4	Stainless steel	Non hardened	200	65 - 120	0.03 - 0.07
	5		Austenitic	180	50 - 100	0.03 - 0.07
	6	Stainless steel Cast ferritic	Hardened	330	50 - 100	0.01 - 0.03
K	7	Malleable cast iron	Ferritic (short chips)	130	50 - 90	0.02 - 0.05
	8	Grey cast iron	Low tensile strength	180	50 - 90	0.03 - 0.07
	9		High tensile strength	260	40 - 70	0.03 - 0.05
N	11	Aluminium alloys	Cast	75	80 - 150	0.07 - 0.15
	12		Cast & aged	90	50 - 100	0.05 - 0.1
	13	Copper and copper alloys	Brass	90	50 - 100	0.05 - 0.1
	14		Bronze and non leaded copper	10	40 - 80	0.3 - 0.08
S	15	High temperature alloys	Annealed (Nickel or Cobalt based)	250	10 - 20	0.01 - 0.03
	16	Titanium alloys	Pure 99.5 Ti	400 Rm	50 - 100	0.02 - 0.05
H	17	Extra hard steel	Hardened & tempered	45-50 HRc	15 - 40	0.05 - 0.1
	18			51-55 HRc	15 - 40	0.05 - 0.1

TROUBLESHOOTING - THREADING

	Problem	Cause	Remedy
	**Flank wear in insert**	improper cutting edge geometry	select suitable / harder insert grade
			select appropriate chip breaker
		improper cutting conditions	select insert with bigger nose radius
			decrease cutting speed
	**Chipping or fracturing of cutting edge**	improper cutting conditions	increase cutting speed
			increase clamping rigidity of tool & workpiece
			minimize holder overhang
		cutting resistance too high	decrease depth of cut
	**Plastic deformation in insert**	improper cutting conditions	decrease cutting speed
			increase number of passes
			increase coolant flow pressure
			check if the workpiece diameter is correct prior to cutting thread
	**Chip welding / Edge built-up**	improper cutting edge geometry	select suitable / harder insert grade
		improper cutting parameters	increase cutting speed

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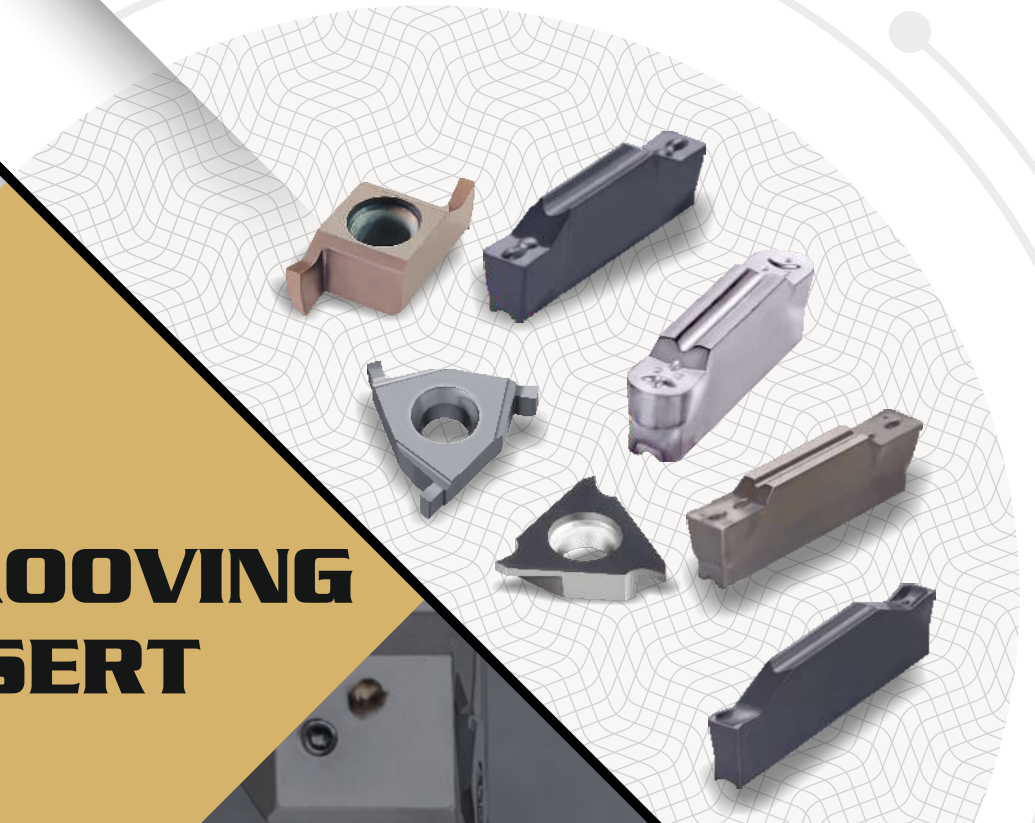
GROOVING INSERT



NOMENCLATURE

GROOVING INSERT

GI	D	030	04	-	B
1	2	3	4		5

1. INSERT APPLICATION

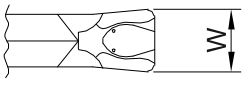
GI - GROOVING	TGE - TRIANGULAR GROOVING - EXTERNAL
GR - ROUND	CGE - CIRCLIP GROOVING - EXTERNAL
PI - PARTING	CGI - CIRCLIP GROOVING - INTERNAL

2. CUTTING EDGE TYPE

S - SINGLE CUTTING EDGE

D - DOUBLE CUTTING EDGE

3. CUTTING EDGE WIDTH OF INSERT



025 = 2.5 mm

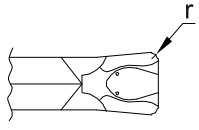
030 = 3.0 mm

040 = 4.0 mm

050 = 5.0 mm

060 = 6.0 mm

4. NOSE RADIUS



02 = 0.2 mm

03 = 0.3 mm

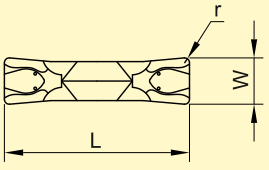
04 = 0.4 mm

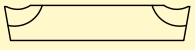
08 = 0.8 mm

5. GRADE

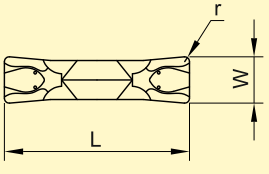
B	= General Purpose Grade
RG	= High Performance Grade
RR 2043	= For Stainless Steel & Hardened Materials
TX	= Triangular Insert
N	= For Non-ferrous Materials

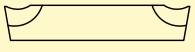
GROOVING INSERT



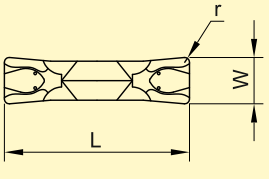


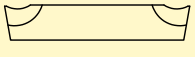
	ITEM CODE	DIMENSIONS			CUTTING DATA	
		W	r	L	Feed f mm/min	Cutting speed V_c m/min
DOUBLE ENDED	GID 020 03 - B	2.0	0.3	17	0.11 (0.05-0.18)	130
	GID 025 03 - B	2.5	0.3	17	0.11 (0.05-0.18)	130
	GID 030 04 - B	3.0	0.4	22	0.11 (0.05-0.18)	130
	GID 040 04 - B	4.0	0.4	22	0.12 (0.05-0.18)	130
	GID 050 04 - B	5.0	0.4	22	0.13 (0.05-0.18)	130





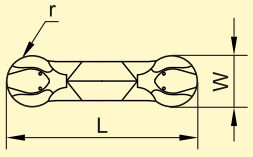
	ITEM CODE	DIMENSIONS			CUTTING DATA	
		W	r	L	Feed f mm/min	Cutting speed V_c m/min
DOUBLE ENDED	GID 030 04 - RG	3	0.4	20	0.11 (0.07~0.18)	30 ~100
	GID 040 04 - RG	4	0.4	20	0.11 (0.07~0.18)	30 ~100

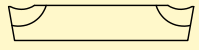




	ITEM CODE	DIMENSIONS			CUTTING DATA	
		W	r	L	Feed f mm/min	Cutting speed V_c m/min
DOUBLE ENDED	GID 020 02 - RR 2043	2	0.2	20	0.11 (0.05~0.150)	30 ~100
	GID 030 02 - RR 2043	3	0.2	20	0.11 (0.05~0.150)	30 ~100
	GID 040 03 - RR 2043	4	0.3	20	0.11 (0.05~0.150)	30 ~100

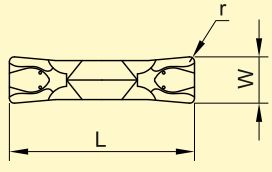
GROOVING INSERT

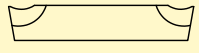




P M K N S H

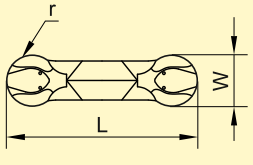
	ITEM CODE	DIMENSIONS			CUTTING DATA	
		W	r	L	Feed f mm/min	Cutting speed V_c m/min
DOUBLE ENDED	GRD 020 - B	2.0	1.0	16	0.11 (0.05-0.18)	130
	GRD 030 - B	3.0	1.5	21	0.11 (0.05-0.18)	130
	GRD 040 - B	4.0	2.0	21	0.12 (0.05-0.18)	130
	GRD 050 - B	5.0	2.5	25	0.13 (0.05-0.18)	140

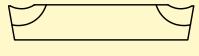




P M K N S H

	ITEM CODE	DIMENSIONS			CUTTING DATA	
		W	r	L	Feed f mm/min	Cutting speed V_c m/min
DOUBLE ENDED	GID 020 03 - N	2.0	0.3	17	0.13 (0.06-0.20)	140
	GID 030 04 - N	3.0	0.4	22	0.13 (0.06-0.20)	140
	GID 040 04 - N	4.0	0.4	22	0.14 (0.06-0.20)	140
	GID 050 04 - N	5.0	0.4	22	0.15 (0.06-0.20)	140



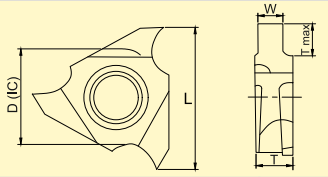


P M K N S H

	ITEM CODE	DIMENSIONS			CUTTING DATA	
		W	r	L	Feed f mm/min	Cutting speed V_c m/min
DOUBLE ENDED	GRD 020 - N	2.0	1.0	16	0.13 (0.06-0.20)	140
	GRD 030 - N	3.0	1.5	21	0.13 (0.06-0.20)	140
	GRD 040 - N	4.0	2.0	21	0.14 (0.06-0.20)	140
	GRD 050 - N	5.0	2.5	25	0.15 (0.06-0.20)	140

GROOVING INSERT

TGE

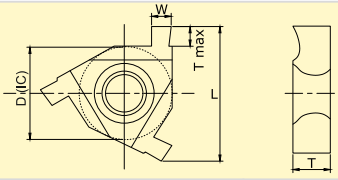


P M K N S H

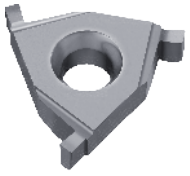
ITEM CODE	DIMENSIONS					CUTTING DATA	
	W	D (IC)	L	T max	T	Vc (m/min)	Feed (mm/rev)
16 TGE 070 - TX	0.70	3/8"	16	1.9	3.18	50~200	0.020~0.080
16 TGE 080 - TX	0.80	3/8"	16	1.9	3.18	50~200	0.020~0.080
16 TGE 090 - TX	0.90	3/8"	16	1.9	3.18	50~200	0.020~0.080
16 TGE 100 - TX	1.00	3/8"	16	2.3	3.18	50~200	0.020~0.080
16 TGE 110 - TX	1.10	3/8"	16	2.3	3.18	50~200	0.020~0.080
16 TGE 120 - TX	1.20	3/8"	16	2.3	3.18	50~200	0.020~0.080
16 TGE 150 - TX	1.50	3/8"	16	2.3	3.18	50~200	0.020~0.080

*Applicable holder: Refer P/116

CGE - EXTERNAL



P M K N S H

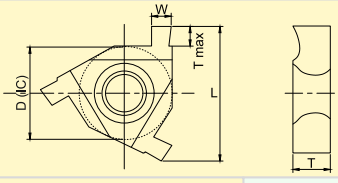


ITEM CODE	DIMENSIONS					CUTTING DATA	
	W	D (IC)	L	T max	T	Vc (m/min)	Feed (mm/rev)
08 CGE 080 - TX	0.80	3/16"	8	0.80	2.2	30~120	0.010~0.030
08 CGE 100 - TX	1.00	3/16"	8	0.80	2.2	30~120	0.010~0.030
11 CGE 100 - TX	1.00	1/4"	11	1.20	3.2	30~120	0.010~0.030
11 CGE 120 - TX	1.20	1/4"	11	1.20	3.2	30~120	0.010~0.030
11 CGE 130 - TX	1.30	1/4"	11	1.20	3.2	30~120	0.010~0.030
11 CGE 140 - TX	1.40	1/4"	11	1.20	3.2	30~120	0.010~0.030
11 CGE 150 - TX	1.50	1/4"	11	1.20	3.2	30~120	0.010~0.030
11 CGE 200 - TX	2.00	1/4"	11	1.20	3.2	30~120	0.010~0.030
16 CGE 080 - TX	0.80	3/8"	16	1.40	3.65	30~120	0.010~0.030
16 CGE 100 - TX	1.00	3/8"	16	1.40	3.65	30~120	0.010~0.030
16 CGE 110 - TX	1.10	3/8"	16	1.80	3.65	30~120	0.010~0.030
16 CGE 120 - TX	1.20	3/8"	16	1.80	3.65	30~120	0.010~0.030
16 CGE 130 - TX	1.30	3/8"	16	1.80	3.65	30~120	0.010~0.030
16 CGE 140 - TX	1.4	3/8"	16	1.80	3.65	30~120	0.010~0.030
16 CGE 150 - TX	1.50	3/8"	16	1.80	3.65	30~120	0.010~0.030
16 CGE 160 - TX	1.60	3/8"	16	2.00	3.65	30~120	0.010~0.030
16 CGE 170 - TX	1.70	3/8"	16	2.00	3.65	30~120	0.010~0.030
16 CGE 180 - TX	1.80	3/8"	16	2.00	3.65	30~120	0.010~0.030
16 CGE 190 - TX	1.90	3/8"	16	2.00	3.65	30~120	0.010~0.030
16 CGE 200 - TX	2.00	3/8"	16	2.00	3.65	30~120	0.010~0.030
16 CGE 220 - TX	2.20	3/8"	16	2.20	3.65	30~120	0.010~0.030
16 CGE 230 - TX	2.30	3/8"	16	2.20	3.65	30~120	0.010~0.030
16 CGE 240 - TX	2.40	3/8"	16	2.20	3.65	30~120	0.010~0.030
16 CGE 250 - TX	2.50	3/8"	16	2.20	3.65	30~120	0.010~0.030
16 CGE 260 - TX	2.60	3/8"	16	2.00	3.65	30~120	0.010~0.030
16 CGE 270 - TX	2.70	3/8"	16	2.00	3.65	30~120	0.010~0.030
16 CGE 280 - TX	2.80	3/8"	16	2.00	3.65	30~120	0.010~0.030
16 CGE 290 - TX	2.90	3/8"	16	2.00	3.65	30~120	0.010~0.030
16 CGE 300 - TX	3.00	3/8"	16	2.00	3.65	30~120	0.010~0.030

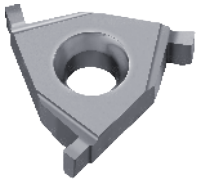
*Refer page no. 105 for holder.

*Applicable holder: Refer P/105

CGI - INTERNAL

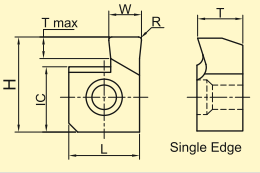


ITEM CODE	DIMENSIONS					CUTTING DATA	
	W	D (IC)	L	T max	T	Vc (m/min)	Feed (mm/rev)
08 CGI 080 - TX	0.80	3/16"	8	0.80	2.2	30~120	0.010~0.030
08 CGI 100 - TX	1.00	3/16"	8	0.80	2.2	30~120	0.010~0.030
11 CGI 100 - TX	1.00	1/4"	11	1.20	3.2	30~120	0.010~0.030
11 CGI 120 - TX	1.20	1/4"	11	1.20	3.2	30~120	0.010~0.030
11 CGI 130 - TX	1.30	1/4"	11	1.20	3.2	30~120	0.010~0.030
11 CGI 140 - TX	1.40	1/4"	11	1.20	3.2	30~120	0.010~0.030
11 CGI 150 - TX	1.50	1/4"	11	1.20	3.2	30~120	0.010~0.030
11 CGI 200 - TX	2.00	1/4"	11	1.20	3.2	30~120	0.010~0.030
16 CGI 080 - TX	0.80	3/8"	16	1.40	3.65	30~120	0.010~0.030
16 CGI 100 - TX	1.00	3/8"	16	1.40	3.65	30~120	0.010~0.030
16 CGI 110 - TX	1.10	3/8"	16	1.80	3.65	30~120	0.010~0.030
16 CGI 120 - TX	1.20	3/8"	16	1.80	3.65	30~120	0.010~0.030
16 CGI 130 - TX	1.30	3/8"	16	1.80	3.65	30~120	0.010~0.030
16 CGI 140 - TX	1.4	3/8"	16	1.80	3.65	30~120	0.010~0.030
16 CGI 150 - TX	1.50	3/8"	16	1.80	3.65	30~120	0.010~0.030
16 CGI 160 - TX	1.60	3/8"	16	2.00	3.65	30~120	0.010~0.030
16 CGI 170 - TX	1.70	3/8"	16	2.00	3.65	30~120	0.010~0.030
16 CGI 180 - TX	1.80	3/8"	16	2.00	3.65	30~120	0.010~0.030
16 CGI 190 - TX	1.90	3/8"	16	2.00	3.65	30~120	0.010~0.030
16 CGI 200 - TX	2.00	3/8"	16	2.00	3.65	30~120	0.010~0.030
16 CGI 220 - TX	2.20	3/8"	16	2.20	3.65	30~120	0.010~0.030
16 CGI 230 - TX	2.30	3/8"	16	2.20	3.65	30~120	0.010~0.030
16 CGI 240 - TX	2.40	3/8"	16	2.20	3.65	30~120	0.010~0.030
16 CGI 250 - TX	2.50	3/8"	16	2.20	3.65	30~120	0.010~0.030
16 CGI 260 - TX	2.60	3/8"	16	2.00	3.65	30~120	0.010~0.030
16 CGI 270 - TX	2.70	3/8"	16	2.00	3.65	30~120	0.010~0.030
16 CGI 280 - TX	2.80	3/8"	16	2.00	3.65	30~120	0.010~0.030
16 CGI 290 - TX	2.90	3/8"	16	2.00	3.65	30~120	0.010~0.030
16 CGI 300 - TX	3.00	3/8"	16	2.00	3.65	30~120	0.010~0.030

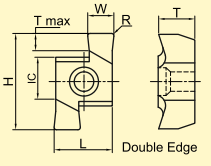


*Applicable holder: Refer P/105

GX - GROOVING INSERT



Single Edge

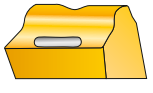
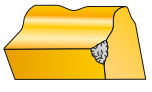
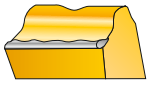


Double Edge

ITEM CODE	DIMENSIONS						
	W	R	T max	L	H	IC	T
06 GR 100 - GX	1.0	0.2	1.5	5.6	6.44	4.76	2.34
06 GR 150 - GX	1.5	0.2	1.5	5.6	6.44	4.76	2.34
06 GR 200 - GX	2.0	0.2	1.5	5.6	6.44	4.76	2.34
07 GR 100 - GX	1.0	0.2	1.5	5.6	7.36	5.56	3.08
07 GR 150 - GX	1.5	0.2	1.5	5.6	7.36	5.56	3.08
07 GR 200 - GX	2.0	0.2	1.5	5.6	7.36	5.56	3.08
08 GR 100 - GX	1.0	0.2	2.0	6.2	10.16	5.56	3.87
08 GR 150 - GX	1.5	0.2	2.0	6.2	10.16	5.56	3.87
08 GR 200 - GX	2.0	0.2	2.0	6.2	10.16	5.56	3.87
08 GR 250 - GX	2.5	0.2	2.0	6.2	10.16	5.56	3.87
08 GR 300 - GX	3.0	0.2	2.0	6.2	10.16	5.56	3.87
09 GR 100 - GX	1.0	0.2	3.0	7.7	12.95	6.35	4.66
09 GR 150 - GX	1.5	0.2	3.0	7.7	12.95	6.35	4.66
09 GR 200 - GX	2.0	0.2	3.0	7.7	12.95	6.35	4.66
09 GR 250 - GX	2.5	0.2	3.0	7.7	12.95	6.35	4.66
09 GR 300 - GX	3.0	0.2	3.0	7.7	12.95	6.35	4.66
09 GR 350 - GX	3.5	0.2	3.0	7.7	12.95	6.35	4.66
09 GR 400 - GX	4.0	0.2	3.0	7.7	12.95	6.35	4.66

*Applicable holder: Refer P/269

TROUBLESHOOTING - GROOVING / PARTING

	Problem	Cause	Remedy
	Flank wear in insert	improper cutting edge geometry	select appropriate chip breaker
		improper cutting conditions	decrease cutting speed
	Crater wear in insert	improper cutting edge geometry	select appropriate chip breaker
		improper cutting conditions	decrease cutting speed
			decrease feed rate
			increase coolant flow pressure
	Chipping or fracturing of cutting edge	improper cutting edge geometry	select appropriate chip breaker
		improper cutting conditions	set insert height at exactly 0 mm
			minimize holder overhang
			decrease cutting speed
			decrease feed rate
			decrease depth of cut
	Chip welding / edge built-up	improper cutting edge geometry	select appropriate chip breaker
		improper cutting conditions	increase cutting speed
			increase feed rate
			select insert with smaller nose radius
	Poor surface finish	improper cutting conditions	increase cutting speed
			decrease feed rate
			increase coolant flow pressure
			set insert height at exactly 0 mm
			increase clamping rigidity of tool & workpiece
			minimize holder overhang

BLOOD®
ROTATING GENIUS

GROOVING HOLDER

NOMENCLATURE

GROOVING HOLDER

GH	E	R	25	25	M	-	30	18
1	2	3	4	5	6		7	8

1. GROOVING HOLDER

1. GH - GROOVING HOLDER
2. TGH - TRIANGULAR GROOVING HOLDER

2. MACHINING MODE

1. EXTERNAL
2. INTERNAL
3. END FACE

3. HAND OF TOOL

1. R - RIGHT HAND
2. L - LEFT HAND
3. N - NATURAL

4. SHANK HEIGHT

1. EXTERNAL - HEIGHT OF SHANK
2. INTERNAL - DIAMETER OF SHANK

5. SHANK WIDTH

1. EXTERNAL - WIDTH OF SHANK

6. TOOL LENGTH

E = 70 mm	M= 150 mm
P = 80 mm	P = 170 mm
H = 100 mm	R = 200 mm
K = 125 mm	S = 250 mm

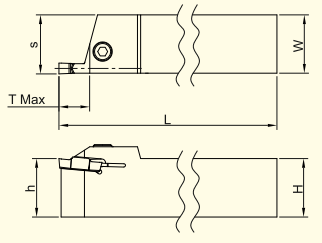
7. INSERT WIDTH

10 = 1.00 mm
20 = 2.00 mm
30 = 3.00 mm
40 = 4.00 mm
50 = 5.00 mm

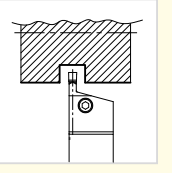
8. MAX CUTTING DEPTH (MM)

GROOVING HOLDER

EXTERNAL



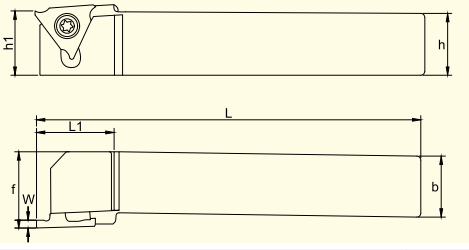
GHER/L



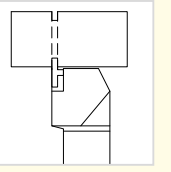
ITEM CODE	Dimension (mm)					Suitable Insert Code
	H=h	W	L	S	T max	
GHER/L 1212 H - 20 15	12	12	100	14.25	14.5	GID 020 GRD 020
GHER/L 1616 H - 20 15	16	16	100	16.25	14.5	
GHER/L 2020 K - 20 15	20	20	125	20.25	14.5	
GHER/L 2525 M - 20 15	25	25	150	25.25	14.5	
GHER/L 1616 H - 25 17	16	16	100	16.30	16.5	GID 025 GRD 025
GHER/L 2020 K - 25 17	20	20	125	20.30	16.5	
GHER/L 2525 M - 25 17	25	25	150	25.30	16.5	
GHER/L 1616 H - 30 19	16	16	100	16.35	18.5	GID 030 GRD 030
GHER/L 2020 K - 30 18	20	20	125	20.4	18.0	
GHER/L 2020 K - 30 10	20	20	125	20.4	10.0	
GHER/L 2525 M - 30 18	25	25	150	25.4	18.0	
GHER/L 2525 M - 30 10	25	25	150	25.4	10.0	
GHER/L 3232 P - 30 18	32	32	170	32.4	18.0	
GHER/L 3232 P - 30 10	32	32	170	32.4	10.0	
GHER/L 2020 K - 40 18	20	20	125	20.4	18.0	GID 040 GRD 040
GHER/L 2020 K - 40 10	20	20	125	20.4	10.0	
GHER/L 2525 M - 40 18	25	25	150	25.4	18.0	
GHER/L 2525 M - 40 10	25	25	150	25.4	10.0	
GHER/L 3232 P - 40 18	32	32	170	32.4	18.0	
GHER/L 3232 P - 40 10	32	32	170	32.4	10.0	
GHER/L 2020 M - 50 23	20	20	150	20.5	23.0	GID 050 GRD 050
GHER/L 2020 M - 50 15	20	20	150	20.5	15.0	
GHER/L 2525 M - 50 23	25	25	150	25.5	23.0	
GHER/L 2525 M - 50 15	25	25	150	25.5	15.0	
GHER/L 3232 P - 50 23	32	32	170	32.5	23.0	
GHER/L 3232 P - 50 15	32	32	170	32.5	15.0	

GROOVING HOLDER

EXTERNAL

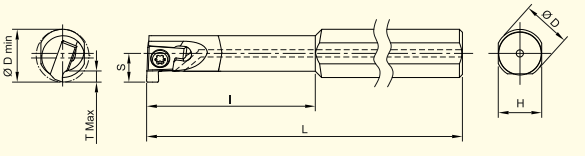


TGHER/L

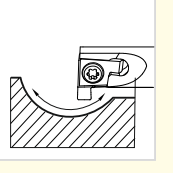


ITEM CODE	Dimension (mm)							Suitable Insert Code
	W	b	h	L	L1	h1	f	
TGHER/L 1616 H16	0.50 ~ 1.5	16	16	100	22	16	20	16 TGE
TGHER/L 2020 K16	0.50 ~ 1.5	20	20	125	26	20	25	
TGHER/L 2525 M16	0.50 ~ 1.5	25	25	150	26	25	32	

INTERNAL



GHIR/L



ITEM CODE	Dimension (mm)							Suitable Insert Code
	D	d	L	l	T max	H	S	
GHIR/L 2016 K - 20 05	20	16	125	35	5	15	12.4	GID 020 GRD 020
GHIR/L 2520 M - 20 05	25	20	150	45	5	18	14	
GHIR/L 2925 R - 20 05	29	25	200	45	5	23	17.2	
GHIR/L 2016 K - 25 06	20	16	125	35	6	15	12.5	GID 025 GRD 025
GHIR/L 2520 M - 25 06	25	20	150	45	6	18	15.1	
GHIR/L 2925 R - 25 06	29	25	200	45	6	23	18.2	
GHIR/L 2520 M - 30 06	25	20	150	45	6	18	15.6	GID 030 GRD 030
GHIR/L 3125 R - 30 06	31	25	200	45	6	23	18.9	
GHIR/L 3732 S - 30 06	37	32	250	65	6	30	21.5	
GHIR/L 2520 M - 40 06	35	20	150	45	6	18	12.6	GID 040 GRD 040
GHIR/L 3125 R - 40 06	31	25	200	45	6	23	18.9	
GHIR/L 3732 S - 40 06	37	32	250	65	6	30	21.5	
GHIR/L 3125 R - 50 08	31	25	200	45	8	23	19.4	GID 050 GRD 050
GHIR/L 3732 S - 50 08	37	32	250	65	8	30	21.5	

GROOVING HOLDER

INTERNAL

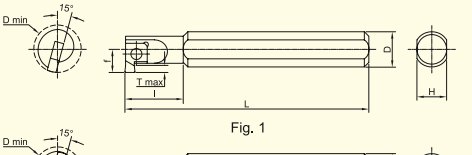


Fig. 1

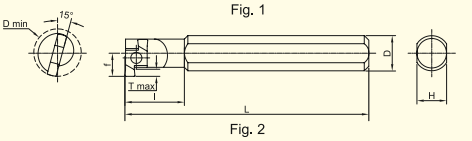
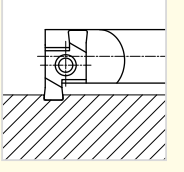


Fig. 2

GHIR



ITEM CODE	Dimension (mm)							Insert Size	Spare	
	D	D min	T max	L	l	H	F		Screw	Wrench
GHIR 0608 H - **10 - GX	06	08	1.5	100	10	05	4.6	6 GR	M 2.2 x 4	T7
GHIR 0808 H - **15 - GX	08	08	1.5	100	15	07	4.7		M 2.5 x 6	T8
GHIR 0810 H - **10 - GX	08	10	1.5	100	10	07	5.8	7 GR		
GHIR 1012 K - **15 - GX	10	12	1.5	125	15	08	6.8			
GHIR 1014 K - **15 - GX	10	14	2.0	125	15	08	7.6	8 GR		
GHIR 1216 M - **15 - GX	12	16	2.0	150	15	11	8.6			
GHIR 1620 Q - **20 - GX	16	20	3.0	180	20	14.8	11.6	9 GR		
GHIR 2024 R - **30 - GX	20	24	3.0	200	30	18.4	13.6			

**- Different Edge thickness of insert.
- Ordering Code for thickness 1 mm:- GHIR 0808 H - 1015 - GX

CUTTING FORMULAE

TURNING

FORMULAE

RPM	$n = \frac{V_c \times 1000}{\pi \times D}$	rev/min
Cutting speed	$V_c = \frac{\pi \times D \times n}{1000}$	m/min
Feed Rate	$Vf = f \times n$	mm/min
Feed per Revolution	$f = fz \times Zn$	mm/rev
Metal Removal Rate	$Q = V_c \times a_p \times f$	cm^3/min

NOMENCLATURE

D =	Cutter diameter	mm
V_c =	Cutting speed	m/min
n =	Revolution per minute	rev/min
Vf =	Feed rate	mm/min
f =	Feed per revolution	mm/rev
fz =	Feed per tooth	mm/tooth
Zn =	No. of teeth	
Q =	Metal removal rate	cm^3/min
a_p =	Depth of cut	mm

MILLING

FORMULAE

RPM	$n = \frac{V_c \times 1000}{\pi \times D}$	rev/min
Cutting speed	$V_c = \frac{\pi \times D \times n}{1000}$	m/min
Feed Rate	$Vf = fz \times n \times z$	mm/min
Feed per Revolution	$f = fz \times z$	mm/rev
Cutting Time	$Tc = \frac{L}{Vf}$	minute/s
Metal Removal Rate	$Q = \frac{a_e \times a_p \times Vf}{1000}$	cm^3/min

NOMENCLATURE

D =	Cutter diameter	mm
V_c =	Cutting speed	m/min
n =	Revolution per minute	rev/min
Vf =	Table Feed	mm/min
f =	Feed per revolution	mm/rev
fz =	Feed per tooth	mm/tooth
z=	No. of teeth	
Tc =	Cutting time	minute/s
L =	Total Table Feed Length (workpiece length) + Cutter Diameter (D)	mm
Q =	Metal removal rate	cm^3/min
a_p =	Depth of cut	mm
a_e =	Width of cut	mm

THREADING

FORMULAE

RPM	$n = \frac{V_c \times 1000}{\pi \times D}$	rev/min
Cutting speed	$V_c = \frac{\pi \times D \times n}{1000}$	m/min
Feed Rate	$Vf = fz \times n \times Zn$	mm/min
	$Vf = fz \times n \times Zc$	mm/min
Feed per Revolution	$f = fz \times Zn$	mm/rev
	$f = fz \times Zc$	mm/rev

NOMENCLATURE

D =	Cutter diameter	mm
V_c =	Cutting speed	m/min
n =	Revolution per minute	rev/min
Vf =	Feed rate	mm/min
f =	Feed per revolution	mm/rev
fz =	Feed per tooth	mm/tooth
Zn =	No. of teeth	
Zc =	Effective no. of teeth for calculation of feed speed or feed per revolution	

MATERIAL GROUPS

According to DIN / ISO 513 & VDI 3323

ISO	Material		Condition	Tensile Strength	Kc (1) [N/mm²]	mc(2)	Hardness HB	Material Number
P	Non-alloy Steel & Cast Steel, Free Cutting Steel	< 0.25% C	Annealed	420	1350	0.21	125	1
		≥ 0.25% C	Annealed	650	1500	0.22	190	2
		< 0.55% C	Quenched & Tempered	850	1675	0.24	250	3
		≥ 0.55% C	Annealed	750	1700	0.24	220	4
			Quenched & Tempered	1000	1900	0.24	300	5
	Low Alloy Steel & Cast Steel (< 5% of Alloying Elements)		Annealed	600	1775	0.24	200	6
				930	1675	0.24	275	7
			Quenched & Tempered	1000	1725	0.24	300	8
				1200	1800	0.24	350	9
	High Alloy Steel, Cast Steel & Tool Steel		Annealed	680	2450	0.23	200	10
			Quenched & Tempered	1100	2500	0.23	325	11
M	Stainless Steel & Cast Steel		Ferritic / Martensitic	680	1875	0.21	200	12
			Martensitic	820	1875	0.21	240	13
			Austenitic	600	2150	0.20	180	14
K	Grey Cast Iron (GG)		Ferritic		1150	0.20	180	15
			Pearlitic		1350	0.28	260	16
	Cast Iron Nodular (GGG)		Pearlitic / Ferritic		1225	0.25	160	17
			Pearlitic / Martensitic		1350	0.28	250	18
	Malleable Cast Iron		Ferritic		1225	0.25	130	19
			Pearlitic		1420	0.30	230	20
N	Aluminium - Wrought alloyed		Not curable		700	0.25	60	21
			Cured		800	0.25	100	22
	Aluminium - cast, alloyed	≥ 12% Si	Not curable		700	0.25	75	23
			Cured		700	0.25	90	24
		> 12% Si	High temperature		750	0.25	130	25
	Copper Alloys	> 1% Pb	Free cutting		700	0.27	110	26
		0.55% C	Brass		700	0.27	90	27
			Electrolitic copper		700	0.27	100	28
	Non-metallic		Duroplastics, Fiber plastics					29
			Hard rubber					30
S	Heat Resistant Alloys	Fe based	Annealed		2600	0.24	200	31
			Cured		3100	0.24	280	32
		Ni or Co based	Annealed		3300	0.24	250	33
			Cured		3300	0.24	350	34
			Cast		3300	0.24	320	35
	Titanium & Titanium Alloys			RM 400	1700	0.23		36
			α+β alloys cured	RM 1050	2110	0.22		37
H	Hardened Steel		Hardened		4600		55 HRc	38
			Hardened		4700		60 HRc	39
	Chilled Cast Iron		Cast		4600		400	40
	Cast Iron		Hardened		4500		55 HRc	41

Our Company

We at **Robin Precision Products Pvt. Ltd.** are heading to produce a world class product- Solid Carbide Cutting Tools & CNC Toolings in a high tech plant spread over 11,000 Sq. Meter area. **We feel proud to be the first manufacturers of Solid Carbide Cutting Tools in Gujarat.** We are committed to provide our products & services that meet the highest industry standards, the most demanding machining parameters & the customer satisfaction.

Under the company's policy of constant R & D, we have dedicated ourselves to pursue a new level of Technology, Quality & Logistic Management.

Our TEAM BLOOD believes in utilizing the most sophisticated equipments which enable us to produce a world class product **BLOOD -** Rotating Genius**.**

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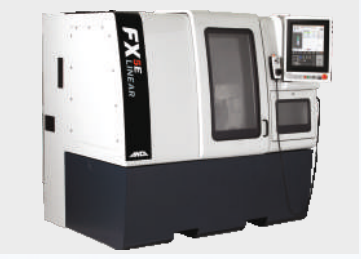



QUALITY STATEMENT

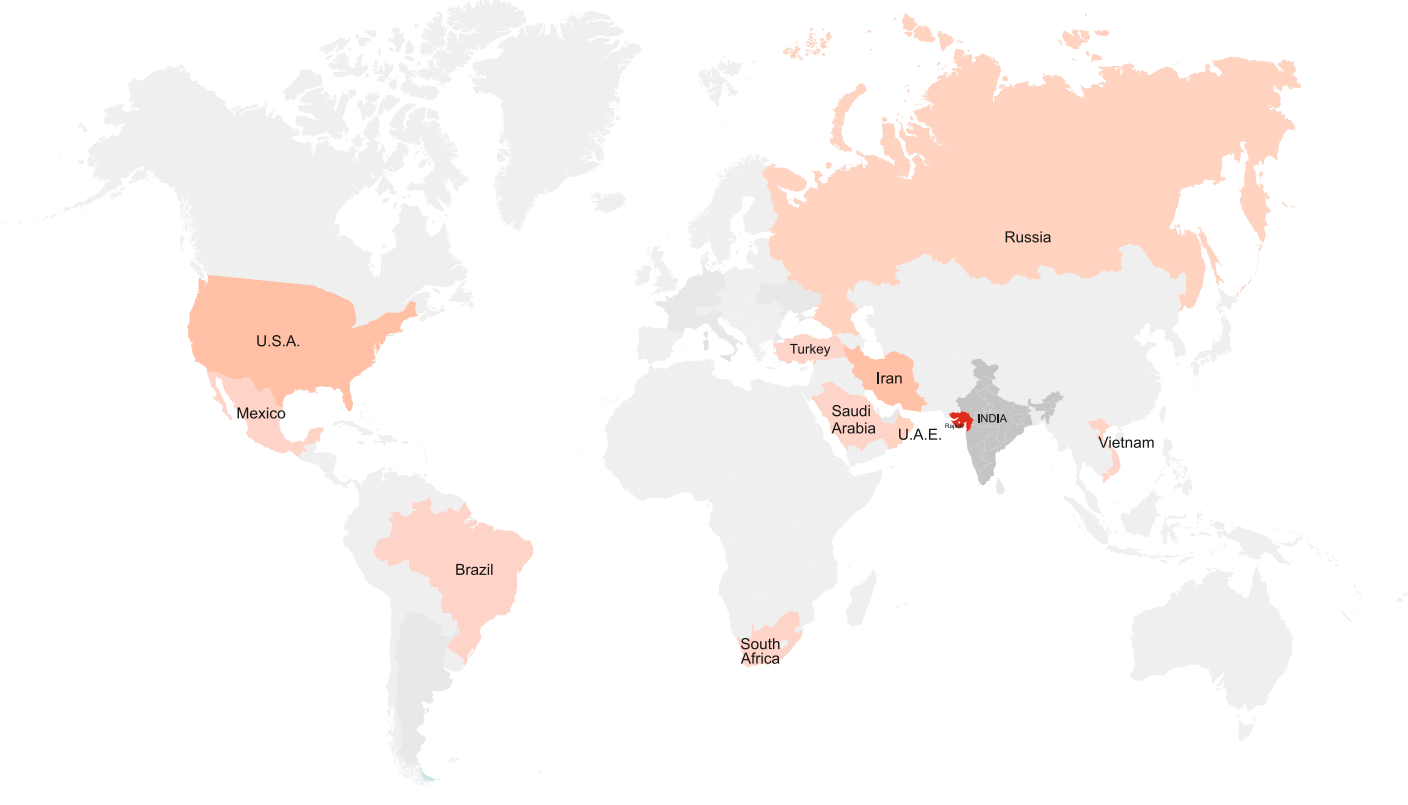
- Promoters with high business ethics
- Best quality carbide rods from Europe
- World class brand new plant & machinery
- Hi-tech tool measuring equipment
- Stringent in-process inspection
- Qualified & trained work-force
- Pleasant & spacious work atmosphere

An ISO 9001 CERTIFIED COMPANY

ICL Integral Certification (P) Ltd. Certified ISO 9001:2015 | EGAC Accredited | CE US0118-CE251 | TÜV SÜD ISO 9001

GLOBLE PRESENCE

The global footprint of our products export has reached to USA, Russia, UAE - Dubai, Iran, Maxico, Vietnam, Saudi Arabia, South Africa, Turkey, Brazil apart from many more.



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