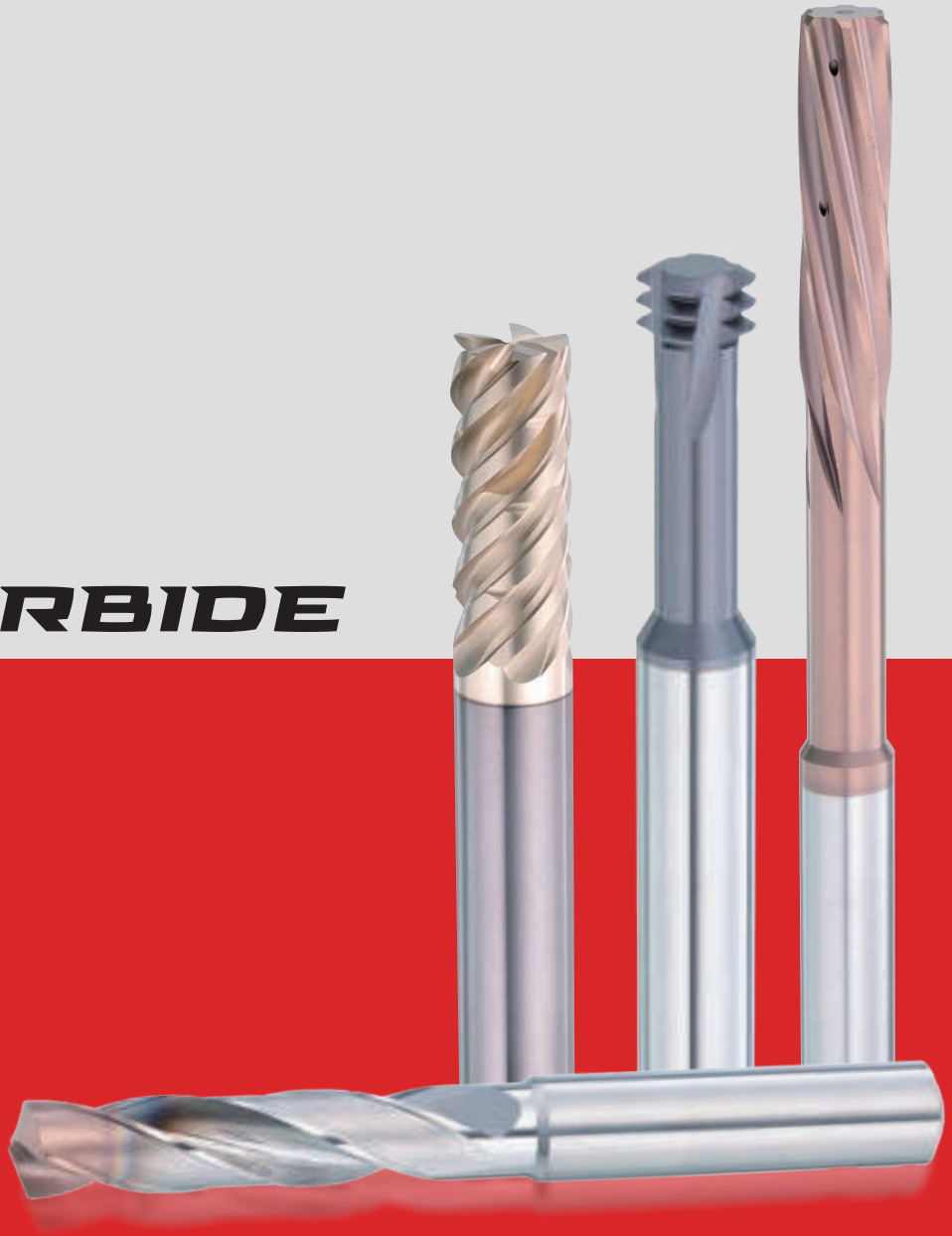
7leaders
The Art of Cutting

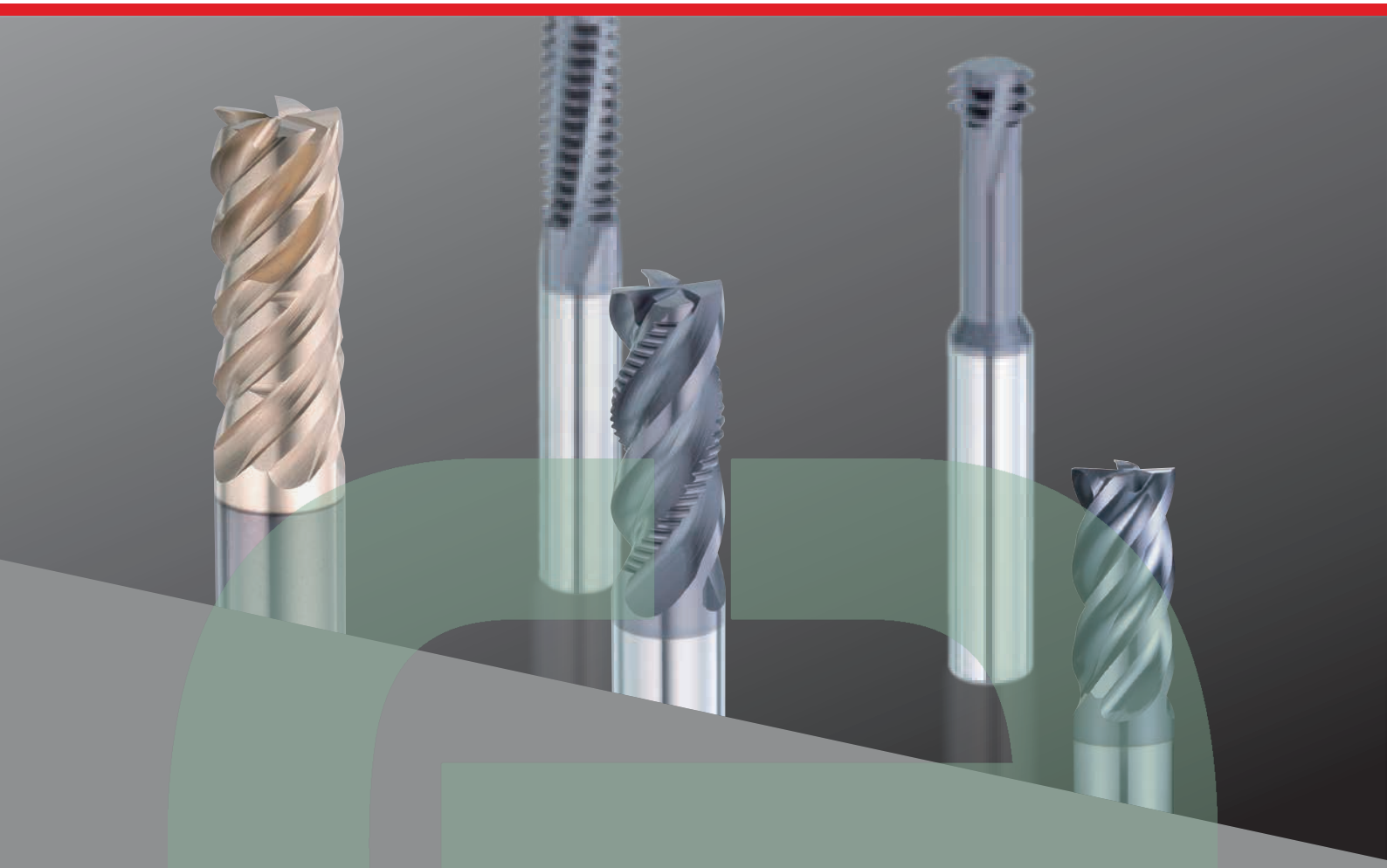
CORDEFER
COMÉRCIO DE FERRAMENTAS, LDA

End Mills/Drills/ Reamers

SOLID CARBIDE



COMPANY PROFILE



7-Leaders Corp. specializes in production and marketing of tungsten carbide cutting tools such as End mills, Drills, Reamers, and etc.

Established in 1990 by Mr. Jack Lee, the company manufactures high quality products and provides best services along with the trade mark " 7leaders® " all over the world. 7Leaders manufactures solid carbide cutting tools for Mold& Die, Machine Tools, Automotive, Aerospace, New Energy, 3C, Watches, Optical and Medical solutions.



Our products have been distributed in the Europe, Asia, Central America, Brazil and other nations.

We keep integrating marketing in all kinds of cutting tools and providing the best quality products to our customers. We aim to become a leading brand name in the cutting tools industry.

PRODUCTION PROCESS

24 Hours a Day. 365 Days a Year Automated Production Capabilities

Tungsten Carbide Rods



01

7-Leaders cooperates with a world-renowned tungsten carbide rod manufacturer, producing high quality tungsten carbide rods in ETM brand.

Tools Manufacturing



02

7-Leaders has Walter and Rollomatic CNC grinding machines and manufactures end mills, drills and reamers.

Coating Service



03

Our Nano thin film coating center uses cathodic arc evaporation splitting coating machines from "PVD" in Switzerland.
7-Leaders is the first company applying "splitting arc" technology in Taiwan. We provide variable coating service.

Application



04

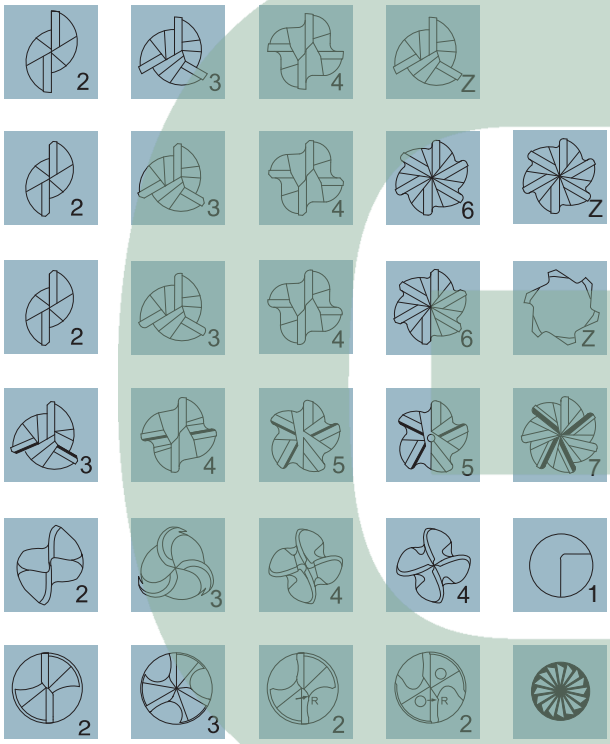
7-Leaders manufactures cutting tools through strict cutting test and fulfill customers' requirements on application.

Guide Lines

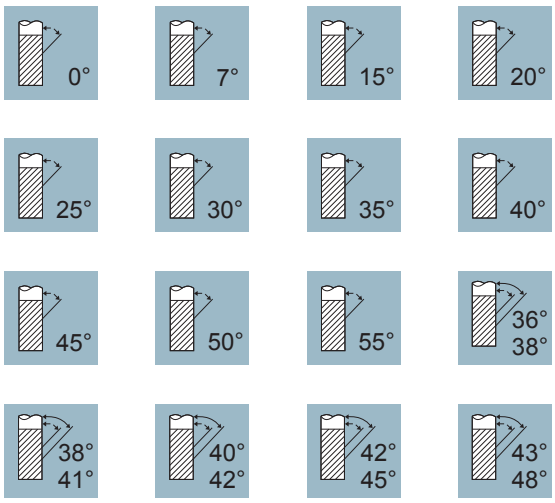
Tool Material

MG Carbide	Micro Grain
UMG Carbide	Ultra Micro Grain
SMG Carbide	Super Micro Grain

Number of Flute



Helix Angl



Coating Type

TiAlN F-NaNo	High heat resistance, high oxidation resistance, nanocomposite coating with lubrication property. Suitable for any material and steels < 48HRC.
AlTiN X-NaNo	Very high heat resistance and oxidation resistance. Suitable for steels < 52HRC.
AlCrN FX	Multilayer nano film have below advantages: high thermal cracking resistance, strong wear resistance and high toughness. Suitable for high performance machining, especially having excellent tool life during wet machining. It is also suitable for steels<48HRC.
AlTiCrN HX	Multilayer, higher hardness, high oxidation resistance. Suitable for steels < 48 HRC.
AlTiXN X1	Multilayer, higher nanohardness, extremely high heat resistance, very good thermal insulation. Suitable for high performance machining condition and also for midhardness alloy steels to 62HRC.
AlTiSiN TX	Multilayer, higher nanohardness, extremely high heat resistance, very good thermal insulation. Suitable for high performance machining condition and also for midhardness alloy steels to 70HRC.
AlTiXZrN SX	The cutting tools that are coated with multilayer nano film have some advantages as follow: AlTiXZrN with extremely high heat and oxidation resistance, as well as good toughness and a smooth surface qualify. These benefits substantially enhance the tool life.
ZrN ZX	Coating features: High surface finish with strong wear resistance, anti-oxidation, low friction, anti-adhesion. Application: Suitable for machining difficult material like aluminum, copper, stainless steels, titanium.
DLC DX	The cutting tools that are coated with multilayer nanorainbow film have some advantages as follow: Abrasion resistance, low-coefficient of friction, Anti-adhesion. These benefits substantially enhance the tool life.
Diamond Dc	Extremely high hardness, good chemical stability. Suitable for machining graphite.

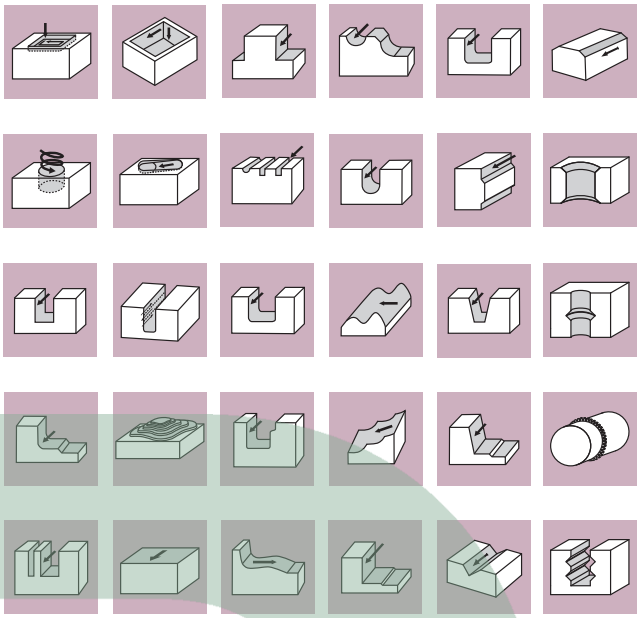
Relief

H — Slant Relief

N — Eccentric Relief

W — Big Eccentric Relief

Type of Operation



Corner of Edges

Sharp

Ball Nose

0.05-0.15 / 45° — Corner Edge 45°

R — Corner Radius

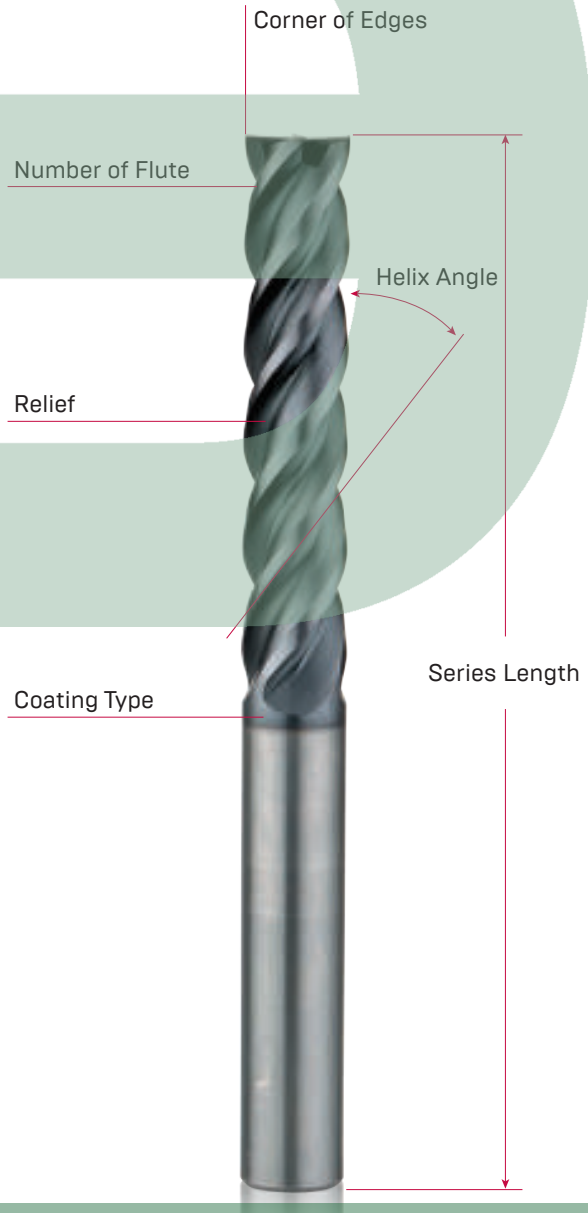
Series Length

Stub Length

Standard Length

Long Length

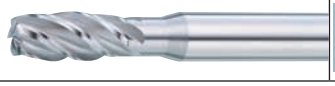
Extra Long Length



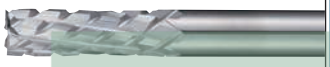
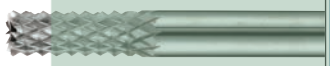
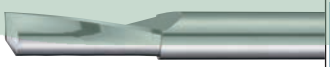
Index

Series	Code No.	Appearance	Flute	Product Name	Page
Multipurpose End Mills/ASIA	A40FX		4	Multipurpose End Mills	3
	A42FX		4	Multipurpose End Mills	5
	A45TX		4	Finishing End Mills	7
	A48FX		4	Multipurpose End Mills (Trinity)	9
	E140FX		4	Multipurpose End Mills	11
	E140-2.0FX E140-2.5FX E140-3.0FX		4	Multipurpose End Mills(Chamfer Corner)	13
	E130HX		3	Multipurpose End Mills	15
	E140HX		4	Multipurpose End Mills	17
	E141-1.5HX E141-2.0HX E141-3.0HX		4	Multipurpose End Mills	19
	E141-4.0HX E141-5.0HX		4	Multipurpose End Mills	21
	E144X		4	Multipurpose End Mills	23
	E144-4.0X E144-5.0X E144-6.0X		4	Multipurpose End Mills	25
	B252-2.5HX		4	Multipurpose End Mills With Corner Radius	27
	B274HX		4	Multipurpose End Mills With Corner Radius	31
	F612HX F617HX		4	Multipurpose End Mills	33
	E148HX		4	Multipurpose End Mills · Slim Shank · Short Type	35
	E149HX		4	Multipurpose End Mills · Slim Shank · Long Type	37
	B270TX		4	Multipurpose End Mills With Corner Radius · Slim Shank · Long Type	39
End Mills For Difficult To Cut Materials/ASIA	E224FX		4	End Mills for Steel and Difficult To Cut Materials	43
	E225FX		5	End Mills for Steel and Difficult To Cut Materials	45
	E226FX		6	End Mills for Steel and Difficult To Cut Materials (Chipbreaker)	47
	E227-3.0FX		4	End Mills With Corner Radius For Steel and Difficult To Cut Materials	49

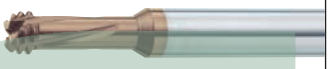
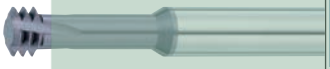
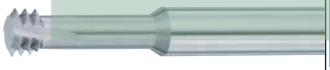
Index

Series	Code No.	Appearance	Flute	Product Name	Page
End Mills For Difficult To Cut Materials/ASIA	B220FX		4	Ball Nose End Mills For Steel and Difficult To Cut Materials	51
	E129SX		4	Finishing End Mills For Difficult To Cut Materials	53
	E233SX		4	End Mills For Difficult To Cut Materials	55
	E234SX		5	End Mills For Difficult To Cut Materials	55
	E235-2.5SX		5	End Mills With Corner Radius for Difficult To Cut Materials	57
	E236-2.5SX E236-4.0SX		7	End Mills With Corner Radius for Difficult To Cut Materials (Chipbreaker)	59
	E237-2.5SX E237-4.0SX		4	End Mills For Difficult To Cut Materials (Chamfer Corner)	61
	E247-2.5SX E247-4.0SX		4	End Mills With Corner Radius For Difficult To Cut Materials	63
	E238-2.5SX E238-4.0SX		5	End Mills For Difficult To Cut Materials (Chamfer Corner • Chipbreaker)	65
	E248-2.5SX E248-4.0SX		5	End Mills With Corner Radius For Difficult To Cut Materials (Chipbreaker)	67
5-Axis End Mills/ASIA	Q136FX		4	5-Axis End Mills (Oval Form)	71
	Q136SX		4	5-Axis End Mills (Oval Form)	71
	Q138FX		4	5-Axis End Mills (Taper Form)	72
	Q138SX		4	5-Axis End Mills (Taper Form)	72
	Q139FX		4	5-Axis End Mills (Lens Form)	73
	Q139SX		4	5-Axis End Mills (Lens Form)	73
	Q135FX		5	5-Axis End Mills (Barrel Form)	74
	Q135SX		5	5-Axis End Mills (Barrel Form)	74
	Q146 Q146DX		4	5-Axis End Mills (Oval Form)	75
	Q148 Q148DX		4	5-Axis End Mills (Taper Form)	76
	Q149 Q149DX		4	5-Axis End Mills (Lens Form)	77
	Q145 Q145DX		5	5-Axis End Mills (Barrel Form)	78

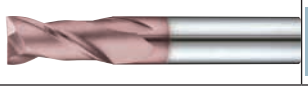
Index

Series	Code No.	Appearance	Flute	Product Name	Page
End Mills For Aluminium/ASIA	E132 E134		2	End Mills For Aluminium	83
	E142		2	End Mills For Aluminium	85
	E143DX		3	End Mills For Aluminium	87
	E143		3	End Mills For Aluminium	89
	E143-3.0 E143-4.0 E143-5.0		3	End Mills For Aluminium	91
	E145		3	End Mills For Aluminium	93
	E194		Z	Utmost Finishing End Mills For Aluminium	95
	E195R		1	End Mills For Aluminium	97
	E195L		1	End Mills For Aluminium	97
Routers For Composite Materials/ASIA	E190 E191			Routers For Composite Materials	101
	E197			Routers For Composite Materials	103
	E198			Routers For Composite Materials	103
	E199			Routers For Composite Materials	103
	E298			Routers For Composite Materials	105
	E299			Routers For Composite Materials	105
	E291		1	Routers For Composite Materials	107
	E294		4	Routers For Composite Materials	107
	E189R		1	End Mills For Plastics	109
	E189L		1	End Mills For Plastics	109
Short End Mills For Lathe Machine/ASIA	E113X		3	Short End Mills For Lathe	113
	E114X		4	Short End Mills For Lathe	113
	E115HX		3	Short End Mills For Lathe	115

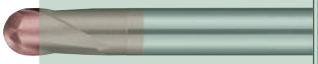
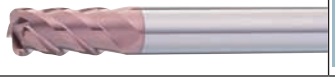
Index

Series	Code No.	Appearance	Flute	Product Name	Page
	E116HX		4	Short End Mills For Lathe	115
Thread Mi/ASIA	T730-2.0FX T730-3.0FX		3~4Z	Micro Thread Mills (ISO)	119
	T730-2.0SX T730-3.0SX		3~4Z	Micro Thread Mills (ISO) (Difficult To Cut Materials)	120
	T730-2.0 T730-3.0		3~4Z	Micro Thread Mills For Aluminum (ISO)	121
	T731SX		3~4Z	Micro Thread Mills (MJ)	122
	T740TX		3~4Z	Oil-Feed Thread Mills Drill (ISO)	123
	T741TX			30° Trapezoidal Thread Mills (ISO/Metric)	124
	T742TX			29° Trapezoidal Thread Mills (ANSI/Acme)	125
	T750-2.0FX		3~4Z	Oil-Feed Thread Mills (ISO)	126
	T752-2.0FX		3~4Z	Oil-Feed Thread Mills (ISO)	127
	T760-2.0FX T760-3.0FX		3~5Z	Micro Thread Mills (UN)	128
	T760-2.0 T760-3.0		3~5Z	Micro Thread Mills For Aluminum (UN)	129
	T761SX		3~4Z	Micro Thread Mills (UNJ)	130
	T762-2.0FX		3~4Z	Oil-Feed Thread Mills (UN)	131
	T764-2.0FX		3~4Z	Oil-Feed Thread Mills (UN)	132
	T765FX T766FX		3~4Z	Oil-Feed Thread Mills For Internal and External Thread (NPT)	133
	T767FX T768FX		3~4Z	Oil-Feed Thread Mills (NPTF)	134
	T784FX T785FX		3~4Z	Oil-Feed Thread Mills (BSP(G))	135
	T786FX T787FX		3~4Z	Oil-Feed Thread Mills (BSPT)	136
	T788FX T789FX		3~5Z	Oil-Feed Thread Mills (Whitworth)	137
End Mills For Chamfering	E106X-60°		2	End Mills For Chamfering 60°	143
	E107X-90°		2	End Mills For Chamfering 90°	143

Index

Series	Code No.	Appearance	Flute	Product Name	Page
End Mills For Chamfering/ASIA	E107X-120°		2	End Mills For Chamfering 120°	143
	E108X-60°		4	End Mills For Chamfering 60°	145
	E109X-90°		4	End Mills For Chamfering 90°	145
	E109X-120°		4	End Mills For Chamfering 120°	145
	E121HX		3	End Mills For Chamfering 90°	147
	E123HX		3	End Mills For Chamfering 90°	147
	E151HX		5	End Mills For Chamfering 90°	149
	E153HX		5	End Mills For Chamfering 90°	149
	E110HX		3~6Z	End Mills For Back and Front Chamfering 30° / 60° / 90° / 120°	151
	E120HX		3~6Z	End Mills For Back and Front Chamfering 30° / 60° / 90° / 120°	153
	E101 E101FX			End Mills For Round Chamfering	155
T-Slot End Mills/ASIA	T116 T116FX		Z	Super Mini Slot Cutter (End Cutting)	159
	T117 T117FX		Z	Super Mini Keyseat Cutter	161
	T118 T118FX		Z	Super Mini Staggered Tooth Keyseat Cutter	163
	T217 T217FX		Z	Solid carbide T-slot Cutter	165
	T218 T218FX		Z	Solid carbide Staggered Tooth T-Slot Cutter	166
	T119 T119FX		Z	Super Mini Dovetail Cutter	167
	T201 T201FX		Z	Super Mini Convex Cutter	168
	T203 T203FX		Z	Super Mini Conave Cutter	169
Universal Finishing End Mills/ASIA	E122X		2	Universal End Mills	175
	E125X E127X		2	Universal End Mills	177
	E162TX E163TX		2	Universal End Mills	179

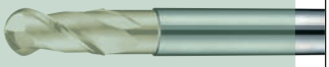
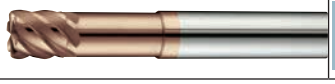
Index

Series	Code No.	Appearance	Flute	Product Name	Page
Universal Finishing End Mills/ASIA	E124X		4	Finishing End Mills	181
	E126X E128X		4	Finishing End Mills	183
	E164TX E165TX		4	Finishing End Mills	185
	E158TX E159TX		4	High Performance End Mills	187
	E158ATX		4	High Performance End Mills	189
	E168TX E169TX		4	High Performance End Mills	191
	E166TX E167TX		6	Finishing End Mills	193
Ball Nose End Mills/ASIA	B222X		2	Ball Nose End Mills	197
	B232X B242X B246X		2	Ball Nose End Mills	199
	B262TX B263TX B264TX		2	Ball Nose End Mills	201
	B272ATX		2	Ball Nose End Mills	203
	B273ATX		2	Ball Nose End Mills	203
	B251TX		2	Ball Nose End Mills	205
	B261TX		2	Ball Nose End Mills	207
	B253TX		3	Ball Nose End Mills - 3 Flutes	209
	B254TX		4	Ball Nose End Mills - 4 Flutes	209
	B250TX		2	Ball Nose End Mills	211
End Mills With Corner Radius/ASIA	B255X		2	End Mills With Corner Radius	215
	B257X		2	End Mills With Corner Radius	217
	B256X		4	End Mills With Corner Radius	219
	B258X		4	End Mills With Corner Radius	221
	B286TX		4	End Mills With Corner Radius	223

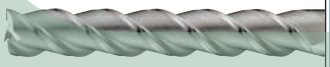
Index

Series	Code No.	Appearance	Flute	Product Name	Page
End Mills With Corner Radius/ASIA	B259TX		6	Finishing End Mills With Corner Radius	225
	B269TX		6	Finishing End Mills With Corner Radius	225
	B271TX		4	High Performance End Mills With Corner Radius	227
	E105X		2	Taper End Mills	229
End Mills For Rib Processing/ASIA	F692TX		2	End Mills For Rib Processing	233
	F694TX		4	End Mills For Rib Processing	235
	F690TX		2	Toric End Mills For Rib Processing With Corner Radius	237
	F693TX		4	Toric End Mills For Rib Processing With Corner Radius	241
	F695TX		2	Ball Nose End Mills For Rib Processing	243
	F691TX		2	End Mills For Rib Processing	245
End Mills For Graphite/ASIA	G696DC		2	Ball Nose End Mills For Graphite	249
	G234DC G244DC		2	Ball Nose End Mills For Graphite	251
	G697DC		2	End Mills For Graphite	253
	G298DC		4	End Mills For Graphite	255
High Performance End Mills/DIN	F513SX		3	Multipurpose End Mills	261
	HF514SX		4	Multipurpose End Mills With Coolant Hole	263
	F514SX F515SX		4	Multipurpose End Mills	265
	F524SX F525SX		4	Premium Cut End Mills	267
	F636TX		4	Multipurpose End Mills	269
	F608HX F609HX		4	Roughing End Mills	271
	F638TX F649TX		4	Roughing End Mills	273
	F651SX		4	End Mills For Difficult To Cut Materials	275

Index

Series	Code No.	Appearance	Flute	Product Name	Page
High Performance End Mills/DIN	F652SX		4	End Mills With Corner Radius For Difficult To Cut Materials	277
	F653SX		5	End Mills With Corner Radius For Difficult To Cut Materials	279
	F631ZX		3	End Mills For Aluminium	281
	F631 F632		3	End Mills For Aluminium	281
	F607ZX		3	Toric End Mills For Aluminium	283
	F642ZX F643ZX		3	Roughing End Mills For Aluminium	285
	F618ZX F620ZX		2	Ball Nose End Mills For Aluminium	287
End Mills/DIN	E102HX		2	Universal End Mills	291
	E104HX		4	Finishing End Mills	291
	F500HX F501HX		2	Universal End Mills	293
	F602TX		2	Universal End Mills	293
	F503HX F504HX		3	Universal End Mills	295
	F603TX		3	Universal End Mills	295
	F506HX F507HX		4	Finishing End Mills	297
	F604TX F606TX		4	Finishing End Mills	299
	F660TX F661TX		Z	Finishing End Mills	301
	B202HX		2	Ball Nose End Mills	303
	F520HX F521HX		2	Ball Nose End Mills	305
	F623HX F624HX		2	Ball Nose End Mills	307
	F625TX F626TX		2	Ball Nose End Mills	309
	F615TX F619TX		4	Toric End Mills	311
	F613TX F614TX		6	Toric End Mills	313

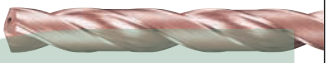
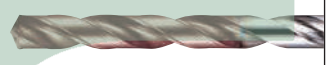
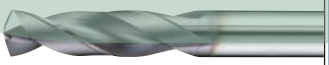
Index

Series	Code No.	Appearance	Flute	Product Name	Page
	F676TX		4	High Feed End Mills	315
Thread Mills /DIN	T781HX		3~5Z	Micro Thread Mills / Oil-Feed Thread Mills	319
	T783		3~5Z	Micro Thread Mills / Thread Mills	321
End Mills/ANSI/METRIC	E172		Z=2	Square End Mills	327
	E174		Z=4	Square End Mills	327
	E182 E185 E187		Z=2	Square End Mills	328
	E184 E186 E188		Z=4	Square End Mills	328
	B212		Z=2	Ball Nose End Mills	329
	B214		Z=4	Ball Nose End Mills	329
	B280 B282		Z=2	Ball Nose End Mills	330
	B281 B284		Z=4	Ball Nose End Mills	330
	E133		Z=3	End Mills For Aluminium	331
	E135		Z=3	End Mills For Aluminium	332
	E136 E137		Z=3	End Mills For Aluminium	332
End Mills/ANSI/INCH	E172		2	Square End Mills	335
	E174		4	Square End Mills	335
	E182 E185		2	Square End Mills	336
	E184 E186		4	Square End Mills	336
	E166TX		Z=6~10	Finishing End Mills	337
	F608HX		Z=3~5	Roughing End Mills	338
	B212		Z=2	Ball Nose End Mills	339
	B214		Z=4	Ball Nose End Mills	339

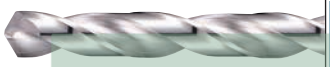
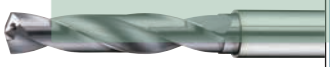
Index

Series	Code No.	Appearance	Flute	Product Name	Page
End Mills/ANSI/INCH	B280 B282		Z=2	Ball Nose End Mills	340
	B281 B284		Z=4	Ball Nose End Mills	340
	B219HX-270°		Z=4	Ball Nose End Mills	341
	B219HX-300°		Z=4	Ball Nose End Mills	343
	E191			Routing End Mills	345
	E197 E198 E199			Routing End Mills	346
	E106X E107X		Z=2	Chamfer Mills	347
	E108X E109X		Z=4	Chamfer Mills	348
	E100HX		3~6Z	Double Angle Cutter	349
High Performance End Mills/ANSI/INCH	S445HX		Z=4	Easy Cut End Mills	353
	E141-1HX		Z=4	Multipurpose End Mills	354
	E141-2HX E141-3HX		Z=4	Multipurpose End Mills	355
	F651SX		Z=4	End Mills For Difficult To Cut Materials	356
	F652SX		Z=4	End Mills With Corner Radius For Difficult To Cut Materials	357
	F653TX		Z=5	End Mills With Corner Radius For Difficult To Cut Materials	358
	E143-1		Z=3	End Mills For Aluminium	359
	E143-2 E143-3		Z=3	End Mills For Aluminium	360
	E133		Z=3	End Mills For Aluminium	361
	E135 E136		Z=3	End Mills For Aluminium	362
Drills/ASIA	D921X D922X D932X		2	NC Spot Drills	367
	D923X D924X		2	NC Spot Drills	369
	D420HX-3		2	Micro Precision Drills	371

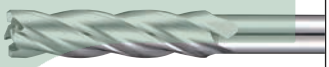
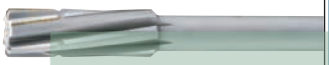
Index

Series	Code No.	Appearance	Flute	Product Name	Page
Drills/ASIA	D420HX-5		2	Micro Precision Drills	375
	D420HX-8		2	Micro Precision Drills	379
	D421TX		2	High Performance Drills	383
	D422TX		2	High Performance Drills	385
	D423TX-3		2	Oil-Feed High Performance Drills	387
	D423TX-5		2	Oil-Feed High Performance Drills	389
	D423TX-8		2	Oil-Feed High Performance Drills	391
	D423TX-12 D423TX-16		2	Oil-Feed High Performance Drills	393
	D423TX-20 D423TX-25 D423TX-30		2	Oil-Feed High Performance Drills	395
	D425TX-2		2	Flat Bottom Drills	397
	D425TX-4		2	Flat Bottom Drills	399
Drills/DIN	D903 / D904 D913 / D914		2	NC Spot Drills 90° / 120°	405
	D908		2	Combined Drills and Countersink 60°	407
	D400		2	Micro Precision Drills	409
	D412		2	Twist Drills	411
	D430FN		2	High Performance Drills	411
	D413		2	Twist Drills	413
	D433FN		2	High Performance Drills	413
	D431FT D435FT		2	High Performance Drills / Oil-Feed High Performance Drills	415
	D432FT D436FT		2	High Performance Drills / Oil-Feed High Performance Drills	417
	D437FT		2	Oil-Feed High Performance Drills	419
	D461TX D463TX		2	High Performance Drills/ Oil-Feed High Performance Drills	421

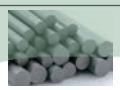
Index

Series	Code No.	Appearance	Flute	Product Name	Page
Drills/DIN	D462TX D464TX		2	High Performance Drills/ Oil-Feed High Performance Drills	423
	D415		3	High Performance 3-Flute Drills	425
	D419FT		2	Combined Drill and Chamfer Tool	427
Drills · Reamers/ANSI	D908		2	Combined Drills & Countersinks	435
	D901		2	NC Spot Drills 60°	436
	D903		2	NC Spot Drills 90°	436
	D913		2	NC Spot Drills 120°	436
	D451		2	Straight Flute Drills	437
	D452		2	Slow Spiral Screw Machine Drills	439
	D453		2	Jobber Drills	441
	D457FT-4		2	High Performance Drills	445
	D458FT-3		2	Oil-Feed High Performance Drills	447
	D458FT-5		2	Oil-Feed High Performance Drills	448
	D458FT-7		2	Oil-Feed High Performance Drills	450
Reamers/DIN	R208TX		Z	NC Machine Reamers (High Hardness)	455
	R212TX		Z	NC Machine Reamers (Difficult To Cut Material • Coolant Hole)	458
	R214TX		Z	High Performance NC Machine Reamers (Coolant Hole)	461
	R216TX		Z	High Performance NC Machine Reamers (Coolant Hole)	461
	IMS..R215		Z	Interchangeable High Performance NC Machine Reamers (Coolant Hole)	463
	IMS..R215TX		Z	Interchangeable High Performance NC Machine Reamers (Coolant Hole)	463
	IMS..R217TX		Z	Interchangeable High Performance NC Machine Reamers (Coolant Hole)	463
	R300		Z	Machine Reamers	465

Index

Series	Code No.	Appearance	Flute	Product Name	Page
Reamers/DIN	R301		Z	Machine Reamers	467
	R307		Z	NC Machine Reamers	469
	R308		Z	NC Machine Reamers	473
	R318		Z	High Precision NC Machine Reamers In Steps of 0.01mm For Automatic Lathes	477
	R319		Z	High Precision NC Machine Reamers In Steps of 0.01mm	479
	R320		Z	High Precision NC Machine Reamers (With Milling Cutting Edge)	481
	R328			High Precision NC Machine Reamers (End Cutting)	483
	R329			High Precision NC Machine Reamers (End Cutting)	487
	R302		Z	Machine Reamers	489
	R303		Z	Machine Reamers	490
Reamers/ANSI	R391		Z	NC Machine Reamers	499
	R391		Z	NC Machine Reamers	501
	R392		Z	High Precision Machine Reamers	503
Interchangeable End Mill	IMP..-E140FX		4	Interchangeable Multipurpose End Mills	517
	IMP..-F608FX		4	Interchangeable Roughing End Mills	517
	IMP..-B252FX		4	Interchangeable Multipurpose End Mills With Corner Radius	518
	IMP..-E143		3	Interchangeable End Mills For Aluminium	519
	IMP..-E145		3	Interchangeable End Mills For Aluminium With Corner Radius	519
	IMP..-B262TX		2	Interchangeable Ball Nose End Mills	520
	IMP..-B254TX		4	Interchangeable Ball Nose End Mills	520
	IMP..-F678TX		6	Interchangeable High Feed End Mills	521
	IMP..-MG			Interchangeable Blank Cutter Heads	521

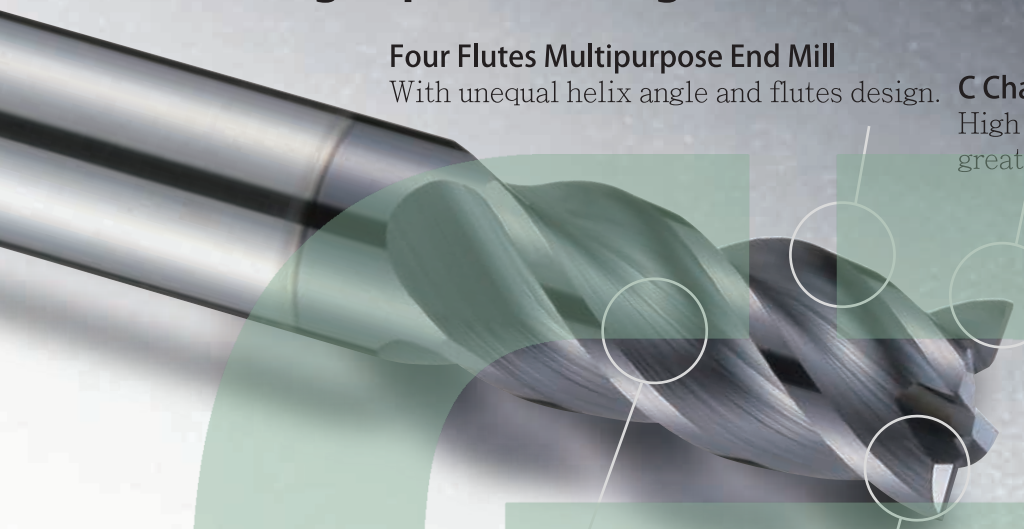
Index

Series	Code No.	Appearance	Flute	Product Name	Page
Interchangeable End Mill	IMP..-E109FX		4	Interchangeable End Mills For Chamfering 90°	522
	IMP..-E151FX		5	Interchangeable End Mills For Chamfering 90°	522
	IMP..S			Interchangeable Multi-Purpose End Mill Shanks	523
	IMP..U			Interchangeable Multi-Purpose End Mill Shanks	524
	IMP..A			Interchangeable Multi-Purpose End Mill Shanks	524
	TW0525NM			Torque Wrench	525
	IMP..-TW			Open Ended Insert Tool	525
Tungsten Carbide Rods	RR...Mxxx			Tungsten Carbide Rods	530
	RR...Mxxx			Tungsten Carbide Rods	531
	RR...Mxxx			Tungsten Carbide Rods	532
	RO...Mxxx			Tungsten Carbide Tubes	533
	RS...Mxxx			Tungsten Carbide Rods With Two Straight Coolant Holes	534
	TS...Mxxx			Tungsten Carbide Strips	535
	RG...Mxxx			Engraving Blanks Precision Ground	536

※Join forces with APC to create high-precision shock-resistant tool holders. Please refer to pages P537~544 for specifications.

Multipurpose End Mills

Unequal Flute
Unequal Helixangle Design
Efficiently Reduce Vibration
Under High Speed Cutting Condition



Four Flutes Multipurpose End Mill
With unequal helix angle and flutes design.

C Chamfer Protection On End Mill Tip
High effieciecy rough machining with great anti-chipping.

Big Capacity Slot
Achieve high efficiency of chip removal.

AlCrN Nano Multilayer Coating
Longer tool life effctually suitable in different materials.

Performance Efficient Chip Removal

Tool	E140-2.5FX ø10 C0.15
Work Piece	S50C (about 20HRC)
Milling Method	Slotting
RMP	3180 rev/min
Cutting Speed	100 m/min
Feed	400 mm/min
Feed	0.031 mm/tooth
Milling Depth	Ap: 20 mm Ae: 10 mm
Coolant	air cooling

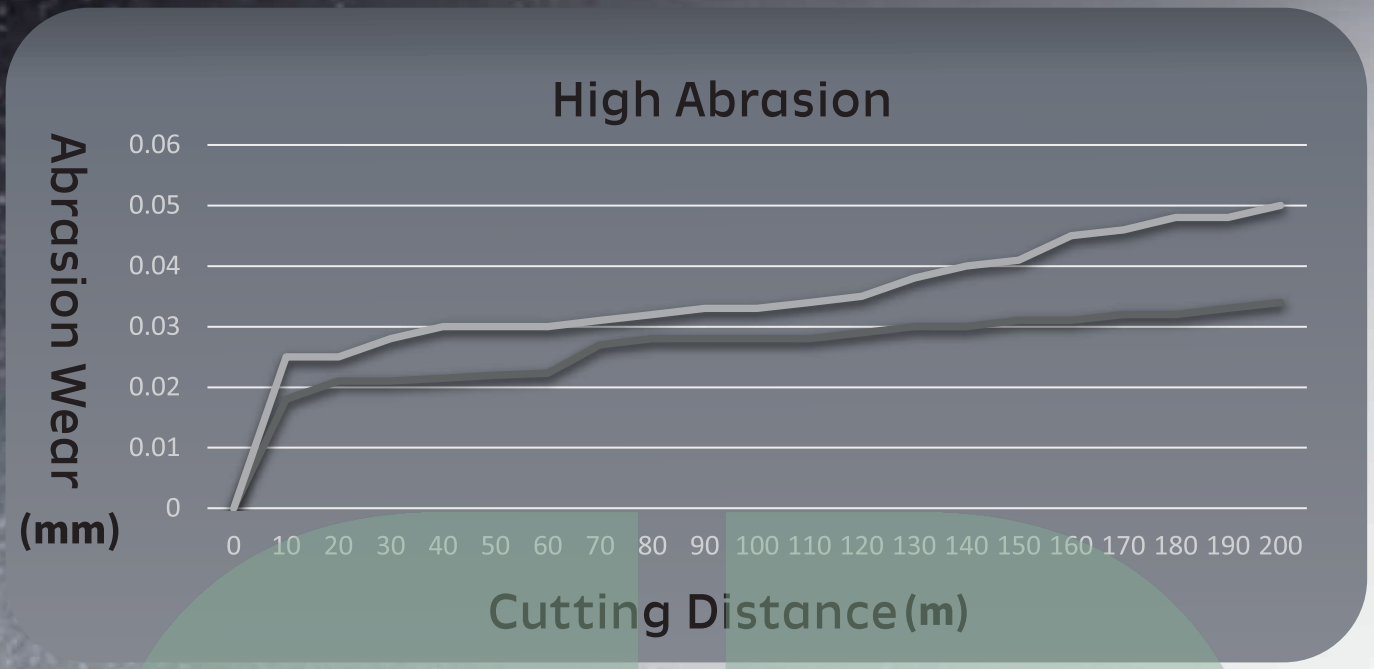
Cutting Chips



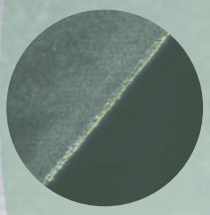
2XD Slotting



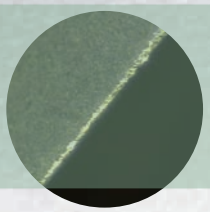
Unequal flutes and variable helix can greatly suppress vibration. Additionally, special design of chip slot perfectly increases the capacity for chip removal and achieve stable slotting machining.



100m

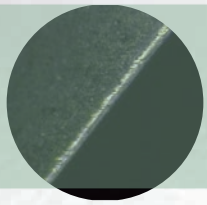


E140-2.5FX
Abrasion 0.027mm

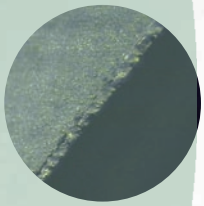


Competitor
Abrasion 0.033mm

200m

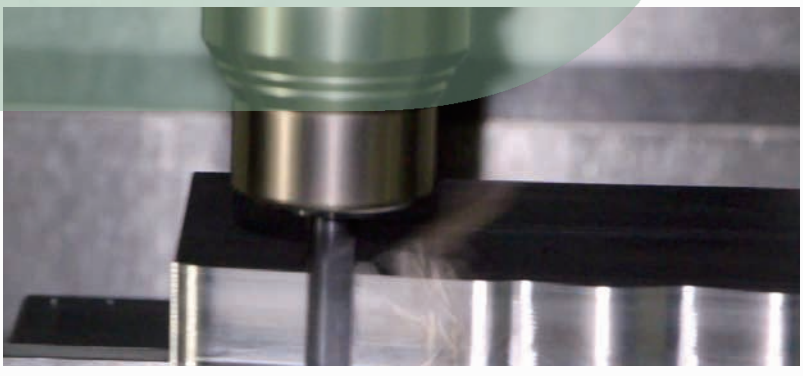


E140-2.5FX
Abrasion 0.035mm



Competitor
Abrasion 0.050mm

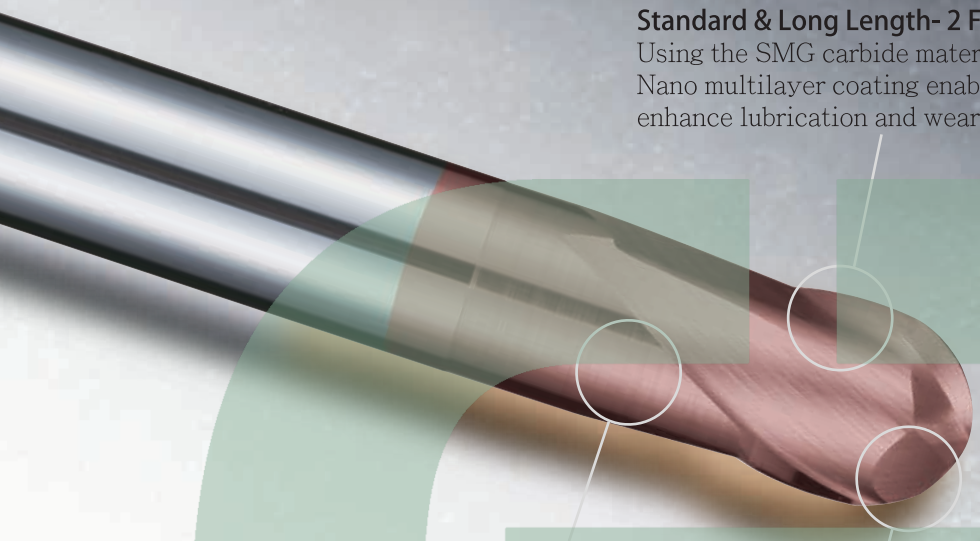
Tool	E140-2.5FX ø10 C0.15
Work Piece	S50C (about 20HRC)
Milling Method	Side Milling
RMP	3630 rev/min
Cutting Speed	114 m/min
Feed	770 mm/min
Feed	0.052 mm/tooth
Milling Depth	Ap: 20 mm Ae: 1 mm
Coolant	air cooling



With the same test condition, the abrasion rate of E140HX from 7Leaders is 30% lower than the competitor brand.
By comparing the pictures of the cutting edge, E140HX reliably shows excellent wear resistance.

Ball Nose End Mills

Superior Ball R Precision Within 5 µm
Excellent Heat & Wear Resistance



Ball Nose End Mills With Standard & Long Length- 2 Flutes
Using the SMG carbide material and Nano multilayer coating enable to enhance lubrication and wear resistance.

S Shape Ball Nose Geometry With Small Cutting Edge Design
Enable to keep longer tool life.

High Precision Ball Head Radius Suitable To Work
On high hardness and high precision mold process.

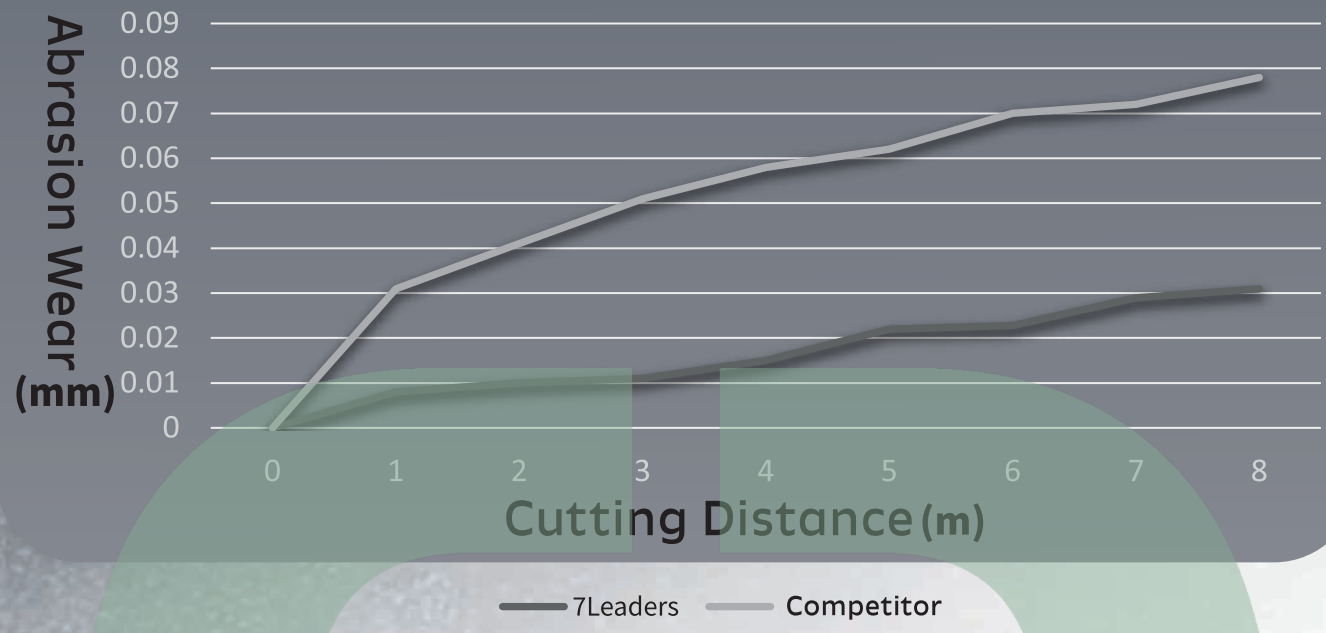
Long Tool Life Remain Sharp Cutting edge Fora Long Time

Tool	B272ATX ø6
Work Piece	SKD11 (about 62HRC)
Milling Method	Profile Copying
RPM	9000 rev/min
Cutting Speed	170 m/min
Feed	2500 mm/min
Feed	0.138 mm/tooth
Milling Depth	Ap: 0.05 mm Ae: 0.1 mm
Coolant	air cooling

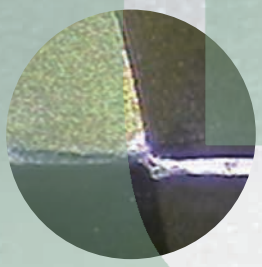
3D Surface Finishing



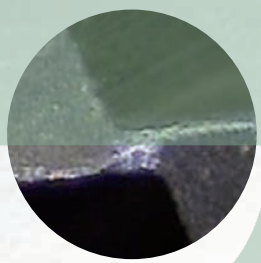
High Abrasion



8hr Work

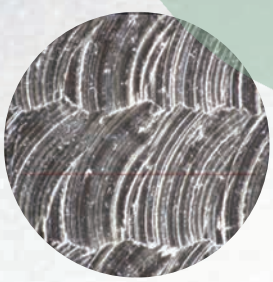


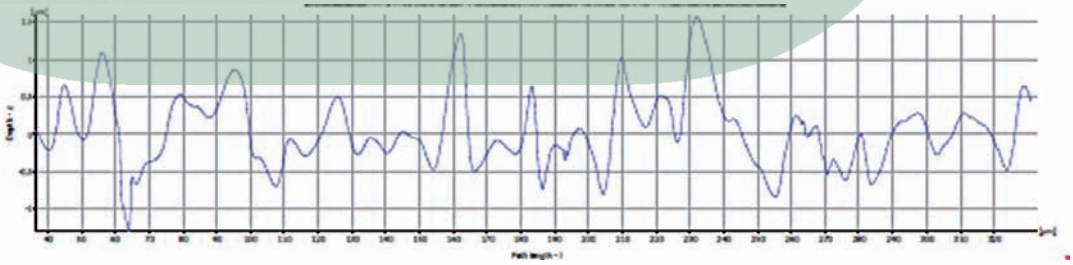
B272ATX
Abrasion 0.031mm



Competitor
Abrasion 0.076mm

Surface Roughness Curve(Ra 0.36 μm)



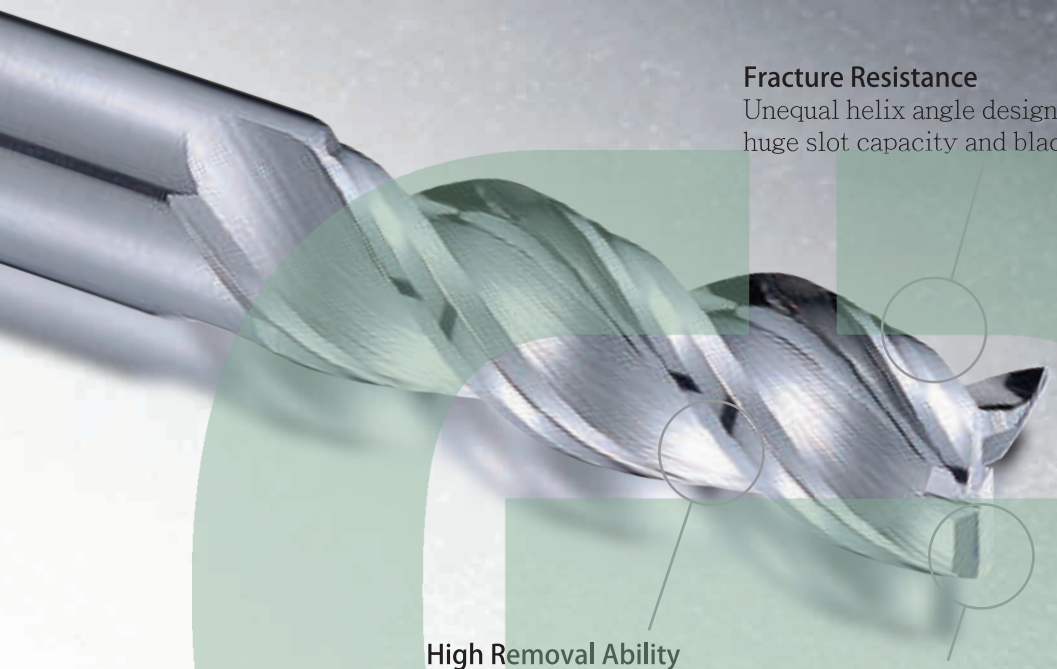


Under the same test condition, the tool life of B272ATX is nearly 50% longer than competitor brand and remain keeps excellent wear resistance in HSC performance.
Meanwhile, the cost of tools for machining high hardness materials are efficiently lower.



End Mills For Aluminium

Unequal Flute,
Unequal Helixangle Design
Efficiently Reduce Vibration
Under High Speed Cutting Condition



Fracture Resistance
Unequal helix angle design makes huge slot capacity and blade stronger.

High Removal Ability
Super big slot capacity makes high removal ability.

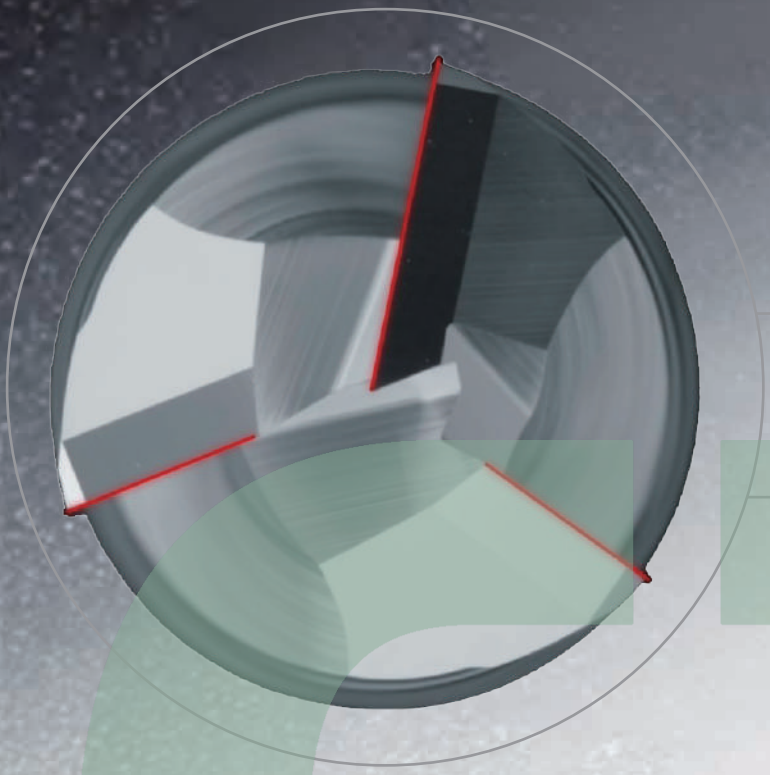
High Surface Quality
Mirror-polished grinding edge can prevent accumulate and no Yin Yang sides.

Specularity Cutting Surface With Prooflike Hilight Effect

Tool	E143 ø10
Work Piece	Aluminium 6061
Milling Method	Finish Machining
RPM	8000 rev/min
Cutting Speed	250 m/min
Feed	300 mm/min
Feed	0.0125 mm/tooth
Milling Depth	Ap: 20 mm Ae: 0.03 mm
Coolant	water cooling

Finish Machining

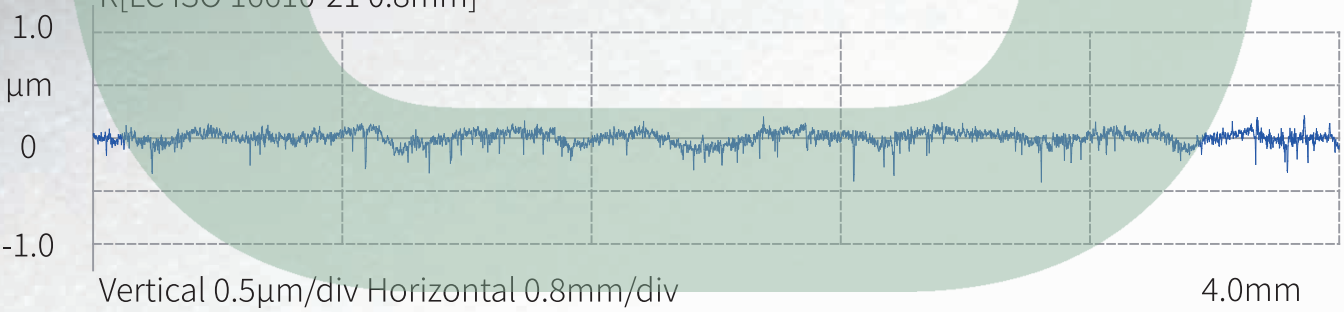




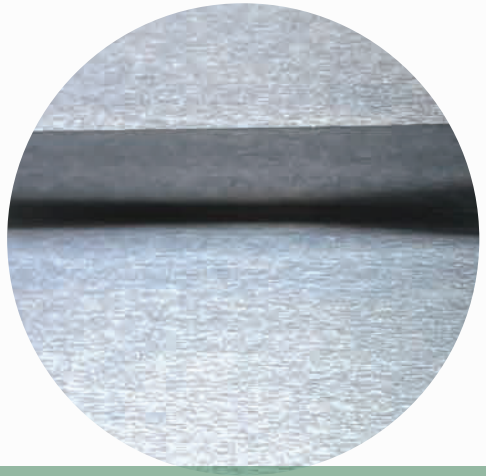
Anti-Vibration
Unequal-flutes design reduce vibration.

Unique Tool Tip Design
Prevent chipping under high speed machining
High flutness and precision on planar milling.

Surface Roughness Curve (Ra 0.049 μm Rz 0.538 μm)

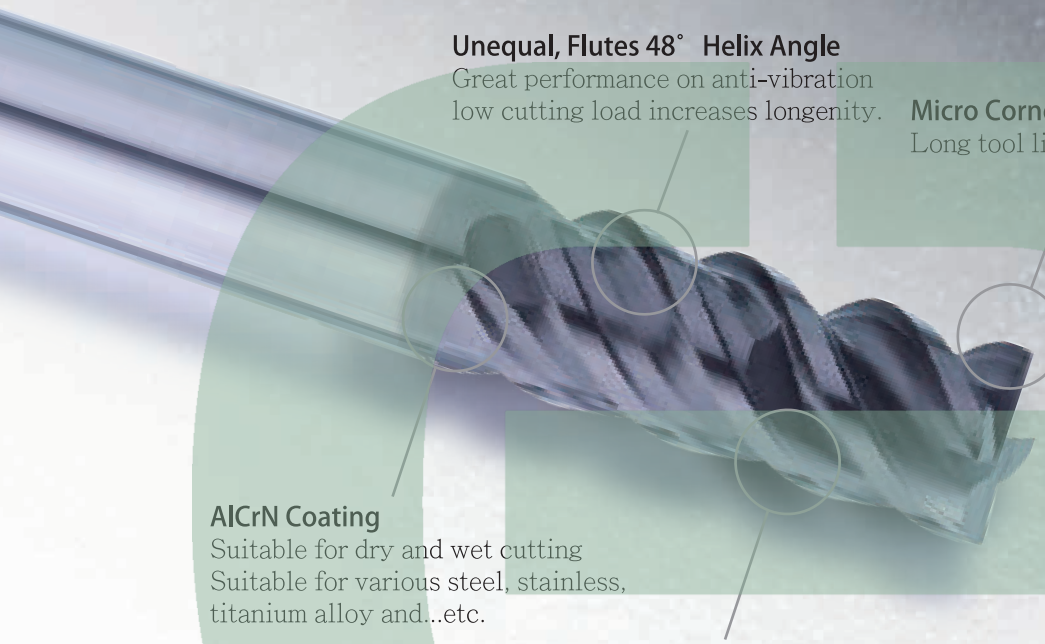


After finishing with the tool of E143 Ø 10 from 7Leaders, tested with a surface roughness meter, the cutting surface was shown that RA value is 0.049 μm and RZ value is 0.538 μm. The surface has no Yin Yang sides, no trace lines, and high finishing surface smoothness.



Multipurpose End Mills

High Speed
Fine Finishing
High Chip Removal
Dynamic High-Speed Machining



Unequal, Flutes 48° Helix Angle
Great performance on anti-vibration
low cutting load increases longenity.

Micro Corner Passivation Protection Design
Long tool life on end milling and side milling.

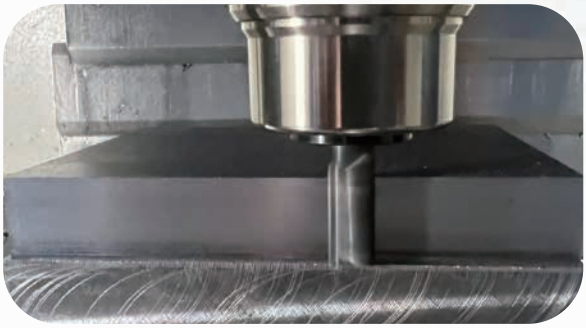
AlCrN Coating
Suitable for dry and wet cutting
Suitable for various steel, stainless,
titanium alloy and...etc.

Arc Clearance Argle
Strong cutting edge prolong tool life.

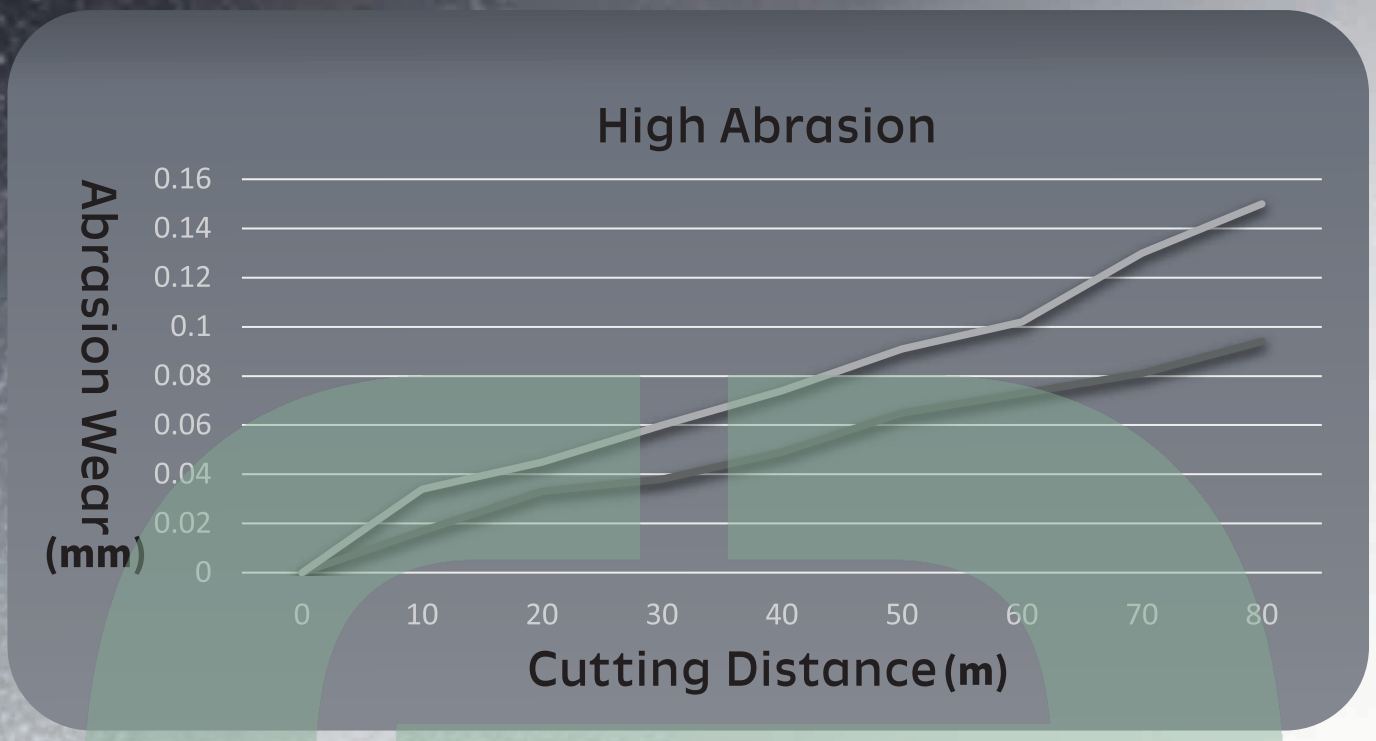
Performance Efficient Chip Removal

Tool	A48FX ø10
Work Piece	SUS304
Milling Method	Side Milling
RPM	4000 rev/min
Cutting Speed	125 m/min
Feed	2000 mm/min
Feed	0.125 mm/tooth
Milling Depth	Ap: 20 mm Ae: 0.8 mm
Coolant	Water Cooling

Dynamic High-Speed Machining



A48FX compared with competitors under same conditions test via wet cooling method demonstrates outstanding performance and macrobiosison end millind and side milling.



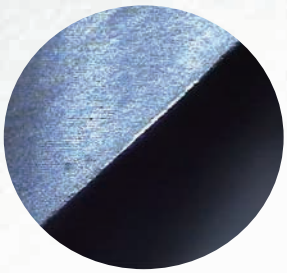


50% Core Thickness
Deep U-Shape Chip Breaker
Great removal ability suitable for end milling,slot milling and side milling.

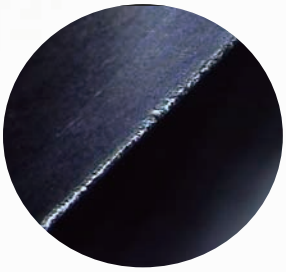


75% Low-U Shape Chip Breaker
High rigidity, sharp edge works for rough and finish maching.

50m

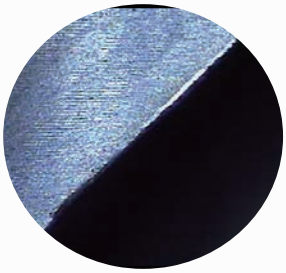


A48FX
Abrasion 0.065mm

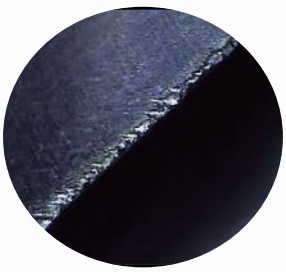


Competitor
Abrasion 0.091mm

100m

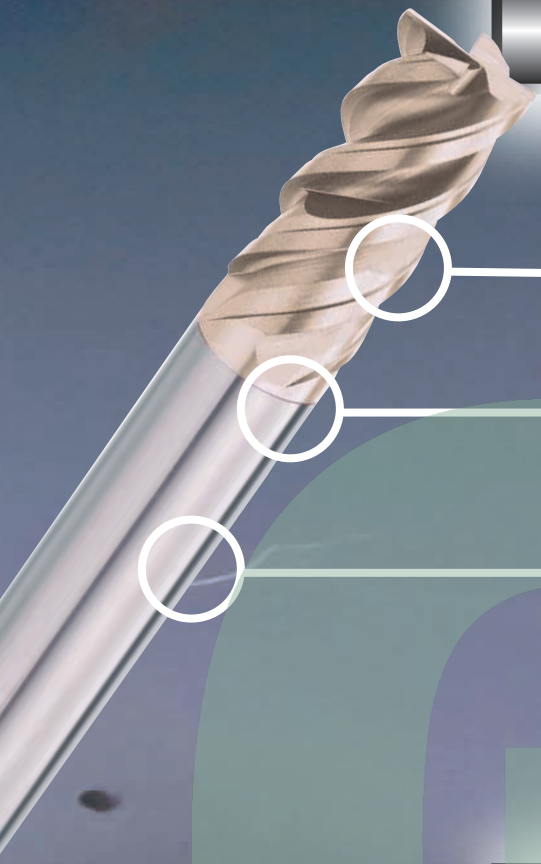


A48FX
Abrasion 0.105mm



Competitor
Abrasion 0.17mm

E237SX

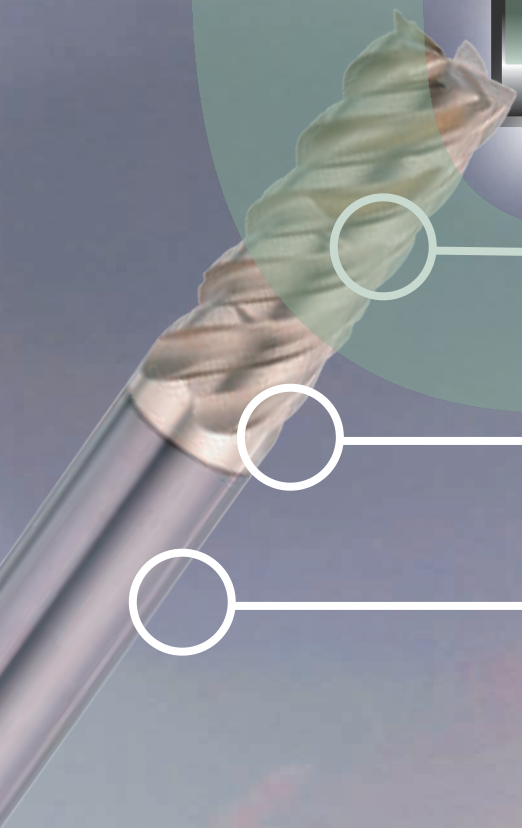


Four flutes, dual cores design. High rigidity.
Unequal flute, high helix.

Suitable for high-speed dynamic
side rough milling

Sharp edge works on hardened steel, stainless
steel, titanium, nickel alloy and high temp alloys.

E238SX



Five flues, dual cores design. High rigidity.
Unequal flute, high helix.

Suitable for high-speed dynamic
side rough milling

Sharp edge works on hardened steel, stainless
steel, titanium, nickel alloy and high temp alloys.

A40FX

Four flutes multipurpose design, equal helix angle, unequal flute makes outstanding anti-vibration. Micro corner passivation protection design.

Big capacity slot achieve high efficiency of chip removal, machine with APC high precision, anti-vibration shank suitable in different materials and milling method.

With AlCrN nano multilayer coating works on carbon-steel, alloy steel, stainless steel and titanium…etc. materials.

A45TX

Sharp edge with micro corner radius passivation protection.

Four flutes, round arc fluting, high rigidity, unequal and 45° high helix angle design.

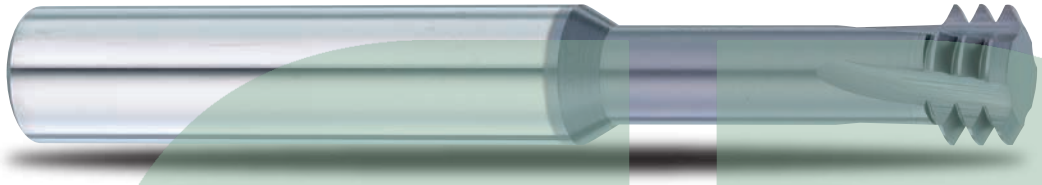
Suitable for carbon-steel, alloy steel, aluminum, nickel alloy and high temp alloys…etc. materials.



T116FX

Super Mini Slot Cutter
(End Cutting)

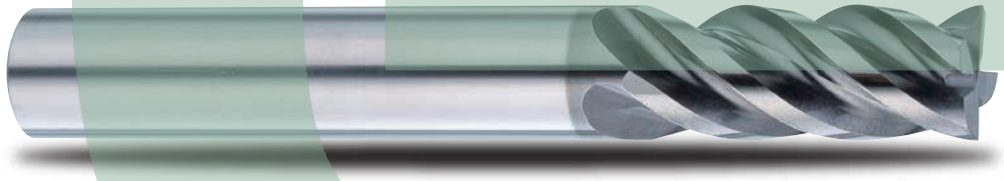
Suitable for mini slot applications, such as T-slot or side slot milling on work material by the straight edge design.
Excellent wear resistance with AlCrN nano multi-layer coating, it is effectively used in carbon steel, alloy steel, hardened steel, stainless steel and difficult-to-cut materials, etc.



T730FX

Micro Thread Mills (ISO)

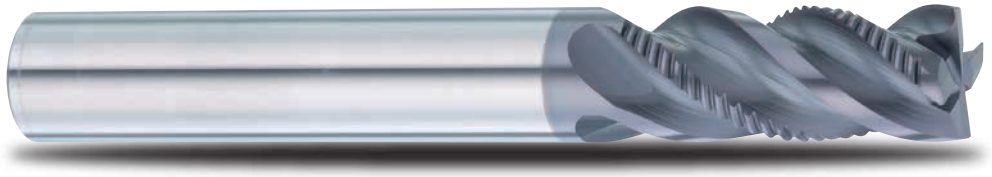
Suitable for carbon steel, alloy steel, below 48HRC hardened steel, stainless steel, cast iron, copper, Aluminium...etc.



A40FX

Multipurpose End Mills

A40FX is a 4-flutes multipurpose end mills. Effectively decrease the vibration by equal helix geometry and unequal flutes designs. End cutting edge with micro corner passivation protection design. High chip removal geometric chip slot is designed to reach high removal rate.For high-efficiency heavy cutting and high-speed dynamic side roughing. Compatible with APC high precision anti-vibration collet chuck, which can cope with various milling conditions.With Nano multilayer coating AlCrN, it is suitable for carbon steel, alloy steel, stainless steel, titanium alloy...etc.



A42FX

Multipurpose End Mills

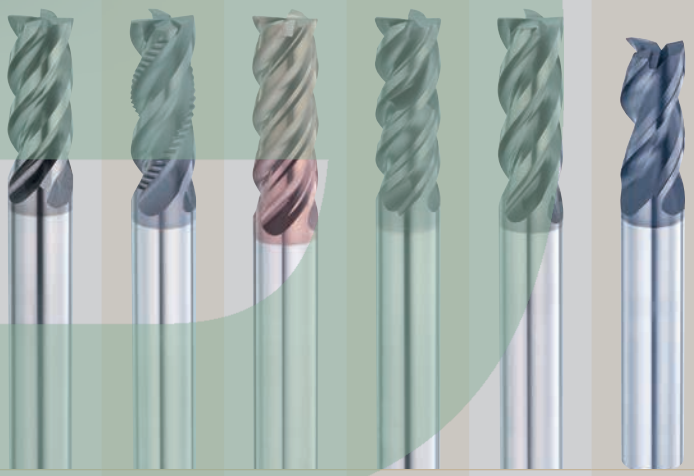
A42FX is a 4-flutes multipurpose roughing and finishing end mill with unequal flutes design, equal helix geometry, two tooth with fine wave shape design, and two eccentric outer circle design. Sharp cutting edge with C-angle design. For high-efficiency heavy cutting and high-speed dynamic side roughing. Compatible with APC high precision anti-vibration collet chuck, which can cope with various milling conditions.With Nano multilayer coating AlCrN, it is suitable for carbon steel, alloy steel, stainless steel, titanium alloy, nickel alloy, high temperature alloy and etc.



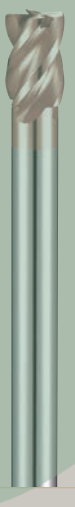
ASIA END MILL



Multipurpose End Mills

Page	3	5	7	9	11	15
Appearance						
Code No	A40FX	A42FX	A45TX	A48FX	E140FX E140-2.0FX E140-2.5FX E140-3.0FX	E130HX
Carbide	MG Carbide	MG Carbide	UMG Carbide	MG Carbide	MG Carbide	MG Carbide
Coating	AlCrN FX	AlCrN FX	AlTiSiN TX	AlCrN FX	AlCrN FX	AlTiCrN HX
Helix Angle	 40°	 40°	 45°	 48°	 38° 41°	 38° 41°
No.of Flutes	 4	 4	 4	 4	 4	 3

ASIA

17	19	21	23	27	31	33	35	37	39
									
E140HX	E141-1.5HX E141-2.0HX E141-3.0HX	E141-4.0HX E141-5.0HX	E144X E144-4.0X E144-5.0X E144-6.0X	B252-2.5HX	B274HX	F612HX F617HX	E148HX	E149HX	B270TX
MG Carbide	MG Carbide	MG Carbide	UMG Carbide	UMG Carbide	UMG Carbide	UMG Carbide	MG Carbide	MG Carbide	UMG Carbide
AlTiCrN HX	AlTiCrN HX	AlTiCrN HX	AlTiXN X	AlTiCrN HX	AlTiCrN HX	AlTiCrN HX	AlTiCrN HX	AlTiCrN HX	AlTiSiN TX
									
									

A40FX

Multipurpose End Mills

MG Carbide

AlCrN FX

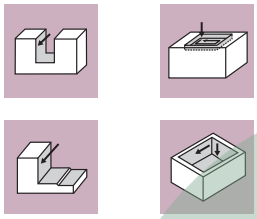
40°

4

N
γ5°

90°

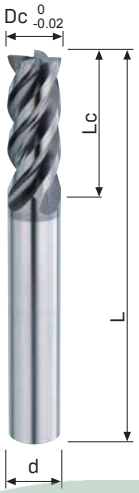
Type of Operation



Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys



Code No. A40FX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlCrN A40FX
3	8	50	6	●
4	11	50	6	●
5	13	50	6	●
6	16	50	6	●
8	20	60	8	●
10	25	75	10	●
12	30	75	12	●
16	40	100	16	●
20	50	100	20	●

Feature of product:

Multipurpose End Mills- 4 Flutes

Effectively decrease the vibration by various helix geometry and unequal flutes designs.

Tip cutting edge with micro passivation protection design.

Big chip breaker is designed to reach smooth chip evacuation. High-efficiency heavy cutting and high-speed trochoidal side-milling, which is compatible with APC high precision anti-vibration collet chuck, coping with various milling conditions.

With Nano multilayer coating AlCrN, suitable for carbon steel, alloy steel, stainless steel, titanium alloy...etc.

Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		120		120		80		65		60		65		120		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
A40FX-3	3	12,700	683	12,700	683	10,000	530	6,550	389	6,400	105	6,550	389	10,600	683	3,200	180
A40FX-4	4	9,550	735	9,550	735	7,640	590	3,950	413	3,800	120	3,950	413	6,350	735	2,400	180
A40FX-5	5	7,640	875	7,640	875	6,100	625	2,800	448	2,730	125	2,800	448	4,550	875	2,000	190
A40FX-6	6	6,300	875	6,300	875	5,000	600	2,200	413	2,100	125	2,200	413	3,540	875	1,600	190
A40FX-8	8	5,000	770	5,000	770	4,000	600	1,975	413	1,900	125	1,975	413	3,185	770	1,200	170
A40FX-10	10	3,800	770	3,800	770	3,000	595	1,645	375	1,595	120	1,645	375	3,650	770	1,000	160
A40FX-12	12	2,275	670	2,275	670	1,770	560	1,410	350	1,365	120	1,410	350	2,275	670	800	160
A40FX-16	16	1,990	670	1,990	670	1,550	520	1,230	312	1,190	100	1,230	312	1,990	670	600	150
A40FX-20	20	1,590	535	1,590	535	1,240	415	985	277	950	90	985	277	1,590	535	480	160
(mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.2D		ae:0.2D		ae:0.1D	

Slotting

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		120		120		80		65		60		65		120		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
A40FX-3	3	12,700	600	12,700	600	10,000	430	6,550	290	6,400	105	6,550	290	10,600	600	3,200	130
A40FX-4	4	9,550	635	9,550	635	7,640	500	3,950	325	3,800	120	3,950	325	6,350	635	2,400	150
A40FX-5	5	7,640	775	7,640	775	6,100	525	2,800	348	2,730	125	2,800	348	4,550	775	2,000	160
A40FX-6	6	6,300	775	6,300	775	5,000	500	2,200	313	2,100	125	2,200	313	3,540	775	1,600	145
A40FX-8	8	5,000	650	5,000	650	4,000	500	1,975	313	1,900	125	1,975	313	3,185	650	1,200	120
A40FX-10	10	3,800	670	3,800	670	3,000	490	1,645	288	1,595	120	1,645	288	3,650	670	1,000	145
A40FX-12	12	2,275	560	2,275	560	1,770	460	1,410	275	1,365	120	1,410	275	2,275	560	800	150
A40FX-16	16	1,990	660	1,990	660	1,550	420	1,230	240	1,190	100	1,230	240	1,990	660	600	150
A40FX-20	20	1,590	500	1,590	500	1,240	360	985	200	950	90	985	200	1,590	500	480	130
(mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.05D		ap:0.5D		ap:0.5D		ap:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

A42FX

Multipurpose End Mills

MG Carbide

AlCrN FX

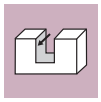


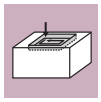


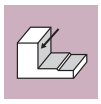


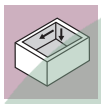


Type of Operation





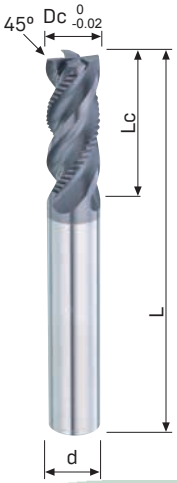




Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys



Code No. A42FX-Dc×C45°

Dc 0 -0.02	C45° mm	Lc mm	L mm	d h6	AlCrN A42FX
6	0.09	16	50	6	●
8	0.12	20	60	8	●
10	0.15	25	75	10	●
12	0.18	30	75	12	●
16	0.24	40	100	16	●
20	0.3	50	100	20	●

Feature of product:

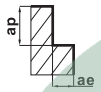
Multipurpose Roughing and Finishing End Mills-4 Flutes

Unequal flutes design, equal helix geometry, two tooth with fine wave shape design, and two eccentric outer circle design.

Sharp cutting edge with corner chamfer design. High-efficiency heavy cutting and high-speed trochoidal side-milling, which is compatible with APC high precision anti-vibration collet chuck, coping with various milling conditions.

With Nano multilayer coating AlCrN, suitable for carbon steel, alloy steel, stainless steel, titanium alloy, nickel alloy, high temperature alloy...etc.

Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		120		120		80		65		60		65		120		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
A42FX-6	6	6,300	875	6,300	875	5,000	600	2,200	413	2,100	125	2,200	413	3,540	875	1,600	190
A42FX-8	8	5,000	770	5,000	770	4,000	600	1,975	413	1,900	125	1,975	413	3,185	770	1,200	170
A42FX-10	10	3,800	770	3,800	770	3,000	595	1,645	375	1,595	120	1,645	375	3,650	770	1,000	160
A42FX-12	12	2,275	670	2,275	670	1,770	560	1,410	350	1,365	120	1,410	350	2,275	670	800	160
A42FX-16	16	1,990	670	1,990	670	1,550	520	1,230	312	1,190	100	1,230	312	1,990	670	600	150
A42FX-20	20	1,590	535	1,590	535	1,240	415	985	277	950	90	985	277	1,590	535	480	160
(mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.2D		ae:0.2D		ae:0.1D	

Slotting

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		120		120		80		65		60		65		120		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
A42FX-6	6	6,300	775	6,300	775	5,000	500	2,200	313	2,100	125	2,200	313	3,540	775	1,600	145
A42FX-8	8	5,000	650	5,000	650	4,000	500	1,975	313	1,900	125	1,975	313	3,185	650	1,200	120
A42FX-10	10	3,800	670	3,800	670	3,000	490	1,645	288	1,595	120	1,645	288	3,650	670	1,000	145
A42FX-12	12	2,275	560	2,275	560	1,770	460	1,410	275	1,365	120	1,410	275	2,275	560	800	150
A42FX-16	16	1,990	660	1,990	660	1,550	420	1,230	240	1,190	100	1,230	240	1,990	660	600	150
A42FX-20	20	1,590	500	1,590	500	1,240	360	985	200	950	90	985	200	1,590	500	480	130
(mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.05D		ap:0.5D		ap:0.5D		ap:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

A45TX

Finishing End Mills

UMG Carbide

AlTiSiN TX

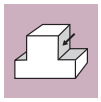


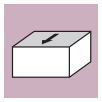


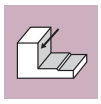




Type of Operation



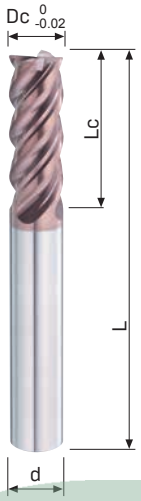




Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys



Code No. A45TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiSiN A45TX
3	8	50	6	●
4	11	50	6	●
5	13	50	6	●
6	16	50	6	●
8	20	60	8	●
10	25	75	10	●
12	30	75	12	●
16	40	100	16	●
20	50	100	20	●

Feature of product:

4 flutes, round arc fluting, high rigidity, unequal flutes design and 45° helix angle design.

Sharp cutting edge with micro corner radius which is suitable for finishing. Using with an APC high precision anti-vibration collet chuck, which has a clamping runout accuracy of <3μm and ensures an excellent finished surface.

Suitable for precision machining applications of carbon steel, alloy steel, hardened steel, stainless steel, titanium alloy, nickel alloy, high temperature alloy...etc.

Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		120		120		80		65		60		65		120		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
A45TX-3	3	12,700	683	12,700	683	10,000	530	6,550	389	6,400	105	6,550	389	10,600	683	3,200	180
A45TX-4	4	9,550	735	9,550	735	7,640	590	3,950	413	3,800	120	3,950	413	6,350	735	2,400	180
A45TX-5	5	7,640	875	7,640	875	6,100	625	2,800	448	2,730	125	2,800	448	4,550	875	2,000	190
A45TX-6	6	6,300	875	6,300	875	5,000	600	2,200	413	2,100	125	2,200	413	3,540	875	1,600	190
A45TX-8	8	5,000	770	5,000	770	4,000	600	1,975	413	1,900	125	1,975	413	3,185	770	1,200	170
A45TX-10	10	3,800	770	3,800	770	3,000	595	1,645	375	1,595	120	1,645	375	3,650	770	1,000	160
A45TX-12	12	2,275	670	2,275	670	1,770	560	1,410	350	1,365	120	1,410	350	2,275	670	800	160
A45TX-16	16	1,990	670	1,990	670	1,550	520	1,230	312	1,190	100	1,230	312	1,990	670	600	150
A45TX-20	20	1,590	535	1,590	535	1,240	415	985	277	950	90	985	277	1,590	535	480	160
(mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.15D		ae:0.15D		ae:0.1D		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.1D		ae:0.05D	

Slotting

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		120		120		80		65		60		65		120		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
A45TX-3	3	12,700	600	12,700	600	10,000	430	6,550	290	6,400	105	6,550	290	10,600	600	3,200	130
A45TX-4	4	9,550	635	9,550	635	7,640	500	3,950	325	3,800	120	3,950	325	6,350	635	2,400	150
A45TX-5	5	7,640	775	7,640	775	6,100	525	2,800	348	2,730	125	2,800	348	4,550	775	2,000	160
A45TX-6	6	6,300	775	6,300	775	5,000	500	2,200	313	2,100	125	2,200	313	3,540	775	1,600	145
A45TX-8	8	5,000	650	5,000	650	4,000	500	1,975	313	1,900	125	1,975	313	3,185	650	1,200	120
A45TX-10	10	3,800	670	3,800	670	3,000	490	1,645	288	1,595	120	1,645	288	3,650	670	1,000	145
A45TX-12	12	2,275	560	2,275	560	1,770	460	1,410	275	1,365	120	1,410	275	2,275	560	800	150
A45TX-16	16	1,990	660	1,990	660	1,550	420	1,230	240	1,190	100	1,230	240	1,990	660	600	150
A45TX-20	20	1,590	500	1,590	500	1,240	360	985	200	950	90	985	200	1,590	500	480	130
(mm) 		ap:0.3D		ap:0.3D		ap:0.3D		ap:0.2D		ap:0.01D		ap:0.1D		ap:0.5D		ap:0.02D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

A48FX

Multipurpose End Mills (Trinity)

MG Carbide

AlCrN FX

48°

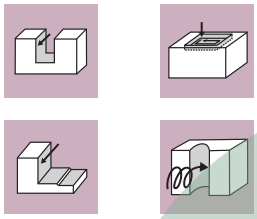
4

N

γ8°

90°

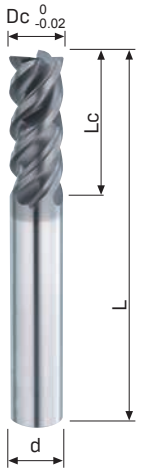
Type of Operation



Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys



Code No. A48FX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlCrN A48FX
3	8	50	6	●
4	11	50	6	●
5	13	50	6	●
6	16	50	6	●
8	20	60	8	●
10	25	75	10	●
12	30	75	12	●
16	40	100	16	●
20	50	100	20	●

Feature of product:

4-flute double core design, high rigidity and chip resistance, unequal flute, high helix angle, sharp cutting edges, tip cutting edge with micro passivation protection, among other design elements, achieve a trinity tool application.

High-speed trochoidal side-milling application.

High-precision surface finishing application.

High rigidity and high removal rate end milling application.

Using with an APC high precision anti-vibration collet chuck, become even more efficient and effective.

The coating is Nano multilayer coating AlCrN, which caused smooth and refined surface, suitable for carbon steel, alloy steel, stainless steel, titanium alloy...etc.

Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		120		120		80		65		60		65		120		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
A48FX-3	3	12,700	683	12,700	683	10,000	530	6,550	389	6,400	105	6,550	389	10,600	683	3,200	180
A48FX-4	4	9,550	735	9,550	735	7,640	590	3,950	413	3,800	120	3,950	413	6,350	735	2,400	180
A48FX-5	5	7,640	875	7,640	875	6,100	625	2,800	448	2,730	125	2,800	448	4,550	875	2,000	190
A48FX-6	6	6,300	875	6,300	875	5,000	600	2,200	413	2,100	125	2,200	413	3,540	875	1,600	190
A48FX-8	8	5,000	770	5,000	770	4,000	600	1,975	413	1,900	125	1,975	413	3,185	770	1,200	170
A48FX-10	10	3,800	770	3,800	770	3,000	595	1,645	375	1,595	120	1,645	375	3,650	770	1,000	160
A48FX-12	12	2,275	670	2,275	670	1,770	560	1,410	350	1,365	120	1,410	350	2,275	670	800	160
A48FX-16	16	1,990	670	1,990	670	1,550	520	1,230	312	1,190	100	1,230	312	1,990	670	600	150
A48FX-20	20	1,590	535	1,590	535	1,240	415	985	277	950	90	985	277	1,590	535	480	160
(mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.2D		ae:0.2D		ae:0.1D	

Slotting

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		120		120		80		65		60		65		120		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
A48FX-3	3	12,700	600	12,700	600	10,000	430	6,550	290	6,400	105	6,550	290	10,600	600	3,200	130
A48FX-4	4	9,550	635	9,550	635	7,640	500	3,950	325	3,800	120	3,950	325	6,350	635	2,400	150
A48FX-5	5	7,640	775	7,640	775	6,100	525	2,800	348	2,730	125	2,800	348	4,550	775	2,000	160
A48FX-6	6	6,300	775	6,300	775	5,000	500	2,200	313	2,100	125	2,200	313	3,540	775	1,600	145
A48FX-8	8	5,000	650	5,000	650	4,000	500	1,975	313	1,900	125	1,975	313	3,185	650	1,200	120
A48FX-10	10	3,800	670	3,800	670	3,000	490	1,645	288	1,595	120	1,645	288	3,650	670	1,000	145
A48FX-12	12	2,275	560	2,275	560	1,770	460	1,410	275	1,365	120	1,410	275	2,275	560	800	150
A48FX-16	16	1,990	660	1,990	660	1,550	420	1,230	240	1,190	100	1,230	240	1,990	660	600	150
A48FX-20	20	1,590	500	1,590	500	1,240	360	985	200	950	90	985	200	1,590	500	480	130
(mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.05D		ap:0.5D		ap:0.5D		ap:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E140FX

Multipurpose End Mills

MG Carbide

AlCrN FX

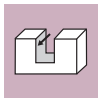


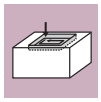


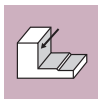


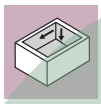


Type of Operation





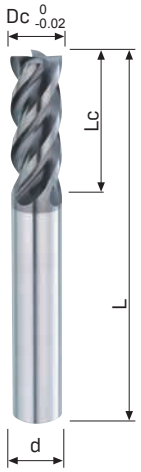




Work Material

P	H	M	K	N	S
●	●	●	●	○	○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys



Code No. E140FX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlCrN E140FX
1	3	50	4	●
1.5	5	50	4	●
2	6	50	4	●
2.5	8	50	4	●
3	8	50	6	●
4	11	50	6	●
5	13	50	6	●
6	16	50	6	●
8	20	60	8	●
10	25	75	10	●
12	30	75	12	●
16	40	100	16	●
20	50	100	20	●

Feature of product:

Multipurpose End Mills- 4 Flutes

Effectively decrease the vibration by various helix geometry and unequal flutes designs.

Big chip breaker is designed to reach smooth chip evacuation for various work materials.

Tip cutting edge with micro corner passivation protection design.

High-efficiency roughing with excellent tip chipping resistance. For high-efficiency heavy cutting, using with an APC high precision anti-vibration collet chuck.

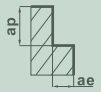
Obviously improve tool life with Nano multilayer coating AlCrN.

Suitable for different kinds of materials cutting.

E140FX

Recommended Milling Conditions

Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		120		120		80		65		60		65		120		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E140FX-1	1	31,800	240	31,800	240	25,000	210	19,750	180	19,000	85	19,750	180	31,800	240	7,100	50
E140FX-1.5	1.5	21,200	245	21,200	245	16,500	210	13,000	180	12,700	90	13,000	180	21,200	245	5,100	100
E140FX-2	2	15,900	245	15,900	245	12,420	210	9,850	180	9,550	90	9,850	180	15,900	245	4,000	120
E140FX-2.5	2.5	12,700	370	12,700	370	10,000	300	7,900	275	7,600	90	7,900	275	12,700	370	3,200	150
E140FX-3	3	12,700	683	12,700	683	10,000	530	6,550	389	6,400	105	6,550	389	10,600	683	3,200	180
E140FX-4	4	9,550	735	9,550	735	7,640	590	3,950	413	3,800	120	3,950	413	6,350	735	2,400	180
E140FX-5	5	7,640	875	7,640	875	6,100	625	2,800	448	2,730	125	2,800	448	4,550	875	2,000	190
E140FX-6	6	6,300	875	6,300	875	5,000	600	2,200	413	2,100	125	2,200	413	3,540	875	1,600	190
E140FX-8	8	5,000	770	5,000	770	4,000	600	1,975	413	1,900	125	1,975	413	3,185	770	1,200	170
E140FX-10	10	3,800	770	3,800	770	3,000	595	1,645	375	1,595	120	1,645	375	3,650	770	1,000	160
E140FX-12	12	$2,275	670	2,275	670	$1,770	560	1,410	350	1,365	120	1,410	350	2,275	670	800	160
E140FX-16	16	$1,990	670	1,990	670	$1,550	520	1,230	312	1,190	100	1,230	312	1,990	670	600	150
E140FX-20	20	$1,590	535	1,590	535	$1,240	415	985	277	950	90	985	277	1,590	535	480	160
(mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.2D		ae:0.2D		ae:0.1D	

Slotting

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		120		120		80		65		60		65		120		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E140FX-1	1	31,800	200	31,800	200	25,000	180	19,750	150	19,000	85	19,750	150	31,800	200	7,100	50
E140FX-1.5	1.5	21,200	200	21,200	200	16,500	180	13,000	150	12,700	90	13,000	150	21,200	200	5,100	80
E140FX-2	2	15,900	220	15,900	220	12,420	180	9,850	150	9,550	90	9,850	150	15,900	220	4,000	100
E140FX-2.5	2.5	12,700	330	12,700	330	10,000	220	7,900	175	7,600	90	7,900	175	12,700	330	3,200	100
E140FX-3	3	12,700	600	12,700	600	10,000	430	6,550	290	6,400	105	6,550	290	10,600	600	3,200	130
E140FX-4	4	9,550	635	9,550	635	7,640	500	3,950	325	3,800	120	3,950	325	6,350	635	2,400	150
E140FX-5	5	7,640	775	7,640	775	6,100	525	2,800	348	2,730	125	2,800	348	4,550	775	2,000	160
E140FX-6	6	6,300	775	6,300	775	5,000	500	2,200	313	2,100	125	2,200	313	3,540	775	1,600	145
E140FX-8	8	5,000	650	5,000	650	4,000	500	1,975	313	1,900	125	1,975	313	3,185	650	1,200	120
E140FX-10	10	3,800	670	3,800	670	3,000	490	1,645	288	1,595	120	1,645	288	3,650	670	1,000	145
E140FX-12	12	$2,275	560	2,275	560	$1,770	460	1,410	275	1,365	120	1,410	275	2,275	560	800	150
E140FX-16	16	$1,990	660	1,990	660	$1,550	420	1,230	240	1,190	100	1,230	240	1,990	660	600	150
E140FX-20	20	$1,590	500	1,590	500	$1,240	360	985	200	950	90	985	200	1,590	500	480	130
(mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.05D		ap:0.5D		ap:0.5D		ap:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E140-2.0FX / 2.5FX / 3.0FX

Multipurpose End Mills

MG Carbide

AlCrN FX

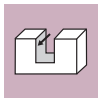


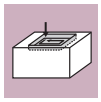


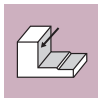


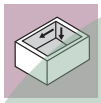


Type of Operation









Work Material

P	H	M	K	N	S
●	●	●	●	○	○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Multipurpose End Mills- 4 Flutes

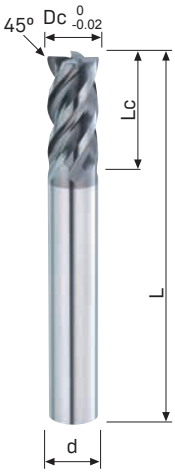
Effectively decrease the vibration by various helix geometry and unequal flutes designs.

Big chip breaker is designed to reach smooth chip evacuation for various work materials.

Tip cutting edge with corner chamfer. High-efficiency roughing with excellent tip chipping resistance. For high-efficiency heavy cutting, using with an APC high precision anti-vibration collet chuck.

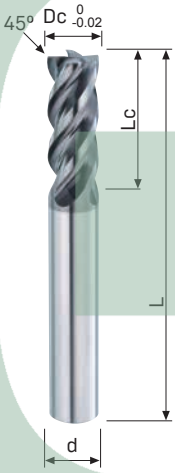
Obviously improve tool life with Nano multilayer coating AlCrN.

Suitable for different kinds of materials cutting.



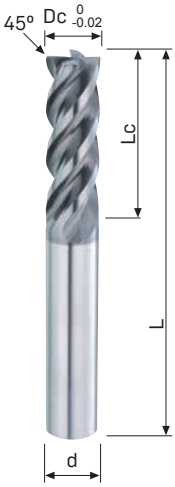
Code No. E140-2.0FX-Dc×C45°

Dc 0 -0.02	C45° mm	Lc mm	L mm	d h6	AlCrN E140-2.0FX
1	0.01	2	50	4	●
1.5	0.02	3	50	4	●
2	0.03	4	50	4	●
2.5	0.04	5	50	4	●
3	0.05	6	50	6	●
4	0.06	8	50	6	●
5	0.08	10	50	6	●
6	0.09	12	50	6	●
8	0.12	16	60	8	●
10	0.15	20	75	10	●
12	0.18	24	75	12	●
16	0.24	32	100	16	●
20	0.30	40	100	20	●



Code No. E140-2.5FX-Dc×C45°

Dc 0 -0.02	C45° mm	Lc mm	L mm	d h6	AlCrN E140-2.5FX
3	0.05	7.5	50	6	●
4	0.06	10	50	6	●
5	0.08	12.5	50	6	●
6	0.09	15	50	6	●
8	0.12	20	60	8	●
10	0.15	25	75	10	●
12	0.18	30	75	12	●
16	0.24	40	100	16	●
20	0.30	50	100	20	●



Code No. E140-3.0FX-Dc×C45°

Dc 0 -0.02	C45° mm	Lc mm	L mm	d h6	AlCrN E140-3.0FX
3	0.05	9	50	6	●
4	0.06	12	50	6	●
5	0.08	15	50	6	●
6	0.09	18	50	6	●
8	0.12	24	60	8	●
10	0.15	30	75	10	●
12	0.18	36	75	12	●
16	0.24	48	100	16	●
20	0.30	60	120	20	●

Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		120		120		80		65		60		65		120		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E140-2.0/E140-3.0FX-3	3	12,700	683	12,700	683	10,000	530	6,550	389	6,400	105	6,550	389	10,600	683	3,200	180
E140-2.0/E140-3.0FX-4	4	9,550	735	9,550	735	7,640	590	3,950	413	3,800	120	3,950	413	6,350	735	2,400	180
E140-2.0/E140-3.0FX-5	5	7,640	875	7,640	875	6,100	625	2,800	448	2,730	125	2,800	448	4,550	875	2,000	190
E140-2.0/E140-3.0FX-6	6	6,300	875	6,300	875	5,000	600	2,200	413	2,100	125	2,200	413	3,540	875	1,600	190
E140-2.0/E140-3.0FX-8	8	5,000	770	5,000	770	4,000	600	1,975	413	1,900	125	1,975	413	3,185	770	1,200	170
E140-2.0/E140-3.0FX-10	10	3,800	770	3,800	770	3,000	595	1,645	375	1,595	120	1,645	375	3,650	770	1,000	160
E140-2.0/E140-3.0FX-12	12	2,275	670	2,275	670	1,770	560	1,410	350	1,365	120	1,410	350	2,275	670	800	160
E140-2.0/E140-3.0FX-16	16	1,990	670	1,990	670	1,550	520	1,230	312	1,190	100	1,230	312	1,990	670	600	150
E140-2.0/E140-3.0FX-20	20	1,590	535	1,590	535	1,240	415	985	277	950	90	985	277	1,590	535	480	160
(mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.2D		ae:0.2D		ae:0.1D	

Slotting

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		120		120		80		65		60		65		120		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E140-2.0FX-1	1	31,800	200	31,800	200	25,000	180	19,750	150	19,000	85	19,750	150	31,800	200	7,100	50
E140-2.0FX-1.5	1.5	21,200	200	21,200	200	16,500	180	13,000	150	12,700	90	13,000	150	21,200	200	5,100	80
E140-2.0FX-2	2	15,900	220	15,900	220	12,420	180	9,850	150	9,550	90	9,850	150	15,900	220	4,000	100
E140-2.0FX-2.5	2.5	12,700	330	12,700	330	10,000	220	7,900	175	7,600	90	7,900	175	12,700	330	3,200	100
E140-2.0FX-3	3	12,700	600	12,700	600	10,000	430	6,550	290	6,400	105	6,550	290	10,600	600	3,200	130
E140-2.0FX-4	4	9,550	635	9,550	635	7,640	500	3,950	325	3,800	120	3,950	325	6,350	635	2,400	150
E140-2.0FX-5	5	7,640	775	7,640	775	6,100	525	2,800	348	2,730	125	2,800	348	4,550	775	2,000	160
E140-2.0FX-6	6	6,300	775	6,300	775	5,000	500	2,200	313	2,100	125	2,200	313	3,540	775	1,600	145
E140-2.0FX-8	8	5,000	650	5,000	650	4,000	500	1,975	313	1,900	125	1,975	313	3,185	650	1,200	120
E140-2.0FX-10	10	3,800	670	3,800	670	3,000	490	1,645	288	1,595	120	1,645	288	3,650	670	1,000	145
E140-2.0FX-12	12	2,275	560	2,275	560	1,770	460	1,410	275	1,365	120	1,410	275	2,275	560	800	150
E140-2.0FX-16	16	1,990	660	1,990	660	1,550	420	1,230	240	1,190	100	1,230	240	1,990	660	600	150
E140-2.0FX-20	20	1,590	500	1,590	500	1,240	360	985	200	950	90	985	200	1,590	500	480	130
(mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.05D		ap:0.5D		ap:0.5D		ap:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E130HX

Multipurpose End Mills

MG Carbide

AlTiCrN HX

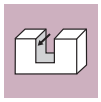


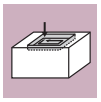


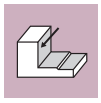


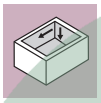


Type of Operation









Work Material

P	H	M	K	N	S
●	●	●	●	○	○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Multipurpose End Mills- 3 Flutes

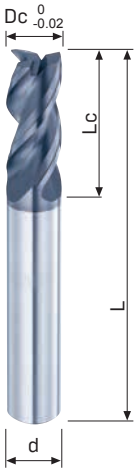
Effectively decrease the vibration by the designs of various helix geometry and unequal flutes.

Big chip breaker is designed to reach high removal rate for various work materials.

For high-efficiency heavy cutting, using with an APC high precision anti-vibration collet chuck.

Obviously improving tool life with Nano multilayer coating AlTiCrN.

Suitable for different kinds of materials cutting.



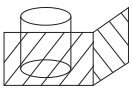
Code No. E130HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E130HX
1	3	50	4	●
1.5	5	50	4	●
2	6	50	4	●
2.5	8	50	4	●
3A	8	50	4	●
4A	11	50	4	●
3	8	50	6	●
3.5	10	50	6	●
4	11	50	6	●
4.5	11	50	6	●
5	13	50	6	●
5.5	13	50	6	●
6	16	50	6	●
6.5	16	60	8	●
7	20	60	8	●
7.5	20	60	8	●
8	20	60	8	●
8.5	20	72	10	●
9	22	72	10	●
9.5	22	72	10	●
10	22	72	10	●
11	26	75	12	●
12	26	75	12	●
14	32	90	16	●
16	38	100	16	●
18	38	100	20	●
20	38	100	20	●

Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		100		100		80		65		60		65		100		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E130HX-1	1	18,000	200	18,000	200	14,500	150	12,800	140	12,800	140	12,800	140	18,000	200	12,800	50
E130HX-1.5	1.5	15,000	220	15,000	220	12,500	180	11,000	160	11,000	160	11,000	160	15,000	220	11,200	52
E130HX-2	2	12,000	400	12,000	400	10,000	300	9,500	230	9,500	230	9,500	230	12,000	400	8,200	50
E130HX-2.5	2.5	10,000	450	10,000	450	8,000	400	7,600	250	7,600	250	7,600	250	10,000	450	5,000	52
E130HX-3	3	9,000	600	9,000	600	6,600	550	6,000	300	3,800	80	6,000	300	9,000	600	3,100	50
E130HX-4	4	6,600	650	6,600	650	5,000	630	4,500	350	2,800	90	4,500	350	6,600	650	2,300	60
E130HX-5	5	5,300	700	5,300	700	4,000	635	3,500	360	2,200	95	3,500	360	5,300	700	1,900	65
E130HX-6	6	5,300	720	5,300	720	4,000	645	3,500	300	2,200	130	3,500	300	5,300	720	1,900	80
E130HX-8	8	4,000	700	4,000	700	3,000	565	2,600	200	1,600	140	2,600	200	4,000	700	1,400	90
E130HX-10	10	3,200	620	3,200	620	2,400	550	2,100	230	1,300	140	2,100	230	3,200	620	1,100	95
E130HX-12	12	2,600	580	2,600	580	2,000	500	1,700	225	1,100	115	1,700	225	2,600	580	1,000	80
E130HX-14	14	2,300	550	2,300	550	1,800	450	1,400	200	900	100	1,400	200	230	550	900	70
E130HX-16	16	2,000	500	2,000	500	1,500	400	1,300	160	830	90	1,300	160	2,000	500	720	65
E130HX-18	18	1,800	450	1,800	450	1,400	350	1,200	140	700	80	1,200	140	1,800	450	650	65
E130HX-20	20	1,500	420	1,500	420	1,200	315	1,000	150	650	70	1,000	150	1,500	420	600	65
(mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.2D		ae:0.2D		ae:0.1D	

Plunge milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		100		100		80		65		60		65		100		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E130HX-3	3	8,500	320	8,500	320	6,300	200	5,800	110	5,800	110	5,800	105	8,500	320	4,800	80
E130HX-4	4	6,300	350	6,300	350	4,700	205	4,200	110	4,200	110	4,200	110	6,300	350	3,600	85
E130HX-5	5	5,000	350	5,000	350	3,800	210	3,500	120	3,500	120	3,500	125	5,000	350	2,800	90
E130HX-6	6	4,200	380	4,200	380	3,200	220	2,800	130	2,800	130	2,800	120	4,200	380	2,400	95
E130HX-8	8	3,200	350	3,200	350	2,400	210	2,200	120	2,200	120	2,200	120	3,200	350	1,800	85
E130HX-10	10	2,500	300	2,500	300	1,800	180	1,700	100	1,700	100	1,700	105	2,500	300	1,500	70
E130HX-12	12	2,000	300	2,000	300	1,600	190	1,400	100	1,400	100	1,400	100	2,000	300	1,200	70
E130HX-14	14	1,800	200	1,800	200	1,400	160	1,300	80	1,300	80	1,300	80	1,800	200	1,000	60
E130HX-16	16	1,500	180	1,500	180	1,200	140	1,200	80	1,200	80	1,200	80	1,500	180	800	60
E130HX-18	18	1,400	150	1,400	150	1,000	120	1,000	60	1,000	60	1,000	60	1,400	150	700	50
E130HX-20	20	1,300	100	1,300	100	800	80	800	60	800	60	800	60	1,300	100	600	50
(mm) 																	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E140HX

Multipurpose End Mills

MG Carbide

AlTiCrN HX

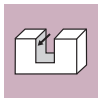


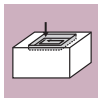


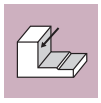


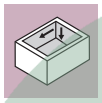


Type of Operation









Work Material

P	H	M	K	N	S
●	●	●	●	○	○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Multipurpose End Mills- 4 Flutes

Effectively decrease the vibration by various helix geometry and unequal flutes designs.

Big chip breaker is designed to reach high removal rate for various work materials.

For high-efficiency heavy cutting, using with an APC high precision anti-vibration collet chuck.

Obviously improving tool life with Nano multilayer coating AlTiCrN.

Suitable for different kinds of materials cutting.

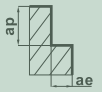


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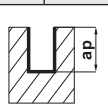
Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E140HX
1	3	50	4	●
1.1	3	50	4	●
1.2	4	50	4	●
1.3	4	50	4	●
1.4	4	50	4	●
1.5	5	50	4	●
1.6	5	50	4	●
1.7	5	50	4	●
1.8	5	50	4	●
1.9	5	50	4	●
2	6	50	4	●
2.1	6	50	4	●
2.2	6	50	4	●
2.3	6	50	4	●
2.4	8	50	4	●
2.5	8	50	4	●
2.6	8	50	4	●
2.7	8	50	4	●
2.8	8	50	4	●
2.9	8	50	4	●
3A	8	50	4	●
4A	11	50	4	●
3	8	50	6	●
3.1	10	50	6	●
3.2	10	50	6	●
3.3	10	50	6	●
3.4	10	50	6	●
3.5	10	50	6	●
3.6	10	50	6	●
3.7	10	50	6	●
3.8	11	50	6	●
3.9	11	50	6	●
4	11	50	6	●
4.1	11	50	6	●
4.2	11	50	6	●
4.3	11	50	6	●
4.4	11	50	6	●
4.5	11	50	6	●
4.6	11	50	6	●
4.7	11	50	6	●
4.8	13	50	6	●
4.9	13	50	6	●
5	13	50	6	●
5.1	13	50	6	●
5.2	13	50	6	●
5.3	13	50	6	●
5.4	13	50	6	●
5.5	13	50	6	●
5.6	16	50	6	●
5.7	16	50	6	●
5.8	16	50	6	●
5.9	16	50	6	●
6	16	50	6	●
6.1	16	60	8	●
6.2	16	60	8	●
6.3	16	60	8	●
6.4	16	60	8	●
6.5	16	60	8	●
6.6	20	60	8	●
6.7	20	60	8	●
6.8	20	60	8	●
6.9	20	60	8	●
7	20	60	8	●
7.1	20	60	8	●

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E140HX
7.2	20	60	8	●
7.3	20	60	8	●
7.4	20	60	8	●
7.5	20	60	8	●
7.6	20	60	8	●
7.7	20	60	8	●
7.8	20	60	8	●
7.9	20	60	8	●
8	20	60	8	●
8.1	20	72	10	●
8.2	20	72	10	●
8.3	20	72	10	●
8.4	20	72	10	●
8.5	20	72	10	●
8.6	22	72	10	●
8.7	22	72	10	●
8.8	22	72	10	●
8.9	22	72	10	●
9	22	72	10	●
9.1	22	72	10	●
9.2	22	72	10	●
9.3	22	72	10	●
9.4	22	72	10	●
9.5	22	72	10	●
9.6	22	72	10	●
9.7	22	72	10	●
9.8	22	72	10	●
9.9	22	72	10	●
10	22	72	10	●
10-25	25	75	10	●
10.1	22	75	12	●
10.2	22	75	12	●
10.3	22	75	12	●
10.4	22	75	12	●
10.5	22	75	12	●
10.6	26	75	12	●
10.7	26	75	12	●
10.8	26	75	12	●
10.9	26	75	12	●
11	26	75	12	●
11.1	26	75	12	●
11.2	26	75	12	●
11.3	26	75	12	●
11.4	26	75	12	●
11.5	26	75	12	●
11.6	26	75	12	●
11.7	26	75	12	●
11.8	26	75	12	●
11.9	26	75	12	●
12	26	75	12	●
12-30	30	75	12	●
13	26	80	12	●
14	32	90	16	●
15	38	100	16	●
16	38	100	16	●
17	38	100	20	●
18	38	100	20	●
19	38	100	20	●
20	38	100	20	●
25	45	120	25	●

Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		120		120		80		65		60		65		120		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E140HX-1	1	31,800	240	31,800	240	25,000	210	19,750	180	19,000	85	19,750	180	31,800	240	7,100	50
E140HX-1.5	1.5	21,200	245	21,200	245	16,500	210	13,000	180	12,700	90	13,000	180	21,200	245	5,100	100
E140HX-2	2	15,900	245	15,900	245	12,420	210	9,850	180	9,550	90	9,850	180	15,900	245	4,000	120
E140HX-2.5	2.5	12,700	370	12,700	370	9,930	300	7,900	275	7,600	90	7,900	275	12,700	370	3,200	150
E140HX-3	3	10,600	683	10,600	683	8,280	530	6,550	389	6,400	105	6,550	389	10,600	683	3,200	180
E140HX-4	4	6,350	735	6,350	735	4,950	590	3,950	413	3,800	120	3,950	413	6,350	735	2,400	180
E140HX-5	5	4,550	875	4,550	875	3,550	625	2,800	448	2,730	125	2,800	448	4,550	875	2,000	190
E140HX-6	6	3,540	875	3,540	875	2,760	600	2,200	413	2,100	125	2,200	413	3,540	875	1,600	190
E140HX-7	7	3,360	820	3,360	820	2,620	600	2,075	413	2,000	125	2,075	413	3,360	820	1,400	180
E140HX-8	8	3,185	770	3,185	770	2,480	600	1,975	413	1,900	125	1,975	413	3,185	770	1,200	170
E140HX-9	9	3,410	770	3,410	770	2,280	595	1,800	390	1,750	120	1,800	390	3,410	770	1,100	165
E140HX-10	10	3,650	770	3,650	770	2,070	595	1,645	375	1,595	120	1,645	375	3,650	770	1,000	160
E140HX-11	11	2,950	720	2,950	720	1,920	575	1,520	360	1,475	120	1,520	360	2,275	720	900	160
E140HX-12	12	2,275	670	2,275	670	1,770	560	1,410	350	1,365	120	1,410	350	2,275	670	800	160
E140HX-14	14	2,040	670	2,040	670	1,590	540	1,360	320	1,250	100	1,360	350	2,040	670	700	150
E140HX-16	16	1,990	670	1,990	670	1,550	520	1,230	312	1,190	100	1,230	312	1,990	670	600	150
E140HX-18	18	1,770	550	1,770	550	1,410	450	1,060	300	1,060	90	1,060	330	1,770	550	500	150
E140HX-20	20	1,590	535	1,590	535	1,240	415	985	277	950	90	985	277	1,590	535	480	160
E140HX-25	25	1,270	420	1,270	420	1,000	330	760	210	750	70	790	210	1,270	420	380	120
(mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.2D		ae:0.2D		ae:0.1D	

Slotting

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		120		120		80		65		60		65		120		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E140HX-1	1	31,800	200	31,800	200	25,000	180	19,750	150	19,000	85	19,750	150	31,800	200	7,100	50
E140HX-1.5	1.5	21,200	200	21,200	200	16,500	180	13,000	150	12,700	90	13,000	150	21,200	200	5,100	80
E140HX-2	2	15,900	220	15,900	220	12,420	180	9,850	150	9,550	90	9,850	150	15,900	220	4,000	100
E140HX-2.5	2.5	12,700	330	12,700	330	9,930	220	7,900	175	7,600	90	7,900	175	12,700	330	3,200	100
E140HX-3	3	10,600	600	10,600	600	8,280	430	6,550	290	6,400	105	6,550	290	10,600	600	3,200	130
E140HX-4	4	6,350	635	6,350	635	4,950	500	3,950	325	3,800	120	3,950	325	6,350	635	2,400	150
E140HX-5	5	4,550	775	4,550	775	3,550	525	2,800	348	2,730	125	2,800	348	4,550	775	2,000	160
E140HX-6	6	3,540	775	3,540	775	2,760	500	2,200	313	2,100	125	2,200	313	3,540	775	1,600	145
E140HX-7	7	3,360	710	3,360	710	2,620	500	2,075	313	2,000	125	2,075	313	3,360	710	1,400	130
E140HX-8	8	3,185	650	3,185	650	2,480	500	1,975	313	1,900	125	1,975	313	3,185	650	1,200	120
E140HX-9	9	3,410	660	3,410	660	2,280	495	1,800	300	1,750	120	1,800	300	3,410	660	1,100	130
E140HX-10	10	3,650	670	3,650	670	2,070	490	1,645	288	1,595	120	1,645	288	3,650	670	1,000	145
E140HX-11	11	2,950	615	2,950	615	1,920	475	1,520	280	1,475	120	1,520	280	2,275	615	900	150
E140HX-12	12	2,275	560	2,275	560	1,770	460	1,410	275	1,365	120	1,410	275	2,275	560	800	150
E140HX-14	14	2,040	500	2,040	500	1,590	440	1,360	250	1,250	100	2,040	250	2,040	660	700	150
E140HX-16	16	1,990	660	1,990	660	1,550	420	1,230	240	1,190	100	1,230	240	1,990	660	600	150
E140HX-18	18	1,770	550	1,770	550	1,410	400	1,060	230	970	90	1,770	220	1,770	500	500	140
E140HX-20	20	1,590	500	1,590	500	1,240	360	985	200	950	90	985	200	1,590	500	480	130
(mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.05D		ap:0.5D		ap:0.5D		ap:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E141-1.5HX / 2.0HX / 3.0HX

Multipurpose End Mills

MG Carbide

AlTiCrN HX

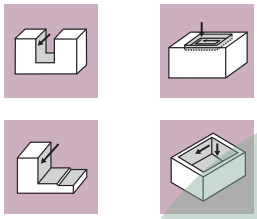
38° 41°

4

N 75°

90°

Type of Operation



Work Material

P	H	M	K	N	S
●	●	●	●	○	○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

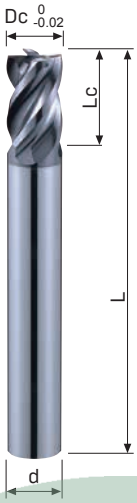
Multipurpose End Mills- 4 Flutes with various short and long length types Effectively decrease the vibration by various helix geometry and unequal flutes designs.

Big chip breaker is designed to reach high removal rate for various work materials.

For high-efficiency heavy cutting, using with an APC high precision anti-vibration collet chuck.

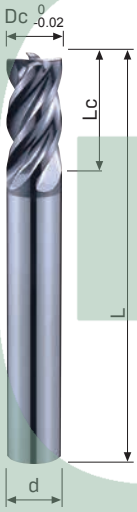
Obviously improving tool life with Nano multilayer coating AlTiCrN.

Suitable for different kinds of materials cutting.



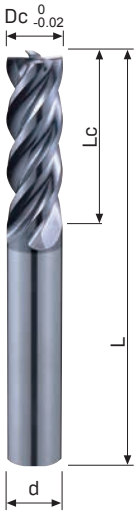
Code No. E141-1.5HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E141-1.5HX
1	1.5	50	4	●
1.5	2.3	50	4	●
2	3	50	4	●
2.5	3.8	50	4	●
3	4.5	50	6	●
3.5	5.3	50	6	●
4	6	50	6	●
4.5	6.8	50	6	●
5	7.5	50	6	●
5.5	8.3	50	6	●
6	9	50	6	●
8	12	65	8	●
10	15	75	10	●
12	18	80	12	●
16	24	100	16	●
20	30	120	20	●



Code No. E141-2.0HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E141-2.0HX
1	2	50	4	●
1.5	3	50	4	●
2	4	50	4	●
2.5	5	50	4	●
3	6	50	6	●
3.5	7	50	6	●
4	8	50	6	●
4.5	9	50	6	●
5	10	50	6	●
5.5	11	50	6	●
6	12	50	6	●
8	16	65	8	●
10	20	75	10	●
12	24	80	12	●
16	32	100	16	●
20	40	120	20	●



Code No. E141-3.0HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E141-3.0HX
1	3	50	4	●
1.5	4.5	50	4	●
2	6	50	4	●
2.5	7.5	50	4	●
3	9	50	6	●
3.5	10.5	50	6	●
4	12	50	6	●
4.5	13.5	50	6	●
5	15	50	6	●
5.5	16.5	50	6	●
6	18	50	6	●
7	21	65	8	●
8	24	65	8	●
9	27	75	10	●

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E141-3.0HX
10	30	75	10	●
11	33	80	12	●
12	36	80	12	●
13	39	100	16	●
14	42	100	16	●
15	45	100	16	●
16	48	100	16	●
17	51	120	20	●
18	54	120	20	●
20	60	120	20	●
25	75	150	25	●

E141-1.5HX / 2.0HX / Slotting

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		120		120		80		65		60		65		120		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E141-1.5HX/2.0HX-1	1	31,800	200	31,800	200	25,000	180	19,750	150	19,000	85	19,750	150	31,800	200	7,100	50
E141-1.5HX/2.0HX-1.5	1.5	21,200	200	21,200	200	16,500	180	13,000	150	12,700	90	13,000	150	21,200	200	5,100	80
E141-1.5HX/2.0HX-2	2	15,900	220	15,900	220	12,420	180	9,850	150	9,550	90	9,850	150	15,900	220	4,000	100
E141-1.5HX/2.0HX-2.5	2.5	12,700	330	12,700	330	9,930	220	7,900	175	7,600	90	7,900	175	12,700	330	3,200	100
E141-1.5HX/2.0HX-3	3	10,600	600	10,600	600	8,280	430	6,550	290	6,400	105	6,550	290	10,600	600	3,200	130
E141-1.5HX/2.0HX-3.5	3.5	8,470	615	8,470	615	6,600	465	5,250	305	5,100	110	5,250	305	8,470	615	2,800	140
E141-1.5HX/2.0HX-4	4	6,350	635	6,350	635	4,950	500	3,950	325	3,800	120	3,950	325	6,350	635	2,400	150
E141-1.5HX/2.0HX-4.5	4.5	5,450	705	5,450	705	4,250	510	3,370	335	3,260	120	3,370	335	5,450	705	2,200	155
E141-1.5HX/2.0HX-5	5	4,550	775	4,550	775	3,550	525	2,800	348	2,730	125	2,800	348	4,550	775	2,000	160
E141-1.5HX/2.0HX-5.5	5.5	4,040	775	4,040	775	3,160	510	2,500	330	2,400	125	2,500	330	4,040	775	1,800	150
E141-1.5HX/2.0HX-6	6	3,540	775	3,540	775	2,760	500	2,200	313	2,100	125	2,200	313	3,540	775	1,600	145
E141-1.5HX/2.0HX-8	8	3,185	650	3,185	650	2,480	500	1,975	313	1,900	125	1,975	313	3,185	650	1,200	120
E141-1.5HX/2.0HX-10	10	3,650	670	3,650	670	2,070	490	1,645	288	1,595	120	1,645	288	3,650	670	1,000	145
E141-1.5HX/2.0HX-12	12	2,275	560	2,275	560	1,770	460	1,410	275	1,365	120	1,410	275	2,275	560	800	150
E141-1.5HX/2.0HX-16	16	1,990	660	1,990	660	1,550	420	1,230	240	1,190	100	1,230	240	1,990	660	600	150
E141-1.5HX/2.0HX-20	20	1,590	500	1,590	500	1,240	360	985	200	950	90	985	200	1,590	500	480	130
(mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.05D		ap:0.5D		ap:0.5D		ap:0.05D	

E141-3.0HX / Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		120		120		80		65		60		65		120		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E141-3.0HX-1	1	31,800	240	31,800	240	25,000	210	19,750	180	19,000	85	19,750	180	31,800	240	7,100	50
E141-3.0HX-1.5	1.5	21,200	245	21,200	245	16,500	210	13,000	180	12,700	90	13,000	180	21,200	245	5,100	100
E141-3.0HX-2	2	15,900	245	15,900	245	12,420	210	9,850	180	9,550	90	9,850	180	15,900	245	4,000	120
E141-3.0HX-2.5	2.5	12,700	370	12,700	370	9,930	300	7,900	275	7,600	90	7,900	275	12,700	370	3,200	150
E141-3.0HX-3	3	10,600	683	10,600	683	8,280	530	6,550	389	6,400	105	6,550	389	10,600	683	3,200	180
E141-3.0HX-3.5	3.5	8,470	710	8,470	710	6,600	560	5,250	400	5,100	110	5,250	400	8,470	710	2,800	180
E141-3.0HX-4	4	6,350	735	6,350	735	4,950	590	3,950	413	3,800	120	3,950	413	6,350	735	2,400	180
E141-3.0HX-4.5	4.5	5,450	805	5,450	805	4,250	605	3,370	428	3,260	120	3,370	428	5,450	805	2,200	185
E141-3.0HX-5	5	4,550	875	4,550	875	3,550	625	2,800	448	2,730	125	2,800	448	4,550	875	2,000	190
E141-3.0HX-5.5	5.5	4,040	875	4,040	875	3,160	610	2,500	428	2,400	125	2,500	428	4,040	875	1,800	190
E141-3.0HX-6	6	3,540	875	3,540	875	2,760	600	2,200	413	2,100	125	2,200	413	3,540	875	1,600	190
E141-3.0HX-8	8	3,185	770	3,185	770	2,480	600	1,975	413	1,900	125	1,975	413	3,185	770	1,200	170
E141-3.0HX-10	10	3,650	770	3,650	770	2,070	595	1,645	375	1,595	120	1,645	375	3,650	770	1,000	160
E141-3.0HX-12	12	2,275	670	2,275	670	1,770	560	1,410	350	1,365	120	1,410	350	2,275	670	800	160
E141-3.0HX-16	16	1,990	670	1,990	670	1,550	520	1,230	312	1,190	100	1,230	312	1,990	670	600	150
E141-3.0HX-20	20	1,590	535	1,590	535	1,240	415	985	277	950	90	985	277	1,590	535	480	160
E141-3.0HX-25	25	1,270	420	1,270	420	1,000	330	760	210	750	70	790	210	1270	420	380	120
(mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.2D		ae:0.2D		ae:0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E141-4.0HX / 5.0HX

Multipurpose End Mills

MG Carbide

AlTiCrN HX

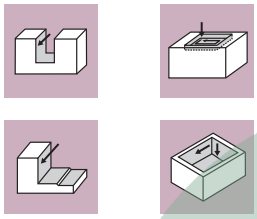
38° 41°

4

N 75°

90°

Type of Operation



Work Material

P	H	M	K	N	S
●	●	●	●	○	○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Multipurpose End Mills- 4 Flutes with various short and long length types.

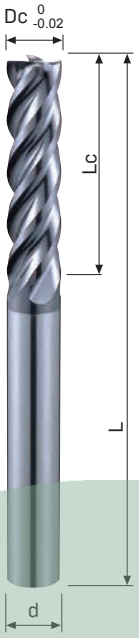
Effectively decrease the vibration by various helix geometry and unequal flutes designs.

Big chip breaker is designed to reach high removal rate for various work materials.

For high-efficiency heavy cutting, using with an APC high precision anti-vibration collet chuck.

Obviously improving tool life with Nano multilayer coating AlTiCrN.

Suitable for different kinds of materials cutting.



Code No. E141-4.0HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E141-4.0HX
1	4	50	4	●
1.5	6	50	4	●
2	8	50	4	●
2.5	10	50	4	●
3	12	50	6	●
3.5	14	50	6	●
4	16	55	6	●
4.5	18	55	6	●
5	20	60	6	●
5.5	22	65	6	●
6	24	65	6	●
8	32	75	8	●
10	40	100	10	●
12	48	110	12	●
16	64	140	16	●
20	80	160	20	●



Code No. E141-5.0HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E141-5.0HX
1	5	50	4	●
1.5	7.5	50	4	●
2	10	50	4	●
2.5	12.5	50	4	●
3	15	55	6	●
3.5	17.5	60	6	●
4	20	60	6	●
4.5	22.5	65	6	●
5	25	65	6	●
5.5	27.5	75	6	●
6	30	75	6	●
8	40	90	8	●
10	50	100	10	●
12	60	110	12	●
16	80	160	16	●
20	100	200	20	●

E141-4.0HX / Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		90		90		60		50		45		50		90		23	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E141-4.0HX-1	1	23,850	180	23,850	180	18,750	158	14,813	135	14,250	64	14,813	135	23,850	180	5,325	38
E141-4.0HX-1.5	1.5	15,900	184	15,900	184	12,375	158	9,750	135	9,525	68	9,750	135	15,900	184	3,825	75
E141-4.0HX-2	2	11,925	184	11,925	184	9,315	158	7,388	135	7,163	68	7,388	135	11,925	184	3,000	90
E141-4.0HX-2.5	2.5	9,525	278	9,525	278	7,448	225	5,925	206	5,700	68	5,925	206	9,525	278	2,400	113
E141-4.0HX-3	3	7,950	512	7,950	512	6,210	398	4,913	291	4,800	79	4,913	291	7,950	512	2,400	135
E141-4.0HX-3.5	3.5	6,350	532	6,350	532	4,960	420	3,930	300	3,850	85	3,930	300	6,350	532	2,100	135
E141-4.0HX-4	4	4,763	551	4,763	551	3,713	443	2,963	310	2,850	90	2,963	310	4,763	551	1,800	135
E141-4.0HX-4.5	4.5	4,080	604	4,080	604	3,180	450	2,530	323	2,447	92	2,530	323	4,080	604	1,650	139
E141-4.0HX-5	5	3,412	656	3,412	656	2,663	469	2,100	336	2,047	94	2,100	336	3,412	656	1,500	143
E141-4.0HX-5.5	5.5	3,030	656	3,030	656	2,360	460	1,875	323	1,800	94	1,875	323	3,030	656	1,350	143
E141-4.0HX-6	6	2,655	656	2,655	656	2,070	450	1,650	310	1,575	94	1,650	310	2,655	656	1,200	143
E141-4.0HX-8	8	2,389	578	2,389	578	1,860	450	1,481	310	1,425	94	1,481	310	2,389	578	900	128
E141-4.0HX-10	10	2,738	578	2,738	578	1,553	446	1,234	281	1,196	90	1,234	281	2,738	578	750	120
E141-4.0HX-12	12	1,706	503	1,706	503	1,328	420	1,058	263	1,024	90	1,058	263	1,706	503	600	120
E141-4.0HX-16	16	1,493	503	1,493	503	1,163	390	923	234	893	75	923	234	1,493	503	450	113
E141-4.0HX-20	20	1,193	401	1,193	401	930	311	739	207	713	68	739	207	1,193	401	360	120
(mm) 		ap:2.5D		ap:2.5D		ap:2.5D		ap:2.5D		ap:2.5D		ap:2.5D		ap:2.5D		ap:2.5D	
		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D	

E141-5.0HX / Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		60		60		40		33		30		33		60		16	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E141-5.0HX-1	1	15,900	120	15,900	120	12,500	105	9,875	90	9,500	43	9,875	90	15,900	120	3,550	25
E141-5.0HX-1.5	1.5	10,600	123	10,600	123	8,250	105	6,500	90	6,350	45	6,500	90	10,600	123	2,550	50
E141-5.0HX-2	2	7,950	123	7,950	123	6,210	105	4,925	90	4,775	45	4,925	90	7,950	123	2,000	60
E141-5.0HX-2.5	2.5	6,350	185	6,350	185	4,965	150	3,950	138	3,800	45	3,950	138	6,350	185	1,600	75
E141-5.0HX-3	3	5,300	341	5,300	341	4,140	265	3,275	194	3,200	53	3,275	194	5,300	341	1,600	90
E141-5.0HX-3.5	3.5	4,230	354	4,230	354	3,300	280	2,620	200	2,550	56	2,620	200	4,230	354	1,400	90
E141-5.0HX-4	4	3,175	368	3,175	368	2,475	295	1,975	207	1,900	60	1,975	207	3,175	368	1,200	90
E141-5.0HX-4.5	4.5	2,720	400	2,720	400	2,120	305	1,680	215	1,630	60	1,680	215	2,720	400	1,100	90
E141-5.0HX-5	5	2,275	438	2,275	438	1,775	313	1,400	224	1,365	63	1,400	224	2,275	438	1,000	95
E141-5.0HX-5.5	5.5	2,020	438	2,020	438	1,570	306	1,250	215	1,200	63	1,250	215	2,020	438	900	95
E141-5.0HX-6	6	1,770	438	1,770	438	1,380	300	1,100	207	1,050	63	1,100	207	1,770	438	800	95
E141-5.0HX-8	8	1,592	385	1,592	385	1,240	300	987	207	950	63	987	207	1,592	385	600	85
E141-5.0HX-10	10	1,825	385	1,825	385	1,035	298	823	187	798	60	823	187	1,825	385	500	80
E141-5.0HX-12	12	1,137	335	1,137	335	885	280	705	175	682	60	705	175	1,137	335	400	80
E141-5.0HX-16	16	995	335	995	335	775	260	615	156	595	50	615	156	995	335	300	75
E141-5.0HX-20	20	795	268	795	268	620	208	493	138	475	45	493	138	795	268	240	80
(mm) 		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D	
		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E144X

Multipurpose End Mills

UMG Carbide

AlTiXN X

43° 48°

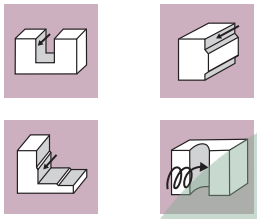
4

N

γ8°

90°

Type of Operation



Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Multipurpose End Mills for Finishing- 4 Flutes

Effectively decrease the vibration by various helix geometry and unequal flutes designs.

Big chip breaker is designed to reach high removal rate for various work materials.

For high-efficiency heavy cutting, using with an APC high precision anti-vibration collet chuck.

Obviously improving tool life with Nano multilayer coating AlTiCrN.

Bigger helix design is for better finishing machining.

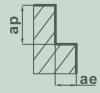
Suitable for different kinds of materials in finishing.



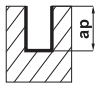
Code No. E144X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiXN E144X
1	3	50	4	●
1.5	5	50	4	●
2	6	50	4	●
2.5	8	50	4	●
3A	8	50	4	●
4A	11	50	4	●
3	8	50	6	●
3.5	10	50	6	●
4	11	50	6	●
4.5	11	50	6	●
5	13	50	6	●
5.5	13	50	6	●
6	16	50	6	●
7	20	60	8	●
8	20	60	8	●
9	25	72	10	●
10	25	72	10	●
11	30	75	12	●
12	30	75	12	●
14	40	100	16	●
16	45	100	16	●
20	50	110	20	●

Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron	
Vc m/min		120		120		80		65		60		65		120	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E144X-1	1	31,800	240	31,800	240	25,000	210	19,750	180	19,000	85	19,750	180	31,800	240
E144X-1.5	1.5	21,200	245	21,200	245	16,500	210	13,000	180	12,700	90	13,000	180	21,200	245
E144X-2	2	15,900	245	15,900	245	12,420	210	9,850	180	9,550	90	9,850	180	15,900	245
E144X-2.5	2.5	12,700	370	12,700	370	9,930	300	7,900	275	7,600	90	7,900	275	12,700	370
E144X-3	3	10,600	683	10,600	683	8,280	530	6,550	389	6,400	105	6,550	389	10,600	683
E144X-4	4	6,350	735	6,350	735	4,950	590	3,950	413	3,800	120	3,950	413	6,350	735
E144X-5	5	4,550	875	4,550	875	3,550	625	2,800	448	2,730	125	2,800	448	4,550	875
E144X-6	6	3,540	875	3,540	875	2,760	600	2,200	413	2,100	125	2,200	413	3,540	875
E144X-8	8	3,185	770	3,185	770	2,480	600	1,975	413	1,900	125	1,975	413	3,185	770
E144X-10	10	3,650	770	3,650	770	2,070	595	1,645	375	1,595	120	1,645	375	3,650	770
E144X-12	12	2,275	670	2,275	670	1,770	560	1,410	350	1,365	120	1,410	350	2,275	670
E144X-14	14	2,130	670	2,130	670	1,660	540	1,320	331	1,277	110	1,320	330	2,130	670
E144X-16	16	1,990	670	1,990	670	1,550	520	1,230	312	1,190	100	1,230	312	1,990	670
E144X-20	20	1,590	535	1,590	535	1,240	415	985	277	950	90	985	277	1,590	535
(mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.2D		ae:0.2D	

Slotting

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron	
Vc m/min		120		120		80		65		60		65		120	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E144X-1	1	31,800	200	31,800	200	25,000	180	19,750	150	19,000	85	19,750	150	31,800	200
E144X-1.5	1.5	21,200	200	21,200	200	16,500	180	13,000	150	12,700	90	13,000	150	21,200	200
E144X-2	2	15,900	220	15,900	220	12,420	180	9,850	150	9,550	90	9,850	150	15,900	220
E144X-2.5	2.5	12,700	330	12,700	330	9,930	220	7,900	175	7,600	90	7,900	175	12,700	330
E144X-3	3	10,600	600	10,600	600	8,280	430	6,550	290	6,400	105	6,550	290	10,600	600
E144X-4	4	6,350	635	6,350	635	4,950	500	3,950	325	3,800	120	3,950	325	6,350	635
E144X-5	5	4,550	775	4,550	775	3,550	525	2,800	348	2,730	125	2,800	348	4,550	775
E144X-6	6	3,540	775	3,540	775	2,760	500	2,200	313	2,100	125	2,200	313	3,540	775
E144X-8	8	3,185	650	3,185	650	2,480	500	1,975	313	1,900	125	1,975	313	3,185	650
E144X-10	10	3,650	670	3,650	670	2,070	490	1,645	288	1,595	120	1,645	288	3,650	670
E144X-12	12	2,275	560	2,275	560	1,770	460	1,410	275	1,365	120	1,410	275	2,275	560
E144X-14	14	2,130	610	2,130	610	1,660	440	1,320	255	1,277	110	1,320	255	2,130	610
E144X-16	16	1,990	660	1,990	660	1,550	420	1,230	240	1,190	100	1,230	240	1,990	660
E144X-20	20	1,590	500	1,590	500	1,240	360	985	200	950	90	985	200	1,590	500
(mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.05D		ap:0.5D		ap:0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E144-4.0X / 5.0X / 6.0X

Multipurpose End Mills

UMG Carbide

AlTiXN X

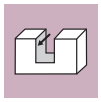


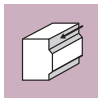


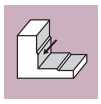




Type of Operation







Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Multipurpose End Mills for Finishing- 4 Flutes · Long Type

Effectively decrease the vibration by various helix geometry and unequal flutes designs.

Big chip breaker is designed to reach high removal rate for various work materials.

For high-efficiency heavy cutting, using with an APC high precision anti-vibration collet chuck.

Obviously improving tool life with Nano multilayer coating AlTiCrN.

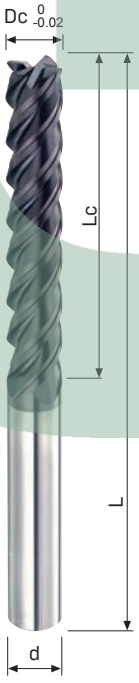
Bigger helix design is for better finishing machining.

Suitable for different kinds of materials in finishing.



Code No. E144-4.0X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiXN E144-4.0X
3	12	50	6	●
4	16	55	6	●
5	20	60	6	●
6	24	65	6	●
8	32	75	8	●
10	40	100	10	●
12	48	110	12	●
14	56	140	16	●
16	64	140	16	●
20	80	160	20	●



Code No. E144-5.0X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiXN E144-5.0X
3	15	55	6	●
4	20	60	6	●
5	25	65	6	●
6	30	75	6	●
8	40	90	8	●
10	50	100	10	●
12	60	110	12	●
14	70	140	16	●
16	80	160	16	●
20	100	200	20	●

Code No. E144-6.0X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiXN E144-6.0X
3	18	70	6	●
4	24	70	6	●
5	30	80	6	●
6	36	80	6	●
8	48	100	8	●
10	60	110	10	●
12	72	120	12	●
16	96	160	16	●
20	120	200	20	●

E144-4.0X / Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel	
Vc m/min		100~120		100~120		100~120		65~80		55~70		55~70	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E144-4.0X-3	3	11,000	618	11,000	618	11,000	618	8,500	285	5,900	199	6,800	228
E144-4.0X-4	4	8,300	659	8,300	659	8,300	659	6,400	304	4,500	213	5,100	243
E144-4.0X-5	5	6,600	669	6,600	669	6,600	669	5,100	323	3,600	227	4,100	258
E144-4.0X-6	6	5,500	680	5,500	680	5,500	680	4,200	342	3,000	239	3,400	265
E144-4.0X-8	8	4,200	699	4,200	699	4,200	699	3,200	355	2,200	241	2,600	284
E144-4.0X-10	10	3,300	689	3,300	689	3,300	689	2,600	366	1,800	240	2,000	282
E144-4.0X-12	12	2,800	633	2,800	633	2,800	633	2,200	337	1,500	220	1,700	271
E144-4.0X-14	14	2,400	538	2,400	538	2,400	538	1,800	283	1,300	194	1,400	222
E144-4.0X-16	16	2,100	466	2,100	466	2,100	466	1,600	269	1,100	188	1,300	219
E144-4.0X-20	20	1,660	454	1,660	454	1,660	454	1,270	256	890	172	1,020	201
(mm)		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D	
		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.05D	

E144-5.0X / Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel	
Vc m/min		100~120		100~120		100~120		65~80		55~70		55~70	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E144-5.0X-3	3	9,700	464	9,700	464	9,700	464	7,400	214	5,200	149	6,000	171
E144-5.0X-4	4	7,300	494	7,300	494	7,300	494	5,600	228	3,900	160	4,500	183
E144-5.0X-5	5	5,800	502	5,800	502	5,800	502	4,500	243	3,200	171	3,600	193
E144-5.0X-6	6	4,800	510	4,800	510	4,800	510	3,700	256	2,600	179	2,900	199
E144-5.0X-8	8	3,600	524	3,600	524	3,600	524	2,800	266	2,000	181	2,200	213
E144-5.0X-10	10	2,900	217	2,900	217	2,900	217	2,200	274	1,500	180	1,800	212
E144-5.0X-12	12	2,500	475	2,500	475	2,500	475	1,900	253	1,300	165	1,500	203
E144-5.0X-16	16	1,800	349	1,800	349	1,800	349	1,400	202	1,000	141	1,100	165
E144-5.0X-20	20	1,450	341	1,450	341	1,450	341	1,110	192	780	129	890	151
(mm)		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D	
		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.05D	

E144-6.0X / Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel	
Vc m/min		100~120		100~120		100~120		65~80		55~70		55~70	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E144-6.0X-3	3	9,700	386	9,700	386	9,700	386	7,400	178	5,200	124	6,000	143
E144-6.0X-4	4	7,300	412	7,300	412	7,300	412	5,600	190	3,900	133	4,500	152
E144-6.0X-5	5	5,800	418	5,800	418	5,800	418	4,500	202	3,200	142	3,600	161
E144-6.0X-6	6	4,800	425	4,800	425	4,800	425	3,700	214	2,600	149	2,900	166
E144-6.0X-8	8	3,600	437	3,600	437	3,600	437	2,800	222	2,000	151	2,200	177
E144-6.0X-10	10	2,900	431	2,900	431	2,900	431	2,200	228	1,500	150	1,800	176
E144-6.0X-12	12	2,500	395	2,500	395	2,500	395	1,900	211	1,300	137	1,500	169
E144-6.0X-16	16	1,800	291	1,800	291	1,800	291	1,400	168	1,000	118	1,100	137
E144-6.0X-20	20	1,450	284	1,450	284	1,450	284	1,110	160	780	107	890	126
(mm)		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D	
		ae:0.03D		ae:0.03D		ae:0.03D		ae:0.03D		ae:0.03D		ae:0.03D	

B252-2.5HX

Multipurpose End Mills With Corner Radius

UMG Carbide

AlTiCrN HX

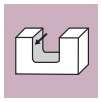


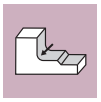


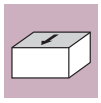


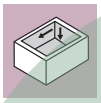


Type of Operation









Work Material

P	H	M	K	N	S
●	●	●	●		●

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Multipurpose End Mills with Corner Radius- 4 Flutes

Using UMG carbide material and Nano multilayer coating AlTiCrN enable to enhance lubrication and wear resistance.

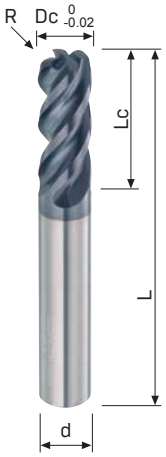
Effectively decrease the vibration by various helix geometry and unequal flutes designs.

Big chip breaker is designed to reach high removal rate for various work materials.

For high-efficiency heavy cutting, using with an APC high precision anti-vibration collet chuck.

Cutting edge with corner radius design to increase tool life.

Suitable for various kinds of work materials from the end of roughing to finishing.



Code No. B252-2.5HX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiCrN B252-2.5HX
1	R0.1	2.5	50	4	●
1	R0.2	2.5	50	4	●
1	R0.3	2.5	50	4	●
1.5	R0.1	3.75	50	4	●
1.5	R0.2	3.75	50	4	●
1.5	R0.3	3.75	50	4	●
2	R0.1	5	50	4	●
2	R0.2	5	50	4	●
2	R0.3	5	50	4	●
2	R0.5	5	50	4	●
2.5	R0.1	6.25	50	4	●
2.5	R0.2	6.25	50	4	●
2.5	R0.3	6.25	50	4	●
2.5	R0.5	6.25	50	4	●
3	R0.1	7.5	50	6	●
3	R0.2	7.5	50	6	●
3	R0.3	7.5	50	6	●
3	R0.4	7.5	50	6	●
3	R0.5	7.5	50	6	●
4	R0.1	10	50	6	●
4	R0.2	10	50	6	●
4	R0.3	10	50	6	●
4	R0.4	10	50	6	●
4	R0.5	10	50	6	●
4	R1	10	50	6	●
5	R0.2	12.5	50	6	●
5	R0.3	12.5	50	6	●
5	R0.4	12.5	50	6	●
5	R0.5	12.5	50	6	●
5	R1	12.5	50	6	●
6	R0.2	15	50	6	●
6	R0.3	15	50	6	●
6	R0.4	15	50	6	●
6	R0.5	15	50	6	●
6	R0.8	15	50	6	●
6	R1	15	50	6	●
6	R1.2	15	50	6	●
6	R1.5	15	50	6	●
6	R1.6	15	50	6	●
6	R1.8	15	50	6	●
6	R2	15	50	6	●
7	R0.2	17.5	60	8	●
7	R0.3	17.5	60	8	●
7	R0.4	17.5	60	8	●
7	R0.5	17.5	60	8	●
7	R1	17.5	60	8	●
7	R1.2	17.5	60	8	●
7	R1.5	17.5	60	8	●
7	R1.6	17.5	60	8	●
7	R1.8	17.5	60	8	●
7	R2	17.5	60	8	●
7	R3	17.5	60	8	●
8	R0.2	20	60	8	●
8	R0.3	20	60	8	●
8	R0.4	20	60	8	●
8	R0.5	20	60	8	●
8	R0.8	20	60	8	●
8	R1	20	60	8	●
8	R1.2	20	60	8	●
8	R1.5	20	60	8	●
8	R1.6	20	60	8	●
8	R1.8	20	60	8	●
8	R2	20	60	8	●
8	R3	20	60	8	●
9	R0.2	22.5	72	10	●
9	R0.3	22.5	72	10	●
9	R0.4	22.5	72	10	●
9	R0.5	22.5	72	10	●
9	R1	22.5	72	10	●
9	R1.2	22.5	72	10	●
9	R1.5	22.5	72	10	●
9	R1.6	22.5	72	10	●
9	R1.8	22.5	72	10	●
9	R2	22.5	72	10	●
9	R3	22.5	72	10	●
10	R0.2	25	72	10	●
10	R0.3	25	72	10	●
10	R0.4	25	72	10	●
10	R0.5	25	72	10	●
10	R0.8	25	72	10	●
10	R1	25	72	10	●
10	R1.2	25	72	10	●
10	R1.5	25	72	10	●
10	R1.6	25	72	10	●
10	R1.8	25	72	10	●
10	R2	25	72	10	●
10	R3	25	72	10	●

Side Milling

Work Material		GR.1 Carbon Steel GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.8 Stainless Stell		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		Ø1.0~2.5 60~80 Ø3.0~20 80~85		Ø1.0~2.5 47~70 Ø3.0~20 70~75		Ø1.0~1.5 47~57 Ø1.5~20 57~70		Ø1.0~2.5 30~47 Ø3.0~20 50~60		Ø1.0~2.5 30~47 Ø3.0~20 50~60		Ø1.0~2.5 75~80 Ø3.0~20 80~85		Ø1.0~2.5 60~80 Ø3.0~20 80~85		Ø1.0~2.5 15~25 Ø3.0~20 25~35	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B252-2.5HX-1	1	20,000	240	15,000	215	15,000	215	10,000	85	7,100	40	25,000	350	20,000	240	7,100	50
B252-2.5HX-1.5	1.5	13,500	245	12,000	215	12,000	215	8,000	90	5,100	50	16,500	375	13,500	245	5,100	100
B252-2.5HX-2	2	13,000	300	11,000	280	11,000	280	7,000	110	3,900	60	12,500	390	13,000	300	4,000	120
B252-2.5HX-2.5	2.5	10,000	320	9,000	300	9,000	300	6,000	120	3,000	60	10,000	400	10,000	320	3,200	150
B252-2.5HX-3	3	8,800	500	7,200	350	7,200	350	5,300	125	2,700	60	8,500	400	8,800	500	3,200	180
B252-2.5HX-4	4	6,600	530	5,500	360	5,500	360	4,200	130	2,200	70	6,500	440	6,600	530	2,400	180
B252-2.5HX-5	5	5,300	600	4,350	420	4,350	420	3,500	140	1,900	75	5,200	460	5,300	600	2,000	190
B252-2.5HX-6	6	4,500	610	3,700	425	3,700	425	2,900	145	1,500	70	4,300	460	4,500	610	1,600	190
B252-2.5HX-7	7	3,800	600	3,200	425	3,200	425	2,500	145	1,200	70	3,650	460	3,800	600	1,400	180
B252-2.5HX-8	8	3,300	590	2,700	425	2,700	425	2,200	145	1,100	65	3,200	460	3,300	590	1,200	170
B252-2.5HX-9	9	2,900	590	2,500	425	2,500	425	2,000	145	1,000	65	2,850	460	2,900	590	1,100	165
B252-2.5HX-10	10	2,600	580	2,200	420	2,200	420	1,700	145	950	65	2,600	460	2,600	580	1,000	160
(mm) 		ap:1.5D ae: < 3 0.05D ≥3 0.1D		ap:1.5D ae: < 3 0.05D ≥3 0.1D		ap:1.5D ae: < 3 0.05D ≥3 0.1D		ap:1.5D ae: < 3 0.05D ≥3 0.1D		ap:1.5D ae:0.02D		ap:1.0D ae:0.05D		ap:1.5D ae: < 3 0.05D ≥3 0.1D		ap:1.0 ae: < 3 0.05D ≥3 0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

B252-2.5HX

Multipurpose End Mills With Corner Radius

UMG Carbide

AlTiCrN HX

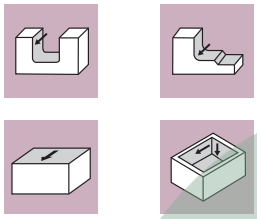
38° 41°

4

N 75°

R

Type of Operation



Work Material

P	H	M	K	N	S
●	●	●	●		●

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Multipurpose End Mills with Corner Radius- 4 Flutes

Using UMG carbide material and Nano multilayer coating AlTiCrN enable to enhance lubrication and wear resistance.

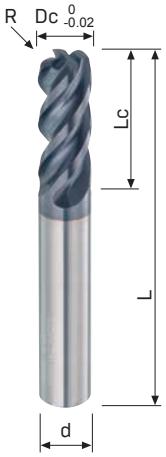
Effectively decrease the vibration by various helix geometry and unequal flutes designs.

Big chip breaker is designed to reach high removal rate for various work materials.

For high-efficiency heavy cutting, using with an APC high precision anti-vibration collet chuck.

Cutting edge with corner radius design to increase tool life.

Suitable for various kinds of work materials from the end of roughing to finishing.



Code No. B252-2.5HX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiCrN B252-2.5HX
11	R0.2	27.5	75	12	●
11	R0.3	27.5	75	12	●
11	R0.4	27.5	75	12	●
11	R0.5	27.5	75	12	●
11	R1	27.5	75	12	●
11	R1.2	27.5	75	12	●
11	R1.5	27.5	75	12	●
11	R1.6	27.5	75	12	●
11	R1.8	27.5	75	12	●
11	R2	27.5	75	12	●
11	R3	27.5	75	12	●
12	R0.2	30	75	12	●
12	R0.3	30	75	12	●
12	R0.4	30	75	12	●
12	R0.5	30	75	12	●
12	R0.8	30	75	12	●
12	R1	30	75	12	●
12	R1.2	30	75	12	●
12	R1.5	30	75	12	●
12	R1.6	30	75	12	●
12	R1.8	30	75	12	●
12	R2	30	75	12	●
12	R3	30	75	12	●
12	R4	30	75	12	●
13	R0.5	32.5	100	16	●
13	R1	32.5	100	16	●
13	R1.5	32.5	100	16	●
13	R2	32.5	100	16	●
13	R3	32.5	100	16	●
14	R0.5	35	100	16	●
14	R1	35	100	16	●
14	R1.5	35	100	16	●
14	R2	35	100	16	●
14	R3	35	100	16	●
15	R0.5	37.5	100	16	●
15	R1	37.5	100	16	●
15	R1.5	37.5	100	16	●
15	R2	37.5	100	16	●
15	R3	37.5	100	16	●
16	R0.5	40	100	16	●
16	R1	40	100	16	●
16	R1.5	40	100	16	●
16	R2	40	100	16	●
16	R3	40	100	16	●
16	R4	40	100	16	●
17	R0.5	42.5	100	20	●
17	R1	42.5	100	20	●
17	R1.5	42.5	100	20	●
17	R2	42.5	100	20	●
17	R3	42.5	100	20	●
18	R0.5	45	100	20	●
18	R1	45	100	20	●
18	R1.5	45	100	20	●
18	R2	45	100	20	●
18	R3	45	100	20	●
19	R0.5	47.5	100	20	●
19	R1	47.5	100	20	●
19	R1.5	47.5	100	20	●
19	R2	47.5	100	20	●
19	R3	47.5	100	20	●
20	R0.5	50	100	20	●
20	R1	50	100	20	●
20	R1.5	50	100	20	●
20	R2	50	100	20	●
20	R3	50	100	20	●
20	R4	50	100	20	●
20	R5	50	100	20	●

Side Milling

Work Material		GR.1 Carbon Steel GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.8 Stainless Stell		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		Ø1.0~2.5 60~80 Ø3.0~20 80~85		Ø1.0~2.5 47~70 Ø3.0~20 70~75		Ø1.0~1.5 47~57 Ø1.5~20 57~70		Ø1.0~2.5 30~47 Ø3.0~20 50~60		Ø1.0~2.5 30~47 Ø3.0~20 50~60		Ø1.0~2.5 75~80 Ø3.0~20 80~85		Ø1.0~2.5 60~80 Ø3.0~20 80~85		Ø1.0~2.5 15~25 Ø3.0~20 25~35	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B252-2.5HX-11	11	2,400	580	2,000	420	2,000	420	1,600	140	850	60	2,350	440	2,400	580	900	160
B252-2.5HX-12	12	2,200	580	1,800	420	1,800	420	1,400	140	800	60	2,150	410	2,200	580	800	160
B252-2.5HX-13	13	2,000	560	1,700	410	1,700	410	1,350	140	700	55	2,000	400	2,000	570	750	160
B252-2.5HX-14	14	1,900	550	1,600	410	1,600	410	1,250	130	650	55	1,820	400	1,850	560	700	160
B252-2.5HX-15	15	1,700	540	1,500	400	1,500	400	1,250	130	600	50	1,700	400	1,700	540	650	150
B252-2.5HX-16	16	1,600	530	1,300	400	1,300	400	1,200	130	600	45	1,600	390	1,600	530	600	150
B252-2.5HX-17	17	1,500	520	1,250	390	1,250	390	1,100	120	550	45	1,500	390	1,500	530	550	150
B252-2.5HX-18	18	1,450	520	1,200	390	1,200	390	1,000	120	520	40	1,450	380	1,450	520	500	150
B252-2.5HX-19	19	1,350	520	1,150	380	1,150	380	950	115	500	40	1,350	380	1,400	510	530	150
B252-2.5HX-20	20	1,300	510	1,100	370	1,100	370	890	110	470	35	1,300	370	1,300	510	480	140
(mm) 		ap:1.5D ae: < 3 0.05D ≥3 0.1D		ap:1.5D ae: < 3 0.05D ≥3 0.1D		ap:1.5D ae: < 3 0.05D ≥3 0.1D		ap:1.5D ae: < 3 0.05D ≥3 0.1D		ap:1.5D ae:0.02D		ap:1.0D ae:0.05D		ap:1.5D ae: < 3 0.05D ≥3 0.1D		ap:1.0 ae: < 3 0.05D ≥3 0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

B274HX

Multipurpose End Mills With Corner Radius

UMG Carbide

AlTiCrN HX

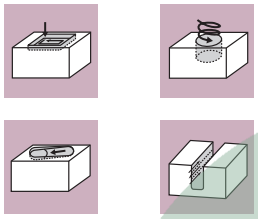
38° 41°

4

N 75°

R

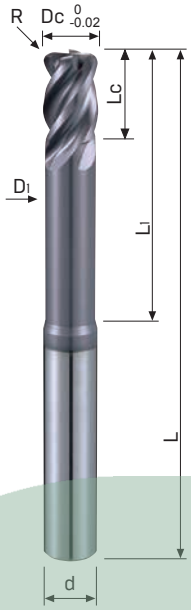
Type of Operation



Work Material

P	H	M	K	N	S
●	●	●	●		●

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys



Feature of product:

Multipurpose End Mills with Corner Radius- 4 Flutes · Short Type · Long Neck

Using UMG carbide material and Nano multilayer coating AlTiCrN enable to enhance lubrication and wear resistance.

Effectively decrease the vibration by various helix geometry and unequal flutes designs.

Big chip breaker is designed to reach high removal rate for various work materials.

For high-efficiency heavy cutting, using with an APC high precision anti-vibration collet chuck.

Designed with step to increase the effective length.

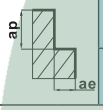
Cutting edge with corner radius design to increase tool life.

Suitable for different kinds of materials cutting.

Code No. B274HX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	L1 mm	D1 mm	AlTiCrN B274HX
1	0.1	1.5	60	6	5	0.95	●
1	0.2	1.5	60	6	5	0.95	●
1.5	0.1	2.3	60	6	7.5	1.45	●
1.5	0.2	2.3	60	6	7.5	1.45	●
2	0.1	3	60	6	10	1.95	●
2	0.2	3	60	6	10	1.95	●
2	0.5	3	60	6	10	1.95	●
2.5	0.1	3.8	60	6	12.5	2.4	●
2.5	0.2	3.8	60	6	12.5	2.4	●
2.5	0.5	3.8	60	6	12.5	2.4	●
3	0.1	4.5	70	6	15	2.8	●
3	0.2	4.5	70	6	15	2.8	●
3	0.5	4.5	70	6	15	2.8	●
4	0.1	6	70	6	20	3.7	●
4	0.2	6	70	6	20	3.7	●
4	0.5	6	70	6	20	3.7	●
4	1	6	70	6	20	3.7	●
5	0.2	7.5	70	6	25	4.6	●
5	0.5	7.5	70	6	25	4.6	●
5	1	7.5	70	6	25	4.6	●
6	0.2	9	70	6	30	5.5	●
6	0.3	9	70	6	30	5.5	●
6	0.5	9	70	6	30	5.5	●
6	1	9	70	6	30	5.5	●
6	1.5	9	70	6	30	5.5	●
6	2	9	70	6	30	5.5	●
8	0.2	12	80	8	40	7.4	●
8	0.3	12	80	8	40	7.4	●
8	0.5	12	80	8	40	7.4	●
8	1	12	80	8	40	7.4	●
8	1.5	12	80	8	40	7.4	●
8	2	12	80	8	40	7.4	●
8	3	12	80	8	40	7.4	●
10	0.2	15	95	10	50	9.2	●
10	0.3	15	95	10	50	9.2	●
10	0.5	15	95	10	50	9.2	●
10	1	15	95	10	50	9.2	●
10	1.5	15	95	10	50	9.2	●
10	2	15	95	10	50	9.2	●
10	3	15	95	10	50	9.2	●
12	0.2	18	110	12	60	11	●
12	0.3	18	110	12	60	11	●
12	0.5	18	110	12	60	11	●
12	1	18	110	12	60	11	●
12	1.5	18	110	12	60	11	●
12	2	18	110	12	60	11	●
12	3	18	110	12	60	11	●
16	0.5	24	140	16	80	14.5	●
16	1	24	140	16	80	14.5	●
16	1.5	24	140	16	80	14.5	●
16	2	24	140	16	80	14.5	●
16	3	24	140	16	80	14.5	●
20	0.5	30	160	20	100	18.2	●
20	1	30	160	20	100	18.2	●
20	1.5	30	160	20	100	18.2	●
20	2	30	160	20	100	18.2	●
20	3	30	160	20	100	18.2	●
20	5	30	160	20	100	18.2	●

Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.8 Stainless Stell		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		Ø1.0~2.5 60~80 Ø3.0~20 80~85		Ø1.0~2.5 60~80 Ø3.0~20 80~85		Ø1.0~2.5 47~70 Ø3.0~20 70~75		Ø1.0~1.5 47~57 Ø1.5~20 57~70		Ø1.0~2.5 30~47 Ø3.0~20 50~60		Ø1.0~20 22~30		Ø1.0~2.5 55~65 Ø3.0~20 60~70		Ø1.0~2.5 60~80 Ø3.0~20 80~85		Ø1.0~2.5 30~35 Ø3.0~0 35~40	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B274HX-1	1	20,000	240	20,000	240	15,000	215	15,000	215	10,000	85	7,100	40	17,500	250	20,000	240	9,550	136
B274HX-1.5	1.5	13,500	245	13,500	245	12,000	215	12,000	215	8,000	90	5,100	50	11,600	250	13,500	245	6,366	115
B274HX-2	2	13,000	300	13,000	300	11,000	280	11,000	280	7,000	110	3,900	60	8,750	263	13,000	300	4,775	122
B274HX-2.5	2.5	10,000	320	10,000	320	9,000	300	9,000	300	6,000	120	3,000	60	7,000	275	10,000	320	3,820	127
B274HX-3	3	8,800	500	8,800	500	7,200	350	7,200	350	5,300	125	2,700	60	6,370	361	8,800	500	3,714	181
B274HX-4	4	6,600	530	6,600	530	5,500	360	5,500	360	4,200	130	2,200	70	4,770	365	6,600	530	2,785	182
B274HX-5	5	5,300	600	5,300	600	4,350	420	4,350	420	3,500	140	1,900	75	3,800	430	5,300	600	2,228	215
B274HX-6	6	4,500	610	4,500	610	3,700	425	3,700	425	2,900	145	1,500	70	3,185	426	4,500	610	1,857	213
B274HX-8	8	3,300	590	3,300	590	2,700	425	2,700	425	2,200	145	1,100	65	2,390	438	3,300	590	1,392	219
B274HX-10	10	2,600	580	2,600	580	2,200	420	2,200	420	1,700	145	950	65	1,910	425	2,600	580	1,114	213
B274HX-12	12	2,200	580	2,200	580	1,800	420	1,800	420	1,400	140	800	60	1,590	433	2,200	580	928	216
B274HX-16	16	1,600	530	1,600	530	1,300	400	1,300	400	1,200	130	600	45	1,195	428	1,600	530	696	214
B274HX-20	20	1,300	510	1,300	510	1,100	370	1,100	370	890	110	470	35	955	374	1,300	510	557	187
(mm) 		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D	
		ae:0.05D		ae:0.05D		ae:0.05D		ae: 0.05D		ae:0.05D		ae:0.02D		ae: 0.05D		ae: 0.05D		ae: 0.05D	

High feed cutting

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.8 Stainless Stell		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		Ø1.0~2.5 60~80 Ø3.0~20 80~85		Ø1.0~2.5 60~80 Ø3.0~20 80~85		Ø1.0~2.5 47~70 Ø3.0~20 70~75		Ø1.0~1.5 47~57 Ø1.5~20 57~70		Ø1.0~2.5 30~47 Ø3.0~20 50~60		Ø1.0~20 22~30		Ø1.0~2.5 80~100 Ø3.0~20 130~150		Ø1.0~2.5 60~80 Ø3.0~20 80~85		Ø1.0~2.5 60~80 Ø3~20 80~85	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B274HX-1	1	32,000	1,280	32,000	1,280	26,000	1,040	26,000	1,040	20,000	800	20,000	800	25,400	1,016	32,000	1,280	19,100	760
B274HX-1.5	1.5	22,000	1,760	22,000	1,760	17,000	1,360	17,000	1,360	13,000	1,040	13,000	1,040	16,800	1,344	22,000	1,760	12,732	1,018
B274HX-2	2	16,000	1,920	16,000	1,920	14,000	1,680	14,000	1,680	10,000	1,200	10,000	1,200	12,700	1,524	16,000	1,920	9,550	1,146
B274HX-2.5	2.5	14,000	2,240	14,000	2,240	12,000	1,920	12,000	1,920	9,000	1,440	9,000	1,440	10,185	1,629	14,000	2,240	7,640	1,222
B274HX-3	3	13,000	2,600	13,000	2,600	10,500	2,100	10,500	2,100	8,500	1,700	8,500	1,700	13,793	2,758	13,000	2,600	8,488	1,698
B274HX-4	4	12,000	2,880	12,000	2,880	10,000	2,400	10,000	2,400	8,500	2,040	8,500	2,040	10,345	2,482	12,000	2,880	6,366	1,528
B274HX-5	5	9,500	2,660	9,500	2,660	8,500	2,380	8,500	2,380	7,000	1,960	7,000	1,960	8,276	2,317	9,500	2,660	5,093	1,426
B274HX-6	6	8,000	2,560	8,000	2,560	7,500	2,400	7,500	2,400	6,500	2,080	6,500	2,080	6,897	2,207	8,000	2,560	4,244	1,358
B274HX-8	8	6,500	2,340	6,500	2,340	5,500	1,980	5,500	1,980	5,500	1,760	5,500	1,760	5,173	1,862	6,500	2,340	3,183	1,145
B274HX-10	10	5,500	2,200	5,500	2,200	4,800	1,920	4,800	1,920	4,000	1,440	4,000	1,440	4,138	1,655	5,500	2,200	2,546	1,018
B274HX-12	12	5,000	2,200	5,000	2,200	4,000	1,760	4,000	1,760	3,500	1,400	3,500	1,400	3,448	1,517	5,000	2,200	2,122	934
B274HX-16	16	4,000	1,920	4,000	1,920	3,000	1,440	3,000	1,440	2,500	1,000	2,500	1,000	2,586	1,241	4,000	1,920	1,592	764
B274HX-20	20	3,000	1,560	3,000	1,560	2,400	1,248	2,400	1,248	2,000	800	2,000	800	2,069	1,075	3,000	1,560	1,273	662
(mm) 		ap:0.3×R		ap:0.3×R		ap:0.3×R		ap:0.3×R		ap:0.2×R		ap:0.1×R		ap:0.3×R		ap:0.3×R		ap:0.3×R	
		ae:0.3×D		ae:0.3×D		ae:0.3×D		ae:0.3×D		ae:0.3×D		ae:0.3×D		ae:0.3×D		ae:0.3×D		ae:0.3×D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

F612HX / F617HX

Multipurpose End Mills

UMG Carbide

AlTiCrN HX

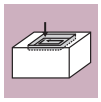


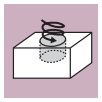


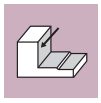


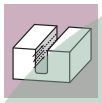


Type of Operation









Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Multipurpose End Mills- 4 Flutes Short Type · Long Neck Using

UMG carbide material and Nano multilayer coating AlTiCrN enable to enhance lubrication and wear resistance.

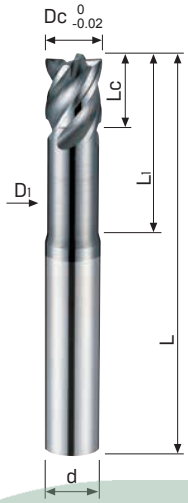
Effectively decrease the vibration by various helix geometry and unequal flutes designs.

Big chip breaker is designed to reach high removal rate for various work materials.

For high-efficiency heavy cutting, using with an APC high precision anti-vibration collet chuck.

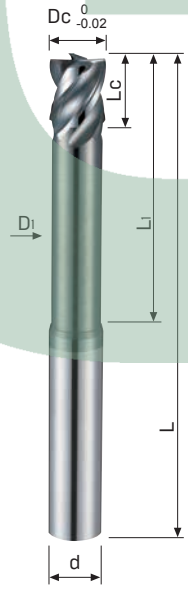
Designed with step to increase the effective length.

Suitable for different kinds of materials in finishing.



Code No. F612HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiCrN F612HX
3	4	57	6	9	2.8	●
3.5	4.5	57	6	12	3.3	●
4	5	57	6	12	3.7	●
4.5	5.5	57	6	15	4.2	●
5	6	57	6	15	4.6	●
5.5	6.5	57	6	20	5.1	●
6	7	57	6	20	5.5	●
6.5	7.5	63	8	23	6	●
7	8	63	8	23	6.4	●
7.5	8.5	63	8	26	6.9	●
8	9	63	8	26	7.4	●
8.5	9.5	72	10	29	7.9	●
9	10	72	10	29	8.3	●
9.5	10.5	72	10	31	8.8	●
10	11	72	10	31	9.2	●
10.5	11.5	83	12	34	9.7	●
11	12	83	12	34	10.2	●
11.5	12.5	83	12	37	10.6	●
12	13	83	12	37	11	●
13	14	92	16	38	11.8	●
14	15	92	16	40	12.7	●
15	16	92	16	42	13.6	●
16	17	92	16	43	14.5	●
17	18	104	20	45	15.4	●
18	19	104	20	48	16.3	●
19	20	104	20	51	17.3	●
20	21	104	20	53	18.2	●



Code No. F617HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiCrN F617HX
3	4	70	6	18	2.8	●
3.5	4.5	70	6	22	3.3	●
4	5	70	6	22	3.7	●
4.5	5.5	70	6	28	4.2	●
5	6	70	6	28	4.6	●
5.5	6.5	70	6	33	5.4	●
6	7	70	6	33	5.5	●
6.5	7.5	80	8	38	6	●
7	8	80	8	38	6.4	●
7.5	8.5	80	8	43	6.9	●
8	9	80	8	43	7.4	●
8.5	9.5	90	10	45	7.9	●
9	10	90	10	45	8.3	●
9.5	10.5	90	10	49	8.8	●
10	11	90	10	49	9.2	●
10.5	11.5	100	12	52	9.7	●
11	12	100	12	52	10.2	●
11.5	12.5	100	12	54	10.6	●
12	13	100	12	54	11	●
13	14	115	16	60	11.8	●
14	15	115	16	62	12.7	●
15	16	115	16	64	13.6	●
16	17	115	16	66	14.5	●
17	18	130	20	70	15.4	●
18	19	130	20	74	16.3	●
19	20	130	20	76	17.3	●
20	21	130	20	79	18.2	●

Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron	
Vc m/min		63		63		63		53		53		60		63	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
F612HX/F617HX-3	3	10,600	683	10,600	683	8,280	530	6,550	389	6,400	105	6,550	389	10,600	683
F612HX/F617HX-4	4	6,350	735	6,350	735	4,950	590	3,950	413	3,800	120	3,950	413	6,350	735
F612HX/F617HX-5	5	4,550	875	4,550	875	3,550	625	2,800	448	2,730	125	2,800	448	4,550	875
F612HX/F617HX-6	6	3,540	875	3,540	875	2,760	600	2,200	413	2,100	125	2,200	413	3,540	875
F612HX/F617HX-7	7	3,360	820	3,360	820	2,620	600	2,085	413	2,000	125	2,085	413	3,360	820
F612HX/F617HX-8	8	3,185	770	3,185	770	2,480	600	1,975	413	1,900	125	1,975	413	3,185	770
F612HX/F617HX-9	9	3,417	770	3,417	770	2,275	600	1,810	394	1,750	120	1,810	394	3,415	770
F612HX/F617HX-10	10	3,650	770	3,650	770	2,070	595	1,645	375	1,595	120	1,645	375	3,650	770
F612HX/F617HX-11	11	2,960	720	2,960	720	1,920	575	1,525	362	1,480	120	1,525	362	2,960	720
F612HX/F617HX-12	12	2,275	670	2,275	670	1,770	560	1,410	350	1,365	120	1,410	350	2,275	670
F612HX/F617HX-13	13	2,300	670	2,300	670	1,715	550	1,365	343	1,370	115	1,365	343	2,200	670
F612HX/F617HX-14	14	2,332	670	2,332	670	1,660	540	1,320	336	1,270	110	1,320	336	2,130	670
F612HX/F617HX-15	15	2,160	670	2,160	670	1,605	530	1,275	324	1,230	105	1,275	324	2,060	670
F612HX/F617HX-16	16	1,990	670	1,990	670	1,550	520	1,230	312	1,190	100	1,230	312	1,990	670
F612HX/F617HX-17	17	1,890	635	1,890	635	1,475	490	1,160	305	1,130	95	1,160	305	1,890	635
F612HX/F617HX-18	18	1,790	600	1,790	600	1,400	465	1,100	295	1,070	95	1,100	295	1,790	600
F612HX/F617HX-19	19	1,690	570	1,690	570	1,320	440	1,040	285	1,010	90	1,040	285	1,690	670
F612HX/F617HX-20	20	1,590	535	1,590	535	1,240	415	985	277	950	90	985	277	1,590	535
(mm) 		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.2D		ae:0.2D	

Slotting

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron	
Vc m/min		100		100		65		55		55		60		65	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
F612HX/F617HX-3	3	10,600	424	10,600	424	8,280	331	6,550	262	6,400	128	6,550	262	10,600	424
F612HX/F617HX-4	4	6,350	508	6,350	508	4,950	396	3,950	316	3,800	152	3,950	316	6,350	508
F612HX/F617HX-5	5	4,550	455	4,550	455	3,550	355	2,800	280	2,730	164	2,800	280	4,550	455
F612HX/F617HX-6	6	3,540	425	3,540	425	2,760	331	2,200	264	2,100	168	2,200	264	3,540	425
F612HX/F617HX-7	7	3,360	403	3,360	403	2,620	314	2,085	250	2,000	160	2,085	250	3,360	403
F612HX/F617HX-8	8	3,185	510	3,185	510	2,480	397	1,975	316	1,900	152	1,975	316	3,185	510
F612HX/F617HX-9	9	3,417	547	3,417	547	2,275	364	1,810	290	1,750	140	1,810	290	3,415	546
F612HX/F617HX-10	10	3,650	584	3,650	584	2,070	331	1,645	263	1,595	191	1,645	263	3,650	584
F612HX/F617HX-11	11	2,960	592	2,960	592	1,920	384	1,525	305	1,480	178	1,525	305	2,960	592
F612HX/F617HX-12	12	2,275	455	2,275	455	1,770	354	1,410	282	1,365	164	1,410	282	2,275	455
F612HX/F617HX-13	13	2,300	460	2,300	460	1,715	343	1,365	273	1,370	164	1,365	273	2,200	440
F612HX/F617HX-14	14	2,332	466	2,332	466	1,660	332	1,320	264	1,270	152	1,320	264	2,130	426
F612HX/F617HX-15	15	2,160	432	2,160	432	1,605	321	1,275	255	1,230	148	1,275	255	2,060	412
F612HX/F617HX-16	16	1,990	398	1,990	398	1,550	310	1,230	246	1,190	143	1,230	246	1,990	398
F612HX/F617HX-17	17	1,890	378	1,890	378	1,475	295	1,160	232	1,130	136	1,160	232	1,890	378
F612HX/F617HX-18	18	1,790	394	1,790	394	1,400	308	1,100	242	1,070	128	1,100	242	1,790	394
F612HX/F617HX-19	19	1,690	406	1,690	406	1,320	317	1,040	250	1,010	121	1,040	250	1,690	406
F612HX/F617HX-20	20	1,590	445	1,590	445	1,240	347	985	276	950	114	985	276	1,590	445
(mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.05D		ap:0.5D		ap:0.5D	

※Notice: F617HX is Long Length series End Mills. Please adjust the parameter according.

E148HX

Multipurpose End Mills · Slim Shank · Short Type

MG Carbide

AlTiCrN HX

38° 41°

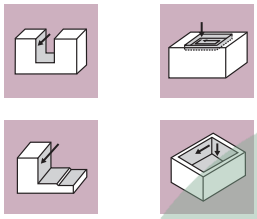
4

N

γ5°

90°

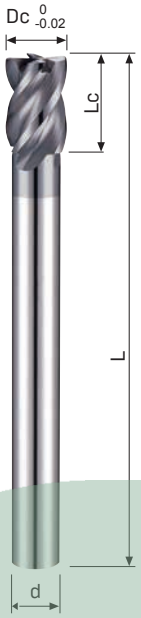
Type of Operation



Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys



Code No. E148HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E148HX
6	9	60	5	●
7	10.5	70	6	●
8	12	75	6	●
9	13.5	80	8	●
10	15	80	8	●
11	16.5	100	10	●
12	18	100	10	●
13	19.5	100	12	●
14	21	110	12	●
15	22.5	110	14	●
16	24	110	14	●
17	22.5	110	16	●
18	27	125	16	●
19	28.5	125	18	●
20	30	125	18	●
22	33	125	20	●

Feature of product:

Multipurpose End Mills- 4 Flutes Slim Shank · Short Type

Effectively decrease the vibration by various helix geometry and unequal flutes designs.

Big chip breaker is designed to reach high removal rate for various work materials.

Obviously improving tool life with Nano multilayer coating AlTiCrN. Designed with step to increase the effective length.

Suitable for different kinds of materials cutting.

Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		130		130		120		100		60		70		130		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E148HX-6	6	6,897	1,150	6,897	1,150	6,366	991	5,308	620	3,715	267	4,246	572	6,897	1,150	1,592	100
E148HX-7	7	5,911	1,150	5,911	1,150	5,457	994	4,550	621	3,185	268	3,640	535	5,911	1,150	1,364	100
E148HX-8	8	5,173	1,150	5,173	1,150	4,775	994	3,981	621	2,787	268	3,185	535	5,173	1,150	1,194	100
E148HX-9	9	4,598	1,150	4,598	1,150	4,244	991	3,539	619	2,477	267	2,831	533	4,598	1,150	1,061	100
E148HX-10	10	4,138	1,150	4,138	1,150	3,820	994	3,185	573	2,229	268	2,548	535	4,138	1,150	955	100
E148HX-11	11	3,762	1,100	3,762	1,100	3,472	942	2,895	543	2,027	254	2,316	507	3,762	1,100	868	100
E148HX-12	12	3,448	1,050	3,448	1,050	3,183	891	2,654	557	1,858	240	2,123	480	3,448	1,050	796	90
E148HX-13	13	3,183	1,000	3,183	1,000	2,938	875	2,450	547	1,715	236	1,960	471	3,183	1,000	735	90
E148HX-14	14	2,956	980	2,956	980	2,728	867	2,275	542	1,592	233	1,820	467	2,956	980	682	85
E148HX-15	15	2,759	960	2,759	960	2,546	851	2,123	532	1,486	258	1,699	458	2,759	960	637	100
E148HX-16	16	2,586	950	2,586	950	2,387	845	1,990	528	1,393	256	1,592	455	2,586	950	597	100
E148HX-17	17	2,434	940	2,434	940	2,247	828	1,873	518	1,311	251	1,499	446	2,434	940	562	95
E148HX-18	18	2,299	920	2,299	920	2,122	810	1,769	509	1,238	245	1,415	436	2,299	920	531	95
E148HX-19	19	2,178	910	2,178	910	2,010	808	1,676	505	1,173	245	1,341	435	2,178	910	503	95
E148HX-20	20	2,069	900	2,069	900	1,910	802	1,592	501	1,115	245	1,274	432	2,069	900	477	95
E148HX-22	22	1,881	820	1,881	820	1,736	729	1,448	455	1,013	221	1,158	392	1,881	820	434	90
(mm) 		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D	
		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.1D		ae:0.05D		ae:0.1D		ae:0.2D		ae:0.05D	

Slotting

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		130		130		120		100		70		80		130		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E148HX-6	6	6,897	1,000	6,897	1,000	6,366	828	5,038	478	3,715	223	4,246	350	6,897	1,000	1,592	85
E148HX-7	7	5,911	1,000	5,911	1,000	5,457	831	4,550	479	3,185	224	3,640	352	5,911	1,000	1,364	85
E148HX-8	8	5,173	950	5,173	950	4,775	828	3,981	478	2,787	223	3,185	350	5,173	950	1,194	85
E148HX-9	9	4,598	950	4,598	950	4,244	827	3,539	477	2,477	223	2,831	350	4,598	950	1,061	85
E148HX-10	10	4,138	950	4,138	950	3,820	833	3,185	481	2,229	224	2,548	353	4,138	950	955	90
E148HX-11	11	3,762	900	3,762	900	3,472	786	2,895	454	2,027	212	2,316	333	3,762	900	868	85
E148HX-12	12	3,448	860	3,448	860	3,183	747	2,654	431	1,858	226	2,123	316	3,448	860	796	90
E148HX-13	13	3,183	840	3,183	840	2,938	729	2,450	420	1,715	221	1,960	308	3,183	840	735	90
E148HX-14	14	2,956	820	2,956	820	2,728	722	2,275	416	1,592	219	1,820	305	2,956	820	682	90
E148HX-15	15	2,759	810	2,759	810	2,546	707	2,123	408	1,486	214	1,699	299	2,759	810	637	85
E148HX-16	16	2,586	800	2,586	800	2,387	701	1,990	404	1,393	236	1,592	296	2,586	800	597	90
E148HX-17	17	2,434	780	2,434	780	2,247	687	1,873	396	1,311	231	1,499	290	2,434	780	562	90
E148HX-18	18	2,299	770	2,299	770	2,122	677	1,769	391	1,238	228	1,415	286	2,299	770	531	90
E148HX-19	19	2,178	760	2,178	760	2,010	671	1,676	387	1,173	226	1,341	284	2,178	760	503	92
E148HX-20	20	2,069	750	2,069	750	1,910	649	1,592	375	1,115	240	1,274	275	2,069	750	477	90
E148HX-22	22	1,881	670	1,881	670	1,736	590	1,448	340	1,013	218	1,158	250	1,881	670	434	85
(mm) 		ap:0.5D		ap:0.5D		ap:0.3D		ap:0.3D		ap:0.3D		ap:0.5D		ap:0.5D		ap:0.3D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E149HX

Multipurpose End Mills · Slim Shank · Long Type

MG Carbide

AlTiCrN HX

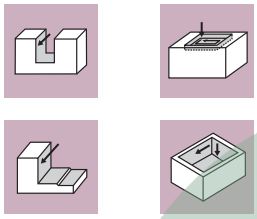
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4

N 75°

90°

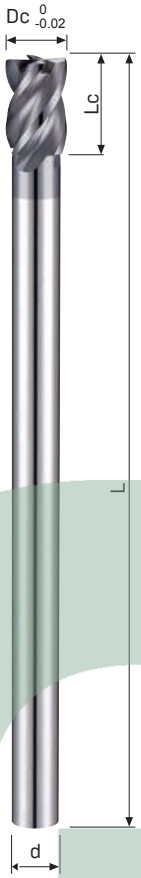
Type of Operation



Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys



Code No. E149HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E149HX
6	9	120	5	●
7	10.5	135	6	●
8	12	135	6	●
9	13.5	135	8	●
10	15	150	8	●
11	16.5	160	10	●
12	18	160	10	●
13	19.5	160	12	●
14	21	160	12	●
15	22.5	180	14	●
16	24	180	14	●
17	22.5	180	16	●
18	27	180	16	●
19	28.5	200	18	●
20	30	200	18	●
22	33	200	20	●

Feature of product:

Multipurpose End Mills- 4 Flutes Slim Shank · Long Type

Effectively decrease the vibration by various helix geometry and unequal flutes designs.

Big chip breaker is designed to reach high removal rate for various work materials.

Obviously improving tool life with Nano multilayer coating AlTiCrN. Designed with step to increase the effective length.

Suitable for different kinds of materials cutting.

Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		130		130		120		100		70		80		130		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E149HX-6	6	6,897	700	6,897	700	6,366	595	5,308	372	3,715	160	4,246	343	6,897	700	1,592	55
E149HX-7	7	5,911	700	5,911	700	5,457	596	4,550	373	3,185	161	3,640	321	5,911	700	1,364	55
E149HX-8	8	5,173	700	5,173	700	4,775	596	3,981	373	2,787	161	3,185	321	5,173	700	1,194	55
E149HX-9	9	4,598	700	4,598	700	4,244	594	3,539	372	2,477	160	2,831	320	4,598	700	1,061	55
E149HX-10	10	4,138	700	4,138	700	3,820	596	3,185	344	2,229	161	2,548	321	4,138	700	955	55
E149HX-11	11	3,762	650	3,762	650	3,472	565	2,895	326	2,027	152	2,316	304	3,762	650	868	50
E149HX-12	12	3,448	650	3,448	650	3,183	535	2,654	334	1,858	144	2,123	288	3,448	650	796	50
E149HX-13	13	3,183	620	3,183	620	2,938	525	2,450	328	1,715	141	1,960	283	3,183	620	735	50
E149HX-14	14	2,956	600	2,956	600	2,728	520	2,275	325	1,592	140	1,820	280	2,956	600	682	50
E149HX-15	15	2,759	600	2,759	600	2,546	511	2,123	319	1,486	155	1,699	275	2,759	600	637	60
E149HX-16	16	2,586	580	2,586	580	2,387	507	1,990	317	1,393	153	1,592	273	2,586	580	597	60
E149HX-17	17	2,434	570	2,434	570	2,247	497	1,873	311	1,311	150	1,499	268	2,434	570	562	57
E149HX-18	18	2,299	560	2,299	560	2,122	486	1,769	304	1,238	147	1,415	262	2,299	560	531	55
E149HX-19	19	2,178	560	2,178	560	2,010	485	1,676	303	1,173	147	1,341	261	2,178	560	503	55
E149HX-20	20	2,069	540	2,069	540	1,910	481	1,592	301	1,115	146	1,274	259	2,069	540	477	55
E149HX-22	22	1,881	500	1,881	500	1,736	437	1,448	273	1,013	132	1,158	235	1,881	500	434	50
(mm) 		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D	
		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.1D		ae:0.05D		ae:0.1D		ae:0.2D		ae:0.1D	

Slotting

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium	
Vc m/min		130		130		120		100		70		80		130		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E149HX-6	6	6,897	550	6,897	550	6,366	414	5,308	239	3,715	111	4,246	175	6,897	550	1,592	45
E149HX-7	7	5,911	540	5,911	540	5,457	415	4,550	240	3,185	112	3,640	176	5,911	540	1,364	45
E149HX-8	8	5,173	530	5,173	530	4,775	414	3,981	239	2,787	111	3,185	175	5,173	530	1,194	45
E149HX-9	9	4,598	510	4,598	510	4,244	414	3,539	239	2,477	111	2,831	175	4,598	510	1,061	40
E149HX-10	10	4,138	500	4,138	500	3,820	417	3,185	240	2,229	112	2,548	176	4,138	500	955	40
E149HX-11	11	3,762	480	3,762	480	3,472	393	2,895	227	2,027	106	2,316	166	3,762	480	868	40
E149HX-12	12	3,448	460	3,448	460	3,183	374	2,654	216	1,858	113	2,123	158	3,448	460	796	40
E149HX-13	13	3,183	440	3,183	440	2,938	364	2,450	210	1,715	110	1,960	154	3,183	440	735	40
E149HX-14	14	2,956	420	2,956	420	2,728	361	2,275	208	1,592	109	1,820	153	2,956	420	682	40
E149HX-15	15	2,759	400	2,759	400	2,546	353	2,123	204	1,486	107	1,699	149	2,759	400	637	40
E149HX-16	16	2,586	400	2,586	400	2,387	350	1,990	202	1,393	118	1,592	148	2,586	400	597	45
E149HX-17	17	2,434	400	2,434	400	2,247	343	1,873	198	1,311	116	1,499	145	2,434	400	562	45
E149HX-18	18	2,299	390	2,299	390	2,122	339	1,769	195	1,238	114	1,415	143	2,299	390	531	45
E149HX-19	19	2,178	390	2,178	390	2,010	335	1,676	193	1,173	113	1,341	142	2,178	390	503	45
E149HX-20	20	2,069	380	2,069	380	1,910	325	1,592	187	1,115	120	1,274	137	2,069	380	477	45
E149HX-22	22	1,881	350	1,881	350	1,736	295	1,448	170	1,013	109	1,158	125	1,881	350	434	40
(mm) 		ap:0.3D		ap:0.3D		ap:0.3D		ap:0.2D		ap:0.05D		ap:0.2D		ap:0.3D		ap:0.2D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

B270TX

Multipurpose End Mills With Corner Radius · Slim Shank · Long Type

UMG Carbide

AlTiSiN TX

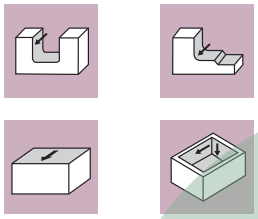
38° 41°

4

N 75°

R

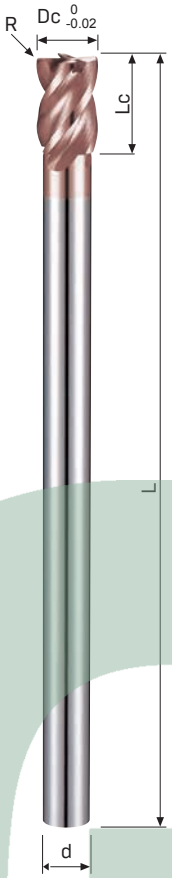
Type of Operation



Work Material

P	H	M	K	N	S
●	●		○		

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **H** <68HRC Hardened Steel
- **K** Cast Iron



Code No. B270TX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiSiN B270TX
10	R0.5	15	130	8	●
10	R1	15	130	8	●
12	R0.5	18	150	10	●
12	R1	18	150	10	●
14	R0.5	21	160	12	●
14	R1	21	160	12	●
18	R0.5	27	180	16	●
18	R1	27	180	16	●
22	R0.5	33	200	20	●
22	R1	33	200	20	●

Feature of product:

Multipurpose End Mills with Corner Radius- 4 Flutes · Slim Shank · Long Type

Effectively decrease the vibration by various helix geometry and unequal flutes designs.

Big chip breaker is designed to reach high removal rate for various work materials.

Cutting edge with corner radius design to increase tool life.

Obviously improving wear and heat resistance with Nano multilayer coating AlTiSiN. Designed with step to increase the effective length.

Suitable for different kinds of materials cutting.

Cavity machining

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.7 Hardened Steel (56~68HRC)	
Vc m/min		200		200		200		150		150		120		100	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B270TX-10	10	6,400	1,300	6,400	1,300	6,400	1,100	4,800	800	4,800	700	3,800	320	3,180	250
B270TX-12	12	5,300	1,300	5,300	1,300	5,300	1,100	4,000	800	4,000	700	3,200	320	2,650	250
B270TX-14	14	4,550	1,300	4,550	1,300	4,550	1,100	3,400	800	3,400	700	2,750	320	2,270	250
B270TX-18	18	3,500	1,300	3,500	1,300	3,500	1,100	2,650	800	2,650	700	2,150	320	1,750	250
B270TX-22	22	2,900	1,300	2,900	1,300	2,900	1,050	2,180	750	2,180	700	1,750	320	1,450	250
(mm) 		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.05D		ap:0.02D	
		ae:0.3D		ae:0.3D		ae:0.3D		ae:0.3D		ae:0.3D		ae:0.2D		ae:0.2D	

※The above parameters is recommended in the range of 4XD extended length.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.



End Mills For Difficult To Cut Materials

Page	43	45	47	49	51	53
Appearance						
Code No	E224FX	E225FX	E226FX	E227-3.0FX	B220FX	E129SX
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
Coating	AlCrN FX	AlCrN FX	AlCrN FX	AlCrN FX	AlCrN FX	AlTiXZrN SX
Helix Angle	 38°≈	 38°	 45°	 48°	 38°≈	 38°
No.of Flutes	 4	 5	 6	 4	 4	 4

55	55	57	59	61	63	65	67
							
E233SX	E234SX	E235-2.5SX	E236-2.5SX E236-4.0SX	E237-2.5SX E237-4.0SX	E247-2.5SX E247-4.0SX	E238-2.5SX E238-4.0SX	E248-2.5SX E248-4.0SX
MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
AlTiXZrN SX	AlTiXZrN SX	AlTiXZrN SX	AlTiXZrN SX	AlTiXZrN SX	AlTiXZrN SX	AlTiXZrN SX	AlTiXZrN SX
 38°	 38°	 38°	 38°	 48°	 48°	 48°	 48°
 4	 5	 5	 7	 4	 4	 5	 5

E224FX

End Mills for Steel and Difficult To Cut Materials

MG Carbide

AlCrN FX

38°

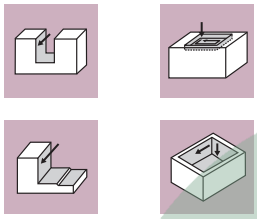
4

N

γ5°

90°

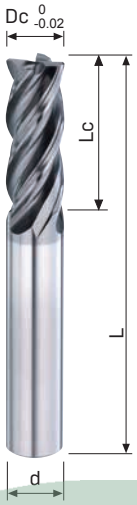
Type of Operation



Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys



Code No. E224FX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlCrN E224FX
3	8	50	6	●
4	11	50	6	●
5	13	50	6	●
6	16	50	6	●
8	20	60	8	●
10	25	75	10	●
12	30	75	12	●
16	40	100	16	●
20	50	100	20	●

Feature of product:

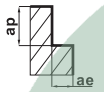
End Mills for Steel and Difficult To Cut Materials-5 Flutes

Various helix geometry, unequal flutes design and high rigidity.

Sharp cutting edge with micro corner radius design. High-efficiency heavy cutting and high-speed trochoidal side-milling, which is compatible with APC high precision anti-vibration collet chuck, coping with various milling conditions.

Suitable for steel, stainless steel, titanium alloy, nickel alloy, high temperature alloy...etc.

Side Milling

Work Material		GR.1/GR.2 /GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (～24HRC) (～30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		140		100		80		120		80		50		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E224FX-3	3	14,863	683	10,617	637	8,493	679	10,600	683	8,493	679	5,308	212	3,185	64
E224FX-4	4	11,148	684	7,963	637	6,370	764	6,350	735	6,370	764	3,981	319	2,389	110
E224FX-5	5	8,918	685	6,370	637	5,096	815	4,550	875	5,096	815	3,185	382	1,911	115
E224FX-6	6	7,432	686	5,308	637	4,247	849	3,540	875	4,247	849	2,654	425	1,593	255
E224FX-8	8	5,574	687	3,981	557	3,185	764	3,185	770	3,185	892	1,991	358	1,194	239
E224FX-10	10	4,459	688	3,185	510	2,548	713	3,650	770	2,548	815	1,593	350	956	229
E224FX-12	12	3,716	689	2,654	531	2,123	679	2,275	670	2,123	764	1,327	319	796	223
E224FX-16	16	2,787	690	1,991	557	1,593	573	1,990	670	1,593	637	995	239	597	191
E224FX-20	20	2,230	691	1,593	510	1,274	510	1,590	535	1,274	510	796	223	478	191
(mm) 		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D	
		ae:0.12D		ae:0.1D		ae:0.1D		ae:0.2D		ae:0.05D		ae:0.05D		ae:0.05D	

Slotting

Work Material		GR.1/GR.2 /GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (～24HRC) (～30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		140		100		80		120		80		50		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E224FX-3	3	14,863	683	10,617	510	8,493	510	10,600	683	8,493	510	5,308	212	3,185	64
E224FX-4	4	11,148	684	7,963	500	6,370	500	6,350	735	6,370	500	3,981	319	2,389	110
E224FX-5	5	8,918	685	6,370	480	5,096	480	4,550	875	5,096	480	3,185	382	1,911	115
E224FX-6	6	7,432	686	5,308	460	4,247	460	3,540	875	4,247	460	2,654	425	1,593	255
E224FX-8	8	5,574	687	3,981	400	3,185	400	3,185	770	3,185	400	1,991	358	1,194	239
E224FX-10	10	4,459	688	3,185	350	2,548	350	3,650	770	2,548	350	1,593	350	956	229
E224FX-12	12	3,716	689	2,654	300	2,123	300	2,275	670	2,123	300	1,327	319	796	223
E224FX-16	16	2,787	690	1,991	250	1,593	250	1,990	670	1,593	250	995	239	597	191
E224FX-20	20	2,230	691	1,593	200	1,274	200	1,590	535	1,274	200	796	223	478	191
(mm) 		ap:0.5D		ap:0.2D		ap:0.3D		ap:0.5D		ap:0.1D		ap:0.05D		ap:0.05D	
		ae:1.0D		ae:1.0D		ae:1.0D		ae:1.0D		ae:1.0D		ae:1.0D		ae:1.0D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E225FX

End Mills for Steel and Difficult To Cut Materials

MG Carbide

AlCrN FX

38°

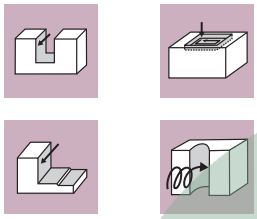
5

N

γ5°

90°

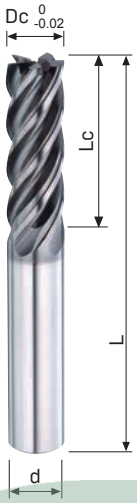
Type of Operation



Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys



Code No. E225FX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlCrN E225FX
3	9	50	6	●
4	12	50	6	●
5	15	50	6	●
6	18	50	6	●
8	24	60	8	●
10	30	75	10	●
12	36	75	12	●
16	48	100	16	●
20	50	100	20	●

Feature of product:

End Mills for Steel and Difficult To Cut Materials-5 Flutes

Unequal flutes design and high rigidity.

Sharp cutting edge with micro corner radius design. High-speed trochoidal side-milling, which is compatible with APC high precision anti-vibration collet chuck, coping with various milling conditions.

Suitable for steel, stainless steel, titanium alloy, nickel alloy, high temperature alloy...etc.

Side Milling

Work Material		GR.1/GR.2/GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (～24HRC) (～30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		140		100		80		120		80		50		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E225FX-3	3	14,863	854	10,617	800	8,493	650	10,600	850	8,493	650	5,308	400	3,185	350
E225FX-4	4	11,148	855	7,963	800	6,370	650	6,350	900	6,370	650	3,981	400	2,389	350
E225FX-5	5	8,918	856	6,370	800	5,096	650	4,550	1,100	5,096	650	3,185	400	1,911	350
E225FX-6	6	7,432	1,858	5,308	1,699	4,247	849	3,540	1,100	4,247	850	2,654	660	1,593	600
E225FX-8	8	5,574	1,672	3,981	1,911	3,185	1,062	3,185	950	3,185	1,050	1,991	550	1,194	500
E225FX-10	10	4,459	1,561	3,185	1,784	2,548	892	3,650	950	2,548	890	1,593	480	956	400
E225FX-12	12	3,716	1,486	2,654	1,699	2,123	849	2,275	840	2,123	890	1,327	430	796	400
E225FX-16	16	2,787	1,254	1,991	1,274	1,593	717	1,990	840	1,593	717	995	350	597	300
E225FX-20	20	2,230	1,115	1,593	1,147	1,274	637	1,590	668	1,274	637	796	320	478	300
(mm) 		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D	
		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.2D		ae:0.05D		ae:0.05D		ae:0.05D	

High Speed Side Milling

Work Material		GR.1/GR.2/GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (～24HRC) (～30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		200		160		130		160		130		100		120	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E225FX-3	3	21,233	1,062	16,987	849	8,493	690	16,987	849	8,493	690	10,617	531	12,740	637
E225FX-4	4	15,925	1,593	12,740	1,274	6,370	1,035	12,740	1,274	6,370	1,035	7,963	796	9,555	956
E225FX-5	5	12,740	2,548	10,192	2,038	5,096	1,656	10,192	2,038	5,096	1,656	6,370	1,274	7,644	1,529
E225FX-6	6	10,617	2,654	8,493	2,123	6,901	1,725	8,493	2,123	6,901	1,725	5,308	1,327	6,370	1,593
E225FX-8	8	7,963	2,389	6,370	1,911	5,176	1,553	6,370	1,911	5,176	1,553	3,981	1,194	4,778	1,433
E225FX-10	10	6,370	2,230	5,096	1,784	4,141	1,449	5,096	1,784	4,141	1,449	3,185	1,115	3,822	1,338
E225FX-12	12	5,308	2,123	4,247	1,699	3,450	1,380	4,247	1,699	3,450	1,380	2,654	1,062	3,185	1,274
E225FX-16	16	3,981	1,792	3,185	1,433	2,588	1,165	3,185	1,433	2,588	1,165	1,991	896	2,389	1,075
E225FX-20	20	3,185	1,593	2,548	1,274	2,070	1,035	2,548	1,274	2,070	1,035	1,593	796	1,911	956
(mm) 		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D	
		ae:0.1D		ae:0.05D		ae:0.08D		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E226FX

End Mills for Steel and Difficult To Cut Materials (Chipbreaker)

MG Carbide

AlCrN FX

45°

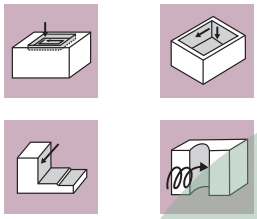
6

N

γ5°

90°

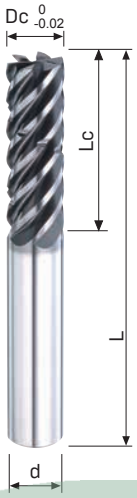
Type of Operation



Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys



Code No. E226FX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlCrN E226FX
3	9	50	6	●
4	12	50	6	●
5	15	50	6	●
6	18	50	6	●
8	24	60	8	●
10	30	75	10	●
12	36	75	12	●
16	48	100	16	●
20	50	100	20	●

Feature of product:

End Mills for Steel and Difficult To Cut Materials-6 Flutes

Unequal flutes design and high rigidity.

Sharp cutting edge with micro corner radius design. High-speed trochoidal side-milling, which is compatible with APC high precision anti-vibration collet chuck, coping with various milling conditions.

Suitable for steel, stainless steel, titanium alloy, nickel alloy, high temperature alloy...etc.

Side Milling

Work Material		GR.1/GR.2/GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (～24HRC) (～30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		140		100		80		120		80		50		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E226FX-3	3	14,863	1,025	10,617	960	8,493	780	10,600	1,020	8,493	780	5,308	480	3,185	420
E226FX-4	4	11,148	1,026	7,963	960	6,370	780	6,350	1,080	6,370	780	3,981	480	2,389	420
E226FX-5	5	8,918	1,027	6,370	960	5,096	780	4,550	1,320	5,096	780	3,185	480	1,911	420
E226FX-6	6	7,432	2,230	5,308	2,039	4,247	1,019	3,540	1,320	4,247	1,020	2,654	792	1,593	720
E226FX-8	8	5,574	2,006	3,981	2,293	3,185	1,274	3,185	1,140	3,185	1,260	1,991	660	1,194	600
E226FX-10	10	4,459	1,873	3,185	2,141	2,548	1,070	3,650	1,140	2,548	1,068	1,593	576	956	480
E226FX-12	12	3,716	1,783	2,654	2,039	2,123	1,019	2,275	1,008	2,123	1,068	1,327	516	796	480
E226FX-16	16	2,787	1,505	1,991	1,529	1,593	860	1,990	1,008	1,593	860	995	420	597	360
E226FX-20	20	2,230	1,338	1,593	1,376	1,274	764	1,590	802	1,274	764	796	384	478	360
(mm) 		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D	
		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.2D		ae:0.05D		ae:0.05D		ae:0.05D	

High Speed Side Milling

Work Material		GR.1/GR.2/GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (～24HRC) (～30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		200		160		130		160		130		100		120	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E226FX-3	3	21,233	1,274	16,987	1,019	8,493	828	16,987	1,019	8,493	828	10,617	637	12,740	764
E226FX-4	4	15,925	1,911	12,740	1,529	6,370	1,242	12,740	1,529	6,370	1,242	7,963	956	9,555	1,147
E226FX-5	5	12,740	3,058	10,192	2,446	5,096	1,987	10,192	2,446	5,096	1,987	6,370	1,529	7,644	1,835
E226FX-6	6	10,617	3,185	8,493	2,548	6,901	2,070	8,493	2,548	6,901	2,070	5,308	1,593	6,370	1,911
E226FX-8	8	7,963	2,867	6,370	2,293	5,176	1,863	6,370	2,293	5,176	1,863	3,981	1,433	4,778	1,720
E226FX-10	10	6,370	2,675	5,096	2,140	4,141	1,739	5,096	2,140	4,141	1,739	3,185	1,338	3,822	1,605
E226FX-12	12	5,308	2,548	4,247	2,038	3,450	1,656	4,247	2,038	3,450	1,656	2,654	1,274	3,185	1,529
E226FX-16	16	3,981	2,150	3,185	1,720	2,588	1,397	3,185	1,720	2,588	1,397	1,991	1,075	2,389	1,290
E226FX-20	20	3,185	1,911	2,548	1,529	2,070	1,242	2,548	1,529	2,070	1,242	1,593	956	1,911	1,147
(mm) 		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D	
		ae:0.1D		ae:0.05D		ae:0.08D		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E227-3.0FX

End Mills With Corner Radius For Steel and Difficult To Cut Materials

MG Carbide

AlCrN FX

48°

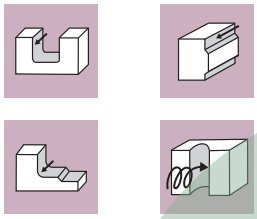
4

N

γ8°

R

Type of Operation



Work Material

P	H	M	K	N	S
●	●	●	●		●

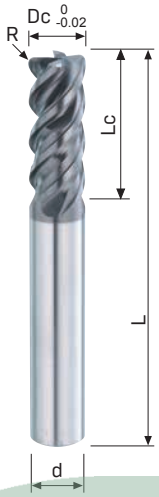
- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

4 Flutes designed with double core diameter, high rigidity, unequal flute and high helix angle.

Suitable for high speed trochoidal side-milling, which is compatible with APC high precision anti-vibration collet chuck.

Sharp cutting edge with radius is for multi-purpose cutting of materials such as carbon steel, alloy steel, stainless steel, cast iron, titanium alloy, nickel alloy, high temperature alloy...etc.



Code No. E227-3.0FX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlCrN E227-3.0FX
3	0.2	9	50	6	●
3	0.5	9	50	6	●
4	0.2	12	50	6	●
4	0.5	12	50	6	●
5	0.2	15	50	6	●
5	0.5	15	50	6	●
6	0.2	18	50	6	●
6	0.3	18	50	6	●
6	0.5	18	50	6	●
6	1.0	18	50	6	●
8	0.3	24	60	8	●
8	0.5	24	60	8	●
8	1.0	24	60	8	●
8	1.5	24	60	8	●
8	2.0	24	60	8	●
10	0.3	30	75	10	●
10	0.5	30	75	10	●
10	1.0	30	75	10	●
10	1.5	30	75	10	●
10	2.0	30	75	10	●
10	3.0	30	75	10	●
12	0.3	36	75	12	●
12	0.5	36	75	12	●
12	1.0	36	75	12	●
12	1.5	36	75	12	●
12	2.0	36	75	12	●
12	3.0	36	75	12	●
16	0.5	48	100	16	●
16	1.0	48	100	16	●
16	1.5	48	100	16	●
16	2.0	48	100	16	●
16	3.0	48	100	16	●
16	4.0	48	100	16	●

Side Milling

Work Material		GR.1/GR.2/GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4/GR.5 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.8 Stainless Steel		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		140		100		80		80		50		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E227-3.0FX-3	3	14,863	1,189	10,617	849	8,493	679	8,493	679	5,308	212	3,185	64
E227-3.0FX-4	4	11,148	1,338	7,963	956	6,370	764	6,370	764	3,981	319	2,389	110
E227-3.0FX-5	5	8,918	1,427	6,370	764	5,096	815	5,096	815	3,185	382	1,911	115
E227-3.0FX-6	6	7,432	1,486	5,308	1,359	4,247	849	4,247	849	2,654	425	1,593	255
E227-3.0FX-8	8	5,574	1,338	3,981	1,274	3,185	764	3,185	892	1,991	358	1,194	239
E227-3.0FX-10	10	4,459	1,249	3,185	1,223	2,548	713	2,548	815	1,593	350	956	229
E227-3.0FX-12	12	3,716	1,189	2,654	1,189	2,123	679	2,123	764	1,327	319	796	223
E227-3.0FX-16	16	2,787	1,003	1,991	892	1,593	573	1,593	637	995	239	597	191
E227-3.0FX-20	20	2,230	892	1,593	815	1,274	510	1,274	510	796	223	478	153
(mm) 		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D	
		ae:0.12D		ae:0.1D		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.05D	

High Speed Side Milling

Work Material		GR.1/GR.2/GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4/GR.5 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.8 Stainless Steel		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		200		160		130		130		100		80	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E227-3.0FX-6	6	10,617	2,973	8,493	1,359	6,901	1,380	6,901	828	5,308	637	4,247	510
E227-3.0FX-8	8	7,963	2,548	6,370	1,274	5,176	1,242	5,176	828	3,981	478	3,185	510
E227-3.0FX-10	10	6,370	2,293	5,096	1,631	4,141	1,159	4,141	994	3,185	382	2,548	612
E227-3.0FX-12	12	5,308	2,123	4,247	1,699	3,450	1,104	3,450	897	2,654	319	2,123	552
E227-3.0FX-16	16	3,981	1,752	3,185	1,274	2,588	932	2,588	725	1,991	239	1,593	446
E227-3.0FX-20	20	3,185	1,529	2,548	1,223	2,070	828	2,070	662	1,593	191	1,274	408
(mm) 		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D	
		ae:0.1D		ae:0.05D		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

B220FX

Ball Nose End Mills For Steel and Difficult To Cut Materials

MG Carbide

AlCrN FX

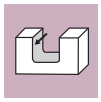








Type of Operation



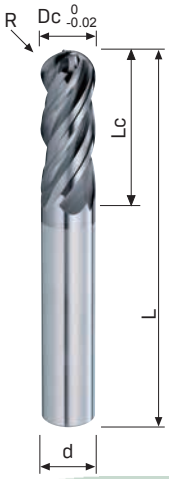




Work Material

P	H	M	K	N	S
●	●	●			●

P	Steel
H	<38HRC Hardened Steel
H	<48HRC Hardened Steel
M	Stainless Steel
S	Titanium
S	Nickel
S	High Temp Alloys



Code No. B220FX-Dc

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlCrN B220FX
6	3	15	50	6	●
8	4	20	60	8	●
10	5	25	75	10	●
12	6	30	75	12	●
16	5	40	100	16	●
20	10	50	100	20	●

Feature of product:

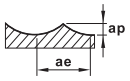
Various Helix Geometry Ball Nose End Mills-4 Flutes

High rigidity and unequal flute.

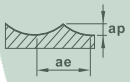
Using with an APC high precision anti-vibration collet chuck.

Sharp cutting edge with micro passivation is for carbon steel, stainless steel, titanium alloy, nickel alloy, high temperature alloy...etc.

Finishing

Work Material		GR.1/GR.2/GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4/GR.5 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.8 Stainless Steel		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		140		100		80		80		50		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B220FX-6	6	7,432	1,486	5,308	849	4,247	849	4,247	849	2,654	425	1,593	255
B220FX-8	8	5,574	1,338	3,981	796	3,185	764	3,185	892	1,991	358	1,194	239
B220FX-10	10	4,459	1,249	3,185	764	2,548	713	2,548	815	1,593	350	956	229
B220FX-12	12	3,716	1,189	2,654	743	2,123	679	2,123	764	1,327	319	796	223
B220FX-16	16	2,787	1,003	1,991	557	1,593	573	1,593	637	995	239	597	191
B220FX-20	20	2,230	892	1,593	510	1,274	510	1,274	510	796	223	478	153
(mm) 		ap:0.05D		ap:0.03D		ap:0.05D		ap:0.05D		ap:0.05D		ap:0.03D	
		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.03D		ae:0.03D		ae:0.03D	

High feed machining

Work Material		GR.1/GR.2/GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4/GR.5 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.8 Stainless Steel		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		200		160		130		130		100		80	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B220FX-6	6	10,617	2,973	8,493	1,359	6,901	1,380	6,901	828	5,308	637	4,247	510
B220FX-8	8	7,963	2,548	6,370	1,274	5,176	1,242	5,176	828	3,981	478	3,185	510
B220FX-10	10	6,370	2,293	5,096	1,631	4,141	1,159	4,141	994	3,185	382	2,548	612
B220FX-12	12	5,308	2,123	4,247	1,699	3,450	1,104	3,450	897	2,654	319	2,123	552
B220FX-16	16	3,981	1,752	3,185	1,274	2,588	932	2,588	725	1,991	239	1,593	446
B220FX-20	20	3,185	1,529	2,548	1,223	2,070	828	2,070	662	1,593	191	1,274	408
(mm) 		ap:0.05D		ap:0.03D		ap:0.05D		ap:0.05D		ap:0.05D		ap:0.03D	
		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.03D		ae:0.03D		ae:0.03D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E129SX

Finishing End Mills For Difficult To Cut Materials

MG Carbide

AlTiXZrN SX

38°

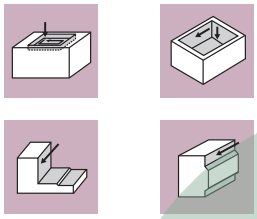
4

N

γ8°

90°

Type of Operation



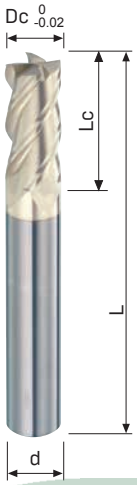
Work Material

P	H	M	K	N	S
●	●	●			●

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Sharp cutting edge is suitable in finishing for difficult-to-cut materials such as, hardened steel, stainless steel, titanium alloy, nickel alloy, high temperature alloy and etc.



Code No. E129SX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiXZrN E129SX
1	3	50	4	●
1.5	5	50	4	●
2	6	50	4	●
2.5	8	50	4	●
3A	8	50	4	●
4A	11	50	4	●
3	8	50	6	●
4	11	50	6	●
5	13	50	6	●
6	16	50	6	●
8	20	60	8	●
10	22	72	10	●
12	26	75	12	●

Side Milling

Work Material		GR.8 Stainless Stell		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		65		50		30		20	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E129SX-1	1	20,703	414	15,925	319	9,555	191	6,370	127
E129SX-1.5	1.5	13,802	442	10,617	340	6,370	204	4,247	136
E129SX-2	2	10,351	414	7,963	319	4,778	191	3,185	127
E129SX-2.5	2.5	8,281	497	6,370	382	3,822	229	2,548	122
E129SX-3	3	6,901	552	8,493	679	3,185	127	2,123	64
E129SX-4	4	5,176	621	6,370	764	2,389	191	1,593	64
E129SX-5	5	4,141	662	5,096	815	1,911	229	1,274	76
E129SX-6	6	3,450	690	2,654	531	1,593	255	1,062	149
E129SX-8	8	2,588	621	1,991	557	1,194	215	796	127
E129SX-10	10	2,070	580	1,593	510	956	210	637	127
E129SX-12	12	1,725	552	1,327	478	796	191	531	127
（mm） 		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D	
		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E233SX / E234SX

Finishing End Mills For Difficult To Cut Materials

MG Carbide

AlTiXZrN SX

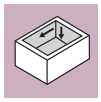


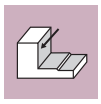


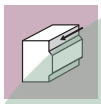


Type of Operation









Work Material

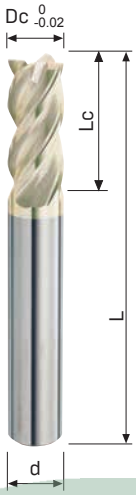
P	H	M	K	N	S
●	●	●			●

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Sharp cutting edge is suitable in roughing and finishing for difficult-to-cut materials such as, hardened steel, stainless steel, titanium alloy, nickel alloy, high temperature alloy and etc.

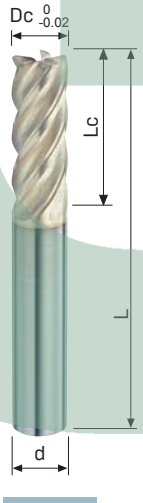
Using with an APC high precision anti-vibration collet chuck.





Code No. E233SX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiXZrN E233SX
3	8	50	6	●
4	11	50	6	●
5	13	50	6	●
6	16	50	6	●
8	20	60	8	●
10	22	72	10	●
12	26	75	12	●





Code No. E234SX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiXZrN E234SX
3	8	50	6	●
4	11	50	6	●
5	13	50	6	●
6	16	50	6	●
8	20	60	8	●
10	25	72	10	●
12	30	75	12	●

E233SX Side Milling

Work Material		GR.1/GR.2/GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4/GR.5 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.8 Stainless Steel		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		140		100		80		80		50		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E233SX-3	3	14,863	1,189	10,617	637	8,493	679	8,493	679	5,308	212	3,185	64
E233SX-4	4	11,148	1,338	7,963	637	6,370	764	6,370	764	3,981	319	2,389	110
E233SX-5	5	8,918	1,427	6,370	637	5,096	815	5,096	815	3,185	382	1,911	115
E233SX-6	6	7,432	1,486	5,308	637	4,247	849	4,247	849	2,654	425	1,593	255
E233SX-8	8	5,574	1,338	3,981	557	3,185	764	3,185	892	1,991	358	1,194	239
E233SX-10	10	4,459	1,249	3,185	510	2,548	713	2,548	815	1,593	350	956	229
E233SX-12	12	3,716	1,189	2,654	531	2,123	679	2,123	764	1,327	319	796	223
E233SX-16	16	2,787	1,003	1,991	557	1,593	573	1,593	637	995	239	597	191
E233SX-20	20	2,230	892	1,593	510	1,274	510	1,274	510	796	223	478	153
(mm) 		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D	
		ae:0.12D		ae:0.1D		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.05D	

E234SX Side Milling

Work Material		GR.1/GR.2/GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4/GR.5 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.8 Stainless Steel		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		140		100		80		80		50		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E234SX-3	3	14,863	1,189	10,617	637	8,493	679	8,493	679	5,308	212	3,185	64
E234SX-4	4	11,148	1,338	7,963	637	6,370	764	6,370	764	3,981	319	2,389	110
E234SX-5	5	8,918	1,427	6,370	637	5,096	815	5,096	815	3,185	382	1,911	115
E234SX-6	6	7,432	1,486	5,308	637	4,247	849	4,247	849	2,654	425	1,593	255
E234SX-8	8	5,574	1,338	3,981	557	3,185	764	3,185	892	1,991	358	1,194	239
E234SX-10	10	4,459	1,249	3,185	510	2,548	713	2,548	815	1,593	350	956	229
E234SX-12	12	3,716	1,189	2,654	531	2,123	679	2,123	764	1,327	319	796	223
E234SX-16	16	2,787	1,003	1,991	557	1,593	573	1,593	637	995	239	597	191
E234SX-20	20	2,230	892	1,593	510	1,274	510	1,274	510	796	223	478	153
(mm) 		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D	
		ae:0.12D		ae:0.1D		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E235-2.5SX

End Mills With Corner Radius for Difficult To Cut Materials

MG Carbide

AlTiXZrN SX

38°

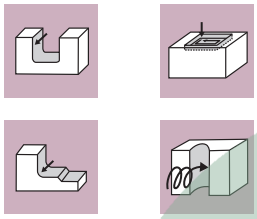
5

N

γ8°

R

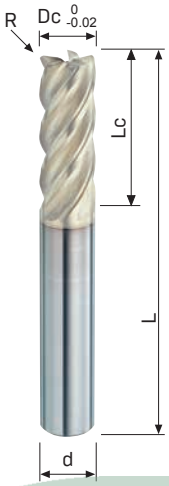
Type of Operation



Work Material

P	H	M	K	N	S
●	●	●			●

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys



Code No. E235-2.5SX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiXZrN E235-2.5SX
6	0.3	15	50	6	●
8	0.3	20	60	8	●
10	0.3	25	72	10	●
12	0.3	30	75	12	●
16	0.5	40	100	16	●
20	0.5	50	100	20	●

Feature of product:

End Mills for Difficult To Cut Materials-5 Flutes

Designed with high rigidity and unequal flute.

Using with an APC high precision anti-vibration collet chuck.

Sharp cutting edge with corner radius is for carbon steel, stainless steel, titanium alloy, nickel alloy, high temperature alloy...etc.

Side Milling

Work Material		GR.1/GR.2/GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4/GR.5 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.8 Stainless Steel		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		140		100		80		80		50		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E235-2.5SX-6	6	7,432	1,858	5,308	1,062	4,247	1,062	4,247	1,062	2,654	531	1,593	319
E235-2.5SX-8	8	5,574	1,672	3,981	995	3,185	956	3,185	1,115	1,991	448	1,194	299
E235-2.5SX-10	10	4,459	1,561	3,185	956	2,548	892	2,548	1,019	1,593	438	956	287
E235-2.5SX-12	12	3,716	1,486	2,654	929	2,123	849	2,123	956	1,327	398	796	279
E235-2.5SX-16	16	2,787	1,254	1,991	697	1,593	717	1,593	796	995	299	597	239
E235-2.5SX-20	20	2,230	1,115	1,593	637	1,274	637	1,274	637	796	279	478	191
(mm) 		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D	
		ae:0.12D		ae:0.1D		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.05D	

High Speed Side Milling

Work Material		GR.1/GR.2/GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4/GR.5 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.8 Stainless Steel		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		200		160		130		130		100		80	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E235-2.5SX-6	6	10,617	3,716	8,493	1,699	6,901	1,725	6,901	1,035	5,308	796	4,247	637
E235-2.5SX-8	8	7,963	3,185	6,370	1,593	5,176	1,553	5,176	1,035	3,981	597	3,185	637
E235-2.5SX-10	10	6,370	2,867	5,096	2,038	4,141	1,449	4,141	1,242	3,185	478	2,548	764
E235-2.5SX-12	12	5,308	2,654	4,247	2,123	3,450	1,380	3,450	1,121	2,654	398	2,123	690
E235-2.5SX-16	16	3,981	2,190	3,185	1,593	2,588	1,165	2,588	906	1,991	299	1,593	557
E235-2.5SX-20	20	3,185	1,911	2,548	1,529	2,070	1,035	2,070	828	1,593	239	1,274	510
(mm) 		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D	
		ae:0.1D		ae:0.05D		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E236-2.5SX / 4.0SX

End Mills With Corner Radius for Difficult To Cut Materials (Chipbreaker)

MG Carbide

AlTiXZrN SX

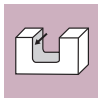


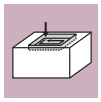


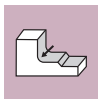


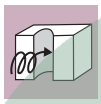


Type of Operation









Work Material

P	H	M	K	N	S
●	●	●			●

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

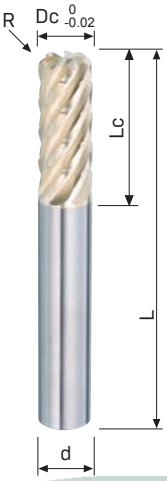
Feature of product:

End Mills for Difficult To Cut Materials-7 Flutes

High rigidity, unequal flute and chip breaker design.

Using with an APC high precision anti-vibration collet chuck.

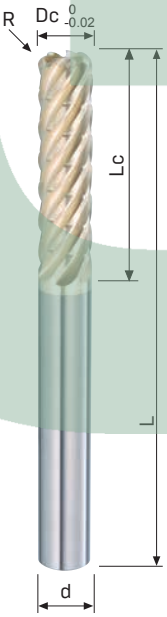
Sharp cutting edge with corner radius is for carbon steel, stainless steel, titanium alloy, nickel alloy, high temperature alloy...etc.



Code No. E236-2.5SX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiXZrN E236-2.5SX
6	0.3	15	50	6	○
6	0.5	15	50	6	○
8	0.5	20	60	8	○
8	1	20	60	8	○
8	2	20	60	8	○
10	0.5	25	72	10	○
10	1	25	72	10	○
10	2	25	72	10	○
12	0.5	30	75	12	○
12	1	30	75	12	○
12	2	30	75	12	○
12	3	30	75	12	○
16	0.5	40	100	16	○
16	1	40	100	16	○
16	2	40	100	16	○
16	3	40	100	16	○
20	0.5	50	100	20	○
20	1	50	100	20	○
20	2	50	100	20	○
20	3	50	100	20	○
20	4	50	100	20	○

○ Non-stock item, MOQ: 10pcs.



Code No. E236-4.0SX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiXZrN E236-4.0SX
6	0.3	24	65	6	○
6	0.5	24	65	6	○
8	0.5	32	75	8	○
8	1	32	75	8	○
8	2	32	75	8	○
10	0.5	40	100	10	○
10	1	40	100	10	○
10	2	40	100	10	○
12	0.5	48	100	12	○
12	1	48	100	12	○
12	2	48	100	12	○
12	3	48	100	12	○
16	0.5	64	120	16	○
16	1	64	120	16	○
16	2	64	120	16	○
16	3	64	120	16	○
20	0.5	80	140	20	○
20	1	80	140	20	○
20	2	80	140	20	○
20	3	80	140	20	○
20	4	80	140	20	○

○ Non-stock item, MOQ: 10pcs.

Side Milling

Work Material		GR.1/GR.2/GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4/GR.5 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.8 Stainless Steel		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		140		100		80		80		50		30	
E236-2.5SX-6	6	7,432	2,601	5,308	1,486	4,247	1,486	4,247	1,486	2,654	743	1,593	446
E236-2.5SX-8	8	5,574	2,341	3,981	1,393	3,185	1,338	3,185	1,561	1,991	627	1,194	418
E236-2.5SX-10	10	4,459	2,185	3,185	1,338	2,548	1,249	2,548	1,427	1,593	613	956	401
E236-2.5SX-12	12	3,716	2,081	2,654	1,301	2,123	1,189	2,123	1,338	1,327	557	796	390
E236-2.5SX-16	16	2,787	1,756	1,991	975	1,593	1,003	1,593	1,115	995	418	597	334
E236-2.5SX-20	20	2,230	1,561	1,593	892	1,274	892	1,274	892	796	390	478	268
(mm) 		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D	
		ae:0.12D		ae:0.1D		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.05D	

High Speed Side Milling

Work Material		GR.1/GR.2/GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4/GR.5 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.8 Stainless Steel		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		200		160		130		130		100		80	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E236-2.5SX-6	6	10,617	5,202	8,493	2,378	6,901	2,415	6,901	1,449	5,308	1,115	4,247	892
E236-2.5SX-8	8	7,963	4,459	6,370	2,230	5,176	2,174	5,176	1,449	3,981	836	3,185	892
E236-2.5SX-10	10	6,370	4,013	5,096	2,854	4,141	2,029	4,141	1,739	3,185	669	2,548	1,070
E236-2.5SX-12	12	5,308	3,716	4,247	2,973	3,450	1,932	3,450	1,570	2,654	557	2,123	966
E236-2.5SX-16	16	3,981	3,066	3,185	2,230	2,588	1,630	2,588	1,268	1,991	418	1,593	780
E236-2.5SX-20	20	3,185	2,675	2,548	2,140	2,070	1,449	2,070	1,159	1,593	334	1,274	713
(mm) 		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D	
		ae:0.1D		ae:0.05D		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.05D	

※ Notice: E236-4.0SX is Long Length series End Mills. Please adjust the parameter according.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E237-2.5SX / 4.0SX

End Mills For Difficult To Cut Materials (Chamfer Corner)

MG Carbide

AlTiXZrN SX

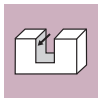


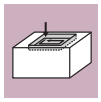


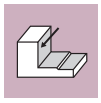


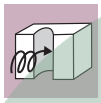


Type of Operation









Work Material

P	H	M	K	N	S
●	●	●			●

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

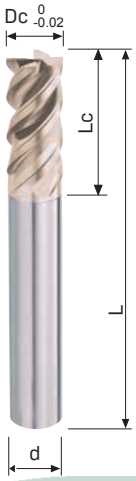
Feature of product:

4 Flutes designed with double core diameter, high rigidity, unequal flute and high helix angle.

Suitable for high speed trochoidal side-milling,

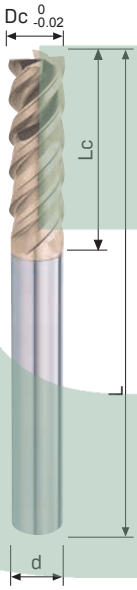
which is compatible with APC high precision anti-vibration collet chuck.

Sharp cutting edge with chamfer corner, is for carbon steel, alloy steel, stainless steel, titanium alloy, nickel alloy, and high temperature alloy...etc.



Code No. E237-2.5SX-Dc×C45°

Dc 0 -0.02	C45° mm	Lc mm	L mm	d h6	AlTiXZrN E237-2.5SX
3	0.05	7.5	50	6	●
4	0.06	10	50	6	●
5	0.08	12.5	50	6	●
6	0.09	15	50	6	●
8	0.12	20	60	8	●
10	0.15	25	72	10	●
12	0.18	30	75	12	●
16	0.24	40	100	16	●
20	0.3	50	100	20	●



Code No. E237-4.0SX-Dc×C45°

Dc 0 -0.02	C45° mm	Lc mm	L mm	d h6	AlTiXZrN E237-4.0SX
6	0.09	24	65	6	●
8	0.12	32	75	8	●
10	0.15	40	100	10	●
12	0.18	48	100	12	●
16	0.24	64	120	16	●
20	0.3	80	140	20	●

Side Milling

Work Material		GR.1/GR.2/GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4/GR.5 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.8 Stainless Steel		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		140		100		80		80		50		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E237-2.5SX-3	3	14,863	1,189	10,617	849	8,493	679	8,493	679	5,308	212	3,185	64
E237-2.5SX-4	4	11,148	1,338	7,963	956	6,370	764	6,370	764	3,981	319	2,389	110
E237-2.5SX-5	5	8,918	1,427	6,370	764	5,096	815	5,096	815	3,185	382	1,911	115
E237-2.5SX-6	6	7,432	1,486	5,308	1,359	4,247	849	4,247	849	2,654	425	1,593	255
E237-2.5SX-8	8	5,574	1,338	3,981	1,274	3,185	764	3,185	892	1,991	358	1,194	239
E237-2.5SX-10	10	4,459	1,249	3,185	1,223	2,548	713	2,548	815	1,593	350	956	229
E237-2.5SX-12	12	3,716	1,189	2,654	1,189	2,123	679	2,123	764	1,327	319	796	223
E237-2.5SX-16	16	2,787	1,003	1,991	892	1,593	573	1,593	637	995	239	597	191
E237-2.5SX-20	20	2,230	892	1,593	815	1,274	510	1,274	510	796	223	478	153
(mm)		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D	
		ae:0.12D		ae:0.1D		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.05D	

High Speed Side Milling

Work Material		GR.1/GR.2/GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4/GR.5 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.8 Stainless Steel		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		200		160		130		130		100		80	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E237-2.5SX-6	6	10,617	2,973	8,493	1,359	6,901	1,380	6,901	828	5,308	637	4,247	510
E237-2.5SX-8	8	7,963	2,548	6,370	1,274	5,176	1,242	5,176	828	3,981	478	3,185	510
E237-2.5SX-10	10	6,370	2,293	5,096	1,631	4,141	1,159	4,141	994	3,185	382	2,548	612
E237-2.5SX-12	12	5,308	2,123	4,247	1,699	3,450	1,104	3,450	897	2,654	319	2,123	552
E237-2.5SX-16	16	3,981	1,752	3,185	1,274	2,588	932	2,588	725	1,991	239	1,593	446
E237-2.5SX-20	20	3,185	1,529	2,548	1,223	2,070	828	2,070	662	1,593	191	1,274	408
(mm)		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D	
		ae:0.1D		ae:0.05D		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.05D	

※ Notice: E237-4.0SX is Long Length series End Mills. Please adjust the parameter according.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E247-2.5SX / 4.0SX

End Mills With Corner Radius For Difficult To Cut Materials

MG Carbide

AlTiXZrN SX

48°

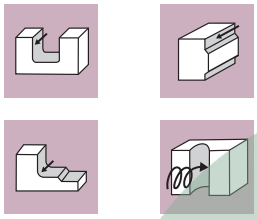
4

N

γ8°

R

Type of Operation



Work Material

P	H	M	K	N	S
●	●	●			●

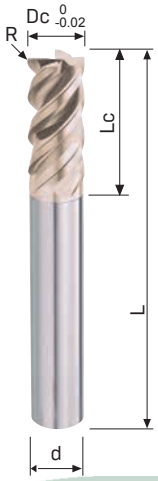
- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

4 Flutes designed with double core diameter, high rigidity, unequal flute and high helix angle.

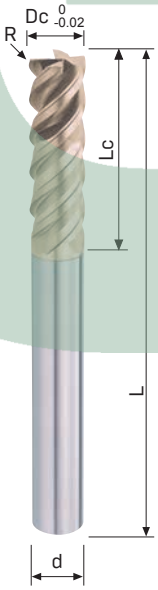
Suitable for high speed trochoidal side-milling, which is compatible with APC high precision anti-vibration collet chuck.

Sharp cutting edge with corner radius, is for carbon steel, alloy steel, stainless steel, titanium alloy, nickel alloy, and high temperature alloy...etc.



Code No. E247-2.5SX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiXZrN E247-2.5SX
3	0.2	7.5	50	6	●
4	0.2	10	50	6	●
5	0.2	12.5	50	6	●
6	0.2	15	50	6	●
6	0.3	15	50	6	●
6	0.5	15	50	6	●
6	1.0	15	50	6	●
8	0.5	20	60	8	●
8	1.0	20	60	8	●
10	0.5	25	72	10	●
10	1.0	25	72	10	●
10	2.0	25	72	10	●
10	3.0	25	72	10	●
12	0.5	30	75	12	●
12	1.0	30	75	12	●
12	2.0	30	75	12	●
12	3.0	30	75	12	●
16	0.5	40	100	16	●
16	1.0	40	100	16	●
16	2.0	40	100	16	●
16	3.0	40	100	16	●
16	4.0	40	100	16	●
16	6.0	40	100	16	●
20	0.5	50	100	20	●
20	1.0	50	100	20	●
20	2.0	50	100	20	●
20	3.0	50	100	20	●
20	4.0	50	100	20	●
20	6.0	50	100	20	●



Code No. E247-4.0SX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiXZrN E247-4.0SX
6	0.2	24	65	6	●
6	0.3	24	65	6	●
6	0.5	24	65	6	●
6	1.0	24	65	6	●
8	0.5	32	75	8	●
8	1.0	32	75	8	●
10	0.5	40	100	10	●
10	1.0	40	100	10	●
10	2.0	40	100	10	●
10	3.0	40	100	10	●
12	0.5	48	100	12	●
12	1.0	48	100	12	●
12	2.0	48	100	12	●
12	3.0	48	100	12	●
16	0.5	64	120	16	●
16	1.0	64	120	16	●
16	2.0	64	120	16	●
16	3.0	64	120	16	●
16	4.0	64	120	16	●
16	6.0	64	120	16	●
20	0.5	80	140	20	●
20	1.0	80	140	20	●
20	2.0	80	140	20	●
20	3.0	80	140	20	●
20	4.0	80	140	20	●
20	6.0	80	140	20	●

Side Milling

Work Material		GR.1/GR.2/GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4/GR.5 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.8 Stainless Steel		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		140		100		80		80		50		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E247-2.5SX-3	3	14,863	1,189	10,617	849	8,493	679	8,493	679	5,308	212	3,185	64
E247-2.5SX-4	4	11,148	1,338	7,963	956	6,370	764	6,370	764	3,981	319	2,389	110
E247-2.5SX-5	5	8,918	1,427	6,370	764	5,096	815	5,096	815	3,185	382	1,911	115
E247-2.5SX-6	6	7,432	1,486	5,308	1,359	4,247	849	4,247	849	2,654	425	1,593	255
E247-2.5SX-8	8	5,574	1,338	3,981	1,274	3,185	764	3,185	892	1,991	358	1,194	239
E247-2.5SX-10	10	4,459	1,249	3,185	1,223	2,548	713	2,548	815	1,593	350	956	229
E247-2.5SX-12	12	3,716	1,189	2,654	1,189	2,123	679	2,123	764	1,327	319	796	223
E247-2.5SX-16	16	2,787	1,003	1,991	892	1,593	573	1,593	637	995	239	597	191
E247-2.5SX-20	20	2,230	892	1,593	815	1,274	510	1,274	510	796	223	478	153
(mm)		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D	
		ae:0.12D		ae:0.1D		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.05D	

High Speed Side Milling

Work Material		GR.1/GR.2/GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4/GR.5 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.8 Stainless Steel		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		200		160		130		130		100		80	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E247-2.5SX-6	6	10,617	2,973	8,493	1,359	6,901	1,380	6,901	828	5,308	637	4,247	510
E247-2.5SX-8	8	7,963	2,548	6,370	1,274	5,176	1,242	5,176	828	3,981	478	3,185	510
E247-2.5SX-10	10	6,370	2,293	5,096	1,631	4,141	1,159	4,141	994	3,185	382	2,548	612
E247-2.5SX-12	12	5,308	2,123	4,247	1,699	3,450	1,104	3,450	897	2,654	319	2,123	552
E247-2.5SX-16	16	3,981	1,752	3,185	1,274	2,588	932	2,588	725	1,991	239	1,593	446
E247-2.5SX-20	20	3,185	1,529	2,548	1,223	2,070	828	2,070	662	1,593	191	1,274	408
(mm)		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D	
		ae:0.1D		ae:0.05D		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.05D	

※ Notice: E247-4.0SX is Long Length series End Mills. Please adjust the parameter according.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E238-2.5SX / 4.0SX

End Mills For Difficult To Cut Materials (Chamfer Corner • Chipbreaker)

MG Carbide

AlTiXZrN SX

48°

5

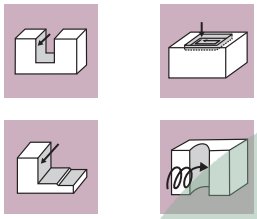
N

γ8°

0.09-0.3

45°

Type of Operation



Work Material

P	H	M	K	N	S
●	●	●			●

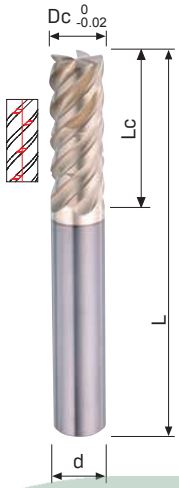
- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

5 Flutes designed with double core diameter, high rigidity, unequal flute ,high helix angle and chip breaker design.

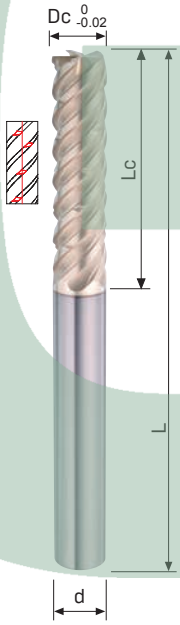
Suitable for high speed trochoidal side-milling, which is compatible with APC high precision anti-vibration collet chuck.

Sharp cutting edge with chamfer corner, is for carbon steel, alloy steel, stainless steel, titanium alloy, nickel alloy, and high temperature alloy...etc.



Code No. E238-2.5SX-Dc×C45°

Dc 0 -0.02	C45° mm	Lc mm	L mm	d h6	AlTiXZrN E238-2.5SX
6	0.09	15	50	6	●
8	0.12	20	60	8	●
10	0.15	25	72	10	●
12	0.18	30	75	12	●
16	0.24	40	100	16	●
20	0.3	50	100	20	●



Code No. E238-4.0SX-Dc×C45°

Dc 0 -0.02	C45° mm	Lc mm	L mm	d h6	AlTiXZrN E238-4.0SX
6	0.09	24	65	6	●
8	0.12	32	75	8	●
10	0.15	40	100	10	●
12	0.18	48	100	12	●
16	0.24	64	120	16	●
20	0.3	80	140	20	●

Side Milling

Work Material		GR.1/GR.2/GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4/GR.5 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.8 Stainless Steel		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		140		100		80		80		50		70	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E238-2.5SX-6	6	7,432	1,858	5,308	1,699	4,247	1,062	4,247	1,062	2,654	664	3,716	929
E238-2.5SX-8	8	5,574	1,672	3,981	1,911	3,185	956	3,185	1,115	1,991	547	2,787	975
E238-2.5SX-10	10	4,459	1,561	3,185	1,784	2,548	892	2,548	1,019	1,593	478	2,230	892
E238-2.5SX-12	12	3,716	1,486	2,654	1,699	2,123	849	2,123	956	1,327	431	1,858	836
E238-2.5SX-16	16	2,787	1,254	1,991	1,274	1,593	717	1,593	796	995	348	1,393	697
E238-2.5SX-20	20	2,230	1,115	1,593	1,147	1,274	637	1,274	637	796	319	1,115	557
(mm) 		ap:2.0D		ap:2.0D		ap:2.0D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D	

High Speed Side Milling

Work Material		GR.1/GR.2/GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4/GR.5 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.8 Stainless Steel		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		200		160		130		130		100		120	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E238-2.5SX-6	6	10,617	3,716	8,493	1,699	6,901	1,725	6,901	1,725	5,308	1,327	6,370	1,593
E238-2.5SX-8	8	7,963	3,185	6,370	1,593	5,176	1,553	5,176	1,811	3,981	1,095	4,778	1,672
E238-2.5SX-10	10	6,370	2,867	5,096	2,038	4,141	1,449	4,141	1,656	3,185	956	3,822	1,529
E238-2.5SX-12	12	5,308	2,654	4,247	2,123	3,450	1,380	3,450	1,553	2,654	863	3,185	1,433
E238-2.5SX-16	16	3,981	2,190	3,185	1,593	2,588	1,165	2,588	1,294	1,991	697	2,389	1,194
E238-2.5SX-20	20	3,185	1,911	2,548	1,529	2,070	1,035	2,070	1,035	1,593	637	1,911	956
(mm) 		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D	
		ae:0.1D		ae:0.05D		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.05D	

※ Notice: E238-4.0SX is Long Length series End Mills. Please adjust the parameter according.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E248-2.5SX / 4.0SX

End Mills With Corner Radius For Difficult To Cut Materials (Chipbreaker)

MG Carbide

AlTiXZrN SX

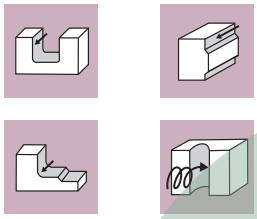
48°

5

N 78°

R

Type of Operation



Work Material

P	H	M	K	N	S
●	●	●			●

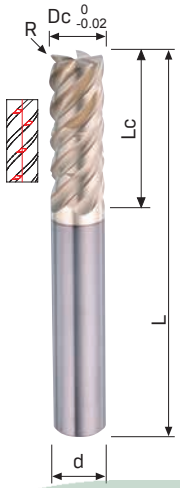
- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

5 Flutes designed with double core diameter, high rigidity, unequal flute ,high helix angle and chip breaker design.

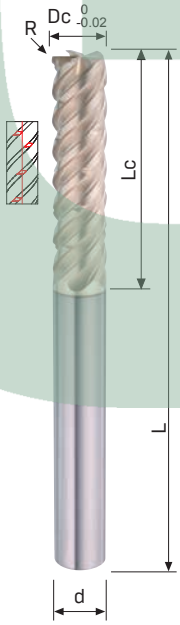
Suitable for high speed trochoidal side-milling, which is compatible with APC high precision anti-vibration collet chuck.

Sharp cutting edge with corner radius, is for carbon steel, alloy steel, stainless steel, titanium alloy, nickel alloy, and high temperature alloy...etc.



Code No. E248-2.5SX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiXZrN E248-2.5SX
6	0.2	15	50	6	●
6	0.3	15	50	6	●
6	0.5	15	50	6	●
6	1.0	15	50	6	●
8	0.5	20	60	8	●
8	1.0	20	60	8	●
10	0.5	25	72	10	●
10	1.0	25	72	10	●
10	2.0	25	72	10	●
10	3.0	25	72	10	●
12	0.5	30	75	12	●
12	1.0	30	75	12	●
12	2.0	30	75	12	●
12	3.0	30	75	12	●
16	0.5	40	100	16	●
16	1.0	40	100	16	●
16	3.0	40	100	16	●
16	6.0	40	100	16	●
20	0.5	50	100	20	●
20	1.0	50	100	20	●
20	3.0	50	100	20	●
20	6.0	50	100	20	●



Code No. E248-4.0SX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiXZrN E248-4.0SX
6	0.2	24	65	6	●
6	0.3	24	65	6	●
6	0.5	24	65	6	●
6	1.0	24	65	6	●
8	0.5	32	75	8	●
8	1.0	32	75	8	●
10	0.5	40	100	10	●
10	1.0	40	100	10	●
10	2.0	40	100	10	●
10	3.0	40	100	10	●
12	0.5	48	100	12	●
12	1.0	48	100	12	●
12	2.0	48	100	12	●
12	3.0	48	100	12	●
16	0.5	64	120	16	●
16	3.0	64	120	16	●
16	6.0	64	120	16	●
20	0.5	80	140	20	●
20	3.0	80	140	20	●
20	6.0	80	140	20	●

Side Milling

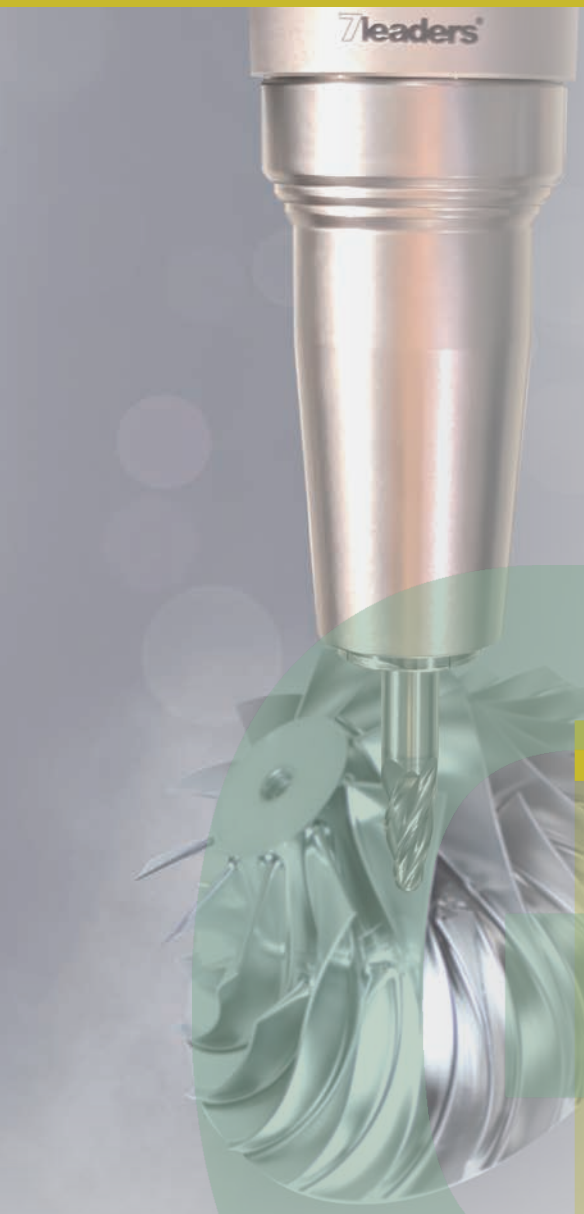
Work Material		GR.1/GR.2/GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4/GR.5 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.8 Stainless Steel		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		140		100		80		80		50		70	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E248-2.5SX-6	6	7,432	1,858	5,308	1,699	4,247	1,062	4,247	1,062	2,654	664	3,716	929
E248-2.5SX-8	8	5,574	1,672	3,981	1,911	3,185	956	3,185	1,115	1,991	547	2,787	975
E248-2.5SX-10	10	4,459	1,561	3,185	1,784	2,548	892	2,548	1,019	1,593	478	2,230	892
E248-2.5SX-12	12	3,716	1,486	2,654	1,699	2,123	849	2,123	956	1,327	431	1,858	836
E248-2.5SX-16	16	2,787	1,254	1,991	1,274	1,593	717	1,593	796	995	348	1,393	697
E248-2.5SX-20	20	2,230	1,115	1,593	1,147	1,274	637	1,274	637	796	319	1,115	557
(mm) 		ap:2.0D		ap:2.0D		ap:2.0D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D	

High Speed Side Milling

Work Material		GR.1/GR.2/GR.3 Carbon Steels/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4/GR.5 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.8 Stainless Steel		GR.15 Titanium		GR.16 Nickel		GR.17 High Temp Alloys	
Vc m/min		200		160		130		130		100		120	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E248-2.5SX-6	6	10,617	3,716	8,493	1,699	6,901	1,725	6,901	1,725	5,308	1,327	6,370	1,593
E248-2.5SX-8	8	7,963	3,185	6,370	1,593	5,176	1,553	5,176	1,811	3,981	1,095	4,778	1,672
E248-2.5SX-10	10	6,370	2,867	5,096	2,038	4,141	1,449	4,141	1,656	3,185	956	3,822	1,529
E248-2.5SX-12	12	5,308	2,654	4,247	2,123	3,450	1,380	3,450	1,553	2,654	863	3,185	1,433
E248-2.5SX-16	16	3,981	2,190	3,185	1,593	2,588	1,165	2,588	1,294	1,991	697	2,389	1,194
E248-2.5SX-20	20	3,185	1,911	2,548	1,529	2,070	1,035	2,070	1,035	1,593	637	1,911	956
(mm) 		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D	
		ae:0.1D		ae:0.05D		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.05D	

※ Notice: E248-4.0SX is Long Length series End Mills. Please adjust the parameter according.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.



5-Axis End Mills

Page	71	71	72	72	73	73
Appearance						
Code No	Q136FX	Q136SX	Q138FX	Q138SX	Q139FX	Q139SX
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
Coating	AlCrN FX	AlTiXZrN SX	AlCrN FX	AlTiXZrN SX	AlCrN FX	AlTiXZrN SX
Helix Angle	 30°	 30°	 30°	 30°	 30°	 30°
No.of Flutes	 4	 4	 4	 4	 4	 4

74	74	75	76	77	78
					
Q135FX	**Q135SX**	**Q146 Q146DX**	**Q148 Q148DX**	**Q149 Q149DX**	**Q145 Q145DX**
MG Carbide	**MG Carbide**	**MG Carbide**	**MG Carbide**	**MG Carbide**	**MG Carbide**
AlCrN FX	**AlTiXZrN SX**	**DLC DX**	**DLC DX**	**DLC DX**	**DLC DX**
 30°	 30°	 30°	 30°	 30°	 30°
 5	 5	 4	 4	 4	 5

Q136FX / Q136SX

5-Axis End Mills (Oval Form)

MG Carbide

AlCrN FX

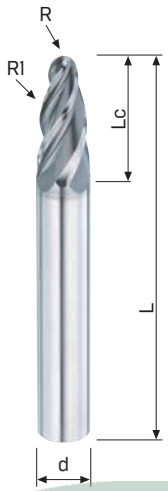
30°

AlTiXZrN SX

H

78°

4



Code No. Q136FX-R×R1
Q136SX-R×R1

R mm	R1 mm	Lc mm	L mm	d h6	AlCrN Q136FX	AlTiXZrN Q136SX
2.5	80	22.03	72	10	○	○
3	96	26.43	75	12	○	○
4	128	35.24	100	16	○	○
5	160	44.05	100	20	○	○

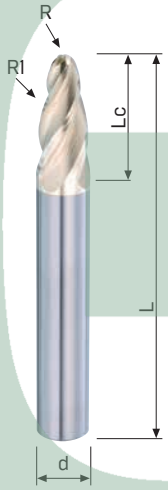
○ Non-stock item, pricing based on order quantity.
Please refer to page P79 for parameters.

Type of Operation

Work Material

P	H	M	K	N	S
●	●	●			●

- P Steel
- H <38HRC Hardened Steel
- H <48HRC Hardened Steel
- M Stainless Steel
- S Titanium
- S Nickel
- S High Temp Alloys



Feature of product:

Specialized contours that significantly reduce cycle times and greatly improve surface finish.

Oval form with two tangential radii and small angles for machining in tight spaces.

4-flute geometry designed for semi-finishing and finishing of stainless steel and high temperature alloys.

AlCrN coating has high hardness and lubricity, suitable for cutting steel, stainless steel, and other metal materials.

AlTiXZrN coating has high lubricity and anti-stickiness, suitable for cutting nickel alloy, high temperature alloy, stainless steel, titanium alloy and other difficult-to-cut materials.

Q138FX / Q138SX

5-Axis End Mills (Taper Form)

MG Carbide

AlCrN FX

30°

AlTiXZrN SX

H

78°

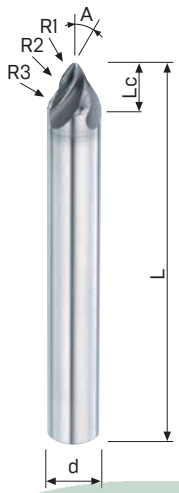
4

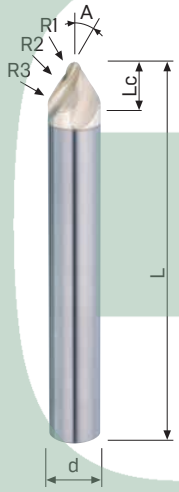
Type of Operation

Work Material

P	H	M	K	N	S
●	●	●			●

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys





Code No. Q138FX-A×R2
Q138SX-A×R2

A Aº	R1 mm	R2 mm	R3 mm	Lc mm	L mm	d h6	AlCrN Q138FX	AlTiXZrN Q138SX
15	1.2	300	2.5	15.55	72	10	○	○
15	1.2	675	2.5	15.55	72	10	○	○
15	1.5	400	3	18.49	75	12	○	○
15	1.5	900	3	18.49	75	12	○	○
15	2	500	4	24.66	100	16	○	○
15	2	1125	4	24.66	100	16	○	○
15	2.5	600	5	30.82	100	20	○	○
15	2.5	1350	5	30.82	100	20	○	○
30	1.2	300	2.5	8.13	72	10	○	○
30	1.2	675	2.5	8.13	72	10	○	○
30	1.5	400	3	9.85	75	12	○	○
30	1.5	900	3	9.85	75	12	○	○
30	2	500	4	12.93	100	16	○	○
30	2	1125	4	12.93	100	16	○	○
30	2.5	600	5	16.16	100	20	○	○
30	2.5	1350	5	16.16	100	20	○	○
45	1.2	300	1.2	5	72	10	○	○
45	1.2	675	1.2	5	72	10	○	○
45	1.5	400	1.5	6	75	12	○	○
45	1.5	900	1.5	6	75	12	○	○
45	2	500	2	8	100	16	○	○
45	2	1125	2	8	100	16	○	○
45	2.5	600	2.5	10	100	20	○	○
45	2.5	1350	5	10	100	20	○	○

○ Non-stock item, pricing based on order quantity.
Please refer to page P79 for parameters.

Feature of product:

Specialized contours that significantly reduce cycle times and greatly improve surface finish.

Taper form with three tangential radii and available in a variety of angles to achieve the best performance and optimum clearance for any workpiece angle.

4-flute geometry designed for finishing steel, stainless steel, high temperature alloy, etc. on multi-axis equipment.

AlCrN coating has high hardness and lubricity, suitable for cutting steel, stainless steel and other metal materials.

AlTiXZrN coating has high lubricity and anti-stickiness, suitable for cutting nickel alloy, high temperature alloy, stainless steel, titanium alloy and other difficult-to-cut materials.

Q139FX / Q139SX

5-Axis End Mills (Lens Form)

MG Carbide

AlCrN FX

30°

AlTiXZrN SX

H
78°

4

R

Type of Operation

Work Material

P	H	M	K	N	S
●	●	●			●

- P Steel
- H <38HRC Hardened Steel
- H <48HRC Hardened Steel
- M Stainless Steel
- S Titanium
- S Nickel
- S High Temp Alloys

Feature of product:

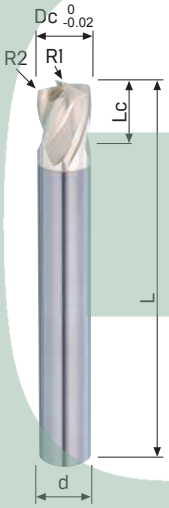
The 4-flute convex mirror shape with a specially defined profile significantly reduces machining paths and improves surface finish.

The 4-flute geometry is specially designed for floor finish surface machining of general steel, stainless steel, high temperature resistant materials and other metal materials.

AlCrN coating has high hardness and lubricity and is suitable for cutting steel, stainless steel, and other metal materials.

AlTiXZrN coating has high lubricity and anti-stickiness, suitable for cutting nickel alloy, high temperature alloy, stainless steel, titanium alloy and other difficult-to-cut materials.





Code No. Q139FX-Dc×R1
Q139SX-Dc×R1

Dc 0 -0.02	R1 mm	R2 mm	Lc mm	L mm	d h6	AlCrN Q139FX	AlTiXZrN Q139SX
10	20	0.6	10	72	10	○	○
12	24	0.72	12	75	12	○	○
16	36	0.96	16	100	16	○	○
20	40	1.2	20	100	20	○	○

○ Non-stock item, pricing based on order quantity.
Please refer to page P79 for parameters.

5-Axis End Mills (Barrel Form)

MG Carbide

AlCrN FX

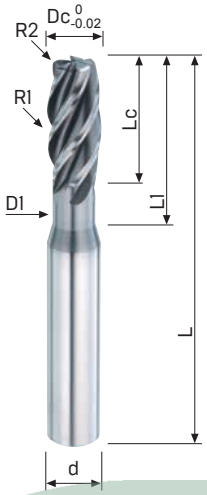
30°

AlTiXZrN SX

H 78°

5

R

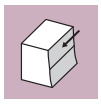


Code No. Q135FX-Dc×R1
Q135SX-Dc×R1

Dc 0 -0.02	R1 mm	R2 mm	Lc mm	L1 mm	D1 mm	L mm	d h6	AlCrN Q135FX	AlTiXZrN Q135SX
10	60	1	22.73	30	8	72	10	○	○
12	70	1	29.31	36	10	75	12	○	○
16	100	1	40.70	48	12	100	16	○	○

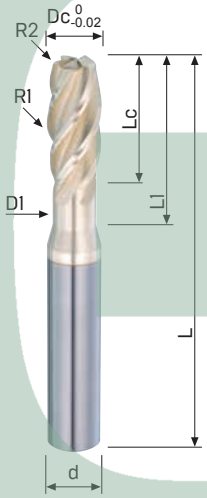
○ Non-stock item, pricing based on order quantity.
Please refer to page P79 for parameters.

Type of Operation



Work Material

P	H	M	K	N	S
●	●	●			●



- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Specialized contours that significantly reduce cycle times and greatly improve surface finish.

Barrel form with a tangential radius for machining in tight spaces.

5-flute unequal cutting geometry designed for semi-finishing and finishing of stainless steel, high-temperature alloys, and more.

AlCrN coating has high hardness and lubricity, suitable for cutting steel, stainless steel, and other metal materials.

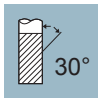
AlTiXZrN coating has high lubricity and anti-stickiness, suitable for cutting nickel alloy, high temperature alloy, stainless steel, titanium alloy and other difficult-to-cut materials.

Q146 / Q146DX

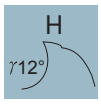
5-Axis End Mills (Oval Form)

MG Carbide

DLC DX

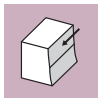








Type of Operation



Work Material

P	H	M	K	N	S
				●	

N Aluminium

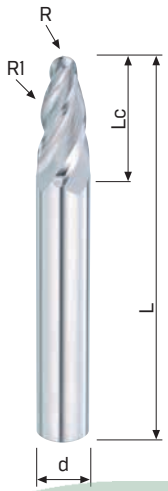
Feature of product:

Specialized contours that significantly reduce cycle times and greatly improve surface finish.

Oval form with two tangential radii and small angles for machining in tight spaces.

4-flute geometry designed for semi-finishing and finishing of aluminum alloy.

DLC coating with extremely wear-resistant DLC diamond-like coating improves surface lubricity and wear resistance for aluminum alloy...etc.



Code No. Q146 -R×R1
Q146DX-R×R1

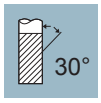
R mm	R1 mm	Lc mm	L mm	d h6	Bright Q146	DLC-DX Q146DX
2.5	80	22.03	72	10	○	○
3	96	26.43	75	12	○	○
4	128	35.24	100	16	○	○
5	160	44.05	100	20	○	○

○ Non-stock item, pricing based on order quantity.
Please refer to page P80 for parameters.

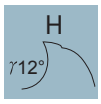
5-Axis End Mills (Taper Form)

MG Carbide

DLC DX

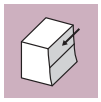








Type of Operation



Work Material

P	H	M	K	N	S
				●	

N	Aluminium

Feature of product:

Specialized contours are defined to significantly reduce cycle times and greatly improve surface finish.

Taper form with three tangential radii and available in a variety of angles to achieve the best performance and optimum clearance for any workpiece angle.

The 4-flute geometry is designed for finishing aluminum alloy on multi-axis equipment.

DLC coating with extremely wear-resistant DLC diamond-like coating enhances surface lubricity and wear resistance for aluminum alloy...etc.



Code No. Q148 -A×R2
Q148DX-A×R2

A Aº	R1 mm	R2 mm	R3 mm	Lc mm	L mm	d h6	Bright Q148	DLC-DX Q148DX
15	1.2	300	2.5	15.55	72	10	○	○
15	1.2	675	2.5	15.55	72	10	○	○
15	1.5	400	3	18.49	75	12	○	○
15	1.5	900	3	18.49	75	12	○	○
15	2	500	4	24.66	100	16	○	○
15	2	1125	4	24.66	100	16	○	○
15	2.5	600	5	30.82	100	20	○	○
15	2.5	1350	5	30.82	100	20	○	○
30	1.2	300	2.5	8.13	72	10	○	○
30	1.2	675	2.5	8.13	72	10	○	○
30	1.5	400	3	9.85	75	12	○	○
30	1.5	900	3	9.85	75	12	○	○
30	2	500	4	12.93	100	16	○	○
30	2	1125	4	12.93	100	16	○	○
30	2.5	600	5	16.16	100	20	○	○
30	2.5	1350	5	16.16	100	20	○	○
45	1.2	300	1.2	5	72	10	○	○
45	1.2	675	1.2	5	72	10	○	○
45	1.5	400	1.5	6	75	12	○	○
45	1.5	900	1.5	6	75	12	○	○
45	2	500	2	8	100	16	○	○
45	2	1125	2	8	100	16	○	○
45	2.5	600	2.5	10	100	20	○	○
45	2.5	1350	5	10	100	20	○	○

○ Non-stock item, pricing based on order quantity.
Please refer to page P80 for parameters.

Q149 / Q149DX

5-Axis End Mills (Lens Form)

MG Carbide

DLC DX

30°

4

H

78°

R

Type of Operation

Work Material

P	H	M	K	N	S
				●	

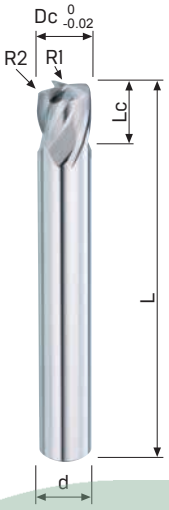
N Aluminium

Feature of product:

The 4-flute convex mirror shape with a specially defined contour significantly reduces machining paths and improves surface finish.

The 4-flute geometry is specifically designed for the machining of floor finely curved surfaces in aluminum alloy metal materials.

DLC coating with extremely wear-resistant DLC diamond-like coating improves surface lubrication and wear resistance for aluminum alloy...etc.



Code No. Q149 -Dc×R1
Q149DX-Dc×R1

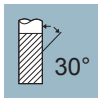
Dc 0 -0.02	R1 mm	R2 mm	Lc mm	L mm	d h6	Bright Q149	DLC-DX Q149DX
10	20	0.6	10	72	10	○	○
12	24	0.72	12	75	12	○	○
16	36	0.96	16	100	16	○	○
20	40	1.2	20	100	20	○	○

○ Non-stock item, pricing based on order quantity.
Please refer to page P80 for parameters.

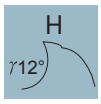
5-Axis End Mills (Barrel Form)

MG Carbide

DLC DX

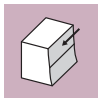








Type of Operation



Work Material

P	H	M	K	N	S
				●	

N Aluminium

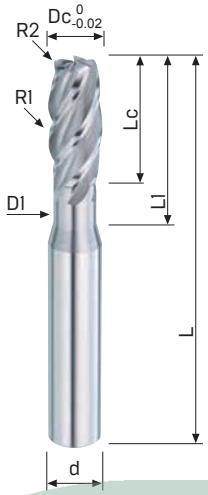
Feature of product:

Specialized contours that significantly reduce cycle times and greatly improve surface finish.

Barrel form with a tangential radius for machining in tight spaces.

5-flute unequal cutting geometry designed for semi-finishing and finishing operations such as aluminum alloy.

DLC coating with extremely wear-resistant DLC diamond-like coating improves surface lubricity and wear resistance for aluminum alloy...and other materials.

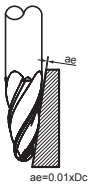
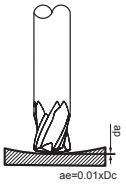
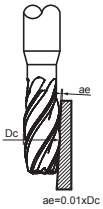


Code No. Q145 -Dc×R1
Q145DX-Dc×R1

Dc 0 -0.02	R1 mm	R2 mm	Lc mm	L1 mm	D1 mm	L mm	d h6	Bright Q145	DLC-DX Q145DX
10	60	1	22.73	30	8	72	10	○	○
12	70	1	29.31	36	10	75	12	○	○
16	100	1	40.70	48	12	100	16	○	○

○ Non-stock item, pricing based on order quantity.
Please refer to page P80 for parameters.

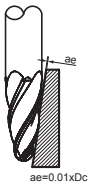
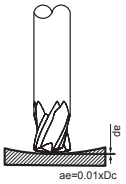
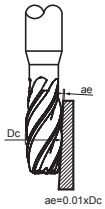
Q136FX
Q136SX
Q138FX
Q138SX
Q139FX
Q139SX
Q135FX
Q135SX

		Q136FX / Q136SX		Q138FX / Q138SX		Q139FX / Q139SX		Q135FX / Q135SX	
									
		cutting speed Vc (m/min)	feed Fn(mm/rev)	cutting speed Vc (m/min)	feed Fn(mm/rev)	cutting speed Vc (m/min)	feed Fn(mm/rev)	cutting speed Vc (m/min)	feed Fn(mm/rev)
P	Carbon Steel Materials								
	GR1 Carbon Steel	250	0.003×Dc	250	0.003×Dc	250	0.003×Dc	250	0.003×Dc
	GR2 <24HRC Low-alloyed Steel	230	0.002×Dc	230	0.002×Dc	230	0.002×Dc	230	0.002×Dc
	GR3 <30HRC Hi-alloyed Steel	210	0.0015×Dc	210	0.0015×Dc	210	0.0015×Dc	210	0.0015×Dc
H	Hardened Steel Materials								
	GR4 30~38HRC Hardened Steel	150	0.0015×Dc	150	0.0015×Dc	150	0.0015×Dc	150	0.0015×Dc
	GR5 38~48HRC Hardened Steel	130	0.001×Dc	130	0.001×Dc	130	0.001×Dc	130	0.001×Dc
	GR6 48~56HRC Hardened Steel								
M	Stainless Steel Materials								
	GR8-1 Ferritic、Martensitic	130	0.0015×Dc	130	0.0015×Dc	130	0.0015×Dc	130	0.0015×Dc
	GR8-2 Austenitic	120	0.0015×Dc	120	0.0015×Dc	120	0.0015×Dc	120	0.0015×Dc
	GR8-3 Austenitic-ferritic	120	0.001×Dc	120	0.001×Dc	120	0.001×Dc	120	0.001×Dc
	GR8-4 Austenitic-ferritic Heat-resistant	120	0.001×Dc	120	0.001×Dc	120	0.001×Dc	120	0.001×Dc
K	Cast Iron Materials								
	GR9-1 Grey cast iron	210	0.002×Dc	210	0.002×Dc	210	0.002×Dc	210	0.002×Dc
	GR9-2 Nodular cast iron	200	0.002×Dc	200	0.002×Dc	200	0.002×Dc	200	0.002×Dc
N	Aluminium Steel Materials								
	GR10-1 Wrought Aluminium alloys								
	GR10-2 Aluminium cast alloys <10%								
	GR10-3 Aluminium cast alloys >10%								
	Copper Steel Materials								
	GR11-1 Pure Copper								
	GR11-2 Brass								
	GR11-3 Bronze								
	Plastics Steel Materials								
	GR12 Plastics								
	FRP CFRP Steel Materials								
	GR13 FRP CFRP								
S	Titanium Materials								
	GR15 Titanium	100	0.002×Dc	100	0.002×Dc	100	0.002×Dc	100	0.002×Dc
	Nickel Materials								
	GR16-1 Nickel	80	0.002×Dc	80	0.002×Dc	80	0.002×Dc	80	0.002×Dc
	GR16-2 cobalt-base alloys	60	0.002×Dc	60	0.002×Dc	60	0.002×Dc	60	0.002×Dc
	GR16-3 Iron-based alloy	50	0.002×Dc	50	0.002×Dc	50	0.002×Dc	50	0.002×Dc
	Heat-resistant Steel Materials								
	GR17 Heat-resistant Steel	30	0.002×Dc	30	0.002×Dc	30	0.002×Dc	30	0.002×Dc

※ All cutting data are for reference only. Please adjust according to actual machining conditions.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

Q146
Q146DX
Q148
Q148DX
Q149
Q149DX
Q145
Q145DX

		Q146 / Q146DX		Q148 / Q148DX		Q149 / Q149DX		Q145 / Q145DX	
									
		cutting speed Vc (m/min)	feed Fn(mm/rev)	Cutting speed Vc (ft/min)	feed Fn(mm/rev)	cutting speed Vc (m/min)	feed Fn(mm/rev)	Cutting speed Vc (ft/min)	feed Fn(mm/rev)
P	Carbon Steel Materials								
	GR1 Carbon Steel								
	GR2 <24HRC Low-alloyed Steel								
	GR3 <30HRC Hi-alloyed Steel								
H	Hardened Steel Materials								
	GR4 30~38HRC Hardened Steel								
	GR5 38~48HRC Hardened Steel								
	GR6 48~56HRC Hardened Steel								
M	Stainless Steel Materials								
	GR8-1 Ferritic、Martensitic								
	GR8-2 Austenitic								
	GR8-3 Austenitic-ferritic								
	GR8-4 Austenitic-ferritic Heat-resistant								
K	Cast Iron Materials								
	GR9-1 Grey cast iron								
	GR9-2 Nodular cast iron								
N	Aluminium Steel Materials								
	GR10-1 Wrought Aluminium alloys	500	0.002×Dc	500	0.002×Dc	500	0.002×Dc	500	0.002×Dc
	GR10-2 Aluminium cast alloys <10%	400	0.002×Dc	400	0.002×Dc	400	0.002×Dc	400	0.002×Dc
	GR10-3 Aluminium cast alloys >10%	450	0.002×Dc	450	0.002×Dc	450	0.002×Dc	450	0.002×Dc
	Copper Steel Materials								
	GR11-1 Pure Copper	200	0.002×Dc	200	0.002×Dc	200	0.002×Dc	200	0.002×Dc
	GR11-2 Brass	180	0.002×Dc	180	0.002×Dc	180	0.002×Dc	180	0.002×Dc
	GR11-3 Bronze	150	0.002×Dc	150	0.002×Dc	150	0.002×Dc	150	0.002×Dc
	Plastics Steel Materials								
	GR12 Plastics								
	FRP CFRP Steel Materials								
	GR13 FRP CFRP								
S	Titanium Materials								
	GR15 Titanium								
	Nickel Materials								
	GR16-1 Nickel								
	GR16-2 cobalt-base alloys								
	GR16-3 Iron-based alloy								
	Heat-resistant Steel Materials								
	GR17 Heat-resistant Steel								

※ All cutting data are for reference only. Please adjust according to actual machining conditions.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.



End Mills For Aluminium

Page	83	85	87	89	91	93
Appearance						
Code No	E132 E134	E142	E143DX	E143	E143-3.0 E143-4.0 E143-5.0	E145
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
Coating	Uncoated Bright	Uncoated Bright	DLC DX	Uncoated Bright	Uncoated Bright	Uncoated Bright
Helix Angle						
No.of Flutes						

95	97	97
		
E194	**E195R**	**E195L**
MG Carbide	**MG Carbide**	**MG Carbide**
Uncoated Bright	**Uncoated Bright**	**Uncoated Bright**
 40°	 30°	 30°
 Z	 1	 1

E132 / E134

End Mills For Aluminium

MG Carbide

Uncoated Bright

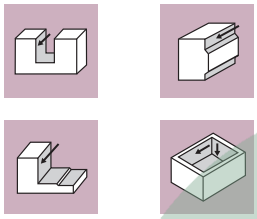
30°

2

N
γ15°

90°

Type of Operation



Work Material

P	H	M	K	N	S
				●	

- N Aluminium
- N Copper

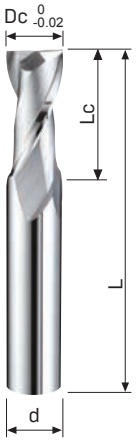
Feature of product:

End Mills for Aluminium with Standard & Long Length- 2 Flutes

With sharp cutting edge and larger chip removal space.

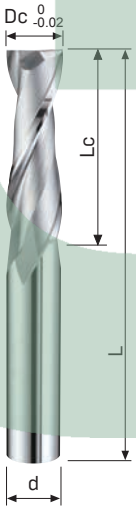
Higher finishing of cutting edge to have better surface roughness after processing.

Application for roughing and finishing in various Aluminium and Copper.



Code No. E132-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Bright E132
1.0	3	50	4	●
1.5	5	50	4	●
2.0	6	50	4	●
2.5	8	50	4	●
3.0	8	50	6	●
4.0	11	50	6	●
5.0	13	50	6	●
6.0	16	50	6	●
8.0	20	60	8	●
10.0	22	72	10	●
12.0	26	75	12	●



Code No. E134-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Bright E134
3	12	50	6	●
4	17	50	6	●
5	20	60	6	●
6	20	60	6	●
8	28	70	8	●
10	34	80	10	●
12	40	90	12	●

Slotting

Work Material		GR.10 Aluminium	
Vc m/min		100	
Code No.	Dc	RPM (min-1)	Feed (mm/min)
E132-1	1	31,500	200
E132-1.5	1.5	21,000	200
E132-2	2	15,500	200
E132-2.5	2.5	13,000	250
E132/E134-3	3	10,500	300
E132/E134-4	4	8,000	300
E132/E134-5	5	6,350	300
E132/E134-6	6	5,300	300
E132/E134-8	8	4,000	300
E132/E134-10	10	3,200	300
E132/E134-12	12	2,650	300
(mm) 		ap:1.0D	

※ Notice: E134 is Long Length series End Mills. Please adjust the parameter according.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

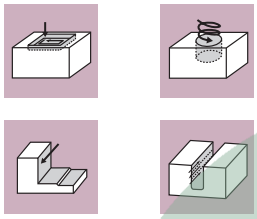
E142

End Mills For Aluminium

MG Carbide | Uncoated Bright

40° | 2 | N γ25° | 90°

Type of Operation



Work Material

P	H	M	K	N	S
				●	

N Aluminium

N Copper

Feature of product:

End Mills for Aluminium- 2 Flutes

Design with sharp cutting edge, high removal cutting geometry, and fine grinding smooth surface to prevent sticking problem.

Larger helix angle to get better finishing.

Higher finishing of cutting edge to have better surface roughness after processing.

Application for roughing and finishing in various Aluminium and Copper.



Code No. E142-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Bright E142
3	8	50	6	●
3.1	10	50	6	●
3.2	10	50	6	●
3.3	10	50	6	●
3.4	10	50	6	●
3.5	10	50	6	●
3.6	10	50	6	●
3.7	10	50	6	●
3.8	11	50	6	●
3.9	11	50	6	●
4	11	50	6	●
4.1	11	50	6	●
4.2	11	50	6	●
4.3	11	50	6	●
4.4	11	50	6	●
4.5	11	50	6	●
4.6	11	50	6	●
4.7	11	50	6	●
4.8	13	50	6	●
4.9	13	50	6	●
5	13	50	6	●
5.1	13	50	6	●
5.2	13	50	6	●
5.3	13	50	6	●
5.4	13	50	6	●
5.5	13	50	6	●
5.6	16	50	6	●
5.7	16	50	6	●
5.8	16	50	6	●
5.9	16	50	6	●
6	16	50	6	●
6.1	16	60	8	●
6.2	16	60	8	●
6.3	16	60	8	●
6.4	16	60	8	●
6.5	16	60	8	●
6.6	20	60	8	●
6.7	20	60	8	●
6.8	20	60	8	●
6.9	20	60	8	●
7	20	60	8	●
7.1	20	60	8	●
7.2	20	60	8	●
7.3	20	60	8	●
7.4	20	60	8	●
7.5	20	60	8	●
7.6	20	60	8	●
7.7	20	60	8	●
7.8	20	60	8	●
7.9	20	60	8	●
8	20	60	8	●
8.5	20	72	10	●
9	25	72	10	●
9.5	25	72	10	●
10	25	72	10	●
10.5	25	75	12	●
11	30	75	12	●
11.5	30	75	12	●
12	30	75	12	●

Slotting

Work Material		GR.10 Aluminium	
Vc m/min		150~380	
Code No.	Dc	RPM (min-1)	Feed (mm/min)
E142-3	3	16,000	1,280
E142-3.5	3.5	14,000	1,120
E142-4	4	12,000	960
E142-4.5	4.5	10,800	1,240
E142-5	5	9,600	1,520
E142-5.5	5.5	8,800	1,400
E142-6	6	8,000	1,280
E142-6.5	6.5	7,500	1,200
E142-7	7	7,000	1,120
E142-7.5	7.5	6,500	1,040
E142-8	8	6,000	960
E142-8.5	8.5	7,500	1,120
E142-9	9	9,000	1,280
E142-9.5	9.5	10,500	1,440
E142-10	10	12,000	1,600
E142-10.5	10.5	11,500	1,600
E142-11	11	11,000	1,600
E142-11.5	11.5	10,500	1,600
E142-12	12	10,000	1,600
(mm) 		ap:0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E143DX

End Mills For Aluminium

MG Carbide

DLC DX

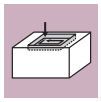




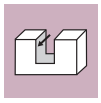


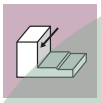


Type of Operation









Work Material

P	H	M	K	N	S
				●	

N	Aluminium

Feature of product:

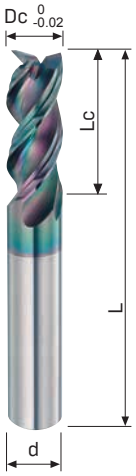
End Mills for Aluminium with Diamond coating- 3 Flutes

Design with sharp cutting edge, high removal cutting geometry, and fine grinding smooth surface to prevent sticking problem.

Higher finishing of cutting edge.

With high abrasion DLC diamond coating type to enhance surface lubrication and wear resistance.

Application for roughing and finishing in various Aluminium.



Code No. E143DX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	DLC E143DX
3	8	50	6	●
4	11	50	6	●
5	13	50	6	●
6	16	50	6	●
8	20	60	8	●
10	25	72	10	●
12	30	75	12	●
16	40	100	16	●
20	40	100	20	●

Side Milling

Work Material		GR.10 Aluminium	
Vc m/min		400	
Code No.	Dc	RPM (min-1)	Feed (mm/min)
E143DX-3	3	42,000	1,900
E143DX-4	4	31,000	2,200
E143DX-5	5	25,000	2,200
E143DX-6	6	21,000	2,400
E143DX-8	8	16,000	2,600
E143DX-10	10	12,700	3,000
E143DX-12	12	10,600	3,200
E143DX-14	14	9,100	3,200
E143DX-16	16	8,000	3,200
E143DX-20	20	6,300	3,100
(mm) 		ap:1.5D	
		ae:0.1D	

Slotting

Work Material		GR.10 Aluminium	
Vc m/min		400	
Code No.	Dc	RPM (min-1)	Feed (mm/min)
E143DX-3	3	42,000	1,340
E143DX-4	4	31,000	1,400
E143DX-5	5	25,000	1,480
E143DX-6	6	21,000	1,640
E143DX-8	8	16,000	1,720
E143DX-10	10	12,700	1,940
E143DX-12	12	10,600	2,100
E143DX-14	14	9,100	2,100
E143DX-16	16	7,900	2,100
E143DX-20	20	6,300	2,100
(mm) 		0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E143

End Mills For Aluminium

MG Carbide

Uncoated Bright

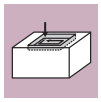




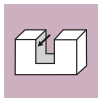


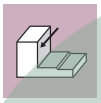


Type of Operation









Work Material

P	H	M	K	N	S
				●	

N	Aluminium

Feature of product:

End Mills for Aluminium- 3 Flutes

Design with sharp cutting edge, high removal cutting geometry, and fine grinding smooth surface to prevent sticking problem.

Higher finishing of cutting edge to have better surface roughness after processing.

Application for roughing and finishing in various Aluminium.



Code No. E143-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Bright E143
1	3	50	4	●
1.5	5	50	4	●
2	6	50	4	●
2.5	8	50	4	●
3	8	50	6	●
4	11	50	6	●
5	13	50	6	●
6	16	50	6	●
8	20	60	8	●
10	25	72	10	●
12	30	75	12	●
14	35	100	16	●
16	40	100	16	●
18	40	100	20	●
20	40	100	20	●

Side Milling

Work Material		GR.10 Aluminium	
Vc m/min		400	
Code No.	Dc	RPM (min-1)	Feed (mm/min)
E143-1	1	63,000	1,890
E143-1.5	1.5	50,000	1,500
E143-2	2	45,000	1,755
E143-2.5	2.5	42,000	1,800
E143-3	3	42,000	1,900
E143-4	4	31,000	2,200
E143-5	5	25,000	2,200
E143-6	6	21,000	2,400
E143-7	7	18,500	2,400
E143-8	8	16,000	2,600
E143-9	9	14 ,500	2,800
E143-10	10	12,700	3,000
E143-12	12	10,600	3,200
E143-14	14	9,100	3,200
E143-16	16	8,000	3,200
E143-18	18	7,000	3,100
E143-20	20	6,300	3,100
(mm) 		ap:1.5D	
		ae:0.1D	

Slotting

Work Material		GR.10 Aluminium	
Vc m/min		400	
Code No.	Dc	RPM (min-1)	Feed (mm/min)
E143-1	1	63,000	1,320
E143-1.5	1.5	50,000	1,050
E143-2	2	45,000	1,230
E143-2.5	2.5	42,000	1,260
E143-3	3	42,000	1,340
E143-4	4	31,000	1,400
E143-5	5	25,000	1,480
E143-6	6	21,000	1,640
E143-7	7	18,500	1,640
E143-8	8	16,000	1,720
E143-9	9	14,500	1,800
E143-10	10	12,700	1,940
E143-12	12	10,600	2,100
E143-14	14	9,100	2,100
E143-16	16	7,900	2,100
E143-18	18	7,000	2,100
E143-20	20	6,300	2,100
(mm) 		0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E143-3.0 / 4.0 / 5.0

End Mills For Aluminium

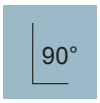
MG Carbide

Uncoated Bright

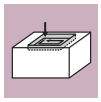




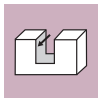


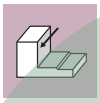


Type of Operation









Work Material

P	H	M	K	N	S
				●	

N Aluminium

Feature of product:

End Mills for Aluminium- 3 Flutes

Design with sharp cutting edge, high removal cutting geometry, and fine grinding smooth surface to prevent sticking problem.

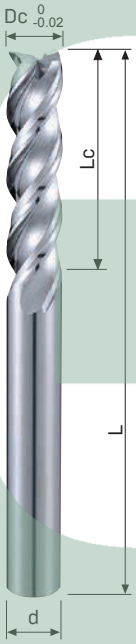
Higher finishing of cutting edge to have better surface roughness after processing.

Application for roughing and finishing in various Aluminium.



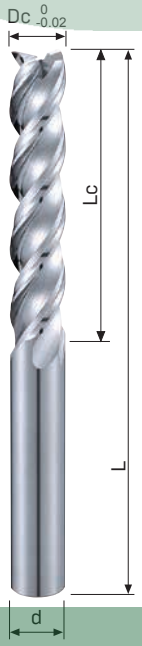
Code No. E143-3.0-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Bright E143-3.0
1	3	50	4	●
2	6	50	4	●
3	9	50	6	●
4	12	50	6	●
5	15	50	6	●
6	18	50	6	●
7	21	65	8	●
8	24	65	8	●
9	27	75	10	●
10	30	75	10	●
12	36	80	12	●
14	42	100	16	●
16	48	100	16	●
18	54	120	20	●
20	60	120	20	●



Code No. E143-4.0-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Bright E143-4.0
1	4	50	4	●
2	8	50	4	●
3	12	50	6	●
4	16	55	6	●
5	20	60	6	●
6	24	65	6	●
7	28	75	8	●
8	32	75	8	●
9	36	100	10	●
10	40	100	10	●
12	48	110	12	●
14	56	140	16	●
16	64	140	16	●
18	72	160	20	●
20	80	160	20	●



Code No. E143-5.0-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Bright E143-5.0
1	5	50	4	●
2	10	50	4	●
3	15	55	6	●
4	20	60	6	●
5	25	65	6	●
6	30	75	6	●
7	35	90	8	●
8	40	90	8	●
9	45	100	10	●
10	50	100	10	●
12	60	110	12	●
14	70	160	16	●
16	80	160	16	●
18	90	200	20	●
20	100	200	20	●

Side Milling

Work Material		GR.10 Aluminium	
Vc m/min		400	
Code No.	Dc	RPM (min-1)	Feed (mm/min)
E143-3.0	1	65,000	900
E143-3.0	2	50,000	900
E143-3.0	3	42,000	1,000
E143-3.0	4	31,000	1,400
E143-3.0	5	25,000	1,800
E143-3.0	6	21,000	2,000
E143-3.0	8	16,000	2,200
E143-3.0	10	12,700	2,400
E143-3.0	12	10,600	2,200
E143-3.0	16	8,000	2,000
E143-3.0	20	6,300	1,800
(mm) 		ap:2.5D	
		ae:0.1D	

Work Material		GR.10 Aluminium	
Vc m/min		300	
Code No.	Dc	RPM (min-1)	Feed (mm/min)
E143-4.0	1	65,000	800
E143-4.0	2	48,000	800
E143-4.0	3	32,000	800
E143-4.0	4	24,000	1,000
E143-4.0	5	20,000	1,300
E143-4.0	6	16,000	1,800
E143-4.0	8	12,000	1,800
E143-4.0	10	9,500	2,000
E143-4.0	12	8,000	1,680
E143-4.0	16	6,000	1,600
E143-4.0	20	4,800	1,400
(mm) 		ap:3.5D	
		ae:0.1D	

Side Milling

Work Material		GR.10 Aluminium	
Vc m/min		200	
Code No.	Dc	RPM (min-1)	Feed (mm/min)
E143-5.0	1	63,000	600
E143-5.0	2	32,000	600
E143-5.0	3	21,000	640
E143-5.0	4	16,000	800
E143-5.0	5	13,000	1,050
E143-5.0	6	10,600	1,500
E143-5.0	8	8,000	1,400
E143-5.0	10	6,400	1,600
E143-5.0	12	5,300	1,300
E143-5.0	16	4,000	1,200
E143-5.0	20	3,200	1,000
(mm) 		ap:4.5D	
		ae:0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E145

End Mills For Aluminium

MG Carbide

Uncoated Bright

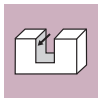


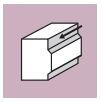


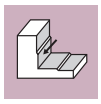




Type of Operation







Work Material

P	H	M	K	N	S
				●	

N Aluminium

Feature of product:

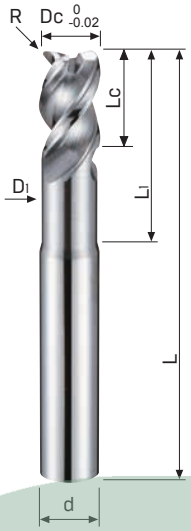
End Mills with Corner Radius for Aluminium- 3 Flutes Short Type ·Long Neck

Design with sharp cutting edge, high removal cutting geometry, and fine grinding smooth surface to prevent sticking problem.

Higher finishing of cutting edge to have better surface roughness after processing.

With corner Radius to enhance tool life.

Application for roughing and finishing in various Aluminium.



Code No. E145-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	L1 mm	D1 mm	Bright E145
3	—	4.5	50	6	9	2.8	●
3	R0.1	4.5	50	6	9	2.8	●
3	R0.2	4.5	50	6	9	2.8	●
3	R0.3	4.5	50	6	9	2.8	●
3	R0.5	4.5	50	6	9	2.8	●
4	—	6	50	6	12	3.7	●
4	R0.1	6	50	6	12	3.7	●
4	R0.2	6	50	6	12	3.7	●
4	R0.3	6	50	6	12	3.7	●
4	R0.5	6	50	6	12	3.7	●
5	—	7.5	60	6	15	4.6	●
5	R0.1	7.5	60	6	15	4.6	●
5	R0.2	7.5	60	6	15	4.6	●
5	R0.3	7.5	60	6	15	4.6	●
5	R0.5	7.5	60	6	15	4.6	●
6	—	9	60	6	18	5.5	●
6	R0.2	9	60	6	18	5.5	●
6	R0.3	9	60	6	18	5.5	●
6	R0.5	9	60	6	18	5.5	●
6	R0.8	9	60	6	18	5.5	●
6	R1	9	60	6	18	5.5	●
6	R1.2	9	60	6	18	5.5	●
6	R1.5	9	60	6	18	5.5	●
6	R1.6	9	60	6	18	5.5	●
6	R2	9	60	6	18	5.5	●
8	—	12	70	8	24	7.4	●
8	R0.2	12	70	8	24	7.4	●
8	R0.3	12	70	8	24	7.4	●
8	R0.5	12	70	8	24	7.4	●
8	R0.8	12	70	8	24	7.4	●
8	R1	12	70	8	24	7.4	●
8	R1.2	12	70	8	24	7.4	●
8	R1.5	12	70	8	24	7.4	●
8	R1.6	12	70	8	24	7.4	●
8	R2	12	70	8	24	7.4	●
8	R3	12	70	8	24	7.4	●
10	—	15	80	10	30	9.2	●
10	R0.2	15	80	10	30	9.2	●
10	R0.3	15	80	10	30	9.2	●
10	R0.5	15	80	10	30	9.2	●
10	R0.8	15	80	10	30	9.2	●
10	R1	15	80	10	30	9.2	●
10	R1.2	15	80	10	30	9.2	●
10	R1.5	15	80	10	30	9.2	●
10	R1.6	15	80	10	30	9.2	●
10	R2	15	80	10	30	9.2	●
10	R3	15	80	10	30	9.2	●
12	—	18	90	12	36	11	●
12	R0.2	18	90	12	36	11	●
12	R0.3	18	90	12	36	11	●
12	R0.5	18	90	12	36	11	●
12	R0.8	18	90	12	36	11	●
12	R1	18	90	12	36	11	●
12	R1.2	18	90	12	36	11	●
12	R1.5	18	90	12	36	11	●
12	R1.6	18	90	12	36	11	●
12	R2	18	90	12	36	11	●
12	R3	18	90	12	36	11	●
16	—	24	110	16	48	14.5	●
16	R0.5	24	110	16	48	14.5	●
16	R1	24	110	16	48	14.5	●
16	R1.5	24	110	16	48	14.5	●
16	R2	24	110	16	48	14.5	●
16	R3	24	110	16	48	14.5	●
16	R4	24	110	16	48	14.5	●
20	—	30	125	20	60	18.2	●
20	R0.5	30	125	20	60	18.2	●
20	R1	30	125	20	60	18.2	●
20	R1.5	30	125	20	60	18.2	●
20	R2	30	125	20	60	18.2	●
20	R3	30	125	20	60	18.2	●
20	R4	30	125	20	60	18.2	●
20	R5	30	125	20	60	18.2	●

Side Milling

Work Material		GR.10 Aluminium	
Vc m/min		400	
Code No.	Dc	RPM (min-1)	Feed (mm/min)
E145-3	3	42,000	1,900
E145-4	4	31,000	2,200
E145-5	5	25,000	2,200
E145-6	6	21,000	2,400
E145-8	8	16,000	2,600
E145-10	10	12,700	3,000
E145-12	12	10,600	3,200
E145-16	16	8,000	3,200
E145-20	20	6,300	3,100
(mm) 		ap:0.75D ae:0.3D	

Slotting

Work Material		GR.10 Aluminium	
Vc m/min		400	
Code No.	Dc	RPM (min-1)	Feed (mm/min)
E145-3	3	42,000	1,340
E145-4	4	31,000	1,400
E145-5	5	25,000	1,480
E145-6	6	21,000	1,640
E145-8	8	16,000	1,720
E145-10	10	12,700	1,940
E145-12	12	10,600	2,100
E145-16	16	7,900	2,100
E145-20	20	6,300	2,100
(mm) 		0.75D	

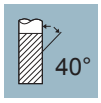
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E194

Utmost Finishing End Mills For Aluminium

MG Carbide

Uncoated Bright

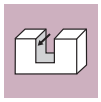


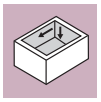


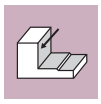




Type of Operation







Work Material

P	H	M	K	N	S
				●	

N	Aluminium

Feature of product:

Finishing End Mills for Aluminium Multiple Flutes

Design with sharp cutting edge, h+C57igh removal cutting geometry, and fine grinding smooth surface to prevent sticking problem.

Higher finishing of cutting edge to have better surface roughness after processing.

Design with Multiple Flutes to enhance working efficiency.

Application for finishing in various Aluminium.



Code No. E194-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Z	Bright E194
3	8	50	6	3	●
4	11	50	6	3	●
5	13	50	6	4	●
6	16	50	6	4	●
8	20	60	8	4	●
10	22	72	10	5	●
12	26	75	12	5	●

※ Offer valid while stocks last.

Side Milling

Work Material		GR.10 Aluminium	
Vc m/min		120	
Code No.	Dc	RPM (min-1)	Feed (mm/min)
E194-3	3	12,500	900
E194-4	4	9,500	950
E194-5	5	7,600	970
E194-6	6	6,350	990
E194-8	8	4,800	1,000
E194-10	10	3,800	1,000
E194-12	12	3,200	1,100
（mm） 		ap:1.5D	
		ae:0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

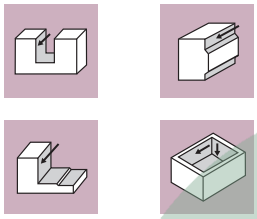
E195R / E195L

End Mills For Aluminium

MG Carbide | Uncoated Bright

30° | 1 | N 7°20° | 90°

Type of Operation



Work Material

P	H	M	K	N	S
				●	

N Aluminium

Feature of product:

E195R End Mills with Right-Hand for Aluminium- Single Point

E195L End Mills with Left-Hand for Aluminium- Single Point

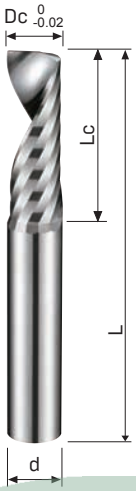
Design with sharp cutting edge, high removal cutting geometry, and fine grinding smooth surface to prevent sticking problem.

Higher finishing of cutting edge to have better surface roughness after processing.

Design with large chip removal space.

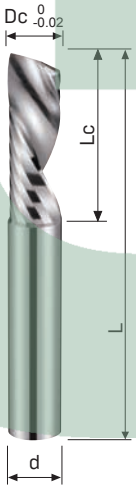
Chips will be removed downwards while cutting process.

Application for finishing in various Aluminium.



Code No. E195R-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Bright E195R
3	12	38	3	●
4	15	50	4	●
6	18	50	6	●
8	22	60	8	●
10	30	72	10	●
12	30	75	12	●



Code No. E195L-Dc

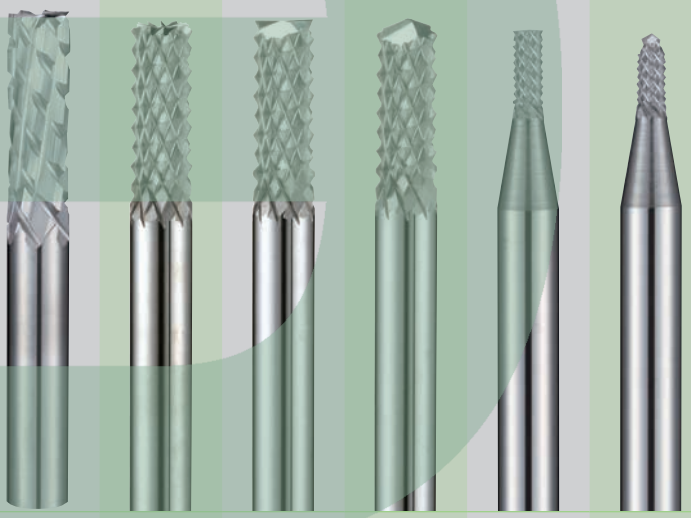
Dc 0 -0.02	Lc mm	L mm	d h6	Bright E195L
3	12	38	3	●
4	15	50	4	●
6	18	50	6	●
8	22	60	8	●
10	30	72	10	●
12	30	75	12	●

Slotting

Work Material		GR.10 Aluminium	
Vc m/min		188	
Code No.	Dc	RPM (min-1)	Feed (mm/min)
E195R/E195L-3	3	20,000	6,000
E195R/E195L-4	4	15,000	5,000
E195R/E195L-6	6	10,000	5,000
E195R/E195L-8	8	8,400	4,000
E195R/E195L-10	10	6,700	4,000
E195R/E195L-12	12	5,000	5,000
(mm) 		ap:0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

Routers For Composite Materials

Page	101	103	103	103	105	105
Appearance						
Code No	E190 E191	E197	E198	E199	E298	E299
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
Coating	Uncoated Bright	Uncoated Bright	Uncoated Bright	Uncoated Bright	Uncoated Bright	Uncoated Bright
Helix Angle						
No.of Flutes						

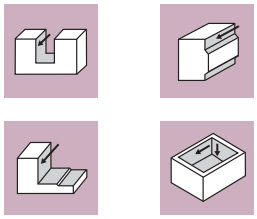
107	107	109	109
			
E291	**E294**	**E189R**	**E189L**
MG Carbide	**MG Carbide**	**MG Carbide**	**MG Carbide**
Uncoated Bright	**Uncoated Bright**	**Uncoated Bright**	**Uncoated Bright**
 10°	 10°	 21°	 21°
 1	 4	 1	 1

Routers For Composite Materials

MG Carbide | Uncoated Bright

Diamond SP3

Type of Operation



Work Material

P	H	M	K	N	S
				●	

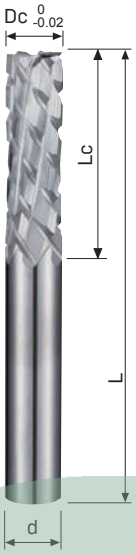
N FRP CFRP Composite Material

Feature of product:

Routers for Composite Materials Design with Staggered blade.

Use to cut out fibers in the material to avoid fiber pulling out.

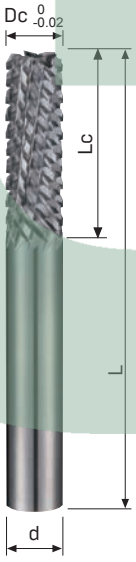
Application for roughing in Phenolic-epoxy parts, Polyester glass reinforced products, Graphite, Composite...etc.



Code No. E190-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Z T	Bright E190	Diamond E190SP
3	9	50	3	4	●	—
4	12	60	4	4	●	—
6	18	70	6	6	●	—
8	24	75	8	6	●	—
10	30	80	10	6	●	—
12	36	80	12	8	●	—

※ Mark: —, On request, no stock



Code No. E191-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Z T	Bright E191	Diamond E191SP
3	9	50	3	6	●	—
4	12	60	4	6	●	—
6	18	70	6	8	●	—
8	24	75	8	10	●	—
10	30	80	10	12	●	—
12	36	80	12	14	●	—

※ Mark: —, On request, no stock

Side Milling

Work Material		GR.13 FRP CFRP Composite Material	
Vc m/min		188	
Code No.	Dc	RPM (min-1)	Feed (mm/min)
E190/E191-3	3	20,000	6,000
E190/E191-4	4	15,000	5,000
E190/E191-6	6	10,000	5,000
E190/E191-8	8	8,400	4,000
E190/E191-10	10	6,700	4,000
E190/E191-12	12	5,000	5,000
(mm) 		ap:0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

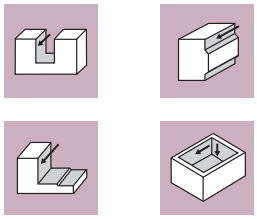
Routers For Composite Materials

MG Carbide

Uncoated Bright

Diamond SP3

Type of Operation



Work Material

P	H	M	K	N	S
				●	

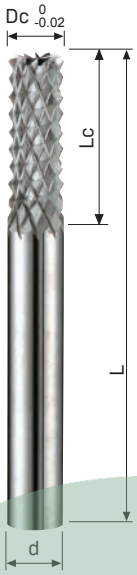
N FRP CFRP Composite Material

Feature of product:

Routers for Composite Materials Design with Staggered blade.

Use to cut out fibers in the material to avoid fiber pulling out.

Application for roughing in Phenolic-epoxy parts, Polyester glass reinforced products, Graphite, Composite...etc.

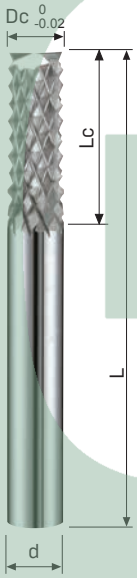


Burr End cut

Code No. E197-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Bright E197	Diamond E197SP
3	12	38	3	●	—
4	15	50	4	●	—
6	18	50	6	●	—
8	22	60	8	●	—
10	30	75	10	●	—
12	30	75	12	●	—

※ Mark: —, On request, no stock

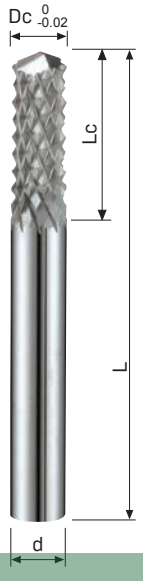


End Mill End cut

Code No. E198-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Bright E198	Diamond E198SP
3	12	38	3	●	—
4	15	50	4	●	—
6	18	50	6	●	—
8	22	60	8	●	—
10	30	75	10	●	—
12	30	75	12	●	—

※ Mark: —, On request, no stock



135° Drill Point

Code No. E199-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Bright E199	Diamond E199SP
3	12	38	3	●	—
4	15	50	4	●	—
6	18	50	6	●	—
8	22	60	8	●	—
10	30	75	10	●	—
12	30	75	12	●	—

※ Mark: —, On request, no stock

Slotting

Work Material		GR.13 FRP CFRP Composite Material	
Vc m/min		188	
Code No.	Dc	RPM (min-1)	Feed (mm/min)
E197/E198/E199-3	3	20,000	6,000
E197/E198/E199-4	4	15,000	5,000
E197/E198/E199-6	6	10,000	5,000
E197/E198/E199-8	8	8,400	4,000
E197/E198/E199-10	10	6,700	4,000
E197/E198/E199-12	12	5,000	5,000
(mm) 		ap:0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

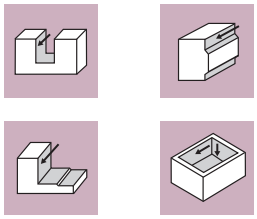
Routers For Composite Materials

MG Carbide

Uncoated Bright

Diamond SP3

Type of Operation



Work Material

P	H	M	K	N	S
				●	

N FRP CFRP Composite Material

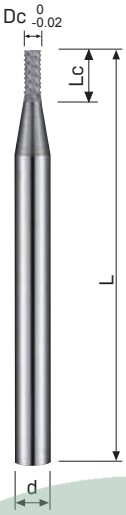
Feature of product:

Routers for Composite Materials Design with Staggered blade.

End cutting edge with drill tip design which could be applied for drilling.

Use to cut out fibers in the material to avoid fiber pulling out.

Application for roughing in Phenolic-epoxy parts, Polyester glass reinforced products, Graphite, Composite...etc.

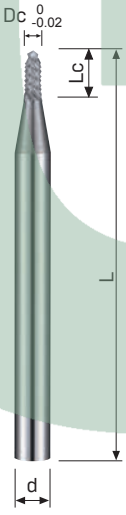


End Mill
End cut

Code No. E298-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Bright E298	Diamond E298SP
1.5	3.0	50	4	●	—
1.8	3.6	50	4	●	—
2.0	4.0	50	4	●	—
2.5	5.0	50	4	●	—
3.0	6.0	50	4	●	—

※ Mark: —, On request, no stock



135° Drill Point

Code No. E299-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Bright E299	Diamond E299SP
1.5	3.0	50	4	●	—
1.8	3.6	50	4	●	—
2.0	4.0	50	4	●	—
2.5	5.0	50	4	●	—
3.0	6.0	50	4	●	—

※ Mark: —, On request, no stock

Slotting

Work Material		GR.13 FRP CFRP Composite Material	
Vc m/min		40~200	
Code No.	Dc	RPM (min-1)	Feed (mm/min)
E298/E299-1.5	1.5	20,000	4,000
E298/E299-1.8	1.8	20,000	4,000
E298/E299-2.0	2.0	20,000	5,000
E298/E299-2.5	2.5	20,000	6,000
E298/E299-3.0	3.0	20,000	6,000
（mm） 		ap:0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

Routers For Composite Materials

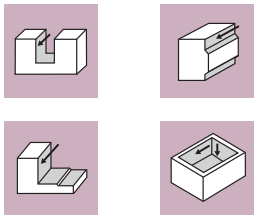
MG Carbide

Uncoated Bright

10°

Diamond SP3

Type of Operation



Work Material

P	H	M	K	N	S
				●	

N FRP CFRP Composite Material

Feature of product:

E291 Routers for Composite Materials- Single Point.

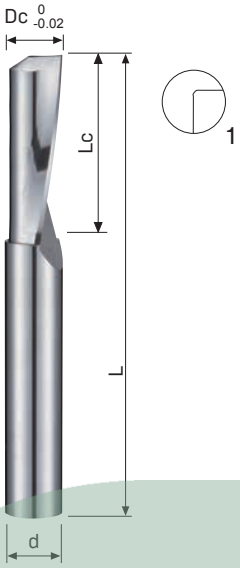
Design with large chip removal space.

E294 Routers for Composite Materials- 4 Flutes.

Design with lower Helix.

Better surface roughness after processing.

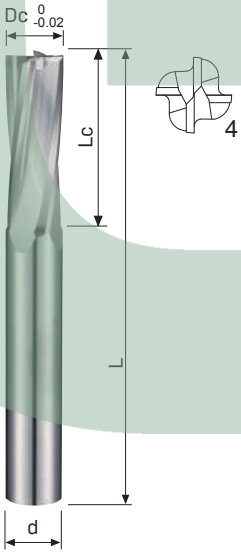
Application for finishing in composite materials.



Code No. E291-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Bright E291	Diamond E291SP
3	9	50	3	●	—
4	12	60	4	●	—
6	18	70	6	●	—
8	24	75	8	●	—
10	30	80	10	●	—
12	36	80	12	●	—

※ Mark: —, On request, no stock



Code No. E294-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Bright E294	Diamond E294SP
3	9	50	3	●	—
4	12	60	4	●	—
6	18	70	6	●	—
8	24	75	8	●	—
10	30	80	10	●	—
12	36	80	12	●	—

※ Mark: —, On request, no stock

E291 / Slotting

Work Material		GR.13 FRP CFRP Composite Material	
Vc m/min		188	
Code No.	Dc	RPM (min-1)	Feed (mm/min)
E291-3	3	20,000	6,000
E291-4	4	15,000	5,000
E291-6	6	10,000	5,000
E291-8	8	8,400	4,000
E291-10	10	6,700	4,000
E291-12	12	5,000	5,000
(mm) 		ap:0.5D	

E294 / Slotting

Work Material		GR.13 FRP CFRP Composite Material	
Vc m/min		200	
Code No.	Dc	RPM (min-1)	Feed (mm/min)
E294-3	3	21,000	4,200
E294-4	4	16,000	3,200
E294-6	6	10,000	3,200
E294-8	8	8,000	2,560
E294-10	10	6,400	3,072
E294-12	12	5,300	3,180
(mm) 		ap:0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

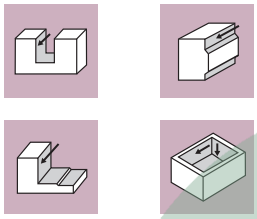
E189R / E189L

End Mills For Plastics

MG Carbide | Uncoated Bright

21° | 1 | H γ25° | 90°

Type of Operation



Work Material

P	H	M	K	N	S
				●	

N Plastics

Feature of product:

E189R End Mills with Right-Hand for Plastic- Single Point

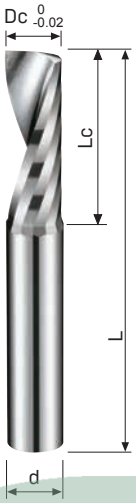
E189L End Mills with Left-Hand for Plastic- Single Point

Design with sharp cutting edge, high removal cutting geometry, and fine grinding smooth surface to prevent sticking problem.

Higher finishing of cutting edge to have better surface roughness after processing.

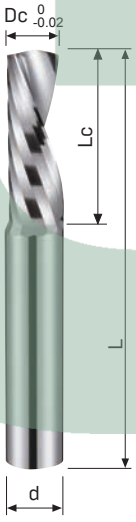
Chips will be removed upwards/ downwards while cutting process.

Application for finishing in various plastic materials.



Code No. E189R-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Bright E189R
3	12	50	3	●
4	15	50	4	●
6	20	63	6	●
8	25	63	8	●
10	30	72	10	●
12	38	75	12	●



Code No. E189L-Dc

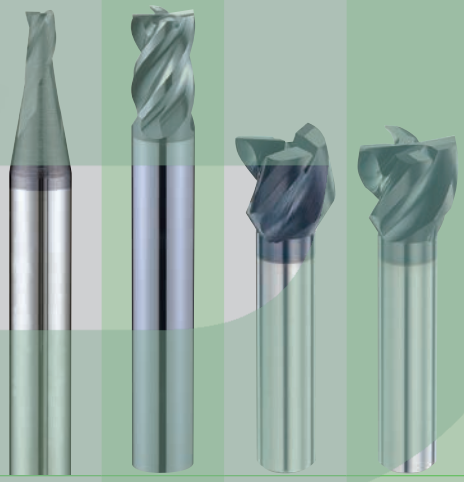
Dc 0 -0.02	Lc mm	L mm	d h6	Bright E189L
3	12	50	3	●
4	15	50	4	●
6	20	63	6	●
8	25	63	8	●
10	30	72	10	●
12	38	75	12	●

Slotting

Work Material		GR.12 Plastics	
Vc m/min		188	
Code No.	Dc	RPM (min-1)	Feed (mm/min)
E189R/E189L-3	3	20,000	6,000
E189R/E189L-4	4	15,000	5,000
E189R/E189L-6	6	10,000	5,000
E189R/E189L-8	8	8,400	4,000
E189R/E189L-10	10	6,700	4,000
E189R/E189L-12	12	5,000	5,000
(mm) 		ap:0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

Short End Mills For Lathe Machine

Page	113	113	115	115
Appearance				
Code No	E113X	E114X	E115HX	E116HX
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
Coating	AlTiN X-NaNo	AlTiN X-NaNo	AlTiCrN HX	AlTiCrN HX
Helix Angle				
No.of Flutes				

ASIA

E113X / E114X

Short End Mills For Lathe

Work Material

P	H	M	K	N	S
●	●	○	●	○	

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Copper

Feature of product:

E113X End Mills For Lathe- 3 Flutes

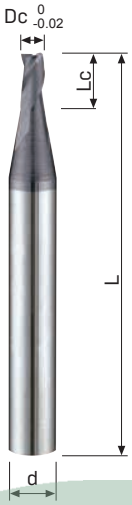
E114X End Mills For Lathe- 4 Flutes

Widely used with driven tool holder in CNC Lathe.

Perform excellent wear resistance with AlTiN coating.

Short cutting length is to prevent from interruption in lathe.

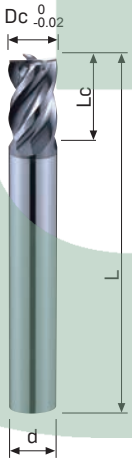
Applied in various steel material up to HRC48.



MG Carbide | AlTiN X-NaNo | 35° | 3 | N γ10° | 90°

Code No. E113X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E113X
2	3	50	6	●
3	5	50	6	●
4	6	50	6	●
5	8	50	6	●
6	10	50	6	●
8	12	50	8	●
10	15	50	10	●



MG Carbide | AlTiN X-NaNo | 36° 38° | 4 | N γ8° | 90°

Code No. E114X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E114X
2	3	50	6	●
3	5	50	6	●
4	6	50	6	●
5	8	50	6	●
6	10	50	6	●
8	12	50	8	●
10	15	50	10	●

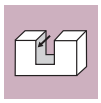
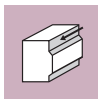
Slotting

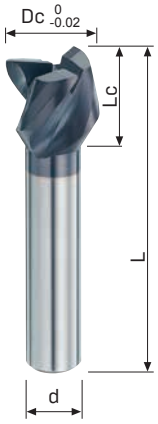
Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.9 Cast Iron		GR.11 Copper	
Vc m/min		80		80		60		50		30		80		100	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E113X/E114X-2	2	11,000	135	11,000	135	7,000	90	6,350	70	3,950	40	11,000	135	15,500	200
E113X/E114X-3	3	7,400	200	7,400	200	5,300	100	4,450	75	2,750	45	7,400	200	10,500	300
E113X/E114X-4	4	5,950	235	5,950	235	4,250	125	3,500	90	2,200	50	5,950	235	7,950	300
E113X/E114X-5	5	5,300	315	5,300	315	3,550	130	3,050	100	1,900	55	5,300	315	6,350	300
E113X/E114X-6	6	4,450	310	4,450	310	2,950	130	2,500	100	1,550	55	4,450	310	5,300	300
E113X/E114X-8	8	3,300	295	3,300	295	2,200	125	1,900	100	1,150	50	3,300	295	3,950	300
E113X/E114X-10	10	2,650	280	2,650	280	1,750	125	1,500	95	955	50	2,650	280	3,150	300
(mm) 		ap:<3 0.3D ≥3 0.5D		ap:<3 0.3D ≥3 0.5D		ap:<3 0.3D ≥3 0.5D		ap:<3 0.3D ≥3 0.5D		ap:<3 0.02D ≥3 0.05D		ap:<3 0.3D ≥3 0.5D		ap:<3 0.3D ≥3 0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E115HX / E116HX

Short End Mills For Lathe



MG Carbide | AlTiCrN HX | 38° 41° | 3 | N γ5° | 90°

Code No. E115HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E115HX
2	6	35	4	●
3	6	35	4	●
4	6	35	4	●
5	6	35	6	●
6	6	35	6	●
7	6	35	6	●
8	6	35	6	●
8A	6	35	8	●
9	6	35	6	●
10	6	35	6	●
10A	6	35	10	●
12	6	35	6	●
12A	6	35	12	●

Work Material

P	H	M	K	N	S
●	●	●		○	

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **N** Aluminium
- **N** Copper

Feature of product:

E115HX End Mills For Lathe- 3 Flutes

E116HX End Mills For Lathe- 4 Flutes

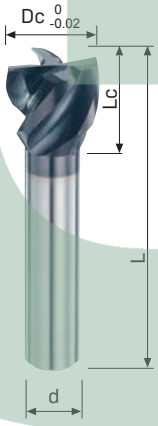
Widely used with driven tool holder in CNC Lathe.

Perform excellent wear resistance with AlTiCrN coating.

The very short tool length is to prevent from interruption in lathe.

Increase the commonality by adopting the same small shank diameter.

Applied in various steel material up to HRC48.



MG Carbide | AlTiCrN HX | 38° 41° | 4 | N γ5° | 90°

Code No. E116HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E116HX
2	6	35	4	●
3	6	35	4	●
4	6	35	4	●
5	6	35	6	●
6	6	35	6	●
7	6	35	6	●
8	6	35	6	●
8A	6	35	8	●
9	6	35	6	●
10	6	35	6	●
10A	6	35	10	●
12	6	35	6	●
12A	6	35	12	●

Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel	
Vc m/min		100～120		100～120		100～120		65～80		55～70		55～70	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E115HX/E116HX-3	3	10,000	600	10,000	600	10,000	600	7,000	400	7,000	400	6,000	300
E115HX/E116HX-4	4	7,500	600	7,500	600	7,500	600	5,200	400	5,200	400	4,500	300
E115HX/E116HX-5	5	6,000	600	6,000	600	6,000	600	4,200	400	4,200	400	3,600	300
E115HX/E116HX-6	6	5,000	600	5,000	600	5,000	600	3,500	400	3,500	400	3,000	300
E115HX/E116HX-7	7	4,500	560	4,500	560	4,500	560	3,000	360	3,000	360	2,700	280
E115HX/E116HX-8	8	4,000	520	4,000	520	4,000	520	2,800	350	2,800	350	2,400	260
E115HX/E116HX-9	9	3,600	500	3,600	500	3,600	500	2,500	320	2,500	320	2,200	250
E115HX/E116HX-10	10	3,200	450	3,200	450	3,200	450	2,200	300	2,200	300	1,900	230
E115HX/E116HX-12	12	2,700	410	2,700	410	2,700	410	1,900	270	1,900	270	1,600	210
（mm） 		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D	

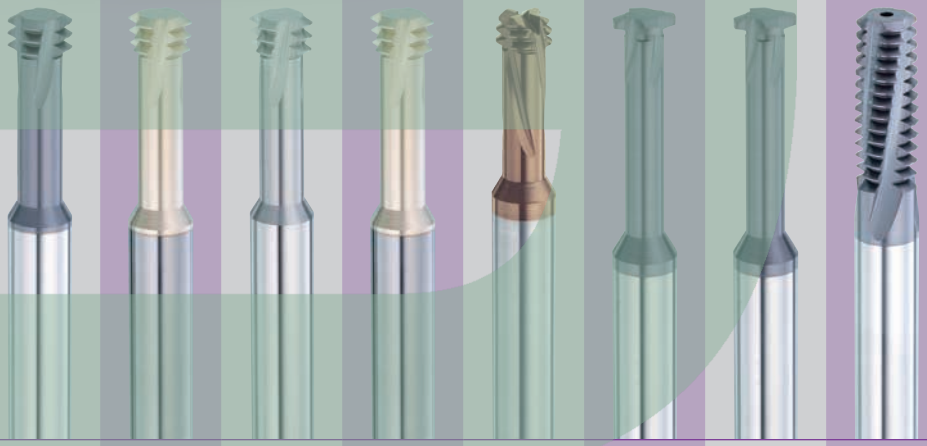
Slotting

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel	
Vc m/min		100～120		100～120		100～120		65～80		55～70		55～70	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E115HX/E116HX-3	3	10,000	600	10,000	600	10,000	600	7,000	400	7,000	400	6,000	300
E115HX/E116HX-4	4	7,500	600	7,500	600	7,500	600	5,200	400	5,200	400	4,500	300
E115HX/E116HX-5	5	6,000	600	6,000	600	6,000	600	4,200	400	4,200	400	3,600	300
E115HX/E116HX-6	6	5,000	600	5,000	600	5,000	600	3,500	400	3,500	400	3,000	300
E115HX/E116HX-7	7	4,500	560	4,500	560	4,500	560	3,000	360	3,000	360	2,700	280
E115HX/E116HX-8	8	4,000	520	4,000	520	4,000	520	2,800	350	2,800	350	2,400	260
E115HX/E116HX-9	9	3,600	500	3,600	500	3,600	500	2,500	320	2,500	320	2,200	250
E115HX/E116HX-10	10	3,200	450	3,200	450	3,200	450	2,200	300	2,200	300	1,900	230
E115HX/E116HX-12	12	2,700	410	2,700	410	2,700	410	1,900	270	1,900	270	1,600	210
（inch） 		ap:0.2D		ap:0.2D		ap:0.2D		ap:0.2D		ap:0.2D		ap:0.2D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.



Thread Mills

Page	119	120	121	122	123	124	125	126
Appearance								
Code No	T730-2.0FX T730-3.0FX	T730-2.0SX T730-3.0SX	T730-2.0 T730-3.0	T731SX	T740TX	T741FX	T742FX	T750-2.0FX
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
Coating	AlCrN FX	AlTiXZrN SX	Uncoated Bright	AlTiXZrN SX	AlTiSiN TX	AlCrN FX	AlCrN FX	AlCrN FX
Helix Angle								
No.of Flutes	 3~4Z	 3~4Z	 3~4Z	 3~4Z	 3~4Z			 3~4Z

127	128	129	130	131	132	133	134	135	136	137
										
T752-2.0FX	T760-2.0FX T760-3.0FX	T760-2.0 T760-3.0	T761SX	T762-2.0FX	T764-2.0FX	T765FX T766FX	T767FX T768FX	T784FX T785FX	T786FX T787FX	T788FX T789FX
MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
AlCrN FX	AlCrN FX	Uncoated Bright	AlTiXZrN SX	AlCrN FX	AlCrN FX	AlCrN FX	AlCrN FX	AlCrN FX	AlCrN FX	AlCrN FX
										
										
3~4Z	3~5Z	3~5Z	3~4Z	3~4Z	3~4Z	3~4Z	3~4Z	3~4Z	3~4Z	3~5Z

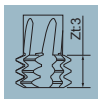
T730-2.0FX / T730-3.0FX

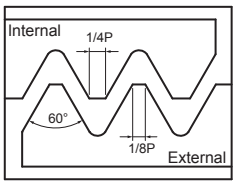
Micro Thread Mills (ISO)

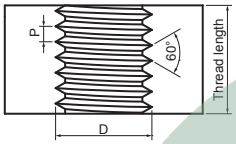
MG Carbide

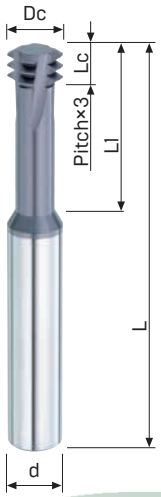
AlCrN FX











Work Material

P	H	M	K	N	S
●	●	●	●	○	○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Suitable for carbon steel, alloy steel, below HRC48 hardened steel, stainless steel, cast iron, copper, and aluminium alloy...etc.

For Internal Thread

Code No. T730-2.0FX

Thread M Coarse	Thread M Fine	Pitch P	Dc mm	Ll mm	L mm	d h6	t Z	Thread depth	Code No.	AlCrN T730-2.0FX
M1×0.25		0.25	0.72	2.3	50	4	3	2×D	T730020FX 0072 023 ISO 025	●
M1.2×0.25	M2~M2.2×0.25	0.25	0.91	2.8	50	4	3	2×D	T730020FX 0091 028 ISO 025	●
M1.4×0.3		0.3	1.05	3.2	50	4	3	2×D	T730020FX 0105 032 ISO 030	●
M1.6×0.35	M2.5~M3.5×0.35	0.35	1.2	3.6	50	4	3	2×D	T730020FX 0120 036 ISO 035	●
M2×0.4		0.4	1.55	4.5	50	4	3	2×D	T730020FX 0155 045 ISO 040	●
M2.2×0.45		0.45	1.65	4.9	50	4	3	2×D	T730020FX 0165 049 ISO 045	●
M2.5×0.45		0.45	1.95	5.5	50	4	3	2×D	T730020FX 0195 055 ISO 045	●
M3×0.5	M3.5~M16×0.5	0.5	2.4	6.5	50	4	3	2×D	T730020FX 0240 065 ISO 050	●
M3.5×0.6		0.6	2.75	7.6	50	4	3	2×D	T730020FX 0275 076 ISO 060	●
M4×0.7		0.7	3.15	8.7	50	6	3	2×D	T730020FX 0315 087 ISO 070	●
M5×0.8		0.8	4	10.8	50	6	3	2×D	T730020FX 0400 108 ISO 080	●
M6×1	M8~M40×1	1	4.8	13	50	6	3	2×D	T730020FX 0480 130 ISO 100	●
M8×1.25	M10~M48×1.25	1.25	6.5	17.3	60	8	3	2×D	T730020FX 0650 173 ISO 125	●
M10×1.5	M12~M48×1.5	1.5	8.2	21.5	75	10	4	2×D	T730020FX 0820 215 ISO 150	●
M12×1.75		1.75	9.9	26	75	10	4	2×D	T730020FX 0990 260 ISO 175	●
M14×2	M17~M80×2	2	11.6	30	75	12	4	2×D	T730020FX 1160 300 ISO 200	●
M16×2	M17~M80×2	2	11.9	35	75	12	4	2×D	T730020FX 1190 350 ISO 200	●
M20×2.5		2.5	15.9	43	100	16	4	2×D	T730020FX 1590 430 ISO 250	●

Please refer to page P138 for parameters.

For Internal Thread

Code No. T730-3.0FX

Thread M Coarse	Thread M Fine	Pitch P	Dc mm	Ll mm	L mm	d h6	t Z	Thread depth	Code No.	AlCrN T730-3.0FX
M2×0.4		0.4	1.55	6.5	50	4	3	3×D	T730030FX 0155 065 ISO 040	●
M2.5×0.45		0.45	1.95	8	50	4	3	3×D	T730030FX 0195 080 ISO 045	●
M3×0.5	M3.5~M16×0.5	0.5	2.4	9.5	50	4	3	3×D	T730030FX 0240 095 ISO 050	●
M3.5×0.6		0.6	2.75	10.5	50	4	3	3×D	T730030FX 0275 105 ISO 060	●
M4×0.7		0.7	3.15	12.7	50	6	3	3×D	T730030FX 0315 127 ISO 070	●
M5×0.8		0.8	4	15.8	50	6	3	3×D	T730030FX 0400 158 ISO 080	●
M6×1	M8~M40×1	1	4.8	19	50	6	3	3×D	T730030FX 0480 190 ISO 100	●
M8×1.25	M10~M48×1.25	1.25	6.5	25.3	60	8	3	3×D	T730030FX 0650 253 ISO 125	●
M10×1.5	M12~M48×1.5	1.5	8.2	31.5	75	10	4	3×D	T730030FX 0820 315 ISO 150	●
M12×1.75		1.75	9.9	38	75	10	4	3×D	T730030FX 0990 380 ISO 175	●

Please refer to page P138 for parameters.

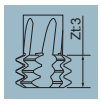
T730-2.0SX / T730-3.0SX

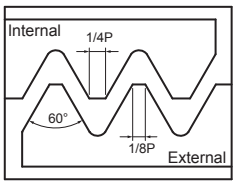
Micro Thread Mills (ISO) (Difficult To Cut Materials)

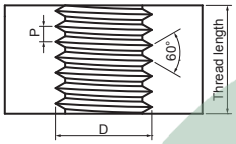
MG Carbide

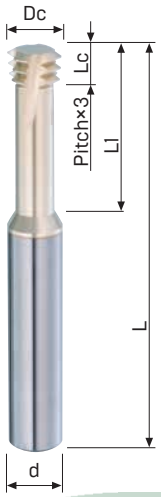
AlTiXZrN SX











Work Material

P	H	M	K	N	S
●	●	●			●

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **M** Stainless Steel
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Suitable for difficult to cut materials such as, titanium alloy, nickel alloy, stainless steel and below HRC56 hardened steel...etc.

For Internal Thread — Code No. T730-2.0SX

Thread M Coarse	Thread M Fine	Pitch P	Dc mm	Ll mm	L mm	d h6	t Z	Thread depth	Code No.	AlCrN T730-2.0SX
M1×0.25		0.25	0.72	2.3	50	4	3	2×D	T730020SX 0072 023 ISO 025	•
M1.2×0.25	M2~M2.2×0.25	0.25	0.91	2.8	50	4	3	2×D	T730020SX 0091 028 ISO 025	•
M1.4×0.3		0.3	1.05	3.2	50	4	3	2×D	T730020SX 0105 032 ISO 030	•
M1.6×0.35	M2.5~M3.5×0.35	0.35	1.2	3.6	50	4	3	2×D	T730020SX 0120 036 ISO 035	•
M2×0.4		0.4	1.55	4.5	50	4	3	2×D	T730020SX 0155 045 ISO 040	•
M2.2×0.45		0.45	1.65	4.9	50	4	3	2×D	T730020SX 0165 049 ISO 045	•
M2.5×0.45		0.45	1.95	5.5	50	4	3	2×D	T730020SX 0195 055 ISO 045	•
M3×0.5	M3.5~M16×0.5	0.5	2.4	6.5	50	4	3	2×D	T730020SX 0240 065 ISO 050	•
M3.5×0.6		0.6	2.75	7.6	50	4	3	2×D	T730020SX 0275 076 ISO 060	•
M4×0.7		0.7	3.15	8.7	50	6	3	2×D	T730020SX 0315 087 ISO 070	•
M5×0.8		0.8	4	10.8	50	6	3	2×D	T730020SX 0400 108 ISO 080	•
M6×1	M8~M40×1	1	4.8	13	50	6	3	2×D	T730020SX 0480 130 ISO 100	•
M8×1.25	M10~M48×1.25	1.25	6.5	17.3	60	8	3	2×D	T730020SX 0650 173 ISO 125	•
M10×1.5	M12~M48×1.5	1.5	8.2	21.5	75	10	4	2×D	T730020SX 0820 215 ISO 150	•
M12×1.75		1.75	9.9	26	75	10	4	2×D	T730020SX 0990 260 ISO 175	•
M14×2	M17~M80×2	2	11.6	30	75	12	4	2×D	T730020SX 1160 300 ISO 200	•
M16×2	M17~M80×2	2	11.9	35	75	12	4	2×D	T730020SX 1190 350 ISO 200	•
M20×2.5		2.5	15.9	43	100	16	4	2×D	T730020SX 1590 430 ISO 250	•

Please refer to page P138 for parameters.

For Internal Thread — Code No. T730-3.0SX

Thread M Coarse	Thread M Fine	Pitch P	Dc mm	Ll mm	L mm	d h6	t Z	Thread depth	Code No.	AlCrN T730-3.0SX
M2×0.4		0.4	1.55	6.5	50	4	3	3×D	T730030SX 0155 065 ISO 040	•
M2.5×0.45		0.45	1.95	8	50	4	3	3×D	T730030SX 0195 080 ISO 045	•
M3×0.5	M3.5~M16×0.5	0.5	2.4	9.5	50	4	3	3×D	T730030SX 0240 095 ISO 050	•
M3.5×0.6		0.6	2.75	10.5	50	4	3	3×D	T730030SX 0275 105 ISO 060	•
M4×0.7		0.7	3.15	12.7	50	6	3	3×D	T730030SX 0315 127 ISO 070	•
M5×0.8		0.8	4	15.8	50	6	3	3×D	T730030SX 0400 158 ISO 080	•
M6×1	M8~M40×1	1	4.8	19	50	6	3	3×D	T730030SX 0480 190 ISO 100	•
M8×1.25	M10~M48×1.25	1.25	6.5	25.3	60	8	3	3×D	T730030SX 0650 253 ISO 125	•
M10×1.5	M12~M48×1.5	1.5	8.2	31.5	75	10	4	3×D	T730030SX 0820 315 ISO 150	•
M12×1.75		1.75	9.9	38	75	10	4	3×D	T730030SX 0990 380 ISO 175	•

Please refer to page P138 for parameters.

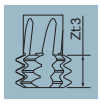
T730-2.0 / T730-3.0

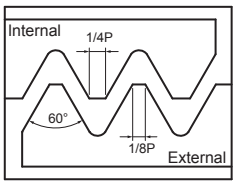
Micro Thread Mills For Aluminum (ISO)

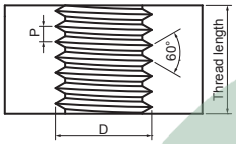
MG Carbide

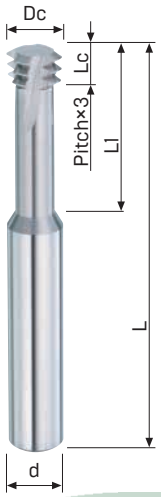
Uncoated Bright











Work Material

P	H	M	K	N	S
				●	

N Aluminium

Feature of product:

ISO Metric Standard Thread

Suitable for cutting in different aluminium alloy materials.

For Internal Thread — Code No. T730-2.0

Thread M Coarse	Thread M Fine	Pitch P	Dc mm	Ll mm	L mm	d h6	t Z	Thread depth	Code No.	Bright T730-2.0
M1×0.25		0.25	0.72	2.3	50	4	3	2×D	T730020 0072 023 ISO 025	•
M1.2×0.25	M2~M2.2×0.25	0.25	0.91	2.8	50	4	3	2×D	T730020 0091 028 ISO 025	•
M1.4×0.3		0.3	1.05	3.2	50	4	3	2×D	T730020 0105 032 ISO 030	•
M1.6×0.35	M2.5~M3.5×0.35	0.35	1.2	3.6	50	4	3	2×D	T730020 0120 036 ISO 035	•
M2×0.4		0.4	1.55	4.5	50	4	3	2×D	T730020 0155 045 ISO 040	•
M2.2×0.45		0.45	1.65	4.9	50	4	3	2×D	T730020 0165 049 ISO 045	•
M2.5×0.45		0.45	1.95	5.5	50	4	3	2×D	T730020 0195 055 ISO 045	•
M3×0.5	M3.5~M16×0.5	0.5	2.4	6.5	50	4	3	2×D	T730020 0240 065 ISO 050	•
M3.5×0.6		0.6	2.75	7.6	50	4	3	2×D	T730020 0275 076 ISO 060	•
M4×0.7		0.7	3.15	8.7	50	6	3	2×D	T730020 0315 087 ISO 070	•
M5×0.8		0.8	4	10.8	50	6	3	2×D	T730020 0400 108 ISO 080	•
M6×1	M8~M40×1	1	4.8	13	50	6	3	2×D	T730020 0480 130 ISO 100	•
M8×1.25	M10~M48×1.25	1.25	6.5	17.3	60	8	3	2×D	T730020 0650 173 ISO 125	•
M10×1.5	M12~M48×1.5	1.5	8.2	21.5	75	10	4	2×D	T730020 0820 215 ISO 150	•
M12×1.75		1.75	9.9	26	75	10	4	2×D	T730020 0990 260 ISO 175	•
M14×2	M17~M80×2	2	11.6	30	75	12	4	2×D	T730020 1160 300 ISO 200	•
M16×2	M17~M80×2	2	11.9	35	75	12	4	2×D	T730020 1190 350 ISO 200	•
M20×2.5		2.5	15.9	43	100	16	4	2×D	T730020 1590 430 ISO 250	•

Please refer to page P138 for parameters.

For Internal Thread — Code No. T730-3.0

Thread M Coarse	Thread M Fine	Pitch P	Dc mm	Ll mm	L mm	d h6	t Z	Thread depth	Code No.	Bright T730-3.0
M2×0.4		0.4	1.55	6.5	50	4	3	3×D	T730030 0155 065 ISO 040	•
M2.5×0.45		0.45	1.95	8	50	4	3	3×D	T730030 0195 080 ISO 045	•
M3×0.5	M3.5~M16×0.5	0.5	2.4	9.5	50	4	3	3×D	T730030 0240 095 ISO 050	•
M3.5×0.6		0.6	2.75	10.5	50	4	3	3×D	T730030 0275 105 ISO 060	•
M4×0.7		0.7	3.15	12.7	50	6	3	3×D	T730030 0315 127 ISO 070	•
M5×0.8		0.8	4	15.8	50	6	3	3×D	T730030 0400 158 ISO 080	•
M6×1	M8~M40×1	1	4.8	19	50	6	3	3×D	T730030 0480 190 ISO 100	•
M8×1.25	M10~M48×1.25	1.25	6.5	25.3	60	8	3	3×D	T730030 0650 253 ISO 125	•
M10×1.5	M12~M48×1.5	1.5	8.2	31.5	75	10	4	3×D	T730030 0820 315 ISO 150	•
M12×1.75		1.75	9.9	38	75	10	4	3×D	T730030 0990 380 ISO 175	•

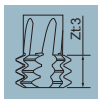
Please refer to page P138 for parameters.

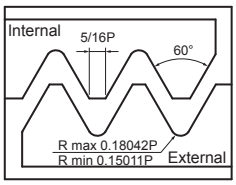
Micro Thread Mills (MJ)

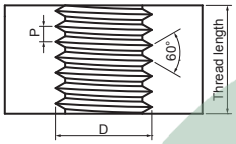
MG Carbide

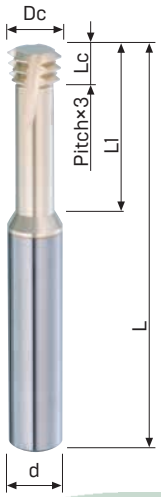
AlTiXZrN SX











Work Material

P	H	M	K	N	S
●	●	●			●

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **M** Stainless Steel
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Suitable for difficult to cut materials such as, titanium alloy, nickel alloy, stainless steel and below HRC56 hardened steel...etc.

For Internal Thread — Code No. T731SX

Thread Standard	Pitch P	Dc mm	Ll mm	L mm	d h6	t Z	Thread depth	Code No.	AlTiXZrN T731SX
MJ3×0.5	0.5	2.4	9.2	50	6	3	3×D	T731SX 0240 092 MJ 005	●
MJ3.5×0.6	0.6	2.85	11	50	6	3	3×D	T731SX 0285 110 MJ 006	●
MJ4×0.7	0.7	3.15	12.3	50	6	3	3×D	T731SX 0315 123 MJ 007	●
MJ5×0.8	0.8	4.05	15.4	50	6	3	3×D	T731SX 0405 154 MJ 008	●
MJ6×1.0	1	4.8	18.5	50	6	3	3×D	T731SX 0480 185 MJ 010	●
MJ8×1.25	1.25	6.5	24.6	60	8	3	3×D	T731SX 0650 246 MJ 125	●
MJ10×1.5	1.5	8.2	30.8	75	10	4	3×D	T731SX 0820 308 MJ 150	●
MJ12×1.75	1.75	9.9	37	75	10	4	3×D	T731SX 0990 370 MJ 175	●
MJ14×2	2	11.9	42.5	80	12	4	3×D	T731SX 1190 425 MJ 200	●

Please refer to page P138 for parameters.

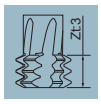
T740TX

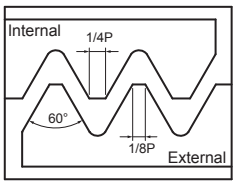
Oil-Feed Thread Mills Drill (ISO)

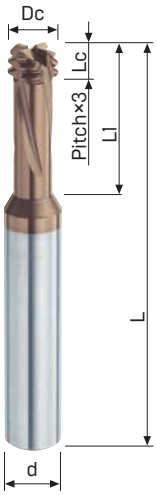
MG Carbide

AlTiSiN TX









Work Material

P	H	M	K	N	S
●	●	●	○		

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **H** <68HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron

Feature of product:

ISO Metric Standard Thread

Designed with left helix and right cutting edge, is beneficial for cutting and getting better chip removal rate.

Cutter tip with chamfering function.

Internal oil-feed design to provide with better cooling effect and chip removal.

Suitable for carbon steel, alloy steel, stainless steel, cast iron, and below HRC68 hardened steel...etc.

For Internal Thread — Code No. T740TX

Thread M Coarse	Thread M Fine	Pitch P	Dc mm	Ll mm	L mm	d h6	Ds mm	t Z	Code No.	AlTiSiN T740TX
M3×0.5	M4×0.5	0.5	2.4	7	57	6	2.1	3	T740TX 024 070 ISO 050	•
M4×0.7		0.7	3.2	9.2	57	6	2.9	3	T740TX 032 092 ISO 070	•
M5×0.8		0.8	3.9	11.5	57	6	3.5	3	T740TX 039 115 ISO 080	•
M6~M7×1	M8~M9×1	1	4.7	14	57	6	4.2	3	T740TX 047 140 ISO 100	•
M8×1.25		1.25	6.1	18	63	8	5.6	4	T740TX 061 180 ISO 125	•
M10×1.5	M11~M15×1.5	1.5	7.8	23	63	8	7.2	4	T740TX 078 230 ISO 150	•
M12×1.75		1.75	9	26	72	10	8.4	4	T740TX 090 260 ISO 175	•
M16×2	M17~M23×2	2	11.8	35	83	12	11.2	4	T740TX 118 350 ISO 200	•

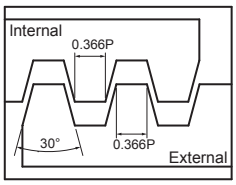
Please refer to page P138 for parameters.

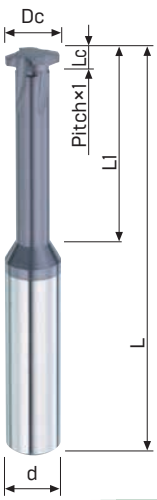
30° Trapezoidal Thread Mills (ISO/Metric)

MG Carbide

AlCrN FX







Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Suitable for carbon steel, alloy steel, below HRC48 hardened steel, stainless steel, and cast iron...etc.

For Internal Thread

Code No. T741FX

Thread Tr	Pitch P	Dc mm	L1 mm	L mm	d h6	t Z	Code No.	AlCrN T741FX
Tr 7×1	1	5.5	20	50	6	4	T741FX 055 200 Tr 010	●
Tr 8×1.5 ~ Tr 9×1.5	1.5	6	20	50	6	4	T741FX 060 200 Tr 015	●
Tr 9×2 ~ Tr11×2	2	6.4	20	60	8	4	T741FX 064 200 Tr 020	●
Tr12×2 ~ Tr20×2	2	9.4	35	75	10	4	T741FX 094 350 Tr 020	●
Tr11×3 ~ Tr14×3	3	7.4	25	60	8	4	T741FX 074 250 Tr 030	●
Tr14×3 ~ Tr30×3	3	10	35	75	10	4	T741FX 100 350 Tr 030	●
Tr16×4 ~ Tr20×4	4	11	38	75	12	4	T741FX 110 380 Tr 040	●
Tr22×5 ~ Tr28×5	5	14	50	100	16	4	T741FX 140 500 Tr 050	●
Tr30×6 ~Tr42×6	6	16	50	100	16	4	T741FX 160 500 Tr 060	●

Please refer to page P139 for parameters.

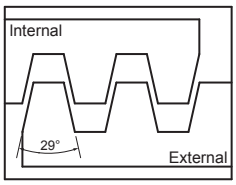
T742FX

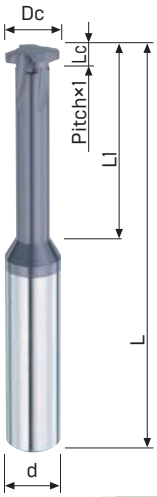
29° Trapezoidal Thread Mills (ANSI/Acme)

MG Carbide

AlCrN FX







Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Suitable for carbon steel, alloy steel, below HRC48 hardened steel, stainless steel, and cast iron...etc.

For Internal Thread — Code No. T742FX

Thread TW	Pitch P	Dc mm	Ll mm	L mm	d h6	t Z	Code No.	AlCrN T742FX
TW 1/4×16	16	4.7	15	50	6	4	T742FX 047 150 TW 16	•
TW 5/16×14	14	6	20	50	6	4	T742FX 060 200 TW 14	•
TW 3/8×12、TW 7/16×12	12	7.2	25	60	8	4	T742FX 072 250 TW 12	•
TW 1/12×10	10	10	35	75	10	4	T742FX 100 350 TW 10	•
TW 5/8×8	8	12	35	75	12	4	T742FX 120 350 TW 08	•
TW 3/4×6、TW 7/8×6	6	12	35	75	12	4	T742FX 120 350 TW 06	•

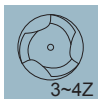
Please refer to page P139 for parameters.

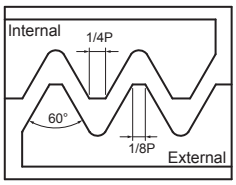
T750-2.0FX

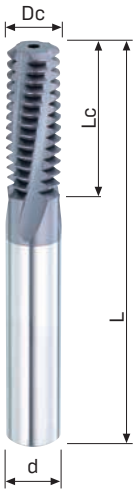
Oil-Feed Thread Mills (ISO)

MG Carbide

AlCrN FX







Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Suitable for carbon steel, alloy steel, below HRC48 hardened steel, stainless steel, and cast iron...etc.

For Internal Thread Lc ≤ 2 × Thread Diameter Code No. T750-2.0FX

Thread M Coarse	Thread M Fine	Pitch P	Dc mm	Lc mm	L mm	d h6	t Z	Code No.	AlCrN T750-2.0FX
M3×0.5	M3.5~M16×0.5	0.5	2.4	6.2	50	4	3	T750020FX 0240 062 ISO 050	●
	M4×0.5	0.5	3.2	8.2	50	6	3	T750020FX 0320 082 ISO 050	●
	M5×0.5	0.5	4.2	10.2	50	6	3	T750020FX 0420 102 ISO 050	●
M4×0.7		0.7	3.15	8.7	50	6	3	T750020FX 0315 087 ISO 070	●
	M6×0.75	0.75	5	12.4	50	6	3	T750020FX 0500 124 ISO 075	●
M5×0.8		0.8	3.9	10.8	50	6	3	T750020FX 0390 108 ISO 080	●
M6×1	M8~M40×1	1	4.8	12.5	50	6	3	T750020FX 0480 125 ISO 100	●
	M8×1	1	6.7	16.5	60	8	3	T750020FX 0670 165 ISO 100	●
	M10×1	1	8.7	20.5	75	10	3	T750020FX 0870 205 ISO 100	●
	M12×1	1	10.7	24.5	75	12	4	T750020FX 1070 245 ISO 100	●
M8×1.25		1.25	6.5	16.9	60	8	3	T750020FX 0650 169 ISO 125	●
	M10×1.25	1.25	8.5	20.6	75	10	3	T750020FX 0850 206 ISO 125	●
M10×1.5	M12~M48×1.5	1.5	8.2	20.2	75	10	3	T750020FX 0820 202 ISO 150	●
	M12×1.5	1.5	9.9	24.7	75	10	4	T750020FX 0990 247 ISO 150	●
	M14×1.5	1.5	11.9	29.2	75	12	4	T750020FX 1190 292 ISO 150	●
	M16×1.5	1.5	13.9	32.2	100	16	4	T750020FX 1390 322 ISO 150	●
M12×1.75		1.75	9.9	25.4	75	10	4	T750020FX 0990 254 ISO 175	●
M14×2	M17~M80×2	2	11.6	29	75	12	4	T750020FX 1160 290 ISO 200	●
M16×2	M17~M80×2	2	13.6	33	100	16	4	T750020FX 1360 330 ISO 200	●
M18×2.5		2.5	14.8	36.2	100	16	4	T750020FX 1480 362 ISO 250	●
M20×2.5		2.5	17.1	41.2	100	20	4	T750020FX 1710 412 ISO 250	●
M24×3.0		3	19.9	49.5	100	20	4	T750020FX 1990 495 ISO 300	●

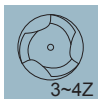
Please refer to page P139 for parameters.

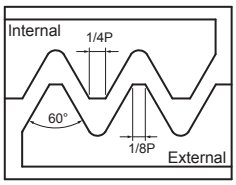
T752-2.0FX

Oil-Feed Thread Mills (ISO)

MG Carbide

AlCrN FX







For Internal Thread Lc ≤ 2 × Thread Diameter Code No. T752-2.0FX

Thread M Coarse	Thread M Fine	Pitch P	Dc mm	Lc mm	L mm	d h6	t Z	Code No.	AlCrN T752-2.0FX
M6×1	M8~M40×1	1	4.8	12.5	50	6	3	T752020FX 0480 125 ISO 100	•
	M10×1	1	8.7	20.5	75	10	3	T752020FX 0870 205 ISO 100	•
	M12×1	1	10.7	24.5	75	12	4	T752020FX 1070 245 ISO 100	•
M8×1.25		1.25	6.5	16.9	60	8	3	T752020FX 0650 169 ISO 125	•
M10×1.5	M12~M48×1.5	1.5	8.2	20.2	75	10	3	T752020FX 0820 202 ISO 150	•
	M12×1.5	1.5	9.9	24.7	75	10	4	T752020FX 0990 247 ISO 150	•
	M14×1.5	1.5	11.9	29.2	75	12	4	T752020FX 1190 292 ISO 150	•
	M16×1.5	1.5	13.9	32.2	100	16	4	T752020FX 1390 322 ISO 150	•
M12×1.75		1.75	9.9	25.4	75	10	4	T752020FX 0990 254 ISO 175	•
M14×2	M17~M80×2	2	11.6	29	75	12	4	T752020FX 1160 290 ISO 200	•
M16×2	M17~M80×2	2	13.6	33	100	16	4	T752020FX 1360 330 ISO 200	•
M20×2.5		2.5	17.1	41.2	100	20	4	T752020FX 1710 412 ISO 250	•

Please refer to page P140 for parameters.

Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Suitable for carbon steel, alloy steel, below HRC48 hardened steel, stainless steel, and cast iron...etc.

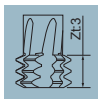
T760-2.0FX / T760-3.0FX

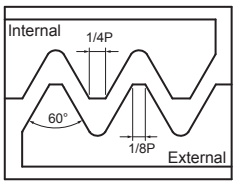
Micro Thread Mills (UN)

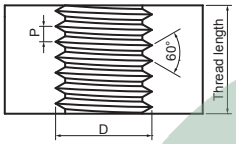
MG Carbide

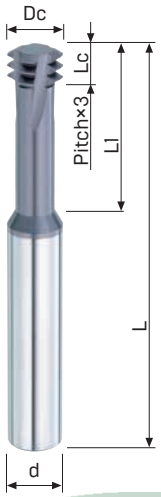
AlCrN FX











Work Material

P	H	M	K	N	S
●	●	●	●	○	○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Suitable for carbon steel, alloy steel, below HRC48 hardened steel, stainless steel, and cast iron...etc.

For Internal Thread — Code No. T760-2.0FX

Thread UNC	Thread UNF	Pitch P	Dc mm	L1 mm	L mm	d h6	t Z	Thread depth	Code No.	AlCrN T760-2.0FX
	NO.0-80	80	1.15	3.4	50	4	3	2×D	T760020FX 0115 034 UN 80	●
	NO.1-72	72	1.45	3.9	50	4	3	2×D	T760020FX 0145 039 UN 72	●
NO.1-64	NO.2-64	64	1.4	4.2	50	4	3	2×D	T760020FX 0140 042 UN 64	●
NO.2-56	NO.3-56	56	1.65	5.0	50	4	3	2×D	T760020FX 0165 050 UN 56	●
NO.3-48	NO.4-48	48	1.9	6.0	50	4	3	2×D	T760020FX 0190 060 UN 48	●
NO.4-40		40	2.1	6.0	50	4	3	2×D	T760020FX 0210 060 UN 40	●
NO.5-40	NO.6-40	40	2.45	7.2	50	4	3	2×D	T760020FX 0245 072 UN 40	●
	NO.8-36	36	3.3	8.7	50	6	3	2×D	T760020FX 0330 087 UN 36	●
NO.6-32		32	2.55	7.4	50	4	3	2×D	T760020FX 0255 074 UN 32	●
NO.8-32		32	3.2	10	50	6	3	2×D	T760020FX 0320 100 UN 32	●
	NO.10-32	32	3.8	10.3	50	6	3	2×D	T760020FX 0380 103 UN 32	●
	1/4"×28	28	5.25	13.2	50	6	3	2×D	T760020FX 0525 132 UN 28	●
NO.10-24		24	3.5	10.7	50	6	3	2×D	T760020FX 0350 107 UN 24	●
	5/16"×24、3/8"×24	24	6.5	16.9	60	8	3	2×D	T760020FX 0650 169 UN 24	●
1/4"×20		20	4.8	13.4	50	6	3	2×D	T760020FX 0480 134 UN 20	●
5/16"×18		18	6.15	17.3	60	8	3	2×D	T760020FX 0615 173 UN 18	●
3/8"×16	3/4"×16	16	6.7	20.6	60	8	3	2×D	T760020FX 0670 206 UN 16	●
7/16"×14	7/8"×14	14	7.7	24	60	8	3	2×D	T760020FX 0770 240 UN 14	●
1/2"×13		13	9.2	27.4	75	10	4	2×D	T760020FX 0920 274 UN 13	●
9/16"×12	1"~1-1/2"×12	12	10.5	30.7	75	12	4	2×D	T760020FX 1050 307 UN 12	●
5/8"×11		11	11.4	34.1	75	12	4	2×D	T760020FX 1140 341 UN 11	●
3/4"×10		10	14.4	41	100	16	4	2×D	T760020FX 1440 410 UN 10	●

Please refer to page P138 for parameters.

For Internal Thread — Code No. T760-3.0FX

Thread UNC	Thread UNF	Pitch P	Dc mm	L1 mm	L mm	d h6	t Z	Thread depth	Code No.	AlCrN T760-3.0FX
NO.2-56	NO.3-56	56	1.65	7.0	50	4	3	3×D	T760030FX 0165 070 UN 56	●
NO.4-40		40	2.1	9.2	50	4	3	3×D	T760030FX 0210 092 UN 40	●
NO.5-40	NO.6-40	40	2.45	10.2	50	4	3	3×D	T760030FX 0245 102 UN 40	●
NO.6-32		32	2.55	11.3	50	4	3	3×D	T760030FX 0255 113 UN 32	●
NO.8-32		32	3.2	13.3	50	6	3	3×D	T760030FX 0320 133 UN 32	●
	NO.10-32	32	3.8	15.3	50	6	3	3×D	T760030FX 0380 153 UN 32	●
	1/4"×28	28	5.25	19.6	50	6	3	3×D	T760030FX 0525 196 UN 28	●
	5/16"×24、3/8"×24	24	6.5	24.9	60	8	3	3×D	T760030FX 0650 249 UN 24	●
1/4"×20	7/16"×20	20	4.8	20.3	50	6	3	3×D	T760030FX 0480 203 UN 20	●
5/16"×18		18	6.15	24	60	8	3	3×D	T760030FX 0615 240 UN 18	●
3/8"×16	3/4"×16	16	6.7	30.2	65	8	3	3×D	T760030FX 0670 302 UN 16	●

Please refer to page P138 for parameters.

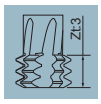
T760-2.0 / T760-3.0

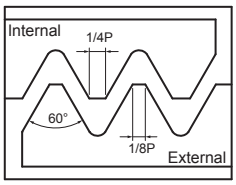
Micro Thread Mills For Aluminum (UN)

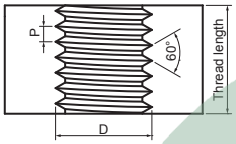
MG Carbide

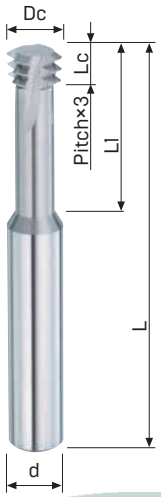
Uncoated Bright











Work Material

P	H	M	K	N	S
				●	

N Aluminium

Feature of product:

UN ANSI Standard Thread

Suitable for cutting in different aluminium alloy materials.

For Internal Thread — Code No. T760-2.0

Thread UNC	Thread UNF	Pitch P	Dc mm	L1 mm	L mm	d h6	t Z	Thread depth	Code No.	Bright T760-2.0
	NO.0-80	80	1.15	3.4	50	4	3	2×D	T760020 0115 034 UN 80	•
	NO.1-72	72	1.45	3.9	50	4	3	2×D	T760020 0145 039 UN 72	•
NO.1-64	NO.2-64	64	1.4	4.2	50	4	3	2×D	T760020 0140 042 UN 64	•
NO.2-56	NO.3-56	56	1.65	5.0	50	4	3	2×D	T760020 0165 050 UN 56	•
NO.3-48	NO.4-48	48	1.9	6.0	50	4	3	2×D	T760020 0190 060 UN 48	•
NO.4-40		40	2.1	6.0	50	4	3	2×D	T760020 0210 060 UN 40	•
NO.5-40	NO.6-40	40	2.45	7.2	50	4	3	2×D	T760020 0245 072 UN 40	•
	NO.8-36	36	3.3	8.7	50	6	3	2×D	T760020 0330 087 UN 36	•
NO.6-32		32	2.55	7.4	50	4	3	2×D	T760020 0255 074 UN 32	•
NO.8-32		32	3.2	10.0	50	6	3	2×D	T760020 0320 100 UN 32	•
	NO.10-32	32	3.8	10.3	50	6	3	2×D	T760020 0380 103 UN 32	•
	1/4"×28	28	5.25	13.2	50	6	3	2×D	T760020 0525 132 UN 28	•
NO.10-24		24	3.5	10.7	50	6	3	2×D	T760020 0350 107 UN 24	•
	5/16"×24、3/8"×24	24	6.5	16.9	60	8	3	2×D	T760020 0650 169 UN 24	•
1/4"×20		20	4.8	13.4	50	6	3	2×D	T760020 0480 134 UN 20	•
5/16"×18		18	6.15	17.3	60	8	3	2×D	T760020 0615 173 UN 18	•
3/8"×16	3/4"×16	16	6.7	20.6	60	8	3	2×D	T760020 0670 206 UN 16	•
7/16"×14	7/8"×14	14	7.7	24	60	8	3	2×D	T760020 0770 240 UN 14	•
1/2"×13		13	9.2	27.4	75	10	4	2×D	T760020 0920 274 UN 13	•
9/16"×12	1"~1-1/2"×12	12	10.5	30.7	75	12	4	2×D	T760020 1050 307 UN 12	•
5/8"×11		11	11.4	34.1	75	12	4	2×D	T760020 1140 341 UN 11	•
3/4"×10		10	14.4	41	100	16	4	2×D	T760020 1440 410 UN 10	•

Please refer to page P138 for parameters.

For Internal Thread — Code No. T760-3.0

Thread UNC	Thread UNF	Pitch P	Dc mm	L1 mm	L mm	d h6	t Z	Thread depth	Code No.	Bright T760-3.0
NO.2-56	NO.3-56	56	1.65	7.0	50	4	3	3×D	T760030 0165 070 UN 56	•
NO.4-40		40	2.1	9.2	50	4	3	3×D	T760030 0210 092 UN 40	•
NO.5-40	NO.6-40	40	2.45	10.2	50	4	3	3×D	T760030 0245 102 UN 40	•
NO.6-32		32	2.55	11.3	50	4	3	3×D	T760030 0255 113 UN 32	•
NO.8-32		32	3.2	13.3	50	6	3	3×D	T760030 0320 133 UN 32	•
	NO.10-32	32	3.8	15.3	50	6	3	3×D	T760030 0380 153 UN 32	•
	1/4"×28	28	5.25	19.6	50	6	3	3×D	T760030 0525 196 UN 28	•
	5/16"×24、3/8"×24	24	6.5	24.9	60	8	3	3×D	T760030 0650 249 UN 24	•
1/4"×20	7/16"×20	20	4.8	20.3	50	6	3	3×D	T760030 0480 203 UN 20	•
5/16"×18		18	6.15	24.0	60	8	3	3×D	T760030 0615 240 UN 18	•
3/8"×16	3/4"×16	16	6.7	30.2	65	8	3	3×D	T760030 0670 302 UN 16	•

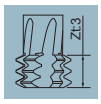
Please refer to page P138 for parameters.

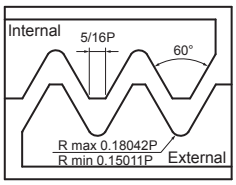
Micro Thread Mills (UNJ)

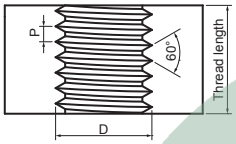
MG Carbide

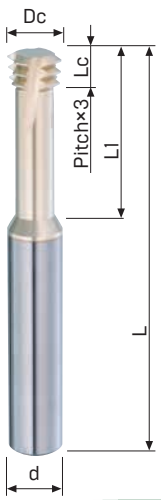
AlTiXZrN SX











Work Material

P	H	M	K	N	S
●	●	●			●

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Suitable for titanium alloy, nickel alloy, stainless steel and below HRC48 hardened steel, and cast iron...etc.

For Internal Thread

Code No. T761SX

Thread UNJC	Thread UNJF	Pitch P	Dc mm	Ll mm	L mm	d h6	t Z	Thread depth	Code No.	AlTiXZrN T761SX
NO.6-32	NO.10-32	32	2.7	11	50	6	3	3×D	T761SX 0270 110 UNJ 32	●
	1/4"×28	28	5.4	19.5	50	6	3	3×D	T761SX 0540 195 UNJ 28	●
NO.10-24		24	3.7	14.9	50	6	3	3×D	T761SX 0370 149 UNJ 24	●
	5/16"×24	24	6.7	24.1	60	8	3	3×D	T761SX 0670 241 UNJ 24	●
1/4"×20		20	5	19.5	50	6	3	3×D	T761SX 0500 195 UNJ 20	●
	7/16"×20	20	9.6	33.5	75	10	4	3×D	T761SX 0960 335 UNJ 20	●
5/16"×18	9/16"×18	18	6.4	24.1	60	8	3	3×D	T761SX 0640 241 UNJ 18	●
3/8"×16	3/4"×16	16	7.7	29	60	8	3	3×D	T761SX 0770 290 UNJ 16	●
7/16"×14	7/8"×14	14	9.2	33.5	75	10	4	3×D	T761SX 0920 335 UNJ 14	●
1/2"×13		13	9.9	38.5	80	10	4	3×D	T761SX 0990 385 UNJ 13	●

Please refer to page P138 for parameters.

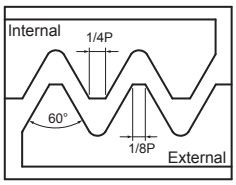
T762-2.0FX

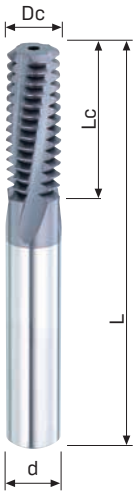
Oil-Feed Thread Mills (UN)

MG Carbide

AlCrN FX







Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Suitable for carbon steel, alloy steel, below HRC48 hardened steel, stainless steel, and cast iron...etc.

For Internal Thread Lc ≤ 2 × Thread Diameter Code No. T762-2.0FX

Thread UNC	Thread UNF	Thread UNEF	Pitch P	Dc mm	Lc mm	L mm	d h6	t Z	Code No.	AlCrN T762-2.0FX
	No.10-32	No.12~3/8"×32	32	3.8	9.9	50	6	3	T762020FX 0380 099 UN 32	●
		No.12~3/8"×32	32	4.4	11.5	50	6	3	T762020FX 0440 115 UN 32	●
	No.12、1/4"×28	7/16"、1/2"×28	28	4.3	11.3	50	6	3	T762020FX 0430 113 UN 28	●
	1/4"×28	7/16"、1/2"×28	28	5.15	13.1	50	6	3	T762020FX 0515 131 UN 28	●
		7/16"、1/2"×28	28	9.9	22.2	75	10	4	T762020FX 0990 222 UN 28	●
No.10-24	5/16"、3/8"×24	9/16"~11/16"×24	24	3.58	10	50	6	3	T762020FX 0358 100 UN 24	●
No.12-24	5/16"、3/8"×24	9/16"~11/16"×24	24	4.15	11.1	50	6	3	T762020FX 0415 111 UN 24	●
	5/16"、3/8"×24	9/16"~11/16"×24	24	6.68	16.4	60	8	3	T762020FX 0668 164 UN 24	●
	3/8"×24	9/16"~11/16"×24	24	8.2	19.6	75	10	4	T762020FX 0820 196 UN 24	●
		9/16"~11/16"×24	24	11.9	29.1	75	12	4	T762020FX 1190 291 UN 24	●
1/4"×20	7/16"、1/12"×20	3/4"~1"×20	20	4.88	13.3	50	6	3	T762020FX 0488 133 UN 20	●
	7/16"、1/12"×20	3/4"~1"×20	20	9.6	22.2	75	10	4	T762020FX 0960 222 UN 20	●
	1/12"×20	3/4"~1"×20	20	11.1	26	75	12	4	T762020FX 1110 260 UN 20	●
		3/4"~1"×20	20	17.4	38.7	100	20	4	T762020FX 1740 387 UN 20	●
5/16"×18	9/16"、5/8"×18	11/16"~1-11/16"×18	18	6.15	16.2	60	8	3	T762020FX 0615 162 UN 18	●
	9/16"、5/8"×18	11/16"~1-11/16"×18	18	11.9	28.9	75	12	4	T762020FX 1190 289 UN 18	●
	5/8"×18	11/16"~1-11/16"×18	18	14.1	31.7	100	16	4	T762020FX 1410 317 UN 18	●
3/8"×16	3/4"×16		16	7.65	19.8	60	8	3	T762020FX 0765 198 UN 16	●
	3/4"×16		16	17	38.8	100	20	4	T762020FX 1700 388 UN 16	●
7/16"×14	7/8"×14		14	9	22.7	75	10	4	T762020FX 0900 227 UN 14	●
	7/8"×14		14	19.9	44.4	100	20	4	T762020FX 1990 444 UN 14	●
1/2"×13			13	10.35	26.4	75	12	4	T762020FX 1035 264 UN 13	●
9/16"×12	1"~1-1/2×12		12	11.8	28.6	75	12	4	T762020FX 1180 286 UN 12	●
	1"~1-1/2×12		12	19.9	51.9	100	20	4	T762020FX 1990 519 UN 12	●
5/8"×11			11	13.1	33.5	100	16	4	T762020FX 1310 335 UN 11	●
3/4"×10			10	15.9	39.4	100	16	4	T762020FX 1590 394 UN 10	●
7/8"×9			9	19	46.6	100	20	4	T762020FX 1900 466 UN 09	●
1"×8			8	19.9	52.4	100	20	4	T762020FX 1990 524 UN 08	●

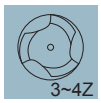
Please refer to page P139 for parameters.

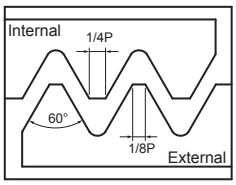
T764-2.0FX

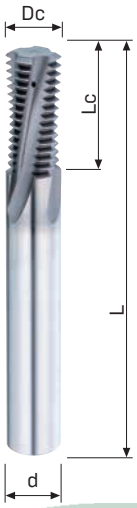
Oil-Feed Thread Mills (UN)

MG Carbide

AlCrN FX







For Internal Thread Lc ≤ 2 × Thread Diameter Code No. T764-2.0FX

Thread UNC	Thread UNF	Thread UNEF	Pitch P	Dc mm	Lc mm	L mm	d h6	t Z	Code No.	AlCrN T764-2.0FX
	1/4"×28	7/16" ~ 1/2"×28	28	5.15	13.1	50	6	3	T764020FX 0515 131 UN 28	•
	5/16" ~ 3/8"×24	9/16"~11/16"×24	24	6.68	16.4	60	8	3	T764020FX 0668 164 UN 24	•
	3/8"×24	9/16"~11/16"×24	24	8.2	19.6	75	10	4	T764020FX 0820 196 UN 24	•
1/4"×20	7/16" ~ 1/12"×20	3/4"~1"×20	20	4.88	13.3	50	6	3	T764020FX 0488 133 UN 20	•
	7/16" ~ 1/12"×20	3/4"~1"×20	20	9.6	22.2	75	10	4	T764020FX 0960 222 UN 20	•
5/16"×18	9/16" ~ 5/8"×18	11/16"~1-11/16"×18	18	6.15	16.2	60	8	3	T764020FX 0615 162 UN 18	•
3/8"×16	3/4"×16		16	7.65	19.8	60	8	3	T764020FX 0765 198 UN 16	•
7/16"×14	7/8"×14		14	9	22.7	75	10	4	T764020FX 0900 227 UN 14	•
1/2"×13			13	10.35	26.4	75	12	4	T764020FX 1035 264 UN 13	•
9/16"×12	1"~1-1/2×12		12	11.8	28.6	75	12	4	T764020FX 1180 286 UN 12	•
5/8"×11			11	13.1	33.5	100	16	4	T764020FX 1310 335 UN 11	•
3/4"×10			10	15.9	39.4	100	16	4	T764020FX 1590 394 UN 10	•
1"×8			8	19.9	52.4	100	20	4	T764020FX 1990 524 UN 08	•

Please refer to page P140 for parameters.

Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

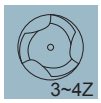
Suitable for carbon steel, alloy steel, below HRC48 hardened steel, stainless steel, and cast iron...etc.

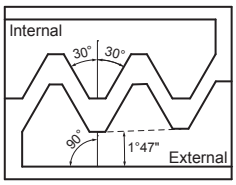
T765FX / T766FX

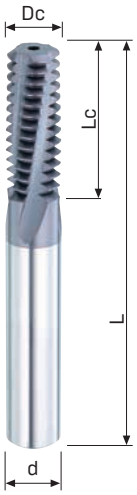
Oil-Feed Thread Mills For Internal and External Thread (NPT)

MG Carbide

AlCrN FX







Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Suitable for carbon steel, alloy steel, below HRC48 hardened steel, stainless steel, and cast iron...etc.

For Internal and External Thread — Code No. T765FX

Thread NPT	Pitch P	Dc mm	Lc mm	L mm	d h6	t Z	Code No.	AlCrN T765FX
1/8×27	27	7.6	10.8	60	8	3	T765FX 076 108 NPT 270	•
1/4×18 ~ 3/8×18	18	10	16.2	75	10	4	T765FX 100 162 NPT 180	•
1/2×14 ~ 3/4×14	14	15.5	22.7	100	16	4	T765FX 155 227 NPT 140	•
1×11.5 ~ 2×11.5	11.5	20	29.8	100	20	4	T765FX 200 298 NPT 115	•
≥ 2-1/2×8	8	20	39.7	100	20	4	T765FX 200 397 NPT 080	•

Please refer to page P139 for parameters.



For Internal and External Thread — Code No. T766FX

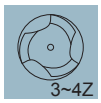
Thread NPT	Pitch P	Dc mm	Lc mm	L mm	d h6	t Z	Code No.	AlCrN T766FX
1/8×27	27	7.6	10.8	60	8	3	T766FX 076 108 NPT 270	•
1/4×18 ~ 3/8×18	18	10	16.2	75	10	4	T766FX 100 162 NPT 180	•
1/2×14 ~ 3/4×14	14	15.5	22.7	100	16	4	T766FX 155 227 NPT 140	•

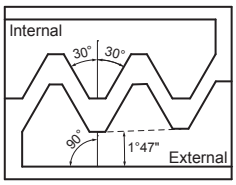
Please refer to page P140 for parameters.

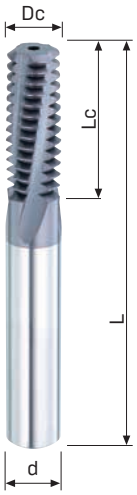
Oil-Feed Thread Mills (NPTF)

MG Carbide

AlCrN FX







Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Suitable for carbon steel, alloy steel, below HRC48 hardened steel, stainless steel, and cast iron...etc.

For Internal and External Thread — Code No. T767FX

Thread NPTF	Pitch P	Dc mm	Lc mm	L mm	d h6	t Z	Code No.	AlCrN T767FX
1/8×27	27	7.6	10.8	60	8	3	T767FX 076 108 NPTF 270	•
1/4×18 ~ 3/8×18	18	10	16.2	75	10	4	T767FX 100 162 NPTF 180	•
1/2×14 ~ 3/4×14	14	15.5	22.7	100	16	4	T767FX 155 227 NPTF 140	•
1×11.5 ~ 2×11.5	11.5	20	29.8	100	20	4	T767FX 200 298 NPTF 115	•
≥ 2-1/2×8	8	20	39.7	100	20	4	T767FX 200 397 NPTF 080	•

Please refer to page P139 for parameters.



For Internal and External Thread — Code No. T768FX

Thread NPTF	Pitch P	Dc mm	Lc mm	L mm	d mm	t Z	Code No.	AlCrN T768FX
1/8×27	27	7.6	10.8	60	8	3	T768FX 076 108 NPTF 270	•
1/4×18 ~ 3/8×18	18	10	16.2	75	10	4	T768FX 100 162 NPTF 180	•
1/2×14 ~ 3/4×14	14	15.5	22.7	100	16	4	T768FX 155 227 NPTF 140	•

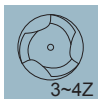
Please refer to page P140 for parameters.

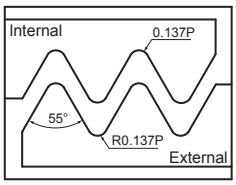
T784FX / T785FX

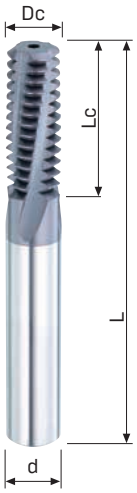
Oil-Feed Thread Mills (BSP(G))

MG Carbide

AlCrN FX







For Internal and External Thread Lc ≤ 2 × Thread Diameter Code No. T784FX

Thread BSP , BSF	Pitch P	Dc mm	Lc mm	L mm	d h6	t Z	Code No.	AlCrN T784FX
G 1/16、1/8×28	28	7.8	14.1	60	8	3	T784FX 078 141 G 28	•
G 1/8×28	28	8	20.4	60	8	3	T784FX 080 204 G 28	•
G 1/4×19、3/8×19	19	11	27.4	75	12	4	T784FX 110 274 G 19	•
G 3/8×19	19	14	34.1	100	16	4	T784FX 140 341 G 19	•
G 1/2×14 ~ G 7/8×14	14	16	26.3	100	16	4	T784FX 160 263 G 14	•

Please refer to page P139 for parameters.

Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Suitable for carbon steel, alloy steel, below HRC48 hardened steel, stainless steel, and cast iron...etc.



For Internal and External Thread Lc ≤ 2 × Thread Diameter Code No. T785FX

Thread BSP , BSF	Pitch P	Dc mm	Lc mm	L mm	d h6	t Z	Code No.	AlCrN T785FX
G 1/8×28	28	7.8	14.1	60	8	3	T785FX 078 141 G 28	•
G 1/4×19	19	11	27.4	75	12	4	T785FX 110 274 G 19	•
G 1/2×14 ~ G 7/8×14	14	16	26.3	100	16	4	T785FX 160 263 G 14	•

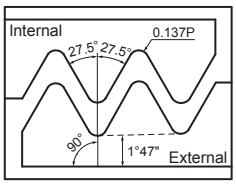
Please refer to page P140 for parameters.

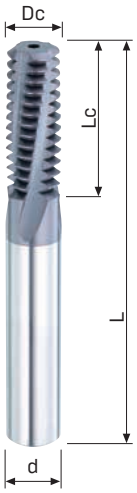
Oil-Feed Thread Mills (BSPT)

MG Carbide

AlCrN FX







For Internal and External Thread

Code No. T786FX

Thread BSPT	Pitch P	Dc mm	Lc mm	L mm	d h6	t Z	Code No.	AlCrN T786FX
RC 1/8×28	28	7.8	14.1	60	8	3	T786FX 078 141 RC 28	•
RC 1/4×19 ~ RC 3/8×19	19	10	16.7	75	10	4	T786FX 100 167 RC 19	•
RC 1/2×14 ~ RC 7/8×14	14	16	26.3	100	16	4	T786FX 160 263 RC 14	•
RC 1×11 ~ RC 2×11	11	16	28.9	100	16	4	T786FX 160 289 RC 11	•

Please refer to page P139 for parameters.

Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Suitable for carbon steel, alloy steel, below HRC48 hardened steel, stainless steel, and cast iron...etc.



For Internal and External Thread

Code No. T787FX

Thread BSPT	Pitch P	Dc mm	Lc mm	L mm	d h6	t Z	Code No.	AlCrN T787FX
RC 1/8×28	28	7.8	14.1	60	8	3	T787FX 078 141 RC 28	•
RC 1/4×19 ~ RC 3/8×19	19	10	16.7	75	10	4	T787FX 100 167 RC 19	•
RC 1/2×14 ~ RC 7/8×14	14	16	26.3	100	16	4	T787FX 160 263 RC 14	•
RC 1×11 ~ RC 2×11	11	16	28.9	100	16	4	T787FX 160 289 RC 11	•

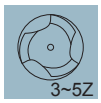
Please refer to page P140 for parameters.

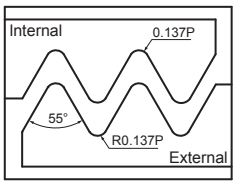
T788FX / T789FX

Oil-Feed Thread Mills (Whitworth)

MG Carbide

AlCrN FX





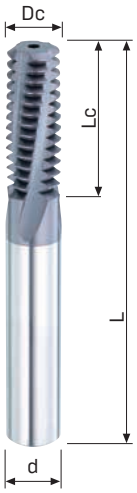
Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

Suitable for carbon steel, alloy steel, below HRC48 hardened steel, stainless steel, and cast iron...etc.



For Internal and External Thread — Code No. T788FX

Thread BSW	Thread BSF	Pitch P	Dc mm	Lc mm	L mm	d h6	t Z	Code No.	AlCrN T788FX
1/4×20		20	4.6	13.3	50	6	3	T788FX 046 133 W 20	●
	3/8×20	20	7.6	19.7	60	8	3	T788FX 076 197 W 20	●
5/16×18		18	5.6	16.2	50	6	3	T788FX 056 162 W 18	●
	7/16×18	18	8.8	23.3	75	10	3	T788FX 088 233 W 18	●
3/8×16		16	7	19.8	60	8	3	T788FX 070 198 W 16	●
	1/2×16 ~ 9/16×16	16	10	26.1	75	10	4	T788FX 100 261 W 16	●
7/16×14		14	8	22.7	60	8	4	T788FX 080 227 W 14	●
	5/8×14 ~ 11/16×14	14	12.8	31.8	100	16	4	T788FX 128 318 W 14	●
1/2×12 ~9/16×12	3/4×12 ~13/16×12	12	9	26.5	75	10	4	T788FX 090 265 W 12	●
5/8×11	7/8×11	11	11.8	33.5	75	12	4	T788FX 118 335 W 11	●
3/4×10	1×10	10	14	39.4	100	16	4	T788FX 140 394 W 10	●
7/8×9	1-1/8×9	9	16	43.7	100	16	4	T788FX 160 437 W 09	●

Please refer to page P139 for parameters.

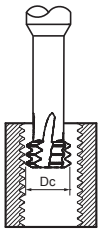
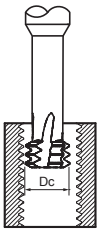
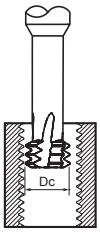
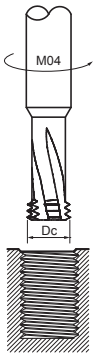


For Internal and External Thread — Code No. T789FX

Thread BSW	Thread BSF	Pitch P	Dc mm	Lc mm	L mm	d h6	t Z	Code No.	AlCrN T789FX
1/4×20	3/8×20	20	4.6	13.3	50	6	3	T789FX 046 133 W 20	●
5/16×18	7/16×18	18	5.6	16.2	50	6	3	T789FX 056 162 W 18	●
3/8×16		16	7	19.8	60	8	3	T789FX 070 198 W 16	●
	1/2×16 ~ 9/16×16	16	10	26.1	75	10	4	T789FX 100 261 W 16	●
7/16×14	5/8×14 ~ 11/16×14	14	8	22.7	60	8	4	T789FX 080 227 W 14	●
1/2×12	3/4×12 ~13/16×12	12	9	26.5	75	10	4	T789FX 090 265 W 12	●
5/8×11	7/8×11	11	11.8	33.5	75	12	4	T789FX 118 335 W 11	●

Please refer to page P140 for parameters.

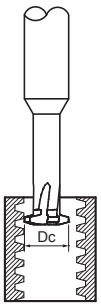
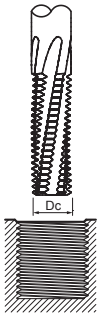
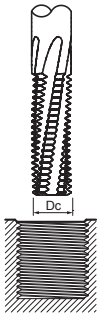
Cutting Conditions

		T730FX / T760FX		T730SX / T73ISX / T760SX / T76ISX		T730 / T760		T740TX	
T730FX T730SX T731SX T730 T760FX T760SX T761SX T760 T740TX									
		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
P	Carbon Steel Materials								
	GRI Carbon Steel	60~120	0.005×Dc					60	0.005×Dc
	GR2 <24HRC Low-alloyed Steel	60~120	0.005×Dc					60	0.002×Dc
	GR3 <30HRC Hi-alloyed Steel	50~100	0.004×Dc					60	0.0015×Dc
H	Hardened Steel Materials								
	GR4 30~38HRC Hardened Steel	30~50	0.003×Dc					30	0.0015×Dc
	GR5 38~48HRC Hardened Steel	20~40	0.002×Dc					20	0.001×Dc
M	Stainless Steel Materials								
	GR8-1 Ferritic、Martensitic	40~80	0.003×Dc					30	0.0015×Dc
	GR8-2 Austenitic	30~70	0.003×Dc					30	0.0015×Dc
	GR8-3 Austenitic-ferritic	30~60	0.003×Dc					20	0.001×Dc
	GR8-4 Austenitic-ferritic Heat-resistant	30~50	0.003×Dc					15	0.001×Dc
K	Cast Iron Materials								
	GR9-1 Grey cast iron	60~120	0.005×Dc					60	0.002×Dc
	GR9-2 Nodular cast iron	60~120	0.005×Dc					60	0.002×Dc
N	Aluminium Steel Materials								
	GRI0-1 Wrought Aluminium alloys					150~200	0.01×Dc		
	GRI0-2 Aluminium cast alloys <10%					140~180	0.01×Dc		
	GRI0-3 Aluminium cast alloys >10%					130~160	0.01×Dc		
	Copper Steel Materials								
	GRII-1 Pure Copper					150~200	0.01×Dc		
	GRII-2 Brass					140~180	0.01×Dc		
	GRII-3 Bronze					130~160	0.01×Dc		
	Plastics Steel Materials								
	GRI2 Plastics								
	FRP CFRP Steel Materials								
	GRI3 FRP CFRP								
S	Titanium Materials								
	GRI5 Titanium			30~50	0.002×Dc				
	Nickel Materials								
	GRI6-1 Nickel			30~40	0.002×Dc				
	GRI6-2 cobalt-base alloys			30~40	0.002×Dc				
	GRI6-3 Iron-based alloy			25~30	0.002×Dc				
	Heat-resistant Steel Materials								
	GRI7 Heat-resistant Steel			30	0.002×Dc				

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4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

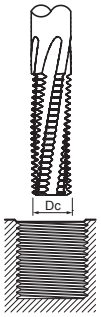
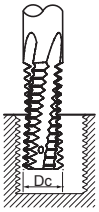
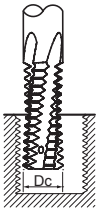
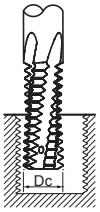
Cutting Conditions

		T741FX / T742FX		T750FX		T762FX / T765FX / T767FX		T781HX / T784FX	
T741FX T742FX T750FX T762FX T765FX T767FX T781HX T784FX									
		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
P	Carbon Steel Materials								
P	GR1 Carbon Steel	60~120	0.005×Dc	80~200	0.005×Dc	80~200	0.005×Dc	80~200	0.005×Dc
P	GR2 <24HRC Low-alloyed Steel	60~120	0.005×Dc	80~170	0.005×Dc	80~170	0.005×Dc	80~170	0.005×Dc
P	GR3 <30HRC Hi-alloyed Steel	50~100	0.004×Dc	80~140	0.004×Dc	80~140	0.004×Dc	80~140	0.004×Dc
H	Hardened Steel Materials								
H	GR4 30~38HRC Hardened Steel	30~50	0.003×Dc	20~30	0.003×Dc	20~30	0.003×Dc	20~30	0.003×Dc
H	GR5 38~48HRC Hardened Steel	20~40	0.002×Dc	15~20	0.002×Dc	15~20	0.002×Dc	15~20	0.002×Dc
M	Stainless Steel Materials								
M	GR8-1 Ferritic、Martensitic	40~80	0.003×Dc	40~100	0.003×Dc	40~100	0.003×Dc	40~100	0.003×Dc
M	GR8-2 Austenitic	30~70	0.003×Dc	30~80	0.003×Dc	30~80	0.003×Dc	30~80	0.003×Dc
M	GR8-3 Austenitic-ferritic	30~60	0.003×Dc	30~70	0.003×Dc	30~70	0.003×Dc	30~70	0.003×Dc
M	GR8-4 Austenitic-ferritic Heat-resistant	30~50	0.003×Dc	30~60	0.003×Dc	30~60	0.003×Dc	30~60	0.003×Dc
K	Cast Iron Materials								
K	GR9-1 Grey cast iron	60~120	0.005×Dc	60~180	0.005×Dc	60~180	0.005×Dc	60~180	0.005×Dc
K	GR9-2 Nodular cast iron	60~120	0.005×Dc	60~150	0.005×Dc	60~150	0.005×Dc	60~150	0.005×Dc
N	Aluminium Steel Materials								
N	GR10-1 Wrought Aluminium alloys								
N	GR10-2 Aluminium cast alloys <10%								
N	GR10-3 Aluminium cast alloys >10%								
N	Copper Steel Materials								
N	GR11-1 Pure Copper								
N	GR11-2 Brass								
N	GR11-3 Bronze								
N	Plastics Steel Materials								
N	GR12 Plastics								
N	FRP CFRP Steel Materials								
N	GR13 FRP CFRP								
S	Titanium Materials								
S	GR15 Titanium								
S	Nickel Materials								
S	GR16-1 Nickel								
S	GR16-2 cobalt-base alloys								
S	GR16-3 Iron-based alloy								
S	Heat-resistant Steel Materials								
S	GR17 Heat-resistant Steel								

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5. If vibration occurs during cutting, please reduce cutting parameter.

Cutting Conditions

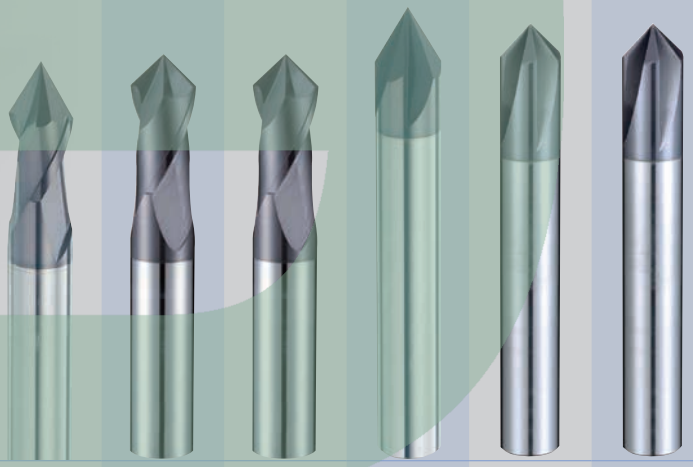
		T786FX / T788FX		T752FX		T764FX / T766FX / T768FX		T785FX / T787FX / T789FX	
T786FX T788FX T752FX T764FX T766FX T768FX T785FX T787FX T789FX									
		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
P	Carbon Steel Materials								
P	GR1 Carbon Steel	80~200	0.005×Dc	80~200	0.005×Dc	80~200	0.005×Dc	80~200	0.005×Dc
P	GR2 <24HRC Low-alloyed Steel	80~170	0.005×Dc	80~170	0.005×Dc	80~170	0.005×Dc	80~170	0.005×Dc
P	GR3 <30HRC Hi-alloyed Steel	80~140	0.004×Dc	80~140	0.004×Dc	80~140	0.004×Dc	80~140	0.004×Dc
H	Hardened Steel Materials								
H	GR4 30~38HRC Hardened Steel	20~30	0.003×Dc	20~30	0.003×Dc	20~30	0.003×Dc	20~30	0.003×Dc
H	GR5 38~48HRC Hardened Steel	15~20	0.002×Dc	15~20	0.002×Dc	15~20	0.002×Dc	15~20	0.002×Dc
M	Stainless Steel Materials								
M	GR8-1 Ferritic、Martensitic	40~100	0.003×Dc	40~100	0.003×Dc	40~100	0.003×Dc	40~100	0.003×Dc
M	GR8-2 Austenitic	30~80	0.003×Dc	30~80	0.003×Dc	30~80	0.003×Dc	30~80	0.003×Dc
M	GR8-3 Austenitic-ferritic	30~70	0.003×Dc	30~70	0.003×Dc	30~70	0.003×Dc	30~70	0.003×Dc
M	GR8-4 Austenitic-ferritic Heat-resistant	30~60	0.003×Dc	30~60	0.003×Dc	30~60	0.003×Dc	30~60	0.003×Dc
K	Cast Iron Materials								
K	GR9-1 Grey cast iron	60~180	0.005×Dc	60~180	0.005×Dc	60~180	0.005×Dc	60~180	0.005×Dc
K	GR9-2 Nodular cast iron	60~150	0.005×Dc	60~150	0.005×Dc	60~150	0.005×Dc	60~150	0.005×Dc
N	Aluminium Steel Materials								
N	GR10-1 Wrought Aluminium alloys								
N	GR10-2 Aluminium cast alloys <10%								
N	GR10-3 Aluminium cast alloys >10%								
N	Copper Steel Materials								
N	GR11-1 Pure Copper								
N	GR11-2 Brass								
N	GR11-3 Bronze								
N	Plastics Steel Materials								
N	GR12 Plastics								
N	FRP CFRP Steel Materials								
N	GR13 FRP CFRP								
S	Titanium Materials								
S	GR15 Titanium								
S	Nickel Materials								
S	GR16-1 Nickel								
S	GR16-2 cobalt-base alloys								
S	GR16-3 Iron-based alloy								
S	Heat-resistant Steel Materials								
S	GR17 Heat-resistant Steel								

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5. If vibration occurs during cutting, please reduce cutting parameter.



End Mills For Chamfering

Page	143	143	143	145	145	145
Appearance						
Code No	E106X-60°	E107X-90°	E107X-120°	E108X-60°	E109X-90°	E109X-120°
Carbide	MG Carbide	MG Carbide	MG Carbide	UMG Carbide	UMG Carbide	UMG Carbide
Coating	AlTiN X-NaNo	AlTiN X-NaNo	AlTiN X-NaNo	AlTiN X-NaNo	AlTiN X-NaNo	AlTiN X-NaNo
Helix Angle	30°	30°	30°	0°	0°	0°
No.of Flutes	2	2	2	4	4	4

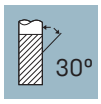
147	147	149	149	151	153	155
						
E121HX	**E123HX**	**E151HX**	**E153HX**	**E110HX**	**E120HX**	**E101 E101FX**
MG Carbide	**MG Carbide**	**MG Carbide**	**MG Carbide**	**MG Carbide**	**MG Carbide**	**MG Carbide**
Bright AlTiCrN	**Bright AlTiCrN**	**Bright AlTiCrN**	**Bright AlTiCrN**	**AlTiCrN HX**	**AlTiCrN HX**	**Bright AlCrN**
 45°	 45°	 45°	 45°	 15°	 15°	 0°
 3	 3	 5	 5	 3~6Z	 3~6Z	

E106X / E107X

End Mills For Chamfering 60° / 90° / 120°

MG Carbide

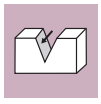
AlTiN X-NaNo

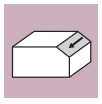


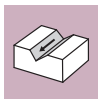




Type of Operation









Work Material

P	H	M	K	N	S
●	●	○	●	●	

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper

Feature of product:

E106 / E106X-60° End Mills for chamfering 60°- 2 Flutes

E107 / E107X-90° End Mills for chamfering 90°- 2 Flutes

E107 / E107X-120° End Mills for chamfering 120°- 2 Flutes

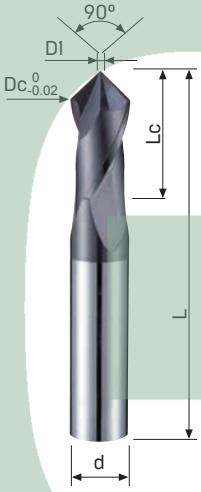
Suitable for drilling, tappering, countersinking, NC Spot drilling and frame milling.

Specially for uncoated aluminium alloy.



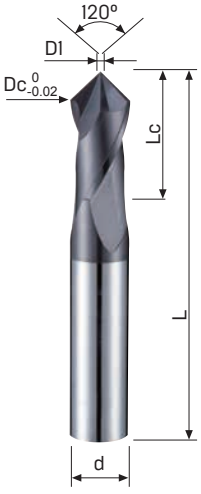
Code No. E106X-60°-Dc

Dc 0 -0.02	D1 mm	Lc mm	L mm	d h6	Bright E106-60°	AlTiN E106X-60°
1	0.02	2	38	3	●	●
2	0.03	4	38	3	●	●
3	0.03	6	50	3	●	●
4	0.04	8	50	4	●	●
5	0.05	12	50	6	●	●
6	0.06	12	50	6	●	●
8	0.08	16	60	8	●	●
10	0.10	20	72	10	●	●
12	0.12	24	75	12	●	●
16	0.16	32	100	16	●	●
20	0.20	40	100	20	●	●



Code No. E107X-90°-Dc

Dc 0 -0.02	D1 mm	Lc mm	L mm	d h6	Bright E107-90°	AlTiN E107X-90°
0.5	0.01	1	38	3		●
0.6	0.01	1.2	38	3		●
0.8	0.01	1.6	38	3		●
1	0.02	2	38	3	●	●
1.2	0.02	2.4	38	3		●
1.5	0.02	3	38	3		●
1.8	0.02	3.6	38	3		●
2	0.03	4	38	3	●	●
2.5	0.03	5	38	3		●
3	0.03	6	50	3	●	●
4	0.04	8	50	4	●	●
5	0.05	12	50	6	●	●
6	0.06	12	50	6	●	●
8	0.08	16	60	8	●	●
10	0.10	20	72	10	●	●
12	0.12	24	75	12	●	●
16	0.16	32	100	16	●	●
20	0.20	40	100	20	●	●



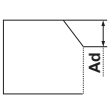
Code No. E107X-120°-Dc

Dc 0 -0.02	D1 mm	Lc mm	L mm	d h6	Bright E107-120°	AlTiN E107X-120°
1	0.02	2	38	3	●	●
2	0.03	4	38	3	●	●
3	0.03	6	50	3	●	●
4	0.04	8	50	4	●	●
5	0.05	12	50	6	●	●
6	0.06	12	50	6	●	●
8	0.08	16	60	8	●	●
10	0.10	20	72	10	●	●
12	0.12	24	75	12	●	●
16	0.16	32	100	16	●	●
20	0.20	40	100	20	●	●

E106X / Chamfering

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.10 Aluminium	
Vc m/min		40~70		40~70		40~70		30~50		30~50		30~50		40~70		100~200	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E106X-1	1	17,500	1050	17,500	1050	17,500	1050	9,550	286	9,550	286	9,550	286	17,500	1050	31,830	2,864
E106X-2	2.0	11,670	700	11,670	700	11,670	700	4,774	143	4,774	143	4,774	143	11,670	700	15,915	1,432
E106X-3	3	8,753	525	8,753	525	8,753	525	3,183	100	3,183	100	3,183	100	8,753	525	10,610	954
E106X-4	4.0	7,000	420	7,000	420	7,000	420	3,183	100	3,183	100	3,183	100	7,000	420	9,550	955
E106X-5	5	5,729	343	5,729	343	5,729	343	2,546	100	2,546	100	2,546	100	5,729	343	7,639	763
E106X-6	6.0	4,774	286	4,774	286	4,774	286	2,122	90	2,122	90	2,122	90	4,774	286	6,366	700
E106X-8	8	3,580	358	3,580	358	3,580	358	1,989	120	1,989	120	1,989	120	3,580	358	5,570	668
E106X-10	10.0	2,864	286	2,864	286	2,864	286	1,591	95	1,591	95	1,591	95	2,864	286	4,456	712
E106X-12	12	2,387	238	2,387	238	2,387	238	1,591	127	1,591	127	1,591	127	2,387	238	3,978	716
E106X-16	16.0	1,790	116	1,790	116	1,790	116	1,193	119	1,193	119	1,193	119	1,790	116	2,984	537
E106X-20	20	1,432	186	1,432	186	1,432	186	954	95	954	95	954	95	1,432	186	2,387	477

E107X / Chamfering / V groove machining

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.10 Aluminium	
Vc m/min		Ø0.5~0.8 48~50 Ø1.0~3.0 55~70 Ø3.1~20 90		Ø0.5~0.8 48~50 Ø1.0~3.0 55~70 Ø3.1~20 90		Ø0.5~0.8 48~50 Ø1.0~3.0 55~70 Ø3.1~20 90		Ø0.5~0.8 40 Ø1.0~3.0 45~65 Ø3.1~20 75		Ø0.5~0.8 40 Ø1.0~3.0 45~65 Ø3.1~20 75		Ø0.5~0.8 50 Ø1.0~3.0 60~95 Ø3.1~20 120	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E107X-0.5	0.5	31,000	460	31,000	460	31,000	460	25,480	320	25,480	320	32,000	650
E107X-0.6	0.6	27,000	500	27,000	500	27,000	500	21,230	320	21,230	320	26,540	700
E107X-0.8	0.8	21,500	530	21,500	530	21,500	530	15,920	350	15,920	350	19,900	750
E107X-1.0	1	17,500	530	17,500	530	17,500	530	14,330	350	14,330	350	17,510	800
E107X-1.2	1.2	15,000	600	15,000	600	15,000	600	13,270	360	13,270	360	14,590	850
E107X-1.5	1.5	12,500	620	12,500	620	12,500	620	10,610	360	10,610	360	12,740	900
E107X-1.8	1.8	10,500	630	10,500	630	10,500	630	9,730	380	9,730	380	10,610	950
E107X-2.0	2	9,700	630	9,700	630	9,700	630	9,555	380	9,555	380	10,350	980
E107X-2.5	2.5	8,200	650	8,200	650	8,200	650	7,640	400	7,640	400	10,192	1,010
E107X-3.0	3	7,430	670	7,430	670	7,430	670	6,900	410	6,900	410	10,080	1,150
E107X-4.0	4	7,200	650	7,200	650	7,200	650	6,000	360	6,000	360	9,600	860
E107X-5.0	5	5,730	515	5,730	515	5,730	515	4,770	290	4,770	290	7,645	690
E107X-6.0	6	4,800	430	4,800	430	4,800	430	4,000	240	4,000	240	6,400	580
E107X-8.0	8	3,600	430	3,600	430	3,600	430	3,000	180	3,000	180	4,800	580
E107X-10.0	10	2,900	410	2,900	410	2,900	410	2,400	140	2,400	140	3,800	530
E107X-12.0	12	2,400	336	2,400	336	2,400	336	2,000	120	2,000	120	3,200	510
E107X-16.0	16	1,800	252	1,800	252	1,800	252	1,500	100	1,500	100	2,400	400
E107X-20.0	20	1,400	196	1,400	196	1,400	196	1,200	95	1,200	95	1,900	340
(mm) 		≤ 0.3 D		≤ 0.3 D		≤ 0.3 D		≤ 0.3 D		≤ 0.3 D		≤ 0.3 D	

※ Pls. set up the feed speed under the 50% of conditions we descripted as above when you do the processing of V groove.
※ The standard of Ap(cutting depth) is 0.3d.

E108X / E109X

End Mills For Chamfering 60° / 90° / 120°

UMG Carbide

AlTiN X-NaNo

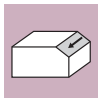
0°

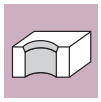
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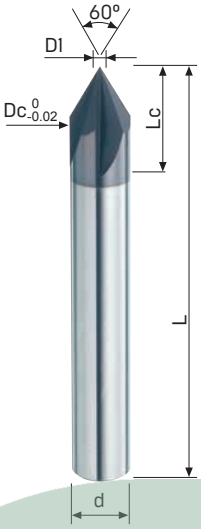
N

γ5°

Type of Operation







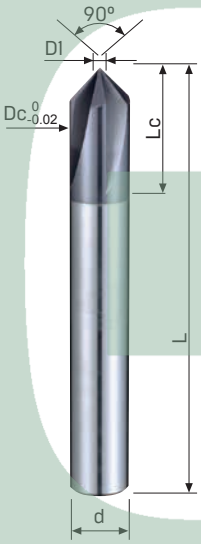
Code No. E108X-60°-Dc

Dc 0 -0.02	D1 mm	Lc mm	L mm	d h6	AlTiN E108X-60°
2	0.06	4	38	3	•
3	0.06	6	38	3	•
4	0.06	9	50	4	•
5	0.06	10	50	6	•
6	0.06	12	50	6	•
8	0.06	15	60	8	•
10	0.06	16	72	10	•
12	0.06	18	75	12	•
16	0.12	25	90	16	•
20	0.12	30	100	20	•

Work Material

P	H	M	K	N	S
●	●	○	●	●	

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper

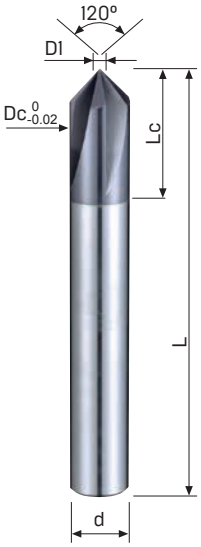


Code No. E109X-90°-Dc

Dc 0 -0.02	D1 mm	Lc mm	L mm	d h6	AlTiN E109X-90°
2	0.07	4	38	3	•
3	0.07	6	38	3	•
4	0.07	9	50	4	•
5	0.07	10	50	6	•
6	0.07	12	50	6	•
8	0.07	15	60	8	•
10	0.07	16	72	10	•
12	0.07	18	75	12	•
16	0.13	25	90	16	•
20	0.13	30	100	20	•

Feature of product:

E108X-60° End Mills for chamfering 60°- 4 Flutes
E109X-90° End Mills for chamfering 90°- 4 Flutes
E109X-120° End Mills for chamfering 120°- 4 Flutes
Suitable for drilling, tappering, countersinking, NC Spot drilling and frame milling.



Code No. E109X-120°-Dc

Dc 0 -0.02	D1 mm	Lc mm	L mm	d h6	AlTiN E109X-120°
2	0.1	4	38	3	•
3	0.1	6	38	3	•
4	0.1	9	50	4	•
5	0.1	10	50	6	•
6	0.1	12	50	6	•
8	0.1	15	60	8	•
10	0.1	16	72	10	•
12	0.1	18	75	12	•
16	0.17	25	90	16	•
20	0.17	30	100	20	•

E108X / E109X / Chamfering

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.10 Aluminium	
Vc m/min		40~70		40~70		40~70		30~50		30~50		30~50		40~70		100~200	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E108X/E109X-2	2	11,670	700	11,670	700	11,670	700	4,774	143	4,774	143	4,774	143	11,670	700	15,915	1,432
E108X/E109X-3	3	8,753	525	8,753	525	8,753	525	3,183	100	3,183	100	3,183	100	8,753	525	10,610	954
E108X/E109X-4	4	7,000	420	7,000	420	7,000	420	3,183	100	3,183	100	3,183	100	7,000	420	9,550	955
E108X/E109X-5	5	5,729	343	5,729	343	5,729	343	2,546	100	2,546	100	2,546	100	5,729	343	7,639	763
E108X/E109X-6	6	4,774	286	4,774	286	4,774	286	2,122	90	2,122	90	2,122	90	4,774	286	6,366	700
E108X/E109X-8	8	3,580	358	3,580	358	3,580	358	1,989	120	1,989	120	1,989	120	3,580	358	5,570	668
E108X/E109X-10	10	2,864	286	2,864	286	2,864	286	1,591	95	1,591	95	1,591	95	2,864	286	4,456	712
E108X/E109X-12	12	2,387	238	2,387	238	2,387	238	1,591	127	1,591	127	1,591	127	2,387	238	3,978	716
E108X/E109X-16	16	1,790	116	1,790	116	1,790	116	1,193	119	1,193	119	1,193	119	1,790	116	2,984	537
E108X/E109X-20	20	1,432	186	1,432	186	1,432	186	954	95	954	95	954	95	1,432	186	2,387	477

E108X / V Groove Process

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.10 Aluminium	
Vc m/min		40~70		40~70		40~70		20~50		20~50		20~50		40~70		100~200	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E108X-2	2	11,670	700	11,670	700	11,670	700	4,774	143	4,774	143	4,774	143	11,670	700	15,915	1,432
E108X-3	3	8,753	525	8,753	525	8,753	525	3,183	100	3,183	100	3,183	100	8,753	525	10,610	954
E108X-4	4	7,000	420	7,000	420	7,000	420	3,183	100	3,183	100	3,183	100	7,000	420	9,550	955
E108X-5	5	5,729	343	5,729	343	5,729	343	2,546	100	2,546	100	2,546	100	5,729	343	7,639	763
E108X-6	6	4,774	286	4,774	286	4,774	286	2,122	90	2,122	90	2,122	90	4,774	286	6,366	700
E108X-8	8	3,580	358	3,580	358	3,580	358	1,989	120	1,989	120	1,989	120	3,580	358	5,570	668
E108X-10	10	2,864	286	2,864	286	2,864	286	1,591	95	1,591	95	1,591	95	2,864	286	4,456	712
E108X-12	12	2,387	238	2,387	238	2,387	238	1,591	127	1,591	127	1,591	127	2,387	238	3,978	716
E108X-16	16	1,790	116	1,790	116	1,790	116	1,193	119	1,193	119	1,193	119	1,790	116	2,984	537
E108X-20	20	1,432	186	1,432	186	1,432	186	954	95	954	95	954	95	1,432	186	2,387	477

※ Pls. set up the feed speed under the 50% of conditions we descripted as above when you do the processing of V groove.
※ The standard of Ap(cutting depth) is 0.3d.
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E121HX / E123HX

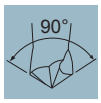
End Mills for Chamfering 90°

MG Carbide

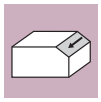
Bright AlTiCrN

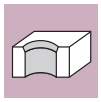






Type of Operation





Work Material

P	H	M	K	N	S
●	○	○	●	●	

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper

Feature of product:

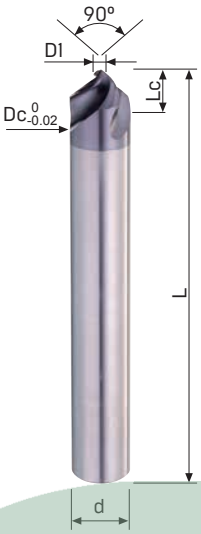
Three flutes chamfering endmill.

With Helix cutting edge design, reduce vibration during cutting process.

Sharp cutting edge could get better surface roughness and reduce burrs.

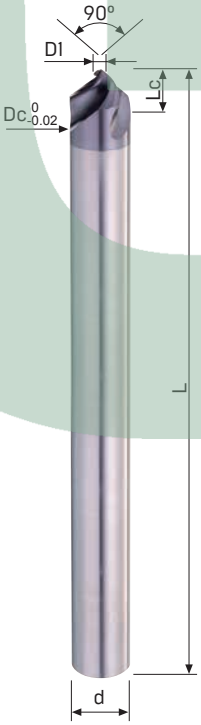
Apply AlTiCrN coating type to enhance tool life and gain better cutting efficiency of cutting tools.

Specialized for uncoated aluminum alloy.



Code No. E121HX-Dc

Dc 0 -0.02	D1 mm	Lc mm	L mm	d h6	Bright E121	AlTiCrN E121HX
2	0.2	0.9	38	3	●	●
3	0.3	1.35	38	3	●	●
4	0.4	1.8	50	4	●	●
5	0.5	2.25	50	6	●	●
6	0.6	2.7	50	6	●	●
8	0.8	3.6	60	8	●	●
10	1	4.5	72	10	●	●
12	1.2	5.4	75	12	●	●
16	1.6	7.2	90	16	●	●
20	2	9	100	20	●	●



Code No. E123HX-Dc

Dc 0 -0.02	D1 mm	Lc mm	L mm	d h6	Bright E123	AlTiCrN E123HX
3	0.3	1.35	80	3	●	●
4	0.4	1.8	100	4	●	●
5	0.5	2.25	100	6	●	●
6	0.6	2.7	100	6	●	●
8	0.8	3.6	100	8	●	●
10	1	4.5	100	10	●	●
12	1.2	5.4	110	12	●	●
16	1.6	7.2	140	16	●	●
20	2	9	160	20	●	●

Chamfering

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.10 Aluminium	
Vc m/min		60~90		60~90		50~80		30~50		30~50		30~50		60~90		100~200	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E121HX/E123HX-2	2	10,500	945	10,500	630	9,550	573	4,780	215	4,780	215	4,780	215	10,500	945	24,000	2,160
E121HX/E123HX-3	3	8,500	893	6,900	725	6,400	672	3,180	239	3,180	239	3,180	239	8,500	893	16,000	1,680
E121HX/E123HX-4	4	5,500	660	5,500	660	5,200	624	2,800	252	2,800	252	2,800	252	5,500	660	11,940	1,612
E121HX/E123HX-5	5	4,500	675	4,500	675	4,150	623	2,300	242	2,300	242	2,300	242	4,500	675	9,550	1,576
E121HX/E123HX-6	6	3,700	666	3,700	666	3,450	621	2,120	254	2,120	254	2,120	254	3,700	666	8,000	1,440
E121HX/E123HX-8	8	3,180	763	3,180	763	2,780	667	1,600	240	1,600	240	1,600	240	3,180	763	6,000	1,440
E121HX/E123HX-10	10	2,550	765	2,550	765	2,230	669	1,270	229	1,270	229	1,270	229	2,550	765	4,800	1,440
E121HX/E123HX-12	12	2,380	714	2,380	714	1,990	597	1,200	252	1,200	252	1,200	252	2,380	714	4,000	1,200
E121HX/E123HX-16	16	1,800	594	1,800	594	1,500	495	1,000	240	1,000	240	1,000	240	1,800	594	3,000	990
E121HX/E123HX-20	20	1,400	546	1,400	546	1,200	468	800	192	800	192	800	192	1,400	546	2,400	936
(mm) 		ap:0.3D		ap:0.3D		ap:0.3D		ap:0.3D		ap:0.3D		ap:0.3D		ap:0.3D		ap:0.3D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E151HX / E153HX

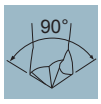
End Mills for Chamfering 90°

MG Carbide

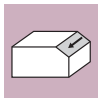
Bright AlTiCrN

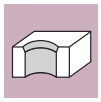






Type of Operation





Work Material

P	H	M	K	N	S
●	○	○	●	●	

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper

Feature of product:

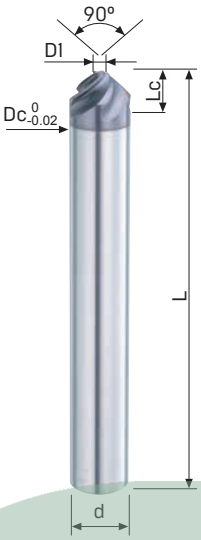
Five flutes chamfering endmill.

With Helix cutting edge design, reduce vibration during cutting process.

Sharp cutting edge could get better surface roughness and reduce burrs.

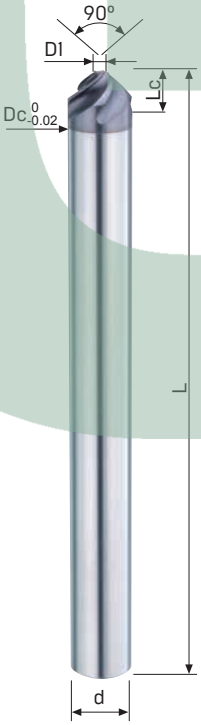
Apply AlTiCrN coating type to enhance tool life and gain better cutting efficiency of cutting tools.

Specialized for uncoated aluminum alloy.



Code No. E151HX-Dc

Dc 0 -0.02	D1 mm	Lc mm	L mm	d h6	Bright E151	AlTiCrN E151HX
2	0.5	0.75	38	3	●	●
3	0.75	1.13	38	3	●	●
4	1	1.5	50	4	●	●
5	1.25	1.88	50	6	●	●
6	1.5	2.25	50	6	●	●
8	2	3	60	8	●	●
10	2.5	3.75	72	10	●	●
12	3	4.5	75	12	●	●
16	4	6	90	16	●	●
20	5	7.5	100	20	●	●



Code No. E153HX-Dc

Dc 0 -0.02	D1 mm	Lc mm	L mm	d h6	Bright E153	AlTiCrN E153HX
3	0.75	1.13	80	3	●	●
4	1	1.5	100	4	●	●
5	1.25	1.88	100	6	●	●
6	1.5	2.25	100	6	●	●
8	2	3	100	8	●	●
10	2.5	3.75	100	10	●	●
12	3	4.5	110	12	●	●
16	4	6	140	16	●	●
20	5	7.5	160	20	●	●

Chamfering

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.10 Aluminium	
Vc m/min		60~90		60~90		50~80		30~50		30~50		30~50		60~90		100~200	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E151HX/E153HX-2	2	10,500	945	10,500	630	9,550	573	4,780	215	4,780	215	4,780	215	10,500	945	24,000	2,160
E151HX/E153HX-3	3	8,500	893	6,900	725	6,400	672	3,180	239	3,180	239	3,180	239	8,500	893	16,000	1,680
E151HX/E153HX-4	4	5,500	660	5,500	660	5,200	624	2,800	252	2,800	252	2,800	252	5,500	660	11,940	1,612
E151HX/E153HX-5	5	4,500	675	4,500	675	4,150	623	2,300	242	2,300	242	2,300	242	4,500	675	9,550	1,576
E151HX/E153HX-6	6	3,700	666	3,700	666	3,450	621	2,120	254	2,120	254	2,120	254	3,700	666	8,000	1,440
E151HX/E153HX-8	8	3,180	763	3,180	763	2,780	667	1,600	240	1,600	240	1,600	240	3,180	763	6,000	1,440
E151HX/E153HX-10	10	2,550	765	2,550	765	2,230	669	1,270	229	1,270	229	1,270	229	2,550	765	4,800	1,440
E151HX/E153HX-12	12	2,380	714	2,380	714	1,990	597	1,200	252	1,200	252	1,200	252	2,380	714	4,000	1,200
E151HX/E153HX-16	16	1,800	594	1,800	594	1,500	495	1,000	240	1,000	240	1,000	240	1,800	594	3,000	990
E151HX/E153HX-20	20	1,400	546	1,400	546	1,200	468	800	192	800	192	800	192	1,400	546	2,400	936
(mm) 		ap:0.3D		ap:0.3D		ap:0.3D		ap:0.3D		ap:0.3D		ap:0.3D		ap:0.3D		ap:0.3D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E110HX

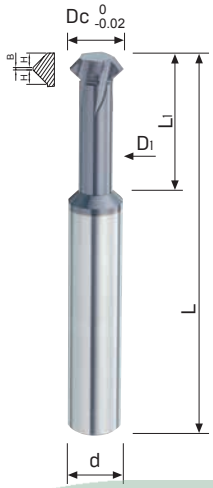
End Mills For Back and Front Chamfering 30° / 60° / 90° / 120°

MG Carbide

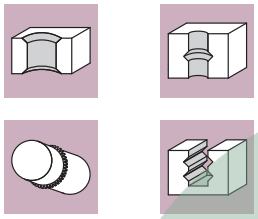
AlTiCrN HX







Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	○	○	○

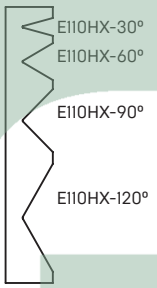
- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **S** Titanium
- **S** High Temp Alloys

Feature of product:

End Mills for Back and Front Chamfering / V-Groove End Mills.

With great heat resistance, applicable in high performance processing.

Suitable for hardened steel, stainless steel, carbon steel, nonferrous metals and other difficult-to-cut materials.



Code No. E110HX-30°-Dc

Dc 0 -0.02	H mm	B mm	L mm	d h6	L1 mm	D1 mm	Z t	AlTiCrN E110HX-30°
3	0.19	0.03	38	3	7.5	1.6	3	●
4	0.24	0.03	50	4	10	2.2	3	●
5	0.32	0.05	50	5	12.5	2.6	3	●
6	0.39	0.08	50	6	15	3.1	3	●
8	0.46	0.15	60	8	20	4.6	4	●
10	0.51	0.15	72	10	25	6.2	5	●
12	0.59	0.15	75	12	30	7.6	6	●

Code No. E110HX-60°-Dc

Dc 0 -0.02	H mm	B mm	L mm	d h6	L1 mm	D1 mm	Z t	AlTiCrN E110HX-60°
1	0.17	0.03	38	3	2.5	0.4	3	●
1.5	0.23	0.03	38	3	3.8	0.7	3	●
2	0.29	0.05	38	3	5	1	3	●
2.5	0.35	0.05	38	3	6.3	1.3	3	●
3	0.4	0.08	38	3	7.5	1.6	3	●
3.5	0.46	0.08	50	4	8.8	1.9	3	●
4	0.52	0.1	50	4	10	2.2	3	●
4.5	0.64	0.15	50	5	11.3	2.3	3	●
5	0.69	0.2	50	5	12.5	2.6	3	●
5.5	0.75	0.2	50	6	13.8	2.9	3	●
6	0.84	0.2	50	6	15	3.1	3	●
8	0.98	0.2	60	8	20	4.6	4	●
10	1.1	0.2	72	10	25	6.2	5	●
12	1.27	0.2	75	12	30	7.6	6	●

Code No. E110HX-90°-Dc

Dc 0 -0.02	H mm	B mm	L mm	d h6	L1 mm	D1 mm	Z t	AlTiCrN E110HX-90°
1	0.3	0.05	38	3	2.5	0.4	3	●
1.5	0.4	0.08	38	3	3.8	0.7	3	●
2	0.5	0.1	38	3	5	1	3	●
2.5	0.6	0.15	38	3	6.3	1.3	3	●
3	0.7	0.2	38	3	7.5	1.6	3	●
3.5	0.8	0.2	50	4	8.8	1.9	3	●
4	0.9	0.2	50	4	10	2.2	3	●
4.5	1.1	0.2	50	5	11.3	2.3	3	●
5	1.2	0.2	50	5	12.5	2.6	3	●
5.5	1.3	0.2	50	6	13.8	2.9	3	●
6	1.45	0.2	50	6	15	3.1	3	●
8	1.7	0.2	60	8	20	4.6	4	●
10	1.9	0.2	72	10	25	6.2	5	●
12	2.2	0.2	75	12	30	7.6	6	●

Code No. E110HX-120°-Dc

Dc 0 -0.02	H mm	B mm	L mm	d h6	L1 mm	D1 mm	Z t	AlTiCrN E110HX-120°
3	1.21	0.2	38	3	7.5	1.6	3	●
4	1.56	0.2	50	4	10	2.2	3	●
5	2.08	0.2	50	5	12.5	2.6	3	●
6	2.51	0.2	50	6	15	3.1	3	●
8	2.94	0.2	60	8	20	4.6	4	●
10	3.29	0.2	72	10	25	6.2	5	●
12	3.81	0.2	75	12	30	7.6	6	●

Chamfering

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.4 Hardened Steel (30~38HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.10 Aluminium		GR.11 Copper		GR.15 Titanium	
Vc m/min		30~60		25~70		15~40		25~50		30~80		100~200		100~200		15~30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E110HX-1	1	14,323	2,148	14,323	2,148	7,957	477	11,140	835	14,323	2,148	14,323	2,148	31,830	4,700	4,774	286
E110HX-1.5	1.5	9,549	1,430	9,549	1,430	5300	318	7,427	557	9,549	1,430	9,549	1,430	21,220	3,183	3,183	190
E110HX-2.0	2	7,161	1,280	7,161	1,280	3978	238	5,570	417	7,161	1,280	7,161	1,280	15,915	2,387	2,387	143
E110HX-2.5	2.5	5,729	1,030	5,729	1,030	3183	238	4,456	400	5,729	1,030	5,729	1,030	12,732	1,900	1,909	114
E110HX-3	3	4,774	1,000	4,774	1,000	2,652	198	3,713	334	4,774	1,000	4,774	1,000	10,610	1,591	1,591	100
E110HX-4	4	3,978	835	3,978	835	2387	214	3,183	334	3,978	835	3,978	818	9,549	1,432	1,818	136
E110HX-5	5	3,183	763	3,183	763	1910	200	2,546	305	3,183	763	3,183	835	7,639	1,145	1,591	119
E110HX-6	6	2,917	612	2,917	612	1856	194	2,387	286	2,917	612	2,917	742	6,366	954	1,414	127
E110HX-8	8	2,188	612	2,188	612	1392	194	1,790	286	2,188	612	2,188	763	5,570	1,114	1,273	114
E110HX-10	10	1,750	612	1,750	612	1114	222	1,432	286	1,750	612	1,750	651	4,456	1,114	1,157	121
E110HX-12	12	1,591	668	1,591	668	928	250	1,193	286	1,591	668	1,591	612	3,713	1,114	1,061	111

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E120HX

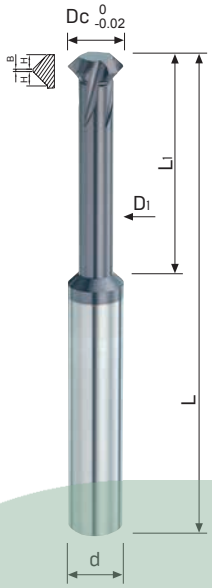
End Mills For Back and Front Chamfering 30° / 60° / 90° / 120°

MG Carbide

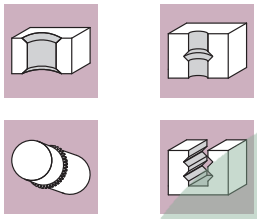
AlTiCrN HX

15°

3~6Z



Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	○	○	○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **S** Titanium
- **S** High Temp Alloys

Feature of product:

End Mills for Back and Front Chamfering / V-Groove End Mills.

With great heat resistance, applicable in high performance processing.

Suitable for hardened steel, stainless steel, carbon steel, nonferrous metals and other difficult-to-cut materials.



Code No. E120HX-30°-Dc

Dc 0 -0.02	H mm	B mm	L mm	d h6	L1 mm	D1 mm	Z t	AlTiCrN E120HX-30°
3	0.19	0.03	50	3	12	1.6	3	●
4	0.24	0.03	50	4	16	2.2	3	●
5	0.32	0.05	50	5	20	2.6	3	●
6	0.39	0.08	60	6	24	3.1	3	●
8	0.46	0.15	70	8	32	4.6	4	●
10	0.51	0.15	80	10	40	6.2	5	●
12	0.59	0.15	90	12	48	7.6	6	●

Code No. E120HX-60°-Dc

Dc 0 -0.02	H mm	B mm	L mm	d h6	L1 mm	D1 mm	Z t	AlTiCrN E120HX-60°
3	0.4	0.08	50	3	12	1.6	3	●
3.5	0.46	0.08	50	4	14	1.9	3	●
4	0.52	0.1	50	4	16	2.2	3	●
4.5	0.64	0.15	50	5	18	2.3	3	●
5	0.69	0.2	50	5	20	2.6	3	●
5.5	0.75	0.2	60	6	22	2.9	3	●
6	0.84	0.2	60	6	24	3.1	3	●
8	0.98	0.2	70	8	32	4.6	4	●
10	1.1	0.2	80	10	40	6.2	5	●
12	1.27	0.2	90	12	48	7.6	6	●

Code No. E120HX-90°-Dc

Dc 0 -0.02	H mm	B mm	L mm	d h6	L1 mm	D1 mm	Z t	AlTiCrN E120HX-90°
3	0.7	0.2	50	3	12	1.6	3	●
4	0.9	0.2	50	4	16	2.2	3	●
5	1.2	0.2	50	5	20	2.6	3	●
6	1.45	0.2	60	6	24	3.1	3	●
8	1.7	0.2	70	8	32	4.6	4	●
10	1.9	0.2	80	10	40	6.2	5	●
12	2.2	0.2	90	12	48	7.6	6	●

Code No. E120HX-120°-Dc

Dc 0 -0.02	H mm	B mm	L mm	d h6	L1 mm	D1 mm	Z t	AlTiCrN E120HX-120°
3	1.21	0.2	50	3	12	1.6	3	●
4	1.56	0.2	50	4	16	2.2	3	●
5	2.08	0.2	50	5	20	2.6	3	●
6	2.51	0.2	60	6	24	3.1	3	●
8	2.94	0.2	70	8	32	4.6	4	●
10	3.29	0.2	80	10	40	6.2	5	●
12	3.81	0.2	90	12	48	7.6	6	●

Chamfering

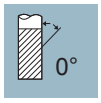
Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.4 Hardened Steel (30~38HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.10 Aluminium		GR.11 Copper		GR.15 Titanium	
Vc m/min		30~60		25~70		15~40		25~50		30~80		25~80		100~200		15~30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E120HX-3	3	4,774	1,000	4,774	1,000	2,652	198	3,713	334	4,774	1,000	4,774	1,000	10,610	1,591	1,591	100
E120HX-3.5	3.5	4,547	818	4,547	818	2,728	204	3,637	381	4,547	818	4,547	818	9,094	1,364	1,818	136
E120HX-4	4	3,978	835	3,978	835	2,387	214	3,183	334	3,978	835	3,978	835	9,549	1,432	1,591	119
E120HX-4.5	4.5	3,536	742	3,536	742	2,122	190	2,828	296	3,536	742	3,536	742	8,848	1,327	1,414	127
E120HX-5	5	3,183	763	3,183	763	1,910	200	2,546	305	3,183	763	3,183	763	7,639	1,145	1,273	114
E120HX-5.5	5.5	3,100	651	3,100	651	1,736	182	2,314	277	3,100	651	3,100	651	6,944	1,041	1,157	121
E120HX-6	6	2,917	612	2,917	612	1,856	194	2,387	286	2,917	612	2,917	612	6,366	954	1,061	111
E120HX-8	8	2,188	612	2,188	612	1,392	194	1,790	286	2,188	612	2,188	612	5,570	1,114	994	159
E120HX-10	10	1,750	612	1,750	612	1,114	222	1,432	286	1,750	612	1,750	612	4,456	1,114	795	159
E120HX-12	12	1,591	668	1,591	668	928	250	1,193	286	1,591	668	1,591	668	3,713	1,114	663	159

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

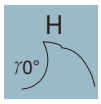
E101 / E101FX

End Mills For Round Chamfering

MG Carbide | Bright AlCrN

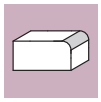


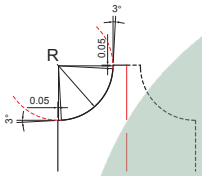






Type of Operation



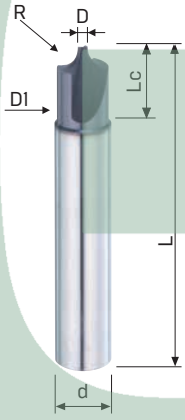


Work Material

P	H	M	K	N	S
●	●	●	●	●	●

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys





Code No. E101 -R / E101FX-R

R +0.02 -0.02	D 0 -0.02	D1 mm	Lc mm	L mm	d h6	Z	Bright E101	AlCrN E101FX
R0.1	0.5	0.8	3	50	4	2	●	●
R0.15	0.5	0.9	3	50	4	2	●	●
R0.2	0.5	1	3	50	4	2	●	●
R0.25	0.5	1.1	3	50	4	2	●	●
R0.3	0.5	1.2	3	50	4	2	●	●
R0.35	0.5	1.3	3	50	4	2	●	●
R0.4	0.5	1.4	3	50	4	2	●	●
R0.45	0.5	1.5	3	50	4	2	●	●
R0.5	0.5	1.6	5	50	4	2	●	●
R0.55	0.5	1.7	5	50	4	2	●	●
R0.6	0.5	1.8	5	50	4	2	●	●
R0.65	0.5	1.9	5	50	4	2	●	●
R0.7	0.5	2	5	50	4	2	●	●
R0.75	0.5	2.1	5	50	4	2	●	●
R0.8	0.8	2.5	5	50	4	2	●	●
R0.85	0.8	2.6	5	50	4	2	●	●
R0.9	0.8	2.7	5	50	4	2	●	●
R0.95	0.8	2.8	5	50	4	2	●	●
R1	0.8	2.9	8	50	4	2	●	●
R1.25	0.8	3.4	8	50	4	2	●	●
R1.5	1.5	4.6	8	50	6	2	●	●
R1.75	1.5	5.1	8	50	6	2	●	●
R2	1.5	5.6	10	50	6	2	●	●
R2.5	1.5	6.6	10	60	8	2	●	●
R3	1.5	7.6	12	60	8	2	●	●
R3.5	2	9.1	12	72	10	2	●	●
R4	2	10.1	12	72	10	2	●	●
R4.5	2	11.1	15	75	12	2	●	●
R5	2	12.1	15	75	12	2	●	●

Feature of product:

Suitable for corner rounding applications.

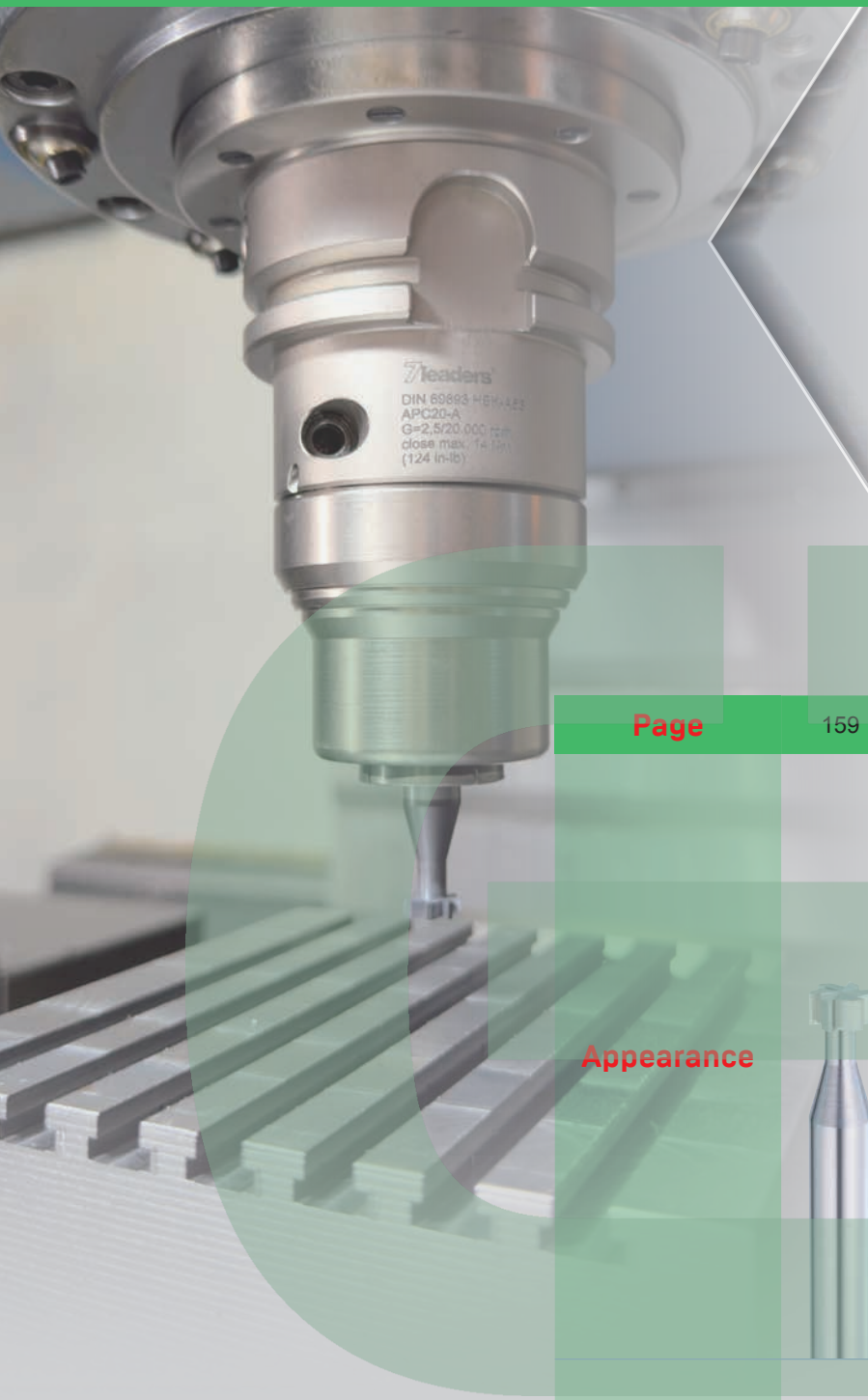
AlCrN Nano multilayer coating enable to enhance wear resistance and make it effective for use on carbon steel, alloy steel, hardened steel, stainless steel, and difficult to cut materials...etc.

Specialized for uncoated aluminum alloy.

Chamfering

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.4 Hardened Steel (30~38HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.10 Aluminium		GR.11 Copper		GR.15 Titanium	
Vc m/min		30~60		25~70		15~40		25~50		30~80		25~80		100~200		15~30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E101FX-R0.1	0.8	27,869	167	23,888	96	15,925	96	19,906	119	27,869	167	47,775	287	39,813	239	11,944	72
E101FX-R0.2	1	22,295	178	19,110	102	12,740	102	15,925	127	22,295	178	38,220	306	31,850	255	9,555	76
E101FX-R0.3	1.2	18,579	204	15,925	117	10,617	117	13,271	146	18,579	204	31,850	350	26,542	292	7,963	88
E101FX-R0.4	1.4	15,925	191	13,650	109	9,100	109	11,375	137	15,925	191	27,300	328	22,750	273	6,825	82
E101FX-R0.5	1.6	13,934	181	11,944	104	7,963	104	9,953	129	13,934	181	23,888	311	19,906	259	5,972	78
E101FX-R0.6	1.8	12,386	173	10,617	99	7,078	99	8,847	124	12,386	173	21,233	297	17,694	248	5,308	74
E101FX-R0.7	2	11,148	178	9,555	102	6,370	102	7,963	127	11,148	178	19,110	306	15,925	255	4,778	76
E101FX-R0.8	2.5	8,918	161	7,644	92	5,096	92	6,370	115	8,918	161	15,288	275	12,740	229	3,822	69
E101FX-R0.9	2.7	8,257	165	7,078	94	4,719	94	5,898	118	8,257	165	14,156	283	11,796	236	3,539	71
E101FX-R1	2.9	7,688	231	6,590	132	4,393	132	5,491	165	7,688	231	13,179	395	10,983	329	3,295	99
E101FX-R1.25	3.4	6,557	262	5,621	150	3,747	150	4,684	187	6,557	262	11,241	450	9,368	375	2,810	112
E101FX-R1.5	4.6	4,847	223	4,154	127	2,770	127	3,462	159	4,847	223	8,309	382	6,924	319	2,077	96
E101FX-R1.75	5.1	4,372	262	3,747	150	2,498	150	3,123	187	4,372	262	7,494	450	6,245	375	1,874	112
E101FX-R2	5.6	3,981	319	3,413	182	2,275	182	2,844	228	3,981	319	6,825	546	5,688	455	1,706	137
E101FX-R2.5	6.6	3,378	338	2,895	193	1,930	193	2,413	241	3,378	338	5,791	579	4,826	483	1,448	145
E101FX-R3	7.6	2,934	352	2,514	201	1,676	201	2,095	251	2,934	352	5,029	603	4,191	503	1,257	151
E101FX-R3.5	9.1	2,450	343	2,100	196	1,400	196	1,750	245	2,450	343	4,200	588	3,500	490	1,050	147
E101FX-R4	10.1	2,207	353	1,892	202	1,261	202	1,577	252	2,207	353	3,784	605	3,153	505	946	151
E101FX-R4.5	11.1	2,009	362	1,722	207	1,148	207	1,435	258	2,009	362	3,443	620	2,869	516	861	155
E101FX-R5	12.1	1,843	369	1,579	211	1,053	211	1,316	263	1,843	369	3,159	632	2,632	526	790	158

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.



T-Slot End Mills

Page	159	161	163	165	166	167
Appearance						
Code No	T116 T116FX	T117 T117FX	T118 T118FX	T217 T217FX	T218 T218FX	T119 T119FX
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
Coating	Bright AlCrN	Bright AlCrN	Bright AlCrN	Bright AlCrN	Bright AlCrN	Bright AlCrN
Helix Angle	0°	0°	10°	0°	15°	0°
No.of Flutes	Z	Z	Z	Z	Z	Z

168 169





T201 T201FX	T203 T203FX
MG Carbide	MG Carbide
Bright AlCrN	Bright AlCrN
 0°	 0°
 Z	 Z

T116FX

Super Mini Slot Cutter (End Cutting)

MG Carbide

Bright AlCrN

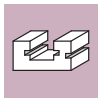
0°

Z

H 70°

90°

Type of Operation



For NO.T116

P	H	M	K	N	S
				●	

For NO.T116FX

P	H	M	K	N	S
●	●	●	●		●

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

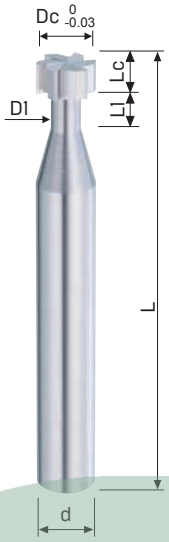
Suitable for mini groove machining applications, such as milling T-shaped or side grooves.

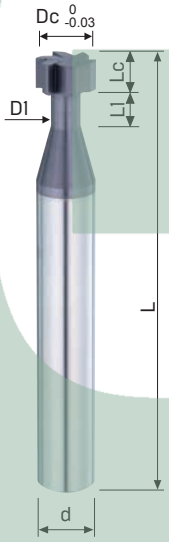
Designed with straight cutting flutes.

Bright uncoated is good for aluminium alloy, plastic, resin material, and etc.

AlCrN Nano multilayer coating enable to enhance wear resistance and make it effective for use on carbon steel, alloy steel, hardened steel, stainless steel, and difficult to cut materials...etc.

Specialized for uncoated aluminum alloy.





Code No. T116 -Dc×Lc
T116FX-Dc×Lc

Dc 0 -0.03	Lc 0 -0.03	D1 mm	L1 mm	L mm	d h6	Z tooth	Bright T116	AlCrN T116FX
3	0.5	1.5	3.5	50	4	4	●	●
3	0.6	1.5	3.5	50	4	4	●	●
3	0.7	1.5	3.5	50	4	4	●	●
3	0.8	1.5	3.5	50	4	4	●	●
3	0.9	1.5	3.5	50	4	4	●	●
3	1	1.5	3.5	50	4	4	●	●
3	1.2	1.5	3.5	50	4	4	●	●
3	1.4	1.5	3.5	50	4	4	●	●
3	1.5	1.5	3.5	50	4	4	●	●
4	0.5	2	3.5	50	4	4	●	●
4	0.6	2	3.5	50	4	4	●	●
4	0.7	2	3.5	50	4	4	●	●
4	0.8	2	3.5	50	4	4	●	●
4	0.9	2	3.5	50	4	4	●	●
4	1	2	3.5	50	4	4	●	●
4	1.2	2	3.5	50	4	4	●	●
4	1.4	2	3.5	50	4	4	●	●
4	1.5	2	3.5	50	4	4	●	●
4	1.6	2	3.5	50	4	4	●	●
4	1.8	2	3.5	50	4	4	●	●
4	2	2	3.5	50	4	4	●	●
5	0.5	2.5	4	50	6	4	●	●
5	0.6	2.5	4	50	6	4	●	●
5	0.7	2.5	4	50	6	4	●	●
5	0.8	2.5	4	50	6	4	●	●
5	0.9	2.5	4	50	6	4	●	●
5	1	2.5	4	50	6	4	●	●
5	1.2	2.5	4	50	6	4	●	●
5	1.4	2.5	4	50	6	4	●	●
5	1.5	2.5	4	50	6	4	●	●
5	1.6	2.5	4	50	6	4	●	●
5	1.8	2.5	4	50	6	4	●	●
5	2	2.5	4	50	6	4	●	●
6	0.5	3	4	50	6	6	●	●
6	0.6	3	4	50	6	6	●	●
6	0.7	3	4	50	6	6	●	●
6	0.8	3	4	50	6	6	●	●
6	0.9	3	4	50	6	6	●	●
6	1	3	4	50	6	6	●	●
6	1.2	3	4	50	6	6	●	●
6	1.4	3	4	50	6	6	●	●
6	1.5	3	4	50	6	6	●	●
6	1.6	3	4	50	6	6	●	●
6	1.8	3	4	50	6	6	●	●
6	2	3	4	50	6	6	●	●
6	2.5	3	4	50	6	6	●	●
6	3	3	4	50	6	6	●	●
8	0.5	4	5	60	8	6	●	●
8	0.6	4	5	60	8	6	●	●
8	0.7	4	5	60	8	6	●	●
8	0.8	4	5	60	8	6	●	●
8	0.9	4	5	60	8	6	●	●
8	1	4	5	60	8	6	●	●
8	1.2	4	5	60	8	6	●	●
8	1.4	4	5	60	8	6	●	●
8	1.5	4	5	60	8	6	●	●

Super Mini Slot Cutter (End Cutting)

MG Carbide

Bright AlCrN

0°

Z

H

70°

90°

Type of Operation

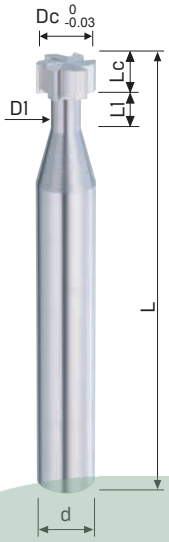
For NO.T116

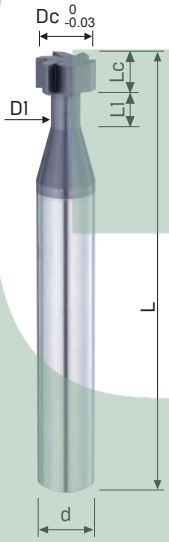
P	H	M	K	N	S
				●	

For NO.T116FX

P	H	M	K	N	S
●	●	●	●		●

- P Steel
- H <38HRC Hardened Steel
- H <48HRC Hardened Steel
- M Stainless Steel
- K Cast Iron
- N Aluminium
- N Copper
- S Titanium
- S Nickel
- S High Temp Alloys





Code No. T116 -Dc×Lc
T116FX-Dc×Lc

Dc 0 -0.03	Lc 0 -0.03	D1 mm	L1 mm	L mm	d h6	Z tooth	Bright T116	AlCrN T116FX
8	1.6	4	5	60	8	6	●	●
8	1.8	4	5	60	8	6	●	●
8	2	4	5	60	8	6	●	●
8	2.5	4	5	60	8	6	●	●
8	3	4	5	60	8	6	●	●
8	3.5	4	5	60	8	6	●	●
8	4	4	5	60	8	6	●	●
10	0.5	5	6	72	10	6	●	●
10	0.6	5	6	72	10	6	●	●
10	0.7	5	6	72	10	6	●	●
10	0.8	5	6	72	10	6	●	●
10	0.9	5	6	72	10	6	●	●
10	1	5	6	72	10	6	●	●
10	1.2	5	6	72	10	6	●	●
10	1.4	5	6	72	10	6	●	●
10	1.5	5	6	72	10	6	●	●
10	1.6	5	6	72	10	6	●	●
10	1.8	5	6	72	10	6	●	●
10	2	5	6	72	10	6	●	●
10	2.5	5	6	72	10	6	●	●
10	3	5	6	72	10	6	●	●
10	3.5	5	6	72	10	6	●	●
10	4	5	6	72	10	6	●	●
10	4.5	5	6	72	10	6	●	●
10	5	5	6	72	10	6	●	●
12	0.5	6	7	75	12	6	●	●
12	0.6	6	7	75	12	6	●	●
12	0.7	6	7	75	12	6	●	●
12	0.8	6	7	75	12	6	●	●
12	0.9	6	7	75	12	6	●	●
12	1	6	7	75	12	6	●	●
12	1.2	6	7	75	12	6	●	●
12	1.4	6	7	75	12	6	●	●
12	1.5	6	7	75	12	6	●	●
12	1.6	6	7	75	12	6	●	●
12	1.8	6	7	75	12	6	●	●
12	2	6	7	75	12	6	●	●
12	2.5	6	7	75	12	6	●	●
12	3	6	7	75	12	6	●	●
12	3.5	6	7	75	12	6	●	●
12	4	6	7	75	12	6	●	●
12	4.5	6	7	75	12	6	●	●
12	5	6	7	75	12	6	●	●

Please refer to page P170 for parameters.

Feature of product:

Suitable for mini groove machining applications, such as milling T-shaped or side grooves.

Designed with straight cutting flutes.

Bright uncoated is good for aluminium alloy, plastic, resin material, and etc.

AlCrN Nano multilayer coating enable to enhance wear resistance and make it effective for use on carbon steel, alloy steel, hardened steel, stainless steel, and difficult to cut materials...etc.

Specialized for uncoated aluminum alloy.

T117FX

Super Mini Keyseat Cutter

MG Carbide

Bright AlCrN

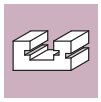
0°

Z

H 70°

90°

Type of Operation



For NO.T117

P	H	M	K	N	S
				●	

For NO.T117FX

P	H	M	K	N	S
●	●	●	●		●

- P Steel
- H <38HRC Hardened Steel
- H <48HRC Hardened Steel
- M Stainless Steel
- K Cast Iron
- N Aluminium
- N Copper
- S Titanium
- S Nickel
- S High Temp Alloys

Feature of product:

Suitable for mini groove machining applications, such as milling T-shaped or side grooves.

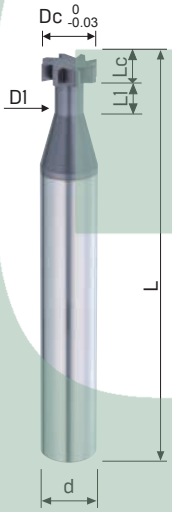
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Specialized for uncoated aluminum alloy.





Code No. T117 -Dc×Lc
T117FX-Dc×Lc

Dc 0 -0.03	Lc 0 -0.03	D1 mm	L1 mm	L mm	d h6	Z tooth	Bright T117	AlCrN T117FX
3	0.5	1.5	3.5	50	4	4	●	●
3	0.6	1.5	3.5	50	4	4	●	●
3	0.7	1.5	3.5	50	4	4	●	●
3	0.8	1.5	3.5	50	4	4	●	●
3	0.9	1.5	3.5	50	4	4	●	●
3	1	1.5	3.5	50	4	4	●	●
3	1.1	1.5	3.5	50	4	4	●	●
3	1.2	1.5	3.5	50	4	4	●	●
3	1.3	1.5	3.5	50	4	4	●	●
3	1.4	1.5	3.5	50	4	4	●	●
3	1.5	1.5	3.5	50	4	4	●	●
4	0.5	2	3.5	50	4	6	●	●
4	0.6	2	3.5	50	4	6	●	●
4	0.7	2	3.5	50	4	6	●	●
4	0.8	2	3.5	50	4	6	●	●
4	0.9	2	3.5	50	4	6	●	●
4	1	2	3.5	50	4	6	●	●
4	1.1	2	3.5	50	4	6	●	●
4	1.2	2	3.5	50	4	6	●	●
4	1.3	2	3.5	50	4	6	●	●
4	1.4	2	3.5	50	4	6	●	●
4	1.5	2	3.5	50	4	6	●	●
4	1.6	2	3.5	50	4	6	●	●
4	1.7	2	3.5	50	4	6	●	●
4	1.8	2	3.5	50	4	6	●	●
4	1.9	2	3.5	50	4	6	●	●
4	2	2	3.5	50	4	6	●	●
5	0.5	2.5	4	50	6	6	●	●
5	0.6	2.5	4	50	6	6	●	●
5	0.7	2.5	4	50	6	6	●	●
5	0.8	2.5	4	50	6	6	●	●
5	0.9	2.5	4	50	6	6	●	●
5	1	2.5	4	50	6	6	●	●
5	1.1	2.5	4	50	6	6	●	●
5	1.2	2.5	4	50	6	6	●	●
5	1.3	2.5	4	50	6	6	●	●
5	1.4	2.5	4	50	6	6	●	●
5	1.5	2.5	4	50	6	6	●	●
5	1.6	2.5	4	50	6	6	●	●
5	1.7	2.5	4	50	6	6	●	●
5	1.8	2.5	4	50	6	6	●	●
5	1.9	2.5	4	50	6	6	●	●
5	2	2.5	4	50	6	6	●	●
6	0.5	3	4	50	6	8	●	●
6	0.6	3	4	50	6	8	●	●
6	0.7	3	4	50	6	8	●	●
6	0.8	3	4	50	6	8	●	●
6	0.9	3	4	50	6	8	●	●
6	1	3	4	50	6	8	●	●
6	1.1	3	4	50	6	8	●	●
6	1.2	3	4	50	6	8	●	●
6	1.3	3	4	50	6	8	●	●
6	1.4	3	4	50	6	8	●	●
6	1.5	3	4	50	6	8	●	●
6	1.6	3	4	50	6	8	●	●
6	1.7	3	4	50	6	8	●	●
6	1.8	3	4	50	6	8	●	●
6	1.9	3	4	50	6	8	●	●
6	2	3	4	50	6	8	●	●
6	2.5	3	4	50	6	8	●	●
6	3	3	4	50	6	8	●	●
8	0.5	4	5	60	8	8	●	●
8	0.6	4	5	60	8	8	●	●
8	0.7	4	5	60	8	8	●	●
8	0.8	4	5	60	8	8	●	●
8	0.9	4	5	60	8	8	●	●
8	1	4	5	60	8	8	●	●
8	1.1	4	5	60	8	8	●	●
8	1.2	4	5	60	8	8	●	●
8	1.3	4	5	60	8	8	●	●
8	1.4	4	5	60	8	8	●	●
8	1.5	4	5	60	8	8	●	●

Super Mini Keyseat Cutter

MG Carbide

Bright AlCrN

0°

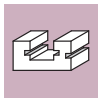
Z

H

70°

90°

Type of Operation



For NO.T117

P	H	M	K	N	S
				●	

For NO.T117FX

P	H	M	K	N	S
●	●	●	●		●

- P Steel
- H <38HRC Hardened Steel
- H <48HRC Hardened Steel
- M Stainless Steel
- K Cast Iron
- N Aluminium
- N Copper
- S Titanium
- S Nickel
- S High Temp Alloys

Feature of product:

Suitable for mini groove machining applications, such as milling T-shaped or side grooves.

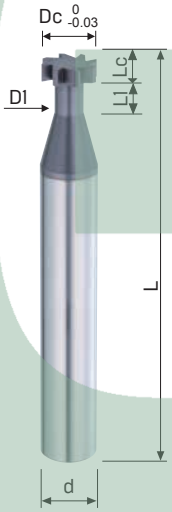
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AlCrN Nano multilayer coating enable to enhance wear resistance and make it effective for use on carbon steel, alloy steel, hardened steel, stainless steel, and difficult to cut materials...etc.

Specialized for uncoated aluminum alloy.





Code No. T117 -Dc×Lc
T117FX-Dc×Lc

Dc 0 -0.03	Lc 0 -0.03	D1 mm	L1 mm	L mm	d h6	Z tooth	Bright T117	AlCrN T117FX
8	1.6	4	5	60	8	8	●	●
8	1.7	4	5	60	8	8	●	●
8	1.8	4	5	60	8	8	●	●
8	1.9	4	5	60	8	8	●	●
8	2	4	5	60	8	8	●	●
8	2.5	4	5	60	8	8	●	●
8	3	4	5	60	8	8	●	●
8	3.5	4	5	60	8	8	●	●
8	4	4	5	60	8	8	●	●
10	0.5	5	6	72	10	8	●	●
10	0.6	5	6	72	10	8	●	●
10	0.7	5	6	72	10	8	●	●
10	0.8	5	6	72	10	8	●	●
10	0.9	5	6	72	10	8	●	●
10	1	5	6	72	10	8	●	●
10	1.1	5	6	72	10	8	●	●
10	1.2	5	6	72	10	8	●	●
10	1.3	5	6	72	10	8	●	●
10	1.4	5	6	72	10	8	●	●
10	1.5	5	6	72	10	8	●	●
10	1.6	5	6	72	10	8	●	●
10	1.7	5	6	72	10	8	●	●
10	1.8	5	6	72	10	8	●	●
10	1.9	5	6	72	10	8	●	●
10	2	5	6	72	10	8	●	●
10	2.5	5	6	72	10	8	●	●
10	3	5	6	72	10	8	●	●
10	3.5	5	6	72	10	8	●	●
10	4	5	6	72	10	8	●	●
10	4.5	5	6	72	10	8	●	●
10	5	5	6	72	10	8	●	●
12	0.5	6	7	75	12	8	●	●
12	0.6	6	7	75	12	8	●	●
12	0.7	6	7	75	12	8	●	●
12	0.8	6	7	75	12	8	●	●
12	0.9	6	7	75	12	8	●	●
12	1	6	7	75	12	8	●	●
12	1.1	6	7	75	12	8	●	●
12	1.2	6	7	75	12	8	●	●
12	1.3	6	7	75	12	8	●	●
12	1.4	6	7	75	12	8	●	●
12	1.5	6	7	75	12	8	●	●
12	1.6	6	7	75	12	8	●	●
12	1.7	6	7	75	12	8	●	●
12	1.8	6	7	75	12	8	●	●
12	1.9	6	7	75	12	8	●	●
12	2	6	7	75	12	8	●	●
12	2.5	6	7	75	12	8	●	●
12	3	6	7	75	12	8	●	●
12	3.5	6	7	75	12	8	●	●
12	4	6	7	75	12	8	●	●
12	4.5	6	7	75	12	8	●	●
12	5	6	7	75	12	8	●	●

Please refer to page P170 for parameters.

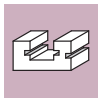
T118FX

Super Mini Staggered Tooth Keyseat Cutter

MG Carbide | Bright AlCrN

10° | Z | H 70° | 90°

Type of Operation



For NO.T118

P	H	M	K	N	S
				●	

For NO.T118FX

P	H	M	K	N	S
●	●	●	●		●

- P Steel
- H <38HRC Hardened Steel
- H <48HRC Hardened Steel
- M Stainless Steel
- K Cast Iron
- N Aluminium
- N Copper
- S Titanium
- S Nickel
- S High Temp Alloys

Feature of product:

Suitable for mini groove machining applications, such as milling T-shaped or side grooves.

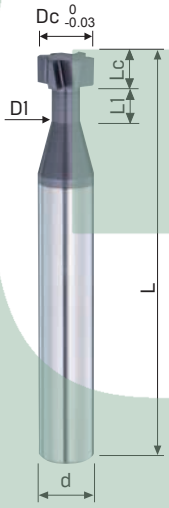
Effectively decrease the vibration and reduced machining resistance by the designs of left helix and right cutting edge.

Bright uncoated is good for aluminium alloy, plastic, resin material, and etc.

AlCrN Nano multilayer coating enable to enhance wear resistance and make it effective for use on carbon steel, alloy steel, hardened steel, stainless steel, and difficult to cut materials...etc.

Specialized for uncoated aluminum alloy.





Code No. T118 -Dc×Lc
T118FX-Dc×Lc

Dc 0 -0.03	Lc 0 -0.03	Dl mm	L1 mm	L mm	d h6	Z tooth	Bright T118	AlCrN T118FX
4	0.5	2	3.5	50	4	6	●	●
4	0.6	2	3.5	50	4	6	●	●
4	0.7	2	3.5	50	4	6	●	●
4	0.8	2	3.5	50	4	6	●	●
4	0.9	2	3.5	50	4	6	●	●
4	1	2	3.5	50	4	6	●	●
4	1.2	2	3.5	50	4	6	●	●
4	1.4	2	3.5	50	4	6	●	●
4	1.5	2	3.5	50	4	6	●	●
4	1.6	2	3.5	50	4	6	●	●
4	1.8	2	3.5	50	4	6	●	●
4	2	2	3.5	50	4	6	●	●
5	0.5	2.5	4	50	6	6	●	●
5	0.6	2.5	4	50	6	6	●	●
5	0.7	2.5	4	50	6	6	●	●
5	0.8	2.5	4	50	6	6	●	●
5	0.9	2.5	4	50	6	6	●	●
5	1	2.5	4	50	6	6	●	●
5	1.2	2.5	4	50	6	6	●	●
5	1.4	2.5	4	50	6	6	●	●
5	1.5	2.5	4	50	6	6	●	●
5	1.6	2.5	4	50	6	6	●	●
5	1.8	2.5	4	50	6	6	●	●
5	2	2.5	4	50	6	6	●	●
6	0.5	3	4	50	6	6	●	●
6	0.6	3	4	50	6	6	●	●
6	0.7	3	4	50	6	6	●	●
6	0.8	3	4	50	6	6	●	●
6	0.9	3	4	50	6	6	●	●
6	1	3	4	50	6	6	●	●
6	1.2	3	4	50	6	6	●	●
6	1.4	3	4	50	6	6	●	●
6	1.5	3	4	50	6	6	●	●
6	1.6	3	4	50	6	6	●	●
6	1.8	3	4	50	6	6	●	●
6	2	3	4	50	6	6	●	●
6	2.5	3	4	50	6	6	●	●
6	3	3	4	50	6	6	●	●
8	0.5	4	5	60	8	6	●	●
8	0.6	4	5	60	8	6	●	●
8	0.7	4	5	60	8	6	●	●
8	0.8	4	5	60	8	6	●	●
8	0.9	4	5	60	8	6	●	●
8	1	4	5	60	8	6	●	●
8	1.2	4	5	60	8	6	●	●
8	1.4	4	5	60	8	6	●	●
8	1.5	4	5	60	8	6	●	●
8	1.6	4	5	60	8	6	●	●
8	1.8	4	5	60	8	6	●	●
8	2	4	5	60	8	6	●	●
8	2.5	4	5	60	8	6	●	●
8	3	4	5	60	8	6	●	●
8	3.5	4	5	60	8	6	●	●
8	4	4	5	60	8	6	●	●
10	0.5	5	6	72	10	6	●	●
10	0.6	5	6	72	10	6	●	●

Super Mini Staggered Tooth Keyseat Cutter

MG Carbide

Bright AlCrN

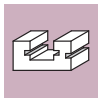
10°

Z

H 70°

90°

Type of Operation



For NO.T118

P	H	M	K	N	S
				●	

For NO.T118FX

P	H	M	K	N	S
●	●	●	●		●

- P Steel
- H <38HRC Hardened Steel
- H <48HRC Hardened Steel
- M Stainless Steel
- K Cast Iron
- N Aluminium
- N Copper
- S Titanium
- S Nickel
- S High Temp Alloys

Feature of product:

Suitable for mini groove machining applications, such as milling T-shaped or side grooves.

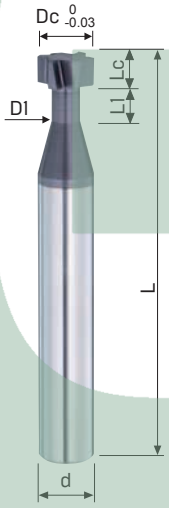
Effectively decrease the vibration and reduced machining resistance by the designs of left helix and right cutting edge.

Bright uncoated is good for aluminium alloy, plastic, resin material, and etc.

AlCrN Nano multilayer coating enable to enhance wear resistance and make it effective for use on carbon steel, alloy steel, hardened steel, stainless steel, and difficult to cut materials...etc.

Specialized for uncoated aluminum alloy.





Code No. T118 -Dc×Lc
T118FX-Dc×Lc

Dc 0 -0.03	Lc 0 -0.03	Dl mm	L1 mm	L mm	d h6	Z tooth	Bright T118	AlCrN T118FX
10	0.7	5	6	72	10	6	●	●
10	0.8	5	6	72	10	6	●	●
10	0.9	5	6	72	10	6	●	●
10	1	5	6	72	10	6	●	●
10	1.2	5	6	72	10	6	●	●
10	1.4	5	6	72	10	6	●	●
10	1.5	5	6	72	10	6	●	●
10	1.6	5	6	72	10	6	●	●
10	1.8	5	6	72	10	6	●	●
10	2	5	6	72	10	6	●	●
10	2.5	5	6	72	10	6	●	●
10	3	5	6	72	10	6	●	●
10	3.5	5	6	72	10	6	●	●
10	4	5	6	72	10	6	●	●
10	4.5	5	6	72	10	6	●	●
10	5	5	6	72	10	6	●	●
12	0.5	6	7	75	12	6	●	●
12	0.6	6	7	75	12	6	●	●
12	0.7	6	7	75	12	6	●	●
12	0.8	6	7	75	12	6	●	●
12	0.9	6	7	75	12	6	●	●
12	1	6	7	75	12	6	●	●
12	1.2	6	7	75	12	6	●	●
12	1.4	6	7	75	12	6	●	●
12	1.5	6	7	75	12	6	●	●
12	1.6	6	7	75	12	6	●	●
12	1.8	6	7	75	12	6	●	●
12	2	6	7	75	12	6	●	●
12	2.5	6	7	75	12	6	●	●
12	3	6	7	75	12	6	●	●
12	3.5	6	7	75	12	6	●	●
12	4	6	7	75	12	6	●	●
12	4.5	6	7	75	12	6	●	●
12	5	6	7	75	12	6	●	●

Please refer to page P170 for parameters.

T217FX

Solid carbide T-slot Cutter

MG Carbide

Bright AlCrN

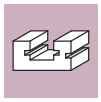
0°

Z

H 70°

90°

Type of Operation



For NO.T217

P	H	M	K	N	S
				●	

For NO.T217FX

P	H	M	K	N	S
●	●	●	●		●

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

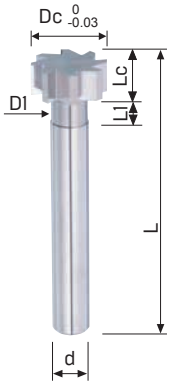
Suitable for mini groove machining applications, such as milling T-shaped or side grooves.

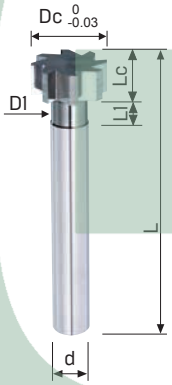
Designed with straight cutting flutes.

Bright uncoated is good for aluminium alloy, plastic, resin material, and etc.

AlCrN Nano multilayer coating enable to enhance wear resistance and make it effective for use on carbon steel, alloy steel, hardened steel, stainless steel, and difficult to cut materials...etc.

Specialized for uncoated aluminum alloy.





Code No. T217 -Dc×Lc
T217FX-Dc×Lc

Dc 0 -0.03	Lc 0 -0.03	D1 mm	L1 mm	L mm	d h6	Z tooth	Bright T217	AlCrN T217FX
16	3	7.5	7	70	8	8	●	●
16	4	7.5	7	70	8	8	●	●
16	5	7.5	7	70	8	8	●	●
16	6	7.5	7	70	8	8	●	●
18	3	9.5	7	75	10	8	●	●
18	4	9.5	7	75	10	8	●	●
18	5	9.5	7	75	10	8	●	●
18	6	9.5	7	75	10	8	●	●
20	3	9.5	7	75	10	8	●	●
20	4	9.5	7	75	10	8	●	●
20	5	9.5	7	75	10	8	●	●
20	6	9.5	7	75	10	8	●	●
20	8	9.5	7	75	10	8	●	●
22	3	11.5	7	80	12	8	●	●
22	4	11.5	7	80	12	8	●	●
22	5	11.5	7	80	12	8	●	●
22	6	11.5	7	80	12	8	●	●
22	8	11.5	7	80	12	8	●	●
25	3	11.5	7	80	12	10	●	●
25	4	11.5	7	80	12	10	●	●
25	5	11.5	7	80	12	10	●	●
25	6	11.5	7	80	12	10	●	●
25	8	11.5	7	80	12	10	●	●
25	10	11.5	7	80	12	10	●	●
30	3	11.5	7	80	12	10	●	●
30	4	11.5	7	80	12	10	●	●
30	5	11.5	7	80	12	10	●	●
30	6	11.5	7	80	12	10	●	●
30	8	11.5	7	80	12	10	●	●
30	10	11.5	7	80	12	10	●	●

Please refer to page P170 for parameters.

Solid carbide Staggered Tooth T-Slot Cutter

MG Carbide

Bright AlCrN

15°

Z

H 70°

90°

Type of Operation

For NO.T218

P	H	M	K	N	S
				●	

For NO.T218FX

P	H	M	K	N	S
●	●	●	●		●

- P Steel
- H <38HRC Hardened Steel
- H <48HRC Hardened Steel
- M Stainless Steel
- K Cast Iron
- N Aluminium
- N Copper
- S Titanium
- S Nickel
- S High Temp Alloys

Feature of product:

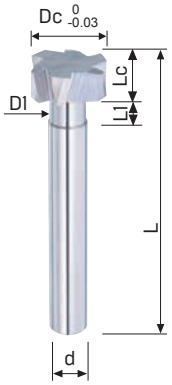
Suitable for mini groove machining applications, such as milling T-shaped or side grooves.

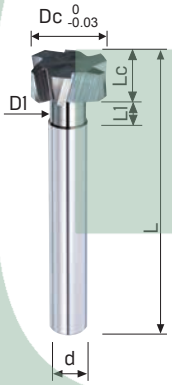
Effectively decrease the vibration and reduced machining resistance by the designs of left helix and right cutting edge.

Bright uncoated is good for aluminium alloy, plastic, resin material, and etc.

AlCrN Nano multilayer coating enable to enhance wear resistance and make it effective for use on carbon steel, alloy steel, hardened steel, stainless steel, and difficult to cut materials...etc.

Specialized for uncoated aluminum alloy.





Code No. T218 -Dc×Lc
T218FX-Dc×Lc

Dc 0 -0.03	Lc 0 -0.03	D1 mm	L1 mm	L mm	d h6	Z tooth	Bright T218	AlCrN T218FX
16	3	7.5	7	70	8	6	●	●
16	4	7.5	7	70	8	6	●	●
16	5	7.5	7	70	8	6	●	●
16	6	7.5	7	70	8	6	●	●
18	3	9.5	7	75	10	6	●	●
18	4	9.5	7	75	10	6	●	●
18	5	9.5	7	75	10	6	●	●
18	6	9.5	7	75	10	6	●	●
20	3	9.5	7	75	10	6	●	●
20	4	9.5	7	75	10	6	●	●
20	5	9.5	7	75	10	6	●	●
20	6	9.5	7	75	10	6	●	●
20	8	9.5	7	75	10	6	●	●
22	3	11.5	7	80	12	6	●	●
22	4	11.5	7	80	12	6	●	●
22	5	11.5	7	80	12	6	●	●
22	6	11.5	7	80	12	6	●	●
22	8	11.5	7	80	12	6	●	●
25	3	11.5	7	80	12	8	●	●
25	4	11.5	7	80	12	8	●	●
25	5	11.5	7	80	12	8	●	●
25	6	11.5	7	80	12	8	●	●
25	8	11.5	7	80	12	8	●	●
25	10	11.5	7	80	12	8	●	●
30	3	11.5	7	80	12	8	●	●
30	4	11.5	7	80	12	8	●	●
30	5	11.5	7	80	12	8	●	●
30	6	11.5	7	80	12	8	●	●
30	8	11.5	7	80	12	8	●	●
30	10	11.5	7	80	12	8	●	●

Please refer to page P170 for parameters.

T119FX

Super Mini Dovetail Cutter

MG Carbide

Bright AlCrN

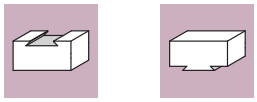
0°

Z

H

70°

Type of Operation



For NO.T119

P	H	M	K	N	S
				●	

For NO.T119FX

P	H	M	K	N	S
●	●	●	●		●

P	Steel
H	<38HRC Hardened Steel
H	<48HRC Hardened Steel
M	Stainless Steel
K	Cast Iron
N	Aluminium
N	Copper
S	Titanium
S	Nickel
S	High Temp Alloys

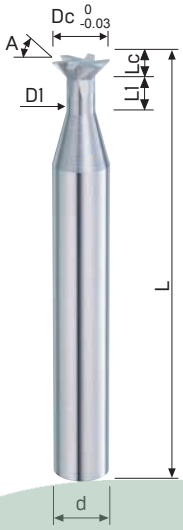
Feature of product:

Suitable for dovetail groove machining applications.

Bright uncoated is good for aluminium alloy, plastic, resin material, and etc.

AlCrN Nano multilayer coating enable to enhance wear resistance and make it effective for use on carbon steel, alloy steel, hardened steel, stainless steel, and difficult to cut materials...etc.

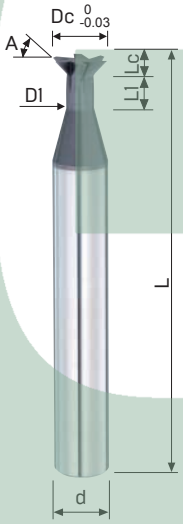
Specialized for uncoated aluminum alloy.



Code No. T119 -Dc×A
T119FX-Dc×A

Dc 0 -0.03	A ±0.5°	Lc mm	D1 mm	L1 mm	L mm	d h6	Z tooth	Bright T119	AlCrN T119FX
3	45	0.75	1.5	4	50	6	4	●	●
4	45	1	2	4	50	6	4	●	●
5	45	1.2	2.5	4	50	6	4	●	●
6	45	1.4	3	4	50	6	4	●	●
8	45	1.9	4	5	60	8	6	●	●
10	45	2.4	5	6	72	10	6	●	●
12	45	2.9	6	7	75	12	6	●	●

Please refer to page P171 for parameters.



Code No. T119 -Dc×A
T119FX-Dc×A

Dc 0 -0.03	A ±0.5°	Lc mm	D1 mm	L1 mm	L mm	d h6	Z tooth	Bright T119	AlCrN T119FX
3	60	1.29	1.5	4	50	6	4	●	●
4	60	1.73	2	4	50	6	4	●	●
5	60	2.2	2.3	4	50	6	4	●	●
6	60	2.7	2.7	4	50	6	4	●	●
8	60	3.7	3.6	5	60	8	6	●	●
10	60	4.6	4.5	6	72	10	6	●	●
12	60	5.6	5.4	7	75	12	6	●	●

Please refer to page P171 for parameters.

Super Mini Convex Cutter

MG Carbide

Bright AlCrN

0°

Z

H

70°

Type of Operation

For NO.T201

P	H	M	K	N	S
				●	

For NO.T201FX

P	H	M	K	N	S
●	●	●	●		●

- P Steel
- H <38HRC Hardened Steel
- H <48HRC Hardened Steel
- M Stainless Steel
- K Cast Iron
- N Aluminium
- N Copper
- S Titanium
- S Nickel
- S High Temp Alloys

Feature of product:

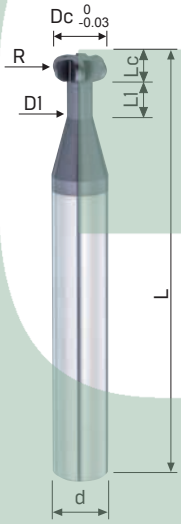
Suitable for dovetail groove machining applications.

Bright uncoated is good for aluminium alloy, plastic, resin material, and etc.

AlCrN Nano multilayer coating enable to enhance wear resistance and make it effective for use on carbon steel, alloy steel, hardened steel, stainless steel, and difficult to cut materials...etc.

Specialized for uncoated aluminum alloy.





Code No. T201 -Dc×R
T201FX-Dc×R

Dc 0 -0.03	R ±0.01	Lc 0 -0.03	D1 mm	L1 mm	L mm	d h6	Z tooth	Bright T201	AlCrN T201FX
4	0.25	0.5	2	3.5	50	4	4	●	●
4	0.3	0.6	2	3.5	50	4	4	●	●
4	0.5	1	2	3.5	50	4	4	●	●
4	0.75	1.5	2	3.5	50	4	4	●	●
4	1	2	2	3.5	50	4	4	●	●
6	0.25	0.5	2.7	4	50	6	4	●	●
6	0.3	0.6	2.7	4	50	6	4	●	●
6	0.5	1	2.7	4	50	6	4	●	●
6	0.75	1.5	2.7	4	50	6	4	●	●
6	1	2	2.7	4	50	6	4	●	●
8	0.25	0.5	3.6	5	60	8	6	●	●
8	0.3	0.6	3.6	5	60	8	6	●	●
8	0.5	1	3.6	5	60	8	6	●	●
8	0.75	1.5	3.6	5	60	8	6	●	●
8	1	2	3.6	5	60	8	6	●	●
10	0.25	0.5	4.5	6	72	10	6	●	●
10	0.3	0.6	4.5	6	72	10	6	●	●
10	0.5	1	4.5	6	72	10	6	●	●
10	1	2	4.5	6	72	10	6	●	●
10	1.5	3	4.5	6	72	10	6	●	●
10	2	4	4.5	6	72	10	6	●	●
12	0.25	0.5	5.5	6	75	12	6	●	●
12	0.3	0.6	5.5	6	75	12	6	●	●
12	0.5	1	5.5	6	75	12	6	●	●
12	1	2	5.5	6	75	12	6	●	●
12	1.5	3	5.5	6	75	12	6	●	●
12	2	4	5.5	6	75	12	6	●	●

Please refer to page P171 for parameters.

T203FX

Super Mini Conave Cutter

MG Carbide

Bright AlCrN

0°

Z

H

70°

Type of Operation

For NO.T203

P	H	M	K	N	S
				●	

For NO.T203FX

P	H	M	K	N	S
●	●	●	●		●

- P Steel
- H <38HRC Hardened Steel
- H <48HRC Hardened Steel
- M Stainless Steel
- K Cast Iron
- N Aluminium
- N Copper
- S Titanium
- S Nickel
- S High Temp Alloys

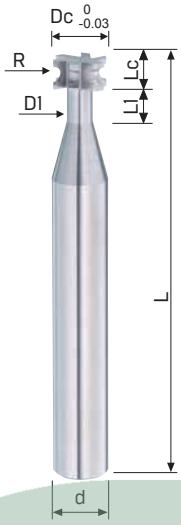
Feature of product:

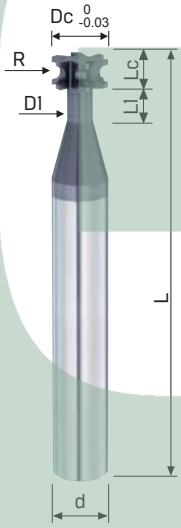
Application for corner radius profile cutting.

Bright uncoated is good for aluminium alloy, plastic, resin material, and etc.

AlCrN Nano multilayer coating enable to enhance wear resistance and make it effective for use on carbon steel, alloy steel, hardened steel, stainless steel, and difficult to cut materials...etc.

Specialized for uncoated aluminum alloy.



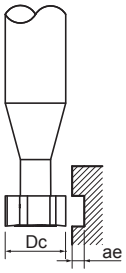
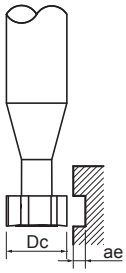
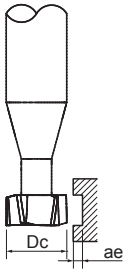
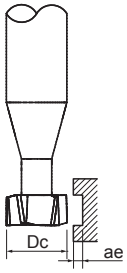


Code No. T203 -Dc×R
T203FX-Dc×R

Dc 0 -0.03	R ±0.01	Lc 0 -0.03	D1 mm	L1 mm	L mm	d h6	Z tooth	Bright T203	AlCrN T203FX
4	0.25	2.5	2	3.5	50	4	4	●	●
4	0.3	2.6	2	3.5	50	4	4	●	●
4	0.5	3	2	3.5	50	4	4	●	●
6	0.25	2.5	2.7	4	50	6	4	●	●
6	0.3	2.6	2.7	4	50	6	4	●	●
6	0.5	3	2.7	4	50	6	4	●	●
8	0.25	2.5	3.6	4	60	8	6	●	●
8	0.3	2.6	3.6	4	60	8	6	●	●
8	0.5	3	3.6	4	60	8	6	●	●
8	0.75	3.5	3.6	4	60	8	6	●	●
8	1	4	3.6	4	60	8	6	●	●
10	0.25	2.5	4.5	6	72	10	6	●	●
10	0.3	2.6	4.5	6	72	10	6	●	●
10	0.5	3	4.5	6	72	10	6	●	●
10	0.75	3.5	4.5	6	72	10	6	●	●
10	1	4	4.5	6	72	10	6	●	●
10	1.5	5	4.5	6	72	10	6	●	●
12	0.25	2.5	5.5	6	75	12	6	●	●
12	0.3	2.6	5.5	6	75	12	6	●	●
12	0.5	3	5.5	6	75	12	6	●	●
12	0.75	3.5	5.5	6	75	12	6	●	●
12	1	4	5.5	6	75	12	6	●	●
12	1.5	5	5.5	6	75	12	6	●	●
12	2	6	5.5	6	75	12	6	●	●

Please refer to page P172 for parameters.

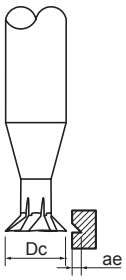
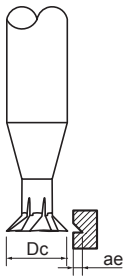
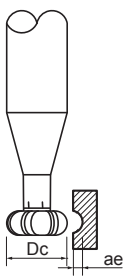
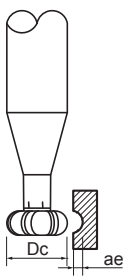
Recommended Milling Conditions

	T116FX / T117FX / T217FX		T116 / T117		T118FX / T218FX		T118	
T116FX T116 T117FX T117 T217FX T118FX T118 T218FX	 ae=0.1xDc		 ae=0.1xDc		 ae=0.1xDc		 ae=0.1xDc	
	cutting speed Vc (m/min)	feed Fn(mm/rev)	cutting speed Vc (m/min)	feed Fn(mm/rev)	cutting speed Vc (m/min)	feed Fn(mm/rev)	Cutting speed Vc (ft/min)	feed Fn(mm/rev)
Carbon Steel Materials								
P GR1 Carbon Steel	40	0.003×Dc			40	0.003×Dc		
P GR2 <24HRC Low-alloyed Steel	35	0.002×Dc			35	0.002×Dc		
P GR3 <30HRC Hi-alloyed Steel	25	0.0015×Dc			25	0.0015×Dc		
Hardened Steel Materials								
H GR4 30~38HRC Hardened Steel	15	0.0015×Dc			15	0.0015×Dc		
H GR5 38~48HRC Hardened Steel	15	0.001×Dc			15	0.001×Dc		
H GR6 48~56HRC Hardened Steel								
Stainless Steel Materials								
M GR8-1 Ferritic、Martensitic	20	0.0015×Dc			20	0.0015×Dc		
M GR8-2 Austenitic	20	0.0015×Dc			20	0.0015×Dc		
M GR8-3 Austenitic-ferritic	15	0.001×Dc			15	0.001×Dc		
M GR8-4 Austenitic-ferritic Heat-resistant	15	0.001×Dc			15	0.001×Dc		
Cast Iron Materials								
K GR9-1 Grey cast iron	40	0.002×Dc			40	0.002×Dc		
K GR9-2 Nodular cast iron	40	0.002×Dc			40	0.002×Dc		
Aluminium Steel Materials								
N GR10-1 Wrought Aluminium alloys			60	0.002×Dc			60	0.002×Dc
N GR10-2 Aluminium cast alloys <10%			50	0.002×Dc			50	0.002×Dc
N GR10-3 Aluminium cast alloys >10%			40	0.002×Dc			40	0.002×Dc
Copper Steel Materials								
N GR11-1 Pure Copper			40	0.002×Dc			40	0.002×Dc
N GR11-2 Brass			30	0.002×Dc			30	0.002×Dc
N GR11-2 Bronze			20	0.002×Dc			20	0.002×Dc
Plastics Steel Materials								
N GR12 Plastics								
FRP CFRP Steel Materials								
N GR13 FRP CFRP								
Titanium Materials								
S GR15 Titanium								
Nickel Materials								
S GR16-1 Nickel								
S GR16-2 cobalt-base alloys								
S GR16-3 Iron-based alloy								
Heat-resistant Steel Materials								
S GR17 Heat-resistant Steel								

※All cutting data are for reference only. Please adjust according to actual machining conditions.

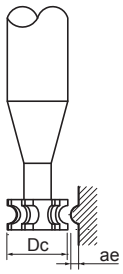
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

T119FX
T119
T201FX
T201

		T119FX		T119		T201FX		T201	
		 ae=0.1xDc		 ae=0.1xDc		 ae=0.1xDc		 ae=0.1xDc	
		cutting speed Vc (m/min)	feed Fn(mm/rev)	cutting speed Vc (m/min)	feed Fn(mm/rev)	cutting speed Vc (m/min)	feed Fn(mm/rev)	Cutting speed Vc (ft/min)	feed Fn(mm/re v)
P	Carbon Steel Materials								
	GR1 Carbon Steel	40	0.003×Dc			40	0.003×Dc		
	GR2 <24HRC Low-alloyed Steel	35	0.002×Dc			35	0.002×Dc		
	GR3 <30HRC Hi-alloyed Steel	25	0.0015×Dc			25	0.0015×Dc		
H	Hardened Steel Materials								
	GR4 30~38HRC Hardened Steel	15	0.0015×Dc			15	0.0015×Dc		
	GR5 38~48HRC Hardened Steel	15	0.001×Dc			15	0.001×Dc		
	GR6 48~56HRC Hardened Steel								
M	Stainless Steel Materials								
	GR8-1 Ferritic、Martensitic	20	0.0015×Dc			20	0.0015×Dc		
	GR8-2 Austenitic	20	0.0015×Dc			20	0.0015×Dc		
	GR8-3 Austenitic-ferritic	15	0.001×Dc			15	0.001×Dc		
	GR8-4 Austenitic-ferritic Heat-resistant	15	0.001×Dc			15	0.001×Dc		
K	Cast Iron Materials								
	GR9-1 Grey cast iron	40	0.002×Dc			40	0.002×Dc		
	GR9-2 Nodular cast iron	40	0.002×Dc			40	0.002×Dc		
N	Aluminium Steel Materials								
	GR10-1 Wrought Aluminium alloys			60	0.002×Dc			60	0.002×Dc
	GR10-2 Aluminium cast alloys <10%			50	0.002×Dc			50	0.002×Dc
	GR10-3 Aluminium cast alloys >10%			40	0.002×Dc			40	0.002×Dc
	Copper Steel Materials								
	GR11-1 Pure Copper			40	0.002×Dc			40	0.002×Dc
	GR11-2 Brass			30	0.002×Dc			30	0.002×Dc
	GR11-3 Bronze			20	0.002×Dc			20	0.002×Dc
	Plastics Steel Materials								
	GR12 Plastics								
	FRP CFRP Steel Materials								
	GR13 FRP CFRP								
S	Titanium Materials								
	GR15 Titanium								
	Nickel Materials								
	GR16-1 Nickel								
	GR16-2 cobalt-base alloys								
	GR16-3 Iron-based alloy								
	Heat-resistant Steel Materials								
	GR17 Heat-resistant Steel								

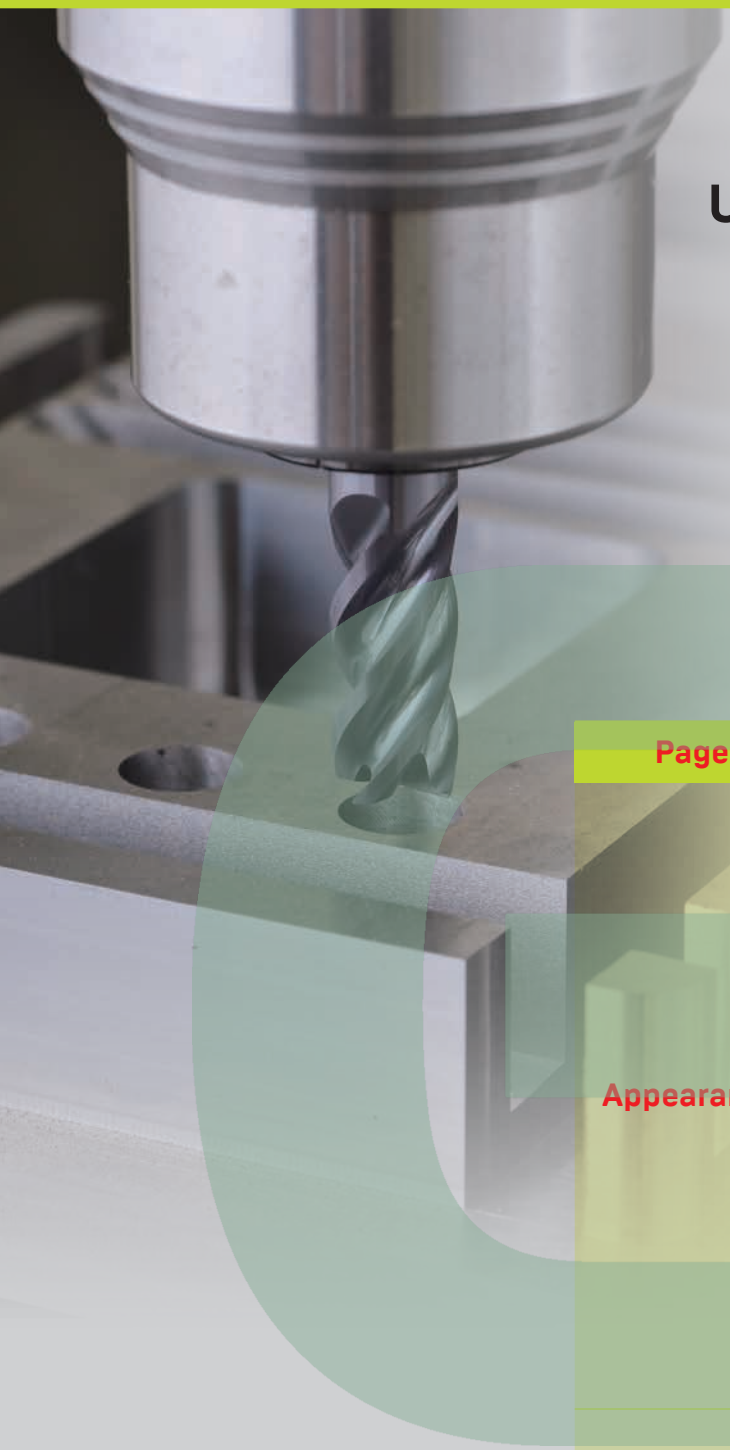
※All cutting data are for reference only. Please adjust according to actual machining conditions.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

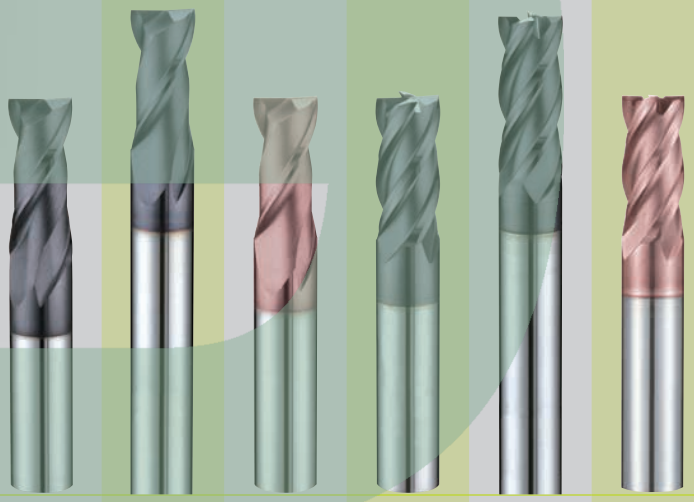
T203FX T203		T203FX  ae=0.1xDc		T203  ae=0.1xDc	
		cutting speed Vc (m/min)	feed Fn(mm/rev)	Cutting speed Vc (ft/min)	feed Fn(mm/rev)
P	Carbon Steel Materials				
	GR1 Carbon Steel	40	0.003×Dc		
	GR2 <24HRC Low-alloyed Steel	35	0.002×Dc		
	GR3 <30HRC Hi-alloyed Steel	25	0.0015×Dc		
H	Hardened Steel Materials				
	GR4 30~38HRC Hardened Steel	15	0.0015×Dc		
	GR5 38~48HRC Hardened Steel	15	0.001×Dc		
	GR6 48~56HRC Hardened Steel				
M	Stainless Steel Materials				
	GR8-1 Ferritic、Martensitic	20	0.0015×Dc		
	GR8-2 Austenitic	20	0.0015×Dc		
	GR8-3 Austenitic-ferritic	15	0.001×Dc		
	GR8-4 Austenitic-ferritic Heat-resistant	15	0.001×Dc		
K	Cast Iron Materials				
	GR9-1 Grey cast iron	40	0.002×Dc		
	GR9-2 Nodular cast iron	40	0.002×Dc		
N	Aluminium Steel Materials				
	GR10-1 Wrought Aluminium alloys			60	0.002×Dc
	GR10-2 Aluminium cast alloys <10%			50	0.002×Dc
	GR10-3 Aluminium cast alloys >10%			40	0.002×Dc
	Copper Steel Materials				
	GR11-1 Pure Copper			40	0.002×Dc
	GR11-2 Brass			30	0.002×Dc
	GR11-3 Bronze			20	0.002×Dc
	Plastics Steel Materials				
	GR12 Plastics				
	FRP CFRP Steel Materials				
	GR13 FRP CFRP				
S	Titanium Materials				
	GR15 Titanium				
	Nickel Materials				
	GR16-1 Nickel				
	GR16-2 cobalt-base alloys				
	GR16-3 Iron-based alloy				
	Heat-resistant Steel Materials				
	GR17 Heat-resistant Steel				

※All cutting data are for reference only. Please adjust according to actual machining conditions.

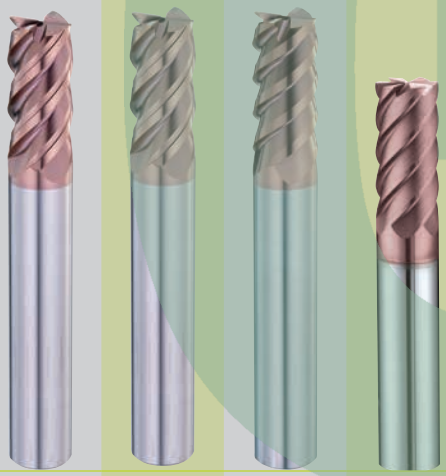
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.



Universal Finishing End Mills

Page	175	177	179	181	183	185
Appearance						
Code No	E122X	E125X E127X	E162TX E163TX	E124X	E126X E128X	E164TX E165TX
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	UMG Carbide
Coating	AlTiN X-NaNo	AlTiN X-NaNo	AlTiSiN TX	AlTiN X-NaNo	AlTiN X-NaNo	AlTiSiN TX
Helix Angle	35°	35°	35°	35°	35°	35°
No.of Flutes	2	2	2	4	4	4

187 189 191 193



E158TX E159TX	E158ATX	E168TX E169TX	E166TX E167TX
SMG Carbide	SMG Carbide	SMG Carbide	SMG Carbide
AlTiSiN TX	AlTiSiN TX	AlTiSiN TX	AlTiSiN TX
45°	45°	55°	45°
4	4	4	6

E122X

Universal End Mills

MG Carbide

AlTiN X-NaNo

35°

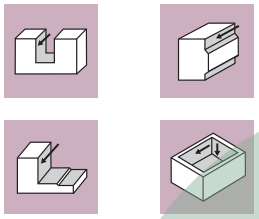
2

N

γ10°

90°

Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	●	○	

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Copper

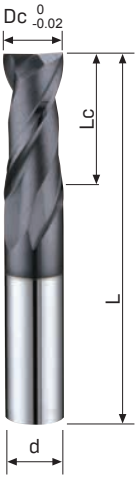
Feature of product:

Universal End Mills- 2 Flutes

Excellent surface cutting effect on work piece.

Nano multilayer coating enable to enhance wear resistance.

Suitable for general cutting process and enable to use for drill milling.



Code No. E122X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E122X
0.1	0.3	50	4	●
0.2	0.5	50	4	●
0.3	0.8	50	4	●
0.4	1	50	4	●
0.5	1.2	50	4	●
0.6	1.5	50	4	●
0.7	1.8	50	4	●
0.8	2	50	4	●
0.9	2.5	50	4	●
1	3	50	4	●
1.1	3	50	4	●
1.2	4	50	4	●
1.3	4	50	4	●
1.4	4	50	4	●
1.5	5	50	4	●
1.6	5	50	4	●
1.7	5	50	4	●
1.8	5	50	4	●
1.9	5	50	4	●
2	6	50	4	●
2.1	6	50	4	●
2.2	6	50	4	●
2.3	6	50	4	●
2.4	8	50	4	●
2.5	8	50	4	●
2.6	8	50	4	●
2.7	8	50	4	●
2.8	8	50	4	●
2.9	8	50	4	●
3A	8	50	4	●
4A	11	50	4	●
3	8	50	6	●
3.1	10	50	6	●
3.2	10	50	6	●
3.3	10	50	6	●
3.4	10	50	6	●
3.5	10	50	6	●
3.6	10	50	6	●
3.7	10	50	6	●
3.8	11	50	6	●
3.9	11	50	6	●
4	11	50	6	●
4.1	11	50	6	●
4.2	11	50	6	●
4.3	11	50	6	●
4.4	11	50	6	●
4.5	11	50	6	●
4.6	11	50	6	●
4.7	11	50	6	●
4.8	13	50	6	●
4.9	13	50	6	●
5	13	50	6	●
5.1	13	50	6	●
5.2	13	50	6	●
5.3	13	50	6	●
5.4	13	50	6	●
5.5	13	50	6	●
5.6	16	50	6	●
5.7	16	50	6	●
5.8	16	50	6	●
5.9	16	50	6	●
6	16	50	6	●
6.1	16	60	8	●
6.2	16	60	8	●
6.3	16	60	8	●
6.4	16	60	8	●
6.5	16	60	8	●
6.6	20	60	8	●
6.7	20	60	8	●
6.8	20	60	8	●
6.9	20	60	8	●
7	20	60	8	●
7.1	20	60	8	●
7.2	20	60	8	●
7.3	20	60	8	●
7.4	20	60	8	●
7.5	20	60	8	●
7.6	20	60	8	●
7.7	20	60	8	●
7.8	20	60	8	●
7.9	20	60	8	●
8	20	60	8	●
8.1	20	72	10	●
8.2	20	72	10	●
8.3	20	72	10	●
8.4	20	72	10	●
8.5	20	72	10	●
8.6	22	72	10	●
8.7	22	72	10	●
8.8	22	72	10	●
8.9	22	72	10	●
9	22	72	10	●
9.1	22	72	10	●
9.2	22	72	10	●
9.3	22	72	10	●
9.4	22	72	10	●
9.5	22	72	10	●
9.6	22	72	10	●
9.7	22	72	10	●
9.8	22	72	10	●
9.9	22	72	10	●
10	22	72	10	●
10.1	22	75	12	●
10.2	22	75	12	●
10.3	22	75	12	●
10.4	22	75	12	●
10.5	22	75	12	●
10.6	26	75	12	●
10.7	26	75	12	●
10.8	26	75	12	●
10.9	26	75	12	●
11	26	75	12	●
11.1	26	75	12	●
11.2	26	75	12	●
11.3	26	75	12	●
11.4	26	75	12	●
11.5	26	75	12	●
11.6	26	75	12	●
11.7	26	75	12	●
11.8	26	75	12	●
11.9	26	75	12	●
12	26	75	12	●
12.1	26	80	12	●
12.2	26	80	12	●
12.3	26	80	12	●
12.4	26	80	12	●
12.5	26	80	12	●
12.6	26	80	12	●
12.7	26	80	12	●
12.8	26	80	12	●
12.9	26	80	12	●
13	26	80	12	●
13.1	26	80	12	●
13.2	26	80	12	●
13.3	26	80	12	●
13.4	26	80	12	●
13.5	26	80	12	●
13.6	26	80	12	●
13.7	26	80	12	●
13.8	26	80	12	●
13.9	26	80	12	●
14	32	90	16	●
14.1	32	90	16	●
14.2	32	90	16	●
14.3	32	90	16	●
14.4	32	90	16	●
14.5	32	90	16	●
14.6	32	90	16	●
14.7	32	90	16	●
14.8	32	90	16	●
14.9	32	90	16	●
15	32	90	16	●
15.1	38	100	16	●
15.2	38	100	16	●
15.3	38	100	16	●
15.4	38	100	16	●
15.5	38	100	16	●
15.6	38	100	16	●
15.7	38	100	16	●
15.8	38	100	16	●
15.9	38	100	16	●
16	38	100	16	●
16.1	38	100	20	●
16.2	38	100	20	●
16.3	38	100	20	●
16.4	38	100	20	●
16.5	38	100	20	●
16.6	38	100	20	●
16.7	38	100	20	●
16.8	38	100	20	●
16.9	38	100	20	●
17	38	100	20	●
17.1	38	100	20	●
17.2	38	100	20	●
17.3	38	100	20	●
17.4	38	100	20	●
17.5	38	100	20	●
17.6	38	100	20	●
17.7	38	100	20	●
17.8	38	100	20	●
17.9	38	100	20	●
18	38	100	20	●
18.1	38	100	20	●
18.2	38	100	20	●
18.3	38	100	20	●
18.4	38	100	20	●
18.5	38	100	20	●
18.6	38	100	20	●
18.7	38	100	20	●
18.8	38	100	20	●
18.9	38	100	20	●
19	38	100	20	●
19.1	38	100	20	●
19.2	38	100	20	●
19.3	38	100	20	●
19.4	38	100	20	●
19.5	38	100	20	●
19.6	38	100	20	●
19.7	38	100	20	●
19.8	38	100	20	●
19.9	38	100	20	●
20	38	100	20	●
1/8 3.175	8	50	6	●
3/16 4.760	12	50	6	●
1/4 6.350	18	60	8	●
5/16 7.940	20	60	8	●
3/8 9.525	22	72	10	●
1/2 12.700	26	75	12	●
5/8 15.880	38	100	16	●
3/4 19.050	38	100	20	●

Slotting

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.11 Copper	
Vc m/min		Ø0.1~0.7 20~50 Ø0.8~3.0 55~65 Ø3.1~20 65~80		Ø0.1~0.7 20~50 Ø0.8~3.0 55~65 Ø3.1~20 65~80		Ø0.1~0.7 20~50 Ø0.8~3.0 55~65 Ø3.1~20 65~80		Ø0.1~0.7 20~40 Ø0.8~3.0 40~50 Ø3.1~20 55~60		Ø0.1~0.7 20~35 Ø0.8~3.0 35~45 Ø3.1~20 45~50		Ø0.1~0.7 20~40 Ø0.8~3.0 40~50 Ø3.1~20 55~60		Ø0.1~0.7 20~50 Ø0.8~3.0 55~65 Ø3.1~20 80~100		Ø0.1~0.7 30~95 Ø0.8~20 125~150	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E122X-0.1	0.1	35,000	60	35,000	60	35,000	60	35,000	50	35,000	20	35,000	50	35,000	60	50,000	100
E122X-0.2	0.2	32,000	85	32,000	85	32,000	80	32,000	75	32,000	30	32,000	75	32,000	85	50,000	140
E122X-0.3	0.3	32,000	100	32,000	100	32,000	90	32,000	80	32,000	55	32,000	80	32,000	100	50,000	170
E122X-0.4	0.4	32,000	110	32,000	110	32,000	100	32,000	90	27,500	60	32,000	90	32,000	110	50,000	190
E122X-0.5	0.5	31,000	115	31,000	115	31,000	150	25,000	90	22,000	60	25,000	90	31,000	115	50,000	200
E122X-0.6	0.6	27,000	118	27,000	118	27,000	105	19,500	90	17,000	60	19,500	90	27,000	118	50,000	230
E122X-0.8	0.8	21,500	120	21,500	120	21,500	108	15,500	90	13,500	60	15,500	90	21,500	120	50,000	290
E122X-1	1	17,500	120	17,500	120	17,500	108	12,500	90	11,000	60	12,500	90	17,500	120	47,500	300
E122X-1.2	1.2	15,000	118	15,000	118	15,000	106	10,500	90	9,300	60	10,500	90	15,000	118	40,500	300
E122X-1.5	1.5	12,500	122	12,500	122	12,500	110	8,900	90	7,900	60	8,900	90	12,500	122	32,000	300
E122X-1.8	1.8	10,500	125	10,500	125	10,500	115	7,500	90	6,800	60	7,500	90	10,500	125	28,000	300
E122X-2	2	9,700	130	9,700	130	9,700	117	7,000	90	6,300	70	7,000	90	9,700	130	24,000	300
E122X-2.5	2.5	8,200	155	8,200	155	8,200	140	6,100	90	5,300	70	6,100	90	8,200	155	20,000	350
E122X-3	3	6,900	170	6,900	170	6,900	153	5,300	100	4,400	70	5,300	100	8,493	200	16,000	400
E122X-3.5	3.5	6,000	190	6,000	190	6,000	190	4,700	100	3,860	70	4,700	100	7,280	210	13,650	415
E122X-4	4	5,400	210	5,400	210	5,400	190	4,200	120	3,500	90	4,200	120	6,370	215	12,000	430
E122X-4.5	4.5	4,850	240	4,850	240	4,850	240	3,800	120	3,200	90	3,800	120	5,660	220	10,600	465
E122X-5	5	4,500	265	4,500	265	4,500	240	3,500	130	3,000	95	3,500	130	5,096	225	9,500	500
E122X-5.5	5.5	4,200	268	4,200	268	4,200	268	3,200	130	2,720	95	3,200	130	4,630	225	8,700	510
E122X-6	6	4,000	270	4,000	270	4,000	243	2,900	130	2,500	100	2,900	130	4,247	230	7,900	520
E122X-7	7	3,500	265	3,500	265	3,500	265	2,550	120	2,200	100	2,550	120	3,640	235	6,900	520
E122X-8	8	3,000	265	3,000	265	3,000	265	2,200	120	1,900	100	2,200	120	3,185	235	5,900	520
E122X-9	9	2,700	260	2,700	260	2,700	260	1,950	120	1,650	95	1,950	120	2,830	215	5,300	500
E122X-10	10	2,400	255	2,400	255	2,400	255	1,700	120	1,400	95	1,700	120	2,548	215	4,700	500
E122X-11	11	2,200	250	2,200	250	2,200	250	1,550	120	1,300	95	1,550	120	2,310	215	4,350	500
E122X-12	12	2,000	246	2,000	246	2,000	246	1,400	120	1,200	95	1,400	120	2,123	215	4,000	500
E122X-13	13	1,850	240	1,850	240	1,850	240	1,300	90	1,100	80	1,300	90	1,960	210	3,750	400
E122X-14	14	1,700	240	1,700	240	1,700	240	1,200	90	1,000	80	1,200	90	1,820	210	3,500	400
E122X-15	15	1,600	220	1,600	220	1,600	220	1,050	90	900	80	1,050	90	1,700	210	3,250	400
E122X-16	16	1,500	200	1,500	200	1,500	200	1,100	90	800	80	1,100	90	1,593	210	3,000	400
E122X-17	17	1,400	190	1,400	190	1,400	190	1,000	90	750	70	1,000	90	1,500	205	2,850	350
E122X-18	18	1,300	180	1,300	180	1,300	180	900	90	700	70	900	90	1,416	205	2,700	350
E122X-19	19	1,100	165	1,100	165	1,100	165	850	90	650	60	850	90	1,340	205	2,550	300
E122X-20	20	1,200	155	1,200	155	1,200	155	800	90	600	60	800	90	1,274	205	2,400	300
(mm) 		ap:<1 0.1D <3 0.3D ≥3 0.5D		ap:<1 0.1D <3 0.3D ≥3 0.5D		ap:<1 0.1D <3 0.3D ≥3 0.5D		ap:<1 0.1D <3 0.3D ≥3 0.5D		ap:<1 0.01D <3 0.02D ≥3 0.05D		ap:<1 0.1D <3 0.3D ≥3 0.5D		ap:<1 0.1D <3 0.3D ≥3 0.5D		ap:<1 0.1D <3 0.3D ≥3 0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E125X / E127X

Universal End Mills

MG Carbide

AlTiN X-NaNo

35°

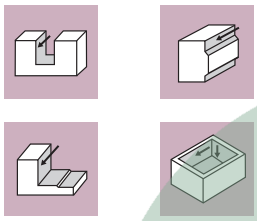
2

N

γ10°

90°

Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	●	○	

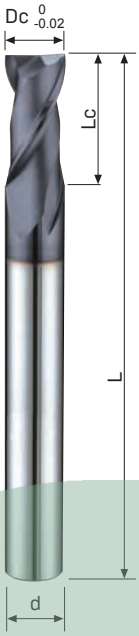
- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Copper

Feature of product:

Universal End Mills with Long Length- 2 Flutes

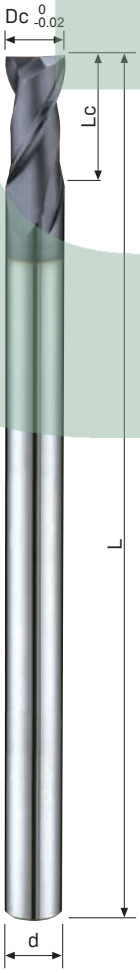
Nano multilayer coating enable to enhance wear resistance.

Suitable for general cutting process, extended length enable to work on deeper work piece with excellent cutting surface.



Code No. E125X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E125X
3	12	70	6	●
4	15	70	6	●
5	20	80	6	●
6	20	80	6	●
7	25	100	8	●
8	25	100	8	●
9	30	100	10	●
10	30	100	10	●
12	40	110	12	●
16	50	140	16	●
20	60	160	20	●



Code No. E127X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E127X
3	12	80	4	●
4	15	80	4	●
5	20	100	6	●
6	20	100	6	●
8	25	130	8	●
10	30	160	10	●
12	40	180	12	●
16	50	210	16	●
20	60	210	20	●

Slotting

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.9 Cast Iron	
Vc m/min		60		60		50		40		30		80	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E125X/E127X-3	3	6,050	140	6,050	140	5,200	120	4,200	80	3,000	65	6,800	140
E125X/E127X-4	4	4,860	149	4,860	149	3,800	120	3,200	90	2,160	65	4,860	149
E125X/E127X-5	5	4,050	162	4,050	162	3,050	120	2,600	90	1,800	75	4,050	162
E125X/E127X-6	6	3,250	162	3,250	162	2,600	120	2,100	90	1,440	75	3,250	162
E125X-7	7	2,850	162	2,850	162	2,275	130	1,850	100	1,260	75	2,850	162
E125X/E127X-8	8	2,450	162	2,450	162	1,950	140	1,600	100	1,080	75	2,450	162
E125X-9	9	2,200	162	2,200	162	1,750	140	1,450	110	970	75	2,200	162
E125X/E127X-10	10	1,950	162	1,950	162	1,550	140	1,300	110	870	75	1,950	162
E125X-11	11	1,780	162	1,780	162	1,420	140	1,200	110	790	75	1,780	162
E125X/E127X-12	12	1,620	162	1,620	162	1,300	140	1,080	110	720	75	1,620	162
E125X-14	14	1,650	180	1,650	180	1,200	150	1,000	118	720	80	1,650	180
E125X/E127X-16	16	1,400	198	1,400	198	1,900	160	900	125	630	90	1,400	198
E125X/E127X-20	20	1,080	198	1,080	198	870	160	720	125	480	90	1,080	198
(mm) 		ap:0.3D		ap:0.3D		ap:0.3D		ap:0.2D		ap:0.2D		ap:0.3D	

※Notice: E127X is Long Length series End Mills. Please adjust the parameter according.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E162TX / E163TX

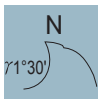
Universal End Mills

UMG Carbide

AlTiSiN TX

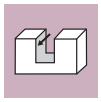


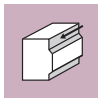


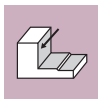


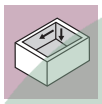


Type of Operation









Work Material

P	H	M	K	N	S
●	●				

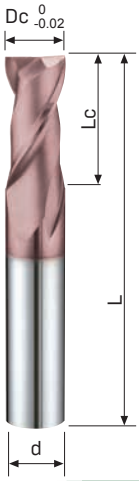
P	Steel
H	<38HRC Hardened Steel
H	<48HRC Hardened Steel
H	<56HRC Hardened Steel

Feature of product:

Universal End Mills- 2 Flutes

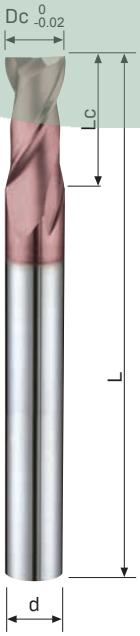
Using UMG carbide material and coated with high wear resistance TX coating enable to enhance tool life.

Suitable for high hardness material finishing, general cutting process and enable to use for drill milling.



Code No. E162TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiSiN E162TX
0.1	0.3	50	4	●
0.2	0.5	50	4	●
0.3	0.8	50	4	●
0.4	1	50	4	●
0.5	1.2	50	4	●
0.6	1.5	50	4	●
0.8	2	50	4	●
1	3	50	4	●
1.5	5	50	4	●
2	6	50	4	●
2.5	8	50	4	●
3A	8	50	4	●
4A	11	50	4	●
3	8	50	6	●
3.5	10	50	6	●
4	11	50	6	●
4.5	11	50	6	●
5	13	50	6	●
5.5	13	50	6	●
6	16	50	6	●
7	20	60	8	●
8	20	60	8	●
9	22	72	10	●
10	22	72	10	●
11	26	75	12	●
12	26	75	12	●
14	32	90	16	●
16	38	100	16	●
18	38	100	20	●
20	38	100	20	●



Code No. E163TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiSiN E163TX
3	12	70	6	●
4	15	70	6	●
5	20	80	6	●
6	20	80	6	●
7	25	100	8	●
8	25	100	8	●
9	30	100	10	●
10	30	100	10	●
12	40	110	12	●
16	50	140	16	●
20	60	160	20	●

Slotting

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)	
Vc m/min		Ø0.1~0.7 28~57 Ø0.8~3.0 60~100 Ø3.1~20 109~120		Ø0.1~0.7 28~57 Ø0.8~3.0 60~100 Ø3.1~20 109~120		Ø0.1~0.7 20~50 Ø0.8~3.0 55~65 Ø3.1~20 65~80		Ø0.1~0.7 28~45 Ø0.8~3.0 48~80 Ø3.1~20 88~110		Ø0.1~0.7 28~34 Ø0.8~3.0 35~59 Ø3.1~20 65~70		Ø0.1~20 21~45	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E162TX-0.1	0.1	30,000	100	30,000	100	30,000	100	30,000	100	30,000	50	30,000	25
E162TX-0.2	0.2	30,000	100	30,000	100	30,000	100	30,000	100	30,000	50	30,000	25
E162TX-0.3	0.3	30,000	110	30,000	110	30,000	110	30,000	110	30,000	55	22,000	25
E162TX-0.4	0.4	30,000	120	30,000	120	30,000	120	30,000	120	27,000	60	17,000	25
E162TX-0.5	0.5	30,000	120	30,000	120	29,000	120	29,000	120	21,500	60	13,000	25
E162TX-0.6	0.6	30,000	120	30,000	120	24,000	120	24,000	120	18,000	60	11,000	25
E162TX-0.8	0.8	24,000	120	24,000	120	19,000	120	19,000	120	13,800	60	8,800	30
E162TX-1	1	28,500	500	28,500	500	28,500	500	25,000	380	19,000	250	12,500	110
E162TX-1.5	1.5	22,000	505	22,000	505	22,000	505	19,250	390	14,500	255	9,650	115
E162TX-2	2	15,500	510	15,500	510	15,500	510	13,500	400	10,000	260	6,800	120
E162TX-2.5	2.5	13,000	530	13,000	530	13,000	530	11,000	405	8,150	270	5,800	130
E162TX/E163TX-3	3	10,500	550	10,500	550	10,500	550	8,500	410	6,300	280	4,800	140
E162TX-3.5	3.5	9,600	555	9,600	555	9,600	555	7,750	405	5,750	275	4,300	135
E162TX/E163TX-4	4	8,700	560	8,700	560	8,700	560	7,000	400	5,200	270	3,800	135
E162TX-4.5	4.5	7,700	550	7,700	550	7,700	550	6,500	450	4,800	260	3,500	130
E162TX/E163TX-5	5	7,500	545	7,500	545	7,500	545	6,150	475	4,450	250	3,225	125
E162TX-5.5	5.5	6,800	540	6,800	540	6,800	540	5,800	500	4,000	240	3,000	120
E162TX/E163TX-6	6	6,300	530	6,300	530	6,300	530	5,300	550	3,700	235	2,650	120
E162TX/E163TX-7	7	5,550	530	5,550	530	5,550	530	4,650	460	3,250	240	2,300	135
E162TX/E163TX-8	8	4,800	530	4,800	530	4,800	530	4,000	370	2,800	250	2,000	130
E162TX/E163TX-9	9	4,300	540	4,300	540	4,300	540	3,600	375	2,550	250	1,800	140
E162TX/E163TX-10	10	3,800	550	3,800	550	3,800	550	3,200	380	2,300	250	1,600	150
E162TX/E163TX-11	11	3,500	540	3,500	540	3,500	540	2,900	380	2,120	255	1,500	150
E162TX/E163TX-12	12	3,200	530	3,200	530	3,200	530	2,600	380	1,950	260	1,400	155
E162TX/E163TX-14	14	2,750	510	2,750	510	2,750	510	2,500	360	1,600	250	1,000	135
E162TX/E163TX-16	16	2,400	500	2,400	500	2,400	500	2,200	350	1,400	240	900	120
E162TX-18	18	2,200	480	2,200	480	2,200	480	1,950	320	1,200	220	800	110
E162TX/E163TX-20	20	1,900	460	1,900	460	1,900	460	1,750	300	1,100	200	720	110
(mm) 		ap:<3 0.1D ≥3 0.2D		ap:<3 0.1D ≥3 0.2D		ap:<3 0.1D ≥3 0.2D		ap:<3 0.1D ≥3 0.2D		ap:<3 0.05D ≥3 0.1D		ap:<3 0.05D ≥3 0.1D	

※Notice: E163X is Long Length series End Mills. Please adjust the parameter according.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E124X

Finishing End Mills

MG Carbide

AlTiN X-NaNo

35°

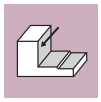
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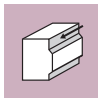
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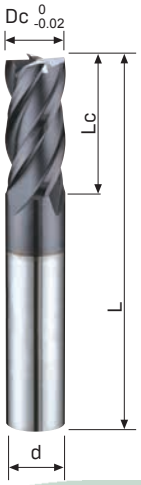
γ10°

90°

Type of Operation







Work Material

P	H	M	K	N	S
●	●	○	●	○	

P Steel

H <38HRC Hardened Steel

H <48HRC Hardened Steel

M Stainless Steel

K Cast Iron

N Copper

Feature of product:

Finishing End Mills- 4 Flutes

Nano multilayer coating enable to enhance wear resistance.

Suitable for general and finishing process with excellent cutting surface on work piece.

Code No. E124X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E124X
1	3	50	4	●
1.2	4	50	4	●
1.4	4	50	4	●
1.5	5	50	4	●
1.6	5	50	4	●
1.8	5	50	4	●
2	6	50	4	●
2.2	6	50	4	●
2.4	8	50	4	●
2.5	8	50	4	●
2.6	8	50	4	●
2.8	8	50	4	●
3A	8	50	4	●
4A	11	50	4	●
3	8	50	6	●
3.5	10	50	6	●
4	11	50	6	●
4.5	11	50	6	●
5	13	50	6	●
5.5	13	50	6	●
6	16	50	6	●
6.5	16	60	8	●
7	20	60	8	●
7.5	20	60	8	●
8	20	60	8	●
8.5	20	72	10	●
9	22	72	10	●
9.5	22	72	10	●
10	22	72	10	●
10.5	22	75	12	●
11	26	75	12	●
12	26	75	12	●
13	26	80	12	●
14	32	90	16	●
15	32	90	16	●
16	38	100	16	●
17	38	100	20	●
18	38	100	20	●
19	38	100	20	●
20	38	100	20	●

Code No. E124X-Dc

Dc 0 -0.02		Lc mm	L mm	d h6	AlTiN E124X
1/8	3.175	8	50	6	●
3/16	4.760	12	50	6	●
1/4	6.350	18	60	8	●
5/16	7.940	20	60	8	●
3/8	9.525	22	72	10	●
1/2	12.700	26	75	12	●
5/8	15.880	38	100	16	●
3/4	19.050	38	100	20	●

Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.11 Copper	
Vc m/min		85		85		75		60		50		60		85		150	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E124X-1	1	20,000	240	20,000	240	15,000	210	11,000	85	7,100	40	11,000	85	20,000	240	47,600	420
E124X-1.5	1.5	13,500	250	13,500	250	12,500	215	8,000	90	6,900	80	8,000	90	13,500	250	31,800	620
E124X-2	2	13,000	300	13,000	300	11,000	280	7,000	110	6,350	100	7,000	110	13,000	300	24,000	590
E124X-2.5	2.5	11,000	370	11,000	370	9,500	245	6,300	110	5,500	105	6,300	110	11,000	370	19,200	960
E124X-3	3	9,000	480	9,000	480	7,400	350	5,300	120	4,800	110	5,300	120	9,000	480	15,800	860
E124X-3.5	3.5	7,800	490	7,800	490	6,500	350	4,800	130	4,300	110	4,800	130	7,800	490	13,600	860
E124X-4	4	6,650	500	6,650	500	5,500	350	4,250	135	3,700	115	4,250	135	6,650	500	12,000	900
E124X-4.5	4.5	6,000	550	6,000	550	5,000	385	3,870	130	3,450	120	3,870	130	5,950	550	10,700	970
E124X-5	5	5,300	600	5,300	600	4,500	420	3,500	130	3,200	120	3,500	130	5,300	600	9,400	1,040
E124X-5.5	5.5	4,900	600	4,900	600	4,100	420	3,250	135	2,920	125	3,250	135	4,900	600	8,600	1,040
E124X-6	6	4,500	600	4,500	600	3,700	425	3,000	140	2,650	125	3,000	140	4,500	600	7,800	1,040
E124X-7	7	3,900	575	3,900	575	2,950	410	2,420	130	2,250	125	2,420	130	3,900	575	6,800	1,025
E124X-8	8	3,300	550	3,300	550	2,600	410	1,850	120	1,900	125	1,850	120	3,300	550	5,800	1,010
E124X-9	9	2,950	535	2,950	535	2,350	405	1,650	125	1,700	130	1,650	125	2,950	530	5,300	1,010
E124X-10	10	2,600	520	2,600	520	2,100	400	1,500	125	1,500	130	1,500	125	2,600	520	4,800	1,010
E124X-11	11	2,400	520	2,400	520	1,950	405	1,350	125	1,350	120	1,350	120	2,400	520	4,400	1,010
E124X-12	12	2,200	520	2,200	520	1,800	405	1,200	120	1,200	120	1,200	120	2,200	520	4,000	1,010
E124X-13	13	2,050	535	2,050	535	1,700	410	1,200	130	1,150	120	1,200	130	2,050	530	3,700	1,000
E124X-14	14	1,900	550	1,900	550	1,600	410	1,200	140	1,100	120	1,200	140	1,900	550	3,400	990
E124X-15	15	1,800	540	1,800	540	1,500	410	1,150	130	1,050	100	1,050	135	1,800	540	3,200	975
E124X-16	16	1,700	530	1,700	530	1,400	410	1,100	130	1,000	100	1,100	130	1,700	530	3,000	960
E124X-17	17	1,600	525	1,600	525	1,300	405	1,020	100	940	95	1,020	115	1,600	525	2,800	950
E124X-18	18	1,500	520	1,500	520	1,200	405	950	100	880	95	950	100	1,500	520	2,600	940
E124X-19	19	1,400	510	1,400	510	1,150	385	925	90	840	90	925	95	1,400	510	2,500	910
E124X-20	20	1,300	500	1,300	500	1,100	370	900	90	800	90	900	90	1,300	500	2,400	890
(mm)		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:<3 0.05D ≥3 0.1D		ae:<3 0.05D ≥3 0.1D		ae:<3 0.05D ≥3 0.1D		ae:<3 0.05D ≥3 0.1D		ae:<3 0.01D ≥3 0.02D		ae:<3 0.05D ≥3 0.1D		ae:<3 0.05D ≥3 0.1D		ae:<3 0.05D ≥3 0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E126X / E128X

Finishing End Mills

MG Carbide

AlTiN X-NaNo

35°

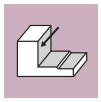
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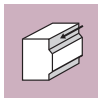
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γ10°

90°

Type of Operation





Work Material

P	H	M	K	N	S
●	●	○	●	○	

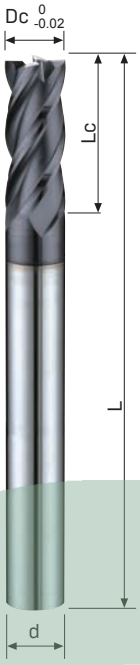
- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Copper

Feature of product:

Finishing End Mills with Long Length- 4 Flutes

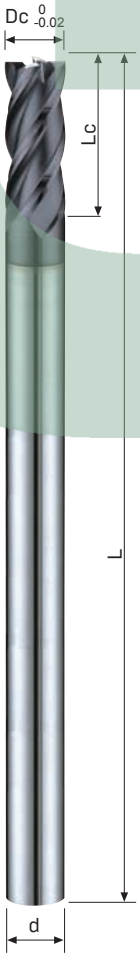
Nano multilayer coating enable to enhance wear resistance.

Suitable for finishing and general cutting process.



Code No. E126X-Dc

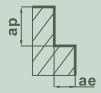
Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E126X
3	12	70	6	●
4	15	70	6	●
5	20	80	6	●
6	20	80	6	●
7	25	100	8	●
8	25	100	8	●
9	30	100	10	●
10	30	100	10	●
12	40	110	12	●
16	50	140	16	●
20	60	160	20	●



Code No. E128X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E128X
3	12	80	4	●
4	15	80	4	●
5	20	100	6	●
6	20	100	6	●
8	25	130	8	●
10	30	160	10	●
12	40	180	12	●
16	50	210	16	●
20	60	210	20	●

Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.11 Copper	
Vc m/min		65		65		55		40		38		40		65		115	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E126X/E128X-3	3	6,750	360	6,750	360	5,550	265	3,975	90	3,600	85	3,975	90	6,750	360	11,850	645
E126X/E128X-4	4	5,000	375	5,000	375	4,125	265	3,200	100	2,775	85	3,200	100	5,000	375	9,000	675
E126X/E128X-5	5	3,975	450	3,975	450	3,375	315	2,625	100	2,400	90	2,625	100	3,975	450	7,050	780
E126X/E128X-6	6	3,375	450	3,375	450	2,775	320	2,250	105	1,988	95	2,250	105	3,375	450	5,850	780
E126X-7	7	2,900	430	2,900	430	2,360	315	1,800	100	1,700	95	1,820	100	2,900	430	5,000	770
E126X/E128X-8	8	2,475	410	2,475	410	1,950	310	1,400	90	1,425	95	1,400	90	2,475	410	4,350	760
E126X-9	9	2,200	400	2,200	400	1,775	305	1,270	95	1,270	100	1,250	95	2,200	400	3,950	760
E126X/E128X-10	10	1,950	390	1,950	390	1,575	300	1,125	95	1,125	100	1,125	95	1,950	390	3,600	760
E126X-11	11	1,800	390	1,800	390	1,450	305	1,000	90	1,000	95	1,000	90	1,800	390	3,300	760
E126X/E128X-12	12	1,650	390	1,650	390	1,350	305	900	90	900	90	900	90	1,650	390	3,000	760
E126X/E128X-16	16	1,275	400	1,275	400	1,050	310	825	100	750	75	825	100	1,275	413	2,550	750
E126X/E128X-20	20	975	375	975	375	825	275	675	70	600	70	675	70	975	400	2,250	720
(mm) 		ap:2.5D		ap:2.5D		ap:2.5D		ap:2.5D		ap:2.5D		ap:2.5D		ap:2.5D		ap:2.5D	
		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D	

※Notice: E128X is Long Length series End Mills. Please adjust the parameter according.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E164TX / E165TX

Finishing End Mills

UMG Carbide

AlTiSiN TX

35°

4

N 71°30'

90°

Type of Operation

Work Material

P	H	M	K	N	S
●	●				

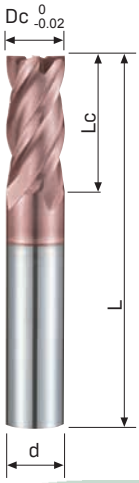
- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **H** <68HRC Hardened Steel

Feature of product:

Finishing End Mills with Standard & Long Length- 4 Flutes

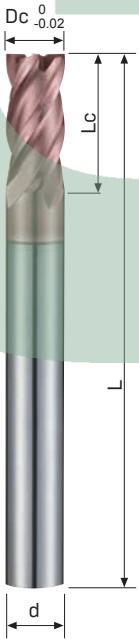
Using UMG carbide material and coated with high wear resistance TX coating enable to enhance tool life.

The small rake angle design with strong cutting edge for chipping resistance, suitable for high hardness material finishing process.



Code No. E164TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiSiN E164TX
1	3	50	4	●
1.5	5	50	4	●
2	6	50	4	●
2.5	8	50	4	●
3A	8	50	4	●
4A	11	50	4	●
3	8	50	6	●
3.5	10	50	6	●
4	11	50	6	●
4.5	11	50	6	●
5	13	50	6	●
5.5	13	50	6	●
6	16	50	6	●
7	20	60	8	●
8	20	60	8	●
9	22	72	10	●
10	22	72	10	●
11	26	75	12	●
12	26	75	12	●
14	32	90	16	●
16	38	100	16	●
18	38	100	20	●
20	38	100	20	●



Code No. E165TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiSiN E165TX
3	12	70	6	●
4	15	70	6	●
5	20	80	6	●
6	20	80	6	●
7	25	100	8	●
8	25	100	8	●
9	30	100	10	●
10	30	100	10	●
12	40	110	12	●
16	50	140	16	●
20	60	160	20	●

Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.7 Hardened Steel (56~68HRC)	
Vc m/min		Ø1.0~2.5 63~70 Ø3.0~20 108~122		Ø1.0~2.5 63~70 Ø3.0~20 108~122		Ø1.0~2.5 63~70 Ø3.0~20 108~122		Ø1.0~2.0 63~67 Ø3.0~20 69~72		Ø1.0~2.0 63~67 Ø3.0~20 69~72		Ø1.0~20 30~45		Ø1.0~20 30~40	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E164TX-1	1	20,000	240	20,000	240	20,000	240	20,000	185	20,000	185	10,000	60	9,500	40
E164TX-1.5	1.5	15,000	245	15,000	245	15,000	245	15,000	185	15,000	185	7,100	70	6,300	50
E164TX-2	2	11,000	480	11,000	480	11,000	480	10,000	300	10,000	300	6,400	150	4,800	95
E164TX-2.5	2.5	8,800	600	8,800	600	8,800	600	8,500	350	8,500	350	5,600	170	4,500	100
E164TX/E165TX-3	3	11,500	500	11,500	500	11,500	500	7,300	450	7,300	450	4,800	220	4,000	150
E164TX-3.5	3.5	10,000	510	10,000	510	10,000	510	6,400	475	6,400	475	4,200	235	3,600	185
E164TX/E165TX-4	4	8,600	515	8,600	515	8,600	515	5,600	500	5,600	500	3,600	250	3,200	220
E164TX-4.5	4.5	7,700	515	7,700	515	7,700	515	5,100	525	5,100	525	3,250	265	2,900	220
E164TX/E165TX-5	5	6,800	515	6,800	515	6,800	515	4,500	550	4,500	550	2,900	280	2,600	220
E164TX-5.5	5.5	6,300	515	6,300	515	6,300	515	4,100	575	4,100	575	2,650	290	2,350	220
E164TX/E165TX-6	6	5,800	520	5,800	520	5,800	520	3,700	600	3,700	600	2,400	300	2,100	220
E164TX-7	7	5,050	520	5,050	520	5,050	520	3,250	610	3,250	610	2,100	305	1,850	210
E164TX/E165TX-8	8	4,300	520	4,300	520	4,300	520	2,800	620	2,800	620	1,800	310	1,600	210
E164TX-9	9	3,850	530	3,850	530	3,850	530	2,550	620	2,550	620	1,600	305	1,450	195
E164TX/E165TX-10	10	3,400	540	3,400	540	3,400	540	2,300	620	2,300	620	1,400	300	1,300	180
E164TX-11	11	3,150	545	3,150	545	3,150	545	2,100	620	2,100	620	1,300	300	1,200	165
E164TX/E165TX-12	12	2,900	545	2,900	545	2,900	545	1,900	620	1,900	620	1,200	300	1,100	150
E164TX-14	14	2,650	575	2,650	575	2,650	575	1,650	550	1,650	550	1,050	265	950	125
E164TX/E165TX-16	16	2,400	610	2,400	610	2,400	610	1,400	480	1,400	480	900	230	800	120
E164TX-18	18	2,250	620	2,250	620	2,250	620	1,250	450	1,250	450	810	220	720	105
E164TX/E165TX-20	20	1,950	630	1,950	630	1,950	630	1,100	420	1,100	420	720	210	640	90
(mm) 		ap:1.5D ae:<3 0.02D ≥3 0.05D		ap:1.5D ae:<3 0.02D ≥3 0.05D		ap:1.5D ae:<3 0.02D ≥3 0.05D		ap:1.5D ae:<3 0.02D ≥3 0.05D		ap:1.5D ae:<3 0.02D ≥3 0.05D		ap:1.5D ae:0.02D		ap:1.5D ae:0.02D	

※Notice: E165TX is Long Length series End Mills. Please adjust the parameter according.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E158TX / E159TX

High Performance End Mills

SMG Carbide

AlTiSiN TX

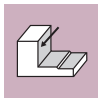
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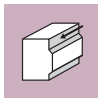
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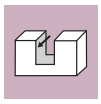
N
γ-5°

90°

Type of Operation







Work Material

P	H	M	K	N	S
●	●		●	○	

P	Steel
H	<38HRC Hardened Steel
H	<48HRC Hardened Steel
H	<56HRC Hardened Steel
H	<68HRC Hardened Steel
K	Cast Iron
N	Copper

Feature of product:

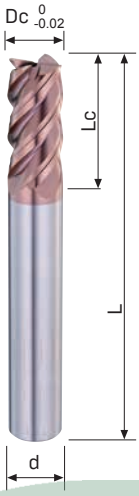
Finishing End Mills with Standard & Long Length- 4 Flutes

Using UMG carbide material and coated with high wear resistance TX coating enable to enhance tool life.

Negative rake angle design makes cutting edge strong and chipping resistance.

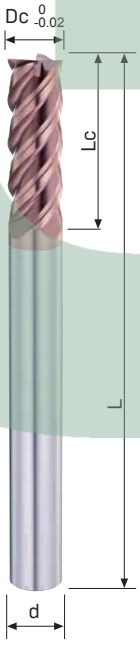
High efficiency 45° helix angle enable to reduce cutting resistance.

Suitable for high hardness material finishing process.



Code No. E158TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiSiN E158TX
1	3	50	4	●
1.5	5	50	4	●
2	6	50	4	●
2.5	8	50	4	●
3A	8	50	4	●
4A	11	50	4	●
3	8	50	6	●
4	11	50	6	●
5	13	50	6	●
6	16	50	6	●
8	20	60	8	●
10	22	72	10	●
12	26	75	12	●
16	38	100	16	●
20	38	100	20	●



Code No. E159TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiSiN E159TX
3	12	70	6	●
4	15	70	6	●
5	20	80	6	●
6	20	80	6	●
8	25	100	8	●
10	30	100	10	●
12	40	110	12	●
16	50	140	16	●
20	60	160	20	●

Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.5 Hardened Steel (48~56HRC)		GR.5 Hardened Steel (56~68HRC)		GR.8 Stainless Steel		GR.9 Cast Iron	
Vc m/min		100		100		80		65		62		60		30		62		100	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E158TX-1	1	31,850	509	31,850	509	25,480	407	20,700	331	19,747	315	19,110	305	9,555	152	19,747	315	31,850	509
E158TX-1.5	1.5	21,233	594	21,233	594	16,986	475	13,800	386	13,164	368	12,740	305	6,370	152	13,164	368	21,233	594
E158TX-2	2	15,925	637	15,925	637	12,740	560	10,351	455	9,873	395	9,555	344	4,777	152	9,873	395	15,925	637
E158TX-2.5	2.5	12,740	764	12,740	764	10,192	611	8,281	496	7,898	473	7,644	458	3,822	152	7,898	473	12,740	764
E158TX-3	3	10,600	950	10,600	950	8,300	750	7,000	560	6,600	510	6,400	480	3,200	180	6,600	510	10,600	950
E158TX-4	4	8,000	1,000	8,000	1,000	6,150	800	5,200	560	5,000	600	4,800	510	2,400	185	5,000	600	8,000	1,000
E158TX-5	5	6,350	1,000	6,350	1,000	5,000	840	4,200	580	4,000	610	3,800	530	2,000	190	4,000	610	6,350	1,000
E158TX/E159TX-6	6	5,300	1,200	5,300	1,200	4,200	950	3,500	700	3,300	650	3,200	540	1,600	190	3,300	650	5,300	1,200
E158TX/E159TX-8	8	4,000	1,200	4,000	1,200	3,100	900	2,700	650	2,500	640	2,400	550	1,200	175	2,500	640	4,000	1,200
E158TX/E159TX-10	10	3,200	1,100	3,200	1,100	2,500	850	2,100	600	2,000	585	1,900	520	950	155	2,000	585	3,200	1,100
E158TX/E159TX-12	12	2,650	1,100	2,650	1,100	2,000	850	1,750	560	1,700	530	1,600	470	800	160	1,700	530	2,650	1,100
E158TX/E159TX-16	16	2,000	950	2,000	950	1,600	730	1,300	500	1,250	430	1,200	400	600	160	1,250	430	2,000	950
E158TX/E159TX-20	20	1,600	760	1,600	760	1,300	580	1,100	450	980	380	950	350	480	160	980	380	1,600	760
(mm)		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.0D		ap:1.0D		ap:1.5D		ap:1.5D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.1D		ae:0.2D	

※Notice: E159TX is Long Length series End Mills. Please adjust the parameter according.

Side Milling (High-speed machining)

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.5 Hardened Steel (48~56HRC)		GR.5 Hardened Steel (56~68HRC)		GR.8 Stainless Steel		GR.9 Cast Iron	
Vc m/min		200		200		200		200		150		100		80		150		200	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E158TX-3	3	21,233	1,274	21,233	1,274	21,233	1,274	21,233	1,274	15,925	955	10,616	637	8493	509	15,925	955	21,233	1,274
E158TX-4	4	15,925	1,274	15,925	1,274	15,925	1,274	15,925	1,274	11,943	955	7,962	637	6370	509	11,943	955	15,925	1,274
E158TX-5	5	12,740	1,528	12,740	1,528	12,740	1,528	12,740	1,528	9,555	1,146	6,370	764	5096	509	9,555	1146	12,740	1,528
E158TX-6	6	10,500	2,800	10,500	2,800	10,500	2,500	10,500	1,800	8,000	1,350	5,300	900	4,200	600	8,000	1,350	10,500	2,800
E158TX-8	8	8,000	2,400	8,000	2,400	8,000	2,300	8,000	1,700	5,900	1,350	4,000	850	3,200	550	5,900	1,350	8,000	2,400
E158TX-10	10	6,300	2,350	6,300	2,350	6,300	2,200	6,300	1,650	4,700	1,300	3,200	800	2,500	500	4,700	1,300	6,300	2,350
E158TX-12	12	5,300	2,350	5,300	2,350	5,300	2,100	5,300	1,650	4,000	1,300	2,600	785	2,100	480	4,000	1,300	5,300	2,350
E158TX-16	16	4,000	1,800	4,000	1,800	4,000	1,800	4,000	1,600	3,000	1,200	2,000	780	1,600	480	3,000	1,200	4,000	1,800
E158TX-20	20	3,200	1,500	3,200	1,500	3,200	1,500	3,200	1,450	2,400	1,100	1,600	730	1,300	475	2,400	1,100	3,200	1,500
(mm)		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.0D		ap:1.0D		ap:1.5D		ap:1.5D	
		ae:0.05D		ae:0.02D		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.02D		ae:0.02D		ae:0.05D		ae:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E158ATX

High Performance End Mills

SMG Carbide

AlTiSiN ATX

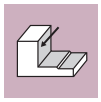
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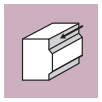
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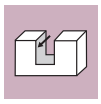
N
γ-5°

90°

Type of Operation







Work Material

P	H	M	K	N	S
●	●		●	○	

P	Steel
H	<38HRC Hardened Steel
H	<48HRC Hardened Steel
H	<56HRC Hardened Steel
H	<68HRC Hardened Steel
K	Cast Iron
N	Copper

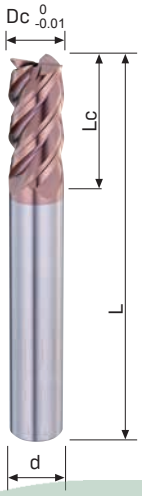
Feature of product:

Finishing End Mills with Standard & Long Length- 4 Flutes

Negative rake angle design makes cutting edge strong and chipping resistance.

High efficiency 45° helix angle enable to reduce cutting resistance.

Suitable for high hardness material finishing process.



Code No. E158ATX-Dc

Dc 0 -0.01	Lc mm	L mm	d h6	AlTiSiN E158ATX
1	3	50	4	•
1.5	5	50	4	•
2	6	50	4	•
2.5	8	50	4	•
3A	8	50	4	•
4A	11	50	4	•
3	8	50	6	•
4	11	50	6	•
5	13	50	6	•
6	16	50	6	•
8	20	60	8	•
10	22	72	10	•
12	26	75	12	•

※ Precision Cutting Diameter Tolerance: : $DC_{-0.01}^{0}$ mm

CORDEFER
FERRAMENTAS PARA A INDÚSTRIA
WWW.CORDEFER.PT

Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.5 Hardened Steel (48~56HRC)		GR.5 Hardened Steel (56~68HRC)		GR.8 Stainless Steel		GR.9 Cast Iron	
Vc m/min		100		100		80		65		62		60		30		62		100	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E158ATX-1	1	31,850	509	31,850	509	25,480	407	20,700	331	19,747	315	19,110	305	9,555	152	19,747	315	31,850	509
E158ATX-1.5	1.5	21,233	594	21,233	594	16,986	475	13,800	386	13,164	368	12,740	305	6,370	152	13,164	368	21,233	594
E158ATX-2	2	15,925	637	15,925	637	12,740	560	10,351	455	9,873	395	9,555	344	4,777	152	9,873	395	15,925	637
E158ATX-2.5	2.5	12,740	764	12,740	764	10,192	611	8,281	496	7,898	473	7,644	458	3,822	152	7,898	473	12,740	764
E158ATX-3	3	10,600	950	10,600	950	8,300	750	7,000	560	6,600	510	6,400	480	3,200	180	6,600	510	10,600	950
E158ATX-4	4	8,000	1,000	8,000	1,000	6,150	800	5,200	560	5,000	600	4,800	510	2,400	185	5,000	600	8,000	1,000
E158ATX-5	5	6,350	1,000	6,350	1,000	5,000	840	4,200	580	4,000	610	3,800	530	2,000	190	4,000	610	6,350	1,000
E158ATX-6	6	5,300	1,200	5,300	1,200	4,200	950	3,500	700	3,300	650	3,200	540	1,600	190	3,300	650	5,300	1,200
E158ATX-8	8	4,000	1,200	4,000	1,200	3,100	900	2,700	650	2,500	640	2,400	550	1,200	175	2,500	640	4,000	1,200
E158ATX-10	10	3,200	1,100	3,200	1,100	2,500	850	2,100	600	2,000	585	1,900	520	950	155	2,000	585	3,200	1,100
E158ATX-12	12	2,650	1,100	2,650	1,100	2,000	850	1,750	560	1,700	530	1,600	470	800	160	1,700	530	2,650	1,100
(mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.0D		ap:1.0D		ap:1.5D		ap:1.5D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.1D		ae:0.2D	

Side Milling (High-speed machining)

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.5 Hardened Steel (48~56HRC)		GR.5 Hardened Steel (56~68HRC)		GR.8 Stainless Steel		GR.9 Cast Iron	
Vc m/min		200		200		200		200		150		100		80		150		200	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E158ATX-3	3	21,233	1,274	21,233	1,274	21,233	1,274	21,233	1,274	15,925	955	10,616	637	8493	509	15,925	955	21,233	1,274
E158ATX-4	4	15,925	1,274	15,925	1,274	15,925	1,274	15,925	1,274	11,943	955	7,962	637	6370	509	11,943	955	15,925	1,274
E158ATX-5	5	12,740	1,528	12,740	1,528	12,740	1,528	12,740	1,528	9,555	1,146	6,370	764	5096	509	9,555	1146	12,740	1,528
E158ATX-6	6	10,500	2,800	10,500	2,800	10,500	2,500	10,500	1,800	8,000	1,350	5,300	900	4,200	600	8,000	1,350	10,500	2,800
E158ATX-8	8	8,000	2,400	8,000	2,400	8,000	2,300	8,000	1,700	5,900	1,350	4,000	850	3,200	550	5,900	1,350	8,000	2,400
E158ATX-10	10	6,300	2,350	6,300	2,350	6,300	2,200	6,300	1,650	4,700	1,300	3,200	800	2,500	500	4,700	1,300	6,300	2,350
E158ATX-12	12	5,300	2,350	5,300	2,350	5,300	2,100	5,300	1,650	4,000	1,300	2,600	785	2,100	480	4,000	1,300	5,300	2,350
(mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.0D		ap:1.0D		ap:1.5D		ap:1.5D	
		ae:0.05D		ae:0.02D		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.02D		ae:0.02D		ae:0.05D		ae:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E168TX / E169TX

High Performance End Mills

SMG Carbide

AlTiSiN TX

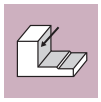
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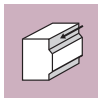
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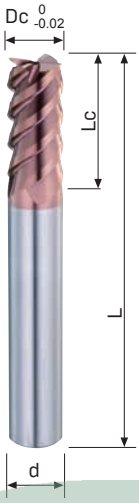
N
γ-10°

0.05-0.15
45°

Type of Operation







Code No. E168TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiSiN E168TX
3	8	50	6	●
4	11	50	6	●
5	13	50	6	●
6	16	50	6	●
8	20	60	8	●
10	22	72	10	●
12	26	75	12	●
16	38	100	16	●
20	38	100	20	●

Work Material

P	H	M	K	N	S
	●				

H	<48HRC Hardened Steel
H	<56HRC Hardened Steel
H	<68HRC Hardened Steel

Feature of product:

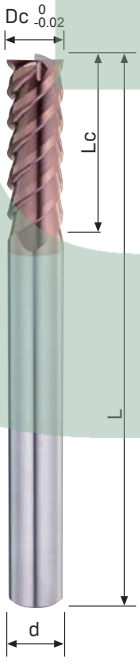
Finishing End Mills with Standard & Long Length- 4 Flutes

Using SMG carbide material and coated with high wear resistance TX coating enable to enhance tool life.

Negative rake angle design makes cutting edge strong and chipping resistance.

High efficiency 55° helix angle enable to reduce cutting resistance.

Suitable for high hardness material finishing process.



Code No. E169TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiSiN E169TX
6	20	80	6	●
8	25	100	8	●
10	30	100	10	●
12	40	110	12	●
16	50	140	16	●
20	60	160	20	●

Side Milling

Work Material		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.7 Hardened Steel (56~68HRC)	
Vc m/min		150		100		50	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E168TX-3	3	15,800	1,200	10,500	820	3,800	120
E168TX-4	4	12,000	1,300	8,000	800	2,650	135
E168TX-5	5	9,500	1,300	6,300	850	2,250	140
E168TX/E169TX-6	6	8,000	1,200	5,300	820	2,200	175
E168TX/E169TX-8	8	6,000	1,100	4,000	750	1,650	185
E168TX/E169TX-10	10	4,800	1,100	3,200	745	1,300	165
E168TX/E169TX-12	12	4,000	1,065	2,700	740	1,100	145
E168TX/E169TX-16	16	3,000	1,000	2,000	730	840	170
E168TX/E169TX-20	20	2,400	955	1,600	700	670	170
(mm) 		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.05D		ae:0.03D		ae:0.02D	

High Speed Side Milling

Work Material		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.7 Hardened Steel (56~68HRC)	
Vc m/min		200		150		100	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E168TX-3	3	21,233	1,620	15,925	1,130	10,617	424
E168TX-4	4	15,925	1,725	11,944	1,200	7,963	477
E168TX-5	5	12,740	1,750	9,555	1,200	6,370	510
E168TX-6	6	10,617	1,200	7,963	700	5,308	530
E168TX-8	8	7,963	1,200	5,972	700	3,981	530
E168TX-10	10	6,370	850	4,778	630	3,185	420
E168TX-12	12	5,308	850	3,981	630	2,654	420
E168TX-16	16	3,981	900	2,986	650	1,991	420
E168TX-20	20	3,185	900	2,389	650	1,593	420
(mm) 		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.01D		ae:0.01D		ae:0.01D	

※Notice: E169TX is Long Length series End Mills. Please adjust the parameter according.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E166TX / E167TX

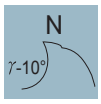
Finishing End Mills

SMG Carbide

AlTiSiN TX

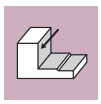


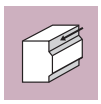


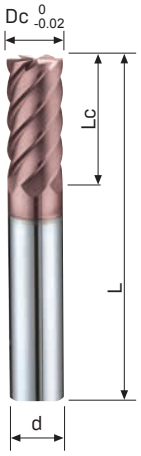




Type of Operation







Code No. E166TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	NO.of Flute	AlTiSiN E166TX
3	8	50	6	4	●
4	11	50	6	4	●
5	13	50	6	6	●
6	16	50	6	6	●
8	20	60	8	6	●
10	22	72	10	6	●
12	26	75	12	6	●
16	38	100	16	6	●
20	38	100	20	6	●

Work Material

P	H	M	K	N	S
	●		○		○

H	<48HRC Hardened Steel
H	<56HRC Hardened Steel
H	<68HRC Hardened Steel
K	Cast Iron
S	Titanium
S	High Temp Alloys

Feature of product:

Finishing End Mills with Standard & Long Length- 6 Flutes

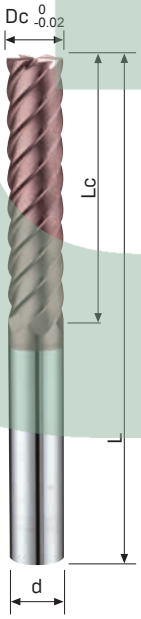
Using SMG carbide material and coated with high wear resistance TX coating enable to enhance tool life.

Negative rake angle design makes cutting edge strong and chipping resistance.

Multi flutes design enable to decrease cutting edge pressure evenly, increase core strength and tool life.

High efficiency 45° helix angle enable to reduce cutting resistance.

Suitable for high hardness material in finishing process.



Code No. E167TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	NO.of Flute	AlTiSiN E167TX
6	26	80	6	6	●
8	36	100	8	6	●
10	46	100	10	6	●
12	56	110	12	6	●
16	66	140	16	6	●
20	76	160	20	6	●

E166TX Side Milling

Work Material		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.7 Hardened Steel (56~68HRC)		GR.9 Cast Iron	
Vc m/min		150		100		90		145	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E166TX-3	3	13,500	1,600	10,500	1,200	7,900	650	15,000	1,800
E166TX-4	4	9,900	1,600	7,900	1,200	5,900	660	11,000	1,800
E166TX-5	5	7,900	1,580	6,300	1,200	4,700	650	8,800	1,750
E166TX-6	6	6,600	2,300	5,300	1,800	4,000	1,000	7,400	2,600
E166TX-8	8	4,900	2,350	4,000	1,850	3,000	1,000	5,500	2,600
E166TX-10	10	4,000	2,400	3,200	1,900	2,400	1,000	4,500	2,600
E166TX-12	12	3,300	2,400	2,600	1,900	2,000	1,000	3,700	2,600
E166TX-16	16	2,500	2,100	2,000	1,700	1,500	900	2,800	2,400
E166TX-20	20	2,000	1,900	1,600	1,400	1,200	830	2,300	2,100
(mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.6D	
		ae:0.1D		ae:0.05D		ae:0.03D		ae:0.1D	

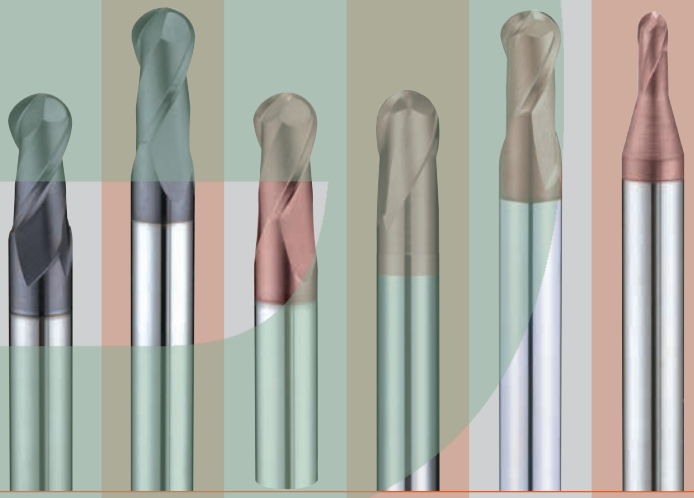
E167TX Side Milling

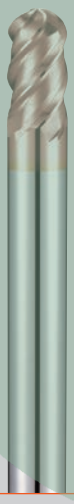
Work Material		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.7 Hardened Steel (56~68HRC)		GR.9 Cast Iron	
Vc m/min		45		35		30		70	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E167TX-6	6	2,100	530	1,500	300	1,350	230	3,200	850
E167TX-8	8	1,800	550	1,200	310	1,100	250	2,800	1,000
E167TX-10	10	1,600	550	1,150	340	1,000	260	2,400	1,000
E167TX-12	12	1,300	520	1,000	280	800	230	1,950	970
E167TX-16	16	985	450	700	230	600	200	1,400	800
E167TX-20	20	800	380	570	210	480	160	1,100	660
(mm) 		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D	
		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.



Ball Nose End Mills

Page	197	199	201	203	203	205
Appearance						
Code No	B222X	B232X B242X B246X	B262TX B263TX B264TX	B272ATX	B273ATX	B251TX
Carbide	MG Carbide	MG Carbide	SMG Carbide	SMG Carbide	SMG Carbide	SMG Carbide
Coating	AlTiN X-NaNo	AlTiN X-NaNo	AlTiSiN TX	AlTiSiN ATX	AlTiSiN ATX	AlTiSiN TX
Helix Angle	 30°	 30°	 30°	 30°	 30°	 25°
No.of Flutes	 2	 2	 2	 2	 2	 2

207	209	209	212
			
B261TX	**B253TX**	**B254TX**	**B250TX**
SMG Carbide	**SMG Carbide**	**SMG Carbide**	**UMG Carbide**
AlTiSiN TX	**AlTiSiN TX**	**AlTiSiN TX**	**AlTiSiN TX**
 15°	 45°	 45°	 30°
 2	 3	 4	 2

B222X

Ball Nose End Mills

MG Carbide

AlTiN X-NaNo

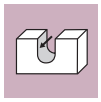
30°

2

N

γ10°

Type of Operation







Work Material

P	H	M	K	N	S
●	●	○	●	○	

P	Steel
H	<38HRC Hardened Steel
H	<48HRC Hardened Steel
M	Stainless Steel
K	Cast Iron
N	Copper

Feature of product:

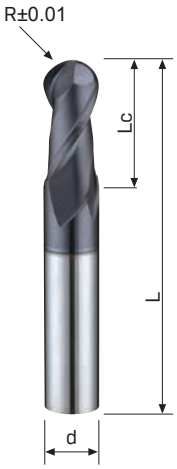
Ball Nose End Mills- 2 Flutes

Suitable to work on various kind of materials.

Nano multilayer coating enable to enhance wear resistance.

S shape ball nose geometry design enable to keep cutting stable.

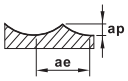
Suitable to work on material below HRC48.



Code No. B222X-Dc

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiN B222X
0.1	0.05R	0.2	50	4	●
0.2	0.1R	0.4	50	4	●
0.3	0.15R	0.6	50	4	●
0.4	0.2R	0.8	50	4	●
0.5	0.25R	1	50	4	●
0.6	0.3R	1.2	50	4	●
0.7	0.35R	1.4	50	4	●
0.8	0.4R	1.6	50	4	●
0.9	0.45R	1.8	50	4	●
1	0.5R	2	50	4	●
1.2	0.6R	2.4	50	4	●
1.4	0.7R	2.8	50	4	●
1.5	0.75R	3	50	4	●
1.6	0.8R	3.2	50	4	●
1.8	0.9R	3.6	50	4	●
2	1R	4	50	4	●
2.5	1.25R	5	50	4	●
3A	1.5R	6	50	4	●
4A	2R	8	50	4	●
3	1.5R	6	50	6	●
3.5	1.75R	8	50	6	●
4	2R	8	50	6	●
4.5	2.25R	10	50	6	●
5	2.5R	10	50	6	●
5.5	2.75R	12	50	6	●
6	3R	12	50	6	●
6.5	3.25R	14	60	8	●
7	3.5R	14	60	8	●
7.5	3.75R	14	60	8	●
8	4R	14	60	8	●
8.5	4.25R	18	72	10	●
9	4.5R	18	72	10	●
9.5	4.75R	18	72	10	●
10	5R	18	72	10	●
11	5.5R	22	75	12	●
12	6R	22	75	12	●
13	6.5R	26	90	16	●
14	7R	26	90	16	●
15	7.5R	30	90	16	●
16	8R	30	100	16	●
17	8.5R	34	100	20	●
18	9R	34	100	20	●
19	9.5R	38	100	20	●
20	10R	38	100	20	●

General processing

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.11 Copper	
Vc m/min		Ø0.1~0.6 20~60 Ø0.8~20 80~120		Ø0.1~0.6 20~60 Ø0.8~20 80~120		Ø0.1~0.6 20~60 Ø0.8~20 80~100		Ø0.1~0.6 20~60 Ø0.8~20 60~80		Ø0.1~0.6 20~60 Ø0.8~20 60~70		Ø0.1~0.6 20~60 Ø0.8~20 60~80		Ø0.1~0.6 20~60 Ø0.8~20 80~120		Ø0.1~0.6 25~75 Ø0.8~20 100~120	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B222X-R0.05	0.1	32,000	140	32,000	140	32,000	140	32,000	120	32,000	120	32,000	100	32,000	140	40,000	180
B222X-R0.1	0.2	32,000	160	32,000	160	32,000	160	32,000	140	32,000	140	32,000	120	32,000	160	40,000	200
B222X-R0.15	0.3	32,000	200	32,000	200	32,000	200	32,000	200	32,000	200	32,000	200	32,000	200	40,000	300
B222X-R0.2	0.4	32,000	296	32,000	296	32,000	330	32,000	330	32,000	205	32,000	330	32,000	296	40,000	490
B222X-R0.25	0.5	32,000	395	32,000	395	32,000	330	32,000	330	32,000	205	32,000	330	32,000	395	40,000	490
B222X-R0.3	0.6	32,000	490	32,000	490	32,000	400	32,000	400	32,000	265	32,000	400	32,000	490	40,000	580
B222X-R0.4	0.8	32,000	550	32,000	550	31,500	406	31,500	406	27,500	290	31,500	406	32,000	550	40,000	660
B222X-R0.5	1	31,500	564	31,500	564	25,000	412	25,000	412	22,000	296	25,000	412	31,500	564	32,000	700
B222X-R0.6	1.2	29,190	570	29,190	570	23,880	410	23,880	410	18,580	300	21,250	410	29,195	570	31,850	710
B222X-R0.75	1.5	26,250	578	26,250	578	20,860	418	20,860	418	14,800	302	20,860	418	26,250	578	25,500	715
B222X-R0.9	1.8	21,230	580	21,230	580	17,690	424	17,690	424	12,380	305	17,690	420	23,000	580	23,000	720
B222X-R1	2	21,000	582	21,000	582	16,720	425	16,720	425	11,000	310	16,720	425	21,000	582	19,000	730
B222X-R1.25	2.5	15,750	596	15,750	596	12,580	430	12,580	430	8,900	316	12,580	430	15,750	596	12,700	745
B222X-R1.5	3	10,500	620	10,500	620	8,450	435	8,450	435	7,400	322	8,450	435	10,500	620	12,500	760
B222X-R1.75	3.5	9,840	625	9,840	625	7,350	440	7,350	440	6,400	330	7,350	440	9,840	625	11,000	760
B222X-R2	4	9,250	630	9,250	630	6,350	442	6,350	442	5,550	342	6,350	442	9,250	630	9,500	765
B222X-R1.25	4.5	8,600	635	8,600	635	5,700	445	5,700	445	5,100	355	5,700	445	8,600	635	8,600	770
B222X-R2.5	5	7,950	640	7,950	640	5,095	447	5,095	447	4,460	377	5,095	447	7,950	640	7,650	775
B222X-R2.75	5.5	6,600	645	6,600	645	4,650	450	4,650	450	4,050	380	4,650	450	6,600	645	6,950	780
B222X-R3	6	5,300	670	5,300	670	4,200	465	4,200	465	3,700	390	4,200	465	5,300	670	6,300	800
B222X-R3.5	7	4,600	730	4,600	730	3,700	510	3,700	510	3,200	420	3,700	510	4,600	730	5,500	870
B222X-R4	8	3,950	790	3,950	790	3,150	555	3,150	555	2,750	455	3,150	555	3,950	790	4,750	950
B222X-R4.5	9	3,550	765	3,550	765	2,825	540	2,825	540	2,450	440	2,825	540	3,550	765	4,250	920
B222X-R5	10	3,150	745	3,150	745	2,500	525	2,500	525	2,200	430	2,500	525	3,150	745	3,800	890
B222X-R5.5	11	2,900	720	2,900	720	2,300	505	2,300	505	2,000	430	2,300	505	2,900	720	3,470	865
B222X-R6	12	2,650	700	2,650	700	2,100	490	2,100	490	1,850	430	2,100	490	2,650	700	3,170	840
B222X-R6.5	13	2,450	655	2,450	655	1,960	460	1,960	460	1,730	400	1,960	460	2,450	655	2,970	790
B222X-R7	14	2,300	610	2,300	610	1,830	430	1,830	430	1,620	375	1,830	430	2,300	610	2,780	730
B222X-R7.5	15	2,150	565	2,150	565	1,700	400	1,700	400	1,500	350	1,700	400	2,150	565	2,590	680
B222X-R8	16	1,990	525	1,990	525	1,580	370	1,580	370	1,390	325	1,580	370	1,990	525	2,400	630
B222X-R8.5	17	1,890	495	1,890	495	1,500	350	1,500	350	1,320	305	1,500	350	1,890	495	2,270	590
B222X-R9	18	1,790	470	1,790	470	1,420	330	1,420	330	1,250	290	1,420	330	1,790	470	2,150	560
B222X-R9.5	19	1,690	445	1,690	445	1,340	310	1,340	310	1,180	275	1,340	310	1,690	445	2,020	530
B222X-R10	20	1,590	420	1,590	420	1,260	290	1,260	290	1,110	260	1,260	290	1,590	420	1,900	500
(mm) 		ap:0.1D ae:<1 0.1D ≥1 0.2D		ap:0.1D ae:<1 0.1D ≥1 0.2D		ap:0.1D ae:<1 0.1D ≥1 0.2D		ap:0.1D ae:<1 0.1D ≥1 0.2D		ap:0.1D ae:<1 0.05D ≥1 0.1D		ap:0.1D ae:<1 0.05D ≥1 0.1D		ap:0.1D ae:<1 0.1D ≥1 0.2D		ap:0.1D ae:<1 0.1D ≥1 0.2D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

B232X / B242X / B246X

Ball Nose End Mills

MG Carbide | AlTiN X-NaNo

30° | 2 | N γ10°

Type of Operation

Work Material

P	H	M	K	N	S
●	●	○	●	○	

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Copper

Feature of product:

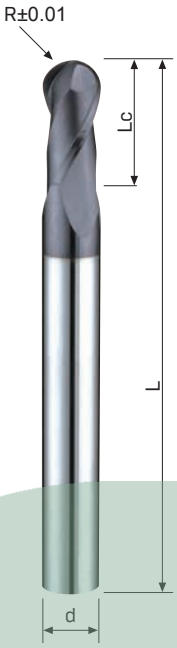
Ball Nose End Mills with Long Length- 2 Flutes

Suitable to work on various kind of materials.

Nano multilayer coating enable to enhance wear resistance.

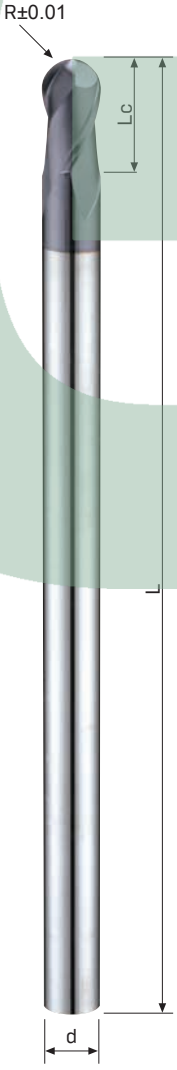
S shape ball nose geometry design enable to keep cutting stable.

Suitable to work on material below HRC48.



Code No. B232X-Dc

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiN B232X
1	0.5R	2	50	6	●
1.5	0.75R	3	50	6	●
2	1R	4	60	6	●
2.5	1.25R	5	60	6	●
3	1.5R	6	70	6	●
4	2R	8	70	6	●
5	2.5R	10	80	6	●
6	3R	12	80	6	●
7	3.5R	14	100	8	●
8	4R	14	100	8	●
9	4.5R	18	100	10	●
10	5R	18	100	10	●
12	6R	22	110	12	●
16	8R	30	140	16	●
20	10R	38	160	20	●



Code No. B242X-Dc

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiN B242X
1	0.5R	2	70	3	●
2	1R	4	70	3	●
3	1.5R	6	80	4	●
4	2R	8	80	4	●
5	2.5R	10	100	6	●
6	3R	12	100	6	●
8	4R	14	130	8	●
10	5R	18	160	10	●
12	6R	22	180	12	●
16	8R	30	210	16	●
20	10R	38	210	20	●

Code No. B246X-Dc

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiN B246X
2	1R	4	100	3	●
4	2R	8	130	4	●
6	3R	12	160	6	●
8	4R	14	180	8	●
10	5R	18	200	10	●
12	6R	22	210	12	●

General processing

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.11 Copper	
Vc m/min		100		100		65		65		55		65		100		100	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B232X/B242X-R0.5	1	25,200	480	25,200	480	20,000	320	20,000	320	17,600	225	20,000	320	25,200	480	25,600	560
B232X-R0.75	1.5	16,640	480	16,640	480	13,600	320	13,600	320	11,840	225	13,600	320	16,640	480	20,400	560
B232X/B242X/B246X-R1	2	12,400	480	12,400	480	10,000	320	10,000	320	8,800	230	10,000	320	12,400	480	15,200	560
B232X-R1.25	2.5	12,400	480	12,400	480	8,160	320	8,160	320	7,120	230	8,160	320	12,400	480	10,160	560
B232X/B242X-R1.5	3	8,400	500	8,400	500	6,760	325	6,760	325	5,920	230	6,760	325	8,400	500	10,000	608
B232X/B242X/B246X-R2	4	6,360	500	6,360	500	5,080	355	5,080	355	4,440	300	5,080	355	6,360	500	7,600	608
B232X/B242X-R2.5	5	6,360	500	6,360	500	4,070	355	4,070	355	3,568	300	4,070	355	6,360	500	6,120	608
B232X/B242X/B246X-R3	6	4,240	535	4,240	535	3,360	370	3,360	370	2,960	310	3,360	370	4,240	535	5,040	640
B232X/B242X/B246X-R4	8	3,160	630	3,160	630	2,520	445	2,520	445	2,200	360	2,520	445	3,160	630	3,800	760
B232X/B242X/B246X-R5	10	2,520	600	2,520	600	2,000	420	2,000	420	1,760	340	2,000	420	2,520	600	3,040	710
B232X/B242X/B246X-R6	12	2,120	560	2,120	560	1,680	390	1,680	390	1,480	340	1,680	390	2,120	560	2,530	670
B232X/B242X-R8	16	1,590	420	1,590	420	1,260	295	1,260	295	1,110	260	1,260	295	1,590	420	1,920	500
B232X/B242X-R10	20	1,270	335	1,270	335	1,000	230	1,000	230	888	200	1,000	230	1,270	335	1,520	400
(mm) 		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.1D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.1D		ae:0.2D		ae:0.2D	

※Notice: B242X&B246X is Long Length series End Mills. Please adjust the parameter according.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

Ball Nose End Mills

SMG Carbide

AlTiSiN TX

30°

2

N

γ5°

Type of Operation

Work Material

P	H	M	K	N	S
●	●		○		

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **H** <68HRC Hardened Steel
- **K** Cast Iron

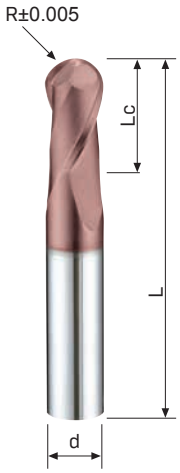
Feature of product:

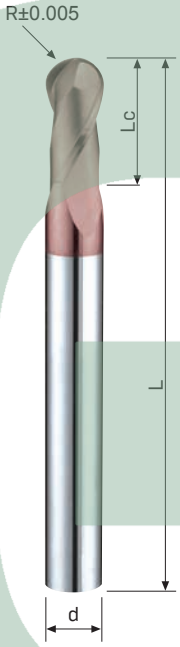
Ball Nose End Mills with Standard & Long Length- 2 Flutes

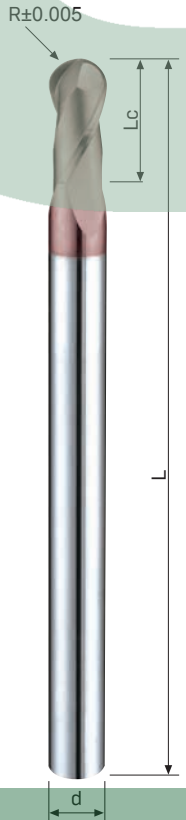
Using SMG carbide material and Nano multilayer coating enable to enhance lubrication and wear resistance.

S shape ball nose geometry with small cutting edge design enable to keep longer tool life.

Suitable to work on high hardness material in finishing process.







Code No. B262TX-Dc

Dc 0 -0.02	R ±0.005	Lc mm	L mm	d h6	AlTiSiN B262TX
0.1	0.05R	0.2	50	4	●
0.2	0.1R	0.4	50	4	●
0.3	0.15R	0.6	50	4	●
0.4	0.2R	0.8	50	4	●
0.5	0.25R	1	50	4	●
0.6	0.3R	1.2	50	4	●
0.8	0.4R	1.6	50	4	●
1	0.5R	2	50	4	●
1.5	0.75R	3	50	4	●
2	1R	4	50	4	●
2.5	1.25R	5	50	4	●
3A	1.5R	6	50	4	●
4A	2R	8	50	4	●
3	1.5R	6	50	6	●
4	2R	8	50	6	●
5	2.5R	10	50	6	●
6	3R	12	50	6	●
7	3.5R	14	60	8	●
8	4R	14	60	8	●
9	4.5R	18	72	10	●
10	5R	18	72	10	●
12	6R	22	75	12	●
14	7R	26	90	16	●
16	8R	30	100	16	●
20	10R	38	100	20	●

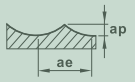
Code No. B263TX-Dc

Dc 0 -0.02	R ±0.005	Lc mm	L mm	d h6	AlTiSiN B263TX
1	0.5R	2	50	6	●
1.5	0.75R	3	50	6	●
2	1R	4	60	6	●
2.5	1.25R	5	60	6	●
3	1.5R	6	70	6	●
4	2R	8	70	6	●
5	2.5R	10	80	6	●
6	3R	12	80	6	●
7	3.5R	14	100	8	●
8	4R	14	100	8	●
9	4.5R	18	100	10	●
10	5R	18	100	10	●
12	6R	22	110	12	●
16	8R	30	140	16	●
20	10R	38	160	20	●

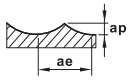
Code No. B264TX-Dc

Dc 0 -0.02	R ±0.005	Lc mm	L mm	d h6	AlTiSiN B264TX
1	0.5R	2	70	3	●
2	1R	4	70	3	●
3	1.5R	6	80	4	●
4	2R	8	80	4	●
5	2.5R	10	100	6	●
6	3R	12	100	6	●
8	4R	14	130	8	●
10	5R	18	160	10	●
12	6R	22	180	12	●
16	8R	30	210	16	●
20	10R	38	210	20	●

General processing

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.7 Hardened Steel (56~68HRC)	
Vc m/min		Ø0.1~0.6 30~60 Ø0.8~20 80~120		Ø0.1~0.6 30~60 Ø0.8~20 80~120		Ø0.1~0.6 30~60 Ø0.8~20 80~100		Ø0.1~0.6 30~60 Ø0.8~20 73~80		Ø0.1~0.6 30~60 Ø0.8~20 65~70		Ø0.1~0.6 23~46 Ø0.8~20 48~60		Ø0.1~0.6 20~35 Ø0.8~20 35~42	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B262TX-R0.05	0.1	32,000	320	32,000	320	32,000	300	32,000	250	24,500	160	24,500	100	24,500	50
B262TX-R0.1	0.2	32,000	360	32,000	360	32,000	320	32,000	280	24,500	180	24,500	100	24,500	75
B262TX-R0.15	0.3	32,000	400	32,000	400	32,000	365	32,000	300	32,000	180	24,500	100	24,500	75
B262TX-R0.2	0.4	32,000	450	32,000	450	32,000	400	32,000	320	32,000	200	24,500	130	24,500	115
B262TX-R0.25	0.5	32,000	485	32,000	485	32,000	440	32,000	360	32,000	230	24,500	150	24,500	130
B262TX-R0.3	0.6	32,000	530	32,000	530	31,500	480	32,000	400	32,000	260	24,500	170	23,500	150
B262TX-R0.4	0.8	32,000	605	32,000	605	31,500	550	29,000	400	27,000	270	19,000	185	14,000	140
B262TX/B263TX/B264TX-R0.5	1	32,000	680	32,000	680	31,500	620	25,000	400	22,000	280	19,000	200	14,000	130
B262TX/B263TX-R0.75	1.5	32,000	680	32,000	680	31,500	620	25,000	400	22,000	280	19,000	200	14,000	130
B262TX/B263TX/B264TX-R1	2	19,000	765	19,000	765	15,500	620	12,500	400	11,000	290	9,500	200	7,100	135
B262TX/B263TX-R1.25	2.5	19,000	765	19,000	765	15,500	620	12,500	400	11,000	290	9,500	200	6,360	135
B262TX/B236TX/B264TX-R1.5	3	12,500	765	12,500	765	10,500	630	8,450	400	7,400	290	6,350	200	4,700	140
B262TX/B236TX/B264TX-R2	4	9,500	765	9,500	765	7,950	630	6,350	450	5,550	370	4,750	270	3,500	170
B262TX/B236TX/B264TX-R2.5	5	7,600	850	7,600	850	6,350	630	5,050	450	4,450	370	3,800	280	2,860	170
B262TX/B236TX/B264TX-R3	6	6,350	850	6,350	850	5,300	650	4,200	460	3,700	390	3,150	290	2,300	175
B262TX/B263TX-R3.5	7	5,050	950	5,050	950	4,650	710	3,650	500	3,200	420	2,750	305	2,000	190
B262TX/B236TX/B264TX-R4	8	4,750	1,050	4,750	1,050	3,950	780	3,150	550	2,750	450	2,350	325	1,700	200
B262TX/B263TX-R4.5	9	4,250	1,000	4,250	1,000	3,550	760	2,850	535	2,450	440	2,120	330	1,550	200
B262TX/B236TX/B264TX-R5	10	3,800	950	3,800	950	3,150	740	2,500	525	2,200	430	1,900	330	1,400	200
B262TX/B236TX/B264TX-R6	12	3,150	890	3,150	890	2,650	700	2,100	490	1,850	430	1,550	310	1,100	190
B262TX/B263TX-R7	14	2,700	860	2,700	860	2,250	670	1,800	475	1,550	380	1,350	300	955	180
B262TX/B236TX/B264TX-R8	16	2,350	840	2,350	840	1,950	640	1,550	475	1,350	380	1,150	265	835	175
B262TX/B236TX/B264TX-R10	20	1,900	760	1,900	760	1,750	570	1,400	450	1,100	350	955	250	665	170
(mm) 		ap:<1 0.05D ≥1 0.1D		ap:<1 0.05D ≥1 0.1D		ap:<1 0.05D ≥1 0.1D		ap:<1 0.05D ≥1 0.1D		ap:<1 0.05D ≥1 0.1D		ap:0.05D		ap:0.05D	
		ae:<1 0.1D ≥1 0.1D		ae:<1 0.1D ≥1 0.1D		ae:<1 0.1D ≥1 0.1D		ae:<1 0.1D ≥1 0.1D		ae:<1 0.1D ≥1 0.1D		ae:0.075D		ae:0.075D	

High-speed machining

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.7 Hardened Steel (56~68HRC)	
Vc m/min		Ø1~3 157~198 Ø4~20 226~300		Ø1~3 157~198 Ø4~20 226~300		Ø1~3 155~165 Ø4~20 195~250		Ø1~3 140~160 Ø4~20 188~220		Ø1~3 125~153 Ø4~20 170~180		Ø1~3 100~113 Ø4~20 138~180		Ø1~3 79~92 Ø4~20 119~126	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B262TX/B263TX/B264TX-R0.5	1	50,000	2,800	50,000	2,800	50,000	2,800	50,000	2,500	47,500	2,200	32,000	1,400	25,000	1,000
B262TX/B263TX-R0.75	1.5	41,800	2,800	41,800	2,800	33,000	2,800	30,000	2,500	26,500	2,200	24,000	1,400	19,500	1,000
B262TX/B263TX/B264TX-R1	2	31,500	3,500	31,500	3,500	25,000	2,800	24,500	2,500	23,500	2,250	17,000	1,500	12,500	1,000
B262TX/B263TX-R1.25	2.5	41,800	3,500	41,800	3,500	21,000	2,800	20,000	25,000	19,500	2,200	14,000	1,500	10,000	950
B262TX/B236TX/B264TX-R1.5	3	21,000	3,500	21,000	3,500	16,500	2,800	16,000	2,500	15,500	2,200	11,000	1,500	8,400	950
B262TX/B236TX/B264TX-R2	4	18,000	3,700	18,000	3,700	15,500	3,200	15,000	2,700	13,500	2,400	11,000	1,900	7,900	1,000
B262TX/B236TX/B264TX-R2.5	5	15,500	4,000	15,500	4,000	15,000	4,000	14,000	2,800	11,000	2,300	10,000	2,000	7,600	1,200
B262TX/B236TX/B264TX-R3	6	15,000	4,800	15,000	4,800	13,500	4,300	11,500	2,700	9,500	2,200	9,500	2,200	6,600	1,050
B262TX/B236TX/B264TX-R4	8	11,500	3,600	11,500	3,600	10,000	3,200	8,900	2,000	7,100	1,700	7,100	1,700	4,900	880
B262TX/B236TX/B264TX-R5	10	9,500	3,000	9,500	3,000	8,200	2,500	7,100	1,700	5,700	1,300	5,700	1,300	3,900	700
B262TX/B236TX/B264TX-R6	12	7,900	2,450	7,900	2,450	6,800	2,100	5,900	1,350	4,700	1,000	4,700	1,000	3,300	580
B262TX/B236TX/B264TX-R8	16	5,900	1,800	5,900	1,800	5,000	1,500	4,500	1,000	3,500	800	3,500	800	2,450	400
B262TX/B236TX/B264TX-R10	20	4,700	1,300	4,700	1,300	4,000	1,200	3,500	800	2,800	650	2,800	650	2,000	320
(mm) 		ap:0.02D		ap:0.02D		ap:0.02D		ap:0.02D		ap:0.02D		ap:0.02D		ap:0.02D	
		ae:0.02D		ae:0.02D		ae:0.02D		ae:0.02D		ae:0.02D		ae:0.02D		ae:0.02D	

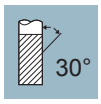
※Notice: B263TX/B264TX is Long Length series End Mills. Please adjust the parameter according.

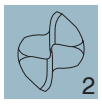
B272ATX / B273ATX

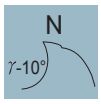
Ball Nose End Mills

SMG Carbide

AlTiSiN ATX

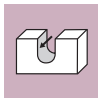








Type of Operation







Work Material

P	H	M	K	N	S
	●				

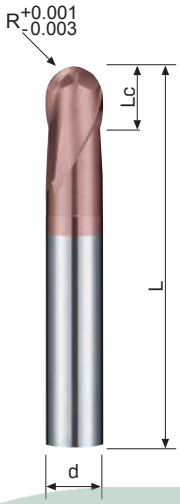
H	<48HRC Hardened Steel
H	<56HRC Hardened Steel
H	<68HRC Hardened Steel

Feature of product:

Ball Nose End Mills with Standard & Long Length- 2 Flutes

Using SMG carbide material and Nano multilayer coating enable to enhance lubrication and wear resistance. S shape ball nose geometry with small cutting edge design enable to keep longer tool life.

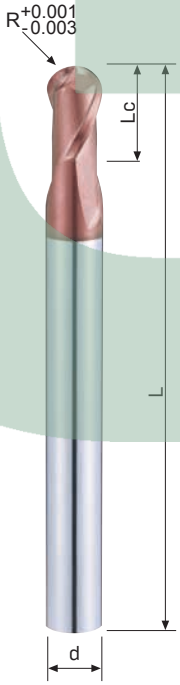
High radius precision of ball nose suitable to work on high hardness and high precision mold process.



Code No. B272ATX-Dc

Dc 0 -0.02	R +0.001 -0.003	Lc mm	L mm	d h5	AlTiSiN B272ATX
0.1	0.05R	0.1	40	4	●
0.2	0.1R	0.2	40	4	●
0.3	0.15R	0.3	40	4	●
0.4	0.2R	0.4	40	4	●
0.5	0.25R	0.5	40	4	●
0.6	0.3R	0.6	40	4	●
0.8	0.3R	0.8	40	4	●
1	0.5R	1	40	4	●
1.5	0.75R	1.5	40	4	●
2	1R	2	45	6	●
2.5	1.25R	2.5	45	6	●
3	1.5R	3	45	6	●
4	2R	4	45	6	●
5	2.5R	5	50	6	●
6	3R	6	50	6	●
8	4R	8	60	8	●
10	5R	10	72	10	●
12	6R	12	75	12	●

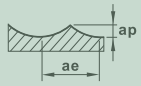
※Suitable for heat shrink chuck.



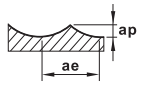
Code No. B273ATX-Dc

Dc 0 -0.02	R +0.001 -0.003	Lc mm	L mm	d h5	AlTiSiN B273ATX
1	0.5R	1.5	50	4	●
1.5	0.75R	2.5	50	4	●
2	1R	3	50	6	●
2.5	1.25R	4	50	6	●
3	1.5R	4.5	70	6	●
4	2R	6	70	6	●
5	2.5R	7.5	80	6	●
6	3R	9	80	6	●
8	4R	12	100	8	●
10	5R	15	100	10	●
12	6R	18	110	12	●

Finishing

Work Material		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.7 Hardened Steel (56~68HRC)	
Vc m/min		130		120		90	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B272ATX-R0.25	0.5	20,000	700	17,000	650	17,000	600
B272ATX/B273ATX-R0.5	1	20,000	800	15,000	750	15,000	750
B272ATX/B273ATX-R0.75	1.5	18,000	1,400	15,000	900	14,000	900
B272ATX/B273ATX-R1	2	15,000	1,600	14,000	1,200	14,000	1,260
B273ATX-R1.25	2.5	14,000	1,700	13,000	1,500	10,000	1,200
B272ATX/B273ATX-R1.5	3	13,000	1,700	12,500	1,500	10,000	1,200
B272ATX/B273ATX-R2	4	11,000	1,680	10,000	1,560	7,200	1,080
B272ATX/B273ATX-R2.5	5	10,000	1,600	9,600	1,440	6,800	1,080
B272ATX/B273ATX-R3	6	6,900	1,450	6,400	1,280	4,800	960
B272ATX/B273ATX-R4	8	5,200	1,200	4,800	1,060	3,600	790
B272ATX/B273ATX-R5	10	4,100	1,030	3,800	910	2,900	700
B272ATX/B273ATX-R6	12	3,500	910	3,200	800	2,400	600
(mm) 		ap:0.02D		ap:0.02D		ap:0.02D	
		ae:0.02D		ae:0.02D		ae:0.02D	

High-speed machining

Work Material		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.7 Hardened Steel (56~68HRC)	
Vc m/min		235		130		115	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B272ATX-R0.25	0.5	50,000	1,450	40,000	1,100	40,000	900
B272ATX/B273ATX-R0.5	1	30,000	1,700	24,000	2,000	21,000	1,700
B272ATX/B273ATX-R0.75	1.5	30,000	2,400	17,000	2,000	15,000	1,700
B272ATX/B273ATX-R1	2	28,000	2,800	14,000	2,100	12,200	1,800
B273ATX-R1.25	2.5	24,000	2,850	12,500	2,100	10,500	1,800
B272ATX/B273ATX-R1.5	3	21,000	3,000	10,500	2,200	9,000	1,750
B272ATX/B273ATX-R2	4	18,000	3,200	9,000	2,300	7,900	2,000
B272ATX/B273ATX-R2.5	5	15,500	3,300	7,800	2,500	6,800	2,000
B272ATX/B273ATX-R3	6	13,000	3,450	6,500	2,500	5,700	2,200
B272ATX/B273ATX-R4	8	9,500	3,000	5,200	2,100	4,500	1,900
B272ATX/B273ATX-R5	10	7,500	2,500	4,200	1,800	3,700	1,700
B272ATX/B273ATX-R6	12	6,200	2,000	3,600	1,700	3,100	1,450
(mm) 		ap:0.02D		ap:0.02D		ap:0.02D	
		ae:0.02D		ae:0.02D		ae:0.02D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

B251TX

Ball Nose End Mills

SMG Carbide

AlTiSiN TX

25°

2

N

75°

Type of Operation

Work Material

P	H	M	K	N	S
	●				

H	<48HRC Hardened Steel
H	<56HRC Hardened Steel
H	<68HRC Hardened Steel

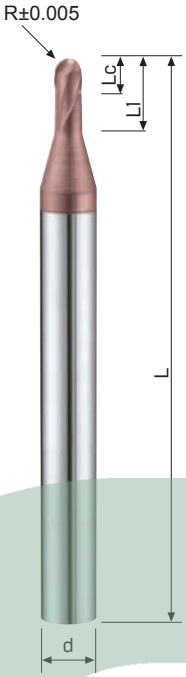
Feature of product:

Ball Nose Short Groove End Mills-Micro.

Using SMG carbide material and Nano multilayer coating enable to enhance lubrication and wear resistance.

S shape ball nose geometry with small cutting edge design enable to keep longer tool life.

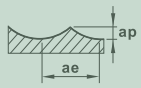
The smallest diameter up to 0.1mm, suitable to work on high hardness and high precision mold process.



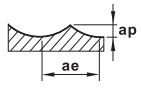
Code No. B251TX-Dc

Dc 0 -0.02	R ±0.005	Lc mm	L mm	d h6	Ll mm	AlTiSiN B251TX
0.1	0.05R	0.1	50	4	0.3	●
0.2	0.1R	0.2	50	4	0.5	●
0.3	0.15R	0.3	50	4	0.8	●
0.4	0.2R	0.4	50	4	1	●
0.5	0.25R	0.5	50	4	1.3	●
0.6	0.3R	0.6	50	4	1.5	●
0.8	0.4R	0.8	50	4	2	●
1	0.5R	1	50	4	2.5	●
1.5	0.75R	1.5	50	4	3.8	●
2	1R	2	50	6	5	●
3	1.5R	3	60	6	8	●
4	2R	4	60	6	10	●
5	2.5R	5	60	6	12	●
6	3R	6	60	6	15	●

Finishing

Work Material		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.7 Hardened Steel (56~68HRC)	
Vc m/min		130		120		90	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B251TX-R0.15	0.3	40,000	500	30,000	400	30,000	350
B251TX-R0.2	0.4	40,000	500	30,000	400	30,000	350
B251TX-R0.25	0.5	40,000	600	30,000	500	30,000	400
B251TX-R0.3	0.6	30,000	600	30,000	500	30,000	500
B251TX-R0.4	0.8	30,000	700	20,000	600	30,000	600
B251TX-R0.5	1	20,000	800	15,000	750	15,000	750
B251TX-R0.75	1.5	18,000	1,400	15,000	900	14,000	900
B251TX-R1	2	15,000	1,600	14,000	1,200	14,000	1,260
B251TX-R1.5	3	13,000	1,700	12,500	1,500	10,000	1,200
B251TX-R2	4	11,000	1,680	10,000	1,560	7,200	1,080
B251TX-R2.5	5	10,000	1,600	9,600	1,440	6,800	1,080
B251TX-R3	6	6,900	1,450	6,400	1,280	4,800	960
(mm) 		ap:0.02D		ap:0.02D		ap:0.02D	
		ae:0.02D		ae:0.02D		ae:0.02D	

High-speed machining

Work Material		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.7 Hardened Steel (56~68HRC)	
Vc m/min		200		175		120	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B251TX-R0.15	0.3	50,000	950	40,000	720	40,000	600
B251TX-R0.2	0.4	50,000	1,200	40,000	900	40,000	800
B251TX-R0.25	0.5	50,000	1,400	40,000	1,000	40,000	930
B251TX-R0.3	0.6	50,000	1,600	40,000	1,200	40,000	1,300
B251TX-R0.4	0.8	50,000	2,000	40,000	1,500	40,000	1,400
B251TX-R0.5	1	50,000	2,500	40,000	1,900	32,000	1,400
B251TX-R0.75	1.5	46,000	3,000	32,000	2,000	25,000	1,600
B251TX-R1	2	35,000	3,300	25,000	2,500	20,000	1,750
B251TX-R1.5	3	23,000	3,200	19,000	2,500	13,000	1,800
B251TX-R2	4	17,500	3,300	14,000	2,500	9,800	1,600
B251TX-R2.5	5	14,000	3,300	11,000	2,500	7,900	1,700
B251TX-R3	6	11,500	3,000	9,500	2,500	6,500	1,700
(mm) 		ap:0.02D		ap:0.02D		ap:0.02D	
		ae:0.02D		ae:0.02D		ae:0.02D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

B261TX

Ball Nose End Mills

SMG Carbide

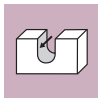
AlTiSiN TX

15°

2

N 71°30'

Type of Operation







Work Material

P	H	M	K	N	S
	●				

H	<48HRC Hardened Steel
H	<56HRC Hardened Steel
H	<68HRC Hardened Steel

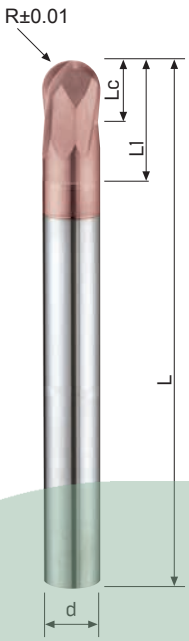
Feature of product:

Ball Nose End Mills with Standard & Long Length- 2 Flutes

Using SMG carbide material and Nano multilayer coating enable to enhance lubrication and wear resistance.

S shape ball nose geometry with small cutting edge design enable to keep longer tool life.

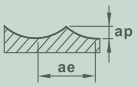
Suitable to work on high hardness and high precision mold process.



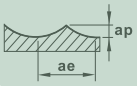
Code No. B261TX-Dc

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	L1 mm	AlTiSiN B261TX
1	0.5R	1	50	4	2	●
1.5	0.75R	1.5	50	4	3	●
2	1R	2	60	6	4	●
3	1.5R	3	70	6	6	●
4	2R	4	70	6	8	●
5	2.5R	5	80	6	10	●
6	3R	6	80	6	12	●
8	4R	8	100	8	16	●
10	5R	10	100	10	20	●
12	6R	12	110	12	24	●

Finishing

Work Material		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.7 Hardened Steel (56~68HRC)	
Vc m/min		230		200		180	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B261TX-R0.5	1	40,000	1,000	31,500	800	23,000	600
B261TX-R0.75	1.5	34,000	1,000	26,000	800	19,200	600
B261TX-R1	2	26,500	1,300	22,000	1,000	16,200	800
B261TX-R1.5	3	25,500	2,300	21,000	1,800	15,500	1,500
B261TX-R2	4	21,000	2,350	17,300	1,800	12,800	1,400
B261TX-R2.5	5	18,000	2,300	14,800	1,850	11,000	1,380
B261TX-R3	6	12,000	2,300	10,500	2,000	9,500	1,800
B261TX-R4	8	9,100	1,700	7,900	1,500	7,100	1,300
B261TX-R5	10	7,300	1,400	6,300	1,200	5,700	1,000
B261TX-R6	12	6,000	1,200	5,300	1,000	4,700	950
(mm) 		ap:0.02D		ap:0.02D		ap:0.02D	
		ae:0.02D		ae:0.02D		ae:0.02D	

High-speed machining

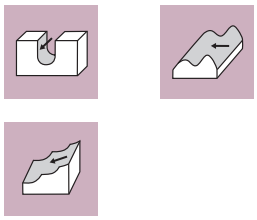
Work Material		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.7 Hardened Steel (56~68HRC)	
Vc m/min		320		250		180	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B261TX-R3	6	17,500	4,000	13,000	3,000	10,000	2,000
B261TX-R4	8	13,000	3,000	9,800	2,300	7,500	1,500
B261TX-R5	10	10,500	2,500	7,900	1,800	6,000	1,200
B261TX-R6	12	8,700	2,000	6,600	1,500	5,000	1,000
(mm) 		ap:0.02D		ap:0.02D		ap:0.02D	
		ae:0.02D		ae:0.02D		ae:0.02D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

B253TX / B254TX

Ball Nose End Mills - 3 Flutes / 4 Flutes

Type of Operation



Work Material

P	H	M	K	N	S
	●		○		○

H	<48HRC Hardened Steel
H	<56HRC Hardened Steel
H	<68HRC Hardened Steel
K	Cast Iron
S	Titanium
S	Nickel
S	High Temp Alloys

Feature of product:

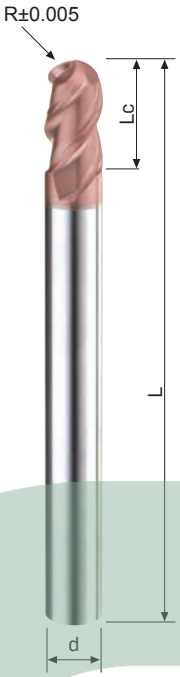
B253TX Ball Nose End Mills- 3 Flutes

B254TX Ball Nose End Mills- 4 Flutes

Using SMG carbide material and Nano multilayer coating enable to enhance lubrication and wear resistance.

S shape ball nose geometry with small cutting edge design enable to keep tool life longer.

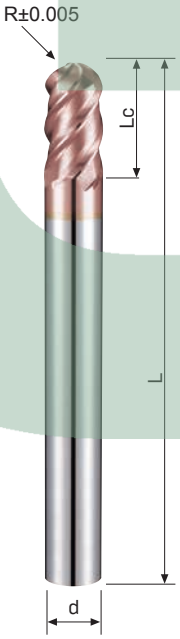
High radius precision of ball nose suitable to work on high hardness and high precision mold process.



SMG Carbide | AlTiSiN TX | 45° | 3 | N γ-10° | U

Code No. B253TX-Dc

Dc 0 -0.02	R ±0.005	Lc mm	L mm	d h6	AlTiSiN B253TX
6	3	12	80	6	●
8	4	14	100	8	●
10	5	18	100	10	●
12	6	22	110	12	●

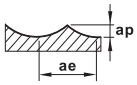


SMG Carbide | AlTiSiN TX | 45° | 4 | N γ-10° | U

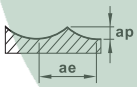
Code No. B254TX-Dc

Dc 0 -0.02	R ±0.005	Lc mm	L mm	d h6	AlTiSiN B254TX
3	1.5R	6	70	6	●
4	2R	8	70	6	●
5	2.5R	10	80	6	●
6	3R	12	80	6	●
8	4R	14	100	8	●
10	5R	18	100	10	●
12	6R	22	110	12	●
16	8R	30	140	16	●
20	10R	38	160	20	●

High feed machining

Work Material		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.7 Hardened Steel (56~68HRC)	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B253TX-R3	6	8000~3200	2700~1200	6400~2500	1900~830	4800~1900	1500~700
B253TX-R4	8	6000~2400	2600~1000	4800~1900	1900~800	3800~1500	1500~600
B253TX-R5	10	4800~1900	3400~1400	3800~1500	2400~1000	3000~1000	1600~800
B253TX-R6	12	4000~1600	2400~1000	3200~1300	1700~1100	2200~800	1350~600
(mm) 		ap:0.075~0.015		ap:0.075~0.015		ap:0.075~0.015	
		ae:0.2~0.18		ae:0.2~0.18		ae:0.2~0.18	

Finishing

Work Material		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.7 Hardened Steel (56~68HRC)	
Vc m/min		280		220		200	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B254TX-R1.5	3	29,000	6,560	23,000	4,500	21,100	4,240
B254TX-R2	4	22,000	6,250	17,100	4,000	15,800	3,520
B254TX-R2.5	5	17,500	5,600	13,600	3,500	12,700	3,200
B254TX-R3	6	15,000	5,000	11,400	3,000	10,600	2,500
B254TX-R4	8	11,000	4,200	8,550	2,500	7,950	2,250
B254TX-R5	10	9,000	3,500	6,850	2,150	6,350	2,000
B254TX-R6	12	7,500	3,000	5,700	2,000	5,300	1,900
B254TX-R8	16	5,500	3,000	4,280	2,000	4,000	1,900
B254TX-R10	20	4,500	3,000	3,500	2,000	3,200	1,900
(mm) 		ap:0.02D		ap:0.02D		ap:0.02D	
		ae:0.05D		ae:0.05D		ae:0.05D	

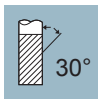
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

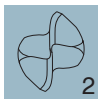
B250TX

Ball Nose End Mills

UMG Carbide

AlTiSiN TX

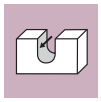








Type of Operation







Work Material

P	H	M	K	N	S
●	●		○		

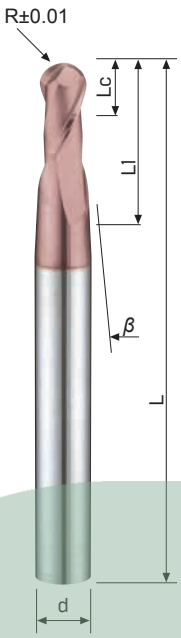
P	Steel
H	<38HRC Hardened Steel
H	<48HRC Hardened Steel
H	<56HRC Hardened Steel
H	<68HRC Hardened Steel
K	Cast Iron

Feature of product:

Ball Nose End Mills- 2 Flutes

Using UMG carbide material and Nano multilayer coating enable to enhance lubrication and wear resistance.

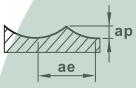
S shape ball nose geometry with side taper cutting edge design, suitable to work on high hardness and high precision mold process.



Code No. B250TX-R×β

R ±0.01	β on Side	Lc mm	L mm	d h6	L1 mm	AlTiSiN B250TX
0.5R	1° 30'	2	60	6	23	●
0.5R	5°	2	60	6	23	●
0.5R	3°	2	80	6	42	●
1R	1° 30'	4	60	6	23	●
1R	5°	4	60	6	23	●
1R	3°	4	80	6	41	●
1.5R	3°	6	70	6	32	●
1.5R	1° 30'	6	90	6	52	●
2R	3°	8	70	6	28	●
2R	1° 30'	8	90	6	49	●
2.5R	3°	10	90	8	41	●
2.5R	1° 30'	10	110	8	61	●
3R	3°	12	90	8	34	●
3R	1° 30'	12	110	8	53	●
4R	3°	14	100	10	36	●
4R	1° 30'	14	120	10	55	●
5R	3°	18	110	12	40	●
5R	1° 30'	18	130	12	59	●
6R	3°	22	140	16	63	●
6R	1° 30'	22	160	16	83	●

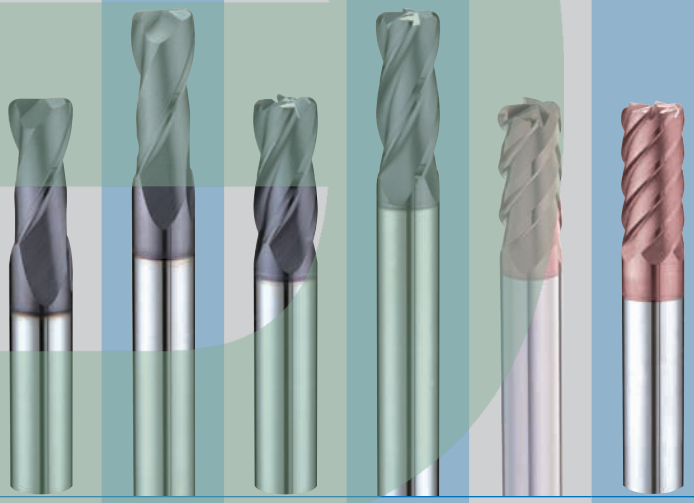
General processing

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)	
Vc m/min		85		85		65		65		45		30	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B250TX-R0.5	1	20,000	125	20,000	125	15,000	120	15,000	120	11,000	65	7,100	30
B250TX-R1	2	11,000	130	11,000	130	85,000	120	85,000	120	6,400	70	4,000	40
B250TX-R1.5	3	5,900	230	5,900	230	5,000	190	5,000	190	3,500	90	2,150	45
B250TX-R2	4	5,300	310	5,300	310	4,200	230	4,200	230	2,950	90	1,850	55
B250TX-R2.5	5	4,400	305	4,400	305	3,500	230	3,500	230	2,450	100	1,500	55
B250TX-R3	6	3,300	290	3,300	290	2,600	230	2,600	230	1,850	95	1,200	50
B250TX-R4	8	2,600	275	2,600	275	2,100	220	2,100	220	1,450	95	950	50
B250TX-R5	10	2,200	275	2,200	275	1,750	220	1,750	220	1,200	90	800	45
B250TX-R6	12	2,650	700	2,650	700	2,100	490	2,100	490	1,850	430	2,100	490
(mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.02D		ae:0.02D		ae:0.02D		ae:0.02D		ae:0.02D		ae:0.02D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.



End Mills With Corner Radius

Page	215	217	219	221	223	225
Appearance						
Code No	B255X	B257X	B256X	B258X	B286TX	B259TX
Carbide	UMG Carbide	UMG Carbide	UMG Carbide	UMG Carbide	SMG Carbide	SMG Carbide
Coating	AlTiN X-NaNo	AlTiN X-NaNo	AlTiN X-NaNo	AlTiN X-NaNo	AlTiSiN TX	AlTiSiN TX
Helix Angle	 30°	 30	 30°	 30°	 45°	 45°
No.of Flutes	 2	 2	 4	 4	 4	 6

225	227	229
		
B269TX	B271TX	E105X
SMG Carbide	SMG Carbide	UMG Carbide
AlTiSiN TX	AlTiSiN TX	AlTiN X-NaNo
 45°	 0°	 30°
 6	 4	 2

B255X

End Mills With Corner Radius

UMG Carbide

AlTiN X-NaNo

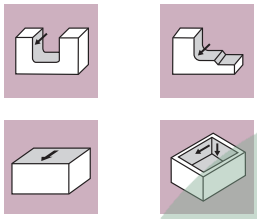
30°

2

N 75°

R

Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	●	○	

P Steel

H <38HRC Hardened Steel

H <48HRC Hardened Steel

H <56HRC Hardened Steel

M Stainless Steel

K Cast Iron

N Copper

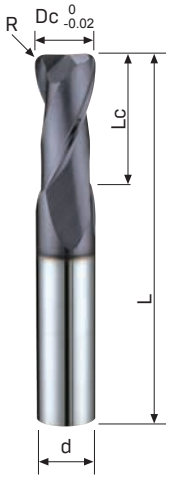
Feature of product:

End Mills with Corner Radius- 2 Flutes

Widely used in roughing 3D curved profile and normal processing.

Coating with AlTiN to have perfect wear resistance.

Suitable for various steel materials up to HRC56.



Code No. B255X-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiN B255X
1	R0.1	3	50	4	●
1	R0.2	3	50	4	●
1	R0.3	3	50	4	●
1.5	R0.1	5	50	4	●
1.5	R0.2	5	50	4	●
1.5	R0.3	5	50	4	●
1.5	R0.5	5	50	4	●
2	R0.1	6	50	4	●
2	R0.2	6	50	4	●
2	R0.3	6	50	4	●
2	R0.5	6	50	4	●
2.5	R0.1	8	50	4	●
2.5	R0.2	8	50	4	●
2.5	R0.3	8	50	4	●
2.5	R0.5	8	50	4	●
3A	R0.1	8	50	4	●
3A	R0.2	8	50	4	●
3A	R0.3	8	50	4	●
3A	R0.5	8	50	4	●
4A	R0.1	11	50	4	●
4A	R0.2	11	50	4	●
4A	R0.3	11	50	4	●
4A	R0.5	11	50	4	●
4A	R1	11	50	4	●
3	R0.1	8	50	6	●
3	R0.2	8	50	6	●
3	R0.3	8	50	6	●
3	R0.5	8	50	6	●
4	R0.1	11	50	6	●
4	R0.2	11	50	6	●
4	R0.3	11	50	6	●
4	R0.5	11	50	6	●
4	R1	11	50	6	●
5	R0.2	13	50	6	●
5	R0.3	13	50	6	●
5	R0.5	13	50	6	●
5	R1	13	50	6	●
6	R0.2	16	50	6	●
6	R0.3	16	50	6	●
6	R0.5	16	50	6	●
6	R1	16	50	6	●
6	R1.5	16	50	6	●
6	R2	16	50	6	●
8	R0.2	20	60	8	●
8	R0.3	20	60	8	●
8	R0.5	20	60	8	●
8	R1	20	60	8	●
8	R1.5	20	60	8	●
8	R2	20	60	8	●
8	R3	20	60	8	●
10	R0.2	22	72	10	●
10	R0.3	22	72	10	●
10	R0.5	22	72	10	●
10	R1	22	72	10	●
10	R1.5	22	72	10	●
10	R2	22	72	10	●
10	R3	22	72	10	●
12	R0.2	26	75	12	●
12	R0.3	26	75	12	●
12	R0.5	26	75	12	●
12	R1	26	75	12	●
12	R1.5	26	75	12	●
12	R2	26	75	12	●
12	R3	26	75	12	●
16	R0.5	38	100	16	●
16	R1	38	100	16	●
16	R1.5	38	100	16	●
16	R2	38	100	16	●
16	R3	38	100	16	●
16	R4	38	100	16	●
20	R0.5	38	100	20	●
20	R1	38	100	20	●
20	R1.5	38	100	20	●
20	R2	38	100	20	●
20	R3	38	100	20	●
20	R4	38	100	20	●
20	R5	38	100	20	●

Slotting

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.9 Cast Iron	
Vc m/min		Ø1.0~3.0 62~70 Ø3.1~20 75~80		Ø1.0~3.0 62~70 Ø3.1~20 75~80		Ø1.0~3.0 62~70 Ø3.1~20 75~80		Ø1.0~3.0 40~50 Ø3.1~20 53~55		Ø1.0~3.0 34~40 Ø3.1~20 44~50		Ø1.0~3.0 22~25 Ø3.1~20 28~30		Ø1.0~3.0 62~70 Ø3.1~20 75~80	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B255X-1	1	19,500	120	19,500	120	14,500	120	12,500	85	11,000	65	7,000	30	19,500	120
B255X-1.5	1.5	14,000	120	14,000	120	10,500	120	8,500	85	8,000	65	5,000	40	14,000	120
B255X-2	2	11,000	130	11,000	130	8,350	120	7,000	85	6,300	70	3,900	40	11,000	130
B255X-2.5	2.5	9,900	115	9,900	115	7,000	130	6,000	85	5,000	70	3,500	40	9,900	115
B255X-3	3	7,500	190	7,500	190	6,350	150	5,300	100	4,350	75	2,700	40	7,500	190
B255X-4	4	6,000	225	6,000	225	4,900	180	4,200	120	3,500	90	2,200	50	6,000	225
B255X-5	5	5,200	300	5,200	300	4,300	230	3,500	125	3,000	100	1,900	55	5,200	300
B255X-6	6	4,500	300	4,500	300	3,600	230	2,900	120	2,500	100	1,600	55	4,500	300
B255X-8	8	3,300	280	3,300	280	2,700	230	2,200	120	1,900	100	1,100	50	3,300	280
B255X-10	10	2,600	270	2,600	270	2,100	220	1,700	120	1,500	90	950	50	2,600	270
B255X-12	12	2,200	270	2,200	270	1,800	210	1,450	125	1,200	95	800	45	2,200	270
B255X-16	16	1,600	250	1,600	250	1,350	190	1,100	100	950	85	600	35	1,600	250
B255X-20	20	1,300	200	1,300	200	1,050	150	880	75	750	65	480	30	1,300	200
(mm) 		ap:≤3 0.3D >3 0.5D		ap:≤3 0.3D >3 0.5D		ap:≤3 0.3D >3 0.5D		ap:≤3 0.3D >3 0.5D		ap:≤3 0.3D >3 0.5D		ap：0.05D		ap:≤3 0.3D >3 0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

B257X

End Mills With Corner Radius

UMG Carbide

AlTiN X-NaNo

30°

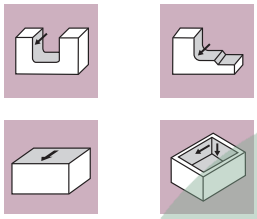
2

N

γ5°

R

Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	●	○	

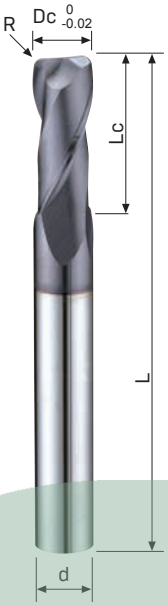
- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Copper

Feature of product:

End Mills with Corner Radius- 2 Flutes Long Length.

Widely used in roughing 3D curved profile and normal processing. Coating with AlTiN to have perfect wear resistance.

Suitable for various steel materials up to HRC56.



Code No. B257X-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiN B257X
3	R0.1	10	50	3	●
3	R0.2	10	50	3	●
3	R0.3	10	50	3	●
3	R0.5	10	50	3	●
4	R0.1	15	60	4	●
4	R0.2	15	60	4	●
4	R0.3	15	60	4	●
4	R0.5	15	60	4	●
4	R1	15	60	4	●
5	R0.2	18	70	5	●
5	R0.3	18	70	5	●
5	R0.5	18	70	5	●
5	R1	18	70	5	●
6	R0.2	20	80	6	●
6	R0.3	20	80	6	●
6	R0.5	20	80	6	●
6	R1	20	80	6	●
6	R1.5	20	80	6	●
6	R2	20	80	6	●
8	R0.2	25	100	8	●
8	R0.3	25	100	8	●
8	R0.5	25	100	8	●
8	R1	25	100	8	●
8	R1.5	25	100	8	●
8	R2	25	100	8	●
8	R3	25	100	8	●
10	R0.2	30	100	10	●
10	R0.3	30	100	10	●
10	R0.5	30	100	10	●
10	R1	30	100	10	●
10	R1.5	30	100	10	●
10	R2	30	100	10	●
10	R3	30	100	10	●
12	R0.2	40	110	12	●
12	R0.3	40	110	12	●
12	R0.5	40	110	12	●
12	R1	40	110	12	●
12	R1.5	40	110	12	●
12	R2	40	110	12	●
12	R3	40	110	12	●
16	R0.5	50	140	16	●
16	R1	50	140	16	●
16	R1.5	50	140	16	●
16	R2	50	140	16	●
16	R3	50	140	16	●
16	R4	50	140	16	●
20	R0.5	60	160	20	●
20	R1	60	160	20	●
20	R1.5	60	160	20	●
20	R2	60	160	20	●
20	R3	60	160	20	●
20	R4	60	160	20	●
20	R5	60	160	20	●

Slotting

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.9 Cast Iron	
Vc m/min		80		80		80		55		50		30		80	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B257X-3	3	7,500	190	7,500	190	6,350	150	5,300	100	4,350	75	2,700	40	7,500	190
B257X-4	4	6,000	225	6,000	225	4,900	180	4,200	120	3,500	90	2,200	50	6,000	225
B257X-5	5	5,200	300	5,200	300	4,300	230	3,500	125	3,000	100	1,900	55	5,200	300
B257X-6	6	4,500	300	4,500	300	3,600	230	2,900	120	2,500	100	1,600	55	4,500	300
B257X-8	8	3,300	280	3,300	280	2,700	230	2,200	120	1,900	100	1,100	50	3,300	280
B257X-10	10	2,600	270	2,600	270	2,100	220	1,700	120	1,500	90	950	50	2,600	270
B257X-12	12	2,200	270	2,200	270	1,800	210	1,450	125	1,200	95	800	45	2,200	270
B257X-16	16	1,600	250	1,600	250	1,350	190	1,100	100	950	85	600	35	1,600	250
B257X-20	20	1,300	200	1,300	200	1,050	150	880	75	750	65	480	30	1,300	200
(mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap：0.05D		ap:0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

B256X

End Mills With Corner Radius

UMG Carbide

AlTiN X-NaNo

30°

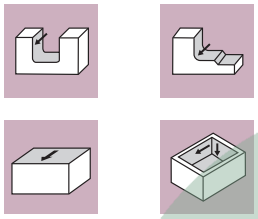
4

N

γ5°

R

Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	●	○	

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Copper

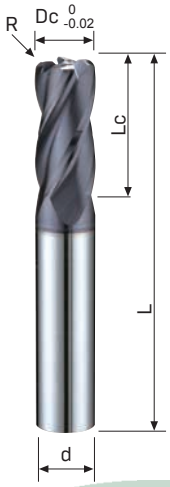
Feature of product:

End Mills with Corner Radius- 4 Flutes

Widely used in roughing and finishing 3D curved profile.

Coating with AlTiN to have perfect wear resistance.

Suitable for various steel materials up to HRC56.

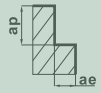


Code No. B256X-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiN B256X
1	R0.1	3	50	4	●
1	R0.2	3	50	4	●
1	R0.3	3	50	4	●
1.5	R0.1	5	50	4	●
1.5	R0.2	5	50	4	●
1.5	R0.3	5	50	4	●
1.5	R0.5	5	50	4	●
2	R0.1	6	50	4	●
2	R0.2	6	50	4	●
2	R0.3	6	50	4	●
2	R0.5	6	50	4	●
2.5	R0.1	8	50	4	●
2.5	R0.2	8	50	4	●
2.5	R0.3	8	50	4	●
2.5	R0.5	8	50	4	●
3A	R0.1	8	50	4	●
3A	R0.2	8	50	4	●
3A	R0.3	8	50	4	●
3A	R0.5	8	50	4	●
4A	R0.1	11	50	4	●
4A	R0.2	11	50	4	●
4A	R0.3	11	50	4	●
4A	R0.5	11	50	4	●
4A	R1	11	50	4	●
3	R0.1	8	50	6	●
3	R0.2	8	50	6	●
3	R0.3	8	50	6	●
3	R0.5	8	50	6	●
4	R0.1	11	50	6	●
4	R0.2	11	50	6	●
4	R0.3	11	50	6	●
4	R0.5	11	50	6	●
4	R1	11	50	6	●
5	R0.2	13	50	6	●
5	R0.3	13	50	6	●
5	R0.5	13	50	6	●
5	R1	13	50	6	●
6	R0.2	16	50	6	●
6	R0.3	16	50	6	●
6	R0.5	16	50	6	●
6	R1	16	50	6	●
6	R1.5	16	50	6	●
6	R2	16	50	6	●
8	R0.2	20	60	8	●
8	R0.3	20	60	8	●
8	R0.5	20	60	8	●
8	R1	20	60	8	●
8	R1.5	20	60	8	●
8	R2	20	60	8	●
8	R3	20	60	8	●
10	R0.2	22	72	10	●
10	R0.3	22	72	10	●
10	R0.5	22	72	10	●
10	R1	22	72	10	●
10	R1.5	22	72	10	●
10	R2	22	72	10	●

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiN B256X
10	R3	22	72	10	●
12	R0.2	26	75	12	●
12	R0.3	26	75	12	●
12	R0.5	26	75	12	●
12	R1	26	75	12	●
12	R1.5	26	75	12	●
12	R2	26	75	12	●
12	R3	26	75	12	●
16	R0.5	38	100	16	●
16	R1	38	100	16	●
16	R1.5	38	100	16	●
16	R2	38	100	16	●
16	R3	38	100	16	●
16	R4	38	100	16	●
20	R0.5	38	100	20	●
20	R1	38	100	20	●
20	R1.5	38	100	20	●
20	R2	38	100	20	●
20	R3	38	100	20	●
20	R4	38	100	20	●
20	R5	38	100	20	●

Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.9 Cast Iron	
Vc m/min		Ø1.0~2.5 60~80 Ø3.0~20 80~85		Ø1.0~2.5 60~80 Ø3.0~20 80~85		Ø1.0~2.5 47~70 Ø3.0~20 70~75		Ø1.0~1.5 47~57 Ø1.5~20 57~70		Ø1.0~2.5 30~47 Ø3.0~20 50~60		Ø1.0~20 22~30		Ø1.0~2.5 60~80 Ø3.0~20 80~85	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B256X-1	1	20,000	240	20,000	240	15,000	215	15,000	215	10,000	85	7,100	40	20,000	240
B256X-1.5	1.5	13,500	245	13,500	245	12,000	215	12,000	215	8,000	90	5,100	50	13,500	245
B256X-2	2	13,000	300	13,000	300	11,000	280	11,000	280	7,000	110	3,900	60	13,000	300
B256X-2.5	2.5	10,000	320	10,000	320	9,000	300	9,000	300	6,000	120	3,000	60	10,000	320
B256X-3	3	8,800	500	8,800	500	7,200	350	7,200	350	5,300	125	2,700	60	8,800	500
B256X-4	4	6,600	530	6,600	530	5,500	360	5,500	360	4,200	130	2,200	70	6,600	530
B256X-5	5	5,300	600	5,300	600	4,350	420	4,350	420	3,500	140	1,900	75	5,300	600
B256X-6	6	4,500	610	4,500	610	3,700	425	3,700	425	2,900	145	1,500	70	4,500	610
B256X-8	8	3,300	590	3,300	590	2,700	425	2,700	425	2,200	145	1,100	65	3,300	590
B256X-10	10	2,600	580	2,600	580	2,200	420	2,200	420	1,700	145	950	65	2,600	580
B256X-12	12	2,200	580	2,200	580	1,800	420	1,800	420	1,400	140	800	60	2,200	580
B256X-16	16	1,600	530	1,600	530	1,300	400	1,300	400	1,200	130	600	45	1,600	530
B256X-20	20	1,300	510	1,300	510	1,100	370	1,100	370	890	110	470	35	1,300	510
(mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:<3 0.05D ≥3 0.1D		ae:<3 0.05D ≥3 0.1D		ae:<3 0.05D ≥3 0.1D		ae:<3 0.05D ≥3 0.1D		ae:<3 0.05D ≥3 0.1D		ae:0.02D		ae:<3 0.05D ≥3 0.1D	

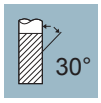
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

B258X

End Mills With Corner Radius

UMG Carbide

AlTiN X-NaNo

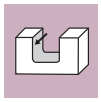


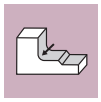


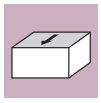


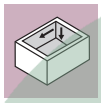


Type of Operation









Work Material

P	H	M	K	N	S
●	●	○	●	○	

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Copper

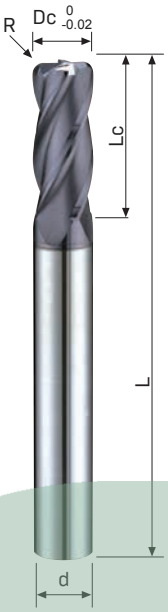
Feature of product:

End Mills with Corner Radius- 4 Flutes Long Length.

Widely used in roughing and finishing 3D curved profile.

Coating with AlTiN to have perfect wear resistance.

Suitable for various steel materials up to HRC56.



Code No. B258X-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiN B258X
3	R0.1	10	50	3	●
3	R0.2	10	50	3	●
3	R0.3	10	50	3	●
3	R0.5	10	50	3	●
4	R0.1	15	60	4	●
4	R0.2	15	60	4	●
4	R0.3	15	60	4	●
4	R0.5	15	60	4	●
4	R1	15	60	4	●
5	R0.2	18	70	5	●
5	R0.3	18	70	5	●
5	R0.5	18	70	5	●
5	R1	18	70	5	●
6	R0.2	20	80	6	●
6	R0.3	20	80	6	●
6	R0.5	20	80	6	●
6	R1	20	80	6	●
6	R1.5	20	80	6	●
6	R2	20	80	6	●
8	R0.2	25	100	8	●
8	R0.3	25	100	8	●
8	R0.5	25	100	8	●
8	R1	25	100	8	●
8	R1.5	25	100	8	●
8	R2	25	100	8	●
8	R3	25	100	8	●
10	R0.2	30	100	10	●
10	R0.3	30	100	10	●
10	R0.5	30	100	10	●
10	R1	30	100	10	●
10	R1.5	30	100	10	●
10	R2	30	100	10	●
10	R3	30	100	10	●
12	R0.2	40	110	12	●
12	R0.3	40	110	12	●
12	R0.5	40	110	12	●
12	R1	40	110	12	●
12	R1.5	40	110	12	●
12	R2	40	110	12	●
12	R3	40	110	12	●
16	R0.5	50	140	16	●
16	R1	50	140	16	●
16	R1.5	50	140	16	●
16	R2	50	140	16	●
16	R3	50	140	16	●
16	R4	50	140	16	●
20	R0.5	60	160	20	●
20	R1	60	160	20	●
20	R1.5	60	160	20	●
20	R2	60	160	20	●
20	R3	60	160	20	●
20	R4	60	160	20	●
20	R5	60	160	20	●

Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.9 Cast Iron	
Vc m/min		85		85		75		70		60		30		85	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B258X-3	3	8,800	500	8,800	500	7,200	350	7,200	350	5,300	125	2,700	60	8,800	500
B258X-4	4	6,600	530	6,600	530	5,500	360	5,500	360	4,200	130	2,200	70	6,600	530
B258X-5	5	5,300	600	5,300	600	4,350	420	4,350	420	3,500	140	1,900	75	5,300	600
B258X-6	6	4,500	610	4,500	610	3,700	425	3,700	425	2,900	145	1,500	70	4,500	610
B258X-8	8	3,300	590	3,300	590	2,700	425	2,700	425	2,200	145	1,100	65	3,300	590
B258X-10	10	2,600	580	2,600	580	2,200	420	2,200	420	1,700	145	950	65	2,600	580
B258X-12	12	2,200	580	2,200	580	1,800	420	1,800	420	1,400	140	800	60	2,200	580
B258X-16	16	1,600	530	1,600	530	1,300	400	1,300	400	1,200	130	600	45	1,600	530
B258X-20	20	1,300	510	1,300	510	1,100	370	1,100	370	890	110	470	35	1,300	510
(mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.02D		ae:0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

B286TX

End Mills With Corner Radius

SMG Carbide

AlTiSiN TX

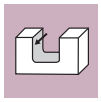


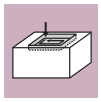


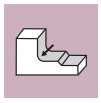


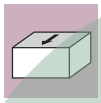


Type of Operation





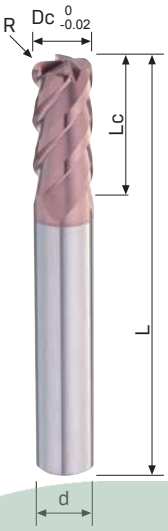




Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **H** <68HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys



Code No. B286TX-Dc×R

Dc 0 -0.02	R +0.015 0	Lc mm	L mm	d h6	AlTiSiN B286TX
1	R0.2	3	50	4	●
1.5	R0.2	5	50	4	●
2	R0.2	6	50	4	●
2	R0.5	6	50	4	●
2.5	R0.2	8	50	4	●
3A	R0.2	8	50	4	●
3A	R0.5	8	50	4	●
4A	R0.2	11	50	4	●
4A	R0.5	11	50	4	●
4A	R1	11	50	4	●
3	R0.2	8	50	6	●
3	R0.5	8	50	6	●
4	R0.2	11	50	6	●
4	R0.5	11	50	6	●
4	R1	11	50	6	●
5	R0.2	13	50	6	●
5	R0.5	13	50	6	●
5	R1	13	50	6	●
6	R0.2	16	50	6	●
6	R0.3	16	50	6	●
6	R0.5	16	50	6	●
6	R1	16	50	6	●
8	R0.2	20	60	8	●
8	R0.3	20	60	8	●
8	R0.5	20	60	8	●
8	R1	20	60	8	●
8	R2	20	60	8	●
10	R0.2	22	72	10	●
10	R0.3	22	72	10	●
10	R0.5	22	72	10	●
10	R1	22	72	10	●
10	R2	22	72	10	●
10	R3	22	72	10	●
12	R0.5	26	75	12	●
12	R1	26	75	12	●
12	R2	26	75	12	●
12	R3	26	75	12	●
16	R1	38	100	16	●
16	R2	38	100	16	●
16	R3	38	100	16	●
20	R1	38	100	20	●
20	R2	38	100	20	●
20	R3	38	100	20	●

Feature of product:

High Performance End Mills with Corner Radius- 4 Flutes

Using SMG carbide material and coated multilayer nano coating to increase lubrication and wear resistance with good tool life.

High rigidity of the carbide center and the tool face is designed with smooth radius angle to reach high chip removal rate.

Widely used in roughing and finishing 3D curved profile.

Side Milling

Work Material		GR.1/GR.2/GR.3 Carbon Steel/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4/GR.5 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.7 Hardened Steel (56~68HRC)		GR.8 Stainless Steel		GR.9 Cast Iron	
Vc m/min		170		150		100		50		60		150	
Code No.	(Dc)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B286TX-1	1	54145	1083	47775	956	31850	637	8500	50	19110	382	47775	956
B286TX-1.5	1.5	36097	1155	31850	637	21233	425	6000	80	12740	408	31850	637
B286TX-2	2	27073	1624	23888	478	15925	319	4050	100	9555	573	23888	478
B286TX-3	3	18048	1444	15,800	1,200	10,500	820	3,800	120	6370	510	15,800	1,200
B286TX-4	4	13536	1624	12,000	1,300	8,000	800	2,650	135	4778	573	12,000	1,300
B286TX-5	5	10829	1733	9,500	1,300	6,300	850	2,250	140	3822	612	9,500	1,300
B286TX-6	6	9024	1805	8,000	1,200	5,300	820	2,200	175	3185	637	8,000	1,200
B286TX-8	8	6768	1624	6,000	1,100	4,000	750	1,650	185	2389	573	6,000	1,100
B286TX-10	10	5415	1516	4,800	1,100	3,200	745	1,300	165	1911	535	4,800	1,100
B286TX-12	12	4512	1444	4,000	1,065	2,700	740	1,100	145	1593	510	4,000	1,065
B286TX-16	16	3384	1218	3,000	1,000	2,000	730	840	170	1194	430	3,000	1,000
B286TX-20	20	2707	1083	2,400	955	1,600	700	670	170	956	382	2,400	955
(mm)		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D	
		ae:0.05D		ae:0.05D		ae:0.03D		ae:0.02D		ae:0.03D		ae:0.05D	

High Speed Side Milling

Work Material		GR.1/GR.2/GR.3 Carbon Steel/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4/GR.5 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.7 Hardened Steel (56~68HRC)		GR.8 Stainless Steel		GR.9 Cast Iron	
Vc m/min		250		200		150		100		100		200	
Code No.	(Dc)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B286TX-1	1	79625	1593	63700	700	47000	560	31850	380	31850	700	63700	700
B286TX-1.5	1.5	53083	1699	42400	850	31850	640	21200	430	21200	848	42400	850
B286TX-2	2	39813	2389	31850	1020	23900	956	16000	600	16000	960	31850	1020
B286TX-3	3	26542	2123	21233	850	15925	630	10617	424	10617	849	21233	850
B286TX-4	4	19906	2389	15925	900	11944	630	7963	477	7963	956	15925	900
B286TX-5	5	15925	2548	12740	1000	9555	650	6370	510	6370	1019	12740	1000
B286TX-6	6	13271	2654	10617	1200	7963	700	5308	530	5308	1062	10617	1200
B286TX-8	8	9953	2389	7963	1200	5972	700	3981	530	3981	956	7963	1200
B286TX-10	10	7963	2230	6370	850	4778	630	3185	420	3185	892	6370	850
B286TX-12	12	6635	2123	5308	850	3981	630	2654	420	2654	849	5308	850
B286TX-16	16	4977	1792	3981	900	2986	650	1991	420	1991	717	3981	900
B286TX-20	20	3981	1593	3185	900	2389	650	1593	420	1593	637	3185	900
(mm)		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D	
		ae:0.01D		ae:0.01D		ae:0.01D		ae:0.01D		ae:0.03D		ae:0.01D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

B259TX / B269TX

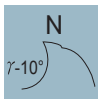
Finishing End Mills With Corner Radius

SMG Carbide

AlTiSiN TX

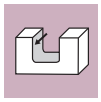


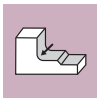


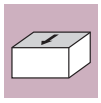


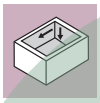


Type of Operation









Work Material

P	H	M	K	N	S
	●		○		

H	<48HRC Hardened Steel
H	<56HRC Hardened Steel
H	<68HRC Hardened Steel
K	Cast Iron

Feature of product:

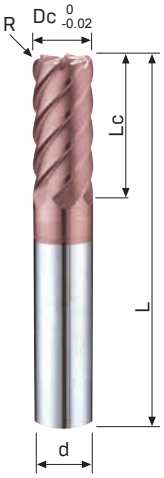
Finishing End Mills with Corner Radius- 6 Flutes Standard & Long Length.

Widely used in roughing and finishing 3D curved profile.

Good wear resistance and lubricating effect with Nano multilayer coating.

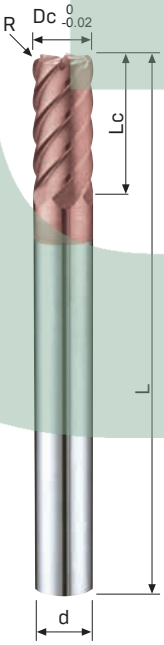
Designed with 6 flutes to have high central hardness.

Suitable for steel materials with high hardness.



Code No. B259TX-Dc×R

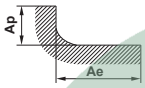
Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiSiN B259TX
6	R0.5	16	50	6	●
6	R1	16	50	6	●
8	R0.5	20	60	8	●
8	R1	20	60	8	●
10	R0.5	22	72	10	●
10	R1	22	72	10	●
12	R0.5	26	75	12	●
12	R1	26	75	12	●
16	R1	38	100	16	●
16	R2	38	100	16	●
20	R1	38	100	20	●
20	R2	38	100	20	●



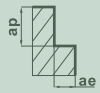
Code No. B269TX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiSiN B269TX
6	R0.5	16	80	6	●
6	R1	16	80	6	●
8	R0.5	20	100	8	●
8	R1	20	100	8	●
10	R0.5	22	100	10	●
10	R1	22	100	10	●
12	R0.5	26	110	12	●
12	R1	26	110	12	●
16	R1	38	140	16	●
16	R2	38	140	16	●
20	R1	38	160	20	●
20	R2	38	160	20	●

High feed cutting

Work Material		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.7 Hardened Steel (56~68HRC)		GR.9 Cast Iron	
Vc m/min		200		180		160		200	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B259TX/B269TX	6	10,617	2,548	9,555	2,293	8,493	2,038	10,617	2,548
B259TX/B269TX	8	7,963	2,389	7,166	2,150	6,370	2,293	7,963	2,389
B259TX/B269TX	10	6,370	3,058	5,733	2,752	5,096	2,446	6,370	3,058
B259TX/B269TX	12	5,308	3,185	4,778	2,867	4,247	2,548	5,308	3,185
B259TX/B269TX	16	3,981	2,867	3,583	2,580	3,185	2,293	3,981	2,867
B259TX/B269TX	20	3,185	2,293	2,867	2,064	2,548	1,835	3,185	2,293
(mm) 		ap:0.2×R		ap:0.2×R		ap:0.1×R		ap:0.2×R	
		ae:0.5D		ae:0.5D		ae:0.5D		ae:0.5D	

Side Milling

Work Material		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.7 Hardened Steel (56~68HRC)		GR.9 Cast Iron	
Vc m/min		150		100		90		145	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B259TX/B269TX-6	6	6,600	2,300	5,300	1,800	4,000	1,000	7,400	2,600
B259TX/B269TX-8	8	4,900	2,350	4,000	1,850	3,000	1,000	5,500	2,600
B259TX/B269TX-10	10	4,000	2,400	3,200	1,900	2,400	1,000	4,500	2,600
B259TX/B269TX-12	12	3,300	2,400	2,600	1,900	2,000	1,000	3,700	2,600
B259TX/B269TX-16	16	2,500	2,100	2,000	1,700	1,500	900	2,800	2,400
B259TX/B269TX-20	20	2,000	1,900	1,600	1,400	1,200	830	2,300	2,100
(mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.6D	
		ae:0.1D		ae:0.05D		ae:0.03D		ae:0.1D	

※Notice: B269TX is Long Length series End Mills. Please adjust the parameter according.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

B271TX

High Performance End Mills With Corner Radius

SMG Carbide

AlTiSiN TX

0°

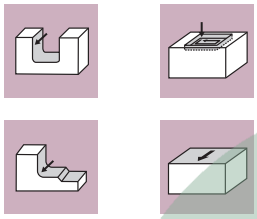
4

N

γ0°

R

Type of Operation



Work Material

P	H	M	K	N	S
	●		●		

H	<48HRC Hardened Steel
H	<56HRC Hardened Steel
H	<68HRC Hardened Steel
K	Cast Iron

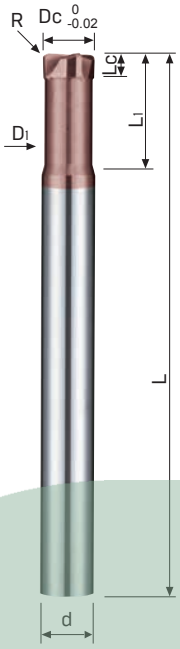
Feature of product:

Stepped High Performance End Mills with Corner Radius

With SMG carbide material and Nano multilayer coating, wear resistance and lubrication effect are highly enhanced to have better tool life.

High precision R value and strong short cutting length.

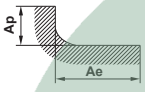
Suitable for working high hardness materials and high precision mold in layer machining.



Code No. B271TX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	L1 mm	D1 mm	AlTiSiN B271TX
3	R0.75	1.2	70	6	7.5	2.7	●
4	R1	1.6	70	6	10	3.6	●
5	R1	2	80	6	12	4.5	●
5	R1.2	2	80	6	12	4.5	●
6	R1	2.5	80	6	12	5.4	●
6	R1.5	2.5	80	6	12	5.4	●
8	R1	3.5	100	8	16	7.2	●
8	R2	3.5	100	8	16	7.2	●
10	R1	4	100	10	20	9	●
10	R2	4	100	10	20	9	●
12	R1	5	110	12	24	11	●
12	R2	5	110	12	24	11	●
12	R3	5	110	12	24	11	●

High feed cutting

Work Material		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)		GR.7 Hardened Steel (56~68HRC)		GR.9 Cast Iron	
Vc m/min		70		50		30		100	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B271TX-3	3	7,400	3,800	5,300	2,500	3,200	990	10,500	6,000
B271TX-4	4	5,500	4,100	4,000	2,700	2,400	1,000	8,000	6,500
B271TX-5	5	4,450	4,300	3,200	2,800	1,900	1,100	6,350	6,800
B271TX-6	6	3,700	4,300	2,600	2,800	1,600	1,100	5,300	6,800
B271TX-8	8	2,800	4,300	2,000	2,800	1,200	1,100	4,000	7,000
B271TX-10	10	2,250	4,400	1,600	2,800	1,000	1,100	3,200	7,000
B271TX-12	12	1,850	4,400	1,350	2,800	800	1,100	2,650	7,000
(mm) 		ap:0.2xR		ap:0.2xR		ap:0.1xR		ap:0.2xR	
		ae:0.5D		ae:0.5D		ae:0.5D		ae:0.5D	

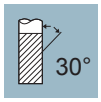
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E105X

Taper End Mills

UMG Carbide

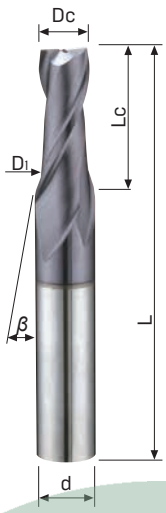
AlTiN X-NaNo



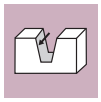


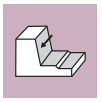






Type of Operation





Work Material

P	H	M	K	N	S
●	●		○	○	

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper

Feature of product:

Taper End Mills

With UMG carbide material and Nano multilayer coating,

wear resistance and lubrication effect are highly enhanced to have better tool life.

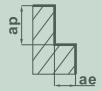
Available in complete spec in various angle.

Suitable in tappered milling process for various mold.

Code No. E105X-Dc×β

Dc mm	β on Side	D1 mm	Lc mm	L mm	d h6	AlTiN E105X
1	30'	1.07	4	50	4	●
1	1°	1.14	4	50	4	●
1	1°30'	1.21	4	50	4	●
1	2°	1.28	4	50	4	●
1	2°30'	1.35	4	50	4	●
1	3°	1.42	4	50	4	●
1	4°	1.56	4	50	4	●
1	5°	1.7	4	50	4	●
1	6°	1.84	4	50	4	●
1	7°	1.98	4	50	4	●
1	10°	2.41	4	50	4	●
1.5	30'	1.59	5	50	4	●
1.5	1°	1.67	5	50	4	●
1.5	1°30'	1.76	5	50	4	●
1.5	2°	1.85	5	50	4	●
1.5	2°30'	1.93	5	50	4	●
1.5	3°	2.02	5	50	4	●
1.5	4°	2.2	5	50	4	●
1.5	5°	2.37	5	50	4	●
1.5	6°	2.55	5	50	4	●
1.5	7°	2.73	5	50	4	●
1.5	10°	3.26	5	50	4	●
2	30'	2.1	6	50	4	●
2	1°	2.21	6	50	4	●
2	1°30'	2.31	6	50	4	●
2	2°	2.41	6	50	4	●
2	2°30'	2.52	6	50	4	●
2	3°	2.62	6	50	4	●
2	4°	2.84	6	50	4	●
2	5°	3.05	6	50	4	●
2	6°	3.26	6	50	4	●
2	7°	3.47	6	50	4	●
2	10°	4.11	6	50	6	●
2.5	30'	2.64	8	50	4	●
2.5	1°	2.78	8	50	4	●
2.5	1°30'	2.91	8	50	4	●
2.5	2°	3.05	8	50	4	●
2.5	2°30'	3.2	8	50	4	●
2.5	3°	3.33	8	50	4	●
2.5	4°	3.62	8	50	4	●
2.5	5°	3.9	8	50	4	●
2.5	6°	4.18	8	50	6	●
2.5	7°	4.46	8	50	6	●
2.5	10°	5.32	8	50	6	●
3	30'	3.17	10	50	6	●
3	1°	3.35	10	50	6	●
3	1°30'	3.52	10	50	6	●
3	2°	3.69	10	50	6	●
3	2°30'	3.87	10	50	6	●
3	3°	4.05	10	50	6	●
3	4°	4.4	10	50	6	●
3	5°	4.75	10	50	6	●
3	6°	5.1	10	50	6	●
3	7°	5.46	10	50	6	●
3	10°	6.53	10	60	8	●
4	30'	4.26	15	50	6	●
4	1°	4.52	15	50	6	●
4	1°30'	4.79	15	50	6	●
4	2°	5.04	15	50	6	●
4	2°30'	5.31	15	50	6	●
4	3°	5.57	15	50	6	●
4	4°	6.1	15	60	8	●
4	5°	6.62	15	60	8	●
4	6°	7.15	15	60	8	●
4	7°	7.68	15	60	8	●
4	10°	9.3	15	70	10	●
5	30'	5.34	20	60	6	●
5	1°	5.7	20	60	6	●
5	1°30'	6	20	60	6	●
5	2°	6.39	20	60	8	●
5	2°30'	6.75	20	60	8	●
5	3°	7.1	20	60	8	●
5	4°	7.8	20	60	8	●
5	5°	8.5	20	70	10	●
5	6°	9.2	20	70	10	●
5	7°	9.91	20	70	10	●
5	10°	12	20	75	12	●
6	30'	6.35	20	60	8	●
6	1°	6.7	20	60	8	●
6	1°30'	7.05	20	60	8	●
6	2°	7.4	20	60	8	●
6	2°30'	7.75	20	60	8	●
6	3°	8	20	60	8	●
6	4°	8.8	20	70	10	●
6	5°	9.5	20	70	10	●
6	6°	10.2	20	75	12	●
6	7°	10.91	20	75	12	●
6	10°	13.05	20	75	12	●
8	30'	8.44	25	70	10	●
8	1°	8.87	25	70	10	●
8	1°30'	9.31	25	70	10	●
8	2°	9.74	25	70	10	●
8	2°30'	10	25	70	10	●
8	3°	10.62	25	75	12	●
8	5°	12.37	25	90	12	●
10	30'	10.61	35	90	10	●
10	1°	11.22	35	90	10	●
10	1°30'	11.83	35	90	10	●
10	2°	12.44	35	90	12	●
10	2°30'	13.06	35	90	12	●
10	3°	13.67	35	90	12	●
10	5°	16	35	100	16	●

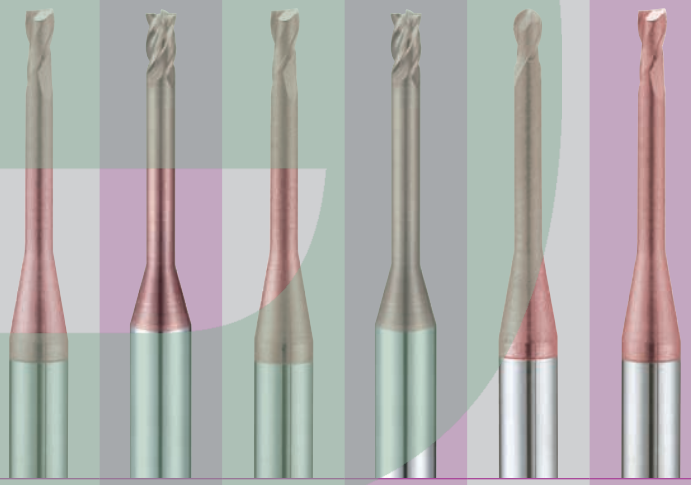
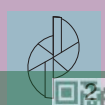
Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.6 Hardened Steel (48~56HRC)	
Vc m/min		60		60		60		45		40		35	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
E105X-1	1	15,500	120	15,500	120	15,500	120	13,000	85	12,000	80	10,500	35
E105X-1.5	1.5	10,500	120	10,500	120	10,500	120	9,000	85	8,200	80	7,000	35
E105X-2	2	7,900	145	7,900	145	7,900	120	6,600	85	6,300	80	5,200	35
E105X-2.5	2.5	6,200	140	6,200	140	6,200	115	5,300	85	4,900	80	4,200	35
E105X-3	3	5,100	140	5,100	140	5,100	120	4,400	80	4,000	80	3,500	35
E105X-4	4	3,800	140	3,800	140	3,800	115	3,400	80	3,000	80	2,500	35
E105X-5	5	3,100	140	3,100	140	3,100	115	2,600	80	2,400	75	2,000	35
E105X-6	6	2,600	140	2,600	140	2,600	115	2,200	80	2,000	75	1,700	35
E105X-8	8	1,900	140	1,900	140	1,900	115	1,600	80	1,500	75	1,300	35
E105X-10	10	1,500	140	1,500	140	1,500	110	1,300	80	1,200	75	1,000	35
(mm) 		ap:2.5		ap:2.5		ap:2.5		ap:2.5		ap:2.5		ap:2.5	
		ae:0.02		ae:0.02		ae:0.02		ae:0.02		ae:0.02		ae:0.02	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.



End Mills For Rib Processing

Page	233	235	237	241	243	245
Appearance						
Code No	F692TX	F694TX	F690TX	F693TX	F695TX	F691TX
Carbide	SMG Carbide	SMG Carbide	SMG Carbide	SMG Carbide	SMG Carbide	SMG Carbide
Coating	AlTiSiN TX	AlTiSiN TX	AlTiSiN TX	AlTiSiN TX	AlTiSiN TX	AlTiSiN TX
Helix Angle	 30°	 30°	 30°	 30°	 30°	 30°
No.of Flutes	 2	 4	 2	 4	 2	 2

ASIA

End Mills For Rib Processing

SMG Carbide

AlTiSiN TX

30°

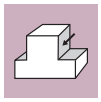
2

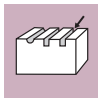
N

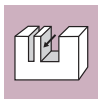
γ5°

90°

Type of Operation







Work Material

P	H	M	K	N	S
●	●		○	○	

P	Steel
H	<38HRC Hardened Steel
H	<48HRC Hardened Steel
H	<56HRC Hardened Steel
H	<68HRC Hardened Steel
K	Cast Iron
N	Copper

Feature of product:

End Mills For Rib Processing- 2 Flutes Square.

Widely used in high precision mold and deep machining angle clean with long neck. Good wear resistance and lubricating effect with Nano multilayer coating.

Available with complete size range.

Workable for various steel materials and copper electrode materials.



Code No. F692TX-Dc×L1

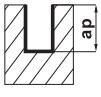
Dc 0 -0.02	L1 mm	Lc mm	L mm	d h5	D1 mm	AlTiSiN F692TX
0.2	0.5	0.3	50	4	0.17	●
0.2	1	0.3	50	4	0.17	●
0.2	2	0.3	50	4	0.17	●
0.2	3	0.3	50	4	0.17	●
0.3	1	0.45	50	4	0.27	●
0.3	1.5	0.45	50	4	0.27	●
0.3	2	0.45	50	4	0.27	●
0.3	3	0.45	50	4	0.27	●
0.3	4	0.45	50	4	0.27	●
0.4	1	0.6	50	4	0.37	●
0.4	1.5	0.6	50	4	0.37	●
0.4	2	0.6	50	4	0.37	●
0.4	3	0.6	50	4	0.37	●
0.4	4	0.6	50	4	0.37	●
0.4	5	0.6	50	4	0.37	●
0.4	6	0.6	50	4	0.37	●
0.4	8	0.6	50	4	0.37	●
0.5	1	0.7	50	4	0.45	●
0.5	2	0.7	50	4	0.45	●
0.5	3	0.7	50	4	0.45	●
0.5	4	0.7	50	4	0.45	●
0.5	6	0.7	50	4	0.45	●
0.5	8	0.7	50	4	0.45	●
0.5	10	0.7	50	4	0.45	●
0.6	2	0.9	50	4	0.55	●
0.6	3	0.9	50	4	0.55	●
0.6	4	0.9	50	4	0.55	●
0.6	6	0.9	50	4	0.55	●
0.6	8	0.9	50	4	0.55	●
0.6	10	0.9	50	4	0.55	●
0.7	2	1	50	4	0.65	●
0.7	4	1	50	4	0.65	●
0.7	6	1	50	4	0.65	●
0.7	8	1	50	4	0.65	●
0.8	2	1.2	50	4	0.75	●
0.8	4	1.2	50	4	0.75	●
0.8	6	1.2	50	4	0.75	●
0.8	8	1.2	50	4	0.75	●
0.8	10	1.2	50	4	0.75	●
0.8	12	1.2	50	4	0.75	●
0.9	4	1.4	50	4	0.85	●
0.9	6	1.4	50	4	0.85	●
0.9	8	1.4	50	4	0.85	●
0.9	10	1.4	50	4	0.85	●
1	2	1.5	50	4	0.95	●
1	3	1.5	50	4	0.95	●
1	4	1.5	50	4	0.95	●
1	6	1.5	50	4	0.95	●
1	8	1.5	50	4	0.95	●
1	10	1.5	50	4	0.95	●
1	12	1.5	50	4	0.95	●
1	14	1.5	50	4	0.95	●
1	16	1.5	50	4	0.95	●
1	18	1.5	60	4	0.95	●
1	20	1.5	60	4	0.95	●
1.2	6	1.8	50	4	1.15	●
1.2	8	1.8	50	4	1.15	●
1.2	10	1.8	50	4	1.15	●
1.2	12	1.8	50	4	1.15	●
1.2	14	1.8	50	4	1.15	●
1.2	16	1.8	50	4	1.15	●
1.4	6	2.1	50	4	1.35	●
1.4	8	2.1	50	4	1.35	●
1.4	10	2.1	50	4	1.35	●
1.4	12	2.1	50	4	1.35	●
1.4	14	2.1	50	4	1.35	●
1.4	16	2.1	50	4	1.35	●
1.5	4	2.3	50	4	1.45	●
1.5	6	2.3	50	4	1.45	●
1.5	8	2.3	50	4	1.45	●

Dc 0 -0.02	L1 mm	Lc mm	L mm	d h5	D1 mm	AlTiSiN F692TX
1.5	10	2.3	50	4	1.45	●
1.5	12	2.3	50	4	1.45	●
1.5	14	2.3	50	4	1.45	●
1.5	16	2.3	50	4	1.45	●
1.5	18	2.3	60	4	1.45	●
1.5	20	2.3	60	4	1.45	●
1.5	25	2.3	65	4	1.45	●
1.5	30	2.3	70	4	1.45	●
1.6	6	2.4	50	4	1.55	●
1.6	8	2.4	50	4	1.55	●
1.6	10	2.4	50	4	1.55	●
1.6	12	2.4	50	4	1.55	●
1.6	14	2.4	50	4	1.55	●
1.6	16	2.4	50	4	1.55	●
1.6	18	2.4	60	4	1.55	●
1.6	20	2.4	60	4	1.55	●
1.8	6	2.7	50	4	1.75	●
1.8	8	2.7	50	4	1.75	●
1.8	10	2.7	50	4	1.75	●
1.8	12	2.7	50	4	1.75	●
1.8	14	2.7	50	4	1.75	●
1.8	16	2.7	50	4	1.75	●
1.8	18	2.7	60	4	1.75	●
1.8	20	2.7	60	4	1.75	●
2	4	3	50	4	1.95	●
2	6	3	50	4	1.95	●
2	8	3	50	4	1.95	●
2	10	3	50	4	1.95	●
2	12	3	50	4	1.95	●
2	14	3	50	4	1.95	●
2	16	3	50	4	1.95	●
2	18	3	60	4	1.95	●
2	20	3	60	4	1.95	●
2	25	3	60	4	1.95	●
2	30	3	70	4	1.95	●
2	35	3	75	4	1.95	●
2	40	3	80	4	1.95	●
2.5	8	3.7	50	4	2.4	●
2.5	10	3.7	50	4	2.4	●
2.5	12	3.7	50	4	2.4	●
2.5	14	3.7	50	4	2.4	●
2.5	16	3.7	60	4	2.4	●
2.5	18	3.7	60	4	2.4	●
2.5	20	3.7	60	4	2.4	●
2.5	25	3.7	70	4	2.4	●
2.5	30	3.7	70	4	2.4	●
2.5	40	3.7	80	4	2.4	●
3	8	4.5	50	6	2.85	●
3	10	4.5	50	6	2.85	●
3	12	4.5	50	6	2.85	●
3	14	4.5	60	6	2.85	●
3	16	4.5	60	6	2.85	●
3	18	4.5	60	6	2.85	●
3	20	4.5	60	6	2.85	●
3	25	4.5	70	6	2.85	●
3	30	4.5	70	6	2.85	●
3	35	4.5	80	6	2.85	●
3	40	4.5	90	6	2.85	●
3	50	4.5	100	6	2.85	●
4	12	6	60	6	3.85	●
4	16	6	60	6	3.85	●
4	20	6	70	6	3.85	●
4	25	6	70	6	3.85	●
4	30	6	80	6	3.85	●
4	35	6	80	6	3.85	●
4	40	6	90	6	3.85	●
4	45	6	100	6	3.85	●
4	50	6	100	6	3.85	●

Slotting

Work Material		GR.1 / GR.2 / GR.3 Carbon Steel / Low-alloyed Steel / Hi-alloyed Steel (~24HRC) (~30HRC)			GR.4 / GR.5 Hardened Steel / Hardened Steel (30~38HRC) (38~48HRC)			GR.6 Hardened Steel (48~56HRC)			GR.7 Hardened Steel (56~68HRC)		
Code No.	Dc×Ll	RPM (min-1)	Feed (mm/min)	ap (mm)	RPM (min-1)	Feed (mm/min)	ap (mm)	RPM (min-1)	Feed (mm/min)	ap (mm)	RPM (min-1)	Feed (mm/min)	ap (mm)
F692TX	0.2×0.5	50,000	320	0.009	50,000	170	0.006	50,000	150	0.004	50,000	10	0.003
F692TX	0.2×1	50,000	320	0.008	50,000	150	0.005	50,000	150	0.004	50,000	10	0.003
F692TX	0.2×2	50,000	290	0.006	50,000	130	0.004	50,000	120	0.003	50,000	10	0.002
F692TX	0.2×3	50,000	280	0.002	50,000	100	0.001	50,000	100	0.001	50,000	10	0.001
F692TX	0.3×1	48,000	448	0.009	48,000	352	0.006	41,680	264	0.004	14,600	14	0.003
F692TX	0.3×1.5	40,640	368	0.008	40,640	288	0.005	34,160	208	0.004	14,600	13	0.003
F692TX	0.3×2	33,200	280	0.006	33,200	224	0.004	26,560	152	0.003	14,600	12	0.002
F692TX	0.3×3	25,520	192	0.002	25,520	152	0.001	20,400	104	0.001	14,600	10	0.001
F692TX	0.3×4	20,960	136	0.001	20,960	112	0.001	16,720	80	0.001	14,600	9	0.001
F692TX	0.4×1	42,160	528	0.011	38,480	376	0.007	30,800	256	0.004	14,300	17	0.003
F692TX	0.4×1.5	42,160	528	0.011	38,480	376	0.007	30,800	256	0.004	14,300	17	0.003
F692TX	0.4×2	40,000	488	0.009	35,680	344	0.006	28,560	232	0.004	14,600	17	0.003
F692TX	0.4×3	35,600	408	0.005	30,000	272	0.004	24,000	184	0.003	14,300	16	0.002
F692TX	0.4×4	32,800	352	0.004	26,480	224	0.003	21,200	152	0.002	14,300	15	0.001
F692TX	0.4×5	30,800	304	0.003	24,080	192	0.002	19,280	128	0.001	14,300	14	0.001
F692TX	0.4×6	30,800	280	0.002	24,000	180	0.001	18,000	100	0.001	14,000	10	0.001
F692TX	0.4×8	30,800	250	0.002	24,000	160	0.001	17,000	80	0.001	14,000	10	0.001
F692TX	0.5×1	45,440	720	0.015	32,480	408	0.011	26,000	280	0.008	14,000	20	0.004
F692TX	0.5×2	45,440	720	0.015	32,480	408	0.011	26,000	280	0.008	14,000	20	0.004
F692TX	0.5×3	35,360	528	0.007	25,760	296	0.007	20,560	208	0.005	14,000	19	0.004
F692TX	0.5×4	32,480	464	0.008	23,760	264	0.006	18,960	184	0.004	14,000	18	0.003
F692TX	0.5×6	26,720	336	0.004	19,760	200	0.003	15,760	136	0.002	14,000	16	0.001
F692TX	0.5×8	23,280	256	0.002	17,280	152	0.001	13,840	104	0.001	14,000	14	0.001
F692TX	0.5×10	20,880	200	0.001	15,680	120	0.001	12,480	80	0.001	14,000	12	0.001
F692TX	0.6×2/0.6×3/0.6×4	50,880	992	0.023	31,280	480	0.016	25,040	328	0.011	12,000	23	0.006
F692TX	0.6×6	25,680	416	0.007	18,400	232	0.005	14,720	160	0.003	12,000	19	0.002
F692TX	0.6×8	21,440	312	0.004	16,000	184	0.003	12,800	128	0.002	12,000	17	0.001
F692TX	0.6×10	18,720	240	0.002	14,320	144	0.002	11,440	104	0.001	12,000	15	0.001
F692TX	0.8×4/0.8×6	29,680	744	0.027	19,280	384	0.019	15,440	264	0.013	8,000	20	0.01
F692TX	0.8×8	19,280	416	0.009	13,760	240	0.006	11,040	160	0.004	8,000	16	0.003
F692TX	0.8×10	16,800	336	0.006	13,760	240	0.006	11,040	160	0.004	8,000	14	0.002
F692TX	0.8×12	14,960	272	0.004	11,280	160	0.003	9,040	112	0.002	8,000	12	0.001
F692TX	1×2 / 1×3 / 1×4	27,280	936	0.04	17,200	464	0.028	13,760	320	0.02	6,500	15	0.01
F692TX	1×6	21,200	680	0.023	14,080	352	0.016	11,280	248	0.012	6,500	14	0.006
F692TX	1×10	15,360	424	0.01	11,040	240	0.007	8,800	168	0.005	6,500	12	0.003
F692TX	1×12	13,760	352	0.007	10,080	200	0.005	8,080	136	0.003	6,500	11	0.002
F692TX	1×16	11,440	240	0.004	8,800	144	0.003	7,040	104	0.002	6,500	10	0.001
F692TX	1×20	10,000	160	0.003	8,800	144	0.003	7,040	104	0.002	6,500	10	0.001
F692TX	1.5×4/1.5×6/1.5×8	18,240	896	0.057	11,520	440	0.04	9,200	304	0.028	9,600	60	0.016
F692TX	1.5×10	13,280	600	0.03	8,960	312	0.021	7,120	216	0.015	9,600	13	0.009
F692TX	1.5×16	10,300	400	0.016	7,300	210	0.011	5,800	150	0.008	9,600	1	0.003
F692TX	1.5×20	9,500	330	0.011	6,600	170	0.007	5,200	130	0.005	9,600	10	0.003
F692TX	1.5×25	9,200	320	0.009	6,400	160	0.008	4,900	120	0.008	9,600	10	0.002
F692TX	1.5×30	9,000	300	0.007	6,200	140	0.006	4,600	110	0.006	9,600	10	0.001
F692TX	2×4 / 2×6 / 2×8	7,500	300	0.064	5,200	150	0.045	4,000	100	0.032	9,600	230	0.019
F692TX	2×10	11,840	736	0.045	7,760	376	0.031	6,240	264	0.022	9,600	45	0.013
F692TX	2×14	9,600	560	0.031	6,560	296	0.022	5,280	208	0.016	9,600	16	0.009
F692TX	2×20	7,680	400	0.018	5,520	224	0.013	4,400	152	0.009	9,600	11	0.002
F692TX	2×30	6,000	248	0.008	4,480	144	0.005	3,600	104	0.004	9,600	11	0.001
F692TX	2×40	5,000	200	0.003	3,800	90	0.001	3,000	40	0.001	9,600	10	0.001
F692TX	2.5×8/2.5×10/2.5×12	12,000	1,072	0.077	7,680	536	0.054	6,160	368	0.039	9,600	227	0.023
F692TX	2.5×14	8,560	704	0.052	5,840	376	0.036	4,640	256	0.026	9,600	42	0.015
F692TX	2.5×20	6,960	520	0.033	4,880	288	0.023	3,920	200	0.017	9,600	14	0.01
F692TX	2.5×25	6,080	416	0.022	4,400	240	0.015	3,520	168	0.011	9,600	10	0.008
F692TX	2.5×30	5,440	344	0.014	4,000	200	0.01	3,200	136	0.007	9,600	10	0.005
F692TX	2.5×40	5,300	300	0.01	3,500	160	0.006	2,800	100	0.004	9,600	10	0.003
F692TX	3×8 / 3×10 / 3×12	10,560	1,176	0.103	6,400	560	0.072	5,120	384	0.052	8,000	435	0.031
F692TX	3×14	7,680	800	0.072	4,960	408	0.051	4,000	280	0.036	8,000	81	0.021
F692TX	3×20	6,240	600	0.05	4,240	320	0.035	3,440	224	0.025	8,000	27	0.015
F692TX	3×30	4,960	416	0.026	3,600	232	0.018	2,880	160	0.013	8,000	10	0.007
F692TX	3×40	4,400	340	0.013	3,100	180	0.009	2,400	110	0.005	8,000	10	0.003
F692TX	3×50	4,200	320	0.009	2,900	160	0.005	2,200	90	0.003	8,000	10	0.001
F692TX	4×12 / 4×16 / 4×20	6,800	1,024	0.112	4,080	480	0.078	3,280	328	0.056	6,000	388	0.033
F692TX	4×30	4,000	504	0.048	2,640	264	0.033	2,080	184	0.024	6,000	24	0.014
F692TX	4×40	3,360	376	0.03	2,320	200	0.021	1,840	144	0.015	6,000	10	0.009
F692TX	4×50	2,960	288	0.018	2,080	160	0.013	1,680	112	0.009	6,000	10	0.001

(mm)



F694TX

End Mills For Rib Processing

SMG Carbide

AlTiSiN TX

30°

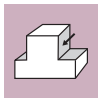
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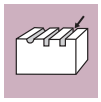
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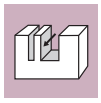
γ5°

90°

Type of Operation







Work Material

P	H	M	K	N	S
●	●		○	○	

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **H** <68HRC Hardened Steel
- **K** Cast Iron
- **N** Copper

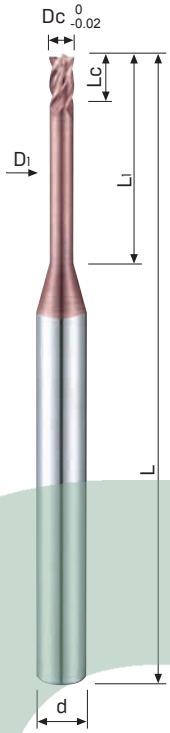
Feature of product:

End Mills For Rib Processing- 4 Flutes Square.

Widely used in high precision mold and deep machining angle clean with long neck.

Good wear resistance and lubricating effect with Nano multilayer coating.

Workable for various steel materials and copper electrode materials.



Code No. F694TX-Dc×L1

Dc 0 -0.02	L1 mm	Lc mm	L mm	d h5	D1 mm	AlTiSiN F694TX
1	3	1.5	50	4	0.95	●
1	4	1.5	50	4	0.95	●
1	6	1.5	50	4	0.95	●
1	8	1.5	50	4	0.95	●
1	10	1.5	50	4	0.95	●
1	12	1.5	50	4	0.95	●
1.5	4	2.3	50	4	1.45	●
1.5	6	2.3	50	4	1.45	●
1.5	8	2.3	50	4	1.45	●
1.5	10	2.3	50	4	1.45	●
1.5	12	2.3	50	4	1.45	●
1.5	16	2.3	50	4	1.45	●
2	6	3	50	4	1.95	●
2	8	3	50	4	1.95	●
2	10	3	50	4	1.95	●
2	12	3	50	4	1.95	●
2	16	3	50	4	1.95	●
2	20	3	60	4	1.95	●
2	25	3	60	4	1.95	●
2	30	3	70	4	1.95	●
3	8	4.5	50	6	2.85	●
3	10	4.5	50	6	2.85	●
3	12	4.5	50	6	2.85	●
3	16	4.5	60	6	2.85	●
3	20	4.5	60	6	2.85	●
3	25	4.5	70	6	2.85	●
3	30	4.5	70	6	2.85	●
4	12	6	60	6	3.85	●
4	16	6	60	6	3.85	●
4	20	6	70	6	3.85	●
4	25	6	70	6	3.85	●
4	30	6	80	6	3.85	●
4	40	6	90	6	3.85	●
5	16	7.5	60	6	4.85	●
5	20	7.5	70	6	4.85	●
5	30	7.5	80	6	4.85	●
5	40	7.5	90	6	4.85	●
6	20	9	70	6	5.85	●
6	30	9	80	6	5.85	●
6	40	9	90	6	5.85	●
6	50	9	100	6	5.85	●

Side Milling

Work Material		GR.5 Hardened Steel (38~48HRC)				GR.6 Hardened Steel (48~56HRC)				GR.7 Hardened Steel (56~68HRC)			
Code No.	Dc×Ll	RPM (min-1)	Feed (mm/min)	ap (mm)	ae (mm)	RPM (min-1)	Feed (mm/min)	ap (mm)	ae (mm)	RPM (min-1)	Feed (mm/min)	ap (mm)	ae (mm)
F694TX	1×3	14,000	1,350	0.04	0.3	13,000	1,100	0.035	0.25	8,800	700	0.02	0.25
F694TX	1×4	13,800	1,310	0.039	0.270	12,000	1,070	0.031	0.243	8,500	640	0.015	0.243
F694TX	1×6	11,300	1,040	0.021	0.216	9,800	860	0.016	0.209	7,000	510	0.01	0.108
F694TX	1×8	9,800	780	0.02	0.189	8,500	720	0.012	0.16	6,100	420	0.008	0.094
F694TX	1×10	8,800	510	0.011	0.126	7,600	510	0.009	0.1	5,400	350	0.006	0.05
F694TX	1×12	8,300	490	0.01	0.1	7,200	490	0.005	0.1	5,000	300	0.003	0.05
F694TX	1.5×4	12,000	1,300	0.045	0.5	12,000	1,250	0.045	0.5	9,000	500	0.03	0.25
F694TX	1.5×6	11,600	1,280	0.041	0.486	10,600	1,210	0.038	0.445	8,100	460	0.025	0.202
F694TX	1.5×8	10,200	1,080	0.038	0.35	9,300	1,020	0.031	0.346	7,100	390	0.015	0.157
F694TX	1.5×10	9,000	900	0.03	0.3	8,200	800	0.03	0.3	6,500	360	0.01	0.1
F694TX	1.5×12	8,500	830	0.029	0.324	7,800	780	0.026	0.297	5,900	300	0.01	0.162
F694TX	1.5×16	7,400	670	0.018	0.216	6,800	600	0.014	0.198	5,100	230	0.005	0.108
F694TX	2×6	12,800	1,280	0.064	0.648	12,000	1,200	0.06	0.729	9,700	700	0.028	0.324
F694TX	2×8	11,200	1,160	0.058	0.612	10,400	1,100	0.055	0.648	8,400	600	0.026	0.288
F694TX	2×10	10,000	1,100	0.045	0.5	9,000	1,000	0.045	0.5	8,200	500	0.02	0.25
F694TX	2×12	9,100	1,030	0.046	0.405	8,500	960	0.044	0.405	6,900	420	0.018	0.180
F694TX	2×16	7,800	860	0.042	0.283	7,300	700	0.039	0.315	5,900	270	0.016	0.157
F694TX	2×20	7,000	800	0.025	0.198	6,600	650	0.024	0.198	5,300	290	0.007	0.116
F694TX	2×25	6,500	650	0.02	0.15	6,500	600	0.02	0.15	5,000	200	0.005	0.08
F694TX	2×30	6,000	500	0.02	0.1	6,000	450	0.02	0.1	4,500	150	0.003	0.05
F694TX	3×8	11,250	2,300	0.1	0.65	11,000	2,000	0.08	0.65	9,000	750	0.05	0.5
F694TX	3×10	11,250	2,277	0.0945	0.63	10,620	1,980	0.063	0.63	8,910	729	0.0423	0.45
F694TX	3×12	10,500	2,020	0.084	0.670	10,000	1,950	0.052	0.67	8,100	660	0.037	0.5
F694TX	3×16	9,200	1,680	0.064	0.634	8,800	1,600	0.04	0.63	7,100	570	0.027	0.378
F694TX	3×20	8,400	1,540	0.058	0.580	7,900	1,490	0.036	0.58	6,300	550	0.022	0.319
F694TX	3×25	7,500	1,350	0.05	0.4	7,000	1,100	0.025	0.4	6,000	450	0.01	0.2
F694TX	3×30	7,000	1,260	0.04	0.38	6,500	1,230	0.015	0.38	5,400	390	0.007	0.144
F694TX	4×12	8,500	1,400	0.1	1.0	7,100	1,350	0.078	1.08	6,000	760	0.051	0.76
F694TX	4×16	7,900	1,370	0.091	1.0	6,600	1,330	0.071	1.0	5,600	740	0.043	0.7
F694TX	4×20	6,200	1,200	0.06	0.8	5,200	1,120	0.047	0.8	4,500	630	0.022	0.56
F694TX	4×25	6,200	1,200	0.06	0.8	5,200	1,120	0.047	0.8	4,500	630	0.022	0.56
F694TX	4×30	5,500	960	0.037	0.648	4,600	920	0.029	0.648	3,900	600	0.011	0.388
F694TX	4×40	5,000	800	0.03	0.5	4,300	800	0.025	0.5	3,500	500	0.005	0.3
F694TX	5×16	8,000	1,100	0.15	1.0	8,000	1,100	0.15	1.0	5,500	700	0.05	0.6
F694TX	5×20	7,500	900	0.1	1.0	7,500	900	0.1	1.0	5,200	680	0.03	0.5
F694TX	5×30	6,500	700	0.08	0.5	6,500	700	0.08	0.5	4,800	630	0.02	0.3
F694TX	5×40	5,500	600	0.05	0.3	5,500	600	0.05	0.3	4,500	600	0.01	0.2
F694TX	6×20	7,000	1,000	0.3	1.2	7,000	1,000	0.3	1.2	5,000	650	0.05	0.6
F694TX	6×30	6,500	800	0.2	1.0	6,500	800	0.2	1.0	4,700	620	0.03	0.5
F694TX	6×40	6,000	700	0.15	0.8	6,000	700	0.15	0.8	4,400	580	0.02	0.3
F694TX	6×50	5,500	600	0.1	0.6	5,500	600	0.1	0.6	4,100	550	0.01	0.2

(mm)



1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

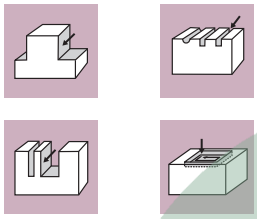
F690TX

Toric End Mills For Rib Processing With Corner Radius

SMG Carbide | AlTiSiN TX

30° | 2 | N 7.5° | R

Type of Operation



Work Material

P	H	M	K	N	S
●	●		○	○	

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **H** <68HRC Hardened Steel
- **K** Cast Iron
- **N** Copper

Feature of product:

End Mills For Rib Processing with Corner Radius- 2 Flutes

Widely used in high precision mold, deep machining angle clean with long neck and micro 3D curved surface.

Good wear resistance and lubricating effect with Nano multilayer coating.

High precision R value and available with complete size range.

Workable for various steel materials and copper electrode materials.



Code No. F690TX-Dc×R×L1

Dc 0 -0.02	R ±0.005	L1 mm	Lc mm	L mm	d h5	Dl mm	AlTiSiN F690TX
0.2	R0.02	0.5	0.15	50	4	0.18	●
0.2	R0.02	1	0.15	50	4	0.18	●
0.2	R0.02	2	0.15	50	4	0.18	●
0.2	R0.05	0.5	0.15	50	4	0.18	●
0.2	R0.05	1	0.15	50	4	0.18	●
0.2	R0.05	2	0.15	50	4	0.18	●
0.3	R0.02	1	0.25	50	4	0.28	●
0.3	R0.02	2	0.25	50	4	0.28	●
0.3	R0.02	3	0.25	50	4	0.28	●
0.3	R0.05	1	0.25	50	4	0.28	●
0.3	R0.05	2	0.25	50	4	0.28	●
0.3	R0.05	3	0.25	50	4	0.28	●
0.4	R0.02	1	0.3	50	4	0.37	●
0.4	R0.02	2	0.3	50	4	0.37	●
0.4	R0.02	3	0.3	50	4	0.37	●
0.4	R0.02	4	0.3	50	4	0.37	●
0.4	R0.05	1	0.3	50	4	0.37	●
0.4	R0.05	2	0.3	50	4	0.37	●
0.4	R0.05	3	0.3	50	4	0.37	●
0.4	R0.05	4	0.3	50	4	0.37	●
0.4	R0.1	1	0.3	50	4	0.37	●
0.4	R0.1	2	0.3	50	4	0.37	●
0.4	R0.1	3	0.3	50	4	0.37	●
0.4	R0.1	4	0.3	50	4	0.37	●
0.5	R0.02	1	0.4	50	4	0.46	●
0.5	R0.02	2	0.4	50	4	0.46	●
0.5	R0.02	3	0.4	50	4	0.46	●
0.5	R0.02	4	0.4	50	4	0.46	●
0.5	R0.02	5	0.4	50	4	0.46	●
0.5	R0.02	6	0.4	50	4	0.46	●
0.5	R0.05	1	0.4	50	4	0.46	●
0.5	R0.05	2	0.4	50	4	0.46	●
0.5	R0.05	3	0.4	50	4	0.46	●
0.5	R0.05	4	0.4	50	4	0.46	●
0.5	R0.05	5	0.4	50	4	0.46	●
0.5	R0.05	6	0.4	50	4	0.46	●
0.5	R0.1	1	0.4	50	4	0.46	●
0.5	R0.1	2	0.4	50	4	0.46	●
0.5	R0.1	3	0.4	50	4	0.46	●
0.5	R0.1	4	0.4	50	4	0.46	●
0.5	R0.1	5	0.4	50	4	0.46	●
0.5	R0.1	6	0.4	50	4	0.46	●
0.6	R0.02	2	0.5	50	4	0.55	●
0.6	R0.02	4	0.5	50	4	0.55	●
0.6	R0.02	6	0.5	50	4	0.55	●
0.6	R0.02	8	0.5	50	4	0.55	●
0.6	R0.05	2	0.5	50	4	0.55	●
0.6	R0.05	4	0.5	50	4	0.55	●
0.6	R0.05	6	0.5	50	4	0.55	●
0.6	R0.05	8	0.5	50	4	0.55	●
0.6	R0.1	2	0.5	50	4	0.55	●
0.6	R0.1	4	0.5	50	4	0.55	●
0.6	R0.1	6	0.5	50	4	0.55	●
0.6	R0.1	8	0.5	50	4	0.55	●
0.8	R0.02	2	0.65	50	4	0.75	●
0.8	R0.02	4	0.65	50	4	0.75	●
0.8	R0.02	6	0.65	50	4	0.75	●
0.8	R0.02	8	0.65	50	4	0.75	●
0.8	R0.02	12	0.65	50	4	0.75	●
0.8	R0.05	2	0.65	50	4	0.75	●
0.8	R0.05	4	0.65	50	4	0.75	●
0.8	R0.05	6	0.65	50	4	0.75	●
0.8	R0.05	8	0.65	50	4	0.75	●
0.8	R0.05	12	0.65	50	4	0.75	●
0.8	R0.1	2	0.65	50	4	0.75	●
0.8	R0.1	4	0.65	50	4	0.75	●
0.8	R0.1	6	0.65	50	4	0.75	●
0.8	R0.1	8	0.65	50	4	0.75	●
0.8	R0.1	12	0.65	50	4	0.75	●
0.8	R0.2	2	0.65	50	4	0.75	●
0.8	R0.2	4	0.65	50	4	0.75	●
0.8	R0.2	6	0.65	50	4	0.75	●
0.8	R0.2	8	0.65	50	4	0.75	●
0.8	R0.2	12	0.65	50	4	0.75	●
1	R0.02	2	0.8	50	4	0.95	●
1	R0.02	4	0.8	50	4	0.95	●
1	R0.02	6	0.8	50	4	0.95	●
1	R0.02	8	0.8	50	4	0.95	●
1	R0.02	10	0.8	50	4	0.95	●
1	R0.02	12	0.8	50	4	0.95	●
1	R0.05	2	0.8	50	4	0.95	●
1	R0.05	4	0.8	50	4	0.95	●
1	R0.05	6	0.8	50	4	0.95	●
1	R0.05	8	0.8	50	4	0.95	●
1	R0.05	10	0.8	50	4	0.95	●
1	R0.05	12	0.8	50	4	0.95	●
1	R0.1	2	0.8	50	4	0.95	●
1	R0.1	4	0.8	50	4	0.95	●
1	R0.1	6	0.8	50	4	0.95	●
1	R0.1	8	0.8	50	4	0.95	●
1	R0.1	10	0.8	50	4	0.95	●
1	R0.1	12	0.8	50	4	0.95	●
1	R0.2	2	0.8	50	4	0.95	●
1	R0.2	4	0.8	50	4	0.95	●
1	R0.2	6	0.8	50	4	0.95	●
1	R0.2	8	0.8	50	4	0.95	●
1	R0.2	10	0.8	50	4	0.95	●
1	R0.2	12	0.8	50	4	0.95	●
1	R0.3	2	0.8	50	4	0.95	●
1	R0.3	4	0.8	50	4	0.95	●
1	R0.3	6	0.8	50	4	0.95	●
1	R0.3	8	0.8	50	4	0.95	●
1	R0.3	10	0.8	50	4	0.95	●
1	R0.3	12	0.8	50	4	0.95	●
1.2	R0.2	6	1	50	4	1.15	●
1.2	R0.2	8	1	50	4	1.15	●
1.2	R0.2	10	1	50	4	1.15	●
1.5	R0.1	4	1.2	50	4	1.45	●
1.5	R0.1	6	1.2	50	4	1.45	●
1.5	R0.1	8	1.2	50	4	1.45	●
1.5	R0.1	10	1.2	50	4	1.45	●
1.5	R0.1	12	1.2	50	4	1.45	●
1.5	R0.1	16	1.2	50	4	1.45	●
1.5	R0.2	4	1.2	50	4	1.45	●
1.5	R0.2	6	1.2	50	4	1.45	●
1.5	R0.2	8	1.2	50	4	1.45	●
1.5	R0.2	10	1.2	50	4	1.45	●
1.5	R0.2	12	1.2	50	4	1.45	●
1.5	R0.2	16	1.2	50	4	1.45	●
1.5	R0.3	4	1.2	50	4	1.45	●
1.5	R0.3	6	1.2	50	4	1.45	●
1.5	R0.3	8	1.2	50	4	1.45	●
1.5	R0.3	10	1.2	50	4	1.45	●
1.5	R0.3	12	1.2	50	4	1.45	●
1.5	R0.3	16	1.2	50	4	1.45	●
2	R0.1	4	1.6	50	4	1.95	●
2	R0.1	6	1.6	50	4	1.95	●
2	R0.1	8	1.6	50	4	1.95	●

Side Milling

Work Material		GR.1 / GR.2 / GR.3 Carbon Steel / Low-alloyed Steel / Hi-alloyed Steel (~24HRC) (~30HRC)				GR.4 / GR.5 Hardened Steel/ Hardened Steel (38~48HRC) (30~38HRC)				GR.6 Hardened Steel (48~56HRC)				GR.7 Hardened Steel (56~68HRC)			
Code No.	Dc×Ll	RPM (min-1)	Feed (mm/min)	ap (mm)	ae (mm)	RPM (min-1)	Feed (mm/min)	ap (mm)	ae (mm)	RPM (min-1)	Feed (mm/min)	ap (mm)	ae (mm)	RPM (min-1)	Feed (mm/min)	ap (mm)	ae (mm)
F690TX	0.2×0.5	38,500	550	0.01	0.05	35000	500	0.01	0.05	31500	400	0.01	0.05	47775	30	0.01	0.05
F690TX	0.2×1	38,115	528	0.008	0.03	34650	480	0.008	0.03	31185	384	0.008	0.03	39812.5	20	0.008	0.03
F690TX	0.2×2	37,026	495	0.005	0.02	33660	450	0.005	0.02	30294	360	0.005	0.02	31850	10	0.005	0.02
F690TX	0.3×1	37,785	638	0.015	0.07	34350	580	0.015	0.07	30915	464	0.015	0.07	31850	30	0.015	0.07
F690TX	0.3×2	36,740	605	0.012	0.06	33400	550	0.012	0.06	30060	440	0.012	0.06	26541.667	20	0.012	0.06
F690TX	0.3×3	30,448	572	0.01	0.05	27680	520	0.01	0.05	24912	416	0.01	0.05	21233.333	10	0.01	0.05
F690TX	0.4×1	36,960	704	0.02	0.1	33600	640	0.02	0.1	30240	512	0.02	0.1	23887.5	50	0.02	0.1
F690TX	0.4×2	35,750	682	0.018	0.08	32500	620	0.018	0.08	29250	496	0.018	0.08	19906.25	45	0.018	0.08
F690TX	0.4×3	29,480	660	0.015	0.06	26800	600	0.015	0.06	24120	480	0.015	0.06	15925	40	0.015	0.06
F690TX	0.4×4	26,785	638	0.01	0.05	24350	580	0.01	0.05	21915	464	0.01	0.05	14332.5	30	0.01	0.05
F690TX	0.5×1	35,200	748	0.03	0.12	32,000	680	0.03	0.12	28800	544	0.03	0.12	21500	70	0.03	0.12
F690TX	0.5×2	35,112	730	0.029	0.117	31,920	664	0.029	0.117	28728	531	0.026	0.117	20,100	68	0.011	0.117
F690TX	0.5×3	28,072	563	0.023	0.113	25,520	512	0.023	0.113	22968	410	0.020	0.113	16,100	52	0.008	0.113
F690TX	0.5×4	25,608	484	0.016	0.108	23,280	440	0.016	0.108	20952	352	0.014	0.108	14,600	45	0.006	0.108
F690TX	0.5×5	23,232	414	0.011	0.099	21,120	376	0.011	0.099	19008	301	0.010	0.099	13,300	39	0.004	0.099
F690TX	0.5×6	21,296	352	0.007	0.090	19,360	320	0.007	0.090	17424	256	0.006	0.090	12,200	33	0.003	0.090
F690TX	0.6×2	25,168	449	0.010	0.219	22,880	408	0.010	0.219	20592	326	0.010	0.219	15,200	43	0.004	0.219
F690TX	0.6×4	17,952	290	0.005	0.104	16,320	264	0.005	0.104	14688	211	0.005	0.104	10,800	28	0.002	0.1035
F690TX	0.6×6	14,784	220	0.003	0.099	13,440	200	0.003	0.099	12096	160	0.003	0.099	8,900	21	0.001	0.099
F690TX	0.6×8	13,695	198	0.003	0.05	12,450	180	0.003	0.08	11205	144	0.003	0.08	10,617	20	0.001	0.08
F690TX	0.8×4	15,400	396	0.014	0.117	14,000	360	0.014	0.117	12600	288	0.015	0.117	10,200	41	0.007	0.117
F690TX	0.8×6	12,848	299	0.008	0.108	11,680	272	0.008	0.108	10512	218	0.008	0.108	8,500	30	0.004	0.108
F690TX	0.8×8	11,264	238	0.005	0.090	10,240	216	0.005	0.090	9216	173	0.004	0.090	7,600	20	0.002	0.090
F690TX	0.8×12	10,780	220	0.003	0.08	9,800	200	0.003	0.08	8820	160	0.003	0.08	6,370	15	0.001	0.05
F690TX	1×2	14,014	770	0.03	0.9	12,740	700	0.03	0.9	11466	560	0.03	0.9	5,308	90	0.02	0.3
F690TX	1×4	12,144	722	0.030	0.870	11,040	656	0.030	0.870	9936	525	0.035	0.270	8,500	80	0.017	0.270
F690TX	1×6	9,944	572	0.0.21	0.216	9,040	520	0.0.21	0.216	8136	416	0.024	0.216	7,000	64	0.012	0.216
F690TX	1×8	8,624	431	0.016	0.189	7,840	392	0.016	0.189	7056	314	0.018	0.189	6,100	48	0.009	0.189
F690TX	1×10	7,744	282	0.011	0.126	7,040	256	0.011	0.126	6336	205	0.013	0.126	5,400	32	0.006	0.126
F690TX	1×12	7,128	185	0.008	0.072	6,480	168	0.008	0.072	5832	134	0.009	0.072	5,000	21	0.004	0.072
F690TX	1.2×6	8,272	510	0.018	0.090	7,520	464	0.018	0.090	6768	371	0.022	0.090	6,200	60	0.011	0.090
F690TX	1.2×8	8,272	510	0.018	0.090	7,520	464	0.018	0.090	6768	371	0.022	0.090	6,200	60	0.011	0.090
F690TX	1.2×10	5,984	326	0.007	0.072	5,440	296	0.007	0.072	4896	237	0.008	0.072	4,500	38	0.004	0.072
F690TX	1.5×4	11,616	959	0.045	0.450	10,560	872	0.045	0.450	9504	698	0.060	0.450	9,200	124	0.033	0450
F690TX	1.5×6	9,328	906	0.041	0.405	8,480	824	0.041	0.405	7632	659	0.055	0.405	7,400	117	0.090	0.405
F690TX	1.5×8	8,184	766	0.034	0.315	7,440	696	0.034	0.315	6696	557	0.045	0.315	6,500	99	0.025	0.315
F690TX	1.5×10	7,480	660	0.032	0.288	6,800	600	0.032	0.288	6120	480	0.042	0.288	6,000	85	0.023	0.288
F690TX	1.5×12	6,864	590	0.029	0.270	6,240	536	0.029	0.270	5616	429	0.038	0.270	5,400	76	0.021	0.270
F690TX	1.5×16	5,984	449	0.015	0.180	5,440	408	0.015	0.180	4896	326	0.020	0.180	4,700	58	0.011	0.180
F690TX	2×4	12,650	935	0.05	0.8	11,500	850	0.05	0.8	10350	680	0.05	0.8	11,148	140	0.04	0.85
F690TX	2×6	11,264	898	0.043	0.810	10,240	816	0.043	0.810	9216	653	0.060	0.810	9,700	133	0.036	0.810
F690TX	2×8	9,856	818	0.039	0.720	8,960	744	0.039	0.720	8064	595	0.055	0.720	8,400	121	0.033	0.720
F690TX	2×10	8,800	766	0.033	0.585	8,000	696	0.033	0.585	7200	557	0.047	0.585	7,600	113	0.028	0.585
F690TX	2×12	8,008	722	0.031	0.450	7,280	656	0.031	0.450	6552	525	0.044	0.0450	6,900	107	0.026	0.450

(mm)



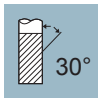
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
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F690TX

Toric End Mills For Rib Processing With Corner Radius

SMG Carbide

AlTiSiN TX

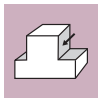


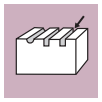


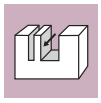




Type of Operation









Work Material

P	H	M	K	N	S
●	●		○	○	

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Code No. F690TX-Dc×R×Ll

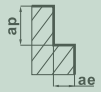
Dc 0 -0.02	R ±0.005	Ll mm	Lc mm	L mm	d h5	Dl mm	AlTiSiN F690TX
2	R0.1	10	1.6	50	4	1.95	●
2	R0.1	12	1.6	50	4	1.95	●
2	R0.1	16	1.6	50	4	1.95	●
2	R0.1	20	1.6	60	4	1.95	●
2	R0.2	4	1.6	50	4	1.95	●
2	R0.2	6	1.6	50	4	1.95	●
2	R0.2	8	1.6	50	4	1.95	●
2	R0.2	10	1.6	50	4	1.95	●
2	R0.2	12	1.6	50	4	1.95	●
2	R0.2	16	1.6	50	4	1.95	●
2	R0.2	20	1.6	60	4	1.95	●
2	R0.3	4	1.6	50	4	1.95	●
2	R0.3	6	1.6	50	4	1.95	●
2	R0.3	8	1.6	50	4	1.95	●
2	R0.3	10	1.6	50	4	1.95	●
2	R0.3	12	1.6	50	4	1.95	●
2	R0.3	16	1.6	50	4	1.95	●
2	R0.3	20	1.6	60	4	1.95	●
2	R0.5	4	1.6	50	4	1.95	●
2	R0.5	6	1.6	50	4	1.95	●
2	R0.5	8	1.6	50	4	1.95	●
2	R0.5	10	1.6	50	4	1.95	●
2	R0.5	12	1.6	50	4	1.95	●
2	R0.5	16	1.6	50	4	1.95	●
2	R0.5	20	1.6	60	4	1.95	●
3	R0.1	6	2.5	50	6	2.85	●
3	R0.1	8	2.5	50	6	2.85	●
3	R0.1	12	2.5	50	6	2.85	●
3	R0.1	16	2.5	60	6	2.85	●
3	R0.1	20	2.5	60	6	2.85	●
3	R0.1	25	2.5	70	6	2.85	●
3	R0.1	30	2.5	70	6	2.85	●
3	R0.2	6	2.5	50	6	2.85	●
3	R0.2	8	2.5	50	6	2.85	●
3	R0.2	12	2.5	50	6	2.85	●
3	R0.2	16	2.5	60	6	2.85	●
3	R0.2	20	2.5	60	6	2.85	●
3	R0.2	25	2.5	70	6	2.85	●
3	R0.2	30	2.5	70	6	2.85	●
3	R0.3	6	2.5	50	6	2.85	●
3	R0.3	8	2.5	50	6	2.85	●
3	R0.3	12	2.5	50	6	2.85	●
3	R0.3	16	2.5	60	6	2.85	●
3	R0.3	20	2.5	60	6	2.85	●
3	R0.3	25	2.5	70	6	2.85	●
3	R0.3	30	2.5	70	6	2.85	●
3	R0.5	6	2.5	50	6	2.85	●
3	R0.5	8	2.5	50	6	2.85	●
3	R0.5	12	2.5	50	6	2.85	●
3	R0.5	16	2.5	60	6	2.85	●
3	R0.5	20	2.5	60	6	2.85	●
3	R0.5	25	2.5	70	6	2.85	●
3	R0.5	30	2.5	70	6	2.85	●
4	R0.1	8	4	60	6	3.85	●
4	R0.1	12	4	60	6	3.85	●
4	R0.1	16	4	60	6	3.85	●
4	R0.1	20	4	70	6	3.85	●
4	R0.1	25	4	70	6	3.85	●
4	R0.1	30	4	80	6	3.85	●
4	R0.1	40	4	90	6	3.85	●
4	R0.2	8	4	60	6	3.85	●
4	R0.2	12	4	60	6	3.85	●
4	R0.2	16	4	60	6	3.85	●
4	R0.2	20	4	70	6	3.85	●

Dc 0 -0.02	R ±0.005	Ll mm	Lc mm	L mm	d h5	Dl mm	AlTiSiN F690TX
4	R0.2	25	4	70	6	3.85	●
4	R0.2	30	4	80	6	3.85	●
4	R0.2	40	4	90	6	3.85	●
4	R0.3	8	4	60	6	3.85	●
4	R0.3	12	4	60	6	3.85	●
4	R0.3	16	4	60	6	3.85	●
4	R0.3	20	4	70	6	3.85	●
4	R0.3	25	4	70	6	3.85	●
4	R0.3	30	4	80	6	3.85	●
4	R0.3	40	4	90	6	3.85	●
4	R0.5	8	4	60	6	3.85	●
4	R0.5	12	4	60	6	3.85	●
4	R0.5	16	4	60	6	3.85	●
4	R0.5	20	4	70	6	3.85	●
4	R0.5	25	4	70	6	3.85	●
4	R0.5	30	4	80	6	3.85	●
4	R0.5	40	4	90	6	3.85	●
4	R1	8	4	60	6	3.85	●
4	R1	12	4	60	6	3.85	●
4	R1	16	4	60	6	3.85	●
4	R1	20	4	70	6	3.85	●
4	R1	25	4	70	6	3.85	●
4	R1	30	4	80	6	3.85	●
4	R1	40	4	90	6	3.85	●
5	R0.2	20	4	70	6	4.85	●
5	R0.2	40	4	90	6	4.85	●
5	R0.3	20	4	70	6	4.85	●
5	R0.3	40	4	90	6	4.85	●
5	R0.5	20	4	70	6	4.85	●
5	R0.5	40	4	90	6	4.85	●
5	R1	20	4	70	6	4.85	●
5	R1	40	4	90	6	4.85	●
6	R0.3	18	5	60	6	5.85	●
6	R0.3	24	5	70	6	5.85	●
6	R0.3	36	5	80	6	5.85	●
6	R0.3	54	5	100	6	5.85	●
6	R0.5	12	5	60	6	5.85	●
6	R0.5	18	5	60	6	5.85	●
6	R0.5	24	5	70	6	5.85	●
6	R0.5	36	5	80	6	5.85	●
6	R0.5	54	5	100	6	5.85	●
6	R1	12	5	60	6	5.85	●
6	R1	18	5	60	6	5.85	●
6	R1	24	5	70	6	5.85	●
6	R1	36	5	80	6	5.85	●
6	R1	54	5	100	6	5.85	●

Side Milling

Work Material		GR.1 / GR.2 / GR.3 Carbon Steel / Low-alloyed Steel / Hi-alloyed Steel (~24HRC) (~30HRC)				GR.4 / GR.5 Hardened Steel/ Hardened Steel (38~48HRC) (30~38HRC)				GR.6 Hardened Steel (48~56HRC)				GR.7 Hardened Steel (56~68HRC)			
Code No.	Dc×Ll	RPM (min-1)	Feed (mm/min)	ap (mm)	ae (mm)	RPM (min-1)	Feed (mm/min)	ap (mm)	ae (mm)	RPM (min-1)	Feed (mm/min)	ap (mm)	ae (mm)	RPM (min-1)	Feed (mm/min)	ap (mm)	ae (mm)
F690TX	2×16	6,864	607	0.028	0.315	6,240	552	0.028	0.315	5616	442	0.039	0.315	5,900	90	0.023	0.315
F690TX	2×20	6,160	563	0.017	0.198	5,600	512	0.017	0.198	5040	410	0.024	0.198	5,300	84	0.014	0.198
F690TX	3×6	13,200	1,375	0.15	0.8	12,000	1,250	0.15	0.8	10800	1000	0.15	0.8	12,740	300	0.15	0.8
F690TX	3×8	12,320	1,329	0.15	0.72	11,200	1,208	0.15	0.72	10080	966	0.15	0.72	12,000	270	0.1	0.72
F690TX	3×12	9,240	1,012	0.105	0.670	8,400	920	0.105	0.670	7560	736	0.105	0.670	9,000	200	0.075	0.670
F690TX	3×16	8,096	845	0.081	0.630	7,360	768	0.081	0.630	6624	614	0.081	0.630	7,900	173	0.054	0.630
F690TX	3×20	7,392	774	0.073	0.580	6,720	704	0.073	0.580	6048	563	0.073	0.580	7,100	150	0.044	0.580
F690TX	3×25	6,600	722	0.065	0.495	6,000	656	0.065	0.495	5400	525	0.065	0.495	6,400	146	0.043	0.495
F690TX	3×30	6,160	634	0.050	0.380	5,600	576	0.050	0.380	5040	461	0.050	0.380	6,000	118	0.029	0.360
F690TX	4×8	8,800	990	0.1	1.2	8,000	900	0.1	1.2	7200	720	0.1	1.2	7,963	230	0.09	1.3
F690TX	4×12	7,832	950	0.083	1.150	7,120	864	0.083	1.150	6408	691	0.120	1.150	6,400	215	0.085	1.150
F690TX	4×16	6,952	906	0.065	1.000	6,320	824	0.065	1.000	5688	659	0.100	1.000	5,600	205	0.065	1.000
F690TX	4×20	6,072	871	0.054	0.900	5,520	792	0.054	0.900	4968	634	0.080	0.900	4,900	198	0.058	0.900
F690TX	4×25	5,456	792	0.043	0.8	4,960	720	0.043	0.8	4464	576	0.065	0.8	4,500	175	0.043	0.8
F690TX	4×30	4,840	634	0.027	0.648	4,400	576	0.027	0.648	3960	461	0.04	0.6	3,900	144	0.029	0.648
F690TX	4×40	4,048	317	0.007	0.315	3,680	288	0.007	0.315	3312	230	0.01	0.315	3,300	72	0.007	0.315
F690TX	5×20	7,007	935	0.05	0.9	6,370	850	0.05	0.9	5733	680	0.05	0.9	6,370	250	0.06	0.9
F690TX	5×40	5,606	770	0.01	0.3	5,096	700	0.01	0.3	4586	560	0.01	0.3	5,733	90	0.03	0.3
F690TX	6×12	5,830	946	0.1	1.0	5,300	860	0.1	1.0	4770	688	0.1	1.0	5,308	200	0.1	1.0
F690TX	6×18	5,170	880	0.05	0.9	4,700	800	0.05	0.9	4230	640	0.05	0.9	4,778	160	0.05	0.9
F690TX	6×24	4,620	770	0.04	0.8	4,200	700	0.04	0.8	3780	560	0.04	0.8	4,247	130	0.04	0.8
F690TX	6×36	4,070	517	0.02	0.6	3,700	470	0.02	0.6	3330	376	0.02	0.6	3,716	120	0.02	0.6
F690TX	6×54	3,498	275	0.01	0.3	3,180	250	0.01	0.3	2862	200	0.01	0.3	3,185	90	0.01	0.3

(mm)



1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

F693TX

Toric End Mills For Rib Processing With Corner Radius

SMG Carbide

AlTiSiN TX

30°

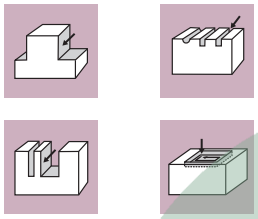
4

N

γ5°

R

Type of Operation



Work Material

P	H	M	K	N	S
	●				

H	<48HRC Hardened Steel
H	<56HRC Hardened Steel
H	<68HRC Hardened Steel

Feature of product:

End Mills For Rib Processing with Corner Radius- 4 Flutes

Widely used in high precision mold, deep machining angle clean with long neck and micro 3D curved surface.

Good wear resistance and lubricating effect with Nano multilayer coating.

High precision R value and available with complete size range.

Workable for various steel materials and copper electrode materials.



Code No. F693TX-Dc×R×L1

Dc 0 -0.02	R ±0.005	L1 mm	Lc mm	L mm	d h5	Dl mm	AlTiSiN F693TX
1	R0.1	4	0.8	50	4	0.95	●
1	R0.1	6	0.8	50	4	0.95	●
1	R0.1	8	0.8	50	4	0.95	●
1	R0.1	10	0.8	50	4	0.95	●
1	R0.1	12	0.8	50	4	0.95	●
1	R0.2	4	0.8	50	4	0.95	●
1	R0.2	6	0.8	50	4	0.95	●
1	R0.2	8	0.8	50	4	0.95	●
1	R0.2	10	0.8	50	4	0.95	●
1	R0.2	12	0.8	50	4	0.95	●
1	R0.3	4	0.8	50	4	0.95	●
1	R0.3	6	0.8	50	4	0.95	●
1	R0.3	8	0.8	50	4	0.95	●
1	R0.3	10	0.8	50	4	0.95	●
1	R0.3	12	0.8	50	4	0.95	●
1.5	R0.1	4	1.2	50	4	1.45	●
1.5	R0.1	6	1.2	50	4	1.45	●
1.5	R0.1	8	1.2	50	4	1.45	●
1.5	R0.1	10	1.2	50	4	1.45	●
1.5	R0.1	12	1.2	50	4	1.45	●
1.5	R0.1	16	1.2	50	4	1.45	●
1.5	R0.2	4	1.2	50	4	1.45	●
1.5	R0.2	6	1.2	50	4	1.45	●
1.5	R0.2	8	1.2	50	4	1.45	●
1.5	R0.2	12	1.2	50	4	1.45	●
1.5	R0.2	16	1.2	50	4	1.45	●
1.5	R0.3	4	1.2	50	4	1.45	●
1.5	R0.3	6	1.2	50	4	1.45	●
1.5	R0.3	8	1.2	50	4	1.45	●
1.5	R0.3	12	1.2	50	4	1.45	●
1.5	R0.3	16	1.2	50	4	1.45	●
2	R0.1	6	1.6	50	4	1.95	●
2	R0.1	8	1.6	50	4	1.95	●
2	R0.1	12	1.6	50	4	1.95	●
2	R0.1	16	1.6	50	4	1.95	●
2	R0.1	20	1.6	60	4	1.95	●
2	R0.2	6	1.6	50	4	1.95	●
2	R0.2	8	1.6	50	4	1.95	●
2	R0.2	12	1.6	50	4	1.95	●
2	R0.2	16	1.6	50	4	1.95	●
2	R0.2	20	1.6	60	4	1.95	●
2	R0.3	6	1.6	50	4	1.95	●
2	R0.3	8	1.6	50	4	1.95	●
2	R0.3	12	1.6	50	4	1.95	●
2	R0.3	16	1.6	50	4	1.95	●
2	R0.3	20	1.6	60	4	1.95	●
2	R0.5	6	1.6	50	4	1.95	●
2	R0.5	8	1.6	50	4	1.95	●
2	R0.5	12	1.6	50	4	1.95	●
2	R0.5	16	1.6	50	4	1.95	●
2	R0.5	20	1.6	60	4	1.95	●
3	R0.1	8	2.5	50	6	2.85	●
3	R0.1	12	2.5	50	6	2.85	●
3	R0.1	16	2.5	60	6	2.85	●
3	R0.1	20	2.5	60	6	2.85	●
3	R0.1	25	2.5	70	6	2.85	●
3	R0.1	30	2.5	70	6	2.85	●
3	R0.2	8	2.5	50	6	2.85	●
3	R0.2	12	2.5	50	6	2.85	●
3	R0.2	16	2.5	60	6	2.85	●
3	R0.2	20	2.5	60	6	2.85	●
3	R0.2	25	2.5	70	6	2.85	●
3	R0.2	30	2.5	70	6	2.85	●
3	R0.3	8	2.5	50	6	2.85	●

Dc 0 -0.02	R ±0.005	L1 mm	Lc mm	L mm	d h5	Dl mm	AlTiSiN F693TX
3	R0.3	12	2.5	50	6	2.85	●
3	R0.3	16	2.5	60	6	2.85	●
3	R0.3	20	2.5	60	6	2.85	●
3	R0.3	25	2.5	70	6	2.85	●
3	R0.3	30	2.5	70	6	2.85	●
3	R0.5	8	2.5	50	6	2.85	●
3	R0.5	12	2.5	50	6	2.85	●
3	R0.5	16	2.5	60	6	2.85	●
3	R0.5	20	2.5	60	6	2.85	●
3	R0.5	25	2.5	70	6	2.85	●
3	R0.5	30	2.5	70	6	2.85	●
4	R0.1	12	4	60	6	3.85	●
4	R0.1	16	4	60	6	3.85	●
4	R0.1	20	4	70	6	3.85	●
4	R0.1	30	4	80	6	3.85	●
4	R0.1	40	4	90	6	3.85	●
4	R0.2	12	4	60	6	3.85	●
4	R0.2	16	4	60	6	3.85	●
4	R0.2	20	4	70	6	3.85	●
4	R0.2	30	4	80	6	3.85	●
4	R0.2	40	4	90	6	3.85	●
4	R0.3	12	4	60	6	3.85	●
4	R0.3	16	4	60	6	3.85	●
4	R0.3	20	4	70	6	3.85	●
4	R0.3	30	4	80	6	3.85	●
4	R0.3	40	4	90	6	3.85	●
4	R0.5	12	4	60	6	3.85	●
4	R0.5	16	4	60	6	3.85	●
4	R0.5	20	4	70	6	3.85	●
4	R0.5	30	4	80	6	3.85	●
4	R0.5	40	4	90	6	3.85	●
4	R1	12	4	60	6	3.85	●
4	R1	16	4	60	6	3.85	●
4	R1	20	4	70	6	3.85	●
4	R1	30	4	80	6	3.85	●
4	R1	40	4	90	6	3.85	●
5	R0.2	20	5	70	6	4.85	●
5	R0.2	40	5	90	6	4.85	●
5	R0.3	20	5	70	6	4.85	●
5	R0.3	40	5	90	6	4.85	●
5	R0.5	20	5	70	6	4.85	●
5	R0.5	40	5	90	6	4.85	●
5	R1	20	5	70	6	4.85	●
5	R1	40	5	90	6	4.85	●
6	R0.2	36	6	80	6	5.85	●
6	R0.2	54	6	100	6	5.85	●
6	R0.3	36	6	80	6	5.85	●
6	R0.3	54	6	100	6	5.85	●
6	R0.5	36	6	80	6	5.85	●
6	R0.5	54	6	100	6	5.85	●
6	R1	36	6	80	6	5.85	●
6	R1	54	6	100	6	5.85	●

Side Milling

Work Material		GR.5 Hardened Steel (38~48HRC)				GR.6 Hardened Steel (48~56HRC)				GR.7 Hardened Steel (56~68HRC)			
Code No.	Dc×Ll	RPM (min-1)	Feed (mm/min)	ap (mm)	ae (mm)	RPM (min-1)	Feed (mm/min)	ap (mm)	ae (mm)	RPM (min-1)	Feed (mm/min)	ap (mm)	ae (mm)
F693TX	1×4	13,800	1,310	0.039	0.270	12,000	1,070	0.031	0.243	8,500	640	0.015	0.243
F693TX	1×6	11,300	1,040	0.021	0.216	9,800	860	0.016	0.209	7,000	510	0.01	0.108
F693TX	1×8	9,800	780	0.02	0.189	8,500	720	0.012	0.16	6,100	420	0.008	0.094
F693TX	1×10	8,800	510	0.011	0.126	7,600	510	0.009	0.1	5,400	350	0.006	0.05
F693TX	1×12	8,000	450	0.01	0.1	7,000	450	0.005	0.05	5,000	300	0.003	0.03
F693TX	1.5×4	13,200	1,360	0.054	0.054	13,200	1,280	0.042	0.495	10,100	700	0.033	0.292
F693TX	1.5×6	11,600	1,280	0.041	0.486	10,600	1,210	0.038	0.445	8,100	460	0.025	0.202
F693TX	1.5×8	10,200	1,080	0.037	0.378	9,300	1,020	0.031	0.346	7,100	390	0.015	0.157
F693TX	1.5×10	9,500	9,000	0.032	0.35	8,800	800	0.03	0.32	6,500	350	0.013	0.15
F693TX	1.5×12	8,500	830	0.029	0.324	7,800	780	0.026	0.297	5,900	300	0.01	0.162
F693TX	1.5×16	7,400	670	0.018	0.216	6,800	600	0.014	0.198	5,100	230	0.005	0.108
F693TX	2×6	12,800	1,280	0.064	0.648	12,000	1,200	0.06	0.729	9,700	700	0.028	0.324
F693TX	2×8	11,200	1,160	0.058	0.612	10,400	1,100	0.055	0.648	8,400	600	0.026	0.288
F693TX	2×12	9,100	1,030	0.046	0.405	8,500	960	0.044	0.405	6,900	420	0.018	0.180
F693TX	2×16	7,800	860	0.042	0.283	7,300	700	0.039	0.315	5,900	270	0.016	0.157
F693TX	2×20	7,000	800	0.025	0.198	6,600	650	0.024	0.198	5,300	290	0.007	0.116
F693TX	3×8	12,500	2,530	0.105	0.7	11,800	2,200	0.07	0.7	9,900	810	0.047	0.50
F693TX	3×12	10,500	2,020	0.084	0.670	10,000	1,950	0.052	0.67	8,100	660	0.037	0.5
F693TX	3×16	9,200	1,680	0.064	0.634	8,800	1,600	0.04	0.63	7,100	570	0.027	0.378
F693TX	3×20	8,400	1,540	0.058	0.580	7,900	1,490	0.036	0.58	6,300	550	0.022	0.319
F693TX	3×25	7,500	1,350	0.05	0.4	7,000	1,100	0.025	0.4	6,000	450	0.01	0.2
F693TX	3×30	7,000	1,260	0.04	0.38	6,500	1,230	0.015	0.38	5,400	390	0.007	0.144
F693TX	4×12	8,500	1,400	0.1	1.0	7,100	1,350	0.078	1.08	6,000	760	0.051	0.76
F693TX	4×16	7,900	1,370	0.091	1.0	6,600	1,330	0.071	1.0	5,600	740	0.043	0.7
F693TX	4×20	6,200	1,200	0.06	0.8	5,200	1,120	0.047	0.8	4,500	630	0.022	0.56
F693TX	4×30	5,500	960	0.037	0.648	4,600	920	0.029	0.648	3,900	600	0.011	0.388
F693TX	4×40	4,125	720	0.027	0.486	3,450	690	0.021	0.486	2,925	450	0.008	0.291
F693TX	5×20	5,800	1,730	0.18	2.358	3,500	1,000	0.1	1.31	3,000	760	0.07	1.31
F693TX	5×40	3,000	800	0.1	1.35	1,700	480	0.1	0.75	1,400	360	0.04	0.5
F693TX	6×36	4,500	1,290	0.158	2.268	2,600	740	0.158	1.260	2,200	580	0.066	1.26
F693TX	6×54	2,000	510	0.05	0.9	1,200	330	0.04	0.5	1,000	240	0.02	0.3

(mm)



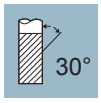
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

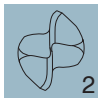
F695TX

Ball Nose End Mills For Rib Processing

SMG Carbide

AlTiSiN TX

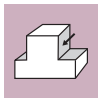


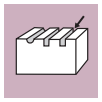


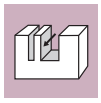




Type of Operation









Work Material

P	H	M	K	N	S
●	●		○	○	

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **H** <68HRC Hardened Steel
- **K** Cast Iron
- **N** Copper

Feature of product:

Ball Nose End Mills For Rib Processing- 2 Flutes

Widely used in high precision mold, deep machining angle clean with long neck and micro 3D curved surface.

Good wear resistance and lubricating effect with Nano multilayer coating.

High precision R value and available with complete size range.

Workable for various steel materials and copper electrode materials.



Code No. F695TX-R×L1

R ±0.005	L1 mm	Lc mm	L mm	d h5	D1 mm	AlTiSiN F695TX
0.1 R	0.5	0.16	50	4	0.18	●
0.1 R	1	0.16	50	4	0.18	●
0.1 R	1.5	0.16	50	4	0.18	●
0.1 R	2	0.16	50	4	0.18	●
0.1 R	3	0.16	50	4	0.18	●
0.15R	1	0.24	50	4	0.27	●
0.15R	1.5	0.24	50	4	0.27	●
0.15R	2	0.24	50	4	0.27	●
0.15R	3	0.24	50	4	0.27	●
0.2 R	1	0.3	50	4	0.37	●
0.2 R	1.5	0.3	50	4	0.37	●
0.2 R	2	0.3	50	4	0.37	●
0.2 R	3	0.3	50	4	0.37	●
0.2 R	4	0.3	50	4	0.37	●
0.2 R	5	0.3	50	4	0.37	●
0.25R	1	0.4	50	4	0.45	●
0.25R	2	0.4	50	4	0.45	●
0.25R	3	0.4	50	4	0.45	●
0.25R	4	0.4	50	4	0.45	●
0.25R	5	0.4	50	4	0.45	●
0.25R	6	0.4	50	4	0.45	●
0.25R	8	0.4	50	4	0.45	●
0.25R	10	0.4	50	4	0.45	●
0.3 R	1	0.5	50	4	0.55	●
0.3 R	2	0.5	50	4	0.55	●
0.3 R	3	0.5	50	4	0.55	●
0.3 R	4	0.5	50	4	0.55	●
0.3 R	5	0.5	50	4	0.55	●
0.3 R	6	0.5	50	4	0.55	●
0.3 R	8	0.5	50	4	0.55	●
0.3 R	10	0.5	50	4	0.55	●
0.3 R	12	0.5	50	4	0.55	●
0.4 R	2	0.6	50	4	0.75	●
0.4 R	3	0.6	50	4	0.75	●
0.4 R	4	0.6	50	4	0.75	●
0.4 R	5	0.6	50	4	0.75	●
0.4 R	6	0.6	50	4	0.75	●
0.4 R	8	0.6	50	4	0.75	●
0.4 R	10	0.6	50	4	0.75	●
0.4 R	12	0.6	50	4	0.75	●
0.5 R	2	0.8	50	4	0.95	●
0.5 R	3	0.8	50	4	0.95	●
0.5 R	4	0.8	50	4	0.95	●
0.5 R	5	0.8	50	4	0.95	●
0.5 R	6	0.8	50	4	0.95	●
0.5 R	8	0.8	50	4	0.95	●
0.5 R	10	0.8	50	4	0.95	●
0.5 R	12	0.8	50	4	0.95	●
0.5 R	16	0.8	50	4	0.95	●
0.5 R	20	0.8	60	4	0.95	●
0.5 R	25	0.8	60	4	0.95	●
0.6 R	2	1	50	4	1.15	●
0.6 R	4	1	50	4	1.15	●
0.6 R	6	1	50	4	1.15	●
0.6 R	8	1	50	4	1.15	●
0.6 R	10	1	50	4	1.15	●
0.6 R	12	1	50	4	1.15	●
0.6 R	16	1	50	4	1.15	●
0.75R	2	1.2	50	4	1.15	●
0.75R	4	1.2	50	4	1.45	●
0.75R	6	1.2	50	4	1.45	●
0.75R	8	1.2	50	4	1.45	●
0.75R	10	1.2	50	4	1.45	●
0.75R	12	1.2	50	4	1.45	●

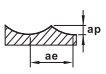
R ±0.005	L1 mm	Lc mm	L mm	d h5	D1 mm	AlTiSiN F695TX
0.75R	12	1.2	50	4	1.45	●
0.75R	16	1.2	50	4	1.45	●
0.75R	20	1.2	60	4	1.45	●
0.75R	25	1.2	60	4	1.45	●
0.75R	30	1.2	70	4	1.45	●
1 R	3	1.6	50	4	1.45	●
1 R	4	1.6	50	4	1.95	●
1 R	6	1.6	50	4	1.95	●
1 R	8	1.6	50	4	1.95	●
1 R	10	1.6	50	4	1.95	●
1 R	12	1.6	50	4	1.95	●
1 R	16	1.6	50	4	1.95	●
1 R	20	1.6	60	4	1.95	●
1 R	25	1.6	60	4	1.95	●
1 R	30	1.6	70	4	1.95	●
1 R	35	1.6	75	4	1.95	●
1 R	40	1.6	80	4	1.95	●
1.5 R	6	2.4	50	6	2.85	●
1.5 R	8	2.4	50	6	2.85	●
1.5 R	10	2.4	50	6	2.85	●
1.5 R	12	2.4	50	6	2.85	●
1.5 R	16	2.4	60	6	2.85	●
1.5 R	20	2.4	60	6	2.85	●
1.5 R	25	2.4	70	6	2.85	●
1.5 R	30	2.4	70	6	2.85	●
1.5 R	35	2.4	80	6	2.85	●
1.5 R	40	2.4	80	6	2.85	●
2 R	8	3.2	60	6	3.85	●
2 R	10	3.2	60	6	3.85	●
2 R	12	3.2	60	6	3.85	●
2 R	16	3.2	60	6	3.85	●
2 R	20	3.2	70	6	3.85	●
2 R	25	3.2	70	6	3.85	●
2 R	30	3.2	80	6	3.85	●
2 R	35	3.2	80	6	3.85	●
2 R	40	3.2	90	6	3.85	●
2 R	45	3.2	100	6	3.85	●
2 R	50	3.2	100	6	3.85	●
2.5 R	10	4	60	6	4.85	●
2.5 R	20	4	70	6	4.85	●
2.5 R	30	4	80	6	4.85	●
2.5 R	40	4	90	6	4.85	●
2.5 R	50	4	100	6	4.85	●
3 R	12	4.8	60	6	5.85	●
3 R	20	4.8	70	6	5.85	●
3 R	30	4.8	80	6	5.85	●
3 R	40	4.8	90	6	5.85	●
3 R	50	4.8	100	6	5.85	●

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General processing

Work Material		GR.1/GR.2/GR.3 Carbon Steel/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)				GR.4 / GR.5 Hardened Steel (30~38HRC)				GR.6 Hardened Steel (48~56HRC)				GR.7 Hardened Steel (56~68HRC)			
Code No.	Dc×Ll	RPM (min-1)	Feed (mm/min)	ap (mm)	ae (mm)	RPM (min-1)	Feed (mm/min)	ap (mm)	ae (mm)	RPM (min-1)	Feed (mm/min)	ap (mm)	ae (mm)	RPM (min-1)	Feed (mm/min)	ap (mm)	ae (mm)
F695TX-R	0.1R×0.5	50,000	325	0.01	0.01	45,500	273	0.01	0.01	37,800	189	0.01	0.01	35,700	147	0.01	0.01
F695TX-R	0.1R×1.5	45,900	325	0.006	0.006	45,500	273	0.006	0.006	37,800	189	0.006	0.006	35,700	147	0.006	0.006
F695TX-R	0.1R×2	45,900	269	0.006	0.006	45,500	273	0.006	0.006	37,800	189	0.006	0.006	35,700	147	0.006	0.006
F695TX-R	0.1R×3	44,500	212	0.003	0.003	40,500	173	0.003	0.003	30,240	121	0.003	0.003	33,500	110	0.003	0.003
F695TX-R	0.15R×1	43,200	432	0.01	0.01	36,000	360	0.01	0.01	30,750	278	0.01	0.01	30,750	233	0.01	0.01
F695TX-R	0.15R×1.5	39,282	400	0.01	0.01	34,000	3,000	0.01	0.01	29,000	250	0.01	0.01	29,000	220	0.01	0.01
F695TX-R	0.15R×2	38,700	333	0.01	0.01	32,250	278	0.008	0.008	27,750	203	0.008	0.008	27,750	173	0.006	0.008
F695TX-R	0.15R×3	34,200	288	0.005	0.005	28,500	240	0.007	0.006	24,000	180	0.006	0.006	24,000	150	0.004	0.006
F695TX-R	0.2R×1	43,200	594	0.03	0.03	36,000	495	0.018	0.024	27,750	338	0.015	0.024	27,750	285	0.013	0.024
F695TX-R	0.2R×1.5	43,200	560	0.02	0.02	36,000	460	0.018	0.024	27,750	320	0.015	0.024	27,750	260	0.012	0.024
F695TX-R	0.2R×2	43,200	531	0.016	0.016	36,000	443	0.018	0.024	27,750	300	0.015	0.024	27,750	255	0.012	0.024
F695TX-R	0.2R×3	36,900	378	0.01	0.01	30,750	315	0.012	0.012	23,250	210	0.011	0.012	23,250	180	0.009	0.012
F695TX-R	0.2R×4	34,500	360	0.01	0.01	2,850	300	0.009	0.012	22,500	203	0.009	0.012	22,500	173	0.007	0.012
F695TX-R	0.2R×5	26,100	297	0.01	0.01	21,750	248	0.008	0.012	19,500	195	0.007	0.012	19,500	158	0.005	0.012
F695TX-R	0.25R×1/0.25R×2/0.25R×3	34,200	522	0.03	0.045	33,000	720	0.03	0.04	26,000	400	0.02	0.04	26,000	230	0.012	0.03
F695TX-R	0.25R×4	34,200	522	0.02	0.04	28,500	435	0.017	0.024	23,250	300	0.014	0.024	23,250	165	0.009	0.012
F695TX-R	0.25R×5	29,700	432	0.02	0.03	24,750	360	0.012	0.012	22,500	293	0.009	0.012	22,500	150	0.008	0.012
F695TX-R	0.25R×6	25,200	360	0.01	0.03	21,000	300	0.008	0.012	20,250	248	0.005	0.012	20,250	150	0.005	0.010
F695TX-R	0.25R×8	25,200	360	0.01	0.02	21,000	300	0.008	0.012	20,250	248	0.005	0.012	20,250	150	0.005	0.010
F695TX-R	0.25R×10	23,500	300	0.006	0.01	18,000	270	0.006	0.01	20,000	210	0.005	0.01	20,000	130	0.005	0.01
F695TX-R	0.3R×1/0.3R×2/0.3R×3	34,500	693	0.04	0.07	30,000	630	0.03	0.1	24,000	420	0.025	0.1	24,000	370	0.025	0.1
F695TX-R	0.3R×4/0.3R×5/0.3R×6	31,500	414	0.02	0.04	26,250	450	0.020	0.072	19,500	285	0.016	0.072	19,500	240	0.013	0.072
F695TX-R	0.3R×8	21,600	360	0.02	0.04	18,000	300	0.009	0.036	17,250	240	0.006	0.036	17,250	203	0.005	0.036
F695TX-R	0.3R×10	20,500	330	0.008	0.03	16,500	300	0.006	0.03	15,000	200	0.005	0.03	15,000	170	0.005	0.03
F695TX-R	0.3R×12	20,000	300	0.005	0.03	15,000	250	0.006	0.03	13,500	170	0.005	0.03	13,500	150	0.005	0.03
F695TX-R	0.5R×2/0.5R×3/0.5R×4	29,500	710	0.07	0.18	25,500	630	0.06	0.2	16,800	380	0.05	0.2	15,500	370	0.01	0.18
F695TX-R	0.5R×5/0.5R×6/0.5R×8	28,800	693	0.05	0.18	24,000	5,775	0.057	0.2	16,500	360	0.045	0.2	14,025	360	0.009	0.180
F695TX-R	0.5R×10	15,840	477	0.03	0.1	13,200	398	0.024	0.060	12,375	315	0.018	0.060	11,550	225	0.009	0.060
F695TX-R	0.5R×12	15,840	477	0.02	0.08	13,200	398	0.024	0.060	12,375	315	0.018	0.060	11,550	225	0.009	0.060
F695TX-R	0.5R×16	13,860	396	0.02	0.05	11,550	330	0.018	0.060	10,725	270	0.014	0.060	9,075	180	0.005	0.036
F695TX-R	0.5R×20	12,870	324	0.02	0.04	10,725	270	0.013	0.036	9,900	225	0.009	0.036	7,425	135	0.005	0.024
F695TX-R	0.5R×25	11,500	300	0.01	0.035	10,000	240	0.01	0.03	8,800	200	0.009	0.03	7,400	110	0.005	0.02
F695TX-R	0.75R×2/0.75R×4/0.75R×6	19,500	1,000	0.15	0.2	19,500	900	0.15	0.2	12,000	550	0.12	0.2	11,000	500	0.09	0.2
F695TX-R	0.75R×8/0.75R×10	14,670	630	0.1	0.155	12,225	525	0.084	0.180	9,075	338	0.069	0.180	9,075	300	0.057	0.180
F695TX-R	0.75R×12/0.75R×16	14,670	630	0.06	0.1	12,225	525	0.084	0.180	9,075	338	0.069	0.180	9,075	300	0.057	0.180
F695TX-R	0.75R×20	11,160	432	0.04	0.05	9,300	360	0.016	0.060	8,700	293	0.012	0.060	8,700	270	0.010	0.060
F695TX-R	0.75R×25	10,000	390	0.03	0.03	9,000	300	0.03	0.03	8,500	250	0.01	0.03	8,200	250	0.01	0.03
F695TX-R	0.75R×30	9,000	380	0.02	0.02	8,500	300	0.02	0.02	8,000	240	0.01	0.01	7,500	220	0.01	0.01
F695TX-R	1R×3/1R×4/1R×6/1R×8	17,000	1,200	0.2	0.2	14,500	1,000	0.2	0.2	10,000	850	0.15	0.2	10,000	650	0.08	0.2
F695TX-R	1R×10/1R×12/1R×16	16,650	1,008	0.05	0.15	13,875	840	0.05	0.15	9,900	653	0.05	0.15	9,900	533	0.03	0.15
F695TX-R	1R×20	13,230	522	0.05	0.05	11,025	435	0.05	0.05	8,700	435	0.05	0.05	8,700	360	0.05	0.05
F695TX-R	1R×30	9,540	405	0.03	0.03	7,950	338	0.03	0.03	7,650	338	0.03	0.03	7,650	270	0.03	0.03
F695TX-R	1R×40	9,100	300	0.02	0.02	7,200	280	0.02	0.02	7,200	260	0.01	0.01	6,800	230	0.01	0.01
F695TX-R	1.5R×6/1.5R×8/1.5R×10	11,610	1,512	0.15	0.2	9,675	1,260	0.1	0.2	6,900	975	0.15	0.2	4,800	533	0.15	0.2
F695TX-R	1.5R×12/1.5R×16	11,610	1,359	0.1	0.2	9,675	1,133	0.1	0.2	6,900	878	0.15	0.2	4,800	488	0.15	0.2
F695TX-R	1.5R×20	9,045	1,067	0.1	0.15	7,538	889	0.13	0.15	6,075	780	0.13	0.15	4,350	443	0.09	0.15
F695TX-R	1.5R×30	7,920	702	0.07	0.07	6,600	585	0.07	0.07	6,075	585	0.04	0.07	4,350	315	0.04	0.07
F695TX-R	1.5R×40	6,350	450	0.03	0.03	6,350	450	0.03	0.03	5,400	450	0.03	0.03	3,600	250	0.03	0.03
F695TX-R	2R×8/2R×10/2R×12	8,730	1,404	0.15	0.2	7,275	1,170	0.1	0.2	5,100	908	0.2	0.2	5,100	735	0.15	0.2
F695TX-R	2R×16/2R×20	8,730	1,287	0.13	0.2	7,275	1,073	0.1	0.2	5,100	833	0.2	0.2	5,100	660	0.15	0.2
F695TX-R	2R×30	7,560	1,125	0.1	0.15	6,300	938	0.1	0.16	4,500	735	0.15	0.15	4,500	585	0.15	0.15
F695TX-R	2R×40	5,940	855	0.08	0.1	4,950	713	0.07	0.15	4,500	735	0.1	0.15	4,500	585	0.1	0.15
F695TX-R	2R×50	5,310	423	0.05	0.1	4,425	353	0.05	0.1	4,200	368	0.05	0.1	4,200	293	0.050	0.05
F695TX-R	2.5R×10/2.5R×20	7644	764	0.15	0.3	7262	726	0.15	0.3	6899	690	0.15	0.2	6554	621	0.13	0.2
F695TX-R	2.5R×30	5733	570	0.1	0.2	5446	542	0.1	0.2	5174	514	0.1	0.15	4657	489	0.1	0.15
F695TX-R	2.5R×40	5415	550	0.08	0.15	5144	523	0.08	0.15	4887	496	0.05	0.15	4398	472	0.05	0.15
F695TX-R	2.5R×50	5096	500	0.08	0.1	4841	475	0.08	0.1	4599	451	0.05	0.1	4139	429	0.05	0.1
F695TX-R	3R×12/3R×20	5839	640	0.2	0.3	5547	608	0.2	0.3	5270	578	0.2	0.15	4743	549	0.2	0.1
F695TX-R	3R×30	4778	590	0.13	0.2	4539	561	0.13	0.2	4312	532	0.1	0.1	3881	506	0.1	0.2
F695TX-R	3R×40	4512	550	0.13	0.2	4286	523	0.13	0.2	4072	496	0.1	0.1	3665	472	0.1	0.2
F695TX-R	3R×50	4247	500	0.1	0.15	4034	475	0.1	0.15	3833	451	0.1	0.1	3449	429	0.05	0.15

(mm)



1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

F691TX

End Mills For Rib Processing

SMG Carbide

AlTiSiN TX

30°

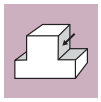
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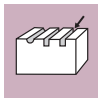
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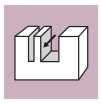
γ5°

90°

Type of Operation







Work Material

P	H	M	K	N	S
●	●		○	○	

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **H** <68HRC Hardened Steel
- **K** Cast Iron
- **N** Copper





Sharp Corner edge

A-1

Code No. F691TX-Dc×L1

Dc 0 -0.02	L1 mm	Lc mm	L mm	d h5	D1 mm	AlTiSiN F691TX
0.5	2	0.7	50	4	0.45	●
0.5	4	0.7	50	4	0.45	●
0.5	6	0.7	50	4	0.45	●
0.6	2	0.9	50	4	0.55	●
0.6	4	0.9	50	4	0.55	●
0.6	6	0.9	50	4	0.55	●
0.7	2	1	50	4	0.65	●
0.7	4	1	50	4	0.65	●
0.7	6	1	50	4	0.65	●
0.8	4	1.2	50	4	0.75	●
0.8	6	1.2	50	4	0.75	●
0.8	8	1.2	50	4	0.75	●
1	6	1.5	50	4	0.95	●
1	8	1.5	50	4	0.95	●
1	10	1.5	50	4	0.95	●
1	12	1.5	50	4	0.95	●
1.2	6	1.8	50	4	1.15	●
1.2	10	1.8	50	4	1.15	●
1.5	6	2.3	50	4	1.45	●
1.5	8	2.3	50	4	1.45	●
1.5	10	2.3	50	4	1.45	●
1.5	12	2.3	50	4	1.45	●
1.5	14	2.3	50	4	1.45	●
1.5	16	2.3	50	4	1.45	●
1.5	20	2.3	60	4	1.45	●
2	6	3	50	4	1.95	●
2	8	3	50	4	1.95	●
2	10	3	50	4	1.95	●
2	12	3	50	4	1.95	●
2	14	3	50	4	1.95	●
2	16	3	50	4	1.95	●
2	20	3	60	4	1.95	●
2.5	8	3.7	50	4	2.4	●
2.5	10	3.7	50	4	2.4	●
2.5	12	3.7	50	4	2.4	●
2.5	16	3.7	60	4	2.4	●
3	12	4.5	50	6	2.85	●
3	14	4.5	60	6	2.85	●
3	16	4.5	60	6	2.85	●
3	18	4.5	60	6	2.85	●
3	20	4.5	60	6	2.85	●
3	25	4.5	70	6	2.85	●

Feature of product:

End Mills For Rib Processing with Sharp Corner Edge- 2 Flutes Square.

Widely used in high precision mold and deep machining angle clean with long neck.

Good wear resistance and lubricating effect with Nano multilayer coating.

Designed with sharp corner edge can accurately work on the right angle.

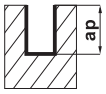
Available with complete size range.

Workable for various steel materials and copper electrode materials.

Slotting

Work Material		GR.1 Carbon Steel			GR.2 Low-alloyed Steel (~24HRC)			GR.3 Hi-alloyed Steel (~30HRC)			GR.4 Hardened Steel (30~38HRC)			GR.5 Hardened Steel (38~48HRC)			GR.6 Hardened Steel (48~56HRC)			GR.7 Hardened Steel (56~68HRC)		
Code No.	Dc×Ll	RPM (min-1)	Feed (mm/min)	ap (mm)	RPM (min-1)	Feed (mm/min)	ap (mm)	RPM (min-1)	Feed (mm/min)	ap (mm)	RPM (min-1)	Feed (mm/min)	ap (mm)	RPM (min-1)	Feed (mm/min)	ap (mm)	RPM (min-1)	Feed (mm/min)	ap (mm)	RPM (min-1)	Feed (mm/min)	ap (mm)
F691TX	0.5×2	45,440	720	0.015	45,440	720	0.015	43,200	608	0.014	32,480	408	0.011	32,480	408	0.011	26,000	280	0.008	14,000	20	0.008
F691TX	0.5×4	32,480	464	0.008	32,480	464	0.008	28,880	368	0.007	23,760	264	0.006	23,760	264	0.006	18,960	184	0.004	14,000	18	0.004
F691TX	0.5×6	26,720	336	0.004	26,720	336	0.004	22,800	256	0.004	19,760	200	0.003	19,760	200	0.003	15,760	136	0.002	14,000	16	0.002
F691TX	0.6×2	50,880	992	0.023	50,880	992	0.023	42,640	744	0.02	31,280	480	0.016	31,280	480	0.016	25,040	328	0.011	12,000	23	0.011
F691TX	0.6×4	33,040	592	0.012	33,040	592	0.012	27,760	440	0.011	22,320	312	0.009	22,320	312	0.009	17,840	216	0.006	12,000	21	0.006
F691TX	0.6×6	25,680	416	0.007	25,680	416	0.007	21,600	312	0.006	18,400	232	0.005	18,400	232	0.005	14,720	160	0.003	12,000	19	0.003
F691TX	0.7×2	31,120	700	0.02	31,120	700	0.02	26,160	510	0.02	20,640	360	0.02	20,640	360	0.02	16,480	240	0.01	10,000	20	0.01
F691TX	0.7×4	31,120	672	0.017	31,120	672	0.017	26,160	504	0.015	20,640	352	0.012	20,640	352	0.012	16,480	232	0.009	10,000	22	0.009
F691TX	0.7×6	24,160	480	0.01	24,160	480	0.01	20,320	360	0.009	16,960	264	0.007	16,960	264	0.007	13,520	184	0.005	10,000	20	0.005
F691TX	0.8×4	29,680	744	0.027	29,680	744	0.027	24,880	560	0.024	19,280	384	0.019	19,280	384	0.019	15,440	264	0.013	8,000	20	0.013
F691TX	0.8×6	23,040	544	0.015	23,040	544	0.015	19,360	408	0.013	15,840	296	0.01	15,840	296	0.01	12,640	200	0.007	8,000	18	0.007
F691TX	0.8×8	19,280	416	0.009	19,280	416	0.009	16,240	312	0.008	13,760	240	0.006	13,760	240	0.006	11,040	160	0.004	8,000	16	0.004
F691TX	1×6	21,200	680	0.023	21,200	680	0.023	17,680	504	0.021	14,080	352	0.016	14,080	352	0.016	11,280	248	0.012	6,500	14	0.012
F691TX	1×8	17,680	528	0.014	17,680	528	0.014	14,880	392	0.013	12,240	288	0.01	12,240	288	0.01	9,840	200	0.01	6,500	14	0.01
F691TX	1×10	15,360	424	0.01	15,360	424	0.01	12,960	320	0.009	11,040	240	0.007	11,040	240	0.007	8,800	168	0.005	6,500	12	0.005
F691TX	1×12	13,760	352	0.007	13,760	352	0.007	11,600	264	0.006	10,080	200	0.005	10,080	200	0.005	8,080	136	0.003	6,500	11	0.003
F691TX	1.2×6	19,840	776	0.037	19,840	776	0.037	16,560	576	0.034	12,880	392	0.026	12,880	392	0.026	10,240	272	0.019	9,600	22	0.019
F691TX	1.2×10	14,400	496	0.016	14,400	496	0.016	12,080	376	0.014	9,920	272	0.011	9,920	272	0.011	7,920	184	0.008	/	/	0.008
F691TX	1.5×6	18,240	896	0.057	18,240	896	0.057	15,200	672	0.051	11,520	440	0.04	11,520	440	0.04	9,200	304	0.028	9,600	60	0.028
F691TX	1.5×8	15,200	720	0.041	15,200	720	0.041	12,720	536	0.037	10,000	368	0.029	10,000	368	0.029	8,000	256	0.02	9,600	25	0.02
F691TX	1.5×10	13,280	600	0.03	13,280	600	0.03	11,040	448	0.027	8,960	312	0.021	8,960	312	0.021	7,120	216	0.015	9,600	13	0.015
F691TX	1.5×12	11,840	504	0.023	11,840	504	0.023	9,920	376	0.02	8,160	272	0.016	8,160	272	0.016	6,560	192	0.011	/	/	0.011
F691TX	1.5×14	10,720	440	0.017	10,720	440	0.017	8,960	328	0.016	7,600	240	0.012	7,600	240	0.012	6,080	168	0.009	/	/	0.009
F691TX	1.5×16	9,840	384	0.013	9,840	384	0.013	8,240	288	0.012	7,120	216	0.009	7,120	216	0.009	5,680	152	0.007	/	/	0.007
F691TX	1.5×20	8,560	296	0.009	8,560	296	0.009	7,200	224	0.008	6,320	160	0.006	6,320	160	0.006	5,040	120	0.004	/	/	0.004
F691TX	2×6	16,240	1,080	0.064	16,240	1,080	0.064	13,920	824	0.058	10,000	520	0.045	10,000	520	0.045	8,000	360	0.032	9,600	211	0.032
F691TX	2×8	13,600	872	0.054	13,600	872	0.054	11,600	664	0.048	8,640	432	0.038	8,640	432	0.038	6,960	304	0.027	9,600	89	0.027
F691TX	2×10	11,840	736	0.045	11,840	736	0.045	10,080	560	0.04	7,760	376	0.031	7,760	376	0.031	6,240	264	0.022	9,600	45	0.022
F691TX	2×12	10,560	632	0.037	10,560	632	0.037	8,960	480	0.034	7,120	336	0.026	7,120	336	0.026	5,680	232	0.019	9,600	56	0.019
F691TX	2×14	9,600	560	0.031	9,600	560	0.031	8,160	424	0.028	6,560	296	0.022	6,560	296	0.022	5,280	208	0.016	9,600	16	0.016
F691TX	2×16	8,880	496	0.026	8,880	496	0.026	7,520	376	0.024	6,160	272	0.018	6,160	272	0.018	4,880	184	0.013	9,600	11	0.013
F691TX	2×20	7,680	400	0.018	7,680	400	0.018	6,480	304	0.016	5,520	224	0.013	5,520	224	0.013	4,400	152	0.009	/	/	0.009
F691TX	2.5×8	12,000	1,072	0.077	12,000	1,072	0.077	10,240	816	0.069	7,680	536	0.054	7,680	536	0.054	6,160	368	0.039	9,600	227	0.039
F691TX	2.5×10	10,480	912	0.068	10,480	912	0.068	8,880	688	0.061	6,880	472	0.048	6,880	472	0.048	5,520	320	0.034	9,600	116	0.034
F691TX	2.5×12	9,440	800	0.06	9,440	800	0.06	8,000	600	0.054	6,320	416	0.042	6,320	416	0.042	5,040	288	0.03	9,600	67	0.03
F691TX	2.5×16	7,920	632	0.045	7,920	632	0.045	6,720	472	0.04	5,440	344	0.031	5,440	344	0.031	4,400	232	0.022	9,600	28	0.022
F691TX	3×12	8,400	888	0.081	8,400	888	0.081	6,960	664	0.073	5,360	448	0.057	5,360	448	0.057	4,240	304	0.041	8,000	128	0.041
F691TX	3×14	7,680	800	0.072	7,680	800	0.072	6,400	592	0.065	4,960	408	0.051	4,960	408	0.051	4,000	280	0.036	8,000	81	0.036
F691TX	3×16	7,120	720	0.064	7,120	720	0.064	5,920	536	0.058	4,720	376	0.045	4,720	376	0.045	3,760	256	0.032	8,000	54	0.032
F691TX	3×18	6,640	656	0.057	6,640	656	0.057	5,600	488	0.051	4,480	344	0.04	4,480	344	0.04	3,600	240	0.028	8,000	38	0.028
F691TX	3×20	6,240	600	0.05	6,240	600	0.05	5,280	448	0.045	4,240	320	0.035	4,240	320	0.035	3,440	224	0.025	8,000	27	0.025
F691TX	3×25	5,520	496	0.036	5,520	496	0.036	4,640	368	0.032	3,840	272	0.025	3,840	272	0.025	3,120	184	0.018	8,000	14	0.018

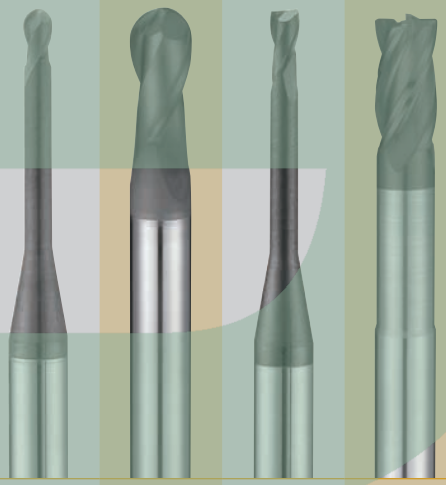
(mm)



1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.



End Mills For Graphite

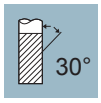
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Coating	Diamond DC	Diamond DC	Diamond DC	Diamond DC
Helix Angle				
No.of Flutes				

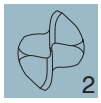
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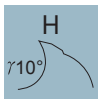
G696DC

Ball Nose End Mills For Graphite

MG Carbide | Diamond DC

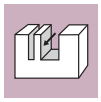


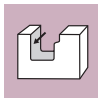






Type of Operation









Work Material

P	H	M	K	N	S
				●	

N Graphite

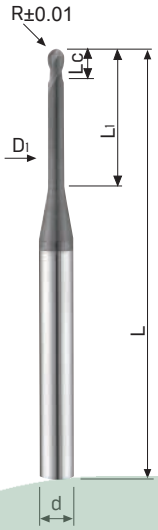
Feature of product:

Ball Nose End Mills for Graphite

Apply with high hardness diamond coating and have a good wear resistance.

Keep lower wear condition level in high speed processing.

Suitable for corner angle cleaning processing of graphite electrodes.

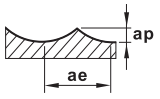


Code No. G696DC-R×L1

R ±0.01	L1 mm	Lc mm	L mm	d h5	D1 mm	Diamond G696DC
0.2R	5	0.6	50	4	0.37	●
0.2R	10	0.6	50	4	0.37	●
0.3R	5	0.9	50	4	0.55	●
0.3R	10	0.9	50	4	0.55	●
0.3R	15	0.9	60	4	0.55	●
0.3R	20	0.9	60	4	0.55	●
0.5R	5	1.5	50	4	0.95	●
0.5R	10	1.5	50	4	0.95	●
0.5R	15	1.5	60	4	0.95	●
0.5R	20	1.5	60	4	0.95	●
0.5R	30	1.5	80	4	0.95	●
0.75R	5	2.3	60	4	1.45	●
0.75R	10	2.3	60	4	1.45	●
0.75R	15	2.3	60	4	1.45	●
0.75R	20	2.3	60	4	1.45	●
0.75R	30	2.3	80	4	1.45	●
0.75R	40	2.3	80	4	1.45	●
1R	5	3	60	4	1.95	●
1R	10	3	60	4	1.95	●
1R	15	3	60	4	1.95	●
1R	20	3	60	4	1.95	●
1R	30	3	80	4	1.95	●
1R	40	3	80	4	1.95	●
1R	60	3	100	4	1.95	●
1.5R	10	4.5	60	4	2.85	●
1.5R	20	4.5	60	4	2.85	●
1.5R	40	4.5	80	4	2.85	●
1.5R	60	4.5	100	4	2.85	●
2R	20	6	60	4	3.85	●
2R	40	6	80	4	3.85	●
2R	60	6	120	4	3.85	●

High-speed machining

Work Material		GR.14 Graphite		
Code No.	R×L1	RPM (min-1)	Feed (mm/min)	AP (mm)
G696DC-0.2R	0.2R×5	38000~20000	850~480	0.03
G696DC-0.2R	0.2R×10	30000~18000	430~250	0.03
G696DC-0.3R	0.3R×5	38000~20000	960~480	0.06
G696DC-0.3R	0.3R×10	30000~20000	580~385	0.05
G696DC-0.3R	0.3R×15	15000~10000	215~145	0.03
G696DC-0.3R	0.3R×20	8000~7000	115~95	0.03
G696DC-0.5R	0.5R×5	38000~20000	1080~600	0.1
G696DC-0.5R	0.5R×10	30000~20000	840~575	0.1
G696DC-0.5R	0.5R×15	23000~18000	530~410	0.08
G696DC-0.5R	0.5R×20	16000~12000	270~205	0.08
G696DC-0.5R	0.5R×30	8000~5000	145~85	0.04
G696DC-0.75R	0.75R×5	38000~20000	1700~900	0.15
G696DC-0.75R	0.75R×10	36000~20000	1440~865	0.15
G696DC-0.75R	0.75R×15	30000~20000	1300~865	0.15
G696DC-0.75R	0.75R×20	20000~18000	670~625	0.15
G696DC-0.75R	0.75R×30	11500~9000	295~240	0.1
G696DC-0.75R	0.75R×40	7000~5000	190~130	0.075
G696DC-1R	1R×5	38000~20000	2650~1350	0.2
G696DC-1R	1R×10	38000~20000	2250~1350	0.2
G696DC-1R	1R×15	28000~20000	1800~1350	0.2
G696DC-1R	1R×20	21800~18000	1470~1100	0.2
G696DC-1R	1R×30	15200~11500	800~615	0.18
G696DC-1R	1R×40	5700~4000	315~210	0.13
G696DC-1R	1R×60	5700~4000	315~210	0.08
G696DC-1.5R	1.5R×10	36000~20000	2400~1350	0.3
G696DC-1.5R	1.5R×20	19000~15500	1945~1550	0.3
G696DC-1.5R	1.5R×40	11875~9200	950~740	0.22
G696DC-1.5R	1.5R×60	6650~4000	465~280	0.15
G696DC-2R	2R×20	19000~14000	2800~2050	0.4
G696DC-2R	2R×40	11000~9500	1615~1350	0.4
G696DC-2R	2R×60	7800~5700	1120~770	0.3



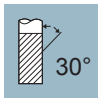
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

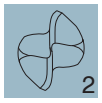
G234DC / G244DC

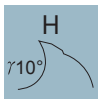
Ball Nose End Mills For Graphite

MG Carbide

Diamond DC

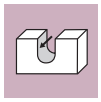








Type of Operation







Work Material

P	H	M	K	N	S
				●	

N	Graphite

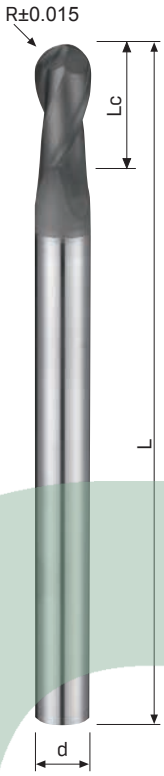
Feature of product:

Ball Nose End Mills for Graphite Long Length.

Apply with high hardness diamond coating and have a good wear resistance.

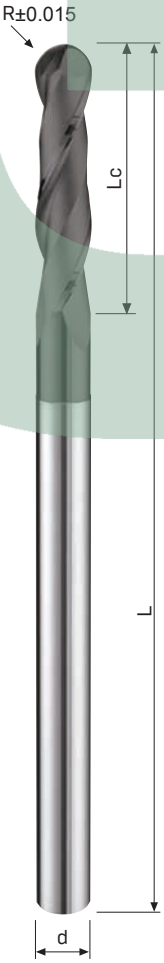
Keep lower wear condition level in high speed processing.

Application for curved surface and round groove processing of graphite



Code No. G234DC-Dc

Dc 0 -0.03	R ±0.015	Lc mm	L mm	d h6	Diamond G234DC
4	2R	8	80	4	●
6	3R	12	80	6	●
8	4R	16	100	8	●
10	5R	20	100	10	●
12	6R	24	110	12	●

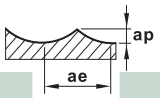


Code No. G244DC-Dc

Dc 0 -0.03	R ±0.015	Lc mm	L mm	d h6	Diamond G244DC
4	2R	20	120	4	●
6	3R	30	120	6	●
8	4R	40	160	8	●
10	5R	50	180	10	●
12	6R	60	200	12	●

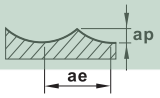
Roughing

Work Material		GR.14 Graphite		
Code No.	Dc	RPM (min-1)	Feed (mm/min)	AP (mm)
G234DC/G244DC-R2	4	19000~11000	2900~1800	0.40
G234DC/G244DC-R3	6	19000~9600	4000~2100	0.60
G234DC/G244DC-R4	8	15200~7200	3700~1800	0.80
G234DC/G244DC-R5	10	11875~5700	2750~1350	1.00
G234DC/G244DC-R6	12	9975~4800	2400~1100	1.20



Finishing

Work Material		GR.14 Graphite		
Code No.	Dc	RPM (min-1)	Feed (mm/min)	AP (mm)
G234DC/G244DC-R2	4	19000~11000	1900~1200	0.12
G234DC/G244DC-R3	6	19000~9600	2800~1400	0.18
G234DC/G244DC-R4	8	15200~7200	2400~1200	0.22
G234DC/G244DC-R5	10	11875~5700	1800~900	0.25
G234DC/G244DC-R6	12	9975~4800	1600~750	0.30



※Notice: G244DC is Long Length series End Mills. Please adjust the parameter according.

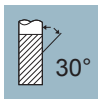
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

G697DC

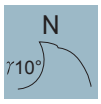
End Mills For Graphite

MG Carbide

Diamond DC

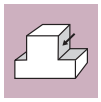


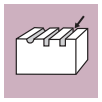


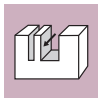




Type of Operation









Work Material

P	H	M	K	N	S
				●	

N	Graphite

Feature of product:

End Mills for Graphite

Apply with high hardness diamond coating and have a good wear resistance.

Keep lower wear condition level in high speed processing.

Suitable for corner angle cleaning processing of graphite electrodes.

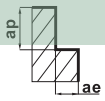


Code No. G697DC-Dc×R×L1

Dc 0 -0.02	R ±0.01	L1 mm	Lc mm	L mm	d h5	D1 mm	Diamond G697DC
0.5	R0.1	5	0.9	50	4	0.45	●
0.5	R0.1	10	0.9	50	4	0.45	●
0.5	R0.1	15	0.9	60	4	0.45	●
0.5	R0.1	20	0.9	60	4	0.45	●
1	R0.2	5	1.5	50	4	0.95	●
1	R0.2	10	1.5	50	4	0.95	●
1	R0.2	15	1.5	60	4	0.95	●
1	R0.2	20	1.5	60	4	0.95	●
1	R0.2	30	1.5	80	4	0.95	●
1.5	R0.2	5	2.3	60	4	1.45	●
1.5	R0.2	10	2.3	60	4	1.45	●
1.5	R0.2	15	2.3	60	4	1.45	●
1.5	R0.2	20	2.3	60	4	1.45	●
1.5	R0.2	30	2.3	80	4	1.45	●
1.5	R0.2	40	2.3	80	4	1.45	●
2	R0.2	5	3	60	4	1.95	●
2	R0.2	10	3	60	4	1.95	●
2	R0.2	15	3	60	4	1.95	●
2	R0.2	20	3	60	4	1.95	●
2	R0.2	30	3	80	4	1.95	●
2	R0.2	40	3	80	4	1.95	●
2	R0.2	60	3	100	4	1.95	●
3	R0.2	10	4.5	60	4	2.85	●
3	R0.2	20	4.5	60	4	2.85	●
3	R0.2	40	4.5	80	4	2.85	●
3	R0.2	60	4.5	100	4	2.85	●
4	R0.2	20	6	60	4	3.85	●
4	R0.2	40	6	80	4	3.85	●
4	R0.2	60	6	120	4	3.85	●

High-speed machining

Work Material		GR.I4 Graphite			
Code No.	Dc×Ll	RPM (min-l)	Feed (mm/min)	AP (mm)	AE (mm)
G697DC	0.5×5	19000~16000	684~575	0.05	0.24
G697DC	0.5×10	15200~12000	540~500	0.04	0.24
G697DC	0.5×15	10400~9000	375~325	0.03	0.12
G697DC	0.5×20	10200~8000	375~290	0.03	0.09
G697DC	1×5	15200~12000	1080~865	0.12	0.45
G697DC	1×10	15200~12000	1080~865	0.1	0.45
G697DC	1×15	13300~11000	950~790	0.1	0.43
G697DC	1×20	11000~8000	820~575	0.1	0.4
G697DC	1×30	8500~700	615~505	0.08	0.35
G697DC	1.5×5	15200~13000	1300~1100	0.17	0.85
G697DC	1.5×10	15200~13000	1300~1100	0.12	0.85
G697DC	1.5×15	13300~11000	1140~925	0.1	0.85
G697DC	1.5×20	12000~10000	1020~850	0.1	0.85
G697DC	1.5×30	11400~8000	950~670	0.08	0.85
G697DC	1.5×40	9500~7000	870~590	0.08	0.7
G697DC	2×5	15200~12000	1900~1500	0.3	1.25
G697DC	2×10	15200~12000	1900~1500	0.3	1.25
G697DC	2×15	12300~9000	1500~1150	0.2	1.25
G697DC	2×20	104500~8000	1330~1000	0.18	1.2
G697DC	2×30	9000~7000	1080~850	0.13	0.8
G697DC	2×40	7600~6000	950~755	0.13	0.8
G697DC	2×60	5700~4000	715~505	0.07	0.6
G697DC	3×10	15200~12000	2300~1850	0.35	2.0
G697DC	3×20	13300~10000	2040~1550	0.3	2.0
G697DC	3×40	11400~8000	1750~1250	0.2	1.8
G697DC	3×60	6650~4000	1045~615	0.15	1.6
G697DC	4×20	12000~8500	3250~2300	0.35	2.8
G697DC	4×40	11400~8000	2950~2100	0.35	2.8
G697DC	4×60	5700~3000	1615~855	0.2	2.0



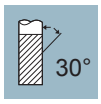
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

G298DC

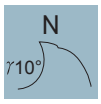
End Mills For Graphite

MG Carbide

Diamond DC

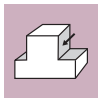


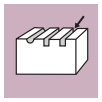


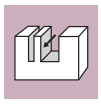




Type of Operation









Work Material

P	H	M	K	N	S
				●	

N	Graphite

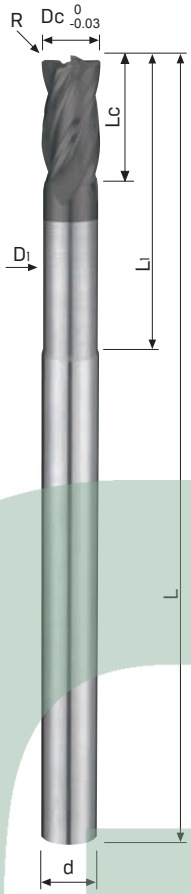
Feature of product:

End Mills for Graphite Long Length.

Apply with high hardness diamond coating and have a good wear resistance.

Keep lower wear condition level in high speed processing.

Application for graphite cutting.

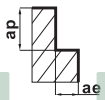


Code No. G298DC-Dc×R×L1

Dc 0 -0.03	R ±0.01	L1 mm	Lc mm	L mm	d h5	D1 mm	Diamond G298DC
4	R0.5	20	8	80	4	3.85	●
6	R0.5	30	12	100	6	5.7	●
8	R0.5	40	16	120	8	7.6	●
10	R0.5	50	20	140	10	9.5	●
12	R0.5	60	24	160	12	11.4	●

Ordinary cutting

Work Material		GR.14 Graphite			
Code No.	Dc	RPM (min-1)	Feed (mm/min)	AP (mm)	AE (mm)
G298DC-4	4	12000~8000	2450~1650	0.08	1.00
G298DC-6	6	12000~7000	3050~1800	0.20	2.00
G298DC-8	8	10000~7000	2700~1900	0.20	2.80
G298DC-10	10	8000~4000	2200~1100	0.20	4.40
G298DC-12	12	6000~3000	1650~815	0.20	4.40



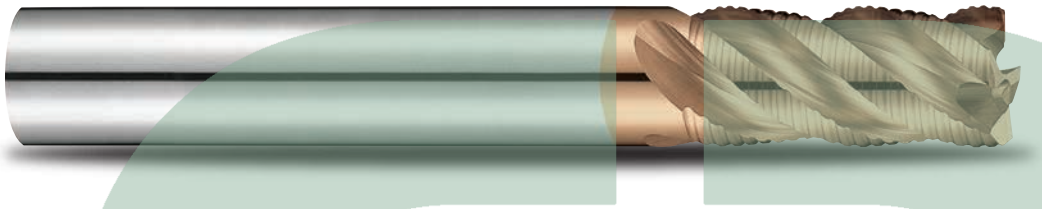
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.



F608HX

Roughing End Mills

Fine tooth staggered chip breaker design on cutting flutes are good for chip breaking.
Good wear resistance and lubricating effect with Nano multilayer coating.
Suitable for cutting different steel below 48HRC as well as cast iron.
Application for roughing cutting process.



F638TX

Roughing End Mills

Fine tooth staggered chip breaker design on cutting flutes are good for chip breaking.
Good wear resistance and lubricating effect with
Nano multilayer coating.
Suitable for cutting different steel below
56HRC as well as cast iron.
Application for roughing cutting process.



HF514SX

Multipurpose End Mills
With Coolant Hole

Designed with variable helix geometry, unequal flutes. Have a good wear resistance and impact resistance. Good wear resistance and lubricating effect with
Nano AlTiXZrN multilayer coating. With Y-shape special oil-feed design can make cutting fluid act more directly on cutting point to enhance chip removal rate.
Suitable for cutting different steel below 48HRC as well as stainless steel and aluminium.
Application from roughing to finishing cutting, drilling, ramping... in different materials.



F661TX

Finishing End Mills

Negative rake angle is good for cutting hardened materials. Selected Super SMG as tool material. Good wear resistance and lubricating effect with Nano multilayer coating.
Stronger strength of cutting edge is suitable for various materials from 40~70HRC.
Various application for finishing cutting.



DIN END MILL



High Performance End Mills

Page	261	263	265	267	269	271
Appearance						
Code No	F513SX	HF514SX	F514SX F515SX	F524SX F525SX	F636TX	F608HX F609HX
Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide
Coating	AlTiXZrN SX	AlTiXZrN SX	AlTiXZrN SX	AlTiXZrN SX	AlTiSiN TX	AlTiCrN HX
Helix Angle						
No.of Flutes						

DIN

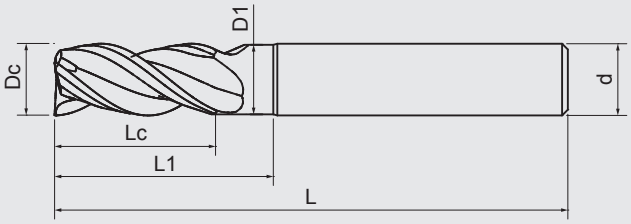
273	275	277	279	281	281	283	285	287
								
F638TX F649TX	F651SX	F652SX	F653SX	F631ZX	F631 F632	F607ZX	F642ZX F643ZX	F618ZX F620ZX
VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide
AlTiSiN TX	AlTiXZrN SX	AlTiXZrN SX	AlTiXZrN SX	ZrN ZX	Bright	ZrN ZX	ZrN ZX	ZrN ZX
								
								

F513SX

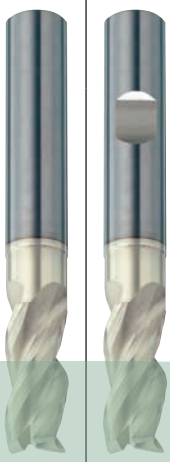
Multipurpose End Mills

Designed with two variable helix geometry, three unequal flutes, sharp cutting edge, and high removal cutting geometry.

Good wear resistance and lubricating effect with Nano multilayer coating.







Sharp cutting edge recommended for stainless steel, as well for cutting different steels below 48HRC, such as cast iron.

Application for roughing and finishing cutting, drilling, and ramping.

Work on any cutting direction with high speed condition.

Compatible with APC high precision anti-vibration collet chuck to work efficiently.

P H M K

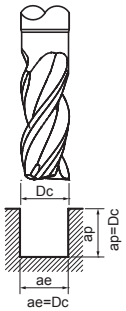
P H M K

DIN 6527 Standard Length

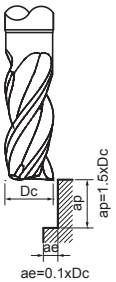
Dc 0 -0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	45° mm	F513SX HA	F513SX HB
3	8	57	6	14	2.8	0.10	•	•
4	11	57	6	16	3.8	0.10	•	•
5	13	57	6	18	4.8	0.15	•	•
6	13	57	6	20	5.8	0.15	•	•
8	19	63	8	26	7.7	0.15	•	•
10	22	72	10	31	9.7	0.20	•	•
12	26	83	12	37	11.6	0.20	•	•
14	26	83	14	37	13.5	0.20	•	•
16	32	92	16	43	15.5	0.20	•	•
18	32	92	18	47	17.5	0.20	•	•
20	38	104	20	53	19.5	0.20	•	•

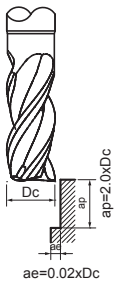
Cutting Conditions

F513SX









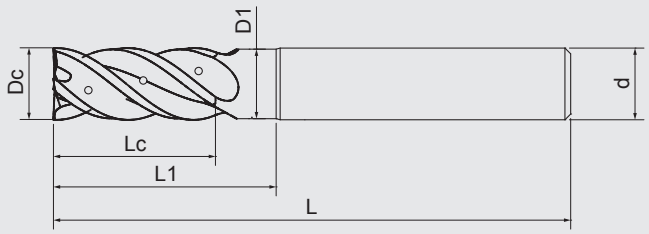
		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
P	Carbon Steel Materials								
	GR1 Carbon Steel	120	0.006×Dc	120	0.006×Dc	130	0.006×Dc	140	0.007×Dc
	GR2 <24HRC Low-alloyed Steel	120	0.005×Dc	120	0.005×Dc	130	0.005×Dc	140	0.006×Dc
	GR3 <30HRC Hi-alloyed Steel	80	0.005×Dc	80	0.005×Dc	90	0.005×Dc	100	0.006×Dc
H	Hardened Steel Materials								
	GR4 30~38HRC Hardened Steel	65	0.004×Dc	90	0.003×Dc	90	0.003×Dc	100	0.003×Dc
	GR5 38~48HRC Hardened Steel	60	0.003×Dc	80	0.003×Dc	80	0.003×Dc	90	0.003×Dc
M	Stainless Steel Materials								
	GR8-1 Ferritic、Martensitic	80	0.003×Dc	90	0.004×Dc	110	0.003×Dc	130	0.003×Dc
	GR8-2 Austenitic	70	0.003×Dc	80	0.003×Dc	90	0.003×Dc	100	0.003×Dc
	GR8-3 Austenitic-ferritic	40	0.002×Dc	50	0.003×Dc	90	0.002×Dc	60	0.002×Dc
	GR8-4 Austenitic-ferritic Heat-resistant	30	0.002×Dc	40	0.003×Dc	40	0.002×Dc	50	0.002×Dc
K	Cast Iron Materials								
	GR9-1 Grey cast iron	110	0.006×Dc	110	0.006×Dc	120	0.006×Dc	130	0.007×Dc
	GR9-2 Nodular cast iron	120	0.006×Dc	120	0.006×Dc	130	0.006×Dc	140	0.007×Dc

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

HF514SX

Multipurpose End Mills With Coolant Hole

Designed with variable helix geometry, unequal flutes.
Have a good wear resistance and impact resistance.
Good wear resistance and lubricating effect with Nano ZrN multilayer coating.
With Y-shape special oil-feed design can make cutting fluid act more directly on cutting point to enhance chip removal rate.







Suitable for cutting different steel below 48HRC as well as stainless steel and aluminium. Application from roughing to finishing cutting, drilling, ramping... in different materials.
Compatible with APC high precision anti-vibration collet chuck to work efficiently.

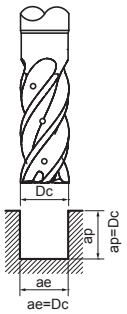
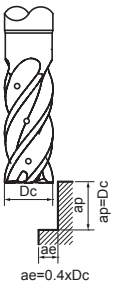
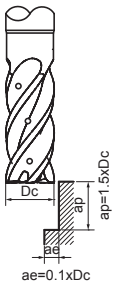
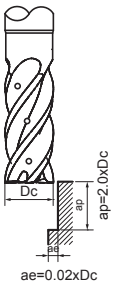
P H M K S

P H M K S

DIN 6527 Standard Length

Dc 0 -0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	HF514SX HA	HF514SX HB
6	13	57	6	20	5.8	•	•
8	19	63	8	26	7.7	•	•
10	22	72	10	31	9.7	•	•
12	26	83	12	37	11.6	•	•
16	32	92	16	43	15.5	•	•
20	38	104	20	53	19.5	•	•

Cutting Conditions

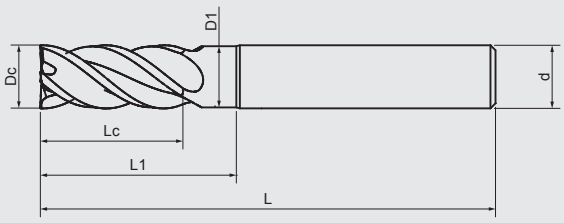
	HF514SX	 ae=Dc		 ae=0.4xDc		 ae=0.1xDc		 ae=0.02xDc	
		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
P	Carbon Steel Materials								
	GR1 Carbon Steel	120	0.006×Dc	120	0.006×Dc	130	0.006×Dc	140	0.007×Dc
	GR2 <24HRC Low-alloyed Steel	120	0.005×Dc	120	0.005×Dc	130	0.005×Dc	140	0.006×Dc
	GR3 <30HRC Hi-alloyed Steel	80	0.005×Dc	80	0.005×Dc	90	0.005×Dc	100	0.006×Dc
H	Hardened Steel Materials								
	GR4 30~38HRC Hardened Steel	65	0.004×Dc	90	0.003×Dc	90	0.003×Dc	100	0.003×Dc
	GR5 38~48HRC Hardened Steel	60	0.003×Dc	80	0.003×Dc	80	0.003×Dc	90	0.003×Dc
M	Stainless Steel Materials								
	GR8-1 Ferritic、Martensitic	80	0.003×Dc	90	0.004×Dc	110	0.003×Dc	130	0.003×Dc
	GR8-2 Austenitic	70	0.003×Dc	80	0.003×Dc	90	0.003×Dc	100	0.003×Dc
	GR8-3 Austenitic-ferritic	40	0.002×Dc	50	0.003×Dc	90	0.002×Dc	60	0.002×Dc
	GR8-4 Austenitic-ferritic Heat-resistant	30	0.002×Dc	40	0.003×Dc	40	0.002×Dc	50	0.002×Dc
K	Cast Iron Materials								
	GR9-1 Grey cast iron	110	0.006×Dc	110	0.006×Dc	120	0.006×Dc	130	0.007×Dc
	GR9-2 Nodular cast iron	120	0.006×Dc	120	0.006×Dc	130	0.006×Dc	140	0.007×Dc

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

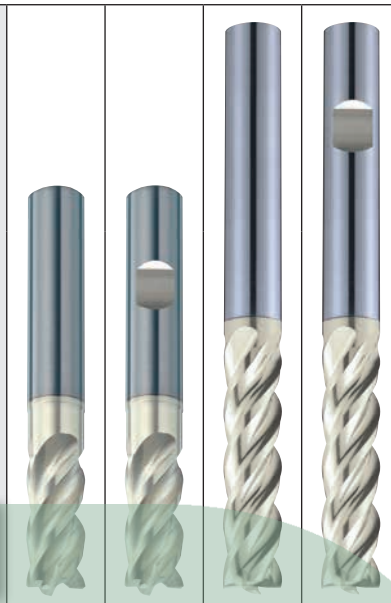
F514SX / F515SX

Multipurpose End Mills

Designed with variable helix geometry, unequal flutes.
Have a good wear resistance and impact resistance.
Good wear resistance and lubricating effect with Nano ZrN multilayer coating.







Suitable for cutting different steel below 48HRC as well as stainless steel and aluminium.
Application from roughing to finishing cutting, drilling, ramping... in different materials.
Compatible with APC high precision anti-vibration collet chuck to work efficiently.

P	P	P	P
H	H	H	H
M	M	M	M
K	K	K	K

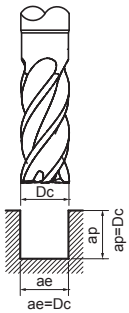
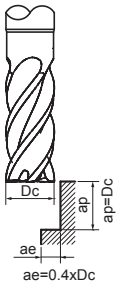
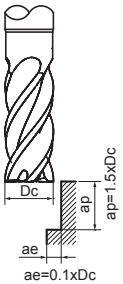
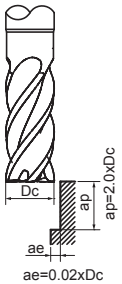
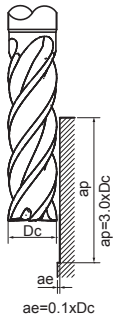
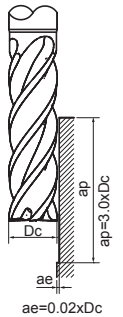
DIN 6527 Standard Length

Dc 0 -0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	45° mm	F514SX HA	F514SX HB				
3	8	57	6	14	2.8	0.10	•	•				
4	11	57	6	16	3.8	0.10	•	•				
5	13	57	6	18	4.8	0.15	•	•				
6	13	57	6	20	5.8	0.15	•	•				
8	19	63	8	26	7.7	0.15	•	•				
10	22	72	10	31	9.7	0.20	•	•				
12	26	83	12	37	11.6	0.20	•	•				
14	26	83	14	37	13.5	0.20	•	•				
16	32	92	16	43	15.5	0.20	•	•				
18	32	92	18	43	17.5	0.20	•	•				
20	38	104	20	53	19.5	0.20	•	•				

Long Length

Dc 0 -0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	45° mm			F515SX HA	F515SX HB		
6	19	63	6	26	5.8	0.15			•	•		
8	28	72	8	35	7.7	0.15			•	•		
10	34	84	10	43	9.7	0.20			•	•		
12	40	97	12	51	11.6	0.20			•	•		
16	48	108	16	59	15.5	0.20			•	•		
20	56	122	20	71	19.5	0.20			•	•		

Cutting Conditions

		F514SX		F514SX		F514SX		F514SX		F515SX		F515SX	
F514SX F515SX		 ae=Dc		 ae=0.4xDc		 ae=0.1xDc		 ae=0.02xDc		 ae=0.1xDc		 ae=0.02xDc	
		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
P	Carbon Steel Materials												
	GR1 Carbon Steel	120	0.006×Dc	120	0.006×Dc	130	0.006×Dc	140	0.007×Dc	110	0.006×Dc	120	0.006×Dc
	GR2 <24HRC Low-alloyed Steel	120	0.005×Dc	120	0.005×Dc	130	0.005×Dc	140	0.006×Dc	110	0.005×Dc	120	0.005×Dc
	GR3 <30HRC Hi-alloyed Steel	80	0.005×Dc	80	0.005×Dc	90	0.005×Dc	100	0.006×Dc	70	0.005×Dc	80	0.005×Dc
H	Hardened Steel Materials												
	GR4 30~38HRC Hardened Steel	65	0.004×Dc	90	0.003×Dc	90	0.003×Dc	100	0.003×Dc	90	0.004×Dc	100	0.003×Dc
	GR5 38~48HRC Hardened Steel	60	0.003×Dc	80	0.003×Dc	80	0.003×Dc	90	0.003×Dc	70	0.003×Dc	80	0.003×Dc
M	Stainless Steel Materials												
	GR8-1 Ferritic、Martensitic	80	0.003×Dc	90	0.004×Dc	110	0.003×Dc	130	0.003×Dc	70	0.003×Dc	80	0.004×Dc
	GR8-2 Austenitic	70	0.003×Dc	80	0.003×Dc	90	0.003×Dc	100	0.003×Dc	60	0.003×Dc	70	0.003×Dc
	GR8-3 Austenitic-ferritic	40	0.002×Dc	50	0.003×Dc	90	0.002×Dc	60	0.002×Dc	50	0.002×Dc	60	0.003×Dc
	GR8-4 Austenitic-ferritic Heat-resistant	30	0.002×Dc	40	0.003×Dc	40	0.002×Dc	50	0.002×Dc	40	0.002×Dc	50	0.003×Dc
K	Cast Iron Materials												
	GR9-1 Grey cast iron	110	0.006×Dc	110	0.006×Dc	120	0.006×Dc	130	0.007×Dc	100	0.006×Dc	110	0.005×Dc
	GR9-2 Nodular cast iron	120	0.006×Dc	120	0.006×Dc	130	0.006×Dc	140	0.007×Dc	110	0.006×Dc	120	0.005×Dc

※ All cutting data are for reference only. Please adjust according to actual machining conditions.
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

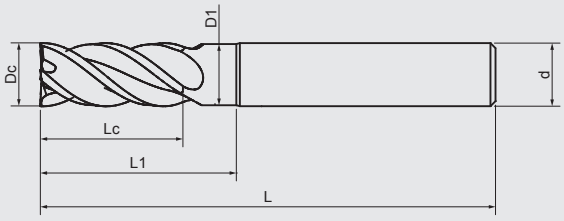
F524SX / F525SX

Premium Cut End Mills

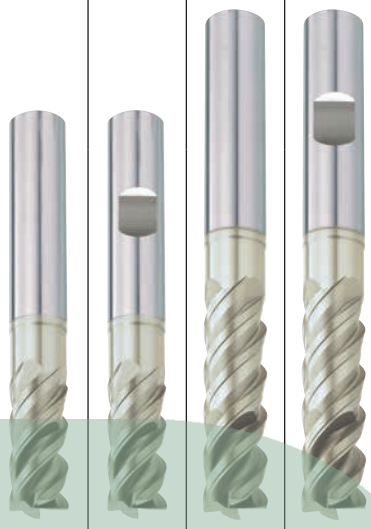
Two unequal flutes, and small edge cutting land with the relief angle, with better impact resistance.

Designed with high removal cutting geometry.

The use of Si-silicon AlTiSiN coating has excellent wear resistance.







Improved cutting edge strength for cutting different materials below 48HRC, stainless steel, cast iron as well as aluminium.

Application from roughing to finishing cutting, drilling, ramping... in different materials.

Compatible with APC high precision anti-vibration collet chuck to work efficiently.

P	P	P	P
H	H	H	H
M	M	M	M
K	K	K	K

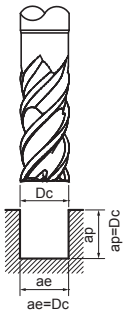
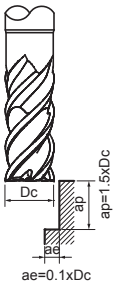
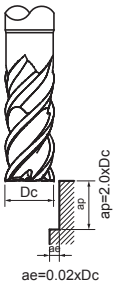
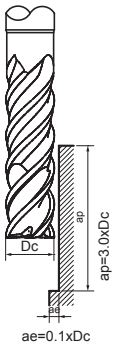
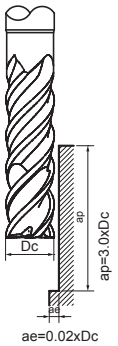
DIN 6527 Standard Length

Dc $^{0}_{-0.02}$	Lc mm	L mm	d h5	L1 mm	D1 mm	45° mm	F524SX HA	F524SX HB
3	8	57	6	14	2.8	0.10	•	•
4	11	57	6	16	3.8	0.10	•	•
5	13	57	6	18	4.8	0.15	•	•
6	13	57	6	20	5.8	0.15	•	•
8	19	63	8	26	7.7	0.15	•	•
10	22	72	10	31	9.7	0.20	•	•
12	26	83	12	37	11.6	0.20	•	•
14	26	83	14	37	13.5	0.20	•	•
16	32	92	16	43	15.5	0.20	•	•
18	32	92	18	43	17.5	0.20	•	•
20	38	104	20	53	19.5	0.20	•	•

Long Length

Dc $^{0}_{-0.02}$	Lc mm	L mm	d h5	L1 mm	D1 mm	45° mm	F525SX HA	F525SX HB
6	19	63	6	26	5.8	0.15	•	•
8	28	72	8	35	7.7	0.15	•	•
10	34	84	10	43	9.7	0.20	•	•
12	40	97	12	51	11.6	0.20	•	•
16	48	108	16	59	15.5	0.20	•	•
20	56	122	20	71	19.5	0.20	•	•

Cutting Conditions

		F524SX		F524SX		F524SX		F524SX		F525SX		F525SX	
F524SX F525SX		 ae=Dc		 ae=0.4xDc		 ae=0.1xDc		 ae=0.02xDc		 ae=0.1xDc		 ae=0.02xDc	
		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
P	Carbon Steel Materials												
	GR1 Carbon Steel	120	0.006×Dc	120	0.006×Dc	130	0.006×Dc	140	0.007×Dc	110	0.006×Dc	120	0.006×Dc
	GR2 <24HRC Low-alloyed Steel	120	0.005×Dc	120	0.005×Dc	130	0.005×Dc	140	0.006×Dc	110	0.005×Dc	120	0.005×Dc
	GR3 <30HRC Hi-alloyed Steel	80	0.005×Dc	80	0.005×Dc	90	0.005×Dc	100	0.006×Dc	70	0.005×Dc	80	0.005×Dc
H	Hardened Steel Materials												
	GR4 30~38HRC Hardened Steel	65	0.004×Dc	90	0.003×Dc	90	0.003×Dc	100	0.003×Dc	90	0.004×Dc	100	0.003×Dc
	GR5 38~48HRC Hardened Steel	60	0.003×Dc	80	0.003×Dc	80	0.003×Dc	90	0.003×Dc	70	0.003×Dc	80	0.003×Dc
M	Stainless Steel Materials												
	GR8-1 Ferritic、Martensitic	80	0.003×Dc	90	0.004×Dc	110	0.003×Dc	130	0.003×Dc	70	0.003×Dc	80	0.004×Dc
	GR8-2 Austenitic	70	0.003×Dc	80	0.003×Dc	90	0.003×Dc	100	0.003×Dc	60	0.003×Dc	70	0.003×Dc
	GR8-3 Austenitic-ferritic	40	0.002×Dc	50	0.003×Dc	90	0.002×Dc	60	0.002×Dc	50	0.002×Dc	60	0.003×Dc
	GR8-4 Austenitic-ferritic Heat-resistant	30	0.002×Dc	40	0.003×Dc	40	0.002×Dc	50	0.002×Dc	40	0.002×Dc	50	0.003×Dc
K	Cast Iron Materials												
	GR9-1 Grey cast iron	110	0.006×Dc	110	0.006×Dc	120	0.006×Dc	130	0.007×Dc	100	0.006×Dc	110	0.005×Dc
	GR9-2 Nodular cast iron	120	0.006×Dc	120	0.006×Dc	130	0.006×Dc	140	0.007×Dc	110	0.006×Dc	120	0.005×Dc

※ All cutting data are for reference only. Please adjust according to actual machining conditions.
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

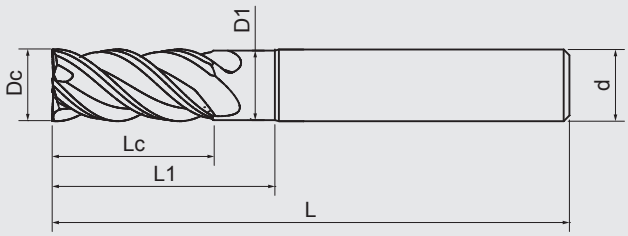
F636TX

Multipurpose End Mills

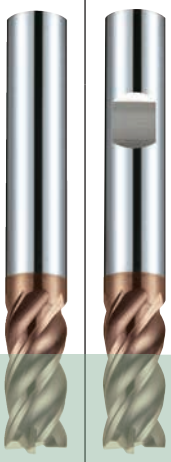
Designed with two variable helix geometry, two unequal flutes.

Designed with high removal cutting geometry.

The use of Si-silicon AlTiSiN coating has excellent wear resistance.







Improved cutting edge strength for cutting different materials below 56HRC, stainless steel, cast iron as well as aluminium.

Application from roughing to finishing cutting, drilling, ramping... in different materials.

Compatible with APC high precision anti-vibration collet chuck to work efficiently.

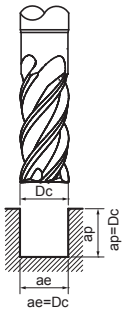
P H M K

P H M K

DIN 6527 Standard Length

Dc $^{0}_{-0.02}$	Lc mm	L mm	d h5	L1 mm	D1 mm	45° mm	F636TX HA	F636TX HB
3	8	57	6	14	2.8	0.10	•	•
4	11	57	6	16	3.8	0.10	•	•
5	13	57	6	18	4.8	0.15	•	•
6	13	57	6	20	5.8	0.15	•	•
8	19	63	8	26	7.7	0.15	•	•
10	22	72	10	31	9.7	0.20	•	•
12	26	83	12	37	11.6	0.20	•	•
16	32	92	16	43	15.5	0.20	•	•
20	38	104	20	53	19.5	0.20	•	•

Cutting Conditions

		F636TX		F636TX					
F636TX									
		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)				
P		Carbon Steel Materials							
	GR1 Carbon Steel	120	0.006×Dc	120	0.006×Dc				
	GR2 <24HRC Low-alloyed Steel	100	0.005×Dc	120	0.005×Dc				
	GR3 <30HRC Hi-alloyed Steel	80	0.005×Dc	80	0.005×Dc				
H		Hardened Steel Materials							
	GR4 30~38HRC Hardened Steel	100	0.004×Dc	90	0.003×Dc				
	GR5 38~48HRC Hardened Steel	80	0.003×Dc	80	0.003×Dc				
M		Stainless Steel Materials							
	GR8-1 Ferritic、Martensitic	60	0.002×Dc	70	0.004×Dc				
	GR8-2 Austenitic	50	0.002×Dc	60	0.003×Dc				
	GR8-3 Austenitic-ferritic	40	0.002×Dc	50	0.003×Dc				
	GR8-4 Austenitic-ferritic Heat-resistant	30	0.002×Dc	40	0.003×Dc				
K		Cast Iron Materials							
	GR9-1 Grey cast iron	110	0.006×Dc	110	0.006×Dc				
	GR9-2 Nodular cast iron	120	0.006×Dc	120	0.006×Dc				

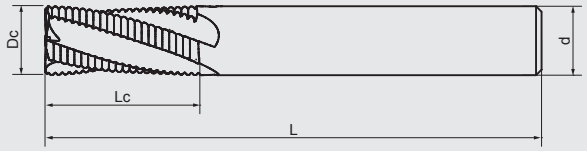
※ All cutting data are for reference only. Please adjust according to actual machining conditions.
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

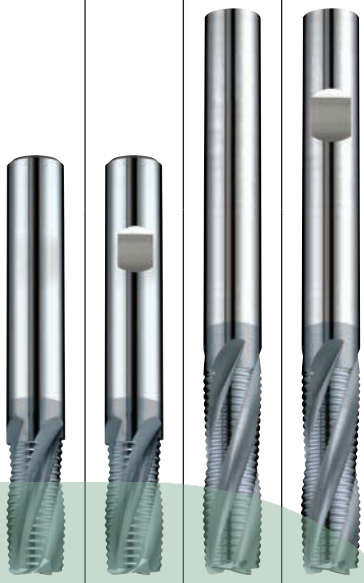
F608HX / F609HX

Roughing End Mills

Fine tooth staggered chip breaker design on cutting flutes are good for chip breaking.

Good wear resistance and lubricating effect with Nano multilayer coating.





VHM Carbide | **AlTiCrN HX** | 20° | 3~4Z | HR | 0.3-0.5 / 45° | **Steel <48HRC**

Suitable for cutting different steel below 48HRC as well as cast iron. Application for roughing cutting process.

Compatible with APC high precision anti-vibration collet chuck to work efficiently.

P H K | P H K | P H K | P H K

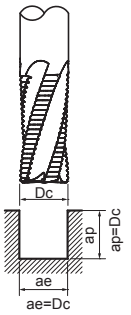
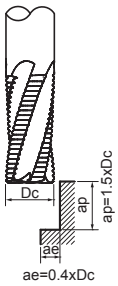
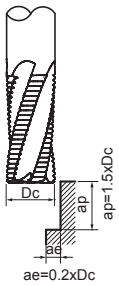
DIN 6527 Standard Length

Dc h10	Lc mm	L mm	d h5	Z T	45° mm	F608HX HA	F608HX HB				
3	8	57	6	3	0.3	•	•				
4	11	57	6	3	0.3	•	•				
5	13	57	6	3	0.4	•	•				
6	13	57	6	3	0.4	•	•				
8	19	63	8	3	0.4	•	•				
10	22	72	10	4	0.5	•	•				
12	26	83	12	4	0.5	•	•				
14	26	83	14	4	0.5	•	•				
16	32	92	16	4	0.5	•	•				
18	32	92	18	4	0.5	•	•				
20	38	104	20	4	0.5	•	•				

Long Length

Dc h10	Lc mm	L mm	d h5	Z T	45° mm			F609HX HA	F609HX HB		
6	19	63	6	3	0.4			•	•		
8	28	72	8	3	0.4			•	•		
10	34	84	10	4	0.5			•	•		
12	40	97	12	4	0.5			•	•		
16	48	108	16	4	0.5			•	•		
20	56	122	20	4	0.5			•	•		

Cutting Conditions

		F608HX F609HX					
							
		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
P		Carbon Steel Materials					
P	GR1 Carbon Steel	60	0.006×Dc	70	0.006×Dc	80	0.006×Dc
P	GR2 <24HRC Low-alloyed Steel	60	0.005×Dc	70	0.005×Dc	80	0.005×Dc
P	GR3 <30HRC Hi-alloyed Steel	50	0.005×Dc	60	0.005×Dc	70	0.005×Dc
H		Hardened Steel Materials					
H	GR4 30~38HRC Hardened Steel	45	0.003×Dc	65	0.003×Dc	70	0.003×Dc
H	GR5 38~48HRC Hardened Steel	40	0.003×Dc	60	0.003×Dc	65	0.003×Dc
K		Cast Iron Materials					
K	GR9-1 Grey cast iron	60	0.006×Dc	70	0.006×Dc	80	0.006×Dc
K	GR9-2 Nodular cast iron	60	0.006×Dc	70	0.006×Dc	80	0.006×Dc

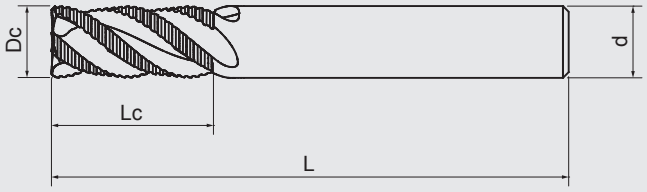
※ All cutting data are for reference only. Please adjust according to actual machining conditions.
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

F638TX / F649TX

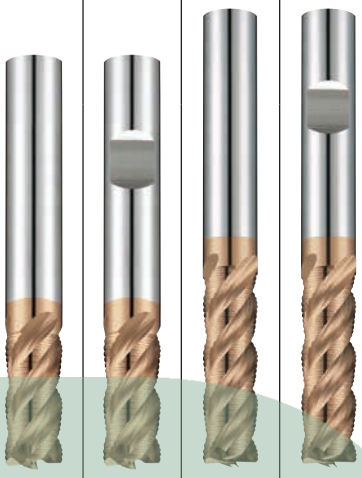
Roughing End Mills

Fine tooth staggered chip breaker design on cutting flutes are good for chip breaking.

Good wear resistance and lubricating effect with Nano multilayer coating.







Suitable for cutting different steel below 56HRC as well as cast iron.

Application for roughing cutting process.

Compatible with APC high precision anti-vibration collet chuck to work efficiently.

P H M

DIN 6527 Standard Length

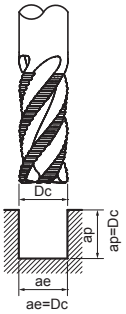
Dc h10	Lc mm	L mm	d h5	Z T	45° mm	F638TX HA	F638TX HB				
3	8	57	6	3	0.2	•	•				
4	11	57	6	3	0.2	•	•				
5	13	57	6	3	0.2	•	•				
6	13	57	6	4	0.4	•	•				
7	16	63	8	4	0.4	•	•				
8	19	63	8	4	0.4	•	•				
9	19	72	10	4	0.5	•	•				
10	22	72	10	4	0.5	•	•				
12	26	83	12	4	0.5	•	•				
14	26	83	14	4	0.5	•	•				
16	32	92	16	4	0.5	•	•				
18	32	92	18	4	0.5	•	•				
20	38	104	20	4	0.5	•	•				

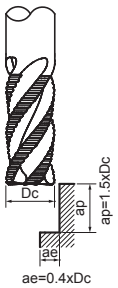
Long Length

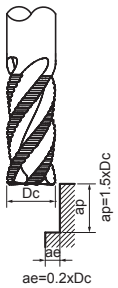
Dc h10	Lc mm	L mm	d h5	Z T	45° mm			F649TX HA	F649TX HB		
6	19	63	6	4	0.4			•	•		
8	28	72	8	4	0.4			•	•		
10	34	84	10	4	0.5			•	•		
12	40	97	12	4	0.5			•	•		
16	48	108	16	4	0.5			•	•		
20	56	122	20	4	0.5			•	•		

Cutting Conditions

F638TX
F649TX







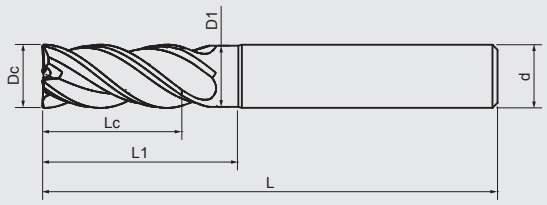
		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
P	Carbon Steel Materials						
	GR1 Carbon Steel	60	0.006×Dc	70	0.006×Dc	80	0.006×Dc
	GR2 <24HRC Low-alloyed Steel	60	0.005×Dc	70	0.005×Dc	80	0.005×Dc
	GR3 <30HRC Hi-alloyed Steel	50	0.005×Dc	60	0.005×Dc	70	0.005×Dc
H	Hardened Steel Materials						
	GR4 30~38HRC Hardened Steel	45	0.003×Dc	65	0.003×Dc	70	0.003×Dc
	GR5 38~48HRC Hardened Steel	40	0.003×Dc	60	0.003×Dc	65	0.003×Dc
M	Stainless Steel Materials						
	GR8-1 Ferritic、Martensitic	60	0.002×Dc	70	0.004×Dc	80	0.003×Dc
	GR8-2 Austenitic	50	0.002×Dc	60	0.003×Dc	70	0.003×Dc
	GR8-3 Austenitic-ferritic	40	0.002×Dc	50	0.003×Dc	60	0.002×Dc
	GR8-4 Austenitic-ferritic Heat-resistant	30	0.002×Dc	40	0.003×Dc	50	0.002×Dc

※ All cutting data are for reference only. Please adjust according to actual machining conditions.
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

F651SX

End Mills For Difficult To Cut Materials

Designed with two variable helix geometry and two unequal flutes.
Sharp cutting edge is good for cutting toughness materials.
Designed with high removal cutting geometry.
Good wear resistance and lubricating effect with Nano multilayer coating.





VHM Carbide | AlTiXZrN SX | 38° | 4 | N | 78° | 0.05-0.2 | 45° | Stainless Titainlum Nickel

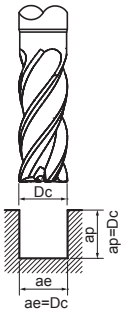
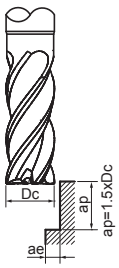
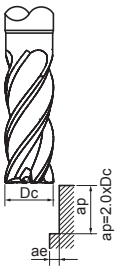
Sharp cutting edge is suitable for cutting stainless steel, titanium, nickel and high temp alloys... etc.
Application for roughing and finishing cutting in different materials.
Compatible with APC high precision anti-vibration collet chuck to work efficiently.

M S | M S

DIN 6527 Standard Length

Dc 0 -0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	45° mm	F651SX HA	F651SX HB
3	8	57	6	14	2.8	0.10	•	•
4	11	57	6	16	3.8	0.10	•	•
5	13	57	6	18	4.8	0.15	•	•
6	13	57	6	20	5.8	0.15	•	•
8	19	63	8	26	7.7	0.15	•	•
10	22	72	10	31	9.7	0.20	•	•
12	26	83	12	37	11.6	0.20	•	•
16	32	92	16	43	15.5	0.20	•	•
20	38	104	20	53	19.5	0.20	•	•

Cutting Conditions

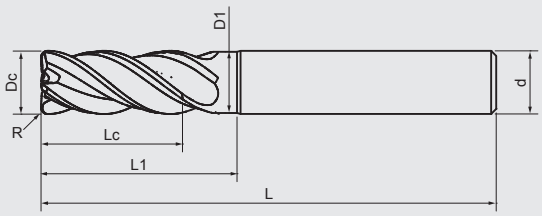
	F651SX	 ae=Dc		 ae=0.4xDc		 ae=0.1xDc		 ae=0.02xDc	
		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
M	Stainless Steel Materials								
	GR8-1 Ferritic、Martensitic	80	0.003×Dc	90	0.004×Dc	110	0.003×Dc	130	0.003×Dc
	GR8-2 Austenitic	70	0.003×Dc	80	0.003×Dc	90	0.003×Dc	100	0.003×Dc
	GR8-3 Austenitic-ferritic	40	0.002×Dc	50	0.003×Dc	60	0.002×Dc	70	0.002×Dc
	GR8-4 Austenitic-ferritic Heat-resistant	30	0.002×Dc	40	0.003×Dc	40	0.002×Dc	50	0.002×Dc
S	Cast Iron Materials								
	GRI5 Titanium	35	0.002×Dc	40	0.002×Dc	40	0.002×Dc	45	0.002×Dc
	Nickel Materials								
	GRI6-1 Nickel	30	0.002×Dc	35	0.002×Dc	35	0.002×Dc	40	0.002×Dc
	GRI6-2 cobalt-base alloys	30	0.002×Dc	35	0.002×Dc	35	0.002×Dc	40	0.002×Dc
	GRI6-3 Iron-based alloy	30	0.002×Dc	35	0.002×Dc	35	0.002×Dc	40	0.002×Dc
	Heat-resistant Steel Materials								
	GRI7 Heat-resistant Steel	30	0.002×Dc	35	0.002×Dc	35	0.002×Dc	40	0.002×Dc

※ All cutting data are for reference only. Please adjust according to actual machining conditions.
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

F652SX

End Mills With Corner Radius For Difficult To Cut Materials

Designed with two variable helix geometry and two unequal flutes.
Sharp cutting edge is good for cutting toughness materials.
Designed with high removal cutting geometry.
Improved cutting edge strength with corner radius.
Applicable for profile surface machining.
Good wear resistance and lubricating effect with Nano multilayer coating.







Sharp cutting edge is suitable for cutting stainless steel, titanium, nickel and high temp alloys... etc. Application for roughing and finishing cutting in different materials.
Compatible with APC high precision anti-vibration collet chuck to work efficiently.

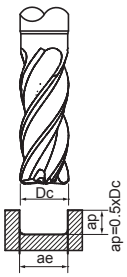
M S M S

DIN 6527 Standard Length

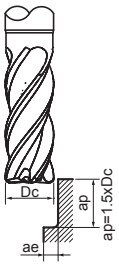
Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h5	L1 mm	D1 mm	F652SX HA	F652SX HB
3	R0.2	8	57	6	14	2.8	•	•
4	R0.2	11	57	6	16	3.8	•	•
5	R0.2	13	57	6	18	4.8	•	•
6	R0.2	13	57	6	20	5.8	•	•
8	R0.2	19	63	8	26	7.7	•	•
10	R0.2	22	72	10	31	9.7	•	•
12	R0.2	26	83	12	37	11.6	•	•
16	R0.2	32	92	16	43	15.5	•	•
20	R0.2	38	104	20	53	19.5	•	•
3	R0.5	8	57	6	14	2.8	•	•
4	R0.5	11	57	6	16	3.8	•	•
5	R0.5	13	57	6	18	4.8	•	•
6	R0.5	13	57	6	20	5.8	•	•
8	R0.5	19	63	8	26	7.7	•	•
10	R0.5	22	72	10	31	9.7	•	•
12	R0.5	26	83	12	37	11.6	•	•
16	R0.5	32	92	16	43	15.5	•	•
20	R0.5	38	104	20	53	19.5	•	•
6	R1	13	57	6	20	5.8	•	•
8	R1	19	63	8	26	7.7	•	•
10	R1	22	72	10	31	9.7	•	•
12	R1	26	83	12	37	11.6	•	•
16	R1	32	92	16	43	15.5	•	•
20	R1	38	104	20	53	19.5	•	•
6	R2	13	57	6	20	5.8	•	•
8	R2	19	63	8	26	7.7	•	•
10	R2	22	72	10	31	9.7	•	•
12	R2	26	83	12	37	11.6	•	•
16	R2	32	92	16	43	15.5	•	•
20	R2	38	104	20	53	19.5	•	•
12	R3	26	83	12	37	11.6	•	•
16	R3	32	92	16	43	15.5	•	•
20	R3	38	104	20	53	19.5	•	•

Cutting Conditions

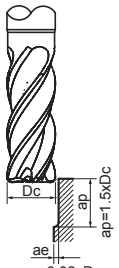
F652SX



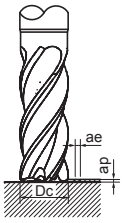
ae=Dc



ae=0.25xDc



ae=0.02xDc



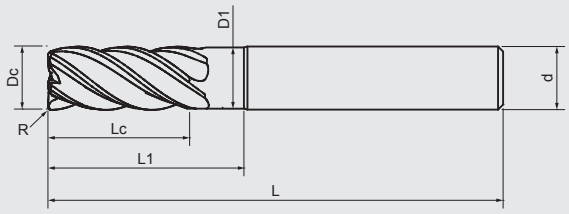
		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
		Stainless Steel Materials							
M	GR8-1 Ferritic、Martensitic	80	0.003×Dc	90	0.004×Dc	110	0.003×Dc	130	0.003×Dc
M	GR8-2 Austenitic	70	0.003×Dc	80	0.003×Dc	90	0.003×Dc	100	0.003×Dc
M	GR8-3 Austenitic-ferritic	40	0.002×Dc	50	0.003×Dc	60	0.002×Dc	70	0.002×Dc
M	GR8-4 Austenitic-ferritic Heat-resistant	30	0.002×Dc	40	0.003×Dc	40	0.002×Dc	50	0.002×Dc
		Cast Iron Materials							
S	GRI5 Titanium	35	0.002×Dc	40	0.002×Dc	40	0.002×Dc	45	0.002×Dc
		Nickel Materials							
S	GRI6-1 Nickel	30	0.002×Dc	35	0.002×Dc	35	0.002×Dc	40	0.002×Dc
S	GRI6-2 cobalt-base alloys	30	0.002×Dc	35	0.002×Dc	35	0.002×Dc	40	0.002×Dc
S	GRI6-3 Iron-based alloy	30	0.002×Dc	35	0.002×Dc	35	0.002×Dc	40	0.002×Dc
		Heat-resistant Steel Materials							
S	GRI7 Heat-resistant Steel	30	0.002×Dc	35	0.002×Dc	35	0.002×Dc	40	0.002×Dc

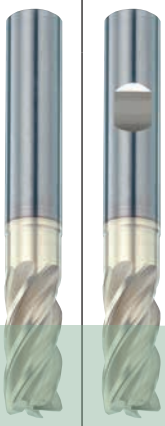
※ All cutting data are for reference only. Please adjust according to actual machining conditions.
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

F653SX

End Mills With Corner Radius For Difficult To Cut Materials

Designed with two variable helix geometry and two unequal flutes.
Sharp cutting edge is good for cutting toughness materials.
Designed with high removal cutting geometry.
Improved cutting edge strength with corner radius.
Good wear resistance and lubricating effect with Nano multilayer coating.





VHM Carbide | AlTiXZrN SX | 38° | 5 | N 78° | R | Stainless Titainlum Nickel

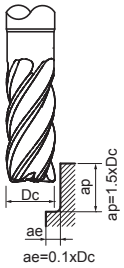
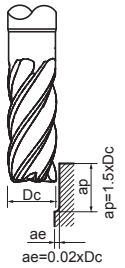
Sharp cutting edge is suitable for cutting stainless steel, titanium, nickel and high temp alloys... etc.
Application for HPC roughing cutting and HSC finishing cutting.
Compatible with APC high precision anti-vibration collet chuck to work efficiently.

M S | M S

DIN 6527 Standard Length

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h5	L1 mm	D1 mm	F653SX HA	F653SX HB
3	R0.5	8	57	6	14	2.8	•	•
4	R0.5	11	57	6	16	3.8	•	•
5	R0.5	13	57	6	18	4.8	•	•
6	R0.5	13	57	6	20	5.8	•	•
8	R0.5	19	63	8	26	7.7	•	•
10	R0.5	22	72	10	31	9.7	•	•
12	R0.5	26	83	12	37	11.6	•	•
16	R0.5	32	92	16	43	15.5	•	•
20	R0.5	38	104	20	53	19.5	•	•

Cutting Conditions

F653SX		 ae=0.1xDc			 ae=0.02xDc			
		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
M		Stainless Steel Materials							
	GR8-1 Ferritic、Martensitic	80		0.003×Dc		90		0.004×Dc	
	GR8-2 Austenitic	70		0.003×Dc		80		0.003×Dc	
	GR8-3 Austenitic-ferritic	40		0.002×Dc		50		0.003×Dc	
	GR8-4 Austenitic-ferritic Heat-resistant	30		0.002×Dc		40		0.003×Dc	
S		Cast Iron Materials							
	GRI5 Titanium	35		0.002×Dc		40		0.002×Dc	
		Nickel Materials							
	GRI6-1 Nickel	30		0.002×Dc		35		0.002×Dc	
	GRI6-2 cobalt-base alloys	30		0.002×Dc		35		0.002×Dc	
	GRI6-3 Iron-based alloy	30		0.002×Dc		35		0.002×Dc	
		Heat-resistant Steel Materials							
	GRI7 Heat-resistant Steel	30		0.002×Dc		35		0.002×Dc	

※ All cutting data are for reference only. Please adjust according to actual machining conditions.
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

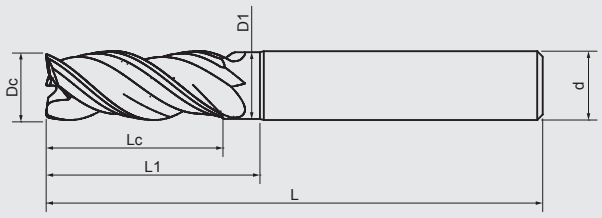
F631ZX / F631 / F632

End Mills For Aluminium

Designed with three variable helix geometry and three unequal flutes.

Designed with sharp cutting edge, high removal cutting geometry, and fine grinding smooth surface to prevent sticking problem.

Adopting ZrN coating without AlTi in the formula would prevent from chemical affinity with Alu metal and enhance tool life by gaining better surface hardness.







Suitable for cutting aluminium.

Application for HPC/ roughing cutting process with high chip removal rate as well as for HSC/ finishing cutting with fine and smooth surface finishing.

N N N

DIN 6527 Standard Length

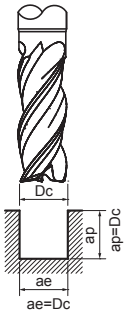
Dc 0 -0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	F631ZX ZrN	F631 Bright
3	8	57	6	14	2.8	•	•
4	11	57	6	16	3.8	•	•
5	13	57	6	18	4.8	•	•
6	13	57	6	20	5.8	•	•
8	19	63	8	26	7.7	•	•
10	22	72	10	31	9.7	•	•
12	26	83	12	37	11.6	•	•
16	32	92	16	43	15.5	•	•
20	38	104	20	53	19.5	•	•

Long Length

Dc 0 -0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	F632 Bright
3	14	63	6	20	2.8	•
4	17	63	6	22	3.8	•
5	19	63	6	24	4.8	•
6	19	63	6	26	5.8	•
8	28	72	8	35	7.7	•
10	34	84	10	43	9.7	•
12	40	97	12	51	11.6	•
16	48	108	16	59	15.5	•
20	56	122	20	71	19.5	•

Cutting Conditions

F631ZX
F631
F632



ae=Dc



ae=0.4xDc



ae=0.1xDc



ae=0.02xDc

		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
Aluminium Steel Materials									
N	GRI0-1 Wrought Aluminium alloys	400	0.005×Dc	400	0.006×Dc	400	0.007×Dc	400	0.008×Dc
N	GRI0-2 Aluminium cast alloys <10%	400	0.005×Dc	400	0.006×Dc	400	0.007×Dc	400	0.008×Dc
N	GRI0-3 Aluminium cast alloys >10%	350	0.005×Dc	380	0.006×Dc	380	0.007×Dc	380	0.008×Dc

※ All cutting data are for reference only. Please adjust according to actual machining conditions.
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

F607ZX

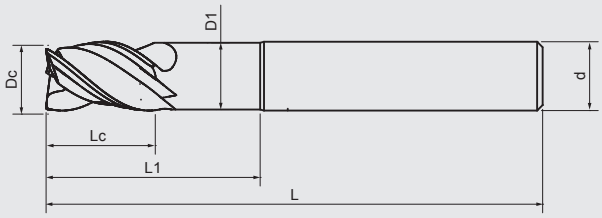
Toric End Mills For Aluminium

Designed with three variable helix geometry and three unequal flutes.

Designed with sharp cutting edge, high removal cutting geometry, and fine grinding smooth surface to prevent sticking problem.

Cutting edge with corner radius for profile machining.

Adopting ZrN coating without AlTi in the formula would prevent from chemical affinity with Alu metal and enhance tool life by gaining better surface hardness.





VHM Carbide | ZrN ZX | 40° | 3 | N | γ20° | 90° | Aluminium

Suitable for cutting aluminium.

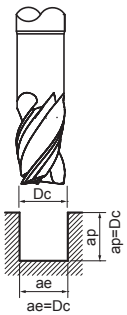
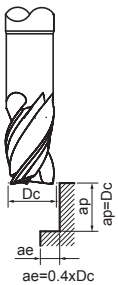
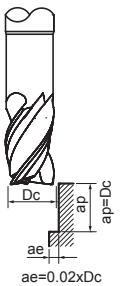
Application for HPC/ roughing cutting process with high chip removal rate as well as for HSC/ finishing cutting process with fine and smooth surface finishing.

N

DIN 6527 Standard Length

Dc 0 -0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	F607ZX ZrN
3	4.5	57	6	9	2.8	•
4	6	57	6	12	3.7	•
5	7.5	57	6	15	4.6	•
6	9	57	6	20	5.5	•
8	12	63	8	26	7.4	•
10	15	72	10	31	9.2	•
12	18	83	12	37	11	•
16	24	92	16	43	14.5	•
20	30	104	20	53	18.2	•

Cutting Conditions

F607ZX		 ae=Dc		 ae=0.4xDc		 ae=0.1xDc		 ae=0.02xDc	
		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
Aluminium Steel Materials									
N	GRI0-1 Wrought Aluminium alloys	400	0.005×Dc	400	0.006×Dc	400	0.007×Dc	400	0.008×Dc
	GRI0-2 Aluminium cast alloys <10%	400	0.005×Dc	400	0.006×Dc	400	0.007×Dc	400	0.008×Dc
	GRI0-3 Aluminium cast alloys >10%	350	0.005×Dc	380	0.006×Dc	380	0.007×Dc	380	0.008×Dc

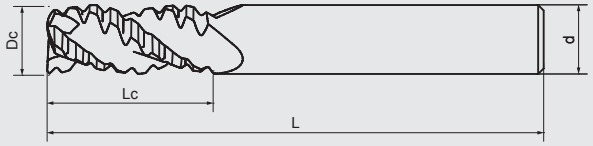
※ All cutting data are for reference only. Please adjust according to actual machining conditions.
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

F642ZX / F643ZX

Roughing End Mills For Aluminium

Coarse tooth staggered chip breaker design on cutting flutes are good for easily chip breaking.

Adopting ZrN coating without AlTi in the formula would prevent from chemical affinity with Alu metal and enhance tool life by gaining better surface hardness.







Suitable for cutting aluminium.

Application for roughing cutting with high chip removal rate.

N N

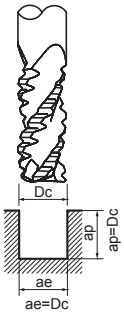
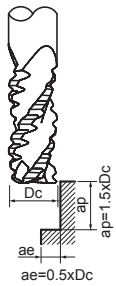
DIN 6527 Standard Length

Dc 0 -0.02	Lc mm	L mm	d h5	F642ZX ZrN					
3	8	57	6	•					
4	11	57	6	•					
5	13	57	6	•					
6	13	57	6	•					
8	19	63	8	•					
10	22	72	10	•					
12	26	83	12	•					
16	32	92	16	•					
20	38	104	20	•					

Long Length

Dc 0 -0.02	Lc mm	L mm	d h5		F643ZX ZrN				
6	19	63	6		•				
8	28	72	8		•				
10	34	84	10		•				
12	40	97	12		•				
16	48	108	16		•				
20	56	122	20		•				

Cutting Conditions

		F642ZX F643ZX				
			cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
		Aluminium Steel Materials				
N	GRI0-1	Wrought Aluminium alloys	400	0.008×Dc	400	0.009×Dc
	GRI0-2	Aluminium cast alloys <10%	400	0.008×Dc	400	0.009×Dc
	GRI0-3	Aluminium cast alloys >10%	350	0.008×Dc	380	0.009×Dc

※ All cutting data are for reference only. Please adjust according to actual machining conditions.
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

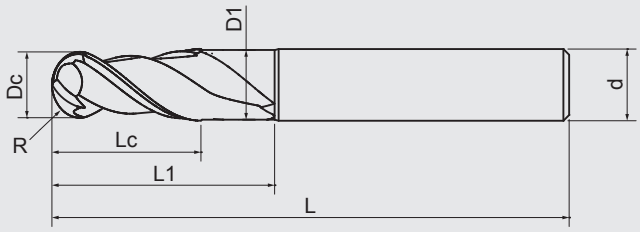
F618ZX / F620ZX

Ball Nose End Mills For Aluminium

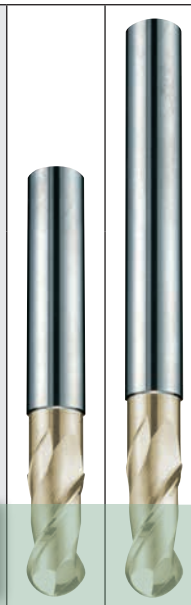
40° helix with round cutting edge and mirror sharp grinding on side cutting edge.

Various applications on Aluminium for curved profile milling.

Adopting ZrN coating without AlTi in the formula would prevent from chemical affinity with Alu metal and enhance tool life by decreasing friction and gaining better surface hardness and smoothness.







Suitable for cutting aluminium.

Application for roughing cutting with high chip removal rate.

N N

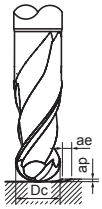
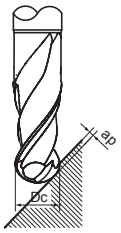
DIN 6527 Standard Length

Dc 0 -0.02	R ±0.005	Lc mm	L mm	d mm	L1 mm	D1 h5	F618ZX ZrN	F620ZX ZrN
3	1.5R	6	57	6	9	2.8	•	
4	2R	8	57	6	12	3.7	•	
5	2.5R	10	57	6	15	4.6	•	
6	3R	12	57	6	20	5.5	•	
8	4R	16	63	8	26	7.4	•	
10	5R	20	72	10	31	9.2	•	
12	6R	24	83	12	37	11.0	•	

Long Length

Dc 0 -0.02	R ±0.005	Lc mm	L mm	d mm	L1 mm	D1 h5	F618ZX ZrN	F620ZX ZrN
3	1.5R	6	70	6	9	2.8		•
4	2R	8	70	6	12	3.7		•
5	2.5R	10	80	6	15	4.6		•
6	3R	12	80	6	20	5.5		•
8	4R	16	100	8	26	7.4		•
10	5R	20	100	10	31	9.2		•
12	6R	24	110	12	37	11.0		•

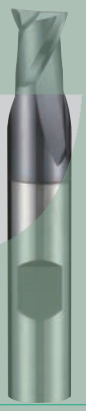
Cutting Conditions

F618ZX F620ZX							
		cutting speed Vc (m/min)	feed per tooth fz(mm)	ae	ap	cutting speed Vc (m/min)	feed per tooth fz(mm)	ap
Aluminium Steel Materials								
N	GRI0-1 Wrought Aluminium alloys	800	0.021×Dc	0.2×Dc	0.05×Dc	900	0.016×Dc	0.02×Dc
	GRI0-2 Aluminium cast alloys <10%	800	0.021×Dc	0.2×Dc	0.05×Dc	900	0.014×Dc	0.02×Dc
	GRI0-3 Aluminium cast alloys >10%	700	0.020×Dc	0.2×Dc	0.05×Dc	800	0.012×Dc	0.02×Dc

※ All cutting data are for reference only. Please adjust according to actual machining conditions.
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.



End Mills

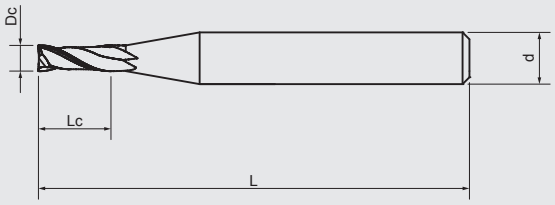
Page	291	291	293	293	295	295
Appearance						
Code No	E102HX	E104HX	F500HX F501HX	F602TX	F503HX F504HX	F603TX
Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide
Coating	AlTiCrN HX	AlTiCrN HX	AlTiCrN HX	AlTiSiN TX	AlTiCrN HX	AlTiSiN TX
Helix Angle	 30°	 30°	 30°	 35°	 30°	 30°
No.of Flutes	 2	 4	 2	 2	 3	 3

297	299	301	303	305	307	309	311	313	315
									
F506HX F507HX	F604TX F606TX	F660TX F661TX	B202HX	F520HX F521HX	F623HX F624HX	F625TX F626TX	F615TX F619TX	F613TX F614TX	F676TX
VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide
AlTiCrN HX	AlTiSiN TX	AlTiSiN TX	AlTiCrN HX	AlTiCrN HX	AlTiCrN HX	AlTiSiN TX	AlTiSiN TX	AlTiSiN TX	AlTiSiN TX
 30°	 35°	 55°	 30°	 30°	 30°	 30°	 30°	 45°	 0°
 4	 4	 Z	 2	 2	 2	 2	 4	 6	 4

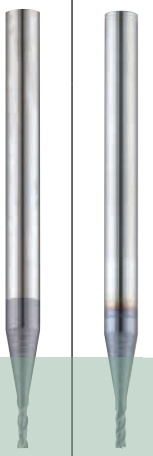
E102HX / E104HX

Universal End Mills / Finishing End Mills

Small diameter series with specification in step of 0.1mm.
Good wear resistance and lubricating effect with Nano multilayer coating.



VHM Carbide | AlTiCrN HX | 30° | N γ10° | 90° | Steel <48HRC



Suitable for cutting different steels below 48HRC as well as cast iron.
Various application for general cutting.

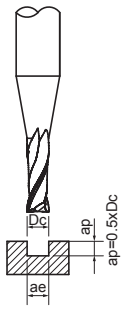
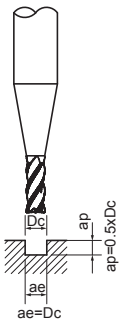
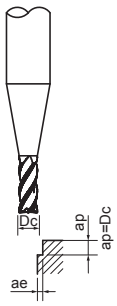
P H K 2 | P H K 4

Standard Length

Dc 0 -0.02	Lc mm	L mm	d h5	E102HX AlTiCrN	E104HX AlTiCrN
0.2	0.5	38	3	•	
0.3	0.8	38	3	•	
0.4	1	38	3	•	
0.5	1.2	38	3	•	
0.6	1.5	38	3	•	
0.7	1.8	38	3	•	
0.8	2	38	3	•	
0.9	2.5	38	3	•	
1	3	38	3	•	•
1.1	3	38	3	•	•
1.2	4	38	3	•	•
1.3	4	38	3	•	•
1.4	4	38	3	•	•
1.5	5	38	3	•	•
1.6	5	38	3	•	•
1.7	5	38	3	•	•
1.8	5	38	3	•	•
1.9	5	38	3	•	•
2	6	38	3	•	•
2.1	6	38	3	•	•
2.2	6	38	3	•	•
2.3	6	38	3	•	•
2.4	8	38	3	•	•
2.5	8	38	3	•	•
2.6	8	38	3	•	•
2.7	8	38	3	•	•
2.8	8	38	3	•	•
2.9	8	38	3	•	•
3	8	38	3	•	•

※Offer valid while stocks last

Cutting Conditions

		E102HX		E102HX		E104HX		E104HX	
E102HX E104HX				 ae=0.01xDc		 ae=Dc		 ae=0.01xDc	
		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
P	Carbon Steel Materials								
	GR1 Carbon Steel	120	0.0015×Dc	120	0.0018×Dc	120	0.0015×Dc	120	0.0018×Dc
	GR2 <24HRC Low-alloyed Steel	120	0.0015×Dc	120	0.0018×Dc	120	0.0015×Dc	120	0.0018×Dc
	GR3 <30HRC Hi-alloyed Steel	80	0.0012×Dc	80	0.0015×Dc	80	0.0012×Dc	80	0.0015×Dc
H	Hardened Steel Materials								
	GR4 30~38HRC Hardened Steel	60	0.001×Dc	65	0.001×Dc	60	0.001×Dc	65	0.001×Dc
	GR5 38~48HRC Hardened Steel	55	0.001×Dc	60	0.001×Dc	55	0.001×Dc	60	0.001×Dc
K	Cast Iron Materials								
	GR9-1 Grey cast iron	120	0.0015×Dc	120	0.0018×Dc	120	0.0015×Dc	120	0.0018×Dc
	GR9-2 Nodular cast iron	120	0.0015×Dc	120	0.0018×Dc	120	0.0015×Dc	120	0.0018×Dc

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

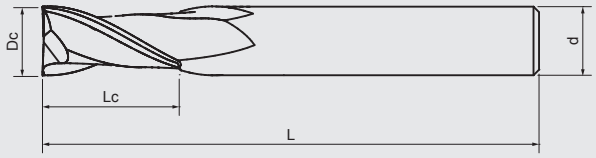
F500HX / F501HX / F602TX

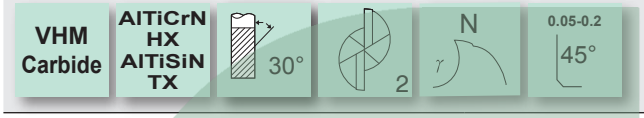
Universal End Mills

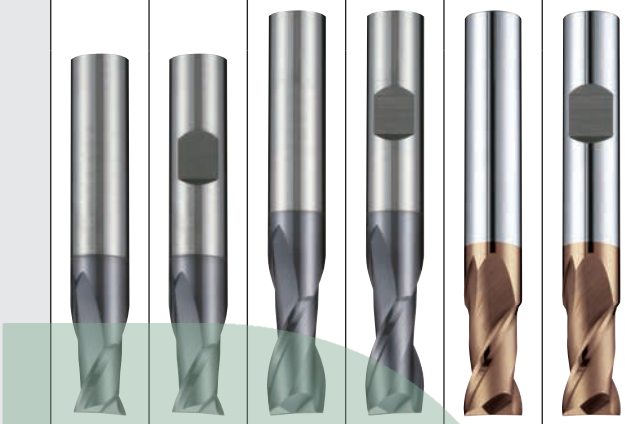
F500HX / F501HX With MG carbide material is good for cutting materials < 48HRC.

F602TX With UMG carbide material is good for cutting hardened materials < 62HRC.

Good wear resistance and lubricating effect with Nano multilayer coating.







F500HX / F501HX With sharp cutting edge is good for cutting different steels below 48HRC as well as cast iron.

F602TX With stronger Strength of cutting edge is suitable for steels below 62HRC.

Various application for general cutting.

P H K	P H K	P H K	P H K	P H	P H
AlTiCrN <48HRC	AlTiCrN <48HRC	AlTiCrN <48HRC	AlTiCrN <48HRC	AlTiSiN <62HRC	AlTiSiN <62HRC

DIN 6527 Stub Length

Dc 0 -0.02	Lc mm	L mm	d h5	45° mm	F500HX HA	F500HX HB				
2	3	50	6	0.02	•	•				
3	4	50	6	0.03	•	•				
4	5	54	6	0.04	•	•				
5	6	54	6	0.05	•	•				
6	7	54	6	0.06	•	•				
8	9	58	8	0.08	•	•				
10	11	66	10	0.10	•	•				
12	12	73	12	0.12	•	•				
14	14	75	14	0.14	•	•				
16	16	82	16	0.16	•	•				
18	18	84	18	0.18	•	•				
20	20	92	20	0.20	•	•				

DIN 6527 Standard Length

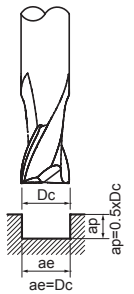
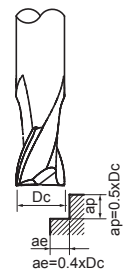
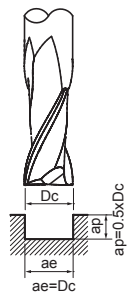
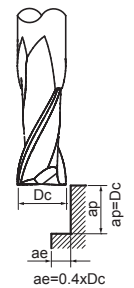
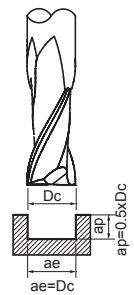
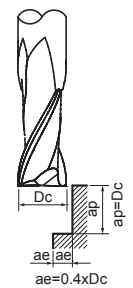
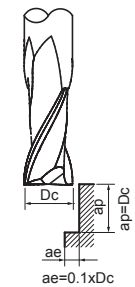
Dc 0 -0.02	Lc mm	L mm	d h5	45° mm			F501HX HA	F501HX HB		
3	7	57	6	0.03			•	•		
4	8	57	6	0.04			•	•		
5	10	57	6	0.05			•	•		
6	10	57	6	0.06			•	•		
8	16	63	8	0.08			•	•		
10	19	72	10	0.10			•	•		
12	22	83	12	0.12			•	•		
14	22	83	14	0.14			•	•		
16	26	92	16	0.16			•	•		
18	26	92	18	0.18			•	•		
20	32	104	20	0.20			•	•		

DIN 6527 Standard Length

Dc 0 -0.02	Lc mm	L mm	d h5	45° mm					F602TX HA	F602TX HB
3	7	57	6	0.03					•	•
4	8	57	6	0.04					•	•
5	10	57	6	0.05					•	•
6	10	57	6	0.06					•	•
8	16	63	8	0.08					•	•
10	19	72	10	0.10					•	•
12	22	83	12	0.12					•	•
16	26	92	16	0.16					•	•
20	32	104	20	0.20					•	•

Cutting Conditions

F500HX
F501HX
F602TX

		F500HX		F500HX		F501HX		F501HX		F602TX		F602TX		F602TX	
															
		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
	Carbon Steel Materials														
P	GR1 Carbon Steel	120	0.004×Dc	120	0.005×Dc	130	0.005×Dc	140	0.006×Dc	120	0.004×Dc	120	0.005×Dc	130	0.005×Dc
P	GR2 <24HRC Low-alloyed Steel	120	0.003×Dc	120	0.004×Dc	130	0.004×Dc	140	0.005×Dc	120	0.003×Dc	120	0.004×Dc	130	0.004×Dc
P	GR3 <30HRC Hi-alloyed Steel	80	0.003×Dc	80	0.003×Dc	90	0.003×Dc	100	0.004×Dc	80	0.003×Dc	80	0.003×Dc	90	0.003×Dc
	Hardened Steel Materials														
H	GR4 30~38HRC Hardened Steel	65	0.002×Dc	65	0.002×Dc	65	0.002×Dc	70	0.002×Dc	65	0.002×Dc	65	0.002×Dc	65	0.002×Dc
H	GR5 38~48HRC Hardened Steel	60	0.0018×Dc	60	0.0018×Dc	60	0.0018×Dc	65	0.0018×Dc	60	0.0018×Dc	60	0.0018×Dc	60	0.0018×Dc
H	GR6 48~56HRC Hardened Steel									55	0.0015×Dc	55	0.0015×Dc	55	0.0015×Dc
	Cast Iron Materials														
K	GR9-1 Grey cast iron	120	0.004×Dc	120	0.005×Dc	130	0.005×Dc	140	0.006×Dc						
K	GR9-2 Nodular cast iron	120	0.004×Dc	120	0.005×Dc	130	0.005×Dc	140	0.006×Dc						

※ All cutting data are for reference only. Please adjust according to actual machining conditions.
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

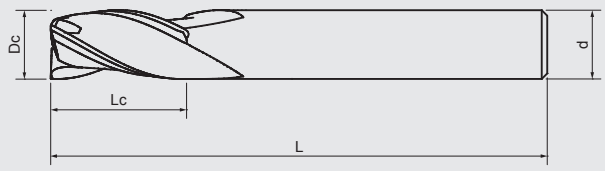
F503HX / F504HX / F603TX

Universal End Mills

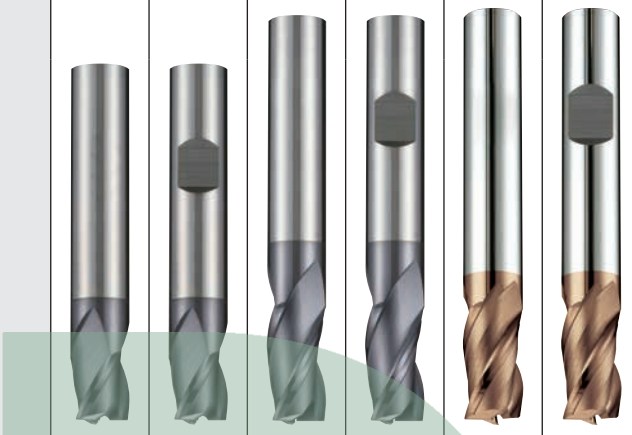
F503HX / F504HX With MG carbide material is good for cutting materials < 48HRC.

F603TX With UMG carbide material is good for cutting hardened materials < 62HRC.

Good wear resistance and lubricating effect with Nano multilayer coating.







F503HX / F504HX With sharp cutting edge is good for cutting different steels below 48HRC as well as cast iron.

F603TX With stronger strength of cutting edge is suitable for steels below 62HRC.

Various application for general cutting.

P H K	P H K	P H K	P H K	P H	P H
AlTiCrN <48HRC	AlTiCrN <48HRC	AlTiCrN <48HRC	AlTiCrN <48HRC	AlTiSiN <62HRC	AlTiSiN <62HRC

DIN 6527 Stub Length

Dc 0 -0.02	Lc mm	L mm	d h5	45° mm	F503HX HA	F503HX HB				
2	3	50	6	0.02	•	•				
3	4	50	6	0.03	•	•				
4	5	54	6	0.04	•	•				
5	6	54	6	0.05	•	•				
6	7	54	6	0.06	•	•				
8	9	58	8	0.08	•	•				
10	11	66	10	0.10	•	•				
12	12	73	12	0.12	•	•				
14	14	75	14	0.14	•	•				
16	16	82	16	0.16	•	•				
18	18	84	18	0.18	•	•				
20	20	92	20	0.20	•	•				

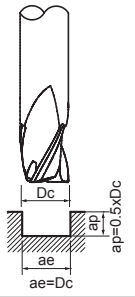
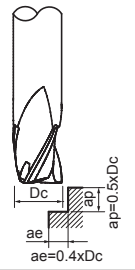
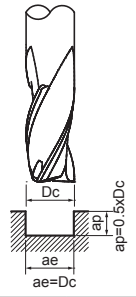
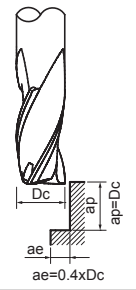
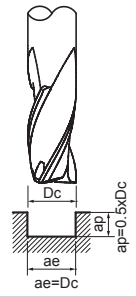
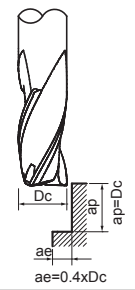
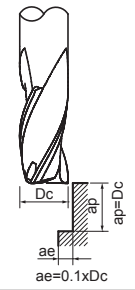
DIN 6527 Standard Length

Dc 0 -0.02	Lc mm	L mm	d h5	45° mm			F504HX HA	F504HX HB		
3	7	57	6	0.03			•	•		
4	8	57	6	0.04			•	•		
5	10	57	6	0.05			•	•		
6	10	57	6	0.06			•	•		
8	16	63	8	0.08			•	•		
10	19	72	10	0.10			•	•		
12	22	83	12	0.12			•	•		
14	22	83	14	0.14			•	•		
16	26	92	16	0.16			•	•		
18	26	92	18	0.18			•	•		
20	32	104	20	0.20			•	•		

DIN 6527 Standard Length

Dc 0 -0.02	Lc mm	L mm	d h5	45° mm					F603TX HA	F603TX HB
3	7	57	6	0.03					•	•
4	8	57	6	0.04					•	•
5	10	57	6	0.05					•	•
6	10	57	6	0.06					•	•
8	16	63	8	0.08					•	•
10	19	72	10	0.10					•	•
12	22	83	12	0.12					•	•
16	26	92	16	0.16					•	•
20	32	104	20	0.20					•	•

Cutting Conditions

		F503HX		F503HX		F504HX		F504HX		F603TX		F603TX		F603TX	
F503HX F504HX F603TX															
		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
	Carbon Steel Materials														
P	GR1 Carbon Steel	120	0.004×Dc	120	0.005×Dc	130	0.005×Dc	140	0.006×Dc	120	0.004×Dc	120	0.005×Dc	130	0.005×Dc
P	GR2 <24HRC Low-alloyed Steel	120	0.003×Dc	120	0.004×Dc	130	0.004×Dc	140	0.005×Dc	120	0.003×Dc	120	0.004×Dc	130	0.004×Dc
P	GR3 <30HRC Hi-alloyed Steel	80	0.003×Dc	80	0.003×Dc	90	0.003×Dc	100	0.004×Dc	80	0.003×Dc	80	0.003×Dc	90	0.003×Dc
	Hardened Steel Materials														
H	GR4 30~38HRC Hardened Steel	65	0.002×Dc	65	0.002×Dc	65	0.002×Dc	70	0.002×Dc	65	0.002×Dc	65	0.002×Dc	65	0.002×Dc
H	GR5 38~48HRC Hardened Steel	60	0.0018×Dc	60	0.0018×Dc	60	0.0018×Dc	65	0.0018×Dc	60	0.0018×Dc	60	0.0018×Dc	60	0.0018×Dc
H	GR6 48~56HRC Hardened Steel									55	0.0015×Dc	55	0.0015×Dc	55	0.0015×Dc
	Cast Iron Materials														
K	GR9-1 Grey cast iron	120	0.004×Dc	120	0.005×Dc	130	0.005×Dc	140	0.006×Dc						
K	GR9-2 Nodular cast iron	120	0.004×Dc	120	0.005×Dc	130	0.005×Dc	140	0.006×Dc						

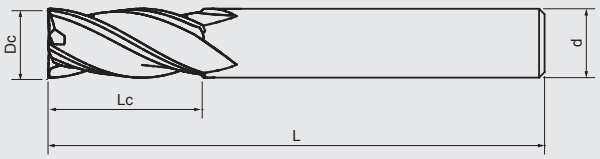
※ All cutting data are for reference only. Please adjust according to actual machining conditions.
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

F506HX / F507HX

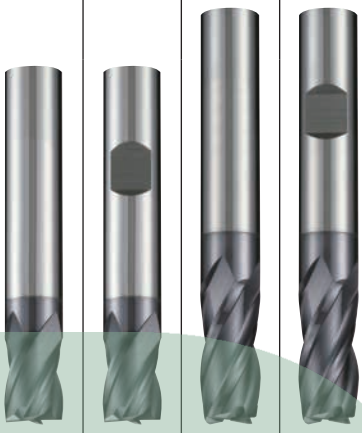
Finishing End Mills

With MG carbide material is good for cutting materials < 48HRC.

Good wear resistance and lubricating effect with Nano multilayer coating.







With sharp cutting edge is good for cutting different steels below 48HRC as well as cast iron.

Various application for finishing cutting.

P H K | P H K | P H K | P H K

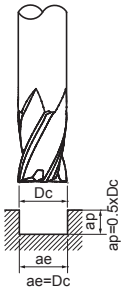
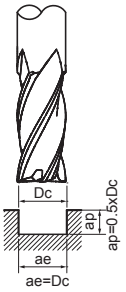
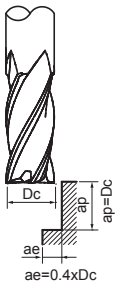
DIN 6527 Stub Length

Dc 0 -0.02	Lc mm	L mm	d h5	45° mm	F506HX HA	F506HX HB				
2	4	50	6	0.02	•	•				
3	5	50	6	0.03	•	•				
4	8	54	6	0.04	•	•				
5	9	54	6	0.05	•	•				
6	10	54	6	0.06	•	•				
8	12	58	8	0.08	•	•				
10	14	66	10	0.10	•	•				
12	16	73	12	0.12	•	•				
14	18	75	14	0.14	•	•				
16	22	82	16	0.16	•	•				
18	24	84	18	0.18	•	•				
20	26	92	20	0.20	•	•				

DIN 6527 Standard Length

Dc 0 -0.02	Lc mm	L mm	d h5	45° mm			F507HX HA	F507HX HB		
3	8	57	6	0.03			•	•		
4	11	57	6	0.04			•	•		
5	13	57	6	0.05			•	•		
6	13	57	6	0.06			•	•		
8	19	63	8	0.08			•	•		
10	22	72	10	0.10			•	•		
12	26	83	12	0.12			•	•		
14	26	83	14	0.14			•	•		
16	32	92	16	0.16			•	•		
18	32	92	18	0.18			•	•		
20	38	104	20	0.20			•	•		

Cutting Conditions

		F506HX		F506HX		F507HX		F507HX	
F506HX F507HX									
		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
	Carbon Steel Materials								
P	GR1 Carbon Steel	120	0.004×Dc	120	0.005×Dc	130	0.005×Dc	140	0.006×Dc
P	GR2 <24HRC Low-alloyed Steel	120	0.003×Dc	120	0.004×Dc	130	0.004×Dc	140	0.005×Dc
P	GR3 <30HRC Hi-alloyed Steel	80	0.003×Dc	80	0.003×Dc	90	0.003×Dc	100	0.004×Dc
	Hardened Steel Materials								
H	GR4 30~38HRC Hardened Steel	65	0.002×Dc	65	0.002×Dc	65	0.002×Dc	70	0.002×Dc
H	GR5 38~48HRC Hardened Steel	60	0.0018×Dc	60	0.0018×Dc	60	0.0018×Dc	65	0.0018×Dc
	Cast Iron Materials								
K	GR9-1 Grey cast iron	120	0.004×Dc	120	0.005×Dc	130	0.005×Dc	140	0.006×Dc
K	GR9-2 Nodular cast iron	120	0.004×Dc	120	0.005×Dc	130	0.005×Dc	140	0.006×Dc

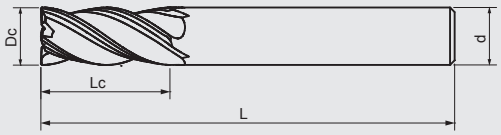
※ All cutting data are for reference only. Please adjust according to actual machining conditions.
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

F604TX / F606TX

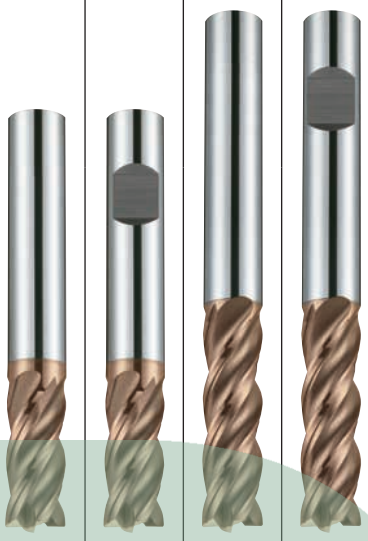
Finishing End Mills

With UMG carbide material is good for cutting hardened materials < 62HRC.

Good wear resistance and lubricating effect with Nano multilayer coating.







With stronger strength of cutting edge is suitable for steels below 62HRC.

Various application for finishing cutting.

P H P H P H P H

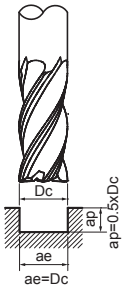
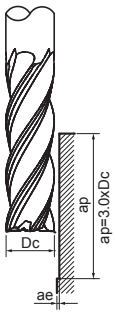
DIN 6527 Standard Length

Dc 0 -0.02	Lc mm	L mm	d h5	45° mm	F604TX HA	F604TX HB				
3	8	57	6	0.03	•	•				
4	11	57	6	0.04	•	•				
5	13	57	6	0.05	•	•				
6	13	57	6	0.06	•	•				
8	19	63	8	0.08	•	•				
10	22	72	10	0.10	•	•				
12	26	83	12	0.12	•	•				
16	32	92	16	0.16	•	•				
20	38	104	20	0.20	•	•				

Long Length

Dc 0 -0.02	Lc mm	L mm	d h5	45° mm			F606TX HA	F606TX HB		
3	12	63	6	0.03			•	•		
4	17	63	6	0.04			•	•		
5	19	63	6	0.05			•	•		
6	19	63	6	0.06			•	•		
8	28	72	8	0.08			•	•		
10	34	84	10	0.10			•	•		
12	40	97	12	0.12			•	•		
16	48	108	16	0.16			•	•		
20	56	122	20	0.20			•	•		

Cutting Conditions

		F604TX		F604TX		F606TX		F606TX	
F604TX F606TX		 ae=Dc		 ae=0.4xDc		 ae=0.05xDc		 ae=0.02xDc	
		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
	Carbon Steel Materials								
P	GR1 Carbon Steel	120	0.004×Dc	120	0.005×Dc	130	0.005×Dc	140	0.004×Dc
P	GR2 <24HRC Low-alloyed Steel	120	0.003×Dc	120	0.004×Dc	130	0.004×Dc	140	0.003×Dc
P	GR3 <30HRC Hi-alloyed Steel	80	0.003×Dc	80	0.003×Dc	90	0.003×Dc	100	0.003×Dc
	Hardened Steel Materials								
H	GR4 30~38HRC Hardened Steel	65	0.002×Dc	65	0.002×Dc	65	0.002×Dc	70	0.002×Dc
H	GR5 38~48HRC Hardened Steel	60	0.0018×Dc	60	0.0018×Dc	60	0.0018×Dc	65	0.0018×Dc
H	GR6 48~56HRC Hardened Steel	55	0.0015×Dc	55	0.0015×Dc	55	0.0015×Dc	60	0.0015×Dc

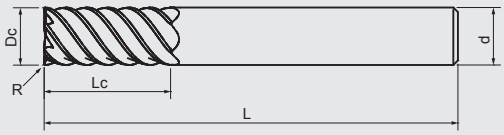
※ All cutting data are for reference only. Please adjust according to actual machining conditions.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

F660TX / F661TX

Finishing End Mills

Negative rake angle is good for cutting hardened materials.
Selected Super SMG as tool material.
Good wear resistance and lubricating effect with Nano multilayer coating.





VHM Carbide | AlTiSiN TX | 55° | Z | N 7-10° | 0.2 R | Steel 40-70 HRC

Stronger strength of cutting edge is suitable for various materials from 40~70HRC.
Various application for finishing cutting.

H H

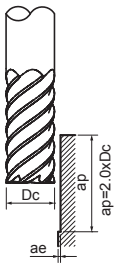
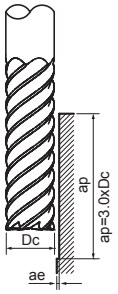
DIN 6527 Standard Length

Dc $^{0}_{-0.02}$	Lc mm	L mm	d h5	Z	R mm	F660TX AlTiSiN					
6	13	57	6	6	0.2	•					
8	19	63	8	6	0.2	•					
10	22	72	10	6	0.2	•					
12	26	83	12	6	0.2	•					
16	32	92	16	8	0.2	•					
20	38	104	20	10	0.2	•					

Long Length

Dc $^{0}_{-0.02}$	Lc mm	L mm	d h5	Z	R mm		F661TX AlTiSiN				
6	19	63	6	6	0.2		•				
8	28	72	8	6	0.2		•				
10	34	84	10	6	0.2		•				
12	40	97	12	6	0.2		•				
16	48	108	16	8	0.2		•				
20	56	122	20	10	0.2		•				

Cutting Conditions

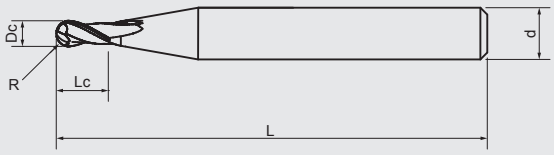
		F660TX		F661TX	
F660TX F661TX		 ae=0.05xDc		 ae=0.02xDc	
		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
	Hardened Steel Materials				
H	GR5 38~48HRC Hardened Steel	150	0.01×Dc	130	0.002×Dc
	GR6 48~56HRC Hardened Steel	100	0.008×Dc	90	0.0018×Dc
	GR7 56~68HRC Hardened Steel	90	0.007×Dc	80	0.0015×Dc

※ All cutting data are for reference only. Please adjust according to actual machining conditions.
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

B202HX

Ball Nose End Mills

Designed with S-style ball nose geometry.
Reduce surface cutting resistance.
Good wear resistance and lubricating effect with Nano multilayer coating.





VHM Carbide | AlTiCrN HX | 30° | 2 | N | 10° | Steel <48HRC

Suitable for cutting different steels below 48HRC as well as cast iron.
Application for finishing profile cutting.

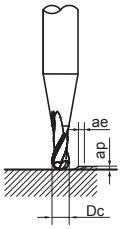
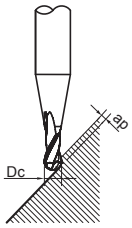
P H K

Standard Length

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h5	B202HX AlTiCrN
0.2	0.1R	0.4	38	3	•
0.3	0.15R	0.6	38	3	•
0.4	0.2R	0.8	38	3	•
0.5	0.25R	1	38	3	•
0.6	0.3R	1.2	38	3	•
0.7	0.35R	1.4	38	3	•
0.8	0.4R	1.6	38	3	•
0.9	0.45R	1.8	38	3	•
1	0.5R	2	38	3	•
1.1	0.55R	2.2	38	3	•
1.2	0.6R	2.4	38	3	•
1.4	0.7R	2.8	38	3	•
1.5	0.75R	3	38	3	•
1.6	0.8R	3.2	38	3	•
1.8	0.9R	3.6	38	3	•
2	1R	4	38	3	•
2.5	1.25R	5	38	3	•
3	1.5R	6	38	3	•

※Offer valid while stocks last

Cutting Conditions

B202HX								
		cutting speed Vc (m/min)	feed per tooth fz(mm)	ae	ap	cutting speed Vc (m/min)	feed per tooth fz(mm)	ae	ap
P	Carbon Steel Materials								
	GR1 Carbon Steel	120	0.013×Dc	0.06×Dc	0.06×Dc	120	0.013×Dc	0.06×Dc	0.06×Dc
	GR2 <24HRC Low-alloyed Steel	110	0.013×Dc	0.06×Dc	0.06×Dc	110	0.013×Dc	0.06×Dc	0.06×Dc
	GR3 <30HRC Hi-alloyed Steel	100	0.012×Dc	0.06×Dc	0.06×Dc	100	0.012×Dc	0.06×Dc	0.06×Dc
H	Hardened Steel Materials								
	GR4 30~38HRC Hardened Steel	60	0.009×Dc	0.02×Dc	0.02×Dc	110	0.01×Dc	0.02×Dc	0.02×Dc
	GR5 38~48HRC Hardened Steel	55	0.008×Dc	0.02×Dc	0.02×Dc	100	0.009×Dc	0.02×Dc	0.02×Dc
K	Cast Iron Materials								
	GR9-1 Grey cast iron	120	0.013×Dc	0.013×Dc	0.013×Dc	120	0.013×Dc	0.013×Dc	0.013×Dc
	GR9-2 Nodular cast iron	120	0.013×Dc	0.013×Dc	0.013×Dc	120	0.013×Dc	0.013×Dc	0.013×Dc

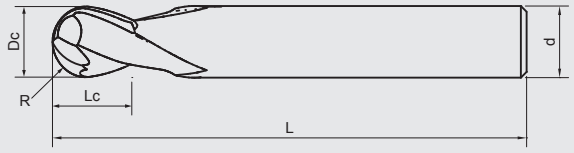
※ All cutting data are for reference only. Please adjust according to actual machining conditions.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

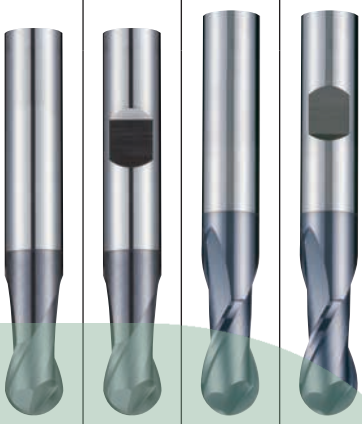
F520HX / F521HX

Ball Nose End Mills

Designed with S-style ball nose geometry.
Reduce surface cutting resistance.
Good wear resistance and lubricating effect with Nano multilayer coating.







Suitable for cutting different steels below 48HRC as well as cast iron.
Application for finishing profile cutting.

Steel <48HRC

P H K | P H K | P H K | P H K

DIN 6527 Stub Length

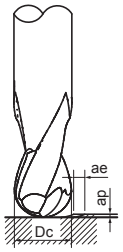
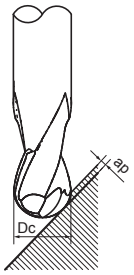
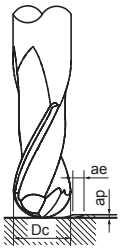
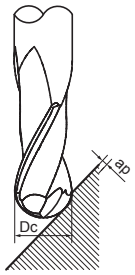
Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h5	F520HX HA	F520HX HB				
2	1R	3	50	6	•	•				
3	1.5R	4	50	6	•	•				
4	2R	5	54	6	•	•				
5	2.5R	6	54	6	•	•				
6	3R	7	54	6	•	•				
8	4R	9	58	8	•	•				
10	5R	11	66	10	•	•				
12	6R	12	73	12	•	•				
14	7R	14	75	14	•	•				
16	8R	16	82	16	•	•				
18	9R	18	84	18	•	•				
20	10R	20	92	20	•	•				

DIN 6527 Standard Length

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h5			F521HX HA	F521HX HB		
3	1.5R	7	57	6			•	•		
4	2R	8	57	6			•	•		
5	2.5R	10	57	6			•	•		
6	3R	10	57	6			•	•		
8	4R	16	63	8			•	•		
10	5R	19	72	10			•	•		
12	6R	22	83	12			•	•		
14	7R	22	83	14			•	•		
16	8R	26	92	16			•	•		
18	9R	26	92	18			•	•		
20	10R	32	104	20			•	•		

Cutting Conditions

F520HX
F521HX

		F520HX				F520HX				F521HX				F521HX			
																	
		cutting speed Vc (m/min)	feed per tooth fz(mm)	ae	ap	cutting speed Vc (m/min)	feed per tooth fz(mm)	ae	ap	cutting speed Vc (m/min)	feed per tooth fz(mm)	ae	ap	cutting speed Vc (m/min)	feed per tooth fz(mm)	ae	ap
P	Carbon Steel Materials																
	GR1 Carbon Steel	120	0.02×Dc	0.2×Dc	0.1×Dc	120	0.023×Dc	0.2×Dc	0.1×Dc	120	0.02×Dc	0.2×Dc	0.1×Dc	120	0.023×Dc	0.2×Dc	0.1×Dc
	GR2 <24HRC Low-alloyed Steel	110	0.02×Dc	0.2×Dc	0.1×Dc	110	0.022×Dc	0.2×Dc	0.1×Dc	110	0.02×Dc	0.2×Dc	0.1×Dc	110	0.022×Dc	0.2×Dc	0.1×Dc
	GR3 <30HRC Hi-alloyed Steel	100	0.018×Dc	0.2×Dc	0.1×Dc	100	0.021×Dc	0.2×Dc	0.1×Dc	100	0.018×Dc	0.2×Dc	0.1×Dc	100	0.021×Dc	0.2×Dc	0.1×Dc
H	Hardened Steel Materials																
	GR4 30~38HRC Hardened Steel	60	0.015×Dc	0.02×Dc	0.02×Dc	60	0.015×Dc	0.02×Dc	0.02×Dc	60	0.015×Dc	0.02×Dc	0.02×Dc	60	0.015×Dc	0.02×Dc	0.02×Dc
	GR5 38~48HRC Hardened Steel	55	0.012×Dc	0.02×Dc	0.02×Dc	55	0.012×Dc	0.02×Dc	0.02×Dc	55	0.012×Dc	0.02×Dc	0.02×Dc	55	0.012×Dc	0.02×Dc	0.02×Dc
K	Cast Iron Materials																
	GR9-1 Grey cast iron	120	0.02×Dc	0.2×Dc	0.1×Dc	120	0.023×Dc	0.2×Dc	0.1×Dc	120	0.02×Dc	0.2×Dc	0.1×Dc	120	0.023×Dc	0.2×Dc	0.1×Dc
	GR9-2 Nodular cast iron	120	0.02×Dc	0.2×Dc	0.1×Dc	120	0.023×Dc	0.2×Dc	0.1×Dc	120	0.02×Dc	0.2×Dc	0.1×Dc	120	0.023×Dc	0.2×Dc	0.1×Dc

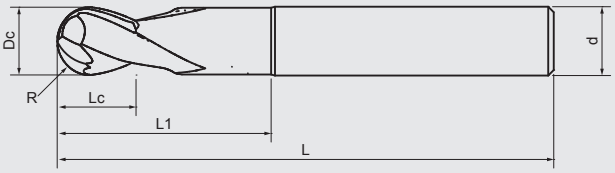
※ All cutting data are for reference only. Please adjust according to actual machining conditions.

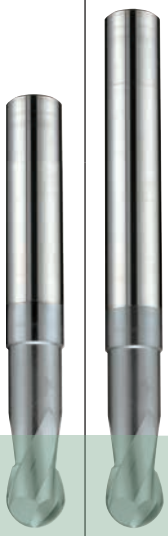
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

F623HX / F624HX

Ball Nose End Mills

Designed with S-style ball nose geometry.
Reduce surface cutting resistance.
Good wear resistance and lubricating effect with Nano multilayer coating
With MG carbide material is good for cutting materials < 48HRC.





VHM Carbide | AlTiCrN HX | 30° | 2 | N 75° | Steel <48HRC

With sharp cutting edge is good for cutting different steels below 48HRC as well as cast iron.
Application for finishing profile cutting.

P H K | P H K

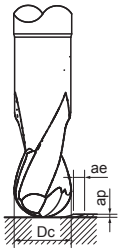
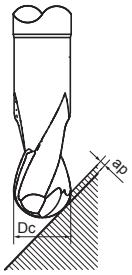
DIN 6527 Standard Length

Dc 0 -0.02	R ±0.005	Lc mm	L mm	d h5	L1 mm	D1 mm	F623HX AlTiCrN
1	0.5R	1	50	6	3	0.95	•
1.5	0.75R	2	50	6	4	1.4	•
2	1R	3	57	6	6	1.9	•
3	1.5R	4	57	6	9	2.8	•
4	2R	5	57	6	12	3.7	•
5	2.5R	6	57	6	15	4.6	•
6	3R	7	57	6	20	5.5	•
8	4R	9	63	8	26	7.4	•
10	5R	11	72	10	31	9.2	•
12	6R	13	83	12	37	11	•

Long Length

Dc 0 -0.02	R ±0.005	Lc mm	L mm	d h5	L1 mm	D1 mm	F624HX AlTiCrN
3	1.5R	4	70	6	9	2.8	•
4	2R	5	70	6	12	3.7	•
5	2R	6	80	6	15	4.6	•
6	3R	7	80	6	20	5.5	•
8	4R	9	100	8	26	7.4	•
10	5R	11	100	10	31	9.2	•
12	6R	13	110	12	37	11	•

Cutting Conditions

		F623HX				F624HX			
F623HX F624HX									
		cutting speed Vc (m/min)	feed per tooth fz(mm)	ae	ap	cutting speed Vc (m/min)	feed per tooth fz(mm)	ae	ap
		Carbon Steel Materials							
P	GR1 Carbon Steel	120	0.02×Dc	0.2×Dc	0.1×Dc	120	0.023×Dc	0.2×Dc	0.1×Dc
P	GR2 <24HRC Low-alloyed Steel	110	0.02×Dc	0.2×Dc	0.1×Dc	110	0.022×Dc	0.2×Dc	0.1×Dc
P	GR3 <30HRC Hi-alloyed Steel	100	0.018×Dc	0.2×Dc	0.1×Dc	100	0.021×Dc	0.2×Dc	0.1×Dc
		Hardened Steel Materials							
H	GR4 30~38HRC Hardened Steel	60	0.015×Dc	0.02×Dc	0.02×Dc	60	0.015×Dc	0.02×Dc	0.02×Dc
H	GR5 38~48HRC Hardened Steel	55	0.012×Dc	0.02×Dc	0.02×Dc	55	0.012×Dc	0.02×Dc	0.02×Dc
		Cast Iron Materials							
K	GR9-1 Grey cast iron	120	0.02×Dc	0.2×Dc	0.1×Dc	120	0.023×Dc	0.2×Dc	0.1×Dc
K	GR9-2 Nodular cast iron	120	0.02×Dc	0.2×Dc	0.1×Dc	120	0.023×Dc	0.2×Dc	0.1×Dc

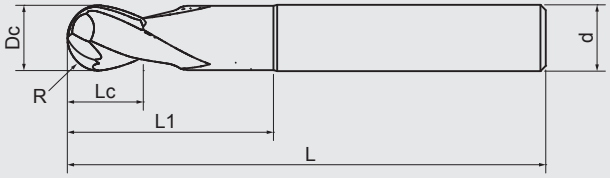
※ All cutting data are for reference only. Please adjust according to actual machining conditions.

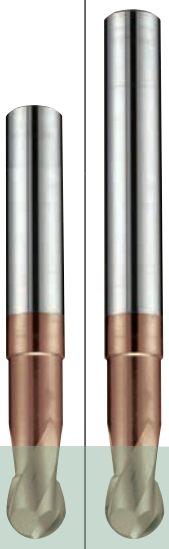
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

F625TX / F626TX

Ball Nose End Mills

Designed with S-style ball nose geometry.
Reduce surface cutting resistance.
Good wear resistance and lubricating effect with Nano multilayer coating
With SMG carbide material is good for cutting hardened materials < 70HRC.





VHM Carbide | AlTiSiN TX | 30° | 2 | N | 7-10° | Steel 40-70 HRC

With stronger strength of cutting edge is suitable for hardened steels from 40~70HRC.
Application for finishing profile cutting.

H H

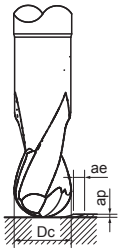
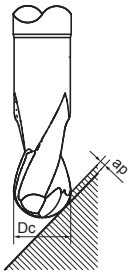
DIN 6527 Standard Length

Dc 0 -0.02	R ±0.005	Lc mm	L mm	d h5	L1 mm	D1 mm	F625TX AlTiSiN
1	0.5R	1	50	6	3	0.95	•
1.5	0.75R	2	50	6	4	1.4	•
2	1R	3	57	6	6	1.9	•
3	1.5R	4	57	6	9	2.8	•
4	2R	5	57	6	12	3.7	•
5	2.5R	6	57	6	15	4.6	•
6	3R	7	57	6	20	5.5	•
8	4R	9	63	8	26	7.4	•
10	5R	11	72	10	31	9.2	•
12	6R	13	83	12	37	11	•

Long Length

Dc 0 -0.02	R ±0.005	Lc mm	L mm	d h5	L1 mm	D1 mm	F626TX AlTiSiN
3	1.5R	4	70	6	9	2.8	•
4	2R	5	70	6	12	3.7	•
5	2.5R	6	80	6	15	4.6	•
6	3R	7	80	6	20	5.5	•
8	4R	9	100	8	26	7.4	•
10	5R	11	100	10	31	9.2	•
12	6R	13	110	12	37	11	•

Cutting Conditions

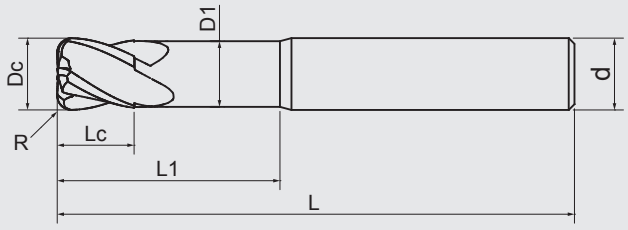
F625TX F626TX		F625TX				F626TX			
									
		cutting speed Vc (m/min)	feed per tooth fz(mm)	ae	ap	cutting speed Vc (m/min)	feed per tooth fz(mm)	ae	ap
Hardened Steel Materials									
H	GR5 38~48HRC Hardened Steel	65	0.015×Dc	0.02×Dc	0.02×Dc	65	0.015×Dc	0.02×Dc	0.02×Dc
H	GR6 48~56HRC Hardened Steel	60	0.012×Dc	0.02×Dc	0.02×Dc	60	0.012×Dc	0.02×Dc	0.02×Dc
H	GR7 56~68HRC Hardened Steel	55	0.011×Dc	0.02×Dc	0.02×Dc	55	0.011×Dc	0.02×Dc	0.02×Dc

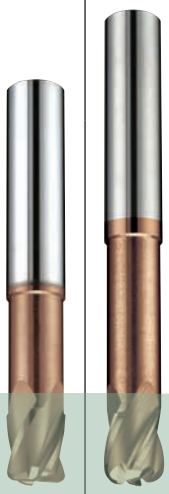
※ All cutting data are for reference only. Please adjust according to actual machining conditions.
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

F615TX / F619TX

Toric End Mills

Honing cutting edge with AlTiSiN Nano multilayer coating to improve tool life effectively.





VHM Carbide | AlTiSiN TX | 30° | 4 | N 75° | R | Steel <62HRC

Suitable for profile surface machining, roughing and finishing in cutting different steel below 62HRC and cast Iron.

P H K | P H K

DIN 6527 Standard Length

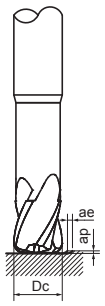
Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h5	L1 mm	D1 mm	F615TX AlTiSiN					
3	R0.3	4	57	6	14	2.8	•					
3	R0.5	4	57	6	14	2.8	•					
4	R0.3	5	57	6	16	3.7	•					
4	R0.5	5	57	6	16	3.7	•					
4	R1	5	57	6	16	3.7	•					
6	R0.5	7	57	6	20	5.5	•					
6	R1	7	57	6	20	5.5	•					
6	R1.5	7	57	6	20	5.5	•					
8	R0.5	9	63	8	26	7.4	•					
8	R1	9	63	8	26	7.4	•					
8	R1.5	9	63	8	26	7.4	•					
8	R2	9	63	8	26	7.4	•					
10	R0.5	11	72	10	31	9.2	•					
10	R1	11	72	10	31	9.2	•					
10	R1.5	11	72	10	31	9.2	•					
10	R2	11	72	10	31	9.2	•					
10	R2.5	11	72	10	31	9.2	•					
12	R0.5	13	83	12	37	11	•					
12	R1	13	83	12	37	11	•					
12	R1.5	13	83	12	37	11	•					
12	R2	13	83	12	37	11	•					
12	R3	13	83	12	37	11	•					
16	R2	17	92	16	43	14.5	•					
16	R4	17	92	16	43	14.5	•					

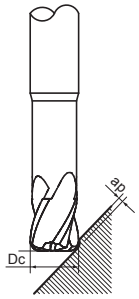
Long Length

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h5	L1 mm	D1 mm		F619TX AlTiSiN				
6	R0.5	7	70	6	33	5.5		•				
6	R1	7	70	6	33	5.5		•				
6	R1.5	7	70	6	33	5.5		•				
8	R0.5	9	80	8	43	7.4		•				
8	R1	9	80	8	43	7.4		•				
8	R2	9	80	8	43	7.4		•				
10	R0.5	11	90	10	49	9.2		•				
10	R1	11	90	10	49	9.2		•				
10	R2	11	90	10	49	9.2		•				
10	R2.5	11	90	10	49	9.2		•				
12	R0.5	13	100	12	54	11		•				
12	R1	13	100	12	54	11		•				
12	R2	13	100	12	54	11		•				
12	R3	13	100	12	54	11		•				
16	R2	17	115	16	66	14.5		•				
16	R4	17	115	16	66	14.5		•				

Cutting Conditions

F615TX
F619TX





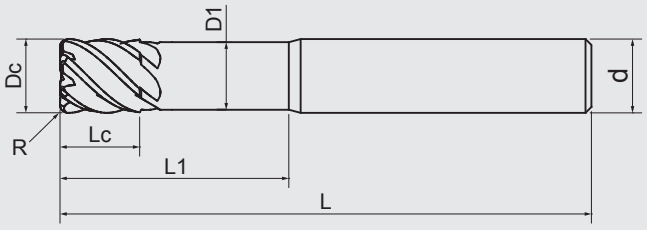
		cutting speed Vc (m/min)	feed per tooth fz(mm)	ae	ap	cutting speed Vc (m/min)	feed per tooth fz(mm)	ap
	Carbon Steel Materials							
P	GR1 Carbon Steel	280	0.011×Dc	0.4×Dc	0.03×Dc	360	0.008×Dc	0.01×Dc
P	GR2 <24HRC Low-alloyed Steel	260	0.011×Dc	0.4×Dc	0.03×Dc	320	0.008×Dc	0.01×Dc
P	GR3 <30HRC Hi-alloyed Steel	230	0.009×Dc	0.4×Dc	0.03×Dc	270	0.008×Dc	0.01×Dc
	Hardened Steel Materials							
H	GR4 30~38HRC Hardened Steel	100	0.008×Dc	0.4×Dc	0.03×Dc	180	0.006×Dc	0.01×Dc
H	GR5 38~48HRC Hardened Steel	80	0.007×Dc	0.3×Dc	0.02×Dc	160	0.005×Dc	0.01×Dc
H	GR6 48~56HRC Hardened Steel	60	0.006×Dc	0.2×Dc	0.01×Dc	140	0.004×Dc	0.01×Dc
	Cast Iron Materials							
K	GR9-1 Grey cast iron	280	0.02×Dc	0.4×Dc	0.03×Dc	360	0.008×Dc	0.01×Dc
K	GR9-2 Nodular cast iron	250	0.02×Dc	0.4×Dc	0.03×Dc	320	0.008×Dc	0.01×Dc

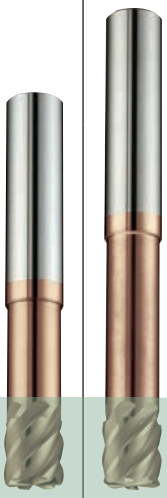
※ All cutting data are for reference only. Please adjust according to actual machining conditions.
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2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

F613TX / F614TX

Toric End Mills

Design with high hardness, rigidity and negative rake angle.
Honing cutting edge with AlTiSiN Nano multilayer coating to improve tool life effectively.





VHM Carbide | AlTiSiN TX | 45° | 6 | N | 7-10° | R | Steel 40-70 HRC

Suitable for profile surface machining, roughing and finishing in cutting different steel below 62HRC.

H K | H K

DIN 6527 Standard Length

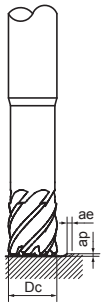
Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h5	L1 mm	D1 mm	Z	F613TX AlTiSiN
3	R0.5	4	57	6	14	2.8	4	•
4	R0.5	5	57	6	16	3.7	4	•
5	R0.5	6	57	6	18	4.6	4	•
6	R0.5	7	57	6	20	5.5	6	•
8	R0.5	9	63	8	26	7.4	6	•
10	R0.5	11	72	10	31	9.2	6	•
12	R0.5	13	83	12	37	11	6	•
6	R1	7	57	6	20	5.5	6	•
8	R1	9	63	8	26	7.4	6	•
10	R1	11	72	10	31	9.2	6	•
12	R1	13	83	12	37	11	6	•

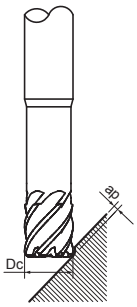
Long Length

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h5	L1 mm	D1 mm	Z	F614TX AlTiSiN
3	R0.5	4	70	6	27	2.8	4	•
4	R0.5	5	70	6	29	3.7	4	•
5	R0.5	6	70	6	31	4.6	4	•
6	R0.5	7	70	6	33	5.5	6	•
8	R0.5	9	80	8	43	7.4	6	•
10	R0.5	11	90	10	49	9.2	6	•
12	R0.5	13	100	12	54	11	6	•
6	R1	7	70	6	33	5.5	6	•
8	R1	9	80	8	43	7.4	6	•
10	R1	11	90	10	49	9.2	6	•
12	R1	13	100	12	54	11	6	•

Cutting Conditions

F613TX
F614TX





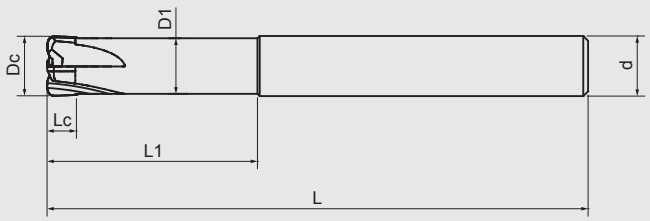
		cutting speed Vc (m/min)	feed per tooth fz(mm)	ae	ap	cutting speed Vc (m/min)	feed per tooth fz(mm)	ap
	Carbon Steel Materials							
P	GR1 Carbon Steel	280	0.011×Dc	0.4×Dc	0.03×Dc	360	0.008×Dc	0.01×Dc
P	GR2 <24HRC Low-alloyed Steel	260	0.011×Dc	0.4×Dc	0.03×Dc	320	0.008×Dc	0.01×Dc
P	GR3 <30HRC Hi-alloyed Steel	230	0.009×Dc	0.4×Dc	0.03×Dc	270	0.008×Dc	0.01×Dc
	Hardened Steel Materials							
H	GR4 30~38HRC Hardened Steel	100	0.008×Dc	0.4×Dc	0.03×Dc	180	0.006×Dc	0.01×Dc
H	GR5 38~48HRC Hardened Steel	80	0.007×Dc	0.3×Dc	0.02×Dc	160	0.005×Dc	0.01×Dc
H	GR6 48~56HRC Hardened Steel	60	0.006×Dc	0.2×Dc	0.01×Dc	140	0.004×Dc	0.01×Dc
	Cast Iron Materials							
K	GR9-1 Grey cast iron	280	0.02×Dc	0.4×Dc	0.03×Dc	360	0.008×Dc	0.01×Dc
K	GR9-2 Nodular cast iron	250	0.02×Dc	0.4×Dc	0.03×Dc	320	0.008×Dc	0.01×Dc

※ All cutting data are for reference only. Please adjust according to actual machining conditions.
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

F676TX

High Feed End Mills

Design with Special R curvature.
Honing cutting edge with AlTiSiN Nano multilayer coating to improve tool life effectively.





VHM Carbide | AlTiSiN TX | 0° | 4 | N 70° | R | Steel <62HRC

Suitable for profile surface machining, roughing in cutting different steel below 62HRC.

P
H
K

Long Length

Dc 0 -0.02	Progrmmable Radius	Lc mm	L mm	d h5	L1 mm	D1 mm	F676TX AlTiSiN
3	0.37	2	70	6	12	2.8	•
4	0.47	2	70	6	16	3.7	•
5	0.60	2.5	70	6	20	4.6	•
6	0.73	3	70	6	25	5.5	•
8	0.98	4	80	8	30	7.4	•
10	1.23	5	90	10	35	9.2	•
12	1.65	6	100	12	40	11	•

Cutting Conditions

F676TX

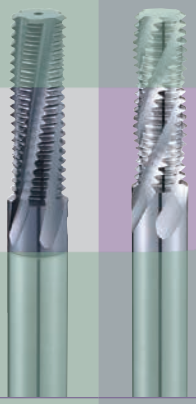


		cutting speed Vc (m/min)	feed per tooth fz(mm)	ae	ap
	Carbon Steel Materials				
P	GR1 Carbon Steel	280	0.011×Dc	0.4×Dc	0.03×Dc
P	GR2 <24HRC Low-alloyed Steel	260	0.011×Dc	0.4×Dc	0.03×Dc
P	GR3 <30HRC Hi-alloyed Steel	230	0.009×Dc	0.4×Dc	0.03×Dc
	Hardened Steel Materials				
H	GR4 30~38HRC Hardened Steel	100	0.008×Dc	0.4×Dc	0.03×Dc
H	GR5 38~48HRC Hardened Steel	80	0.007×Dc	0.3×Dc	0.02×Dc
H	GR6 48~56HRC Hardened Steel	60	0.006×Dc	0.2×Dc	0.01×Dc
H	GR6 56~68HRC Hardened Steel	40	0.005×Dc	0.15×Dc	0.01×Dc

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4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.



Thread Mills

Page	319	321
Appearance		
Code No	T781HX	T783
Carbide	VHM Carbide	VHM Carbide
Coating	AlTiCrN HX	Uncoated Bright
Helix Angle	 11°	 30°
No.of Flutes	 3~5Z	 3~5Z

DIN

T781HX

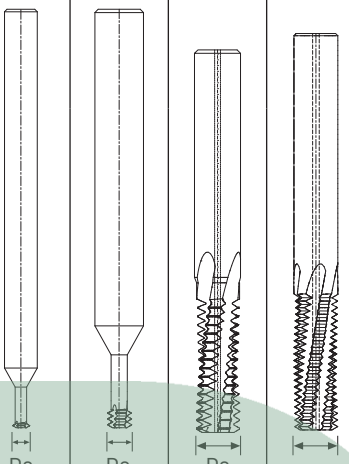
Micro Thread Mills / Oil-Feed Thread Mills

ISO Metric Standard Thread.
Good wear resistance effect with Nano multilayer coating.





VHM Carbide | **AlTiCrN HX** | **Steel <48HRC**



Suitable for carbon steel, below 48HRC hardened steel, stainless steel, cast iron...etc.

P	P	P	P
H	H	H	H
M	M	M	M
K	K	K	K

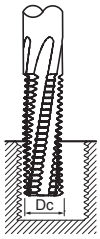
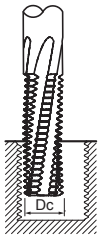
Standard Length

Thread		Pitch	Dc	Lc	Ll	L	d	t	Zt	T781HX AlTiCrN	T781HX AlTiCrN				
Coarse	Fine	mm	mm	mm	mm	mm	h6	mm							
M1×0.25		0.25	0.72	0.25	2.8	50	4	3	1	•					
M1.2×0.25		0.25	0.91	0.25	3.3	50	4	3	1	•					
M1.4×0.3		0.3	1.05	0.3	3.8	50	4	3	1	•					
M1.6×0.35		0.35	1.2	0.35	4.3	50	4	3	1	•					
M1.8×0.35		0.35	1.3	0.35	4.8	50	4	3	1	•					
M2×0.4		0.4	1.5	1.2	4.5	50	4	3	3		•				
M2.5×0.45		0.45	1.9	1.4	5.6	50	4	3	3		•				
M3×0.5	M3.5~M16×0.5	0.5	2.4	1.5	6.5	50	4	3	3		•				
M4×0.7		0.7	3.1	2.1	8.7	50	6	3	3		•				
M5×0.8		0.8	4	2.4	10.8	50	6	3	3		•				

Standard Length

Thread		Pitch	Dc	Lc	Ll	L	d	t			T781HX AlTiCrN	T781HX AlTiCrN		
Coarse	Fine	mm	mm	mm	mm	mm	h6	mm						
M6×1		1	4.5	13	15	60	6	4			•			
M8×1.25		1.25	6	17.8	—	65	6	4			•			
M10×1.5		1.5	7.5	22.5	25	70	8	4			•			
M12×1.75		1.75	9.5	26.3	27	80	10	5				•		
M14×2		2	10	30	—	90	10	5				•		
M16×2		2	12	34	—	100	12	5				•		
M20×2.5		2.5	16	42.5	—	110	16	5				•		

Cutting Conditions

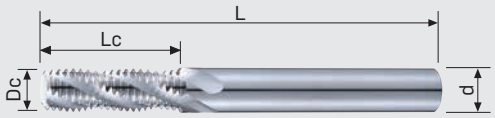
T781HX					
		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
P	Carbon Steel Materials				
	GR1 Carbon Steel	120	0.016×Dc	40	0.006×Dc
	GR2 <24HRC Low-alloyed Steel	100	0.016×Dc	30	0.005×Dc
	GR3 <30HRC Hi-alloyed Steel	80	0.016×Dc	20	0.005×Dc
H	Hardened Steel Materials				
	GR4 30~38HRC Hardened Steel	90	0.01×Dc	10	0.003×Dc
	GR5 38~48HRC Hardened Steel	80	0.01×Dc	10	0.003×Dc
M	Stainless Steel Materials				
	GR8-1 Ferritic、Martensitic	70	0.01×Dc	20	0.004×Dc
	GR8-2 Austenitic	60	0.01×Dc	20	0.003×Dc
	GR8-3 Austenitic-ferritic	50	0.01×Dc	20	0.003×Dc
	GR8-4 Austenitic-ferritic Heat-resistant	40	0.01×Dc	20	0.003×Dc
K	Cast Iron Materials				
	GR9-1 Grey cast iron	110	0.016×Dc	40	0.006×Dc
	GR9-2 Nodular cast iron	120	0.016×Dc	30	0.006×Dc

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5. If vibration occurs during cutting, please reduce cutting parameter.

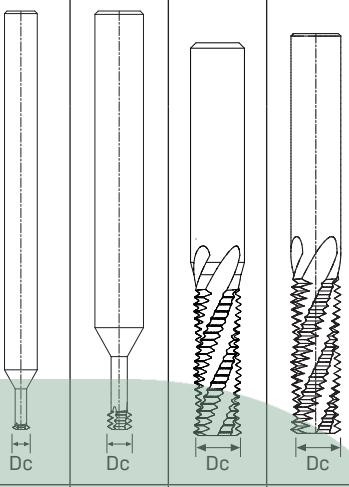
T783

Micro Thread Mills / Thread Mills

ISO Metric Standard Thread.



VHM Carbide | Uncoated Bright | 30° | 3~5Z | 78° | Aluminium



Suitable for cutting in different Aluminium materials.

N N N N

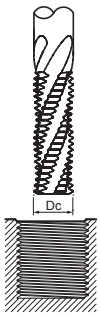
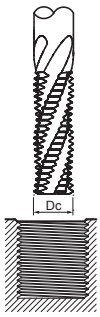
Standard Length

Thread Coarse	Thread Fine	Pitch mm	Dc mm	Lc mm	Ll mm	L mm	d h6	t mm	Zt	T783 Bright	T783 Bright				
M1×0.25		0.25	0.72	0.25	2.8	50	4	3	1	•					
M1.2×0.25		0.25	0.91	0.25	3.3	50	4	3	1	•					
M1.4×0.3		0.3	1.05	0.3	3.8	50	4	3	1	•					
M1.6×0.35		0.35	1.2	0.35	4.3	50	4	3	1	•					
M1.8×0.35		0.35	1.3	0.35	4.8	50	4	3	1	•					
M2×0.4		0.4	1.5	1.2	4.5	50	4	3	3		•				
M2.5×0.45		0.45	1.9	1.4	5.6	50	4	3	3		•				
M3×0.5	M3.5~M16×0.5	0.5	2.4	1.5	6.5	50	4	3	3		•				
M4×0.7		0.7	3.1	2.1	8.7	50	6	3	3		•				
M5×0.8		0.8	4	2.4	10.8	50	6	3	3		•				

Standard Length

Thread Coarse	Thread Fine	Pitch mm	Dc mm	Lc mm	Ll mm	L mm	d h6	t mm			T783 Bright	T783 Bright		
M6×1		1	4.5	13	15	60	6	4			•			
M8×1.25		1.25	6	17.8	—	65	6	4			•			
M10×1.5		1.5	7.5	22.5	25	70	8	4			•			
M12×1.75		1.75	9.5	26.3	27	80	10	5				•		
M14×2		2	10	30	—	90	10	5				•		
M16×2		2	12	34	—	100	12	5				•		
M20×2.5		2.5	16	42.5	—	110	16	5				•		

Cutting Conditions

T783					
		cutting speed Vc (m/min)	feed per tooth fz(mm)	cutting speed Vc (m/min)	feed per tooth fz(mm)
Aluminium Steel Materials					
N	GRI0-1 Wrought Aluminium alloys	200	0.016×Dc	60	0.01×Dc
	GRI0-2 Aluminium cast alloys <10%	150	0.014×Dc	50	0.008×Dc
	GRI0-3 Aluminium cast alloys >10%	150	0.012×Dc	40	0.005×Dc

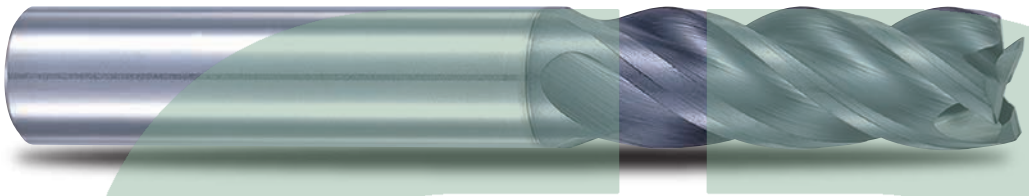
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2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.



E174
Square End Mills

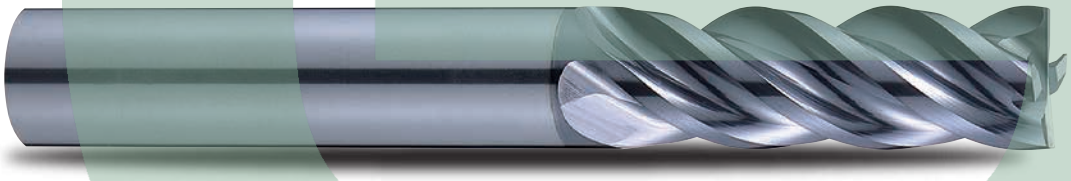
Center Cutting tools are used in a variety of applications including plunging, drilling or ramping.....

TiAlN is one of abrasive resistant coatings. It is commonly used formachining aircraft and aerospace material, Nickel Alloys, Stainless Steels, Titanium, Cast Iron and Steel.



S445HX
Easy Cut End Mills

Unique tool design can minimize chatter for smoother machining. Single tool for roughing and finishing operations means fewer setups. Application for Steel, Cast Iron,Stainless Steels, High Temp Alloys and also can be used in various Metal materials.

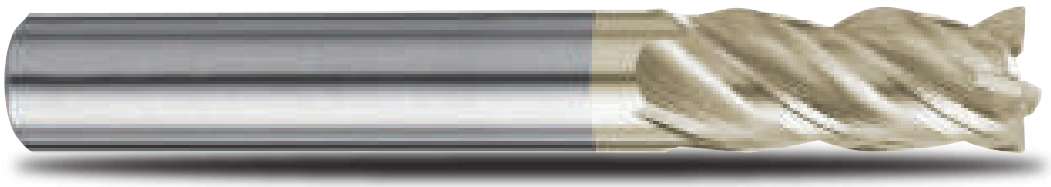


E141HX
Multipurpose End Mills

Multipurpose End Mills- 4 Flutes with various short and long length types. Effectively decrease the vibration by various helix geometry and unequal flutes designs.

Big chip breaker is designed to reach high removal rate for various work materials.

Obviously improving tool life with Nano multilayer coating AlTiCrN.Suitable for different kinds of materials cutting.

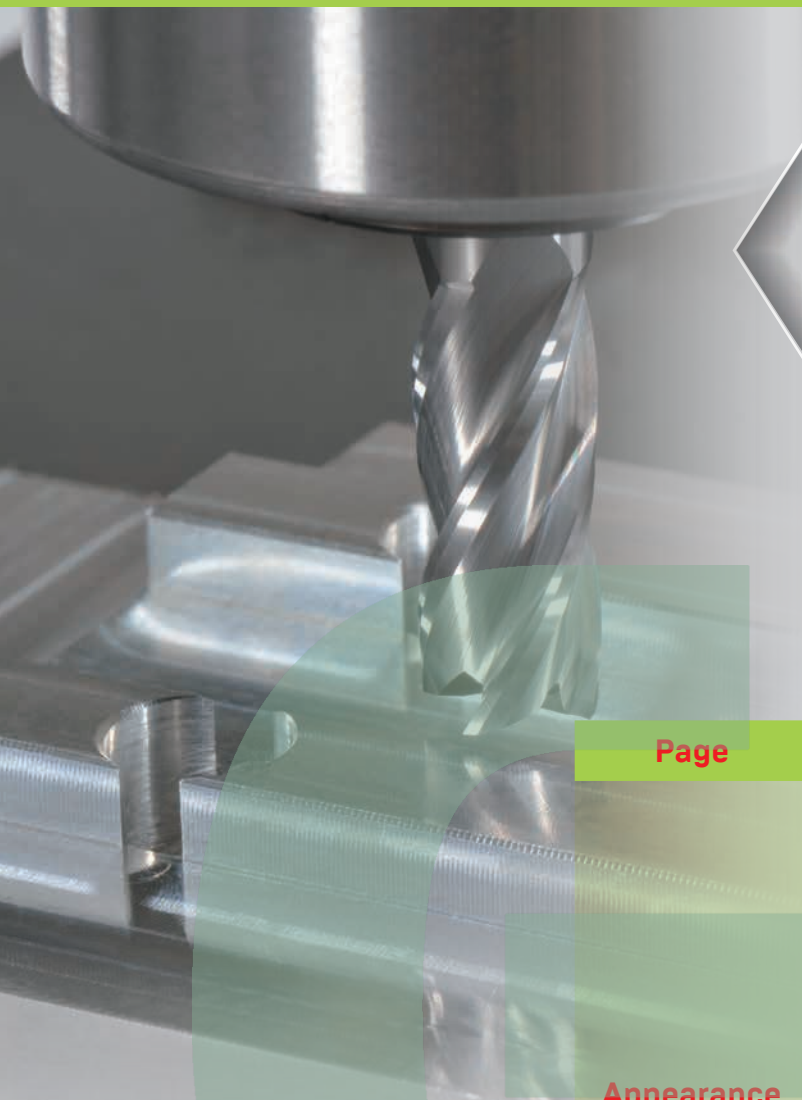


F651SX
End Mills For Difficult To Cut Materials

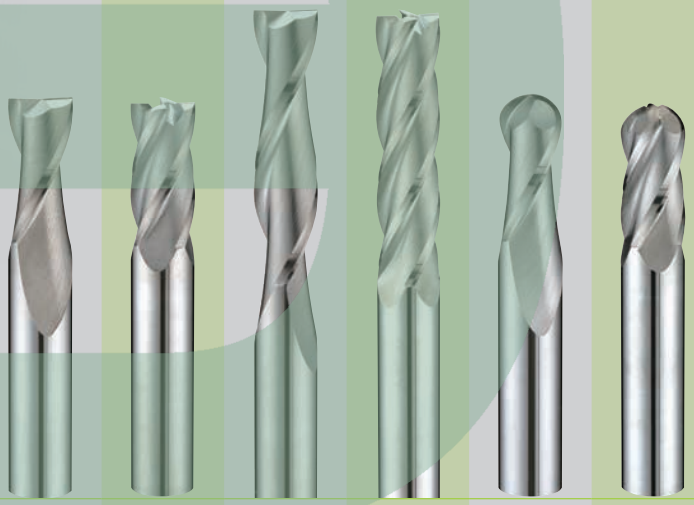
Application for roughing and finishing cutting in different materials. Sharp cutting edge is suitable for cutting Steel, Stainless Steels, Titanium, Nickel and High Temp Alloys... etc.



ANSI END MILL



End Mills

Page	327	327	328	328	329	329
Appearance						
Code No	E172	E174	E182 E185 E187	E184 E186 E188	B212	B214
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
Coating	Uncoated Bright	Uncoated Bright	Uncoated Bright	Uncoated Bright	Uncoated Bright	Uncoated Bright
Helix Angle	30°	30°	30°	30°	30°	30°
No.of Flutes	Z=2	Z=4	Z=2	Z=4	Z=2	Z=4

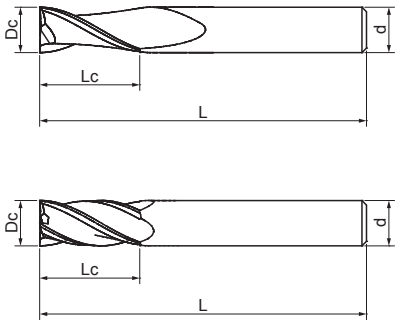
ANSI/METRIC

330	330	331	332	332
				
B280 B282	**B281 B284**	**E133**	**E135**	**E136 E137**
MG Carbide	**MG Carbide**	**MG Carbide**	**MG Carbide**	**MG Carbide**
Uncoated Bright	**Uncoated Bright**	**Uncoated Bright**	**Uncoated Bright**	**Uncoated Bright**
 30°	 30°	 45°	 45°	 45°
 Z=2	 Z=4	 Z=3	 Z=3	 Z=3

Square End Mills
2&4 Flute Center Cutting

MG Carbide | Bright / TiAlN | 30° | H γ10° | 90°

Code No: E172-DC / E172-DC







Work Material

P	H	M	K	N	S
●		○	○	●	○

- **P** Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics
- **S** Titanium
- **S** Nickel

Tolerance: DC

All Sizes: +0/-0.03mm

Feature of product:

Center Cutting tools are used in a variety of applications including plunging, drilling or ramping... TiAlN is one of abrasive resistant coatings.

It is commonly used for machining aircraft and aerospace material, Nickel Alloys, Stainless Steels, Titanium, Cast Iron and Steel.

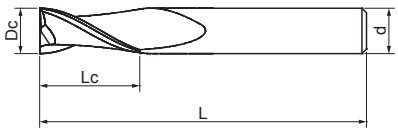
Standard Length

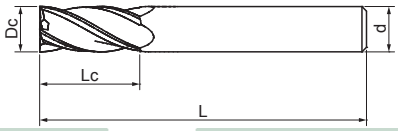
Dc 0 -0.03	Lc mm	L mm	d h6	Bright E172	TiAlN E172F	Bright E174	TiAlN E174F
0.2	0.5	38	3	●	●		
0.3	0.8	38	3	●	●		
0.4	1	38	3	●	●		
0.5	1.2	38	3	●	●		
0.6	1.5	38	3	●	●		
0.7	1.8	38	3	●	●		
0.8	2	38	3	●	●		
0.9	2.5	38	3	●	●		
1	3	38	3	●	●	●	●
1.5	5	38	3	●	●	●	●
2	6	38	3	●	●	●	●
2.5	7	38	3	●	●	●	●
3	9	38	3	●	●	●	●
3.5	12	50	4	●	●	●	●
4	14	50	4	●	●	●	●
4.5	14	50	5	●	●	●	●
5	16	50	5	●	●	●	●
5.5	16	50	6	●	●	●	●
6	20	63	6	●	●	●	●
6.5	20	63	8	●	●	●	●
7	20	63	8	●	●	●	●
7.5	20	63	8	●	●	●	●
8	20	63	8	●	●	●	●
8.5	22	72	10	●	●	●	●
9	22	72	10	●	●	●	●
9.5	22	72	10	●	●	●	●
10	22	72	10	●	●	●	●
11	26	75	12	●	●	●	●
12	26	75	12	●	●	●	●
13	32	89	14	●	●	●	●
14	32	89	14	●	●	●	●
15	32	89	16	●	●	●	●
16	32	89	16	●	●	●	●
17	38	100	18	●	●	●	●
18	38	100	18	●	●	●	●
20	38	100	20	●	●	●	●

Square End Mills
2&4 Flute Center Cutting

MG Carbide | Bright / TiAlN | 30° | H γ10° | 90°

Code No: E182-DC / E184-DC
Code No: E185-DC / E186-DC
Code No: E187-DC / E188-DC









Work Material

P	H	M	K	N	S
●		○	○	●	○

- **P** Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics
- **S** Titanium
- **S** Nickel

Tolerance: DC

All Sizes: +0/-0.03mm

Feature of product:

Center Cutting tools are used in a variety of applications including plunging, drilling or ramping... TiAlN is one of abrasive resistant coatings.

It is commonly used for machining aircraft and aerospace material, Nickel Alloys, Stainless Steels, Titanium, Cast Iron and Steel.

Long Length

Dc 0 -0.03	Lc mm	L mm	d h6	Bright E182	TiAlN E182F	Bright E184	TiAlN E184F
3	20	57	3	●	●	●	●
4	20	57	4	●	●	●	●
5	25	63	5	●	●	●	●
6	28	75	6	●	●	●	●
7	30	75	8	●	●	●	●
8	30	75	8	●	●	●	●
9	32	75	10	●	●	●	●
10	32	75	10	●	●	●	●
12	50	100	12	●	●	●	●
14	57	127	14	●	●	●	●
16	57	127	16	●	●	●	●
20	57	127	20	●	●	●	●

Extra Long Length

Dc 0 -0.03	Lc mm	L mm	d h6	Bright E185	TiAlN E185F	Bright E186	TiAlN E186F
3	25	75	3	●	●	●	●
4	28	75	4	●	●	●	●
5	32	75	5	●	●	●	●
6	38	100	6	●	●	●	●
8	42	100	8	●	●	●	●
10	45	100	10	●	●	●	●
12	75	150	12	●	●	●	●
14	80	150	14	●	●	●	●
16	80	150	16	●	●	●	●
20	80	150	20	●	●	●	●

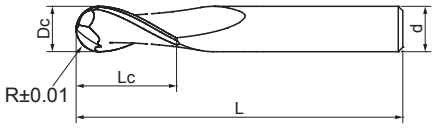
Extra Long Length

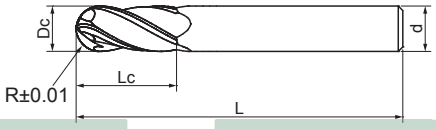
Dc 0 -0.03	Lc mm	L mm	d h6	Bright E187	TiAlN E187F	Bright E188	TiAlN E188F
5	45	100	6	●	●	●	●
6	50	100	6	●	●	●	●
8	75	150	8	●	●	●	●
10	75	150	10	●	●	●	●
12	75	200	12	●	●	●	●
16	80	200	16	●	●	●	●
20	80	200	20	●	●	●	●

Ball Nose End Mills
2&4 Flute Center Cutting

MG Carbide | Bright / TiAlN | 30° | H γ10° | U

Code No: B212-DC / B214-DC









Work Material

P	H	M	K	N	S
●		○	○	●	○

- **P** Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics
- **S** Titanium
- **S** Nickel

Tolerance: DC

All Sizes: +0/-0.03mm

Feature of product:

Provide better rigidity and heat resistant.

Use for high speed applications on cast iron, nonferrous materials, plastics and other tough-tomachine materials.

TiAlN is one of the abrasive resistant coatings. It is commonly used for machining aircraft and aerospace material, Nickel Alloys, Stainless Steels, Titanium, Cast Iron and Steel.

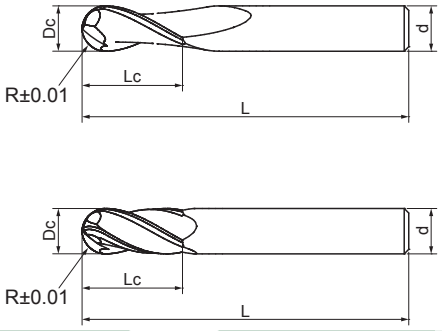
Standard Length

Dc 0 -0.03	R ±0.01	Lc mm	L mm	d h6	Bright B212	TiAlN B212F	Bright B214	TiAlN B214F
0.2	0.1R	0.4	38	3	●	●		
0.3	0.15R	0.6	38	3	●	●		
0.4	0.2R	0.8	38	3	●	●		
0.5	0.25R	1	38	3	●	●		
0.6	0.3R	1.2	38	3	●	●		
0.7	0.35R	1.4	38	3	●	●		
0.8	0.4R	1.6	38	3	●	●		
0.9	0.45R	2	38	3	●	●		
1	0.5R	3	38	3	●	●	●	●
1.5	0.75R	5	38	3	●	●	●	●
2	1R	6	38	3	●	●	●	●
2.5	1.25R	7	38	3	●	●	●	●
3	1.5R	9	38	3	●	●	●	●
3.5	1.75R	12	50	4	●	●	●	●
4	2R	14	50	4	●	●	●	●
4.5	2.25R	16	50	5	●	●	●	●
5	2.5R	16	50	5	●	●	●	●
5.5	2.75R	16	50	6	●	●	●	●
6	3R	20	63	6	●	●	●	●
6.5	3.25R	20	63	8	●	●	●	●
7	3.5R	20	63	8	●	●	●	●
7.5	3.75R	20	63	8	●	●	●	●
8	4R	20	63	8	●	●	●	●
8.5	4.25R	22	72	10	●	●	●	●
9	4.5R	22	72	10	●	●	●	●
9.5	4.75R	22	72	10	●	●	●	●
10	5R	22	72	10	●	●	●	●
11	5.5R	26	75	12	●	●	●	●
12	6R	26	75	12	●	●	●	●
13	6.5R	32	89	14	●	●	●	●
14	7R	32	89	14	●	●	●	●
15	7.5R	32	89	16	●	●	●	●
16	8R	32	89	16	●	●	●	●
17	8.5R	38	100	18	●	●	●	●
18	9R	38	100	18	●	●	●	●
20	10R	38	100	20	●	●	●	●

Ball Nose End Mills
2&4 Flute Center Cutting

MG Carbide | Bright / TiAlN | 30° | H γ10° | U

Code No: B280-DC / B281-DC
Code No: B282-DC / B284-DC





Work Material

P	H	M	K	N	S
●		○	○	●	○

- **P** Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics
- **S** Titanium
- **S** Nickel

Tolerance: DC

All Sizes: +0/-0.03mm

Feature of product:

Provide better rigidity and heat resistant.

Use for high speed applications on cast iron, nonferrous materials, plastics and other tough-tomachine materials.

TiAlN is one of the abrasive resistant coatings. It is commonly used for machining aircraft and aerospace material, Nickel Alloys, Stainless Steels, Titanium, Cast Iron and Steel.

Long Length

Dc 0 -0.03	R ±0.01	Lc mm	L mm	d h6	Bright B280	TiAlN B280F	Bright B281	TiAlN B281F
3	1.5R	20	57	3	●	●	●	●
4	2R	20	57	4	●	●	●	●
5	2.5R	25	63	5	●	●	●	●
6	3R	28	75	6	●	●	●	●
7	3.5R	30	75	8	●	●	●	●
8	4R	30	75	8	●	●	●	●
9	4.5R	32	75	10	●	●	●	●
10	5R	32	75	10	●	●	●	●
12	6R	50	100	12	●	●	●	●
14	7R	57	127	14	●	●	●	●
16	8R	57	127	16	●	●	●	●
20	10R	57	127	20	●	●	●	●

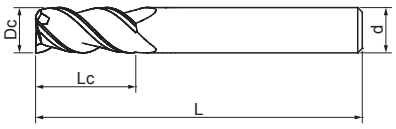
Extra Long Length

Dc 0 -0.03	R ±0.01	Lc m	L mm	d h6	Bright B282	TiAlN B282F	Bright B284	TiAlN B284F
3	1.5R	25	75	3	●	●	●	●
4	2R	28	75	4	●	●	●	●
5	2.5R	32	75	5	●	●	●	●
6	3R	38	100	6	●	●	●	●
8	4R	42	100	8	●	●	●	●
10	5R	45	100	10	●	●	●	●
12	6R	75	150	12	●	●	●	●
14	7R	80	150	14	●	●	●	●
16	8R	80	150	16	●	●	●	●
20	10R	80	150	20	●	●	●	●

End Mills For Aluminium
3 Flute Center Cutting

MG Carbide | Uncoated Bright | 45° | H γ12° | 90°

Code No: E133-DC





Work Material

P	H	M	K	N	S
				●	

N	Aluminium
N	Copper
N	Plastics

Tolerance: DC

All Sizes: +0/-0.03mm

Feature of product:

Application for universe cutting such as Aluminium, Copper, and Plastics.

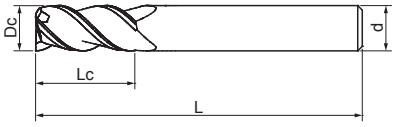
Standard Length

Dc 0 -0.03	Lc mm	L mm	d h6	Bright E133
1	3	38	3	●
1.5	5	38	3	●
2	6	38	3	●
2.5	7	38	3	●
3	9	38	3	●
4	14	50	4	●
5	16	50	5	●
6	20	63	6	●
7	20	63	8	●
8	20	63	8	●
9	22	72	10	●
10	22	72	10	●
12	26	75	12	●
14	32	89	14	●
16	32	89	16	●
18	38	100	18	●
20	38	100	20	●

End Mills For Aluminium
3 Flute Center Cutting

MG Carbide | Uncoated Bright | 45° | H | γ12° | 90°

Code No: E135-DC
Code No: E136-DC
Code No: E137-DC





Work Material

P	H	M	K	N	S
				●	

N	Aluminium
N	Copper
N	Plastics

Tolerance: DC

All Sizes: +0/-0.03mm

Feature of product:

Application for universe cutting such as Aluminium, Copper, and Plastics.

Long Length

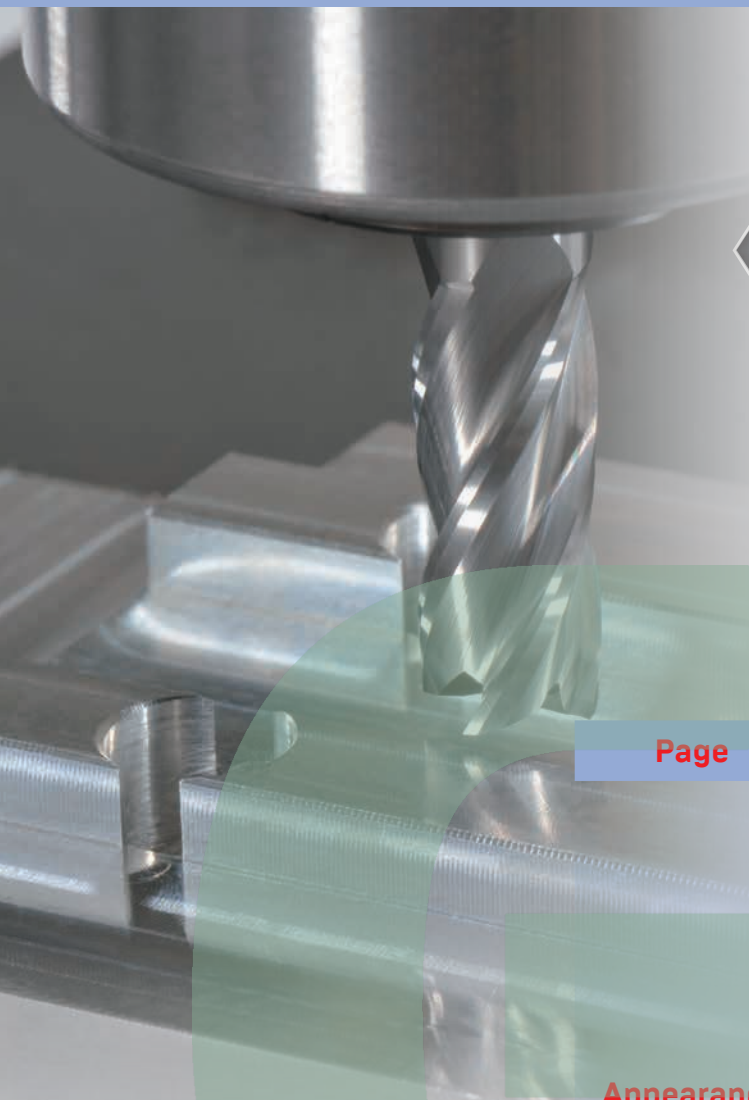
Dc 0 -0.03	Lc mm	L mm	d h6	Bright E135
3	20	57	3	●
4	20	57	4	●
5	25	63	5	●
6	28	75	6	●
7	30	75	8	●
8	30	75	8	●
9	32	75	10	●
10	32	75	10	●
12	50	100	12	●
14	57	127	14	●
16	57	127	16	●
20	57	127	20	●

Extra Long Length

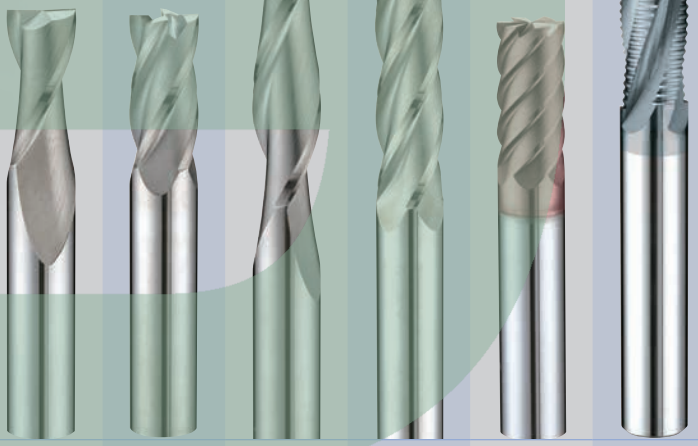
Dc 0 -0.03	Lc mm	L mm	d h6	Bright E136
3	25	75	3	●
4	28	75	4	●
5	32	75	5	●
6	38	100	6	●
8	42	100	8	●
10	45	100	10	●
12	75	150	12	●
14	80	150	14	●
16	80	150	16	●
20	80	150	20	●

Extra Long Length

Dc 0 -0.03	Lc mm	L mm	d h6	Bright E137
6	50	100	6	●
8	75	150	8	●
10	75	150	10	●
12	75	200	12	●
16	75	200	16	●
20	75	200	20	●



End Mills

Page	335	335	336	336	337	338
Appearance						
Code No	E172	E174	E182 E185	E184 E186	E166TX	F608HX
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	SMG Carbide	UMG Carbide
Coating	Bright TiAlN	Bright TiAlN	Bright TiAlN	Bright TiAlN	AlTiSiN TX	AlTiCrN HX
Helix Angle						
No.of Flutes						

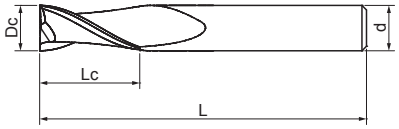
ANSI/INCH

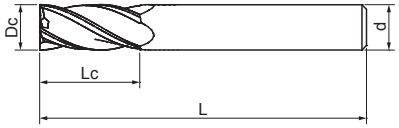
339	339	340	340	341	343	345	346	347	348	349
										
B212	**B214**	**B280 B282**	**B281 B284**	**B219HX-270°**	**B219HX-300°**	**E191**	**E197 E198 E199**	**E106 E107**	**E108 E109**	**E100HX**
MG Carbide	**MG Carbide**	**MG Carbide**	**MG Carbide**	**MG Carbide**	**MG Carbide**	**MG Carbide**	**MG Carbide**	**MG Carbide**	**MG Carbide**	**MG Carbide**
Bright TiAlN	**Bright TiAlN**	**Bright TiAlN**	**Bright TiAlN**	**AlTiCrN HX**	**AlTiCrN HX**	**Uncoated Bright**	**Uncoated Bright**	**Bright AlTiN**	**Bright AlTiN**	**AlTiCrN HX**
 30°	 30°	 30°	 30°					 30°	 0°	 15°
 Z=2	 Z=4	 Z=2	 Z=4					 Z=2	 Z=4	

Square End Mills
2&4 Flute Center Cutting

MG Carbide | Bright / TiAlN | 30° | H γ10° | 90°

Code No: E172-DC / E172-DC






Z=2


Z=4

Work Material

P	H	M	K	N	S
●		○	○	●	○

- **P** Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics
- **S** Titanium
- **S** Nickel

Tolerance: DC

All Sizes: +0/-0.001"

Feature of product:

Center Cutting tools are used in a variety of applications including plunging, drilling or ramping... TiAlN is one of abrasive resistant coatings.

It is commonly used for machining aircraft and aerospace material, Nickel Alloys, Stainless Steels, Titanium, Cast Iron and Steel.

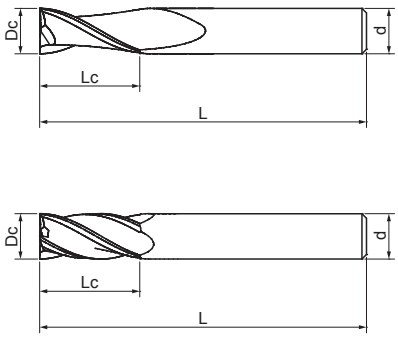
Standard Length

Dc 0 -0.001"	Lc Inch	L Inch	d h6	Bright E172	TiAlN E172F	Bright E174	TiAlN E174F
1/32	3/32	1-1/2	1/8	●	●		
3/64	1/8	1-1/2	1/8	●	●		
1/16	3/16	1-1/2	1/8	●	●	●	●
5/64	1/4	1-1/2	1/8	●	●	●	●
3/32	3/8	1-1/2	1/8	●	●	●	●
7/64	3/8	1-1/2	1/8	●	●	●	●
1/8	1/2	1-1/2	1/8	●	●	●	●
5/32	9/16	2	3/16	●	●	●	●
3/16	5/8	2	3/16	●	●	●	●
7/32	5/8	2-1/2	1/4	●	●	●	●
1/4	3/4	2-1/2	1/4	●	●	●	●
9/32	3/4	2-1/2	5/16	●	●	●	●
5/16	13/16	2-1/2	5/16	●	●	●	●
3/8	1	2-1/2	3/8	●	●	●	●
7/16	1	2-3/4	7/16	●	●	●	●
1/2	1	3	1/2	●	●	●	●
9/16	1-1/4	3-1/2	9/16	●	●	●	●
5/8	1-1/4	3-1/2	5/8	●	●	●	●
3/4	1-1/2	4	3/4	●	●	●	●
1	1-1/2	4	1	●	●	●	●

Square End Mills
2&4 Flute Center Cutting

MG Carbide | Bright / TiAlN | 30° | H γ10° | 90°

Code No: E182-DC / E184-DC
Code No: E185-DC / E186-DC





Work Material

P	H	M	K	N	S
●		○	○	●	○

- **P** Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics
- **S** Titanium
- **S** Nickel

Tolerance: DC

All Sizes: +0/-0.001"

Feature of product:

Center Cutting tools are used in a variety of applications including plunging, drilling or ramping... TiAlN is one of abrasive resistant coatings.

It is commonly used for machining aircraft and aerospace material, Nickel Alloys, Stainless Steels, Titanium, Cast Iron and Steel.

Long Length

Dc 0 -0.001"	Lc Inch	L Inch	d h6	Bright E182	TiAlN E182F	Bright E184	TiAlN E184F
1/8	3/4	2-1/4	1/8	●	●	●	●
3/16	3/4	2-1/2	3/16	●	●	●	●
1/4	1-1/8	3	1/4	●	●	●	●
5/16	1-1/8	3	5/16	●	●	●	●
3/8	1-1/8	3	3/8	●	●	●	●
7/16	2	4	7/16	●	●	●	●
1/2	2	4	1/2	●	●	●	●
5/8	2-1/4	5	5/8	●	●	●	●
3/4	2-1/4	5	3/4	●	●	●	●
1	2-1/4	5	1	●	●	●	●

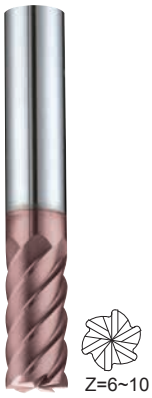
Extra Long Length

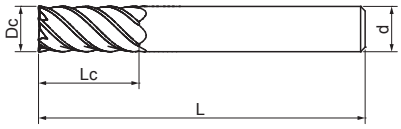
Dc 0 -0.001"	Lc Inch	L Inch	d h6	Bright E185	TiAlN E185F	Bright E186	TiAlN E186F
1/8	1	3	1/8	●	●	●	●
3/16	1-1/8	3	3/16	●	●	●	●
1/4	1-1/2	4	1/4	●	●	●	●
5/16	1-5/8	4	5/16	●	●	●	●
3/8	1-3/4	4	3/8	●	●	●	●
7/16	3	6	7/16	●	●	●	●
1/2	3	6	1/2	●	●	●	●
5/8	3	6	5/8	●	●	●	●
3/4	3	6	3/4	●	●	●	●
1	3	6	1	●	●	●	●

Finishing End Mills
6&8&10 Flute Center Cutting

SMG Carbide | AlTiSiN TX | 45° | N | 0.004"-0.008" | 45°

Code No: E166TX-DC





Work Material

P	H	M	K	N	S
	●		○		○

H	<40~70HRC Hardened Steel
K	Cast Iron
S	Titanium
S	High Temp Alloys

Tolerance: DC

All Sizes: +0/-0.001"

Feature of product:

Recommended for tough materials such as High hardened Steels, Stainless Steels, High Temp Alloys, and Titanium.

Standard Length

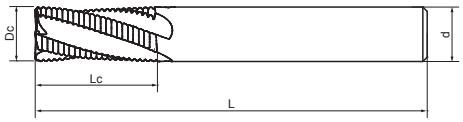
Dc 0 -0.001"	Lc Inch	L Inch	d h5	No. of Flute	AlTiSiN E166TX
1/4	3/4	2-1/2	1/4	6	●
5/16	13/16	2-1/2	5/16	6	●
3/8	1	2-1/2	3/8	6	●
1/2	1	3	1/2	6	●
5/8	1-1/4	3-1/2	5/8	6	●
3/4	1-1/2	4	3/4	8	●
1	1-1/2	4	1	10	●

Roughing End Mills
3&4&5 Flute Center Cutting

UMG Carbide | AlTiCrN HX | 20° | HR | 45°

Code No: F608HX-DC





Work Material

P	H	M	K	N	S
●	●	○	●		

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron

Tolerance: DC

All Sizes: h10

Feature of product:

20° Helix angle provides for greater edge support and shock absorption.

Fine Profile for optimum metal removal rates.

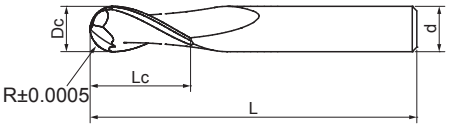
Standard Length

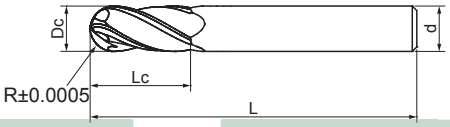
Dc h10	Lc Inch	L Inch	d h5	No. of Flute	C Inch	AlTiCrN F608HX
1/4	3/4	2-1/2	1/4	3	0.020	●
5/16	13/16	2-1/2	5/16	4	0.020	●
3/8	1	2-1/2	3/8	4	0.020	●
7/16	1	2-3/4	7/16	4	0.020	●
1/2	1	3	1/2	4	0.025	●
5/8	1-1/4	3-1/2	5/8	4	0.025	●
3/4	1-1/2	4	3/4	4	0.025	●
1	1-1/2	4	1	5	0.025	●

Ball Nose End Mills
2&4 Flute Center Cutting

MG Carbide | Bright / TiAlN | 30° | H γ10° | U

Code No: B212-DC / B214-DC









Work Material

P	H	M	K	N	S
●		○	○	●	○

- **P** Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics
- **S** Titanium
- **S** Nickel

Tolerance: DC

All Sizes: +0/-0.001"

Feature of product:

Provide better rigidity and heat resistant.

Use for high speed applications on cast iron, nonferrous materials, plastics and other tough-tomachine materials.

TiAlN is one of the abrasive resistant coatings. It is commonly used for machining aircraft and aerospace material, Nickel Alloys, Stainless Steels, Titanium, Cast Iron and Steel.

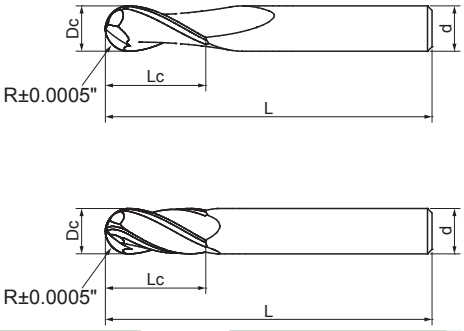
Standard Length

Dc 0 -0.001"	Lc Inch	L Inch	d h6	Bright B212	TiAlN B212F	Bright B214	TiAlN B214F
1/32	3/32	1-1/2	1/8	●	●		
3/64	1/8	1-1/2	1/8	●	●		
1/16	3/16	1-1/2	1/8	●	●	●	●
5/64	1/4	1-1/2	1/8	●	●	●	●
3/32	3/8	1-1/2	1/8	●	●	●	●
7/64	3/8	1-1/2	1/8	●	●	●	●
1/8	1/2	1-1/2	1/8	●	●	●	●
5/32	9/16	2	3/16	●	●	●	●
3/16	5/8	2	3/16	●	●	●	●
7/32	5/8	2-1/2	1/4	●	●	●	●
1/4	3/4	2-1/2	1/4	●	●	●	●
9/32	3/4	2-1/2	5/16	●	●	●	●
5/16	13/16	2-1/2	5/16	●	●	●	●
3/8	1	2-1/2	3/8	●	●	●	●
7/16	1	2-3/4	7/16	●	●	●	●
1/2	1	3	1/2	●	●	●	●
9/16	1-1/4	3-1/2	9/16	●	●	●	●
5/8	1-1/4	3-1/2	5/8	●	●	●	●
3/4	1-1/2	4	3/4	●	●	●	●
1	1-1/2	4	1	●	●	●	●

Ball Nose End Mills
2&4 Flute Center Cutting

MG Carbide | Bright / TiAlN | 30° | H | γ10° | U

Code No: B280-DC / B281-DC
Code No: B282-DC / B284-DC







Work Material

P	H	M	K	N	S
●		○	○	●	○

- **P** Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics
- **S** Titanium
- **S** Nickel

Tolerance: DC

All Sizes: +0/-0.001"

Feature of product:

Provide better rigidity and heat resistant.

Use for high speed applications on cast iron, nonferrous materials, plastics and other tough-tomachine materials.

TiAlN is one of the abrasive resistant coatings. It is commonly used for machining aircraft and aerospace material, Nickel Alloys, Stainless Steels, Titanium, Cast Iron and Steel.

Long Length

Dc 0 -0.001"	Lc Inch	L Inch	d h6	Bright B280	TiAlN B280F	Bright B281	TiAlN B281F
1/8	3/4	2-1/4	1/8	●	●	●	●
3/16	3/4	2-1/2	3/16	●	●	●	●
1/4	1-1/8	3	1/4	●	●	●	●
5/16	1-1/8	3	5/16	●	●	●	●
3/8	1-1/8	3	3/8	●	●	●	●
7/16	2	4	7/16	●	●	●	●
1/2	2	4	1/2	●	●	●	●
5/8	2-1/4	5	5/8	●	●	●	●
3/4	2-1/4	5	3/4	●	●	●	●
1	2-1/4	5	1	●	●	●	●

Extra Long Length

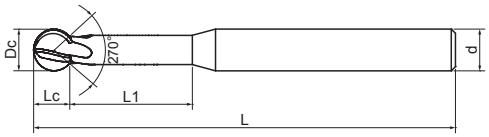
Dc 0 -0.001"	Lc Inch	L Inch	d h6	Bright B282	TiAlN B282F	Bright B284	TiAlN B284F
1/8	1	3	1/8	●	●	●	●
3/16	1-1/8	3	3/16	●	●	●	●
1/4	1-1/2	4	1/4	●	●	●	●
5/16	1-5/8	4	5/16	●	●	●	●
3/8	1-3/4	4	3/8	●	●	●	●
7/16	3	6	7/16	●	●	●	●
1/2	3	6	1/2	●	●	●	●
5/8	3	6	5/8	●	●	●	●
3/4	3	6	3/4	●	●	●	●
1	3	6	1	●	●	●	●

Ball Nose End Mills
270° Spherical Ball Undercutting

MG Carbide | AlTiCrN HX | 2 | 4

Code No: B219HX-270°-Dc×L1





Work Material

P	H	M	K	N	S
●	●	○	○	○	○

- **P** Steel
- **H** <52HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **S** Titanium
- **S** High Temp Alloys

Tolerance: DC

All Sizes: +0/-0.002"

Feature of product:

Suitable for multi-axis machining.
Excellent performance in undercutting, deburring and 3D contouring applications.

Standard & Long Length

Dc 0 -0.002"	Dec. Equiv. Inch	Lc Inch	L Inch	d Inch	L1 Inch	Z Inch	AlTiCrN B219HX-270°
1/32	0.0313	0.0270	1-1/2	1/8	0.0310	2	●
1/32	0.0313	0.0270	1-1/2	1/8	0.0620	2	●
1/32	0.0313	0.0270	1-1/2	1/8	0.0930	2	●
1/32	0.0313	0.0270	1-1/2	1/8	0.1250	2	●
1/32	0.0313	0.0270	1-1/2	1/8	0.1870	2	●
3/64	0.0469	0.0400	1-1/2	1/8	0.0930	2	●
3/64	0.0469	0.0400	1-1/2	1/8	0.1560	2	●
3/64	0.0469	0.0400	1-1/2	1/8	0.2500	2	●
1/16	0.0625	0.0530	1-1/2	1/8	0.0620	2	●
1/16	0.0625	0.0530	1-1/2	1/8	0.0930	2	●
1/16	0.0625	0.0530	1-1/2	1/8	0.1250	2	●
1/16	0.0625	0.0530	1-1/2	1/8	0.1870	2	●
1/16	0.0625	0.0530	1-1/2	1/8	0.2500	2	●
1/16	0.0625	0.0530	1-1/2	1/8	0.3120	2	●
5/64	0.0781	0.0670	1-1/2	1/8	0.0620	2	●
5/64	0.0781	0.0670	1-1/2	1/8	0.1250	2	●
5/64	0.0781	0.0670	1-1/2	1/8	0.1870	2	●
5/64	0.0781	0.0670	1-1/2	1/8	0.2500	2	●
3/32	0.0938	0.0790	1-1/2	1/8	0.0620	2	●
3/32	0.0938	0.0790	1-1/2	1/8	0.1250	2	●
3/32	0.0938	0.0790	1-1/2	1/8	0.2500	2	●
3/32	0.0938	0.0790	1-1/2	1/8	0.3120	2	●
3/32	0.0938	0.0790	1-1/2	1/8	0.3750	2	●
3/32	0.0938	0.0790	1-1/2	1/8	0.5000	2	●
3/32	0.0938	0.0790	1-1/2	1/8	0.6250	2	●
1/8	0.1250	0.1070	1-1/2	1/8	0.0620	4	●
1/8	0.1250	0.1070	1-1/2	1/8	0.1250	4	●
1/8	0.1250	0.1070	1-1/2	1/8	0.2500	4	●
1/8	0.1250	0.1070	1-1/2	1/8	0.3750	4	●
1/8	0.1250	0.1070	1-1/2	1/8	0.5000	4	●
1/8	0.1250	0.1070	2	1/8	0.6250	4	●
1/8	0.1250	0.1070	2	1/8	0.7500	4	●
1/8	0.1250	0.1070	3	1/8	1.0000	4	●
1/8	0.1250	0.1070	3	1/8	1.2500	4	●
1/8	0.1250	0.1070	3	1/8	1.5000	4	●
9/64	0.1406	0.1190	2	3/16	0.2500	4	●
9/64	0.1406	0.1190	2	3/16	0.5000	4	●
5/32	0.1562	0.1330	2	3/16	0.1250	4	●

Ball Nose End Mills
270° Spherical Ball Undercutting

MG Carbide | AlTiCrN HX | 2 | 4

Code No: B219HX-270°-Dc×L1

Work Material

P	H	M	K	N	S
●	●	○	○	○	○

- **P** Steel
- **H** <52HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **S** Titanium
- **S** High Temp Alloys

Tolerance: DC

All Sizes: +0/-0.002"

Feature of product:

Suitable for multi-axis machining.
Excellent performance in undercutting, deburring and 3D contouring applications.

Standard & Long Length

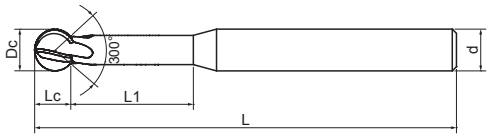
Dc 0 -0.002"	Dec. Equiv. Inch	Lc Inch	L Inch	d Inch	L1 Inch	Z Inch	AlTiCrN B219HX-270°
5/32	0.1562	0.1330	2	3/16	0.3750	4	●
5/32	0.1562	0.1330	2	3/16	0.5000	4	●
5/32	0.1562	0.1330	2	3/16	0.7500	4	●
5/32	0.1562	0.1330	3	3/16	1.0000	4	●
3/16	0.1875	0.1600	2	3/16	0.1250	4	●
3/16	0.1875	0.1600	2	3/16	0.2500	4	●
3/16	0.1875	0.1600	2	3/16	0.3750	4	●
3/16	0.1875	0.1600	2	3/16	0.5000	4	●
3/16	0.1875	0.1600	2	3/16	0.7500	4	●
3/16	0.1875	0.1600	3	3/16	1.0000	4	●
3/16	0.1875	0.1600	3	3/16	1.2500	4	●
3/16	0.1875	0.1600	3	3/16	1.5000	4	●
3/16	0.1875	0.1600	3	3/16	1.7500	4	●
7/32	0.2188	0.1860	2-1/2	1/4	0.2500	4	●
7/32	0.2188	0.1860	2-1/2	1/4	0.5000	4	●
1/4	0.2500	0.2130	2-1/2	1/4	0.0780	4	●
1/4	0.2500	0.2130	2-1/2	1/4	0.1250	4	●
1/4	0.2500	0.2130	2-1/2	1/4	0.3750	4	●
1/4	0.2500	0.2130	2-1/2	1/4	0.5000	4	●
1/4	0.2500	0.2130	2-1/2	1/4	0.6250	4	●
1/4	0.2500	0.2130	2-1/2	1/4	0.7500	4	●
1/4	0.2500	0.2130	2-1/2	1/4	1.1250	4	●
1/4	0.2500	0.2130	4	1/4	1.5000	4	●
1/4	0.2500	0.2130	4	1/4	2.0000	4	●
1/4	0.2500	0.2130	4	1/4	2.2500	4	●
1/4	0.2500	0.2130	4	1/4	2.5000	4	●
9/32	0.2812	0.2400	2-1/2	5/16	0.3750	4	●
9/32	0.2812	0.2400	2-1/2	5/16	0.7500	4	●
5/16	0.3125	0.2660	2-1/2	5/16	0.1870	4	●
5/16	0.3125	0.2660	2-1/2	5/16	0.3750	4	●
5/16	0.3125	0.2660	2-1/2	5/16	0.7500	4	●
5/16	0.3125	0.2660	4	5/16	1.1250	4	●
5/16	0.3125	0.2660	4	5/16	1.5000	4	●
5/16	0.3125	0.2660	4	5/16	2.0000	4	●
5/16	0.3125	0.2660	4	5/16	2.2500	4	●
3/8	0.3750	0.3200	2-1/2	3/8	0.0930	4	●
3/8	0.3750	0.3200	2-1/2	3/8	0.1870	4	●
3/8	0.3750	0.3200	2-1/2	3/8	0.3750	4	●
3/8	0.3750	0.3200	2-1/2	3/8	0.7500	4	●
3/8	0.3750	0.3200	4	3/8	1.1250	4	●
3/8	0.3750	0.3200	4	3/8	1.5000	4	●
3/8	0.3750	0.3200	4	3/8	2.0000	4	●
3/8	0.3750	0.3200	4	3/8	2.2500	4	●
1/2	0.5000	0.4270	3	1/2	0.1870	4	●
1/2	0.5000	0.4270	3	1/2	0.5000	4	●
1/2	0.5000	0.4270	3	1/2	1.0000	4	●
1/2	0.5000	0.4270	6	1/2	1.5000	4	●
1/2	0.5000	0.4270	6	1/2	2.0000	4	●
1/2	0.5000	0.4270	6	1/2	3.0000	4	●
5/8	0.6250	0.5330	3-1/2	5/8	1.0000	4	●
5/8	0.6250	0.5330	3-1/2	5/8	1.5000	4	●

Ball Nose End Mills
300° Spherical Ball Undercutting

MG Carbide | AlTiCrN HX | 2 | 4

Code No: B219HX-300°-Dc×L1





Work Material

P	H	M	K	N	S
●	●	○	○	○	○

- **P** Steel
- **H** <52HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **S** Titanium
- **S** High Temp Alloys

Tolerance: DC

All Sizes: +0/-0.002"

Feature of product:

Suitable for multi-axis machining.
Excellent performance in undercutting, deburring and 3D contouring applications.

Standard & Long Length

Dc 0 -0.002"	Dec. Equiv. Inch	Lc Inch	L Inch	d Inch	L1 Inch	Z Inch	AlTiCrN B219HX-300°
1/16	0.0625	0.0570	1-1/2	1/8	0.0310	2	●
1/16	0.0625	0.0570	1-1/2	1/8	0.0780	2	●
5/64	0.0781	0.0720	1-1/2	1/8	0.0470	2	●
5/64	0.0781	0.0720	1-1/2	1/8	0.0930	2	●
3/32	0.0938	0.0860	1-1/2	1/8	0.0620	2	●
3/32	0.0938	0.0860	1-1/2	1/8	0.1250	2	●
3/32	0.0938	0.0860	1-1/2	1/8	0.2180	2	●
1/8	0.1250	0.1160	1-1/2	1/8	0.0930	4	●
1/8	0.1250	0.1160	1-1/2	1/8	0.1250	4	●
1/8	0.1250	0.1160	1-1/2	1/8	0.2810	4	●
1/8	0.1250	0.1160	1-1/2	1/8	0.3750	4	●
1/8	0.1250	0.1160	1-1/2	1/8	0.5000	4	●
5/32	0.1562	0.1450	2	3/16	0.1250	4	●
5/32	0.1562	0.1450	2	3/16	0.2500	4	●
5/32	0.1562	0.1450	2	3/16	0.3750	4	●
3/16	0.1875	0.1740	2	3/16	0.1250	4	●
3/16	0.1875	0.1740	2	3/16	0.2500	4	●
3/16	0.1875	0.1740	2	3/16	0.3120	4	●
3/16	0.1875	0.1740	2	3/16	0.4370	4	●
3/16	0.1875	0.1740	2	3/16	0.6250	4	●
3/16	0.1875	0.1740	2	3/16	0.7500	4	●
1/4	0.2500	0.2330	2-1/2	1/4	0.1870	4	●
1/4	0.2500	0.2330	2-1/2	1/4	0.2500	4	●
1/4	0.2500	0.2330	2-1/2	1/4	0.3750	4	●
1/4	0.2500	0.2330	2-1/2	1/4	0.5000	4	●
1/4	0.2500	0.2330	2-1/2	1/4	0.6250	4	●
1/4	0.2500	0.2330	2-1/2	1/4	0.7500	4	●
1/4	0.2500	0.2330	2-1/2	1/4	1.0000	4	●
5/16	0.3125	0.2910	2-1/2	5/16	0.2500	4	●
5/16	0.3125	0.2910	2-1/2	5/16	0.4370	4	●
5/16	0.3125	0.2910	2-1/2	5/16	0.7500	4	●
3/8	0.3750	0.3490	2-1/2	3/8	0.2500	4	●
3/8	0.3750	0.3490	2-1/2	3/8	0.5000	4	●
3/8	0.3750	0.3490	3	3/8	1.0000	4	●
3/8	0.3750	0.3490	4	3/8	1.5000	4	●
1/2	0.5000	0.4660	3	1/2	0.3120	4	●
1/2	0.5000	0.4660	3	1/2	0.7500	4	●
1/2	0.5000	0.4660	4	1/2	1.2500	4	●

Recommended Milling Conditions

Side Milling

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.10 Alumini-um		GR.15 Titanium	
Vc m/min		164		131		98		82		82		164		328		82	
Code No.	Dc	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)	RPM (min-1)	Feed (mm/min)
B219HX-1/16	1/16	10,028	5.01	8,010	4.01	5,992	1.44	5,014	0.40	5,014	0.30	10,028	5.01	20,056	12.03	5,014	0.30
B219HX-5/64	5/64	8,025	4.81	6,410	3.85	4,795	1.53	4,012	0.64	4,012	0.64	8,025	4.81	16,050	12.84	4,012	0.64
B219HX-3/32	3/32	6,689	4.68	5,343	3.74	3,997	2.40	3,344	1.00	3,344	0.80	6,689	4.68	13,378	16.05	3,344	0.80
B219HX-1/8	1/8	5,014	9.23	4,005	7.37	2,996	5.51	2,507	2.01	2,507	1.70	5,014	9.23	10,028	32.09	2,507	1.70
B219HX-5/32	5/32	4,018	12.86	3,209	7.70	2,401	5.76	2,009	3.21	2,009	2.41	4,018	12.86	8,035	32.14	2,009	2.41
B219HX-3/16	3/16	3,343	15.78	2,670	8.54	1,997	6.39	1,671	4.01	1,671	2.67	3,343	15.78	6,685	32.09	1,671	2.67
B219HX-1/4	1/4	2,507	15.04	2,003	8.81	1,498	6.59	1,254	4.51	1,254	3.01	2,507	15.04	5,014	30.08	1,254	3.01
B219HX-5/16	5/16	2,006	15.24	1,602	9.61	1,198	7.19	1,003	5.21	1,003	4.01	2,006	15.24	4,011	30.49	1,003	4.01
B219HX-3/8	3/8	1,671	15.38	1,335	10.15	999	7.59	836	5.68	836	4.68	1,671	15.38	3,343	33.43	836	4.68
B219HX-1/2	1/2	1,254	15.54	1,001	10.81	749	8.09	627	6.02	627	5.01	1,254	15.54	2,507	35.10	627	5.01

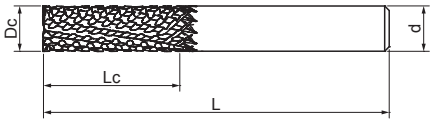
※ All cutting data serve for orientation only and should be adapted individually to the technical conditions on location.
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

Routing End Mills
Multiple Flutes Routers For Composite

MG Carbide | Uncoated Bright

Code No: E191-DC





Work Material

P	H	M	K	N	S
				●	

N	FRP CFRP Composite Material
N	Graphite

Tolerance: DC

All Sizes: +0/-0.002"

Feature of product:

Application for Phenolicepoxy parts, Polyester glass reinforced products, Graphite, Composite...etc.

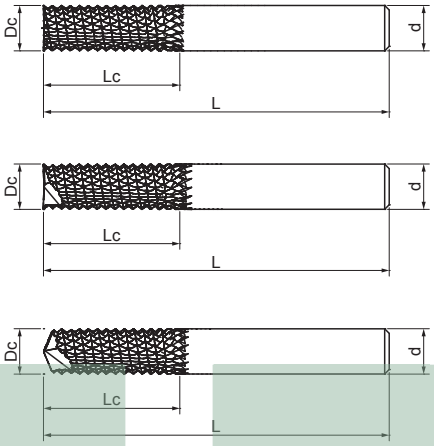
Standard Length

Dc 0 -0.002"	Lc Inch	L Inch	d h6	Bright E191
1/8	1/2	2	1/8	●
3/16	5/8	2	3/16	●
1/4	3/4	3	1/4	●
5/16	3/4	3	5/16	●
3/8	1-1/8	3-1/2	3/8	●
1/2	1-1/8	3-1/2	1/2	●

Routing End Mills
Multiple Flutes Routers For Composite

MG Carbide | Uncoated Bright

Code No: E197-DC
Code No: E198-DC
Code No: E199-DC





Work Material

P	H	M	K	N	S
				●	

N	FRP CFRP Composite Material
N	Graphite

Tolerance: DC

All Sizes: +0/-0.002"

Feature of product:

Application for Phenolicepoxy parts, Polyester glass reinforced products, Graphite, Composite...etc.

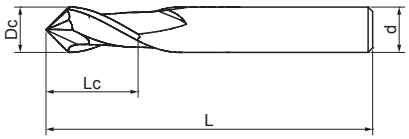
Standard Length

Dc 0 -0.002"	Lc Inch	L Inch	d h6	Bright E197	Bright E198	Bright E199
1/8	1/2	1-1/2	1/8	●	●	●
3/16	5/8	2	3/16	●	●	●
1/4	1	3	1/4	●	●	●
5/16	1	3	5/16	●	●	●
3/8	1	3	3/8	●	●	●
1/2	1-1/8	3	1/2	●	●	●

Chamfer Mills
2 Flute Chamfering 60°&90°

MG Carbide | Bright / AlTiN | 30° | N

Code No: E106-DC-60°
Code No: E107-DC-90°







Work Material

P	H	M	K	N	S
●	●	○	●	●	

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper

Tolerance: DC

All Sizes: +0/-0.001"

Feature of product:

Application for drilling, chamfering, countersink, spotting, and profile milling.

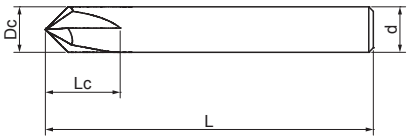
Standard Length

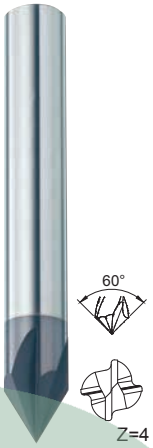
Dc 0 -0.001"	Lc Inch	L Inch	d h6	Bright E106	AlTiN E106X	Bright E107	AlTiN E107X
1/16	3/16	1-1/2	1/8	●	●	●	●
3/32	3/8	1-1/2	1/8	●	●	●	●
1/8	1/2	1-1/2	1/8	●	●	●	●
3/16	5/8	2	3/16	●	●	●	●
1/4	3/4	2-1/2	1/4	●	●	●	●
5/16	13/16	2-1/2	5/16	●	●	●	●
3/8	1	2-1/2	3/8	●	●	●	●
7/16	1	2-3/4	7/16	●	●	●	●
1/2	1	3	1/2	●	●	●	●
5/8	1-1/4	3-1/2	5/8	●	●	●	●
3/4	1-1/2	4	3/4	●	●	●	●

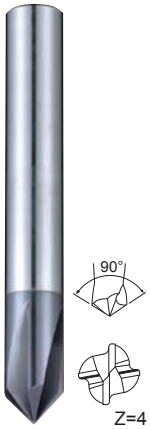
Chamfer Mills
4 Flute Chamfering 60°&90°

MG Carbide | Bright / AlTiN | 0° | N 75°

Code No: E108-DC-60°
Code No: E109-DC-90°







Work Material

P	H	M	K	N	S
●	●	○	●	●	

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper

Tolerance: DC

All Sizes: +0/-0.001"

Feature of product:

Application for drilling, chamfering, countersink, spotting, and profile milling.

Standard Length

Dc 0 -0.001"	Lc Inch	L Inch	d h6	Bright E108	AlTiN E108X	Bright E109	AlTiN E109X
1/16	3/16	1-1/2	1/8	●	●	●	●
3/32	3/8	1-1/2	1/8	●	●	●	●
1/8	1/2	1-1/2	1/8	●	●	●	●
3/16	5/8	2	3/16	●	●	●	●
1/4	3/4	2-1/2	1/4	●	●	●	●
5/16	13/16	2-1/2	5/16	●	●	●	●
3/8	1	2-1/2	3/8	●	●	●	●
7/16	1	2-3/4	7/16	●	●	●	●
1/2	1	3	1/2	●	●	●	●
5/8	1-1/4	3-1/2	5/8	●	●	●	●
3/4	1-1/2	4	3/4	●	●	●	●

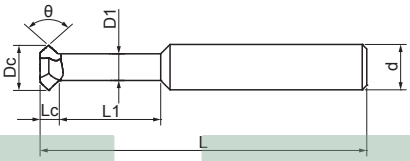
Double Angle Cutter
4 Flute Chamfering 30°&60°&90°&120°

MG Carbide | AlTiCrN HX | 15° | N 75°

Code No: E100HX-30°-DC×L1
E100HX-60°-DC×L1
E100HX-90°-DC×L1
E100HX-120°-DC×L1

Cutter Width(Lc)

Dc \ Angle	30°	60°	90°	120°
1/16	0.0080	0.0180	0.0310	-
5/64	0.0100	0.0230	0.0390	-
3/32	0.0120	0.0270	0.0470	-
1/8	0.0170	0.0360	0.0620	0.1090
5/32	-	0.0450	0.0780	-
3/16	0.0250	0.0550	0.0930	0.1630
1/4	0.0330	0.0720	0.1250	0.2160
5/16	-	0.0720	0.1250	-
3/8	0.0330	0.0720	0.1250	0.2160
1/2	0.0500	0.1090	0.1870	0.3250





Work Material

P	H	M	K	N	S
●	●	○	○	○	○

- **P** Steel
- **H** <52HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **S** Titanium
- **S** High Temp Alloys

Tolerance: DC

All Sizes: +0/-0.002"

Feature of product:

Use for high performace applications.

It is extremely heat resistant and used on Steel, Stainless Steels, Cast Iron, Non-ferrous metals and other tough to machine materials.

Standard & Long Length

Dc 0 -0.002"	L Inch	d h6	L1 Inch	D1 Inch	Z Inch	AlTiCrN E100HX-30°	AlTiCrN E100HX-60°	AlTiCrN E100HX-90°	AlTiCrN E100HX-120°
1/16	1-1/2	1/8	1/16	1/32	2	—	—	●	—
1/16	1-1/2	1/8	3/32	1/32	2	—	●	●	—
1/16	1-1/2	1/8	1/8	1/32	2	—	—	●	—
1/16	1-1/2	1/8	5/32	1/32	2	—	●	●	—
1/16	1-1/2	1/8	1/4	1/32	2	—	—	●	—
1/16	1-1/2	1/8	3/8	1/32	2	—	—	●	—
5/64	1-1/2	1/8	5/64	0.0390	2	—	—	●	—
5/64	1-1/2	1/8	1/8	0.0390	2	—	●	●	—
5/64	1-1/2	1/8	3/16	0.0390	2	—	—	●	—
5/64	1-1/2	1/8	1/4	0.0390	2	—	—	●	—
5/64	1-1/2	1/8	5/16	0.0390	2	—	—	●	—
5/64	1-1/2	1/8	1/2	0.0390	2	—	—	●	—
3/32	1-1/2	1/8	3/32	3/64	2	—	—	●	—
3/32	1-1/2	1/8	1/8	3/64	2	—	●	●	—
3/32	1-1/2	1/8	1/4	3/64	2	—	●	●	—
3/32	1-1/2	1/8	5/16	3/64	2	—	—	●	—
3/32	1-1/2	1/8	3/8	3/64	2	—	—	●	—
3/32	1-1/2	1/8	1/2	3/64	2	—	—	●	—
3/32	2	1/8	5/8	3/64	2	—	—	●	—
3/32	2	1/8	3/4	3/64	2	—	—	●	—
1/8	1-1/2	1/8	1/8	1/16	4	—	●	●	—
1/8	1-1/2	1/8	3/16	1/16	4	●	●	●	●
1/8	1-1/2	1/8	1/4	1/16	4	—	—	●	—
1/8	1-1/2	1/8	5/16	1/16	4	—	●	●	—
1/8	1-1/2	1/8	3/8	1/16	4	—	—	●	—
1/8	2	1/8	1/2	1/16	4	●	●	●	●
1/8	2	1/8	5/8	1/16	4	—	—	●	—
1/8	2	1/8	3/4	1/16	4	—	—	●	—
1/8	2	1/8	7/8	1/16	4	—	●	●	—
1/8	2	1/8	1	1/16	4	—	—	●	—
5/32	2	3/16	5/32	5/64	4	—	—	●	—
5/32	2	3/16	1/4	5/64	4	—	●	●	—
5/32	2	3/16	3/8	5/64	4	—	—	●	—
5/32	2	3/16	1/2	5/64	4	—	—	●	—
5/32	2-1/2	3/16	5/8	5/64	4	—	●	●	—
5/32	2-1/2	3/16	1-1/8	5/64	4	—	—	●	—

Double Angle Cutter
4 Flute Chamfering 30°&60°&90°&120°

MG Carbide | AlTiCrN HX | 15° | N 75°

Code No: E100HX-30°-DC×L1
E100HX-60°-DC×L1
E100HX-90°-DC×L1
E100HX-120°-DC×L1

Work Material

P	H	M	K	N	S
●	●	○	○	○	○

- **P** Steel
- **H** <52HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **S** Titanium
- **S** High Temp Alloys

Tolerance: DC

All Sizes: +0/-0.002"

Feature of product:

Use for high performace applications.

It is extremely heat resistant and used on Steel, Stainless Steels, Cast Iron, Non-ferrous metals and other tough to machine materials.

Standard & Long Length

Dc 0 -0.002"	L Inch	d h6	L1 Inch	D1 Inch	Z Inch	AlTiCrN E100HX-30°	AlTiCrN E100HX-60°	AlTiCrN E100HX-90°	AlTiCrN E100HX-120°
3/16	2	3/16	3/16	3/32	4	—	●	●	—
3/16	2	3/16	1/4	3/32	4	—	—	●	—
3/16	2	3/16	5/16	3/32	4	●	●	●	●
3/16	2	3/16	3/8	3/32	4	—	—	●	—
3/16	2	3/16	1/2	3/32	4	—	●	●	—
3/16	2-1/2	3/16	3/4	3/32	4	●	●	●	●
3/16	2-1/2	3/16	1	3/32	4	—	●	●	—
3/16	2-1/2	3/16	1-5/16	3/32	4	—	—	●	—
3/16	3	3/16	1-5/8	3/32	4	—	—	●	—
1/4	2	1/4	3/16	1/8	4	—	●	●	—
1/4	2	1/4	1/4	1/8	4	—	—	●	—
1/4	2	1/4	5/16	1/8	4	●	●	●	●
1/4	2	1/4	3/8	1/8	4	—	—	●	—
1/4	2	1/4	1/2	1/8	4	—	—	●	—
1/4	2-1/2	1/4	5/8	1/8	4	●	●	●	●
1/4	2-1/2	1/4	3/4	1/8	4	—	—	●	—
1/4	3	1/4	1	1/8	4	●	●	●	●
1/4	3	1/4	1-1/4	1/8	4	—	—	●	—
1/4	3	1/4	1-3/8	1/8	4	—	●	●	—
1/4	3	1/4	1-3/4	1/8	4	—	●	●	—
1/4	4	1/4	2-1/8	1/8	4	—	—	●	—
5/16	2-1/2	5/16	1/4	3/16	6	—	—	●	—
5/16	2-1/2	5/16	3/8	3/16	6	—	●	●	—
5/16	2-1/2	5/16	5/8	3/16	6	—	—	●	—
5/16	2-1/2	5/16	7/8	3/16	6	—	●	●	—
5/16	3	5/16	1-1/4	3/16	6	—	—	●	—
5/16	3	5/16	1-5/8	3/16	6	—	—	●	—
5/16	3	5/16	2-1/8	3/16	6	—	—	●	—
3/8	2-1/2	3/8	5/16	1/4	6	—	●	●	—
3/8	2-1/2	3/8	3/8	1/4	6	—	—	●	—
3/8	2-1/2	3/8	1/2	1/4	6	●	●	●	●
3/8	2-1/2	3/8	3/4	1/4	6	—	—	●	—
3/8	2-1/2	3/8	1	1/4	6	●	●	●	●
3/8	3-1/2	3/8	1-1/2	1/4	6	●	●	●	●
3/8	3-1/2	3/8	1-3/4	1/4	6	—	—	●	—
3/8	3-1/2	3/8	2	1/4	6	—	●	●	—
3/8	3-1/2	3/8	2-5/16	1/4	6	—	—	●	—
3/8	4	3/8	2-5/8	1/4	6	—	—	●	—
1/2	3	1/2	5/16	5/16	6	—	—	●	—
1/2	3	1/2	1/2	5/16	6	●	●	●	●
1/2	3	1/2	1	5/16	6	●	●	●	●
1/2	3-1/2	1/2	1-1/4	5/16	6	—	—	●	—
1/2	4	1/2	1-1/2	5/16	6	●	●	●	●
1/2	4	1/2	2	5/16	6	—	●	●	—
1/2	4	1/2	2-5/8	5/16	6	—	●	●	—
1/2	6	1/2	3-1/8	5/16	6	—	—	●	—

※ Mark—— On request, no stock



High Performance End Mills

Page	353	354	355	356	357	358
Appearance						
Code No	S445HX	E141-1HX	E141-2HX E141-3HX	F651SX	F652SX	F653TX
Carbide	MG Carbide	MG Carbide	MG Carbide	UMG Carbide	UMG Carbide	UMG Carbide
Coating	AlTiCrN HX	AlTiCrN HX	AlTiCrN HX	AlTiXZrN SX	AlTiXZrN SX	AlTiSiN TX
Helix Angle						
No.of Flutes						

ANSI/INCH

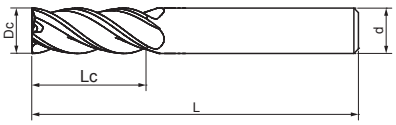
359	360	361	362
			
E143-1	E143-2 E143-3	E133	E135 E136
MG Carbide	MG Carbide	MG Carbide	MG Carbide
Uncoated Bright	Uncoated Bright	Uncoated Bright	Uncoated Bright
			
			

Easy Cut End Mills
4 Flute Center Cutting

MG Carbide | AlTiCrN HX | 36°~38° | N 78° | 90°

Code No: S445HX-DC





Work Material

P	H	M	K	N	S
●	●	●	○	○	○

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Tolerance: DC

All Sizes: +0/-0.001"

Feature of product:

Unique tool design can minimize chatter for smoother machining.

Single tool for roughing and finishing operations means fewer setups.

Application for Steel, Cast Iron, Stainless Steels, High Temp Alloys and also can be used in various Metal materials.

Standard Length

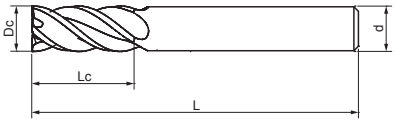
Dc 0 -0.001"	Lc Inch	L Inch	d h5	AlTiCrN S445HX
1/8	3/8	2	1/4	●
5/32	7/16	2	1/4	●
3/16	1/2	2	1/4	●
1/4	5/8	2	1/4	●
5/16	13/16	2-1/2	5/16	●
3/8	1	2-1/2	3/8	●
7/16	1	2-3/4	7/16	●
1/2	1	3	1/2	●
9/16	1-1/4	3-1/2	9/16	●
5/8	1-1/4	3-1/2	5/8	●
3/4	1-1/2	4	3/4	●
1	1-1/2	4	1	●

Multipurpose End Mills
4 Flute Center Cutting

MG Carbide | AlTiCrN HX | 38° 41° | N 75° | 90°

Code No: E141-1HX-DC





Work Material

P	H	M	K	N	S
●	●	●	○	○	○

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Tolerance: DC

All Sizes: +0/-0.001"

Feature of product:

Unique tool design can minimize chatter for smoother machining.

Single tool for roughing and finishing operations means fewer setups.

Application for Steel, Cast Iron, Stainless Steels, High Temp Alloys and also can be used in various Metal materials.

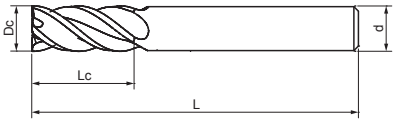
Stub Length

Dc 0 -0.001"	Lc Inch	L Inch	d h5	AlTiCrN E141-1HX
1/8	1/4	1-1/2	1/8	●
5/32	3/8	2	3/16	●
3/16	3/8	2	3/16	●
1/4	3/8	2	1/4	●
5/16	7/16	2	5/16	●
3/8	1/2	2	3/8	●
7/16	9/16	2-1/2	7/16	●
1/2	5/8	2-1/2	1/2	●

Multipurpose End Mills
4 Flute Center Cutting

MG Carbide | AlTiCrN HX | 38° 41° | N 75° | 90°

Code No: E141-2HX-DC
Code No: E141-3HX-DC







Work Material

P	H	M	K	N	S
●	●	●	○	○	○

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Tolerance: DC

All Sizes: +0/-0.001"

Feature of product:

Unique tool design can minimize chatter for smoother machining.

Single tool for roughing and finishing operations means fewer setups.

Application for Steel, Cast Iron, Stainless Steels, High Temp Alloys and also can be used in various Metal materials.

Standard Length

Dc 0 -0.001"	Lc Inch	L Inch	d h5	AlTiCrN E141-2HX	
1/8	1/2	1-1/2	1/8	●	
5/32	9/16	2	3/16	●	
3/16	5/8	2	3/16	●	
1/4	3/4	2-1/2	1/4	●	
5/16	13/16	2-1/2	5/16	●	
3/8	1	2-1/2	3/8	●	
7/16	1	2-3/4	7/16	●	
1/2	1-1/4	3	1/2	●	
9/16	1-1/4	3-1/2	9/16	●	
5/8	1-5/8	3-1/2	5/8	●	
3/4	1-5/8	4	3/4	●	
1	2	4	1	●	

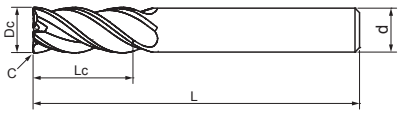
Long Length

Dc 0 -0.001"	Lc Inch	L Inch	d h5		AlTiCrN E141-3HX
1/8	3/4	3	1/8		●
3/16	3/4	3	3/16		●
1/4	1-1/4	3	1/4		●
5/16	1-3/8	3	5/16		●
3/8	1-1/2	4	3/8		●
7/16	2	4	7/16		●
1/2	2	4	1/2		●
5/8	2-1/4	5	5/8		●
3/4	2-1/4	5	3/4		●
1	3-1/4	6	1		●

End Mills For Difficult To Cut Materials
4 Flute Center Cutting

UMG Carbide	AlTiXZrN SX	38°	N 78°	45°

Code No: F651SX-DC





Work Material

P	H	M	K	N	S
●	●	●	●		●

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Tolerance: DC

All Sizes: +0/-0.001"

Feature of product:

Application for roughing and finishing cutting in different materials.

Sharp cutting edge is suitable for cutting Steel, Stainless Steels, Titanium, Nickel and High Temp Alloys... etc.

Standard Length

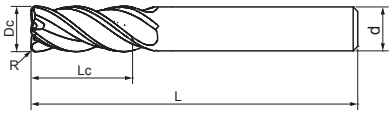
Dc 0 -0.001"	Lc Inch	L Inch	d h5	C Inch	AlTiXZrN F651SX
1/8	1/2	1-1/2	1/8	0.1	●
5/32	9/16	2	3/16	0.1	●
3/16	5/8	2	3/16	0.15	●
1/4	3/4	2-1/2	1/4	0.15	●
5/16	13/16	2-1/2	5/16	0.15	●
3/8	1	2-1/2	3/8	0.2	●
7/16	1	2-3/4	7/16	0.2	●
1/2	1-1/4	3	1/2	0.2	●
5/8	1-5/8	3-1/2	5/8	0.2	●
3/4	1-5/8	4	3/4	0.2	●
1	2	4	1	0.2	●

End Mills With Corner Radius For Difficult To Cut Materials 4 Flute Center Cutting

UMG Carbide | AlTiXZrN SX | 38° | 78° | N | R

Code No: F652SX-DC×R





Work Material

P	H	M	K	N	S
●	●	●	●		●

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Tolerance: DC

All Sizes: +0/-0.001"

Feature of product:

Application for roughing and finishing cutting in different materials.

Sharp cutting edge is suitable for cutting Steel, Stainless Steels, Titanium, Nickel and High Temp Alloys... etc.

Standard Length

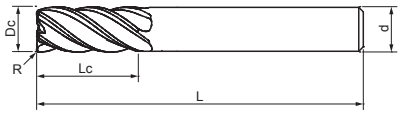
Dc 0 -0.001"	R Inch	Lc Inch	L Inch	d h5	AlTiXZrN F652SX
1/8	0.010R	1/2	1-1/2	1/8	●
1/8	0.015R	1/2	1-1/2	1/8	●
1/8	0.030R	1/2	1-1/2	1/8	●
3/16	0.010R	5/8	2	3/16	●
3/16	0.015R	5/8	2	3/16	●
3/16	0.030R	5/8	2	3/16	●
1/4	0.015R	3/4	2-1/2	1/4	●
1/4	0.020R	3/4	2-1/2	1/4	●
1/4	0.030R	3/4	2-1/2	1/4	●
1/4	0.060R	3/4	2-1/2	1/4	●
5/16	0.015R	13/16	2-1/2	5/16	●
5/16	0.020R	13/16	2-1/2	5/16	●
5/16	0.030R	13/16	2-1/2	5/16	●
5/16	0.060R	13/16	2-1/2	5/16	●
5/16	0.090R	13/16	2-1/2	5/16	●
3/8	0.015R	1	2-1/2	3/8	●
3/8	0.020R	1	2-1/2	3/8	●
3/8	0.030R	1	2-1/2	3/8	●
3/8	0.060R	1	2-1/2	3/8	●
3/8	0.090R	1	2-1/2	3/8	●
1/2	0.015R	1-1/4	3	1/2	●
1/2	0.030R	1-1/4	3	1/2	●
1/2	0.060R	1-1/4	3	1/2	●
1/2	0.090R	1-1/4	3	1/2	●
1/2	0.125R	1-1/4	3	1/2	●
5/8	0.030R	1-5/8	3-1/2	5/8	●
5/8	0.060R	1-5/8	3-1/2	5/8	●
5/8	0.090R	1-5/8	3-1/2	5/8	●
5/8	0.125R	1-5/8	3-1/2	5/8	●
3/4	0.030R	1-5/8	4	3/4	●
3/4	0.060R	1-5/8	4	3/4	●
3/4	0.090R	1-5/8	4	3/4	●
3/4	0.125R	1-5/8	4	3/4	●
1	0.030R	2	4	1	●
1	0.060R	2	4	1	●
1	0.090R	2	4	1	●
1	0.125R	2	4	1	●

End Mills With Corner Radius For Difficult To Cut Materials 5 Flute Center Cutting

UMG Carbide | AlTiSiN TX | 38° | 78° | N | R

Code No: F653TX-DC×R





Work Material

P	H	M	K	N	S
●	●	●	●		●

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Tolerance: DC

All Sizes: +0/-0.001"

Feature of product:

Application for HPC/ roughing cutting and HSC/ finishing cutting.

Sharp cutting edge is suitable for cutting Steel, Stainless Steels, Titanium, Nickel and High Temp Alloys... etc.

Standard Length

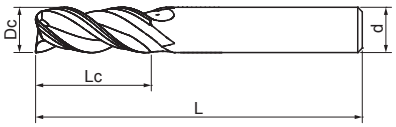
Dc 0 -0.001"	R ±0.0005	Lc Inch	L Inch	d h5	AlTiSiN F653TX
1/8	0.010R	1/2	1-1/2	1/8	●
1/8	0.015R	1/2	1-1/2	1/8	●
1/8	0.030R	1/2	1-1/2	1/8	●
3/16	0.010R	5/8	2	3/16	●
3/16	0.015R	5/8	2	3/16	●
3/16	0.030R	5/8	2	3/16	●
1/4	0.015R	3/4	2-1/2	1/4	●
1/4	0.020R	3/4	2-1/2	1/4	●
1/4	0.030R	3/4	2-1/2	1/4	●
1/4	0.060R	3/4	2-1/2	1/4	●
5/16	0.015R	13/16	2-1/2	5/16	●
5/16	0.020R	13/16	2-1/2	5/16	●
5/16	0.030R	13/16	2-1/2	5/16	●
5/16	0.060R	13/16	2-1/2	5/16	●
5/16	0.090R	13/16	2-1/2	5/16	●
3/8	0.015R	1	2-1/2	3/8	●
3/8	0.020R	1	2-1/2	3/8	●
3/8	0.030R	1	2-1/2	3/8	●
3/8	0.060R	1	2-1/2	3/8	●
3/8	0.090R	1	2-1/2	3/8	●
1/2	0.015R	1-1/4	3	1/2	●
1/2	0.030R	1-1/4	3	1/2	●
1/2	0.060R	1-1/4	3	1/2	●
1/2	0.090R	1-1/4	3	1/2	●
1/2	0.125R	1-1/4	3	1/2	●
5/8	0.030R	1-5/8	3-1/2	5/8	●
5/8	0.060R	1-5/8	3-1/2	5/8	●
5/8	0.090R	1-5/8	3-1/2	5/8	●
5/8	0.125R	1-5/8	3-1/2	5/8	●
3/4	0.030R	1-5/8	4	3/4	●
3/4	0.060R	1-5/8	4	3/4	●
3/4	0.090R	1-5/8	4	3/4	●
3/4	0.125R	1-5/8	4	3/4	●
1	0.030R	2	4	1	●
1	0.060R	2	4	1	●
1	0.090R	2	4	1	●
1	0.125R	2	4	1	●

End Mills For Aluminium
3 Flute Center Cutting

MG Carbide | Uncoated Bright | 40° | N | γ20° | 90°

Code No: E143-1-DC





Work Material

P	H	M	K	N	S
				●	

N Aluminium

Tolerance: DC

All Sizes: +0/-0.001"

Feature of product:

Designed for maximum metal removal rates, superior surface finishes and better anti-vibration rate.

Use for Aluminium which from roughing to finishing operations with one tool.

High spiral and optimal rake angle allow reduce cutting forces.

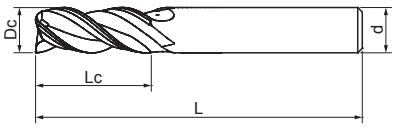
Standard Length

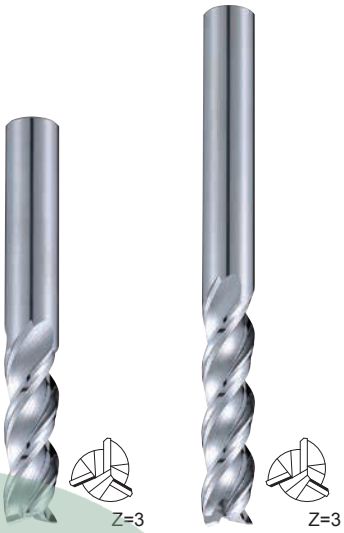
Dc 0 -0.001"	Lc Inch	L Inch	d h5	Bright E143-1
1/8	1/4	1-1/2	1/8	●
5/32	3/8	2	3/16	●
3/16	3/8	2	3/16	●
1/4	3/8	2	1/4	●
5/16	7/16	2	5/16	●
3/8	1/2	2	3/8	●
7/16	9/16	2-1/2	7/16	●
1/2	5/8	2-1/2	1/2	●

End Mills For Aluminium
3 Flute Center Cutting

MG Carbide | Uncoated Bright | 40° | N | γ20° | 90°

Code No: E143-2-DC
Code No: E143-3-DC





Work Material

P	H	M	K	N	S
				●	

N	Aluminium

Tolerance: DC

All Sizes: +0/-0.001"

Feature of product:

Designed for maximum metal removal rates, superior surface finishes and better anti-vibration rate.

Use for Aluminium which from roughing to finishing operations with one tool.

High spiral and optimal rake angle allow reduce cutting forces.

Long Length

Dc 0 -0.001"	Lc Inch	L Inch	d h5	Bright E143-2
1/8	1/2	1-1/2	1/8	●
5/32	9/16	2	3/16	●
3/16	5/8	2	3/16	●
1/4	3/4	2-1/2	1/4	●
5/16	13/16	2-1/2	5/16	●
3/8	1	2-1/2	3/8	●
7/16	1	2-3/4	7/16	●
1/2	1-1/4	3	1/2	●
9/16	1-1/4	3-1/2	9/16	●
5/8	1-5/8	3-1/2	5/8	●
3/4	1-5/8	4	3/4	●
1	2	4	1	●

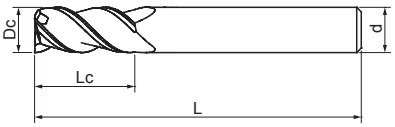
Extra Long Length

Dc 0 -0.001"	Lc Inch	L Inch	d h5	Bright E143-3
1/8	3/4	3	1/8	●
3/16	3/4	3	3/16	●
1/4	1-1/4	3	1/4	●
5/16	1-3/8	3	5/16	●
3/8	1-1/2	4	3/8	●
7/16	2	4	7/16	●
1/2	2	4	1/2	●
5/8	2-1/4	5	5/8	●
3/4	2-1/4	5	3/4	●
1	3-1/4	6	1	●

End Mills For Aluminium
3 Flute Center Cutting

MG Carbide | Uncoated Bright | 45° | H γ12° | 90°

Code No: E133-DC





Work Material

P	H	M	K	N	S
				●	

N	Aluminium
N	Copper
N	Plastics

Tolerance: DC

All Sizes: +0/-0.001"

Feature of product:

Application for universe cutting such as Aluminium, Copper, and Plastics.

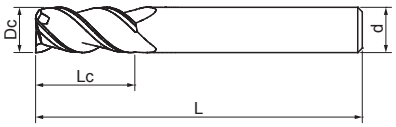
Standard Length

Dc 0 -0.001"	Lc Inch	L Inch	d h6	Bright E133
1/32	3/32	1-1/2	1/8	●
3/64	1/8	1-1/2	1/8	●
1/16	3/16	1-1/2	1/8	●
5/64	1/4	1-1/2	1/8	●
3/32	3/8	1-1/2	1/8	●
7/64	3/8	1-1/2	1/8	●
1/8	1/2	1-1/2	1/8	●
5/32	9/16	2	3/16	●
3/16	5/8	2	3/16	●
7/32	5/8	2-1/2	1/4	●
1/4	3/4	2-1/2	1/4	●
9/32	3/4	2-1/2	5/16	●
5/16	13/16	2-1/2	5/16	●
3/8	1	2-1/2	3/8	●
7/16	1	2-3/4	7/16	●
1/2	1	3	1/2	●
9/16	1-1/4	3-1/2	9/16	●
5/8	1-1/4	3-1/2	5/8	●
3/4	1-1/2	4	3/4	●
1	1-1/2	4	1	●

End Mills For Aluminium
3 Flute Center Cutting

MG Carbide | Uncoated Bright | 45° | H γ12° | 90°

Code No: E135-DC
Code No: E136-DC





Work Material

P	H	M	K	N	S
				●	

N	Aluminium
N	Copper
N	Plastics

Tolerance: DC

All Sizes: +0/-0.001"

Feature of product:

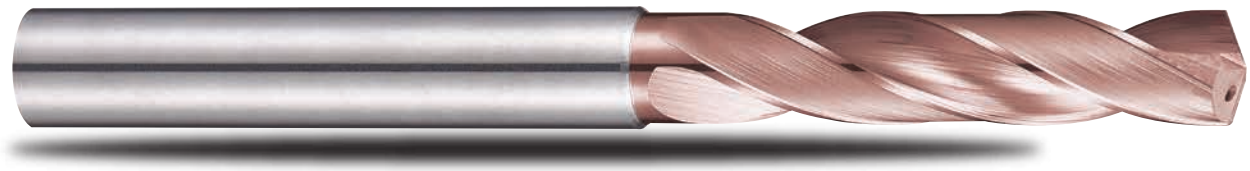
Application for universe cutting such as Aluminium, Copper, and Plastics.

Long Length

Dc 0 -0.001"	Lc Inch	L Inch	d h6	Bright E135	
1/8	3/4	2-1/4	1/8	●	
3/16	3/4	2-1/2	3/16	●	
1/4	1-1/8	3	1/4	●	
5/16	1-1/8	3	5/16	●	
3/8	1-1/8	3	3/8	●	
7/16	2	4	7/16	●	
1/2	2	4	1/2	●	
5/8	2-1/4	5	5/8	●	
3/4	2-1/4	5	3/4	●	
1	2-1/4	5	1	●	

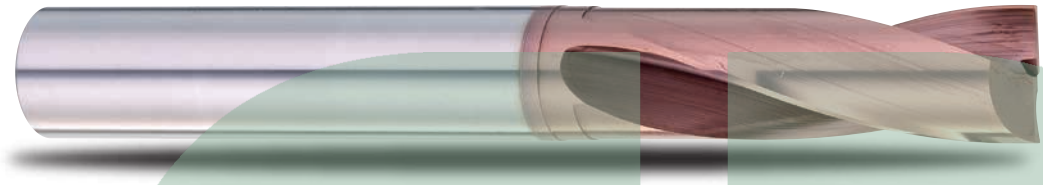
Extra Long Length

Dc 0 -0.001"	Lc Inch	L Inch	d h6		Bright E136
1/8	1	3	1/8		●
3/16	1-1/8	3	3/16		●
1/4	1-1/2	4	1/4		●
5/16	1-5/8	4	5/16		●
3/8	1-3/4	4	3/8		●
7/16	3	6	7/16		●
1/2	3	6	1/2		●
5/8	3	6	5/8		●
3/4	3	6	3/4		●
1	3	6	1		●



D423TX
Oil-Feed High Performance Drills

JIS 3XD Drills with Oil-Feed 140° S-shape drill tip design to reduce axial force.
Design with groove shape to provide higher chip removal rates.
Good wear resistance and lubrication with Nano multilayer coating.Oil-feed design could reduce temperature effectively and increase chip removal ratesduring cutting process.
Application for drilling with Steels which is below HRC48, Cast Iron...etc.
Suitable for drilling with 3XD depth.



D425TX
Flat Bottom Drills

With 0° point of drill tip, it can avoid shift or skewing during non-planar drilling such ascountersinks, ramping, curved surface..etc.
With AlTiSiN coating type to have longer tool life and enhance cutting and using efficiency.



D922X
NC Spot Drills

D922X NC Spot Drills 90°
Design with double drill tip angleto enhance the strength of drill tip.
Apply with AlTiN coating to increase wear resistance and improved tool life.
Application for spot drilling in different steels.



D420HX
Micro Precision Drills

Micro Precision Drills 140° X-shape drill tip design which included sharp and strength.
Dc. range from 0.1 to 2.0mm with every 0.01mm as size range.
Good wear resistance and lubrication with Nano multilayer coating.
Suitable for drilling application with Steels which is below HRC30, Stainless Steels, Cast Iron, Aluminium, Copper...etc.



ASIA DRILL



Drills

Page	367	369	371	375	379	383
Appearance						
Code No	D921X D922X D932X	D923X D924X	D420HX-3	D420HX-5	D420HX-8	D421TX
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
Coating	AlTiN X-NaNo	AlTiN X-NaNo	AlTiCrN HX	AlTiCrN HX	AlTiCrN HX	AlTiSiN TX
Helix Angle	 D	 D	 30° 3XD	 30° 5XD	 30° 8XD	 3XD
No.of Flutes	 2	 2	 2	 2	 2	 2

385	387	389	391	393	395	397	399
							
D422TX	D423TX-3	D423TX-5	D423TX-8	D423TX-12 D423TX-16	D423TX-20 D423TX-25 D423TX-30	D425TX-2	D425TX-4
MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
AlTiSiN TX	AlTiSiN TX	AlTiSiN TX	AlTiSiN TX	AlTiSiN TX	AlTiSiN TX	AlTiSiN TX	AlTiSiN TX
5XD	3XD	5XD	8XD	12XD 16XD	20XD 25XD 30XD	2XD	4XD
2	2	2	2	2	2	2	2

NC Spot Drills

MG Carbide

AlTiN X-NaNo

D

2

Work Material

P	H	M	K	N	S
●	●	○	●	○	○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Copper
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

D921X NC Spot Drills 60°

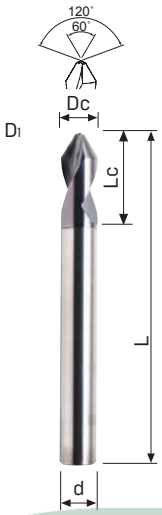
D922X NC Spot Drills 90°

D932X NC Spot Drills 90°- Long Length

Design with double drill tip angle to enhance the strength of drill tip.

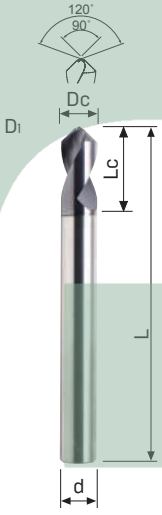
Apply with AlTiN coating to increase wear resistance and improved tool life.

Application for spot drilling in different steels.



Code No. D921X-Dc

Dc h6	Lc mm	L mm	d h6	D1 mm	60° D921X
0.5	1	38	3	0.15	●
1	2	38	3	0.3	●
2	4	38	3	0.6	●
3	6	50	3	1.0	●
4	8	50	4	1.5	●
6	12	70	6	2.0	●
8	16	80	8	2.5	●
10	20	90	10	3.0	●
12	24	110	12	4.0	●
16	32	120	16	5.0	●
20	40	130	20	6.0	●



Code No. D922X-Dc

Dc h6	Lc mm	L mm	d h6	D1 mm	90° D922X
0.5	1	38	3	0.15	●
1	2	38	3	0.3	●
2	4	38	3	0.6	●
3	6	50	3	1.0	●
4	8	50	4	1.5	●
6	12	70	6	2.0	●
8	16	80	8	2.5	●
10	20	90	10	3.0	●
12	24	110	12	4.0	●
16	32	120	16	5.0	●
20	40	130	20	6.0	●



Code No. D932X-Dc

Dc h6	Lc mm	L mm	d h6	D1 mm	90° D932X
3	9	75	3	1	●
4	12	100	4	1.5	●
6	15	150	6	2	●
8	20	150	8	2.5	●
10	25	200	10	3	●
12	30	200	12	4	●
16	40	250	16	5	●
20	45	250	20	6	●

Borehole parameters

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.9 Cast Iron	
Vc m/min		40~85		40~85		40~85		20~30		15~25		65~100	
Code No.	Dc	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)
D921X/D922X-0.5	0.5	20,000	0.003~0.02	20,000	0.003~0.02	20,000	0.003~0.02	15,000	0.003~0.02	9,000	0.003~0.02	-	-
D921X/D922X-1	1	10,000	0.01~0.04	10,000	0.01~0.04	10,000	0.01~0.04	7,500	0.01~0.04	4,500	0.01~0.04	20,000	0.01~0.035
D921X/D922X-2	2	5,000	0.03~0.07	5,000	0.03~0.07	5,000	0.03~0.07	3,800	0.03~0.07	2,200	0.03~0.07	12,000	0.03~0.063
D921X/D922X/D932X-3	3	7,500	0.04~0.085	7,500	0.04~0.085	7,500	0.04~0.085	2,500	0.04~0.085	1,500	0.04~0.085	8,000	0.05~0.095
D921X/D922X/D932X-4	4	5,700	0.05~0.12	5,700	0.05~0.12	5,700	0.05~0.12	1,900	0.05~0.12	1,100	0.05~0.12	6,500	0.07~0.15
D921X/D922X/D932X-6	6	3,800	0.06~0.13	3,800	0.06~0.13	3,800	0.06~0.13	1,300	0.06~0.13	750	0.06~0.13	4,300	0.12~0.2
D921X/D922X/D932X-8	8	2,800	0.08~0.16	2,800	0.08~0.16	2,800	0.08~0.16	1,000	0.08~0.16	550	0.08~0.16	3,200	0.15~0.2
D921X/D922X/D932X-10	10	2,300	0.1~0.2	2,300	0.1~0.2	2,300	0.1~0.2	750	0.1~0.2	450	0.1~0.2	2,600	0.1~0.25
D921X/D922X/D932X-12	12	1,900	0.15~0.25	1,900	0.15~0.25	1,900	0.15~0.25	650	0.15~0.25	370	0.15~0.25	2,200	0.2~0.3
D921X/D922X/D932X-16	16	1,400	0.15~0.3	1,400	0.15~0.3	1,400	0.15~0.3	480	0.15~0.3	280	0.15~0.3	1,600	0.25~0.35
D921X/D922X/D932X-20	20	1,150	0.18~0.35	1,150	0.18~0.35	1,150	0.18~0.35	380	0.18~0.35	220	0.18~0.35	1,300	0.28~0.4

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

D923X / D924X

NC Spot Drills

MG Carbide

AlTiN X-NaNo

D

2

Work Material

P	H	M	K	N	S
●	●	○	●	○	○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Copper
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

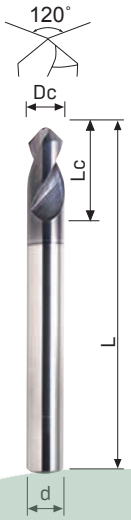
D923X NC Spot Drills 120°

D924X NC Spot Drills 142°

Design with double drill tip angle to enhance the strength of drill tip.

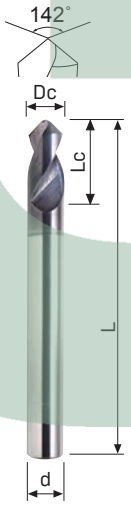
Apply with AlTiN coating to increase wear resistance and improved tool life.

Application for spot drilling in different steels.



Code No. D923X-Dc

Dc h6	Lc mm	L mm	d h6	120° D923X
0.5	1	38	3	●
1	2	38	3	●
2	4	38	3	●
3	6	50	3	●
4	8	50	4	●
6	12	70	6	●
8	16	80	8	●
10	20	90	10	●
12	24	110	12	●
16	32	120	16	●
20	40	130	20	●



Code No. D924X-Dc

Dc h6	Lc mm	L mm	d h6	142° D924X
0.5	1	38	3	●
1	2	38	3	●
2	4	38	3	●
3	6	50	3	●
4	8	50	4	●
6	12	70	6	●
8	16	80	8	●
10	20	90	10	●
12	24	110	12	●
16	32	120	16	●
20	40	130	20	●

Borehole parameters

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.9 Cast Iron	
Vc m/min		40~85		40~85		40~85		20~30		15~25		65~100	
Code No.	Dc	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)
D923X/D924X-0.5	0.5	20,000	0.003~0.02	20,000	0.003~0.02	20,000	0.003~0.02	15,000	0.003~0.02	9,000	0.003~0.02	-	-
D923X/D924X-1	1	10,000	0.01~0.04	10,000	0.01~0.04	10,000	0.01~0.04	7,500	0.01~0.04	4,500	0.01~0.04	20,000	0.01~0.035
D923X/D924X-2	2	5,000	0.03~0.07	5,000	0.03~0.07	5,000	0.03~0.07	3,800	0.03~0.07	2,200	0.03~0.07	12,000	0.03~0.063
D923X/D924X-3	3	7,500	0.04~0.085	7,500	0.04~0.085	7,500	0.04~0.085	2,500	0.04~0.085	1,500	0.04~0.085	8,000	0.05~0.095
D923X/D924X-4	4	5,700	0.05~0.12	5,700	0.05~0.12	5,700	0.05~0.12	1,900	0.05~0.12	1,100	0.05~0.12	6,500	0.07~0.15
D923X/D924X-6	6	3,800	0.06~0.13	3,800	0.06~0.13	3,800	0.06~0.13	1,300	0.06~0.13	750	0.06~0.13	4,300	0.12~0.2
D923X/D924X-8	8	2,800	0.08~0.16	2,800	0.08~0.16	2,800	0.08~0.16	1,000	0.08~0.16	550	0.08~0.16	3,200	0.15~0.2
D923X/D924X-10	10	2,300	0.1~0.2	2,300	0.1~0.2	2,300	0.1~0.2	750	0.1~0.2	450	0.1~0.2	2,600	0.1~0.25
D923X/D924X-12	12	1,900	0.15~0.25	1,900	0.15~0.25	1,900	0.15~0.25	650	0.15~0.25	370	0.15~0.25	2,200	0.2~0.3
D923X/D924X-16	16	1,400	0.15~0.3	1,400	0.15~0.3	1,400	0.15~0.3	480	0.15~0.3	280	0.15~0.3	1,600	0.25~0.35
D923X/D924X-20	20	1,150	0.18~0.35	1,150	0.18~0.35	1,150	0.18~0.35	380	0.18~0.35	220	0.18~0.35	1,300	0.28~0.4

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

D420HX-3

Micro Precision Drills

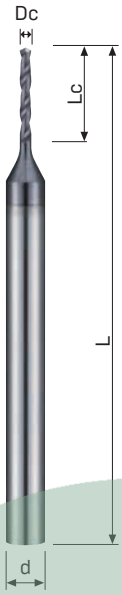
MG Carbide

AlTiCrN HX

30° 3XD

2

<0.19 120° <0.20 140°



Work Material

P	H	M	K	N	S
●		●	●	●	

- P Steel
- M Stainless Steel
- K Cast Iron
- N Aluminium
- N Copper
- N Plastics

Feature of product:

Micro Precision Drills

140° X-shape drill tip design which included sharp and strength.

Dc. range from 0.1 to 2.0mm with every 0.01mm as size range.

Good wear resistance and lubrication with Nano multilayer coating.

Suitable for drilling application with Steels which is below HRC30, Stainless Steels, Cast Iron, Aluminium, Copper...etc.

Code No. D420HX-3-DC

Dc 0 -0.005	Lc mm	L mm	d h6	AlTiCrN D420HX-3	Dc 0 -0.005	Lc mm	L mm	d h6	AlTiCrN D420HX-3	Dc 0 -0.005	Lc mm	L mm	d h6	AlTiCrN D420HX-3
0.1	0.6	38	3	●	0.7	4.5	38	3	●	1.3	8	42	3	●
0.11	0.6	38	3	●	0.71	4.5	38	3	●	1.31	8	42	3	●
0.12	0.8	38	3	●	0.72	4.5	38	3	●	1.32	8	42	3	●
0.13	0.8	38	3	●	0.73	4.5	38	3	●	1.33	9	42	3	●
0.14	0.8	38	3	●	0.74	4.5	38	3	●	1.34	9	42	3	●
0.15	1	38	3	●	0.75	4.5	38	3	●	1.35	9	42	3	●
0.16	1	38	3	●	0.76	5	38	3	●	1.36	9	42	3	●
0.17	1	38	3	●	0.77	5	38	3	●	1.37	9	42	3	●
0.18	1.2	38	3	●	0.78	5	38	3	●	1.38	9	42	3	●
0.19	1.2	38	3	●	0.79	5	38	3	●	1.39	9	42	3	●
0.2	1.5	38	3	●	0.8	5	38	3	●	1.4	9	42	3	●
0.21	1.5	38	3	●	0.81	5	38	3	●	1.41	9	42	3	●
0.22	1.5	38	3	●	0.82	5	38	3	●	1.42	9	42	3	●
0.23	1.5	38	3	●	0.83	5	38	3	●	1.43	9	42	3	●
0.24	1.5	38	3	●	0.84	5	38	3	●	1.44	9	42	3	●
0.25	1.5	38	3	●	0.85	5	38	3	●	1.45	9	42	3	●
0.26	1.5	38	3	●	0.86	5.5	38	3	●	1.46	9	42	3	●
0.27	1.5	38	3	●	0.87	5.5	38	3	●	1.47	9	42	3	●
0.28	1.5	38	3	●	0.88	5.5	38	3	●	1.48	9	42	3	●
0.29	1.5	38	3	●	0.89	5.5	38	3	●	1.49	9	42	3	●
0.3	1.5	38	3	●	0.9	5.5	38	3	●	1.5	9	42	3	●
0.31	2	38	3	●	0.91	5.5	38	3	●	1.51	10	42	3	●
0.32	2	38	3	●	0.92	5.5	38	3	●	1.52	10	42	3	●
0.33	2	38	3	●	0.93	5.5	38	3	●	1.53	10	42	3	●
0.34	2	38	3	●	0.94	5.5	38	3	●	1.54	10	42	3	●
0.35	2	38	3	●	0.95	5.5	38	3	●	1.55	10	42	3	●
0.36	2	38	3	●	0.96	6	38	3	●	1.56	10	42	3	●
0.37	2	38	3	●	0.97	6	38	3	●	1.57	10	42	3	●
0.38	2	38	3	●	0.98	6	38	3	●	1.58	10	42	3	●
0.39	2.5	38	3	●	0.99	6	38	3	●	1.59	10	42	3	●
0.4	2.5	38	3	●	1	6	38	3	●	1.6	10	42	3	●
0.41	2.5	38	3	●	1.01	6	38	3	●	1.61	10	42	3	●
0.42	2.5	38	3	●	1.02	6	38	3	●	1.62	10	42	3	●
0.43	2.5	38	3	●	1.03	6	38	3	●	1.63	10	42	3	●
0.44	2.5	38	3	●	1.04	6	38	3	●	1.64	10	42	3	●
0.45	2.5	38	3	●	1.05	6	38	3	●	1.65	10	42	3	●
0.46	2.5	38	3	●	1.06	6	38	3	●	1.66	10	42	3	●
0.47	2.5	38	3	●	1.07	7	42	3	●	1.67	10	42	3	●
0.48	2.5	38	3	●	1.08	7	42	3	●	1.68	10	42	3	●
0.49	3	38	3	●	1.09	7	42	3	●	1.69	10	42	3	●
0.5	3	38	3	●	1.1	7	42	3	●	1.7	10	42	3	●
0.51	3	38	3	●	1.11	7	42	3	●	1.71	11	42	3	●
0.52	3	38	3	●	1.12	7	42	3	●	1.72	11	42	3	●
0.53	3	38	3	●	1.13	7	42	3	●	1.73	11	42	3	●
0.54	3.5	38	3	●	1.14	7	42	3	●	1.74	11	42	3	●
0.55	3.5	38	3	●	1.15	7	42	3	●	1.75	11	42	3	●
0.56	3.5	38	3	●	1.16	7	42	3	●	1.76	11	42	3	●
0.57	3.5	38	3	●	1.17	7	42	3	●	1.77	11	42	3	●
0.58	3.5	38	3	●	1.18	7	42	3	●	1.78	11	42	3	●
0.59	3.5	38	3	●	1.19	8	42	3	●	1.79	11	42	3	●
0.6	3.5	38	3	●	1.2	8	42	3	●	1.8	11	42	3	●
0.61	4	38	3	●	1.21	8	42	3	●	1.81	11	42	3	●
0.62	4	38	3	●	1.22	8	42	3	●	1.82	11	42	3	●
0.63	4	38	3	●	1.23	8	42	3	●	1.83	11	42	3	●
0.64	4	38	3	●	1.24	8	42	3	●	1.84	11	42	3	●
0.65	4	38	3	●	1.25	8	42	3	●	1.85	11	42	3	●
0.66	4	38	3	●	1.26	8	42	3	●	1.86	11	42	3	●
0.67	4	38	3	●	1.27	8	42	3	●	1.87	11	42	3	●
0.68	4.5	38	3	●	1.28	8	42	3	●	1.88	11	42	3	●
0.69	4.5	38	3	●	1.29	8	42	3	●	1.89	11	42	3	●

Borehole parameters

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.10 Aluminium		GR.11 Copper	
Vc m/min		37		37		34		31		37		37		20	
Code No.	Dc	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)
D420HX-3-0.2	0.2	25,000	0.002	25,000	0.002	25,000	0.002	25,000	0.002	25,000	0.002	25,000	0.004	25,000	0.002
D420HX-3-0.25	0.25	22,500	0.002	22,500	0.002	22,500	0.002	22,500	0.002	22,500	0.002	22,500	0.005	22,500	0.002
D420HX-3-0.3	0.3	20,000	0.003	20,000	0.003	20,000	0.003	20,000	0.003	20,000	0.003	20,000	0.007	20,000	0.003
D420HX-3-0.35	0.35	18,750	0.004	18,750	0.004	18,500	0.004	18,250	0.004	18,750	0.004	18,750	0.009	18,250	0.004
D420HX-3-0.4	0.4	17,500	0.005	17,500	0.005	17,000	0.005	16,500	0.005	17,500	0.005	17,500	0.011	16,500	0.005
D420HX-3-0.45	0.45	16,250	0.006	16,250	0.006	15,500	0.006	14,750	0.006	16,250	0.006	16,250	0.013	14,750	0.006
D420HX-3-0.5	0.5	15,000	0.007	15,000	0.007	14,000	0.007	13,000	0.007	15,000	0.007	15,000	0.015	13,000	0.007
D420HX-3-0.55	0.55	14,750	0.008	14,750	0.008	13,750	0.008	12,820	0.008	14,750	0.008	14,750	0.016	12,450	0.007
D420HX-3-0.6	0.6	14,500	0.008	14,500	0.008	13,500	0.008	12,660	0.008	14,500	0.008	14,500	0.017	11,900	0.007
D420HX-3-0.65	0.65	14,250	0.009	14,250	0.009	13,250	0.009	12,500	0.009	14,250	0.009	14,250	0.018	11,350	0.008
D420HX-3-0.7	0.7	14,000	0.009	14,000	0.009	13,000	0.009	12,320	0.009	14,000	0.009	14,000	0.018	10,800	0.008
D420HX-3-0.75	0.75	13,750	0.010	13,750	0.010	12,750	0.010	12,160	0.010	13,750	0.010	13,750	0.019	10,250	0.008
D420HX-3-0.8	0.8	13,500	0.010	13,500	0.010	12,500	0.010	12,000	0.010	13,500	0.010	13,500	0.020	9,700	0.009
D420HX-3-0.85	0.85	13,000	0.013	13,000	0.013	12,000	0.013	11,320	0.013	13,000	0.013	13,000	0.024	8,600	0.009
D420HX-3-0.9	0.9	12,500	0.016	12,500	0.016	11,500	0.016	10,660	0.016	12,500	0.016	12,500	0.037	7,500	0.010
D420HX-3-1	1	12,000	0.020	12,000	0.020	11,000	0.020	10,000	0.020	12,000	0.020	12,000	0.030	6,400	0.010
D420HX-3-1.05	1.05	11,200	0.020	11,200	0.020	10,800	0.020	9,400	0.020	11,200	0.020	11,200	0.030	6,350	0.010
D420HX-3-1.1	1.1	10,700	0.020	10,700	0.020	9,850	0.020	9,000	0.020	10,700	0.020	10,700	0.030	6,050	0.010
D420HX-3-1.15	1.15	10,250	0.025	10,250	0.025	9,400	0.025	8,550	0.025	10,250	0.025	10,250	0.030	5,500	0.010
D420HX-3-1.2	1.2	9,800	0.025	9,800	0.025	9,000	0.025	8,200	0.025	9,800	0.025	9,800	0.030	5,300	0.010
D420HX-3-1.25	1.25	9,400	0.025	9,400	0.025	8,650	0.025	7,900	0.025	9,400	0.025	9,400	0.040	5,100	0.015
D420HX-3-1.3	1.3	9,000	0.025	9,000	0.025	8,300	0.025	7,600	0.025	9,000	0.025	9,000	0.040	4,900	0.015
D420HX-3-1.35	1.35	8,700	0.030	8,700	0.030	8,000	0.030	7,300	0.030	8,700	0.030	8,700	0.040	4,700	0.015
D420HX-3-1.4	1.4	8,400	0.030	8,400	0.030	7,700	0.030	7,050	0.030	8,400	0.030	8,400	0.050	4,550	0.015
D420HX-3-1.45	1.45	8,100	0.030	8,100	0.030	7,450	0.030	6,800	0.030	8,100	0.030	8,100	0.050	4,400	0.015
D420HX-3-1.5	1.5	7,800	0.030	7,800	0.030	7,200	0.030	6,550	0.030	7,800	0.030	7,800	0.050	4,250	0.020
D420HX-3-1.55	1.55	7,600	0.035	7,600	0.035	7,000	0.035	6,350	0.035	7,600	0.035	7,600	0.050	4,100	0.020
D420HX-3-1.6	1.6	7,350	0.035	7,350	0.035	6,750	0.035	6,150	0.035	7,350	0.035	7,350	0.060	3,950	0.020
D420HX-3-1.65	1.65	7,150	0.035	7,150	0.035	6,550	0.035	5,950	0.035	7,150	0.035	7,150	0.060	3,850	0.020
D420HX-3-1.7	1.7	6,900	0.035	6,900	0.035	6,350	0.035	5,800	0.035	6,900	0.035	6,900	0.060	3,750	0.020
D420HX-3-1.75	1.75	6,700	0.035	6,700	0.035	6,200	0.035	5,650	0.035	6,700	0.035	6,700	0.060	3,650	0.025
D420HX-3-1.8	1.8	6,550	0.040	6,550	0.040	6,000	0.040	5,450	0.040	6,550	0.040	6,550	0.060	3,500	0.025
D420HX-3-1.85	1.85	6,350	0.040	6,350	0.040	5,850	0.040	5,300	0.040	6,350	0.040	6,350	0.060	3,450	0.025

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

Micro Precision Drills

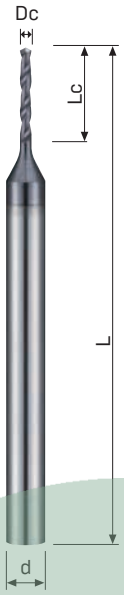
MG Carbide

AlTiCrN HX

30° 3XD

2

<0.19 120° <0.20 140°



Work Material

P	H	M	K	N	S
●		●	●	●	

- **P** Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics

Feature of product:

Micro Precision Drills

140° X-shape drill tip design which included sharp and strength.

Dc. range from 0.1 to 2.0mm with every 0.01mm as size range.

Good wear resistance and lubrication with Nano multilayer coating.

Suitable for drilling application with Steels which is below HRC30, Stainless Steels, Cast Iron, Aluminium, Copper...etc.

Code No. D420HX-3-DC

Dc $^{0}_{-0.005}$	Lc mm	L mm	d h6	AlTiCrN D420HX-3	Dc $^{0}_{-0.005}$	Lc mm	L mm	d h6	AlTiCrN D420HX-3
1.9	11	42	3	●	2.46	14	50	3	●
1.91	12	50	3	●	2.47	14	50	3	●
1.92	12	50	3	●	2.48	14	50	3	●
1.93	12	50	3	●	2.49	14	50	3	●
1.94	12	50	3	●	2.5	14	50	3	●
1.95	12	50	3	●	2.51	14	50	3	●
1.96	12	50	3	●	2.52	14	50	3	●
1.97	12	50	3	●	2.53	14	50	3	●
1.98	12	50	3	●	2.54	14	50	3	●
1.99	12	50	3	●	2.55	14	50	3	●
2	12	50	3	●	2.56	14	50	3	●
2.01	12	50	3	●	2.57	14	50	3	●
2.02	12	50	3	●	2.58	14	50	3	●
2.03	12	50	3	●	2.59	14	50	3	●
2.04	12	50	3	●	2.6	14	50	3	●
2.05	12	50	3	●	2.61	14	50	3	●
2.06	12	50	3	●	2.62	14	50	3	●
2.07	12	50	3	●	2.63	14	50	3	●
2.08	12	50	3	●	2.64	14	50	3	●
2.09	12	50	3	●	2.65	14	50	3	●
2.1	12	50	3	●	2.66	16	50	3	●
2.11	12	50	3	●	2.67	16	50	3	●
2.12	12	50	3	●	2.68	16	50	3	●
2.13	13	50	3	●	2.69	16	50	3	●
2.14	13	50	3	●	2.7	16	50	3	●
2.15	13	50	3	●	2.71	16	50	3	●
2.16	13	50	3	●	2.72	16	50	3	●
2.17	13	50	3	●	2.73	16	50	3	●
2.18	13	50	3	●	2.74	16	50	3	●
2.19	13	50	3	●	2.75	16	50	3	●
2.2	13	50	3	●	2.76	16	50	3	●
2.21	13	50	3	●	2.77	16	50	3	●
2.22	13	50	3	●	2.78	16	50	3	●
2.23	13	50	3	●	2.79	16	50	3	●
2.24	13	50	3	●	2.8	16	50	3	●
2.25	13	50	3	●	2.81	16	50	3	●
2.26	13	50	3	●	2.82	16	50	3	●
2.27	13	50	3	●	2.83	16	50	3	●
2.28	13	50	3	●	2.84	16	50	3	●
2.29	13	50	3	●	2.85	16	50	3	●
2.3	13	50	3	●	2.86	16	50	3	●
2.31	13	50	3	●	2.87	16	50	3	●
2.32	13	50	3	●	2.88	16	50	3	●
2.33	13	50	3	●	2.89	16	50	3	●
2.34	13	50	3	●	2.9	16	50	3	●
2.35	13	50	3	●	2.91	16	50	3	●
2.36	13	50	3	●	2.92	16	50	3	●
2.37	14	50	3	●	2.93	16	50	3	●
2.38	14	50	3	●	2.94	16	50	3	●
2.39	14	50	3	●	2.95	16	50	3	●
2.4	14	50	3	●	2.96	16	50	3	●
2.41	14	50	3	●	2.97	16	50	3	●
2.42	14	50	3	●	2.98	16	50	3	●
2.43	14	50	3	●	2.99	16	50	3	●
2.44	14	50	3	●	3	16	50	3	●
2.45	14	50	3	●					

Borehole parameters

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.10 Aluminium		GR.11 Copper	
Vc m/min		37		37		34		31		37		37		20	
Code No.	Dc	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)
D420HX-3-1.9	1.9	6,200	0.040	6,200	0.040	5,700	0.040	5,200	0.040	6,200	0.040	6,200	0.060	3350	0.020
D420HX-3-1.95	1.95	6,000	0.040	6,000	0.040	5,550	0.040	5,050	0.040	6,000	0.040	6,000	0.060	3250	0.020
D420HX-3-2	2	5,900	0.050	5,900	0.050	5,400	0.050	5,000	0.050	5,900	0.050	5,900	0.060	3150	0.020
D420HX-3-2.05	2.05	5,750	0.050	5,750	0.050	5,300	0.050	4,800	0.050	5,750	0.050	5,750	0.060	3100	0.020
D420HX-3-2.1	2.1	5,600	0.050	5,600	0.050	5,150	0.050	4,700	0.050	5,600	0.050	5,600	0.080	3000	0.020
D420HX-3-2.15	2.15	5,450	0.050	5,450	0.050	5,000	0.050	4,600	0.050	5,450	0.050	5,450	0.080	2950	0.030
D420HX-3-2.2	2.2	5,350	0.050	5,350	0.050	4,900	0.050	4,500	0.050	5,350	0.050	5,350	0.080	2900	0.030
D420HX-3-2.25	2.25	5,200	0.060	5,200	0.060	4,800	0.060	4,400	0.060	5,200	0.060	5,200	0.080	2800	0.030
D420HX-3-2.3	2.3	5,100	0.060	5,100	0.060	4,700	0.060	4,300	0.060	5,100	0.060	5,100	0.080	2750	0.030
D420HX-3-2.35	2.35	5,000	0.060	5,000	0.060	4,600	0.060	4,200	0.060	5,000	0.060	5,000	0.080	2700	0.030
D420HX-3-2.4	2.4	4,900	0.060	4,900	0.060	4,500	0.060	4,100	0.060	4,900	0.060	4,900	0.080	2650	0.030
D420HX-3-2.45	2.45	4,800	0.060	4,800	0.060	4,400	0.060	4,000	0.060	4,800	0.060	4,800	0.080	2600	0.030
D420HX-3-2.5	2.5	4,700	0.080	4,700	0.080	4,300	0.080	4,332	0.080	4,700	0.080	4,700	0.100	2550	0.040
D420HX-3-2.55	2.55	4,600	0.080	4,600	0.080	4,250	0.080	3850	0.080	4,600	0.080	4,600	0.100	2500	0.040
D420HX-3-2.6	2.6	4,500	0.080	4,500	0.080	4,150	0.080	3,800	0.080	4,500	0.080	4,500	0.100	2450	0.040
D420HX-3-2.65	2.65	4,450	0.080	4,450	0.080	4,050	0.080	3,700	0.080	4,450	0.080	4,450	0.100	2400	0.040
D420HX-3-2.7	2.7	4,350	0.080	4,350	0.080	4,000	0.080	3,650	0.080	4,350	0.080	4,350	0.100	2350	0.040
D420HX-3-2.75	2.75	4,300	0.090	4,300	0.090	4,000	0.090	3,600	0.090	4,300	0.090	4,300	0.100	2300	0.050
D420HX-3-2.8	2.8	4,200	0.090	4,200	0.090	3,800	0.090	3,500	0.090	4,200	0.090	4,200	0.120	2250	0.050
D420HX-3-2.85	2.85	4,100	0.090	4,100	0.090	3,800	0.090	3,400	0.090	4,100	0.090	4,100	0.120	2200	0.050
D420HX-3-2.9	2.9	4,050	0.090	4,050	0.090	3,700	0.090	3,400	0.090	4,050	0.090	4,050	0.120	2200	0.050
D420HX-3-2.95	2.95	4,000	0.090	4,000	0.090	3,650	0.090	3,350	0.090	4,000	0.090	4,000	0.120	2150	0.050
D420HX-3-3	3	4,000	0.090	4,000	0.090	3,600	0.090	3,300	0.090	4,000	0.090	4,000	0.120	2100	0.050

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

Micro Precision Drills

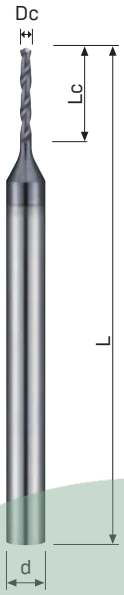
MG Carbide

AlTiCrN HX

30° 5XD

2

<0.19 120° <0.20 140°



Work Material

P	H	M	K	N	S
●		●	●	●	

- **P** Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics

Feature of product:

Micro Precision Drills

140° X-shape drill tip design which included sharp and strength.

Dc. range from 0.1 to 2.0mm with every 0.01mm as size range.

Good wear resistance and lubrication with Nano multilayer coating.

Suitable for drilling application with Steels which is below HRC30, Stainless Steels, Cast Iron, Aluminium, Copper...etc.

Code No. D420HX-5-DC

Dc $^{0}_{-0.005}$	Lc mm	L mm	d h6	AlTiCrN D420HX-5	Dc $^{0}_{-0.005}$	Lc mm	L mm	d h6	AlTiCrN D420HX-5	Dc $^{0}_{-0.005}$	Lc mm	L mm	d h6	AlTiCrN D420HX-5
0.1	0.9	38	3	●	0.7	7	42	3	●	1.3	12	50	3	●
0.11	0.9	38	3	●	0.71	7	42	3	●	1.31	12	50	3	●
0.12	1.1	38	3	●	0.72	7	42	3	●	1.32	12	50	3	●
0.13	1.1	38	3	●	0.73	7	42	3	●	1.33	14	50	3	●
0.14	1.1	38	3	●	0.74	7	42	3	●	1.34	14	50	3	●
0.15	1.4	38	3	●	0.75	7	42	3	●	1.35	14	50	3	●
0.16	1.4	38	3	●	0.76	7.5	42	3	●	1.36	14	50	3	●
0.17	1.4	38	3	●	0.77	7.5	42	3	●	1.37	14	50	3	●
0.18	1.7	38	3	●	0.78	7.5	42	3	●	1.38	14	50	3	●
0.19	1.7	38	3	●	0.79	7.5	42	3	●	1.39	14	50	3	●
0.2	2	38	3	●	0.8	7.5	42	3	●	1.4	14	50	3	●
0.21	2	38	3	●	0.81	7.5	42	3	●	1.41	14	50	3	●
0.22	2	38	3	●	0.82	7.5	42	3	●	1.42	14	50	3	●
0.23	2	38	3	●	0.83	7.5	42	3	●	1.43	14	50	3	●
0.24	2	38	3	●	0.84	7.5	42	3	●	1.44	14	50	3	●
0.25	2	38	3	●	0.85	7.5	42	3	●	1.45	14	50	3	●
0.26	2	38	3	●	0.86	8.5	42	3	●	1.46	14	50	3	●
0.27	2	38	3	●	0.87	8.5	42	3	●	1.47	14	50	3	●
0.28	2	38	3	●	0.88	8.5	42	3	●	1.48	14	50	3	●
0.29	2	38	3	●	0.89	8.5	42	3	●	1.49	14	50	3	●
0.3	2	38	3	●	0.9	8.5	42	3	●	1.5	14	50	3	●
0.31	3	38	3	●	0.91	8.5	42	3	●	1.51	15	50	3	●
0.32	3	38	3	●	0.92	8.5	42	3	●	1.52	15	50	3	●
0.33	3	38	3	●	0.93	8.5	42	3	●	1.53	15	50	3	●
0.34	3	38	3	●	0.94	8.5	42	3	●	1.54	15	50	3	●
0.35	3	38	3	●	0.95	8.5	42	3	●	1.55	15	50	3	●
0.36	3	38	3	●	0.96	9	42	3	●	1.56	15	50	3	●
0.37	3	38	3	●	0.97	9	42	3	●	1.57	15	50	3	●
0.38	3	38	3	●	0.98	9	42	3	●	1.58	15	50	3	●
0.39	4	38	3	●	0.99	9	42	3	●	1.59	15	50	3	●
0.4	4	38	3	●	1	9	42	3	●	1.6	15	50	3	●
0.41	4	38	3	●	1.01	9	42	3	●	1.61	15	54	3	●
0.42	4	38	3	●	1.02	9	42	3	●	1.62	15	54	3	●
0.43	4	38	3	●	1.03	9	42	3	●	1.63	15	54	3	●
0.44	4	38	3	●	1.04	9	42	3	●	1.64	15	54	3	●
0.45	4	38	3	●	1.05	9	42	3	●	1.65	15	54	3	●
0.46	4	38	3	●	1.06	9	42	3	●	1.66	15	54	3	●
0.47	4	38	3	●	1.07	11	50	3	●	1.67	15	54	3	●
0.48	4	38	3	●	1.08	11	50	3	●	1.68	15	54	3	●
0.49	4.5	38	3	●	1.09	11	50	3	●	1.69	15	54	3	●
0.5	4.5	42	3	●	1.1	11	50	3	●	1.7	15	54	3	●
0.51	4.5	42	3	●	1.11	11	50	3	●	1.71	17	54	3	●
0.52	4.5	42	3	●	1.12	11	50	3	●	1.72	17	54	3	●
0.53	4.5	42	3	●	1.13	11	50	3	●	1.73	17	54	3	●
0.54	5.5	42	3	●	1.14	11	50	3	●	1.74	17	54	3	●
0.55	5.5	42	3	●	1.15	11	50	3	●	1.75	17	54	3	●
0.56	5.5	42	3	●	1.16	11	50	3	●	1.76	17	54	3	●
0.57	5.5	42	3	●	1.17	11	50	3	●	1.77	17	54	3	●
0.58	5.5	42	3	●	1.18	11	50	3	●	1.78	17	54	3	●
0.59	5.5	42	3	●	1.19	12	50	3	●	1.79	17	54	3	●
0.6	5.5	42	3	●	1.2	12	50	3	●	1.8	17	54	3	●
0.61	6	42	3	●	1.21	12	50	3	●	1.81	17	54	3	●
0.62	6	42	3	●	1.22	12	50	3	●	1.82	17	54	3	●
0.63	6	42	3	●	1.23	12	50	3	●	1.83	17	54	3	●
0.64	6	42	3	●	1.24	12	50	3	●	1.84	17	54	3	●
0.65	6	42	3	●	1.25	12	50	3	●	1.85	17	54	3	●
0.66	6	42	3	●	1.26	12	50	3	●	1.86	17	54	3	●
0.67	6	42	3	●	1.27	12	50	3	●	1.87	17	54	3	●
0.68	7	42	3	●	1.28	12	50	3	●	1.88	17	54	3	●
0.69	7	42	3	●	1.29	12	50	3	●	1.89	17	54	3	●

Borehole parameters

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.10 Aluminium		GR.11 Copper	
Vc m/min		37		37		34		31		37		37		20	
Code No.	Dc	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)
D420HX-5-0.2	0.2	25,000	0.002	25,000	0.002	25,000	0.002	25,000	0.002	25,000	0.002	25,000	0.004	25,000	0.002
D420HX-5-0.25	0.25	22,500	0.002	22,500	0.002	22,500	0.002	22,500	0.002	22,500	0.002	22,500	0.005	22,500	0.002
D420HX-5-0.3	0.3	20,000	0.003	20,000	0.003	20,000	0.003	20,000	0.003	20,000	0.003	20,000	0.007	20,000	0.003
D420HX-5-0.35	0.35	18,750	0.004	18,750	0.004	18,500	0.004	18,250	0.004	18,750	0.004	18,750	0.009	18,250	0.004
D420HX-5-0.4	0.4	17,500	0.005	17,500	0.005	17,000	0.005	16,500	0.005	17,500	0.005	17,500	0.011	16,500	0.005
D420HX-5-0.45	0.45	16,250	0.006	16,250	0.006	15,500	0.006	14,750	0.006	16,250	0.006	16,250	0.013	14,750	0.006
D420HX-5-0.5	0.5	15,000	0.007	15,000	0.007	14,000	0.007	13,000	0.007	15,000	0.007	15,000	0.015	13,000	0.007
D420HX-5-0.55	0.55	14,750	0.008	14,750	0.008	13,750	0.008	12,820	0.008	14,750	0.008	14,750	0.016	12,450	0.007
D420HX-5-0.6	0.6	14,500	0.008	14,500	0.008	13,500	0.008	12,660	0.008	14,500	0.008	14,500	0.017	11,900	0.007
D420HX-5-0.65	0.65	14,250	0.009	14,250	0.009	13,250	0.009	12,500	0.009	14,250	0.009	14,250	0.018	11,350	0.008
D420HX-5-0.7	0.7	14,000	0.009	14,000	0.009	13,000	0.009	12,320	0.009	14,000	0.009	14,000	0.018	10,800	0.008
D420HX-5-0.75	0.75	13,750	0.010	13,750	0.010	12,750	0.010	12,160	0.010	13,750	0.010	13,750	0.019	10,250	0.008
D420HX-5-0.8	0.8	13,500	0.010	13,500	0.010	12,500	0.010	12,000	0.010	13,500	0.010	13,500	0.020	9,700	0.009
D420HX-5-0.85	0.85	13,000	0.013	13,000	0.013	12,000	0.013	11,320	0.013	13,000	0.013	13,000	0.024	8,600	0.009
D420HX-5-0.9	0.9	12,500	0.016	12,500	0.016	11,500	0.016	10,660	0.016	12,500	0.016	12,500	0.037	7,500	0.010
D420HX-5-1	1	12,000	0.020	12,000	0.020	11,000	0.020	10,000	0.020	12,000	0.020	12,000	0.030	6,400	0.010
D420HX-5-1.05	1.05	11,200	0.020	11,200	0.020	10,800	0.020	9,400	0.020	11,200	0.020	11,200	0.030	6,350	0.010
D420HX-5-1.1	1.1	10,700	0.020	10,700	0.020	9,850	0.020	9,000	0.020	10,700	0.020	10,700	0.030	6,050	0.010
D420HX-5-1.15	1.15	10,250	0.025	10,250	0.025	9,400	0.025	8,550	0.025	10,250	0.025	10,250	0.030	5,500	0.010
D420HX-5-1.2	1.2	9,800	0.025	9,800	0.025	9,000	0.025	8,200	0.025	9,800	0.025	9,800	0.030	5,300	0.010
D420HX-5-1.25	1.25	9,400	0.025	9,400	0.025	8,650	0.025	7,900	0.025	9,400	0.025	9,400	0.040	5,100	0.015
D420HX-5-1.3	1.3	9,000	0.025	9,000	0.025	8,300	0.025	7,600	0.025	9,000	0.025	9,000	0.040	4,900	0.015
D420HX-5-1.35	1.35	8,700	0.030	8,700	0.030	8,000	0.030	7,300	0.030	8,700	0.030	8,700	0.040	4,700	0.015
D420HX-5-1.4	1.4	8,400	0.030	8,400	0.030	7,700	0.030	7,050	0.030	8,400	0.030	8,400	0.050	4,550	0.015
D420HX-5-1.45	1.45	8,100	0.030	8,100	0.030	7,450	0.030	6,800	0.030	8,100	0.030	8,100	0.050	4,400	0.015
D420HX-5-1.5	1.5	7,800	0.030	7,800	0.030	7,200	0.030	6,550	0.030	7,800	0.030	7,800	0.050	4,250	0.020
D420HX-5-1.55	1.55	7,600	0.035	7,600	0.035	7,000	0.035	6,350	0.035	7,600	0.035	7,600	0.050	4,100	0.020
D420HX-5-1.6	1.6	7,350	0.035	7,350	0.035	6,750	0.035	6,150	0.035	7,350	0.035	7,350	0.060	3,950	0.020
D420HX-5-1.65	1.65	7,150	0.035	7,150	0.035	6,550	0.035	5,950	0.035	7,150	0.035	7,150	0.060	3,850	0.020
D420HX-5-1.7	1.7	6,900	0.035	6,900	0.035	6,350	0.035	5,800	0.035	6,900	0.035	6,900	0.060	3,750	0.020
D420HX-5-1.75	1.75	6,700	0.035	6,700	0.035	6,200	0.035	5,650	0.035	6,700	0.035	6,700	0.060	3,650	0.025
D420HX-5-1.8	1.8	6,550	0.040	6,550	0.040	6,000	0.040	5,450	0.040	6,550	0.040	6,550	0.060	3,500	0.025
D420HX-5-1.85	1.85	6,350	0.040	6,350	0.040	5,850	0.040	5,300	0.040	6,350	0.040	6,350	0.060	3,450	0.025

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

D420HX-5

Micro Precision Drills

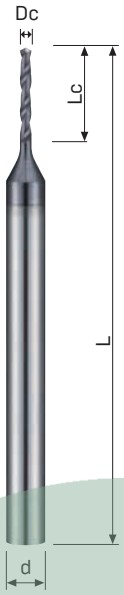
MG Carbide

AlTiCrN HX

30° 5XD

2

<0.19 120° <0.20 140°



Work Material

P	H	M	K	N	S
●		●	●	●	

- **P** Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics

Feature of product:

Micro Precision Drills

140° X-shape drill tip design which included sharp and strength.

Dc. range from 0.1 to 2.0mm with every 0.01mm as size range.

Good wear resistance and lubrication with Nano multilayer coating.

Suitable for drilling application with Steels which is below HRC30, Stainless Steels, Cast Iron, Aluminium, Copper...etc.

Code No. D420HX-5-DC

Dc $^{0}_{-0.005}$	Lc mm	L mm	d h6	AlTiCrN D420HX-5	Dc $^{0}_{-0.005}$	Lc mm	L mm	d h6	AlTiCrN D420HX-5
1.9	17	54	3	●	2.46	22	58	3	●
1.91	18	54	3	●	2.47	22	58	3	●
1.92	18	54	3	●	2.48	22	58	3	●
1.93	18	54	3	●	2.49	22	58	3	●
1.94	18	54	3	●	2.5	22	58	3	●
1.95	18	54	3	●	2.51	22	58	3	●
1.96	18	54	3	●	2.52	22	58	3	●
1.97	18	54	3	●	2.53	22	58	3	●
1.98	18	54	3	●	2.54	22	58	3	●
1.99	18	54	3	●	2.55	22	58	3	●
2.0	18	54	3	●	2.56	22	58	3	●
2.01	18	58	3	●	2.57	22	58	3	●
2.02	18	58	3	●	2.58	22	58	3	●
2.03	18	58	3	●	2.59	22	58	3	●
2.04	18	58	3	●	2.6	22	58	3	●
2.05	18	58	3	●	2.61	22	58	3	●
2.06	18	58	3	●	2.62	22	58	3	●
2.07	18	58	3	●	2.63	22	58	3	●
2.08	18	58	3	●	2.64	22	58	3	●
2.09	18	58	3	●	2.65	22	58	3	●
2.1	18	58	3	●	2.66	25	62	3	●
2.11	18	58	3	●	2.67	25	62	3	●
2.12	18	58	3	●	2.68	25	62	3	●
2.13	20	58	3	●	2.69	25	62	3	●
2.14	20	58	3	●	2.7	25	62	3	●
2.15	20	58	3	●	2.71	25	62	3	●
2.16	20	58	3	●	2.72	25	62	3	●
2.17	20	58	3	●	2.73	25	62	3	●
2.18	20	58	3	●	2.74	25	62	3	●
2.19	20	58	3	●	2.75	25	62	3	●
2.2	20	58	3	●	2.76	25	62	3	●
2.21	20	58	3	●	2.77	25	62	3	●
2.22	20	58	3	●	2.78	25	62	3	●
2.23	20	58	3	●	2.79	25	62	3	●
2.24	20	58	3	●	2.8	25	62	3	●
2.25	20	58	3	●	2.81	25	62	3	●
2.26	20	58	3	●	2.82	25	62	3	●
2.27	20	58	3	●	2.83	25	62	3	●
2.28	20	58	3	●	2.84	25	62	3	●
2.29	20	58	3	●	2.85	25	62	3	●
2.3	20	58	3	●	2.86	25	62	3	●
2.31	20	58	3	●	2.87	25	62	3	●
2.32	20	58	3	●	2.88	25	62	3	●
2.33	20	58	3	●	2.89	25	62	3	●
2.34	20	58	3	●	2.9	25	62	3	●
2.35	20	58	3	●	2.91	25	62	3	●
2.36	20	58	3	●	2.92	25	62	3	●
2.37	22	58	3	●	2.93	25	62	3	●
2.38	22	58	3	●	2.94	25	62	3	●
2.39	22	58	3	●	2.95	25	62	3	●
2.4	22	58	3	●	2.96	25	62	3	●
2.41	22	58	3	●	2.97	25	62	3	●
2.42	22	58	3	●	2.98	25	62	3	●
2.43	22	58	3	●	2.99	25	62	3	●
2.44	22	58	3	●	3	25	62	3	●
2.45	22	58	3	●					

Borehole parameters

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.10 Aluminium		GR.11 Copper	
Vc m/min		37		37		34		31		37		37		20	
Code No.	Dc	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)
D420HX-5-1.9	1.9	6,200	0.040	6,200	0.040	5,700	0.040	5,200	0.040	6,200	0.040	6,200	0.060	3350	0.020
D420HX-5-1.95	1.95	6,000	0.040	6,000	0.040	5,550	0.040	5,050	0.040	6,000	0.040	6,000	0.060	3250	0.020
D420HX-5-2	2	5,900	0.050	5,900	0.050	5,400	0.050	5,000	0.050	5,900	0.050	5,900	0.060	3150	0.020
D420HX-5-2.05	2.05	5,750	0.050	5,750	0.050	5,300	0.050	4,800	0.050	5,750	0.050	5,750	0.060	3100	0.020
D420HX-5-2.1	2.1	5,600	0.050	5,600	0.050	5,150	0.050	4,700	0.050	5,600	0.050	5,600	0.080	3000	0.020
D420HX-5-2.15	2.15	5,450	0.050	5,450	0.050	5,000	0.050	4,600	0.050	5,450	0.050	5,450	0.080	2950	0.030
D420HX-5-2.2	2.2	5,350	0.050	5,350	0.050	4,900	0.050	4,500	0.050	5,350	0.050	5,350	0.080	2900	0.030
D420HX-5-2.25	2.25	5,200	0.060	5,200	0.060	4,800	0.060	4,400	0.060	5,200	0.060	5,200	0.080	2800	0.030
D420HX-5-2.3	2.3	5,100	0.060	5,100	0.060	4,700	0.060	4,300	0.060	5,100	0.060	5,100	0.080	2750	0.030
D420HX-5-2.35	2.35	5,000	0.060	5,000	0.060	4,600	0.060	4,200	0.060	5,000	0.060	5,000	0.080	2700	0.030
D420HX-5-2.4	2.4	4,900	0.060	4,900	0.060	4,500	0.060	4,100	0.060	4,900	0.060	4,900	0.080	2650	0.030
D420HX-5-2.45	2.45	4,800	0.060	4,800	0.060	4,400	0.060	4,000	0.060	4,800	0.060	4,800	0.080	2600	0.030
D420HX-5-2.5	2.5	4,700	0.080	4,700	0.080	4,300	0.080	4,332	0.080	4,700	0.080	4,700	0.100	2550	0.040
D420HX-5-2.55	2.55	4,600	0.080	4,600	0.080	4,250	0.080	3850	0.080	4,600	0.080	4,600	0.100	2500	0.040
D420HX-5-2.6	2.6	4,500	0.080	4,500	0.080	4,150	0.080	3,800	0.080	4,500	0.080	4,500	0.100	2450	0.040
D420HX-5-2.65	2.65	4,450	0.080	4,450	0.080	4,050	0.080	3,700	0.080	4,450	0.080	4,450	0.100	2400	0.040
D420HX-5-2.7	2.7	4,350	0.080	4,350	0.080	4,000	0.080	3,650	0.080	4,350	0.080	4,350	0.100	2350	0.040
D420HX-5-2.75	2.75	4,300	0.090	4,300	0.090	4,000	0.090	3,600	0.090	4,300	0.090	4,300	0.100	2300	0.050
D420HX-5-2.8	2.8	4,200	0.090	4,200	0.090	3,800	0.090	3,500	0.090	4,200	0.090	4,200	0.120	2250	0.050
D420HX-5-2.85	2.85	4,100	0.090	4,100	0.090	3,800	0.090	3,400	0.090	4,100	0.090	4,100	0.120	2200	0.050
D420HX-5-2.9	2.9	4,050	0.090	4,050	0.090	3,700	0.090	3,400	0.090	4,050	0.090	4,050	0.120	2200	0.050
D420HX-5-2.95	2.95	4,000	0.090	4,000	0.090	3,650	0.090	3,350	0.090	4,000	0.090	4,000	0.120	2150	0.050
D420HX-5-3	3	4,000	0.090	4,000	0.090	3,600	0.090	3,300	0.090	4,000	0.090	4,000	0.120	2100	0.050

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

D420HX-8

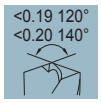
Micro Precision Drills

MG Carbide

AlTiCrN HX







Work Material

P	H	M	K	N	S
●		●	●	●	

- **P** Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics

Feature of product:

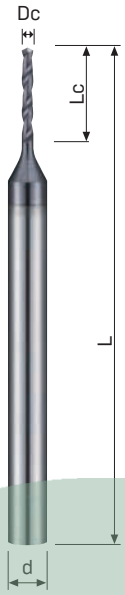
Micro Precision Drills

140° X-shape drill tip design which included sharp and strength.

Dc. range from 0.1 to 2.0mm with every 0.01mm as size range.

Good wear resistance and lubrication with Nano multilayer coating.

Suitable for drilling application with Steels which is below HRC30, Stainless Steels, Cast Iron, Aluminium, Copper...etc.



Code No. D420HX-8-DC

Dc $^{0}_{-0.005}$	Lc mm	L mm	d h6	AlTiCrN D420HX-8
0.1	1.2	38	3	●
0.15	1.8	38	3	●
0.2	2.4	38	3	●
0.25	3	38	3	●
0.3	5	38	3	●
0.35	5	38	3	●
0.4	6	38	3	●
0.45	6	38	3	●
0.5	6	42	3	●
0.55	6.6	42	3	●
0.6	7.2	42	3	●
0.65	7.8	46	3	●
0.7	8.4	46	3	●
0.75	9	46	3	●
0.8	9.6	46	3	●
0.85	10.2	46	3	●
0.9	10.8	46	3	●
0.95	11.4	46	3	●
1	12	46	3	●
1.05	12.6	50	3	●
1.1	13.2	50	3	●
1.15	13.8	50	3	●
1.2	14.4	50	3	●
1.25	15	50	3	●
1.3	15.6	50	3	●
1.35	16.2	54	3	●
1.4	16.8	54	3	●
1.45	17.4	54	3	●
1.5	18	54	3	●
1.55	18.6	54	3	●
1.6	19.2	54	3	●
1.65	19.8	58	3	●
1.7	20.4	58	3	●
1.75	21	58	3	●
1.8	21.6	58	3	●
1.85	22.2	58	3	●

Borehole parameters

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.10 Aluminium		GR.11 Copper	
Vc m/min		37		37		34		31		37		37		20	
Code No.	Dc	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)
D420HX-8-0.2	0.2	25,000	0.002	25,000	0.002	25,000	0.002	22,500	0.002	25,000	0.002	25,000	0.003	22,500	0.002
D420HX-8-0.25	0.25	22,500	0.002	22,500	0.002	22,500	0.002	20,250	0.002	22,500	0.002	22,500	0.004	20,250	0.002
D420HX-8-0.3	0.3	20,000	0.003	20,000	0.003	20,000	0.003	18,000	0.003	20,000	0.003	20,000	0.006	18,000	0.003
D420HX-8-0.35	0.35	18,750	0.004	18,750	0.004	18,750	0.004	16,875	0.004	18,750	0.004	18,750	0.008	16,875	0.003
D420HX-8-0.4	0.4	17,500	0.005	17,500	0.005	17,500	0.005	15,750	0.005	17,500	0.005	17,500	0.010	15,750	0.003
D420HX-8-0.45	0.45	16,250	0.005	16,250	0.005	16,250	0.005	14,625	0.005	16,250	0.005	16,250	0.010	14,625	0.004
D420HX-8-0.5	0.5	15,000	0.006	15,000	0.006	15,000	0.006	13,500	0.005	15,000	0.006	15,000	0.013	13,500	0.004
D420HX-8-0.55	0.55	14,750	0.006	14,750	0.006	14,750	0.006	13,275	0.005	14,750	0.006	14,750	0.015	13,275	0.004
D420HX-8-0.6	0.6	14,500	0.007	14,500	0.007	14,500	0.007	13,050	0.006	14,500	0.007	14,500	0.017	13,050	0.005
D420HX-8-0.65	0.65	14,250	0.007	14,250	0.007	14,250	0.007	12,825	0.006	14,250	0.007	14,250	0.018	12,825	0.005
D420HX-8-0.7	0.7	14,000	0.008	14,000	0.008	14,000	0.008	12,600	0.007	14,000	0.008	14,000	0.018	12,600	0.006
D420HX-8-0.75	0.75	13,750	0.008	13,750	0.008	13,750	0.008	12,375	0.007	13,750	0.008	13,750	0.019	12,375	0.006
D420HX-8-0.8	0.8	13,500	0.011	13,500	0.011	13,500	0.011	12,150	0.010	13,500	0.011	13,500	0.020	12,150	0.007
D420HX-8-0.85	0.85	13,000	0.012	13,000	0.012	13,000	0.012	11,700	0.011	13,000	0.012	13,000	0.024	11,700	0.007
D420HX-8-0.9	0.9	12,500	0.013	12,500	0.013	12,500	0.013	11,250	0.012	12,500	0.013	12,500	0.026	11,250	0.008
D420HX-8-1	1	12,000	0.016	12,000	0.016	12,000	0.016	10,800	0.014	12,000	0.016	12,000	0.030	10,800	0.008
D420HX-8-1.05	1.05	11,200	0.016	11,200	0.016	11,200	0.016	10,080	0.014	11,200	0.016	11,200	0.030	10,080	0.009
D420HX-8-1.1	1.1	10,700	0.016	10,700	0.016	10,700	0.016	9,630	0.014	10,700	0.016	10,700	0.030	9,630	0.009
D420HX-8-1.15	1.15	10,250	0.020	10,250	0.020	10,250	0.020	9,225	0.018	10,250	0.020	10,250	0.030	9,225	0.010
D420HX-8-1.2	1.2	9,800	0.020	9,800	0.020	9,800	0.020	8,820	0.018	9,800	0.020	9,800	0.030	8,820	0.010
D420HX-8-1.25	1.25	9,400	0.020	9,400	0.020	9,400	0.020	8,460	0.018	9,400	0.020	9,400	0.036	8,460	0.010
D420HX-8-1.3	1.3	9,000	0.020	9,000	0.020	9,000	0.020	8,100	0.018	9,000	0.020	9,000	0.040	8,100	0.012
D420HX-8-1.35	1.35	8,700	0.024	8,700	0.024	8,700	0.024	7,830	0.022	8,700	0.024	8,700	0.040	7,830	0.012
D420HX-8-1.4	1.4	8,400	0.024	8,400	0.024	8,400	0.024	7,560	0.022	8,400	0.024	8,400	0.045	7,560	0.013
D420HX-8-1.45	1.45	8,100	0.024	8,100	0.024	8,100	0.024	7,290	0.022	8,100	0.024	8,100	0.050	7,290	0.013
D420HX-8-1.5	1.5	7,800	0.024	7,800	0.024	7,800	0.024	7,020	0.022	7,800	0.024	7,800	0.050	7,020	0.014
D420HX-8-1.55	1.55	7,600	0.028	7,600	0.028	7,600	0.028	6,840	0.025	7,600	0.028	7,600	0.055	6,840	0.014
D420HX-8-1.6	1.6	7,350	0.028	7,350	0.028	7,350	0.028	6,615	0.025	7,350	0.028	7,350	0.060	6,615	0.015
D420HX-8-1.65	1.65	7,150	0.028	7,150	0.028	7,150	0.028	6,435	0.025	7,150	0.028	7,150	0.060	6,435	0.015
D420HX-8-1.7	1.7	6,900	0.028	6,900	0.028	6,900	0.028	6,210	0.025	6,900	0.028	6,900	0.060	6,210	0.016
D420HX-8-1.75	1.75	6,700	0.028	6,700	0.028	6,700	0.028	6,030	0.025	6,700	0.028	6,700	0.060	6,030	0.016
D420HX-8-1.8	1.8	6,550	0.032	6,550	0.032	6,550	0.032	5,895	0.029	6,550	0.032	6,550	0.060	5,895	0.016
D420HX-8-1.85	1.85	6,350	0.032	6,350	0.032	6,350	0.032	5,715	0.029	6,350	0.032	6,350	0.060	5,715	0.016

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

D420HX-8

Micro Precision Drills

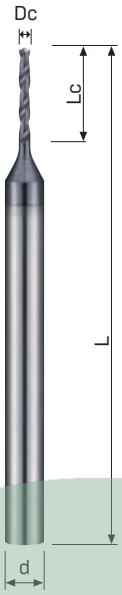
MG Carbide

AlTiCrN HX

30° 8XD

2

<0.19 120°
<0.20 140°



Work Material

P	H	M	K	N	S
●		●	●	●	

- P Steel
- M Stainless Steel
- K Cast Iron
- N Aluminium
- N Copper
- N Plastics

Feature of product:

Micro Precision Drills

140° X-shape drill tip design which included sharp and strength.

Dc. range from 0.1 to 2.0mm with every 0.01mm as size range.

Good wear resistance and lubrication with Nano multilayer coating.

Suitable for drilling application with Steels which is below HRC30, Stainless Steels, Cast Iron, Aluminium, Copper...etc.

Code No. D420HX-8-DC

Dc 0 -0.005	Lc mm	L mm	d h6	AlTiCrN D420HX-8
1.9	22.8	58	3	●
1.95	23.4	58	3	●
2.0	24	58	3	●
2.05	24.6	62	3	●
2.1	25.2	62	3	●
2.15	25.8	62	3	●
2.2	26.4	62	3	●
2.25	27	62	3	●
2.3	27.6	62	3	●
2.35	28.2	62	3	●
2.4	28.8	62	3	●
2.45	29.4	66	3	●
2.5	30	66	3	●
2.55	30.6	66	3	●
2.6	31.2	66	3	●
2.65	31.8	66	3	●
2.7	32.4	66	3	●
2.75	33	66	3	●
2.8	33.6	66	3	●
2.85	34.2	66	3	●
2.9	34.8	66	3	●
2.95	35.4	66	3	●
3	36	66	3	●

Borehole parameters

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.10 Aluminium		GR.11 Copper	
Vc m/min		37		37		34		31		37		37		20	
Code No.	Dc	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)
D420HX-8-1.9	1.9	6,200	0.032	6,200	0.032	5,700	0.030	5,200	0.030	6,200	0.040	6,200	0.060	3,350	0.016
D420HX-8-1.95	1.95	6,000	0.032	6,000	0.032	5,550	0.030	5,050	0.030	6,000	0.040	6,000	0.060	3,250	0.016
D420HX-8-2	2	5,900	0.040	5,900	0.040	5,400	0.036	5,000	0.036	5,900	0.050	5,900	0.060	3,150	0.018
D420HX-8-2.05	2.05	5,750	0.040	5,750	0.040	5,300	0.036	4,800	0.036	5,750	0.050	5,750	0.060	3,100	0.018
D420HX-8-2.1	2.1	5,600	0.040	5,600	0.040	5,150	0.036	4,700	0.036	5,600	0.050	5,600	0.080	3,000	0.020
D420HX-8-2.15	2.15	5,450	0.040	5,450	0.040	5,000	0.036	4,600	0.036	5,450	0.050	5,450	0.080	2,950	0.020
D420HX-8-2.2	2.2	5,350	0.040	5,350	0.040	4,900	0.036	4,500	0.036	5,350	0.050	5,350	0.080	2,900	0.024
D420HX-8-2.25	2.25	5,200	0.048	5,200	0.048	4,800	0.045	4,400	0.045	5,200	0.060	5,200	0.080	2,800	0.024
D420HX-8-2.3	2.3	5,100	0.048	5,100	0.048	4,700	0.045	4,300	0.045	5,100	0.060	5,100	0.080	2,750	0.024
D420HX-8-2.35	2.35	5,000	0.048	5,000	0.048	4,600	0.045	4,200	0.045	5,000	0.060	5,000	0.080	2,700	0.024
D420HX-8-2.4	2.4	4,900	0.048	4,900	0.048	4,500	0.045	4,100	0.045	4,900	0.060	4,900	0.080	2,650	0.024
D420HX-8-2.45	2.45	4,800	0.048	4,800	0.048	4,400	0.045	4,000	0.045	4,800	0.060	4,800	0.080	2,600	0.024
D420HX-8-2.5	2.5	4,700	0.064	4,700	0.064	4,300	0.060	4,330	0.060	4,700	0.080	4,700	0.100	2,550	0.036
D420HX-8-2.55	2.55	4,600	0.064	4,600	0.064	450	0.060	3,850	0.060	4,600	0.080	4,600	0.100	2,500	0.036
D420HX-8-2.6	2.6	4,500	0.064	4,500	0.064	4,150	0.060	3,800	0.060	4,500	0.080	4,500	0.100	2,450	0.036
D420HX-8-2.65	2.65	4,450	0.064	4,450	0.064	4,050	0.060	3,700	0.060	4,450	0.080	4,450	0.100	2,400	0.036
D420HX-8-2.7	2.7	4,350	0.064	4,350	0.064	4,000	0.060	3,650	0.060	4,350	0.080	4,350	0.100	2,350	0.036
D420HX-8-2.75	2.75	4,300	0.072	4,300	0.072	4,000	0.070	3,600	0.070	4,300	0.090	4,300	0.100	2,300	0.050
D420HX-8-2.8	2.8	4,200	0.072	4,200	0.072	3,800	0.070	3,500	0.070	4,200	0.090	4,200	0.120	2,250	0.050
D420HX-8-2.85	2.85	4,100	0.072	4,100	0.072	3,800	0.070	3,400	0.070	4,100	0.090	4,100	0.120	2,200	0.050
D420HX-8-2.9	2.9	4,050	0.072	4,050	0.072	3,700	0.070	3,400	0.070	4,050	0.090	4,050	0.120	2,200	0.050
D420HX-8-2.95	2.95	4,000	0.072	4,000	0.072	3,650	0.070	3,350	0.070	4,000	0.090	4,000	0.120	2,150	0.050
D420HX-8-3	3	4,000	0.072	4,000	0.072	3,600	0.070	3,300	0.070	4,000	0.090	4,000	0.120	2,100	0.050

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

D421TX

High Performance Drills

MG Carbide

AlTiSiN TX

3XD

2

140°

Work Material

P	H	M	K	N	S
●	●	○	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

JIS 3XD Drills

140° S-shape drill tip design to reduce axial force.

Design with groove shape to provide higher chip removal rates.

Good wear resistance and lubrication with Nano multilayer coating.

Application for drilling with Steels which is below HRC48, Cast Iron, Aluminium...etc.

Suitable for drilling with 3XD depth.



Code No. D421TX-Dc

Dc h7	Lc mm	L mm	d h6	AlTiSiN D421TX
1	6	50	3	●
1.1	6	50	3	●
1.2	6	50	3	●
1.3	6	50	3	●
1.4	6	50	3	●
1.5	6	50	3	●
1.6	8	50	3	●
1.7	8	50	3	●
1.8	8	50	3	●
1.9	8	50	3	●
2	8	50	3	●
2.1	10	62	3	●
2.2	10	62	3	●
2.3	10	62	3	●
2.4	10	62	3	●
2.5	10	62	3	●
2.6	13	62	3	●
2.7	13	62	3	●
2.8	13	62	3	●
2.9	13	62	3	●
3	13	62	3	●
3.1	19	66	4	●
3.2	19	66	4	●
3.3	19	66	4	●
3.4	19	66	4	●
3.5	19	66	4	●
3.6	21	66	4	●
3.7	21	66	4	●
3.8	21	66	4	●
3.9	21	66	4	●
4	21	66	4	●
4.1	23	66	5	●
4.2	23	66	5	●
4.3	23	66	5	●
4.4	23	66	5	●
4.5	23	66	5	●
4.6	25	66	5	●
4.7	25	66	5	●
4.8	25	66	5	●
4.9	25	66	5	●
5	25	66	5	●
5.1	28	66	6	●
5.2	28	66	6	●
5.3	28	66	6	●
5.4	28	66	6	●
5.5	28	66	6	●
5.6	28	66	6	●
5.7	28	66	6	●
5.8	28	66	6	●
5.9	28	66	6	●
6	28	66	6	●
6.1	34	79	7	●
6.2	34	79	7	●
6.3	34	79	7	●
6.4	34	79	7	●
6.5	34	79	7	●
6.6	34	79	7	●
6.7	34	79	7	●
6.8	34	79	7	●
6.9	34	79	7	●

Dc h7	Lc mm	L mm	d h6	AlTiSiN D421TX
7	34	79	7	●
7.1	41	79	8	●
7.2	41	79	8	●
7.3	41	79	8	●
7.4	41	79	8	●
7.5	41	79	8	●
7.6	41	79	8	●
7.7	41	79	8	●
7.8	41	79	8	●
7.9	41	79	8	●
8	41	79	8	●
8.1	47	89	9	●
8.2	47	89	9	●
8.3	47	89	9	●
8.4	47	89	9	●
8.5	47	89	9	●
8.6	47	89	9	●
8.7	47	89	9	●
8.8	47	89	9	●
8.9	47	89	9	●
9	47	89	9	●
9.1	47	89	10	●
9.2	47	89	10	●
9.3	47	89	10	●
9.4	47	89	10	●
9.5	47	89	10	●
9.6	47	89	10	●
9.7	47	89	10	●
9.8	47	89	10	●
9.9	47	89	10	●
10	47	89	10	●
10.1	55	102	11	●
10.2	55	102	11	●
10.3	55	102	11	●
10.4	55	102	11	●
10.5	55	102	11	●
10.6	55	102	11	●
10.7	55	102	11	●
10.8	55	102	11	●
10.9	55	102	11	●
11	55	102	11	●
11.1	55	102	12	●
11.2	55	102	12	●
11.3	55	102	12	●
11.4	55	102	12	●
11.5	55	102	12	●
11.6	55	102	12	●
11.7	55	102	12	●
11.8	55	102	12	●
11.9	55	102	12	●
12	55	102	12	●
12.5	60	107	13	●
13	60	107	13	●
13.5	60	107	14	●
14	60	107	14	●
14.5	65	115	15	●
15	65	115	15	●
15.5	65	115	16	●
16	65	115	16	●

Borehole parameters

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.9 Cast Iron	
Vc m/min		60~100		60~100		60~100		40~65		30~45		60~100	
Code No.	Dc	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)
D421TX-1	1	19,000	0.03	19,000	0.03	19,000	0.03	12,000	0.02	10,000	0.02	19,000	0.03
D421TX-1.5	1.5	15,000	0.04	15,000	0.04	15,000	0.04	9,800	0.04	8,000	0.04	15,000	0.04
D421TX-2	2	11,000	0.06	11,000	0.06	11,000	0.06	7,600	0.06	6,000	0.06	11,000	0.06
D421TX-2.5	2.5	9,500	0.07	9,500	0.07	9,500	0.07	6,300	0.07	5,000	0.07	9,500	0.07
D421TX-3	3	8,000	0.09	8,000	0.09	8,000	0.09	5,000	0.09	4,000	0.09	8,000	0.09
D421TX-3.5	3.5	7,100	0.09	7,100	0.09	7,100	0.09	4,400	0.09	3,900	0.09	7,100	0.09
D421TX-4	4	6,300	0.10	6,300	0.10	6,300	0.10	3,800	0.10	3,800	0.10	6,300	0.10
D421TX-4.5	4.5	5,600	0.11	5,600	0.11	5,600	0.11	3,400	0.11	3,400	0.11	5,600	0.11
D421TX-5	5	5,000	0.12	5,000	0.12	5,000	0.12	3,000	0.12	3,000	0.12	5,000	0.12
D421TX-5.5	5.5	4,600	0.13	4,600	0.13	4,600	0.13	2,800	0.13	2,800	0.13	4,600	0.13
D421TX-6	6	4,200	0.14	4,200	0.14	4,200	0.14	2,600	0.14	2,600	0.14	4,200	0.14
D421TX-6.5	6.5	3,950	0.14	3,950	0.14	3,950	0.14	2,400	0.14	2,400	0.14	3,950	0.14
D421TX-7	7	3,700	0.15	3,700	0.15	3,700	0.15	2,250	0.15	2,250	0.15	3,700	0.15
D421TX-7.5	7.5	3,450	0.15	3,450	0.15	3,450	0.15	2,050	0.15	2,050	0.15	3,450	0.15
D421TX-8	8	3,200	0.16	3,200	0.16	3,200	0.16	1,900	0.16	1,900	0.16	3,200	0.16
D421TX-8.5	8.5	3,000	0.16	3,000	0.16	3,000	0.16	1,825	0.16	1,825	0.16	3,000	0.16
D421TX-9	9	2,870	0.17	2,870	0.17	2,870	0.17	1,750	0.17	1,750	0.17	2,870	0.17
D421TX-9.5	9.5	2,700	0.17	2,700	0.17	2,700	0.17	1,675	0.17	1,675	0.17	2,700	0.17
D421TX-10	10	2,550	0.18	2,550	0.18	2,550	0.18	1,600	0.18	1,600	0.18	2,550	0.18
D421TX-10.5	10.5	2,420	0.18	2,420	0.18	2,420	0.18	1,525	0.18	1,525	0.18	2,420	0.18
D421TX-11	11	2,320	0.19	2,320	0.19	2,320	0.19	1,450	0.19	1,450	0.19	2,320	0.19
D421TX-11.5	11.5	2,200	0.19	2,200	0.19	2,200	0.19	1,375	0.19	1,375	0.19	2,200	0.19
D421TX-12	12	2,100	0.20	2,100	0.20	2,100	0.20	1,300	0.20	1,300	0.20	2,100	0.20
D421TX-12.5	12.5	2,025	0.20	2,025	0.20	2,025	0.20	1,250	0.20	1,250	0.20	2,025	0.20
D421TX-13	13	1,950	0.21	1,950	0.21	1,950	0.21	1,200	0.21	1,200	0.21	1,950	0.21
D421TX-13.5	13.5	1,875	0.21	1,875	0.21	1,875	0.21	1,150	0.21	1,150	0.21	1,875	0.21
D421TX-14	14	1,800	0.22	1,800	0.22	1,800	0.22	1,100	0.22	1,100	0.22	1,800	0.22
D421TX-14.5	14.5	1,750	0.22	1,750	0.22	1,750	0.22	1,055	0.22	1,055	0.22	1,750	0.22
D421TX-15	15	1,700	0.23	1,700	0.23	1,700	0.23	1,025	0.23	1,025	0.23	1,700	0.23
D421TX-15.5	15.5	1,650	0.23	1,650	0.23	1,650	0.23	980	0.24	980	0.24	1,650	0.23
D421TX-16	16	1,600	0.25	1,600	0.25	1,600	0.25	950	0.25	950	0.25	1,600	0.25

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

D422TX

High Performance Drills

MG Carbide

AlTiSiN TX

5XD

2

140°

Work Material

P	H	M	K	N	S
●	●	○	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys



Feature of product:

JIS 5XD Drills

140° S-shape drill tip design to reduce axial force.

Design with groove shape to provide higher chip removal rates.

Good wear resistance and lubrication with Nano multilayer coating.

Application for drilling with Steels which is below HRC48, Cast Iron, Aluminium...etc.

Suitable for drilling with 5XD depth.

Code No. D422TX-Dc

Dc h7	Lc mm	L mm	d h6	AlTiSiN D422TX	Dc h7	Lc mm	L mm	d h6	AlTiSiN D422TX
1	12	62	3	●	7	53	91	7	●
1.1	12	62	3	●	7.1	53	91	8	●
1.2	12	62	3	●	7.2	53	91	8	●
1.3	12	62	3	●	7.3	53	91	8	●
1.4	12	62	3	●	7.4	53	91	8	●
1.5	12	62	3	●	7.5	53	91	8	●
1.6	15	62	3	●	7.6	53	91	8	●
1.7	15	62	3	●	7.7	53	91	8	●
1.8	15	62	3	●	7.8	53	91	8	●
1.9	15	62	3	●	7.9	53	91	8	●
2	15	62	3	●	8	53	91	8	●
2.1	18	66	3	●	8.1	61	103	9	●
2.2	18	66	3	●	8.2	61	103	9	●
2.3	18	66	3	●	8.3	61	103	9	●
2.4	18	66	3	●	8.4	61	103	9	●
2.5	18	66	3	●	8.5	61	103	9	●
2.6	20	66	3	●	8.6	61	103	9	●
2.7	20	66	3	●	8.7	61	103	9	●
2.8	20	66	3	●	8.8	61	103	9	●
2.9	20	66	3	●	8.9	61	103	9	●
3	20	66	3	●	9	61	103	9	●
3.1	24	74	4	●	9.1	61	103	10	●
3.2	24	74	4	●	9.2	61	103	10	●
3.3	24	74	4	●	9.3	61	103	10	●
3.4	24	74	4	●	9.4	61	103	10	●
3.5	24	74	4	●	9.5	61	103	10	●
3.6	28	74	4	●	9.6	61	103	10	●
3.7	28	74	4	●	9.7	61	103	10	●
3.8	28	74	4	●	9.8	61	103	10	●
3.9	28	74	4	●	9.9	61	103	10	●
4	28	74	4	●	10	61	103	10	●
4.1	32	74	5	●	10.1	71	118	11	●
4.2	32	74	5	●	10.2	71	118	11	●
4.3	32	74	5	●	10.3	71	118	11	●
4.4	32	74	5	●	10.4	71	118	11	●
4.5	32	74	5	●	10.5	71	118	11	●
4.6	38	74	5	●	10.6	71	118	11	●
4.7	38	74	5	●	10.7	71	118	11	●
4.8	38	74	5	●	10.8	71	118	11	●
4.9	38	74	5	●	10.9	71	118	11	●
5	38	74	5	●	11	71	118	11	●
5.1	44	82	6	●	11.1	71	118	12	●
5.2	44	82	6	●	11.2	71	118	12	●
5.3	44	82	6	●	11.3	71	118	12	●
5.4	44	82	6	●	11.4	71	118	12	●
5.5	44	82	6	●	11.5	71	118	12	●
5.6	44	82	6	●	11.6	71	118	12	●
5.7	44	82	6	●	11.7	71	118	12	●
5.8	44	82	6	●	11.8	71	118	12	●
5.9	44	82	6	●	11.9	71	118	12	●
6	44	82	6	●	12	71	118	12	●
6.1	53	91	7	●	12.5	77	124	13	●
6.2	53	91	7	●	13	77	124	13	●
6.3	53	91	7	●	13.5	77	124	14	●
6.4	53	91	7	●	14	77	124	14	●
6.5	53	91	7	●	14.5	83	133	15	●
6.6	53	91	7	●	15	83	133	15	●
6.7	53	91	7	●	15.5	83	133	16	●
6.8	53	91	7	●	16	83	133	16	●
6.9	53	91	7	●					

Borehole parameters

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.9 Cast Iron	
Vc m/min		60~100		60~100		60~100		40~65		30~45		60~100	
Code No.	Dc	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)
D422TX-1	1	19,000	0.03	19,000	0.03	19,000	0.03	12,000	0.02	10,000	0.02	19,000	0.03
D422TX-1.5	1.5	15,000	0.04	15,000	0.04	15,000	0.04	9,800	0.04	8,000	0.04	15,000	0.04
D422TX-2	2	11,000	0.06	11,000	0.06	11,000	0.06	7,600	0.06	6,000	0.06	11,000	0.06
D422TX-2.5	2.5	9,500	0.07	9,500	0.07	9,500	0.07	6,300	0.07	5,000	0.07	9,500	0.07
D422TX-3	3	8,000	0.09	8,000	0.09	8,000	0.09	5,000	0.09	4,000	0.09	8,000	0.09
D422TX-3.5	3.5	7,100	0.09	7,100	0.09	7,100	0.09	4,400	0.09	3,900	0.09	7,100	0.09
D422TX-4	4	6,300	0.10	6,300	0.10	6,300	0.10	3,800	0.10	3,800	0.10	6,300	0.10
D422TX-4.5	4.5	5,600	0.11	5,600	0.11	5,600	0.11	3,400	0.11	3,400	0.11	5,600	0.11
D422TX-5	5	5,000	0.12	5,000	0.12	5,000	0.12	3,000	0.12	3,000	0.12	5,000	0.12
D422TX-5.5	5.5	4,600	0.13	4,600	0.13	4,600	0.13	2,800	0.13	2,800	0.13	4,600	0.13
D422TX-6	6	4,200	0.14	4,200	0.14	4,200	0.14	2,600	0.14	2,600	0.14	4,200	0.14
D422TX-6.5	6.5	3,950	0.14	3,950	0.14	3,950	0.14	2,400	0.14	2,400	0.14	3,950	0.14
D422TX-7	7	3,700	0.15	3,700	0.15	3,700	0.15	2,250	0.15	2,250	0.15	3,700	0.15
D422TX-7.5	7.5	3,450	0.15	3,450	0.15	3,450	0.15	2,050	0.15	2,050	0.15	3,450	0.15
D422TX-8	8	3,200	0.16	3,200	0.16	3,200	0.16	1,900	0.16	1,900	0.16	3,200	0.16
D422TX-8.5	8.5	3,000	0.16	3,000	0.16	3,000	0.16	1,825	0.16	1,825	0.16	3,000	0.16
D422TX-9	9	2,870	0.17	2,870	0.17	2,870	0.17	1,750	0.17	1,750	0.17	2,870	0.17
D422TX-9.5	9.5	2,700	0.17	2,700	0.17	2,700	0.17	1,675	0.17	1,675	0.17	2,700	0.17
D422TX-10	10	2,550	0.18	2,550	0.18	2,550	0.18	1,600	0.18	1,600	0.18	2,550	0.18
D422TX-10.5	10.5	2,420	0.18	2,420	0.18	2,420	0.18	1,525	0.18	1,525	0.18	2,420	0.18
D422TX-11	11	2,320	0.19	2,320	0.19	2,320	0.19	1,450	0.19	1,450	0.19	2,320	0.19
D422TX-11.5	11.5	2,200	0.19	2,200	0.19	2,200	0.19	1,375	0.19	1,375	0.19	2,200	0.19
D422TX-12	12	2,100	0.20	2,100	0.20	2,100	0.20	1,300	0.20	1,300	0.20	2,100	0.20
D422TX-12.5	12.5	2,025	0.20	2,025	0.20	2,025	0.20	1,250	0.20	1,250	0.20	2,025	0.20
D422TX-13	13	1,950	0.21	1,950	0.21	1,950	0.21	1,200	0.21	1,200	0.21	1,950	0.21
D422TX-13.5	13.5	1,875	0.21	1,875	0.21	1,875	0.21	1,150	0.21	1,150	0.21	1,875	0.21
D422TX-14	14	1,800	0.22	1,800	0.22	1,800	0.22	1,100	0.22	1,100	0.22	1,800	0.22
D422TX-14.5	14.5	1,750	0.22	1,750	0.22	1,750	0.22	1,055	0.22	1,055	0.22	1,750	0.22
D422TX-15	15	1,700	0.23	1,700	0.23	1,700	0.23	1,025	0.23	1,025	0.23	1,700	0.23
D422TX-15.5	15.5	1,650	0.23	1,650	0.23	1,650	0.23	980	0.24	980	0.24	1,650	0.23
D422TX-16	16	1,600	0.25	1,600	0.25	1,600	0.25	950	0.25	950	0.25	1,600	0.25

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

D423TX-3

Oil-Feed High Performance Drills

MG Carbide

AlTiSiN TX

3XD

2

140°

Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

JIS 3XD Drills with Oil-Feed

140° S-shape drill tip design to reduce axial force.

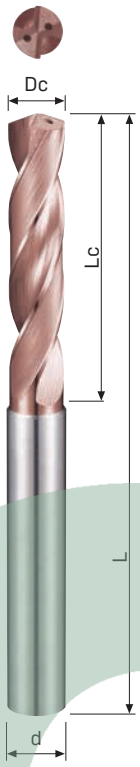
Design with groove shape to provide higher chip removal rates.

Good wear resistance and lubrication with Nano multilayer coating.

Oil-feed design could reduce temperature effectively and increase chip removal rates during cutting process.

Application for drilling with Steels which is below HRC48, Cast Iron... etc.

Suitable for drilling with 3XD depth.



Code No. D423TX-3-Dc

Dc h7	Lc mm	L mm	d h6	AlTiSiN D423TX-3
2	13	60	3	●
2.1	15	66	3	●
2.2	15	66	3	●
2.3	15	66	3	●
2.4	15	66	3	●
2.5	15	66	3	●
2.6	18	66	3	●
2.7	18	66	3	●
2.8	18	66	3	●
2.9	18	66	3	●
3	18	66	3	●
3.1	20	74	4	●
3.2	20	74	4	●
3.3	20	74	4	●
3.4	20	74	4	●
3.5	20	74	4	●
3.6	23	74	4	●
3.7	23	74	4	●
3.8	23	74	4	●
3.9	23	74	4	●
4	23	74	4	●
4.1	25	80	5	●
4.2	25	80	5	●
4.3	25	80	5	●
4.4	25	80	5	●
4.5	25	80	5	●
4.6	28	80	5	●
4.7	28	80	5	●
4.8	28	80	5	●
4.9	28	80	5	●
5	28	80	5	●
5.1	28	82	6	●
5.2	28	82	6	●
5.3	28	82	6	●
5.4	28	82	6	●
5.5	28	82	6	●
5.6	30	82	6	●
5.7	30	82	6	●
5.8	30	82	6	●
5.9	30	82	6	●
6	30	82	6	●
6.1	33	88	7	●
6.2	33	88	7	●
6.3	33	88	7	●
6.4	33	88	7	●
6.5	33	88	7	●
6.6	35	88	7	●
6.7	35	88	7	●
6.8	35	88	7	●
6.9	35	88	7	●
7	35	88	7	●
7.1	38	91	8	●
7.2	38	91	8	●
7.3	38	91	8	●
7.4	38	91	8	●
7.5	38	91	8	●

Dc h7	Lc mm	L mm	d h6	AlTiSiN D423TX-3
7.6	40	91	8	●
7.7	40	91	8	●
7.8	40	91	8	●
7.9	40	91	8	●
8	40	91	8	●
8.1	43	100	9	●
8.2	43	100	9	●
8.3	43	100	9	●
8.4	43	100	9	●
8.5	43	100	9	●
8.6	45	100	9	●
8.7	45	100	9	●
8.8	45	100	9	●
8.9	45	100	9	●
9	45	100	9	●
9.1	48	103	10	●
9.2	48	103	10	●
9.3	48	103	10	●
9.4	48	103	10	●
9.5	48	103	10	●
9.6	50	103	10	●
9.7	50	103	10	●
9.8	50	103	10	●
9.9	50	103	10	●
10	50	103	10	●
10.1	53	116	11	●
10.2	53	116	11	●
10.3	53	116	11	●
10.4	53	116	11	●
10.5	53	116	11	●
10.6	55	116	11	●
10.7	55	116	11	●
10.8	55	116	11	●
10.9	55	116	11	●
11	55	116	11	●
11.1	58	118	12	●
11.2	58	118	12	●
11.3	58	118	12	●
11.4	58	118	12	●
11.5	58	118	12	●
11.6	60	118	12	●
11.7	60	118	12	●
11.8	60	118	12	●
11.9	60	118	12	●
12	60	118	12	●
12.5	63	128	14	●
13	65	128	14	●
13.5	68	134	14	●
14	70	134	14	●
14.5	73	140	16	●
15	75	140	16	●
15.5	78	146	16	●
16	80	146	16	●

Borehole parameters

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron	
Vc m/min		80~150		80~150		80~150		40~70		32~50		50~80		80~150	
Code No.	Dc	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)
D423TX-3-2	2	19,000	0.07	19,000	0.07	19,000	0.07	9,550	0.07	7,960	0.05	9,550	0.07	19,000	0.07
D423TX-3-2.5	2.5	15,300	0.08	15,300	0.08	15,300	0.08	7,600	0.08	6,370	0.06	7,650	0.08	15,300	0.08
D423TX-3-3	3	13,000	0.09	13,000	0.09	13,000	0.09	6,400	0.09	5,300	0.07	6,300	0.09	13,000	0.09
D423TX-3-3.5	3.5	11,250	0.09	11,250	0.09	11,250	0.09	5,600	0.09	4,600	0.07	5,500	0.09	11,250	0.09
D423TX-3-4	4	9,500	0.10	9,500	0.10	9,500	0.10	4,800	0.10	4,000	0.08	4,700	0.10	9,500	0.10
D423TX-3-4.5	4.5	8,550	0.11	8,550	0.11	8,550	0.11	4,300	0.11	3,600	0.09	4,250	0.11	8,550	0.11
D423TX-3-5	5	7,600	0.12	7,600	0.12	7,600	0.12	3,800	0.12	3,200	0.10	3,800	0.12	7,600	0.12
D423TX-3-5.5	5.5	7,000	0.13	7,000	0.13	7,000	0.13	3,500	0.13	2,900	0.11	3,500	0.13	7,000	0.13
D423TX-3-6	6	6,400	0.14	6,400	0.14	6,400	0.14	3,200	0.14	2,650	0.12	3,200	0.14	6,400	0.14
D423TX-3-6.5	6.5	6,000	0.14	6,000	0.14	6,000	0.14	3,000	0.14	2,450	0.12	3,000	0.14	6,000	0.14
D423TX-3-7	7	5,600	0.15	5,600	0.15	5,600	0.15	2,800	0.15	1,300	0.13	2,800	0.15	5,600	0.15
D423TX-3-7.5	7.5	5,200	0.15	5,200	0.15	5,200	0.15	2,600	0.15	1,250	0.13	2,600	0.15	5,200	0.15
D423TX-3-8	8	4,800	0.16	4,800	0.16	4,800	0.16	2,400	0.16	2,000	0.14	2,400	0.16	4,800	0.16
D423TX-3-8.5	8.5	4,550	0.16	4,550	0.16	4,550	0.16	2,275	0.16	1,900	0.14	2,275	0.16	4,550	0.16
D423TX-3-9	9	4,300	0.17	4,300	0.17	4,300	0.17	2,150	0.17	1,800	0.15	2,150	0.17	4,300	0.17
D423TX-3-9.5	9.5	4,050	0.17	4,050	0.17	4,050	0.17	2,025	0.17	1,700	0.15	2,025	0.17	4,050	0.17
D423TX-3-10	10	3,800	0.18	3,800	0.18	3,800	0.18	1,900	0.18	1,600	0.15	1,900	0.18	3,800	0.18
D423TX-3-10.5	10.5	3,650	0.18	3,650	0.18	3,650	0.18	1,825	0.18	1,525	0.15	1,825	0.18	3,650	0.18
D423TX-3-11	11	3,500	0.19	3,500	0.19	3,500	0.19	1,750	0.19	1,450	0.16	1,750	0.19	3,500	0.19
D423TX-3-11.5	11.5	3,350	0.19	3,350	0.19	3,350	0.19	1,675	0.19	1,375	0.16	1,675	0.19	3,350	0.19
D423TX-3-12	12	3,200	0.20	3,200	0.20	3,200	0.20	1,600	0.20	1,300	0.17	1,600	0.20	3,200	0.20
D423TX-3-12.5	12.5	3,075	0.20	3,075	0.20	3,075	0.20	1,535	0.20	1,275	0.17	1,535	0.20	3,075	0.20
D423TX-3-13	13	2,950	0.21	2,950	0.21	2,950	0.21	1,475	0.21	1,250	0.18	1,475	0.21	2,950	0.21
D423TX-3-13.5	13.5	2,775	0.21	2,775	0.21	2,775	0.21	1,400	0.21	1,225	0.18	1,400	0.21	2,775	0.21
D423TX-3-14	14	2,700	0.22	2,700	0.22	2,700	0.22	1,350	0.22	1,200	0.18	1,350	0.22	2,700	0.22
D423TX-3-14.5	14.5	2,625	0.23	2,625	0.23	2,625	0.23	1,310	0.23	1,150	0.18	1,310	0.23	2,625	0.23
D423TX-3-15	15	2,550	0.24	2,550	0.24	2,550	0.24	1,275	0.24	1,100	0.19	1,275	0.24	2,550	0.24
D423TX-3-15.5	15.5	2,475	0.24	2,475	0.24	2,475	0.24	1,235	0.24	1,050	0.19	1,235	0.24	2,475	0.24
D423TX-3-16	16	2,400	0.25	2,400	0.25	2,400	0.25	1,200	0.25	1,000	0.20	1,200	0.25	2,400	0.25

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

D423TX-5

Oil-Feed High Performance Drills

MG Carbide

AlTiSiN TX

5XD

2

140°

Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

JIS 5XD Drills with Oil-Feed

140° S-shape drill tip design to reduce axial force.

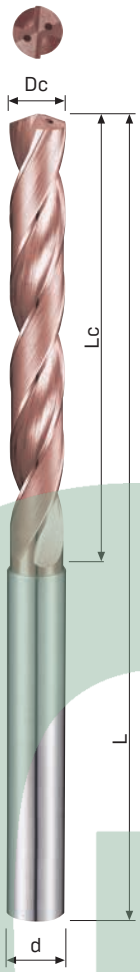
Design with groove shape to provide higher chip removal rates.

Good wear resistance and lubrication with Nano multilayer coating.

Oil-feed design could reduce temperature effectively and increase chip removal rates during cutting process.

Application for drilling with Steels which is below HRC48, Cast Iron... etc.

Suitable for drilling with 5XD depth.



Code No. D423TX-5-Dc

Dc h7	Lc mm	L mm	d h6	AlTiSiN D423TX-5
2	19	70	3	●
2.1	24	78	3	●
2.2	24	78	3	●
2.3	24	78	3	●
2.4	24	78	3	●
2.5	24	78	3	●
2.6	28	78	3	●
2.7	28	78	3	●
2.8	28	78	3	●
2.9	28	78	3	●
3	28	78	3	●
3.1	32	86	4	●
3.2	32	86	4	●
3.3	32	86	4	●
3.4	32	86	4	●
3.5	32	86	4	●
3.6	36	86	4	●
3.7	36	86	4	●
3.8	36	86	4	●
3.9	36	86	4	●
4	36	86	4	●
4.1	40	95	5	●
4.2	40	95	5	●
4.3	40	95	5	●
4.4	40	95	5	●
4.5	40	95	5	●
4.6	44	95	5	●
4.7	44	95	5	●
4.8	44	95	5	●
4.9	44	95	5	●
5	44	95	5	●
5.1	44	97	6	●
5.2	44	97	6	●
5.3	44	97	6	●
5.4	44	97	6	●
5.5	44	97	6	●
5.6	48	97	6	●
5.7	48	97	6	●
5.8	48	97	6	●
5.9	48	97	6	●
6	48	97	6	●
6.1	52	109	7	●
6.2	52	109	7	●
6.3	52	109	7	●
6.4	52	109	7	●
6.5	52	109	7	●
6.6	56	109	7	●
6.7	56	109	7	●
6.8	56	109	7	●
6.9	56	109	7	●
7	56	109	7	●
7.1	60	116	8	●
7.2	60	116	8	●
7.3	60	116	8	●
7.4	60	116	8	●
7.5	60	116	8	●
7.6	64	116	8	●
7.7	64	116	8	●
7.8	64	116	8	●
7.9	64	116	8	●
8	64	116	8	●
8.1	68	127	9	●
8.2	68	127	9	●
8.3	68	127	9	●
8.4	68	127	9	●
8.5	68	127	9	●
8.6	72	127	9	●
8.7	72	127	9	●
8.8	72	127	9	●
8.9	72	127	9	●
9	72	127	9	●
9.1	76	139	10	●
9.2	76	139	10	●
9.3	76	139	10	●
9.4	76	139	10	●
9.5	76	139	10	●
9.6	80	139	10	●
9.7	80	139	10	●
9.8	80	139	10	●
9.9	80	139	10	●
10	80	139	10	●
10.1	84	149	11	●
10.2	84	149	11	●
10.3	84	149	11	●
10.4	84	149	11	●
10.5	84	149	11	●
10.6	88	149	11	●
10.7	88	149	11	●
10.8	88	149	11	●
10.9	88	149	11	●
11	88	149	11	●
11.1	92	163	12	●
11.2	92	163	12	●
11.3	92	163	12	●
11.4	92	163	12	●
11.5	92	163	12	●
11.6	96	163	12	●
11.7	96	163	12	●
11.8	96	163	12	●
11.9	96	163	12	●
12	96	163	12	●
12.5	100	167	14	●
13	104	167	14	●
13.5	108	176	14	●
14	112	176	14	●
14.5	116	185	16	●
15	120	185	16	●
15.5	124	194	16	●
16	128	194	16	●

Borehole parameters

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron	
Vc m/min		80~150		80~150		80~150		40~70		32~50		50~80		80~150	
Code No.	Dc	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)
D423TX-5-2	2	19,000	0.07	19,000	0.07	19,000	0.07	9,550	0.07	7,960	0.05	9,550	0.07	19,000	0.07
D423TX-5-2.5	2.5	15,300	0.08	15,300	0.08	15,300	0.08	7,600	0.08	6,370	0.06	7,650	0.08	15,300	0.08
D423TX-5-3	3	13,000	0.09	13,000	0.09	13,000	0.09	6,400	0.09	5,300	0.07	6,300	0.09	13,000	0.09
D423TX-5-3.5	3.5	11,250	0.09	11,250	0.09	11,250	0.09	5,600	0.09	4,600	0.07	5,500	0.09	11,250	0.09
D423TX-5-4	4	9,500	0.10	9,500	0.10	9,500	0.10	4,800	0.10	4,000	0.08	4,700	0.10	9,500	0.10
D423TX-5-4.5	4.5	8,550	0.11	8,550	0.11	8,550	0.11	4,300	0.11	3,600	0.09	4,250	0.11	8,550	0.11
D423TX-5-5	5	7,600	0.12	7,600	0.12	7,600	0.12	3,800	0.12	3,200	0.10	3,800	0.12	7,600	0.12
D423TX-5-5.5	5.5	7,000	0.13	7,000	0.13	7,000	0.13	3,500	0.13	2,900	0.11	3,500	0.13	7,000	0.13
D423TX-5-6	6	6,400	0.14	6,400	0.14	6,400	0.14	3,200	0.14	2,650	0.12	3,200	0.14	6,400	0.14
D423TX-5-6.5	6.5	6,000	0.14	6,000	0.14	6,000	0.14	3,000	0.14	2,450	0.12	3,000	0.14	6,000	0.14
D423TX-5-7	7	5,600	0.15	5,600	0.15	5,600	0.15	2,800	0.15	1,300	0.13	2,800	0.15	5,600	0.15
D423TX-5-7.5	7.5	5,200	0.15	5,200	0.15	5,200	0.15	2,600	0.15	1,250	0.13	2,600	0.15	5,200	0.15
D423TX-5-8	8	4,800	0.16	4,800	0.16	4,800	0.16	2,400	0.16	2,000	0.14	2,400	0.16	4,800	0.16
D423TX-5-8.5	8.5	4,550	0.16	4,550	0.16	4,550	0.16	2,275	0.16	1,900	0.14	2,275	0.16	4,550	0.16
D423TX-5-9	9	4,300	0.17	4,300	0.17	4,300	0.17	2,150	0.17	1,800	0.15	2,150	0.17	4,300	0.17
D423TX-5-9.5	9.5	4,050	0.17	4,050	0.17	4,050	0.17	2,025	0.17	1,700	0.15	2,025	0.17	4,050	0.17
D423TX-5-10	10	3,800	0.18	3,800	0.18	3,800	0.18	1,900	0.18	1,600	0.15	1,900	0.18	3,800	0.18
D423TX-5-10.5	10.5	3,650	0.18	3,650	0.18	3,650	0.18	1,825	0.18	1,525	0.15	1,825	0.18	3,650	0.18
D423TX-5-11	11	3,500	0.19	3,500	0.19	3,500	0.19	1,750	0.19	1,450	0.16	1,750	0.19	3,500	0.19
D423TX-5-11.5	11.5	3,350	0.19	3,350	0.19	3,350	0.19	1,675	0.19	1,375	0.16	1,675	0.19	3,350	0.19
D423TX-5-12	12	3,200	0.20	3,200	0.20	3,200	0.20	1,600	0.20	1,300	0.17	1,600	0.20	3,200	0.20
D423TX-5-12.5	12.5	3,075	0.20	3,075	0.20	3,075	0.20	1,535	0.20	1,275	0.17	1,535	0.20	3,075	0.20
D423TX-5-13	13	2,950	0.21	2,950	0.21	2,950	0.21	1,475	0.21	1,250	0.18	1,475	0.21	2,950	0.21
D423TX-5-13.5	13.5	2,775	0.21	2,775	0.21	2,775	0.21	1,400	0.21	1,225	0.18	1,400	0.21	2,775	0.21
D423TX-5-14	14	2,700	0.22	2,700	0.22	2,700	0.22	1,350	0.22	1,200	0.18	1,350	0.22	2,700	0.22
D423TX-5-14.5	14.5	2,625	0.23	2,625	0.23	2,625	0.23	1,310	0.23	1,150	0.18	1,310	0.23	2,625	0.23
D423TX-5-15	15	2,550	0.24	2,550	0.24	2,550	0.24	1,275	0.24	1,100	0.19	1,275	0.24	2,550	0.24
D423TX-5-15.5	15.5	2,475	0.24	2,475	0.24	2,475	0.24	1,235	0.24	1,050	0.19	1,235	0.24	2,475	0.24
D423TX-5-16	16	2,400	0.25	2,400	0.25	2,400	0.25	1,200	0.25	1,000	0.20	1,200	0.25	2,400	0.25

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

D423TX-8

Oil-Feed High Performance Drills

MG Carbide

AlTiSiN TX







Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

JIS 8XD Drills with Oil-Feed

140° S-shape drill tip design to reduce axial force.

Design with groove shape to provide higher chip removal rates.

Good wear resistance and lubrication with Nano multilayer coating.

Oil-feed design could reduce temperature effectively and increase chip removal rates during cutting process.

Application for drilling with Steels which is below HRC48, Cast Iron... etc.

Suitable for drilling with 8XD depth.



Code No. D423TX-8-Dc

Dc h7	Lc mm	L mm	d h6	AlTiSiN D423TX-8
2	24	76	3	●
2.1	28	80	3	●
2.2	28	80	3	●
2.3	28	80	3	●
2.4	28	80	3	●
2.5	28	80	3	●
2.6	31	80	3	●
2.7	31	80	3	●
2.8	31	80	3	●
2.9	31	80	3	●
3	31	80	3	●
3.1	39	95	4	●
3.2	39	95	4	●
3.3	39	95	4	●
3.4	39	95	4	●
3.5	39	95	4	●
3.6	44	95	4	●
3.7	44	95	4	●
3.8	44	95	4	●
3.9	44	95	4	●
4	44	95	4	●
4.1	50	105	5	●
4.2	50	105	5	●
4.3	50	105	5	●
4.4	50	105	5	●
4.5	50	105	5	●
4.6	55	105	5	●
4.7	55	105	5	●
4.8	55	105	5	●
4.9	55	105	5	●
5	55	105	5	●
5.1	61	118	6	●
5.2	61	118	6	●
5.3	61	118	6	●
5.4	61	118	6	●
5.5	61	118	6	●
5.6	66	118	6	●
5.7	66	118	6	●
5.8	66	118	6	●
5.9	66	118	6	●
6	66	118	6	●
6.1	72	130	7	●
6.2	72	130	7	●
6.3	72	130	7	●
6.4	72	130	7	●
6.5	72	130	7	●
6.6	77	130	7	●
6.7	77	130	7	●
6.8	77	130	7	●
6.9	77	130	7	●
7	77	130	7	●
7.1	83	142	8	●
7.2	83	142	8	●
7.3	83	142	8	●
7.4	83	142	8	●
7.5	83	142	8	●

Dc h7	Lc mm	L mm	d h6	AlTiSiN D423TX-8
7.6	88	142	8	●
7.7	88	142	8	●
7.8	88	142	8	●
7.9	88	142	8	●
8	88	142	8	●
8.1	94	154	9	●
8.2	94	154	9	●
8.3	94	154	9	●
8.4	94	154	9	●
8.5	94	154	9	●
8.6	99	154	9	●
8.7	99	154	9	●
8.8	99	154	9	●
8.9	99	154	9	●
9	99	154	9	●
9.1	105	166	10	●
9.2	105	166	10	●
9.3	105	166	10	●
9.4	105	166	10	●
9.5	105	166	10	●
9.6	110	166	10	●
9.7	110	166	10	●
9.8	110	166	10	●
9.9	110	166	10	●
10	110	166	10	●
10.1	116	182	11	●
10.2	116	182	11	●
10.3	116	182	11	●
10.4	116	182	11	●
10.5	116	182	11	●
10.6	121	182	11	●
10.7	121	182	11	●
10.8	121	182	11	●
10.9	121	182	11	●
11	121	182	11	●
11.1	127	194	12	●
11.2	127	194	12	●
11.3	127	194	12	●
11.4	127	194	12	●
11.5	127	194	12	●
11.6	132	194	12	●
11.7	132	194	12	●
11.8	132	194	12	●
11.9	132	194	12	●
12	132	194	12	●
12.5	138	206	14	●
13	143	206	14	●
13.5	149	218	14	●
14	154	218	14	●
14.5	160	230	16	●
15	165	230	16	●
15.5	171	242	16	●
16	176	242	16	●

Borehole parameters

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.5 Hardened Steel (38~48HRC)		GR.8 Stainless Steel		GR.9 Cast Iron	
Vc m/min		80~150		80~150		80~150		40~70		32~50		50~80		80~150	
Code No.	Dc	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)
D423TX-8-2	2	19,000	0.07	19,000	0.07	19,000	0.07	9,550	0.07	7,960	0.05	9,550	0.07	19,000	0.07
D423TX-8-2.5	2.5	15,300	0.08	15,300	0.08	15,300	0.08	7,600	0.08	6,370	0.06	7,650	0.08	15,300	0.08
D423TX-8-3	3	13,000	0.09	13,000	0.09	13,000	0.09	6,400	0.09	5,300	0.07	6,300	0.09	13,000	0.09
D423TX-8-3.5	3.5	11,250	0.09	11,250	0.09	11,250	0.09	5,600	0.09	4,600	0.07	5,500	0.09	11,250	0.09
D423TX-8-4	4	9,500	0.10	9,500	0.10	9,500	0.10	4,800	0.10	4,000	0.08	4,700	0.10	9,500	0.10
D423TX-8-4.5	4.5	8,550	0.11	8,550	0.11	8,550	0.11	4,300	0.11	3,600	0.09	4,250	0.11	8,550	0.11
D423TX-8-5	5	7,600	0.12	7,600	0.12	7,600	0.12	3,800	0.12	3,200	0.10	3,800	0.12	7,600	0.12
D423TX-8-5.5	5.5	7,000	0.13	7,000	0.13	7,000	0.13	3,500	0.13	2,900	0.11	3,500	0.13	7,000	0.13
D423TX-8-6	6	6,400	0.14	6,400	0.14	6,400	0.14	3,200	0.14	2,650	0.12	3,200	0.14	6,400	0.14
D423TX-8-6.5	6.5	6,000	0.14	6,000	0.14	6,000	0.14	3,000	0.14	2,450	0.12	3,000	0.14	6,000	0.14
D423TX-8-7	7	5,600	0.15	5,600	0.15	5,600	0.15	2,800	0.15	1,300	0.13	2,800	0.15	5,600	0.15
D423TX-8-7.5	7.5	5,200	0.15	5,200	0.15	5,200	0.15	2,600	0.15	1,250	0.13	2,600	0.15	5,200	0.15
D423TX-8-8	8	4,800	0.16	4,800	0.16	4,800	0.16	2,400	0.16	2,000	0.14	2,400	0.16	4,800	0.16
D423TX-8-8.5	8.5	4,550	0.16	4,550	0.16	4,550	0.16	2,275	0.16	1,900	0.14	2,275	0.16	4,550	0.16
D423TX-8-9	9	4,300	0.17	4,300	0.17	4,300	0.17	2,150	0.17	1,800	0.15	2,150	0.17	4,300	0.17
D423TX-8-9.5	9.5	4,050	0.17	4,050	0.17	4,050	0.17	2,025	0.17	1,700	0.15	2,025	0.17	4,050	0.17
D423TX-8-10	10	3,800	0.18	3,800	0.18	3,800	0.18	1,900	0.18	1,600	0.15	1,900	0.18	3,800	0.18
D423TX-8-10.5	10.5	3,650	0.18	3,650	0.18	3,650	0.18	1,825	0.18	1,525	0.15	1,825	0.18	3,650	0.18
D423TX-8-11	11	3,500	0.19	3,500	0.19	3,500	0.19	1,750	0.19	1,450	0.16	1,750	0.19	3,500	0.19
D423TX-8-11.5	11.5	3,350	0.19	3,350	0.19	3,350	0.19	1,675	0.19	1,375	0.16	1,675	0.19	3,350	0.19
D423TX-8-12	12	3,200	0.20	3,200	0.20	3,200	0.20	1,600	0.20	1,300	0.17	1,600	0.20	3,200	0.20
D423TX-8-12.5	12.5	3,075	0.20	3,075	0.20	3,075	0.20	1,535	0.20	1,275	0.17	1,535	0.20	3,075	0.20
D423TX-8-13	13	2,950	0.21	2,950	0.21	2,950	0.21	1,475	0.21	1,250	0.18	1,475	0.21	2,950	0.21
D423TX-8-13.5	13.5	2,775	0.21	2,775	0.21	2,775	0.21	1,400	0.21	1,225	0.18	1,400	0.21	2,775	0.21
D423TX-8-14	14	2,700	0.22	2,700	0.22	2,700	0.22	1,350	0.22	1,200	0.18	1,350	0.22	2,700	0.22
D423TX-8-14.5	14.5	2,625	0.23	2,625	0.23	2,625	0.23	1,310	0.23	1,150	0.18	1,310	0.23	2,625	0.23
D423TX-8-15	15	2,550	0.24	2,550	0.24	2,550	0.24	1,275	0.24	1,100	0.19	1,275	0.24	2,550	0.24
D423TX-8-15.5	15.5	2,475	0.24	2,475	0.24	2,475	0.24	1,235	0.24	1,050	0.19	1,235	0.24	2,475	0.24
D423TX-8-16	16	2,400	0.25	2,400	0.25	2,400	0.25	1,200	0.25	1,000	0.20	1,200	0.25	2,400	0.25

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

D423TX-12 / 16

Oil-Feed High Performance Drills

MG Carbide

AlTiSiN TX

12XD 16XD

2

138°

Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

D423TX-12 JIS 12XD Drills with Oil-Feed.

Suitable for drilling with 12XD depth.

D423TX-16 JIS 16XD Drills with Oil-Feed.

Suitable for drilling with 16XD depth.

138° S-shape drill tip design to reduce axial force.

Design with groove shape to provide higher chip removal rates.

Good wear resistance and lubrication with Nano multilayer coating.

Oil-feed design could reduce temperature effectively and increase chip removal rates during cutting process.

Application for drilling with Steels which is below HRC48, Cast Iron... etc.



Code No. D423TX-12-Dc
D423TX-16-Dc

Dc h7	Lc mm	L mm	d h6	12XD D423TX-12	Dc h7	Lc mm	L mm	d h6	16XD D423TX-16
3	51	99	3	●	3	60	108	3	●
3.1	60	108	4	●	3.1	70	118	4	●
3.2	60	108	4	●	3.2	70	118	4	●
3.3	60	108	4	●	3.3	70	118	4	●
3.4	60	108	4	●	3.4	70	118	4	●
3.5	60	108	4	●	3.5	70	118	4	●
3.6	68	116	4	●	3.6	80	128	4	●
3.7	68	116	4	●	3.7	80	128	4	●
3.8	68	116	4	●	3.8	80	128	4	●
3.9	68	116	4	●	3.9	80	128	4	●
4	68	116	4	●	4	80	128	4	●
4.1	77	127	5	●	4.1	90	140	5	●
4.2	77	127	5	●	4.2	90	140	5	●
4.3	77	127	5	●	4.3	90	140	5	●
4.4	77	127	5	●	4.4	90	140	5	●
4.5	77	127	5	●	4.5	90	140	5	●
4.6	85	135	5	●	4.6	100	150	5	●
4.7	85	135	5	●	4.7	100	150	5	●
4.8	85	135	5	●	4.8	100	150	5	●
4.9	85	135	5	●	4.9	100	150	5	●
5	85	135	5	●	5	100	150	5	●
5.1	94	146	6	●	5.1	110	162	6	●
5.2	94	146	6	●	5.2	110	162	6	●
5.3	94	146	6	●	5.3	110	162	6	●
5.4	94	146	6	●	5.4	110	162	6	●
5.5	94	146	6	●	5.5	110	162	6	●
5.6	102	154	6	●	5.6	120	172	6	●
5.7	102	154	6	●	5.7	120	172	6	●
5.8	102	154	6	●	5.8	120	172	6	●
5.9	102	154	6	●	5.9	120	172	6	●
6	102	154	6	●	6	120	172	6	●
6.1	111	164	7	●	6.1	130	183	7	●
6.2	111	164	7	●	6.2	130	183	7	●
6.3	111	164	7	●	6.3	130	183	7	●
6.4	111	164	7	●	6.4	130	183	7	●
6.5	111	164	7	●	6.5	130	183	7	●
6.6	119	172	7	●	6.6	140	193	7	●
6.7	119	172	7	●	6.7	140	193	7	●
6.8	119	172	7	●	6.8	140	193	7	●
6.9	119	172	7	●	6.9	140	193	7	●
7	119	172	7	●	7	140	193	7	●
7.1	128	182	8	●	7.1	150	204	8	●
7.2	128	182	8	●	7.2	150	204	8	●
7.3	128	182	8	●	7.3	150	204	8	●
7.4	128	182	8	●	7.4	150	204	8	●
7.5	128	182	8	●	7.5	150	204	8	●
7.6	136	190	8	●	7.6	160	214	8	●
7.7	136	190	8	●	7.7	160	214	8	●
7.8	136	190	8	●	7.8	160	214	8	●
7.9	136	190	8	●	7.9	160	214	8	●
8	136	190	8	●	8	160	214	8	●
8.5	145	200	9	●	8.5	170	225	9	●
9	153	208	9	●	9	180	235	9	●
9.5	162	218	10	●	9.5	190	246	10	●
10	170	226	10	●	10	200	256	10	●
10.5	179	240	11	●	10.5	210	271	11	●
11	187	248	11	●	11	220	281	11	●
11.5	196	258	12	●	11.5	230	292	12	●
12	204	266	12	●	12	240	302	12	●

Borehole parameters

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.8 Stainless Steel		GR.9 Cast Iron	
Vc m/min		60~125		60~125		60~125		40~80		40~80		50~80	
Code No.	Dc	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)
D423TX-12-16-3	3	7,500	0.06	7,500	0.06	7,500	0.06	5,300	0.06	5,300	0.06	5,300	0.06
D423TX-12-16-3.5	3.5	6,950	0.07	6,950	0.07	6,950	0.07	5,150	0.07	5,150	0.07	5,150	0.07
D423TX-12-16-4	4	6,400	0.08	6,400	0.08	6,400	0.08	5,000	0.08	5,000	0.08	5,000	0.08
D423TX-12-16-4.5	4.5	6,100	0.09	6,100	0.09	6,100	0.09	4,750	0.09	4,750	0.09	4,750	0.09
D423TX-12-16-5	5	5,800	0.10	5,800	0.10	5,800	0.10	4,500	0.10	4,500	0.10	4,500	0.10
D423TX-12-16-5.5	5.5	5,300	0.11	5,300	0.11	5,300	0.11	4,150	0.11	4,150	0.11	4,150	0.11
D423TX-12-16-6	6	4,800	0.12	4,800	0.12	4,800	0.12	3,800	0.12	3,800	0.12	3,800	0.12
D423TX-12-16-6.5	6.5	4,500	0.13	4,500	0.13	4,500	0.13	3,550	0.13	3,550	0.13	3,550	0.13
D423TX-12-16-7	7	4,200	0.14	4,200	0.14	4,200	0.14	3,300	0.14	3,300	0.14	3,300	0.14
D423TX-12-16-7.5	7.5	3,900	0.15	3,900	0.15	3,900	0.15	3,050	0.15	3,050	0.15	3,050	0.15
D423TX-12-16-8	8	3,600	0.16	3,600	0.16	3,600	0.16	2,800	0.16	2,800	0.16	2,800	0.16
D423TX-12-16-8.5	8.5	3,410	0.17	3,410	0.17	3,410	0.17	2,675	0.17	2,675	0.17	2,675	0.17
D423TX-12-16-9	9	3,250	0.18	3,250	0.18	3,250	0.18	2,550	0.18	2,550	0.18	2,550	0.18
D423TX-12-16-9.5	9.5	3,060	0.19	3,060	0.19	3,060	0.19	2,425	0.19	2,425	0.19	2,425	0.19
D423TX-12-16-10	10	2,900	0.20	2,900	0.20	2,900	0.20	2,300	0.20	2,300	0.20	2,300	0.20
D423TX-12-16-10.5	10.5	2,775	0.21	2,775	0.21	2,775	0.21	2,200	0.21	2,200	0.21	2,200	0.21
D423TX-12-16-11	11	2,650	0.22	2,650	0.22	2,650	0.22	2,100	0.22	2,100	0.22	2,100	0.22
D423TX-12-16-11.5	11.5	2,525	0.23	2,525	0.23	2,525	0.23	2,000	0.23	2,000	0.23	2,000	0.23
D423TX-12-16-12	12	2,400	0.24	2,400	0.24	2,400	0.24	1,900	0.24	1,900	0.24	1,900	0.24

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

D423TX-20 / 25 / 30

Oil-Feed High Performance Drills

MG Carbide

AlTiSiN TX

20XD
25XD
30XD

2

20X138°
>25X135°

Work Material

P	H	M	K	N	S
●	●	●	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **H** <56HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

D423TX-20 JIS 20XD Drills with Oil-Feed.

Suitable for drilling with 20XD depth.

D423TX-25 JIS 25XD Drills with Oil-Feed.

Suitable for drilling with 25XD depth.

D423TX-30 JIS 30XD Drills with Oil-Feed.

Suitable for drilling with 30XD depth.

135° S-shape drill tip design to reduce axial force.

Design with groove shape to provide higher chip removal rates.

Good wear resistance and lubrication with Nano multilayer coating.

Oil-feed design could reduce temperature effectively and increase chip removal rates during cutting process.

Application for drilling with Steels which is below HRC48, Cast Iron... etc.



Code No. D423TX-20-Dc

Dc h7	Lc mm	L mm	d h6	20XD D423TX-20
3	75	123	3	●
3.5	88	136	4	●
4	100	148	4	●
4.5	113	163	5	●
5	125	175	5	●
5.5	140	192	6	●
6	150	202	6	●
6.5	163	216	7	●
7	175	228	7	●
7.5	188	242	8	●
8	200	254	8	●
8.5	213	268	9	●
9	225	280	9	●
9.5	238	294	10	●
10	250	306	10	●
12	300	362	12	●

Code No. D423TX-25-Dc

Dc h7	Lc mm	L mm	d h6	25XD D423TX-25
3	90	138	3	●
3.5	105	153	4	●
4	120	168	4	●
4.5	135	185	5	●
5	150	200	5	●
5.5	165	217	6	●
6	180	232	6	●
6.5	195	248	7	●
7	210	263	7	●
7.5	225	279	8	●
8	240	294	8	●
10	300	356	10	●

Code No. D423TX-30-Dc

Dc h7	Lc mm	L mm	d h6	30XD D423TX-30
3	105	153	3	●
3.5	123	171	4	●
4	140	188	4	●
4.5	158	208	5	●
5	175	225	5	●
5.5	193	245	6	●
6	210	262	6	●
6.5	228	281	7	●
7	245	298	7	●
7.5	263	317	8	●
8	280	334	8	●
10	350	406	10	●

Borehole parameters

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.4 Hardened Steel (30~38HRC)		GR.8 Stainless Steel		GR.9 Cast Iron	
Vc m/min		60~125		60~125		60~125		40~80		40~80		50~80	
Code No.	Dc	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)
D423TX-20-25-30-3	3	7,500	0.06	7,500	0.06	7,500	0.06	5,300	0.06	5,300	0.06	5,300	0.06
D423TX-20-25-30-3.5	3.5	6,950	0.07	6,950	0.07	6,950	0.07	5,150	0.07	5,150	0.07	5,150	0.07
D423TX-20-25-30-4	4	6,400	0.08	6,400	0.08	6,400	0.08	5,000	0.08	5,000	0.08	5,000	0.08
D423TX-20-25-30-4.5	4.5	6,100	0.09	6,100	0.09	6,100	0.09	4,750	0.09	4,750	0.09	4,750	0.09
D423TX-20-25-30-5	5	5,800	0.10	5,800	0.10	5,800	0.10	4,500	0.10	4,500	0.10	4,500	0.10
D423TX-20-25-30-5.5	5.5	5,300	0.11	5,300	0.11	5,300	0.11	4,150	0.11	4,150	0.11	4,150	0.11
D423TX-20-25-30-6	6	4,800	0.12	4,800	0.12	4,800	0.12	3,800	0.12	3,800	0.12	3,800	0.12
D423TX-20-25-30-6.5	6.5	4,500	0.13	4,500	0.13	4,500	0.13	3,550	0.13	3,550	0.13	3,550	0.13
D423TX-20-25-30-7	7	4,200	0.14	4,200	0.14	4,200	0.14	3,300	0.14	3,300	0.14	3,300	0.14
D423TX-20-25-30-7.5	7.5	3,900	0.15	3,900	0.15	3,900	0.15	3,050	0.15	3,050	0.15	3,050	0.15
D423TX-20-25-30-8	8	3,600	0.16	3,600	0.16	3,600	0.16	2,800	0.16	2,800	0.16	2,800	0.16
D423TX-20-25-30-8.5	8.5	3,410	0.17	3,410	0.17	3,410	0.17	2,675	0.17	2,675	0.17	2,675	0.17
D423TX-20-25-30-9	9	3,250	0.18	3,250	0.18	3,250	0.18	2,550	0.18	2,550	0.18	2,550	0.18
D423TX-20-25-30-9.5	9.5	3,060	0.19	3,060	0.19	3,060	0.19	2,425	0.19	2,425	0.19	2,425	0.19
D423TX-20-25-30-10	10	2,900	0.20	2,900	0.20	2,900	0.20	2,300	0.20	2,300	0.20	2,300	0.20
D423TX-20-25-30-10.5	10.5	2,775	0.21	2,775	0.21	2,775	0.21	2,200	0.21	2,200	0.21	2,200	0.21
D423TX-20-25-30-11	11	2,650	0.22	2,650	0.22	2,650	0.22	2,100	0.22	2,100	0.22	2,100	0.22
D423TX-20-25-30-11.5	11.5	2,525	0.23	2,525	0.23	2,525	0.23	2,000	0.23	2,000	0.23	2,000	0.23
D423TX-20-25-30-12	12	2,400	0.24	2,400	0.24	2,400	0.24	1,900	0.24	1,900	0.24	1,900	0.24

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

D425TX-2

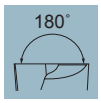
Flat Bottom Drills

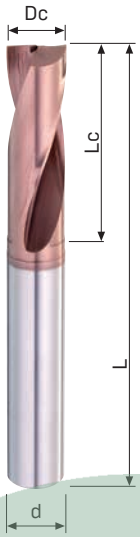
MG Carbide

AlTiSiN TX









Work Material

P	H	M	K	N	S
●	●	○	●		○

P	Steel
H	<38HRC Hardened Steel
H	<48HRC Hardened Steel
M	Stainless Steel
K	Cast Iron
S	Titanium
S	Nickel
S	High Temp Alloys

Feature of product:

With 0° point of drill tip, it can avoid shift or skewing during non-planar drilling such as countersinks, ramping, curved surface..etc.

With AlTiSiN coating type to have longer tool life and enhance cutting and using efficiency.

Code No. D425TX-2-Dc

Dc h7	Lc mm	L mm	d h6	AlTiSiN D425TX-2	Dc h7	Lc mm	L mm	d h6	AlTiSiN D425TX-2
1	3	50	3	●	7	24	70	6	●
1.1	4	50	3	●	7.1	26	70	6	●
1.2	4	50	3	●	7.2	26	70	6	●
1.3	4	50	3	●	7.3	26	70	6	●
1.4	5	50	3	●	7.4	27	70	6	●
1.5	5	50	3	●	7.5	27	70	6	●
1.6	5	50	3	●	7.6	27	70	6	●
1.7	6	50	3	●	7.7	28	70	6	●
1.8	6	50	3	●	7.8	28	70	6	●
1.9	7	50	3	●	7.9	28	70	6	●
2	7	50	4	●	8	28	70	8	●
2.1	8	50	4	●	8.1	29	80	8	●
2.2	8	50	4	●	8.2	29	80	8	●
2.3	8	50	4	●	8.3	29	80	8	●
2.4	9	50	4	●	8.4	30	80	8	●
2.5	9	50	4	●	8.5	30	80	8	●
2.6	9	50	4	●	8.6	30	80	8	●
2.7	10	50	4	●	8.7	32	80	8	●
2.8	10	50	4	●	8.8	32	80	8	●
2.9	11	50	4	●	8.9	32	80	8	●
3	11	50	6	●	9	32	80	8	●
3.1	12	50	6	●	9.1	33	80	8	●
3.2	12	50	6	●	9.2	33	80	8	●
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3.5	13	50	6	●	9.5	34	80	8	●
3.6	13	50	6	●	9.6	34	80	8	●
3.7	14	50	6	●	9.7	35	80	8	●
3.8	14	50	6	●	9.8	35	80	8	●
3.9	14	50	6	●	9.9	35	80	8	●
4	14	50	6	●	10	35	80	10	●
4.1	15	60	6	●	10.1	36	90	10	●
4.2	15	60	6	●	10.2	36	90	10	●
4.3	15	60	6	●	10.3	36	90	10	●
4.4	16	60	6	●	10.4	37	90	10	●
4.5	16	60	6	●	10.5	37	90	10	●
4.6	16	60	6	●	10.6	37	90	10	●
4.7	18	60	6	●	10.7	38	90	10	●
4.8	18	60	6	●	10.8	38	90	10	●
4.9	18	60	6	●	10.9	38	90	10	●
5	18	60	6	●	11	38	90	10	●
5.1	19	60	6	●	11.1	40	90	10	●
5.2	19	60	6	●	11.2	40	90	10	●
5.3	19	60	6	●	11.3	40	90	10	●
5.4	20	60	6	●	11.4	41	90	10	●
5.5	20	60	6	●	11.5	41	90	10	●
5.6	20	60	6	●	11.6	41	90	10	●
5.7	21	60	6	●	11.7	42	90	10	●
5.8	21	60	6	●	11.8	42	90	10	●
5.9	21	60	6	●	11.9	42	90	10	●
6	21	60	6	●	12	42	90	12	●
6.1	22	70	6	●	12.5	44	100	12	●
6.2	22	70	6	●	12.7	45	100	12	●
6.3	22	70	6	●	13	45	100	12	●
6.4	23	70	6	●	13.5	48	100	12	●
6.5	23	70	6	●	14	49	105	12	●
6.6	23	70	6	●	14.5	51	105	12	●
6.7	24	70	6	●	15	52	105	12	●
6.8	24	70	6	●	15.5	55	115	12	●
6.9	24	70	6	●	16	56	115	16	●

Borehole parameters

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.12 Aluminium	
Vc m/min		55~70		55~70		55~70		25~30		55~70		100~110	
Code No.	Dc	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)
D425TX-2-1	1	18,000	450	14,300	358	12,700	318	7,900	55	18,000	450	31,800	636
D425TX-2-1.5	1.5	13,500	473	10,000	350	8,400	294	5,300	53	13,500	473	21,200	424
D425TX-2-2	2	9,500	380	7,900	316	6,700	268	4,700	71	9,500	380	17,500	875
D425TX-2-2.5	2.5	7,900	395	6,600	330	5,700	285	3,800	57	7,900	395	14,000	840
D425TX-2-3	3	7,900	474	7,900	474	6,800	408	3,100	186	7,900	474	11,600	696
D425TX-2-4	4	5,900	472	5,900	472	5,100	408	2,300	184	5,900	472	8,700	696
D425TX-2-5	5	4,700	470	4,700	470	4,100	410	1,900	190	4,700	470	7,000	700
D425TX-2-6	6	3,900	507	3,900	507	3,400	442	1,500	195	3,900	507	5,800	754
D425TX-2-7	7	3,400	476	3,400	476	3,000	420	1,300	182	3,400	476	5,100	740
D425TX-2-8	8	2,900	435	2,900	435	2,500	375	1,100	165	2,900	435	4,300	688
D425TX-2-9	9	2,600	416	2,600	416	2,250	360	1,000	160	2,600	416	3,900	780
D425TX-2-10	10	2,300	391	2,300	391	2,000	340	950	162	2,300	391	3,500	700
D425TX-2-11	11	2,100	378	2,100	378	1,800	324	850	153	2,100	378	3,100	682
D425TX-2-12	12	1,900	380	1,900	380	1,700	340	790	158	1,900	380	2,900	696
D425TX-2-13	13	1,800	360	1,800	360	1,600	320	740	148	1,800	360	2,700	675
D425TX-2-14	14	1,650	363	1,650	363	1,500	330	690	152	1,650	363	2,500	650
D425TX-2-15	15	1,500	345	1,500	345	1,400	322	640	147	1,500	345	2,300	621
D425TX-2-16	16	1,400	350	1,400	350	1,200	300	590	148	1,400	350	2,100	588
(mm)		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

D425TX-4

Flat Bottom Drills

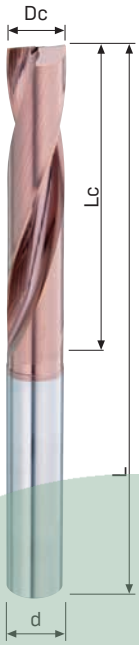
MG Carbide

AlTiSiN TX

4XD

2

180°



Work Material

P	H	M	K	N	S
●	●	○	●		○

- **P** Steel
- **H** <38HRC Hardened Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Feature of product:

With 0° point of drill tip, it can avoid shift or skewing during non-planar drilling such as countersinks, ramping, curved surface..etc.

With AlTiSiN coating type to have longer tool life and enhance cutting and using efficiency.

Code No. D425TX-4-Dc

Dc h7	Lc mm	L mm	d h6	AlTiSiN D425TX-4	Dc h7	Lc mm	L mm	d h6	AlTiSiN D425TX-4
1	5	60	3	●	7	38	85	6	●
1.1	7	60	3	●	7.1	41	90	6	●
1.2	7	60	3	●	7.2	41	90	6	●
1.3	7	60	3	●	7.3	41	90	6	●
1.4	8	60	3	●	7.4	42	90	6	●
1.5	8	60	3	●	7.5	42	90	6	●
1.6	8	60	3	●	7.6	42	90	6	●
1.7	9	60	3	●	7.7	44	90	6	●
1.8	9	60	3	●	7.8	44	90	6	●
1.9	11	60	3	●	7.9	44	90	6	●
2	11	60	4	●	8	44	90	8	●
2.1	13	60	4	●	8.1	46	100	8	●
2.2	13	60	4	●	8.2	46	100	8	●
2.3	13	60	4	●	8.3	46	100	8	●
2.4	14	60	4	●	8.4	47	100	8	●
2.5	14	60	4	●	8.5	47	100	8	●
2.6	14	60	4	●	8.6	47	100	8	●
2.7	16	60	4	●	8.7	50	100	8	●
2.8	16	60	4	●	8.8	50	100	8	●
2.9	17	60	4	●	8.9	50	100	8	●
3	17	60	6	●	9	50	100	8	●
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3.6	20	60	6	●	9.6	53	100	8	●
3.7	22	60	6	●	9.7	55	100	8	●
3.8	22	60	6	●	9.8	55	100	8	●
3.9	22	60	6	●	9.9	55	100	8	●
4	22	60	6	●	10	55	100	10	●
4.1	24	70	6	●	10.1	57	110	10	●
4.2	24	70	6	●	10.2	57	110	10	●
4.3	24	70	6	●	10.3	57	110	10	●
4.4	25	70	6	●	10.4	58	110	10	●
4.5	25	70	6	●	10.5	58	110	10	●
4.6	25	70	6	●	10.6	58	110	10	●
4.7	28	70	6	●	10.7	60	110	10	●
4.8	28	70	6	●	10.8	60	110	10	●
4.9	28	70	6	●	10.9	60	110	10	●
5	28	70	6	●	11	60	110	10	●
5.1	30	70	6	●	11.1	63	115	10	●
5.2	30	70	6	●	11.2	63	115	10	●
5.3	30	70	6	●	11.3	63	115	10	●
5.4	31	70	6	●	11.4	64	115	10	●
5.5	31	70	6	●	11.5	64	115	10	●
5.6	31	70	6	●	11.6	64	115	10	●
5.7	33	70	6	●	11.7	66	115	10	●
5.8	33	70	6	●	11.8	66	115	10	●
5.9	33	70	6	●	11.9	66	115	10	●
6	33	70	6	●	12	66	115	12	●
6.1	35	85	6	●	12.5	69	125	12	●
6.2	35	85	6	●	12.7	71	125	12	●
6.3	35	85	6	●	13	71	125	12	●
6.4	36	85	6	●	13.5	75	130	12	●
6.5	36	85	6	●	14	77	130	12	●
6.6	36	85	6	●	14.5	80	135	12	●
6.7	38	85	6	●	15	82	135	12	●
6.8	38	85	6	●	15.5	86	145	12	●
6.9	38	85	6	●	16	88	145	16	●

Borehole parameters

Work Material		GR.1 Carbon Steel		GR.2 Low-alloyed Steel (~24HRC)		GR.3 Hi-alloyed Steel (~30HRC)		GR.8 Stainless Steel		GR.9 Cast Iron		GR.12 Aluminium	
Vc m/min		55~70		55~70		55~70		25~30		55~70		100~110	
Code No.	Dc	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)
D425TX-4-1	1	18,000	450	14,300	358	12,700	318	7,900	55	18,000	450	31,800	636
D425TX-4-1.5	1.5	13,500	473	10,000	350	8,400	294	5,300	53	13,500	473	21,200	424
D425TX-4-2	2	9,500	380	7,900	316	6,700	268	4,700	71	9,500	380	17,500	875
D425TX-4-2.5	2.5	7,900	395	6,600	330	5,700	285	3,800	57	7,900	395	14,000	840
D425TX-4-3	3	7,900	474	7,900	474	6,800	408	3,100	186	7,900	474	11,600	696
D425TX-4-4	4	5,900	472	5,900	472	5,100	408	2,300	184	5,900	472	8,700	696
D425TX-4-5	5	4,700	470	4,700	470	4,100	410	1,900	190	4,700	470	7,000	700
D425TX-4-6	6	3,900	507	3,900	507	3,400	442	1,500	195	3,900	507	5,800	754
D425TX-4-7	7	3,400	476	3,400	476	3,000	420	1,300	182	3,400	476	5,100	740
D425TX-4-8	8	2,900	435	2,900	435	2,500	375	1,100	165	2,900	435	4,300	688
D425TX-4-9	9	2,600	416	2,600	416	2,250	360	1,000	160	2,600	416	3,900	780
D425TX-4-10	10	2,300	391	2,300	391	2,000	340	950	162	2,300	391	3,500	700
D425TX-4-11	11	2,100	378	2,100	378	1,800	324	850	153	2,100	378	3,100	682
D425TX-4-12	12	1,900	380	1,900	380	1,700	340	790	158	1,900	380	2,900	696
D425TX-4-13	13	1,800	360	1,800	360	1,600	320	740	148	1,800	360	2,700	675
D425TX-4-14	14	1,650	363	1,650	363	1,500	330	690	152	1,650	363	2,500	650
D425TX-4-15	15	1,500	345	1,500	345	1,400	322	640	147	1,500	345	2,300	621
D425TX-4-16	16	1,400	350	1,400	350	1,200	300	590	148	1,400	350	2,100	588
(mm)		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0D		ap:2.0	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.



D430FN

High Performance Drills

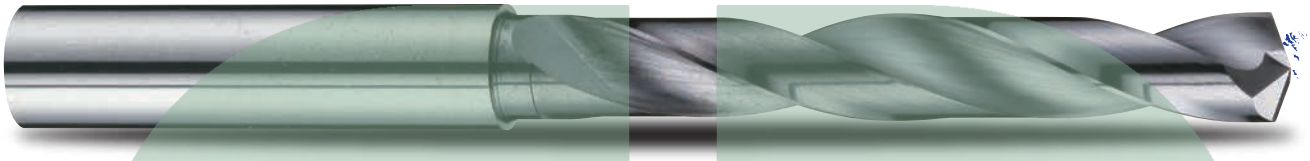
Designed with sharp drill point.

D430FN 140° S-type drill point design with centringand positioning function, reduce axial drilling force.

Designed with high chip evacuating flutes.

Good wear resistance and lubricating effect with Nano multilayer coating. Application for drilling steels below48HRC, cast iron...and etc.



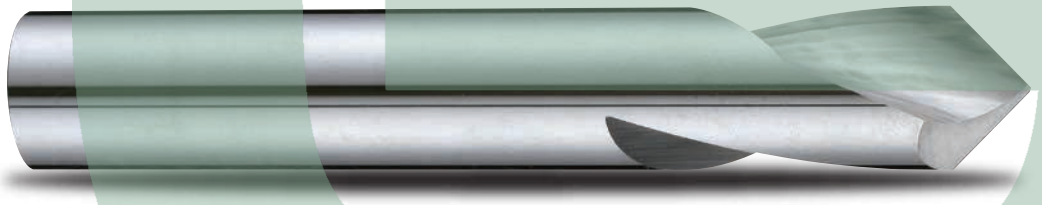


D432FT

High Performance Drills

140° S-type drill point design with centring and positioning function, reduce axial drilling force. Designed with high chip evacuating flutes.

Good wear resistance and lubricating effect with Nano multilayer coating. Application for drilling steels below 48HRC, castiron...and etc. Suitable for drilling with 5XD depth.

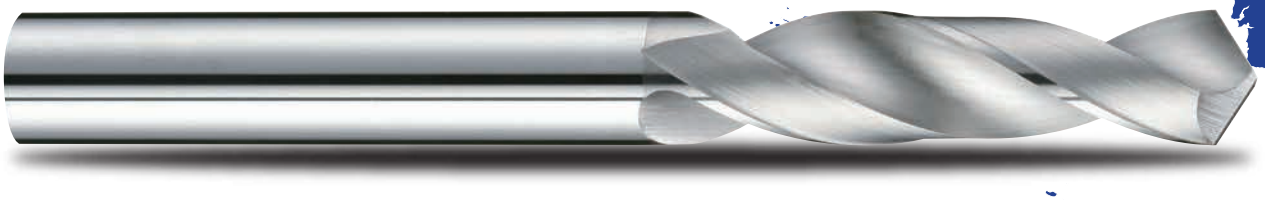




D903

NC Spot Drills

Can be used at higher speeds and feeds, compatible with other carbide tools. Suitable for Steels, Cast Iron, Aluminium, Stainless Steels, Plastics, Bronze and High Temp Alloys.



D412

Twist Drills

D412 118° X-type drill point design is easy for positioning.

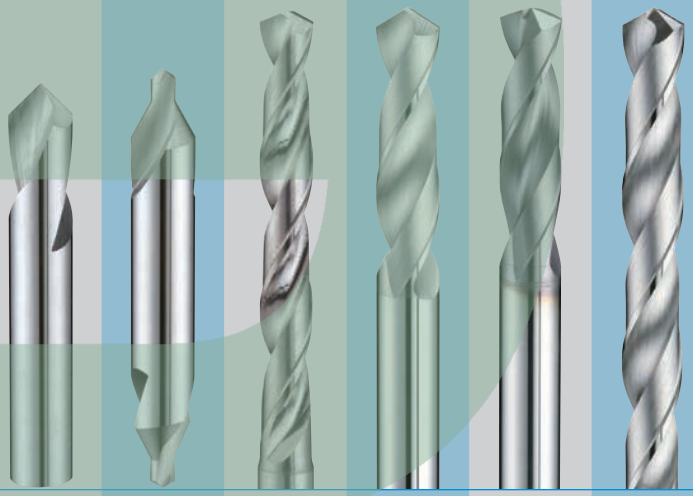
Designed with sharp drill point.Suitable for drilling with 3XD depth. Application for drilling cast iron, aluminium, copper, plastic, composite materials...and etc.



DIN DRILL



Drills

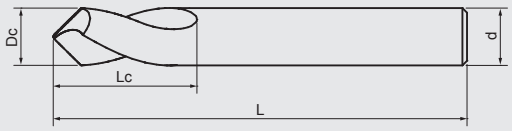
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Appearance						
Code No	D903 D904 D913 D914	D908	D400	D412	D430FN	D413
Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide
Coating	Uncoated Bright	Uncoated Bright	Uncoated Bright	Uncoated Bright	AlTiCrN FN	Uncoated Bright
Helix Angle	 D		 5XD	 3XD	 3XD	 5XD
No.of Flutes	 2	 2	 2	 2	 2	 2

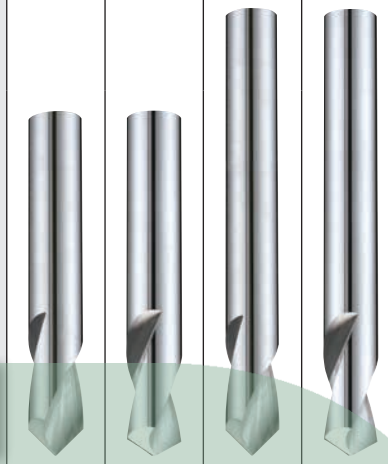
413	415	417	419	421	423	425	427
							
D433FN	D431FT D435FT	D432FT D436FT	D437FT	D461TX D463TX	D462TX D464TX	D415	D419FT
VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide	VHM Carbide
AlTiCrN FN	AlTiCrN FT	AlTiCrN FT	AlTiCrN FT	AlTiCrN FT	AlTiCrN FT	Uncoated Bright	AlTiCrN FT
 5XD	 3XD	 5XD	 8XD	 3XD	 5XD	 5XD	
 2	 2	 2	 2	 2	 2	 3	 2

D903 / D904 / D913 / D914

NC Spot Drills 90° / 120°

Two specifications of length.
Drill point angle 90° and 120°.





VHM Carbide | Uncoated Bright | D | 2 | 90° | 120° | Steel Cast Iron AL. Copper

Improved strength design for cutting different steels below 48HRC, cast iron, aluminium and copper.
Application for drill positioning and chamfering.

P	P	P	P
H	H	H	H
K	K	K	K
N	N	N	N

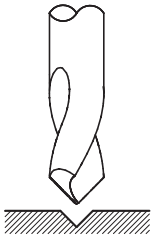
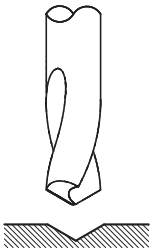
Standard Length

Dc h6	Lc mm	L mm	d h6	D903 90°	D913 120°				
3	10	38	3	•	•				
4	12	50	4	•	•				
5	15	50	5	•	•				
6	20	60	6	•	•				
8	25	60	8	•	•				
10	25	72	10	•	•				
12	30	75	12	•	•				
16	35	100	16	•	•				
20	40	100	20	•	•				

Long Length

Dc h6	Lc mm	L mm	d h6			D904 90°	D914 120°		
6	20	100	6			•	•		
8	25	125	8			•	•		
10	25	150	10			•	•		
12	30	150	12			•	•		
16	35	150	16			•	•		
20	40	150	20			•	•		

Cutting Conditions

		D903		D904		D913		D914	
D903 D904 D913 D914									
		cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)	cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)	cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)	cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)
P	Carbon Steel Materials								
	GR1 Carbon Steel	70	0.004xDc	80	0.005xDc	70	0.004xDc	80	0.005xDc
	GR2 <24HRC Low-alloyed Steel	60	0.004xDc	70	0.005xDc	60	0.004xDc	70	0.005xDc
	GR3 <30HRC Hi-alloyed Steel	50	0.004xDc	60	0.004xDc	50	0.004xDc	60	0.004xDc
H	Hardened Steel Materials								
	GR4 30~38HRC Hardened Steel	40	0.003xDc	35	0.003xDc	40	0.003xDc	35	0.003xDc
	GR5 38~48HRC Hardened Steel	30	0.002xDc	30	0.002xDc	30	0.002xDc	30	0.002xDc
K	Cast Iron Materials								
	GR9-1 Grey cast iron	70	0.004xDc	80	0.005xDc	70	0.004xDc	80	0.005xDc
	GR9-2 Nodular cast iron	70	0.004xDc	80	0.005xDc	70	0.004xDc	80	0.005xDc
N	Aluminium Steel Materials								
	GR10-1 Wrought Aluminium alloys	200	0.007xDc	200	0.007xDc	200	0.007xDc	200	0.007xDc
	GR10-2 Aluminium cast alloys <10%	200	0.007xDc	200	0.007xDc	200	0.007xDc	200	0.007xDc
	GR10-3 Aluminium cast alloys >10%	180	0.007xDc	180	0.007xDc	180	0.007xDc	180	0.007xDc
	Copper Steel Materials								
	GR11-1 Pure Copper	60	0.004xDc	70	0.005xDc	60	0.004xDc	70	0.005xDc
	GR11-2 Brass	70	0.004xDc	80	0.005xDc	70	0.004xDc	80	0.005xDc
	GR11-2 Bronze	60	0.004xDc	70	0.005xDc	60	0.004xDc	70	0.005xDc

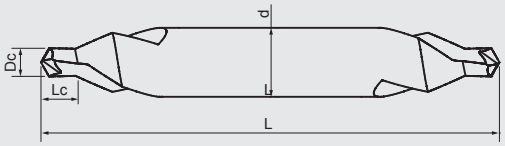
※All cutting data serve for orientation only and should be adapted individually to the technical conditions on location .

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

D908

Combined Drills and Countersink 60°

60° Combined drill and countersink centre drill.





VHM Carbide | Uncoated Bright | 60° | 2 | DIN 333 | 120° | Steel Cast Iron AL. Copper

Improved strength design for cutting different steels below 48HRC, cast iron, aluminium and copper. Application for centre hole preparations for lathe and Cylindrical grinding.

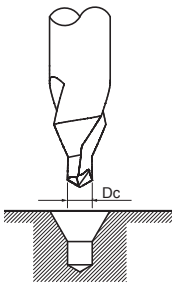
P H K N

DIN 333 Standard Length

Dc h7	Lc mm	L mm	d h5	D908 60°
0.5	0.8	38	3	•
0.8	1.1	38	3	•
1	1.3	38	3	•
1.25	1.6	38	3	•
1.6	2	38	4	•
2	2.5	50	5	•
2.5	3.1	50	6	•
3.15	3.9	63	8	•
4	5	66	10	•
5	6.3	73	12	•

Cutting Conditions

D908



		cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)
P	Carbon Steel Materials		
	GR1 Carbon Steel	30	0.01xDc
	GR2 <24HRC Low-alloyed Steel	30	0.01xDc
	GR3 <30HRC Hi-alloyed Steel	20	0.01xDc
H	Hardened Steel Materials		
	GR4 30~38HRC Hardened Steel	10	0.008xDc
	GR5 38~48HRC Hardened Steel	10	0.006xDc
K	Cast Iron Materials		
	GR9-1 Grey cast iron	30	0.01xDc
	GR9-2 Nodular cast iron	35	0.01xDc
N	Aluminium Steel Materials		
	GR10-1 Wrought Aluminium alloys	60	0.016xDc
	GR10-2 Aluminium cast alloys <10%	60	0.016xDc
	GR10-3 Aluminium cast alloys >10%	55	0.014xDc
	Copper Steel Materials		
	GR11-1 Pure Copper	30	0.01xDc
	GR11-2 Brass	30	0.01xDc
	GR11-2 Bronze	30	0.01xDc

※All cutting data serve for orientation only and should be adapted individually to the technical conditions on location .

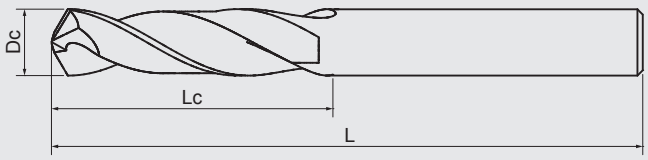
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

D400

Micro Precision Drills

Small diameter with drill point angle 130° Design with sharp and strength drill point shape.

Diameter specification from 0.2mm to 1.4mm in step of 0.05mm.





VHM Carbide | Uncoated Bright | 5XD | 2 | DIN 1899 | 130° | AL, Cu, PVC, Copper

Application for drilling aluminium, copper, plastic materials... and etc.

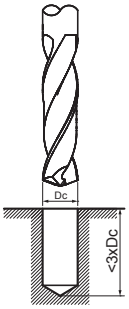
P K N

Standard Length

Dc h7	Lc mm	L mm	d h6	D400 Bright
0.2	1.2	25	1	•
0.25	1.5	25	1	•
0.3	1.9	25	1	•
0.35	2.4	25	1	•
0.4	3	25	1	•
0.45	3	25	1	•
0.5	3.4	25	1	•
0.55	3.9	25	1	•
0.6	3.9	25	1	•
0.65	4.2	25	1	•
0.7	4.8	25	1	•
0.75	4.8	25	1	•
0.8	5.3	25	1.5	•
0.85	5.3	25	1.5	•
0.9	6	25	1.5	•
0.95	6	25	1.5	•
1	6.8	25	1.5	•
1.05	6.8	25	1.5	•
1.1	7.6	25	1.5	•
1.15	7.6	25	1.5	•
1.2	8.5	25	1.5	•
1.25	8.5	25	1.5	•
1.3	8.5	25	1.5	•
1.35	9.5	25	1.5	•
1.4	9.5	25	1.5	•

Cutting Conditions

D400



		cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)
	Carbon Steel Materials		
P	GR1 Carbon Steel	40	0.008xDc
P	GR2 <24HRC Low-alloyed Steel	30	0.008xDc
P	GR3 <30HRC Hi-alloyed Steel	20	0.008xDc
	Cast Iron Materials		
K	GR9-1 Grey cast iron	40	0.008xDc
K	GR9-2 Nodular cast iron	40	0.008xDc
	Aluminium Steel Materials		
N	GR10-1 Wrought Aluminium alloys	200	0.01xDc
N	GR10-2 Aluminium cast alloys <10%	200	0.01xDc
N	GR10-3 Aluminium cast alloys >10%	180	0.01xDc
	Copper Steel Materials		
N	GR11-1 Pure Copper	60	0.01xDc
N	GR11-2 Brass	60	0.01xDc
N	GR11-2 Bronze	60	0.01xDc
	Plastics Steel Materials		
N	GR12 Plastics	100	0.01xDc
	FRP CFRP Steel Materials		
N	GR13 FRP CFRP Composite Material	80	0.01xDc

※All cutting data serve for orientation only and should be adapted individually to the technical conditions on location .
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

D412 / D430FN

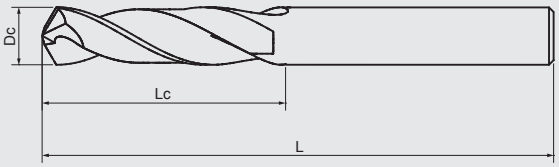
Twist Drills / High Performance Drills

D412 118° X-type drill point design is easy for positioning.

Designed with sharp drill point. D430FN 140° S-type drill point design with centring and positioning function, reduce axial drilling force.

Designed with high chip evacuating flutes.

Good wear resistance and lubricating effect with Nano multilayer coating.







VHM Carbide | 3XD | 2 | DIN 6539

Suitable for drilling with 3XD depth. D412 Application for drilling cast iron, aluminium, copper, plastic, composite materials...and etc.

D430FN Application for drilling steels below 48HRC, cast iron...and etc.

K N | Uncoated Bright | 118° | AL, Cu, PVC, CFRP

P H K | AlTiCrN FN | 140° | Steel <48HRC Stainless Cast Iron

DIN 6539 Stub Length

Dc h7	Lc mm	L mm	D412 Bright	D430FN AlTiCrN
1	6	26	•	•
1.05	6	26	•	•
1.1	7	28	•	•
1.15	7	28	•	•
1.2	8	30	•	•
1.25	8	30	•	•
1.3	8	30	•	•
1.35	9	32	•	•
1.4	9	32	•	•
1.45	9	32	•	•
1.5	9	32	•	•
1.55	10	34	•	•
1.6	10	34	•	•
1.65	10	34	•	•
1.7	10	34	•	•
1.75	11	36	•	•
1.8	11	36	•	•
1.85	11	36	•	•
1.9	11	36	•	•
1.95	12	38	•	•
2	12	38	•	•
2.05	12	38	•	•
2.1	12	38	•	•
2.15	13	40	•	•
2.2	13	40	•	•
2.25	13	40	•	•
2.3	13	40	•	•
2.35	13	40	•	•
2.4	14	43	•	•
2.45	14	43	•	•
2.5	14	43	•	•
2.55	14	43	•	•
2.6	14	43	•	•
2.65	14	43	•	•
2.7	16	46	•	•
2.75	16	46	•	•
2.8	16	46	•	•
2.85	16	46	•	•
2.9	16	46	•	•
2.95	16	46	•	•
3	16	46	•	•
3.1	18	49	•	•
3.2	18	49	•	•
3.3	18	49	•	•

Twist Drills / High Performance Drills

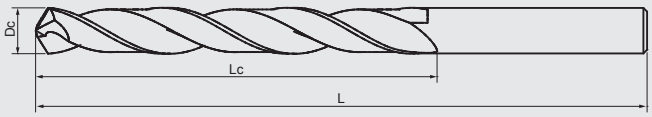
Dc h7	Lc mm	L mm	D412 Bright	D430FN AlTiCrN	
3.4	20	52	•	•	
3.5	20	52	•	•	
3.6	20	52	•	•	
3.7	20	52	•	•	
3.8	22	55	•	•	
3.9	22	55	•	•	
4	22	55	•	•	
4.1	22	55	•	•	
4.2	22	55	•	•	
4.3	24	58	•	•	
4.4	24	58	•	•	
4.5	24	58	•	•	
4.6	24	58	•	•	
4.7	24	58	•	•	
4.8	26	62	•	•	
4.9	26	62	•	•	
5	26	62	•	•	
5.1	26	62	•	•	
5.2	26	62	•	•	
5.3	26	62	•	•	
5.4	28	66	•	•	
5.5	28	66	•	•	
5.6	28	66	•	•	
5.7	28	66	•	•	
5.8	28	66	•	•	
5.9	28	66	•	•	
6	28	66	•	•	
6.1	31	70	•	•	
6.2	31	70	•	•	
6.3	31	70	•	•	
6.4	31	70	•	•	
6.5	31	70	•	•	
6.6	31	70	•	•	
6.7	31	70	•	•	
6.8	34	74	•	•	
6.9	34	74	•	•	
7	34	74	•	•	
7.1	34	74	•	•	
7.2	34	74	•	•	
7.3	34	74	•	•	
7.4	34	74	•	•	
7.5	34	74	•	•	
7.6	37	79	•	•	
7.7	37	79	•	•	
7.8	37	79	•	•	
7.9	37	79	•	•	
8	37	79	•	•	
8.1	37	79	•	•	
8.2	37	79	•	•	
8.3	37	79	•	•	
8.4	37	79	•	•	
8.5	37	79	•	•	
8.6	40	84	•	•	
8.7	40	84	•	•	
8.8	40	84	•	•	
8.9	40	84	•	•	
9	40	84	•	•	
9.1	40	84	•	•	
9.2	40	84	•	•	
9.3	40	84	•	•	
9.4	40	84	•	•	
9.5	40	84	•	•	
9.6	43	89	•	•	
9.7	43	89	•	•	
9.8	43	89	•	•	
9.9	43	89	•	•	
10	43	89	•	•	
10.2	43	89	•	•	
10.5	43	89	•	•	
10.8	47	95	•	•	
11	47	95	•	•	
11.5	47	95	•	•	
12	51	102	•	•	
12.5	51	102	•	•	
13	51	102	•	•	

Please refer to page P428 for parameters.

D413 / D433FN

Twist Drills / High Performance Drills

D413 118° X-type drill point design is easy for positioning.
Designed with sharp drill point.
D433FN 140° S-type drill point design with centring and positioning function, reduce axial drilling force.
Designed with high chip evacuating flutes.
Good wear resistance and lubricating effect with Nano multilayer coating.







VHM Carbide | 5XD | 2 | DIN 338

Suitable for drilling with 5XD depth.
D413 Application for drilling cast iron, aluminium, copper, plastic, composite materials...and etc. D433FN Application for drilling steels below 48HRC, cast iron...and etc.

K N | Uncoated Bright | 118° | AL, Cu, PVC, CFRP

P H K | AlTiCrN FN | 140° | Steel <48HRC Stainless Cast Iron

DIN 338 Standard Length

Dc h7	Lc mm	L mm	D413 Bright	D433FN AlTiCrN	
1	12	34	•	•	
1.1	14	36	•	•	
1.2	16	38	•	•	
1.3	16	38	•	•	
1.4	18	40	•	•	
1.5	18	40	•	•	
1.6	20	43	•	•	
1.7	20	43	•	•	
1.8	22	46	•	•	
1.9	22	46	•	•	
2	24	49	•	•	
2.1	24	49	•	•	
2.2	27	53	•	•	
2.3	27	53	•	•	
2.4	30	57	•	•	
2.5	30	57	•	•	
2.6	30	57	•	•	
2.7	33	61	•	•	
2.8	33	61	•	•	
2.9	33	61	•	•	
3	33	61	•	•	
3.1	36	65	•	•	
3.2	36	65	•	•	
3.3	36	65	•	•	
3.4	39	70	•	•	
3.5	39	70	•	•	
3.6	39	70	•	•	
3.7	39	70	•	•	
3.8	43	75	•	•	
3.9	43	75	•	•	
4	43	75	•	•	
4.1	43	75	•	•	
4.2	43	75	•	•	
4.3	47	80	•	•	
4.4	47	80	•	•	
4.5	47	80	•	•	
4.6	47	80	•	•	
4.7	47	80	•	•	
4.8	52	86	•	•	
4.9	52	86	•	•	

Twist Drills / High Performance Drills

Dc h7	Lc mm	L mm	D413 Bright	D433FN AlTiCrN	
5	52	86	•	•	
5.1	52	86	•	•	
5.2	52	86	•	•	
5.3	52	86	•	•	
5.4	57	93	•	•	
5.5	57	93	•	•	
5.6	57	93	•	•	
5.7	57	93	•	•	
5.8	57	93	•	•	
5.9	57	93	•	•	
6	57	93	•	•	
6.1	63	101	•	•	
6.2	63	101	•	•	
6.3	63	101	•	•	
6.4	63	101	•	•	
6.5	63	101	•	•	
6.6	63	101	•	•	
6.7	63	101	•	•	
6.8	69	109	•	•	
6.9	69	109	•	•	
7	69	109	•	•	
7.1	69	109	•	•	
7.2	69	109	•	•	
7.3	69	109	•	•	
7.4	69	109	•	•	
7.5	69	109	•	•	
7.6	75	117	•	•	
7.7	75	117	•	•	
7.8	75	117	•	•	
7.9	75	117	•	•	
8	75	117	•	•	
8.1	75	117	•	•	
8.2	75	117	•	•	
8.3	75	117	•	•	
8.4	75	117	•	•	
8.5	75	117	•	•	
8.6	81	125	•	•	
8.7	81	125	•	•	
8.8	81	125	•	•	
8.9	81	125	•	•	
9	81	125	•	•	
9.1	81	125	•	•	
9.2	81	125	•	•	
9.3	81	125	•	•	
9.4	81	125	•	•	
9.5	81	125	•	•	
9.6	87	133	•	•	
9.7	87	133	•	•	
9.8	87	133	•	•	
9.9	87	133	•	•	
10	87	133	•	•	
10.2	87	133	•	•	
10.5	87	133	•	•	
10.8	94	142	•	•	
11	94	142	•	•	
11.5	94	142	•	•	
12	101	151	•	•	
12.5	101	151	•	•	
13	101	151	•	•	

Please refer to page P428 for parameters.

D431FT / D435FT

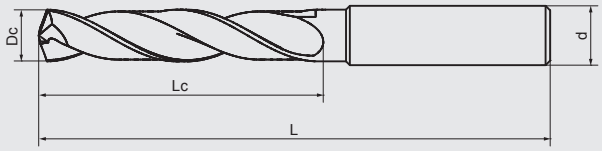
High Performance Drills / Oil-Feed High Performance Drills

140° S-type drill point design with centring and positioning function, reduce axial drilling force.

Designed with high chip evacuating flutes.

Good wear resistance and lubricating effect with Nano multilayer coating.

D435FT Oil-feed design for internal coolant supply.



VHM Carbide | AlTiCrN FT | 3XD | DIN 6537K | 140° | Steel <48HRC Stainless Cast Iron





Application for drilling steels below 48HRC, cast iron... and etc.

Suitable for drilling with 3XD depth.

P H M K



P H M K



DIN 6537K Stub Length

Dc m7	Lc mm	L mm	d h6	D431FT AlTiCrN	D435FT AlTiCrN
3	20	62	6	•	•
3.1	20	62	6	•	•
3.2	20	62	6	•	•
3.3	20	62	6	•	•
3.4	20	62	6	•	•
3.5	20	62	6	•	•
3.6	20	62	6	•	•
3.7	20	62	6	•	•
3.8	24	66	6	•	•
3.9	24	66	6	•	•
4	24	66	6	•	•
4.1	24	66	6	•	•
4.2	24	66	6	•	•
4.3	24	66	6	•	•
4.4	24	66	6	•	•
4.5	24	66	6	•	•
4.6	24	66	6	•	•
4.7	24	66	6	•	•
4.8	28	66	6	•	•
4.9	28	66	6	•	•
5	28	66	6	•	•
5.1	28	66	6	•	•
5.2	28	66	6	•	•
5.3	28	66	6	•	•
5.4	28	66	6	•	•
5.5	28	66	6	•	•
5.6	28	66	6	•	•
5.7	28	66	6	•	•
5.8	28	66	6	•	•
5.9	28	66	6	•	•
6	28	66	6	•	•
6.1	34	79	8	•	•
6.2	34	79	8	•	•
6.3	34	79	8	•	•
6.4	34	79	8	•	•
6.5	34	79	8	•	•
6.6	34	79	8	•	•
6.7	34	79	8	•	•

High Performance Drills / Oil-Feed High Performance Drills

Dc m7	Lc mm	L mm	d h6	D431FT AlTiCrN	D435FT AlTiCrN	
6.8	34	79	8	•	•	
6.9	34	79	8	•	•	
7	34	79	8	•	•	
7.1	41	79	8	•	•	
7.2	41	79	8	•	•	
7.3	41	79	8	•	•	
7.4	41	79	8	•	•	
7.5	41	79	8	•	•	
7.6	41	79	8	•	•	
7.7	41	79	8	•	•	
7.8	41	79	8	•	•	
7.9	41	79	8	•	•	
8	41	79	8	•	•	
8.1	47	89	10	•	•	
8.2	47	89	10	•	•	
8.3	47	89	10	•	•	
8.4	47	89	10	•	•	
8.5	47	89	10	•	•	
8.6	47	89	10	•	•	
8.7	47	89	10	•	•	
8.8	47	89	10	•	•	
8.9	47	89	10	•	•	
9	47	89	10	•	•	
9.1	47	89	10	•	•	
9.2	47	89	10	•	•	
9.3	47	89	10	•	•	
9.4	47	89	10	•	•	
9.5	47	89	10	•	•	
9.6	47	89	10	•	•	
9.7	47	89	10	•	•	
9.8	47	89	10	•	•	
9.9	47	89	10	•	•	
10	47	89	10	•	•	
10.2	55	102	12	•	•	
10.5	55	102	12	•	•	
10.8	55	102	12	•	•	
11	55	102	12	•	•	
11.5	55	102	12	•	•	
12	55	102	12	•	•	
12.5	60	107	14	•	•	
13	60	107	14	•	•	
13.5	60	107	14	•	•	
14	60	107	14	•	•	
14.5	65	115	16	•	•	
15	65	115	16	•	•	
15.5	65	115	16	•	•	
16	65	115	16	•	•	
16.5	73	123	18	•	•	
17	73	123	18	•	•	
17.5	73	123	18	•	•	
18	73	123	18	•	•	
18.5	79	131	20	•	•	
19	79	131	20	•	•	
19.5	79	131	20	•	•	
20	79	131	20	•	•	

Please refer to page P429 for parameters.

D432FT / D436FT

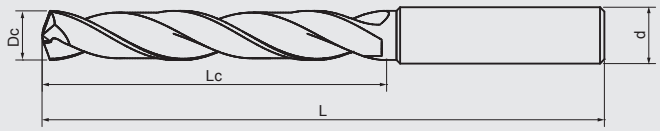
High Performance Drills / Oil-Feed High Performance Drills

140° S-type drill point design with centring and positioning function, reduce axial drilling force.

Designed with high chip evacuating flutes.

Good wear resistance and lubricating effect with Nano multilayer coating.

D436FT Oil-feed design for internal coolant supply.



VHM Carbide | AlTiCrN FT | 5XD | DIN 6537L | 140° | Steel <48HRC Stainless Cast Iron





Application for drilling steels below 48HRC, cast iron...and etc.

Suitable for drilling with 5XD depth.

P H M K

P H M K

DIN 6537L Standard Length

Dc m7	Lc mm	L mm	d h6	D432FT AlTiCrN	D436FT AlTiCrN
3	28	66	6	•	•
3.1	28	66	6	•	•
3.2	28	66	6	•	•
3.3	28	66	6	•	•
3.4	28	66	6	•	•
3.5	28	66	6	•	•
3.6	28	66	6	•	•
3.7	28	66	6	•	•
3.8	36	74	6	•	•
3.9	36	74	6	•	•
4	36	74	6	•	•
4.1	36	74	6	•	•
4.2	36	74	6	•	•
4.3	36	74	6	•	•
4.4	36	74	6	•	•
4.5	36	74	6	•	•
4.6	36	74	6	•	•
4.7	36	74	6	•	•
4.8	44	82	6	•	•
4.9	44	82	6	•	•
5	44	82	6	•	•
5.1	44	82	6	•	•
5.2	44	82	6	•	•
5.3	44	82	6	•	•
5.4	44	82	6	•	•
5.5	44	82	6	•	•
5.6	44	82	6	•	•
5.7	44	82	6	•	•
5.8	44	82	6	•	•
5.9	44	82	6	•	•
6	44	82	6	•	•
6.1	53	91	8	•	•
6.2	53	91	8	•	•
6.3	53	91	8	•	•
6.4	53	91	8	•	•
6.5	53	91	8	•	•
6.6	53	91	8	•	•
6.7	53	91	8	•	•

High Performance Drills / Oil-Feed High Performance Drills

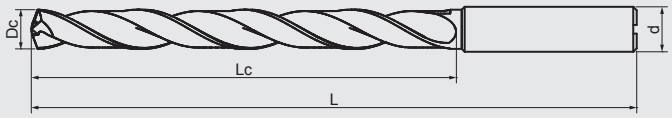
Dc m7	**Lc** mm	**L** mm	**d** h6	D432FT AlTiCrN	D436FT AlTiCrN	
6.8	53	91	8	•	•	
6.9	53	91	8	•	•	
7	53	91	8	•	•	
7.1	53	91	8	•	•	
7.2	53	91	8	•	•	
7.3	53	91	8	•	•	
7.4	53	91	8	•	•	
7.5	53	91	8	•	•	
7.6	53	91	8	•	•	
7.7	53	91	8	•	•	
7.8	53	91	8	•	•	
7.9	53	91	8	•	•	
8	53	91	8	•	•	
8.1	61	103	10	•	•	
8.2	61	103	10	•	•	
8.3	61	103	10	•	•	
8.4	61	103	10	•	•	
8.5	61	103	10	•	•	
8.6	61	103	10	•	•	
8.7	61	103	10	•	•	
8.8	61	103	10	•	•	
8.9	61	103	10	•	•	
9	61	103	10	•	•	
9.1	61	103	10	•	•	
9.2	61	103	10	•	•	
9.3	61	103	10	•	•	
9.4	61	103	10	•	•	
9.5	61	103	10	•	•	
9.6	61	103	10	•	•	
9.7	61	103	10	•	•	
9.8	61	103	10	•	•	
9.9	61	103	10	•	•	
10	61	103	10	•	•	
10.2	71	118	12	•	•	
10.5	71	118	12	•	•	
10.8	71	118	12	•	•	
11	71	118	12	•	•	
11.5	71	118	12	•	•	
12	71	118	12	•	•	
12.5	77	124	14	•	•	
13	77	124	14	•	•	
13.5	77	124	14	•	•	
14	77	124	14	•	•	
14.5	83	133	16	•	•	
15	83	133	16	•	•	
15.5	83	133	16	•	•	
16	83	133	16	•	•	
16.5	93	143	18	•	•	
17	93	143	18	•	•	
17.5	93	143	18	•	•	
18	93	143	18	•	•	
18.5	101	153	20	•	•	
19	101	153	20	•	•	
19.5	101	153	20	•	•	
20	101	153	20	•	•	

Please refer to page P429 for parameters.

D437FT

Oil-Feed High Performance Drills

140° S-type drill point design with centring and positioning function, reduce axial drilling force.
Designed with high chip evacuating flutes.
Oil-feed design for internal coolant supply.
Good wear resistance and lubricating effect with Nano multilayer coating.





VHM Carbide | AlTiCrN FT | 8XD | 140° | Steel <48HRC Stainless Cast Iron

Application for drilling steels below 48HRC, cast iron...and etc.
Suitable for drilling with 8XD depth.

P
H
M
K

Long Length

Dc m7	Lc mm	L mm	d h6	D437FT AlTiCrN
3	34	74	6	•
3.1	34	74	6	•
3.2	34	74	6	•
3.3	34	74	6	•
3.4	34	74	6	•
3.5	34	74	6	•
3.6	34	74	6	•
3.7	34	74	6	•
3.8	45	85	6	•
3.9	45	85	6	•
4	45	85	6	•
4.1	45	85	6	•
4.2	45	85	6	•
4.3	45	85	6	•
4.4	45	85	6	•
4.5	45	85	6	•
4.6	45	85	6	•
4.7	45	85	6	•
4.8	57	97	6	•
4.9	57	97	6	•
5	57	97	6	•
5.1	57	97	6	•
5.2	57	97	6	•
5.3	57	97	6	•
5.4	57	97	6	•
5.5	57	97	6	•
5.6	57	97	6	•
5.7	57	97	6	•
5.8	57	97	6	•
5.9	57	97	6	•
6	57	97	6	•
6.1	66	106	8	•
6.2	66	106	8	•
6.3	66	106	8	•
6.4	66	106	8	•
6.5	66	106	8	•
6.6	66	106	8	•
6.7	66	106	8	•

Oil-Feed High Performance Drills

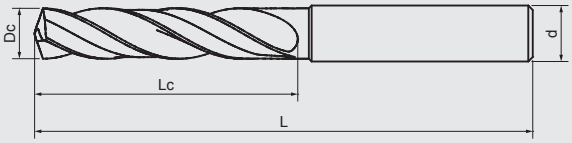
Dc m7	Lc mm	L mm	d h6	D437FT AlTiCrN		
6.8	66	106	8	•		
6.9	66	106	8	•		
7	66	106	8	•		
7.1	76	116	8	•		
7.2	76	116	8	•		
7.3	76	116	8	•		
7.4	76	116	8	•		
7.5	76	116	8	•		
7.6	76	116	8	•		
7.7	76	116	8	•		
7.8	76	116	8	•		
7.9	76	116	8	•		
8	76	116	8	•		
8.1	95	139	10	•		
8.2	95	139	10	•		
8.3	95	139	10	•		
8.4	95	139	10	•		
8.5	95	139	10	•		
8.6	95	139	10	•		
8.7	95	139	10	•		
8.8	95	139	10	•		
8.9	95	139	10	•		
9	95	139	10	•		
9.1	95	139	10	•		
9.2	95	139	10	•		
9.3	95	139	10	•		
9.4	95	139	10	•		
9.5	95	139	10	•		
9.6	95	139	10	•		
9.7	95	139	10	•		
9.8	95	139	10	•		
9.9	95	139	10	•		
10	95	139	10	•		
10.2	114	163	12	•		
10.5	114	163	12	•		
10.8	114	163	12	•		
11	114	163	12	•		
11.5	114	163	12	•		
12	114	163	12	•		
12.5	133	182	14	•		
13	133	182	14	•		
13.5	133	182	14	•		
14	133	182	14	•		
14.5	152	204	16	•		
15	152	204	16	•		
15.5	152	204	16	•		
16	152	204	16	•		
16.5	171	223	18	•		
17	171	223	18	•		
17.5	171	223	18	•		
18	171	223	18	•		
18.5	190	244	20	•		
19	190	244	20	•		
19.5	190	244	20	•		
20	190	244	20	•		

Please refer to page P430 for parameters.

D461TX / D463TX

High Performance Drills/ Oil-Feed High Performance Drills

140° S-shape drill tip design to reduce axial force.
Design with groove shape to provide higher chip removal rates.
The drill tip with a rounded arc relief angle offers excellent resistance to chipping.
The diameter has ground double-edged design, which ensures good surface accuracy of the inner diameter after drilling.
Good wear resistance and lubrication with Nano multilayer coating.
D463TX Oil-feed design for internal coolant supply.







VHM Carbide | AlTiSiN TX | 3XD | DIN 6537K | 140° | Steel <52HRC Stainless Cast Iron | Titanium Nickel High Temp Alloys

Application for drilling with steels which is below HRC52, cast iron, titanium alloy, nickel alloy, high temperature alloy... etc.
Suitable for drilling with 3XD depth.

P H M K S

P H M K S

DIN 6537K Stub Length

Dc m7	Lc mm	L mm	d h6	D461TX AlTiSiN	D463TX AlTiSiN
3	20	62	6	•	•
3.1	20	62	6	•	•
3.2	20	62	6	•	•
3.3	20	62	6	•	•
3.4	20	62	6	•	•
3.5	20	62	6	•	•
3.6	20	62	6	•	•
3.7	20	62	6	•	•
3.8	24	66	6	•	•
3.9	24	66	6	•	•
4	24	66	6	•	•
4.1	24	66	6	•	•
4.2	24	66	6	•	•
4.3	24	66	6	•	•
4.4	24	66	6	•	•
4.5	24	66	6	•	•
4.6	24	66	6	•	•
4.7	24	66	6	•	•
4.8	28	66	6	•	•
4.9	28	66	6	•	•
5	28	66	6	•	•
5.1	28	66	6	•	•
5.2	28	66	6	•	•
5.3	28	66	6	•	•
5.4	28	66	6	•	•
5.5	28	66	6	•	•
5.6	28	66	6	•	•
5.7	28	66	6	•	•
5.8	28	66	6	•	•
5.9	28	66	6	•	•
6	28	66	6	•	•
6.1	34	79	8	•	•
6.2	34	79	8	•	•
6.3	34	79	8	•	•
6.4	34	79	8	•	•
6.5	34	79	8	•	•
6.6	34	79	8	•	•
6.7	34	79	8	•	•

High Performance Drills/ Oil-Feed High Performance Drills

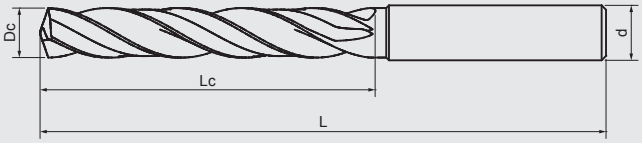
Dc m7	Lc mm	L mm	d h6	D461TX AlTiSiN	D463TX AlTiSiN	
6.8	34	79	8	•	•	
6.9	34	79	8	•	•	
7	34	79	8	•	•	
7.1	41	79	8	•	•	
7.2	41	79	8	•	•	
7.3	41	79	8	•	•	
7.4	41	79	8	•	•	
7.5	41	79	8	•	•	
7.6	41	79	8	•	•	
7.7	41	79	8	•	•	
7.8	41	79	8	•	•	
7.9	41	79	8	•	•	
8	41	79	8	•	•	
8.1	47	89	10	•	•	
8.2	47	89	10	•	•	
8.3	47	89	10	•	•	
8.4	47	89	10	•	•	
8.5	47	89	10	•	•	
8.6	47	89	10	•	•	
8.7	47	89	10	•	•	
8.8	47	89	10	•	•	
8.9	47	89	10	•	•	
9	47	89	10	•	•	
9.1	47	89	10	•	•	
9.2	47	89	10	•	•	
9.3	47	89	10	•	•	
9.4	47	89	10	•	•	
9.5	47	89	10	•	•	
9.6	47	89	10	•	•	
9.7	47	89	10	•	•	
9.8	47	89	10	•	•	
9.9	47	89	10	•	•	
10	47	89	10	•	•	
10.2	55	102	12	•	•	
10.5	55	102	12	•	•	
10.8	55	102	12	•	•	
11	55	102	12	•	•	
11.5	55	102	12	•	•	
12	55	102	12	•	•	
12.5	60	107	14	•	•	
13	60	107	14	•	•	
13.5	60	107	14	•	•	
14	60	107	14	•	•	
14.5	65	115	16	•	•	
15	65	115	16	•	•	
15.5	65	115	16	•	•	
16	65	115	16	•	•	
16.5	73	123	18	•	•	
17	73	123	18	•	•	
17.5	73	123	18	•	•	
18	73	123	18	•	•	
18.5	79	131	20	•	•	
19	79	131	20	•	•	
19.5	79	131	20	•	•	
20	79	131	20	•	•	

Please refer to page P429 for parameters.

D462TX / D464TX

High Performance Drills/ Oil-Feed High Performance Drills

140° S-shape drill tip design to reduce axial force.
Design with groove shape to provide higher chip removal rates.
The drill tip with a rounded arc relief angle offers excellent resistance to chipping.
The diameter has ground double-edged design, which ensures good surface accuracy of the inner diameter after drilling.
Good wear resistance and lubrication with Nano multilayer coating.
D464TX Oil-feed design for internal coolant supply.







VHM Carbide | AlTiSiN TX | 5XD | DIN 6537L | 140° | Steel <52HRC Stainless Cast Iron | Titanium Nickel High Temp Alloys

Application for drilling with steels which is below HRC52, cast iron, titanium alloy, nickel alloy, high temperature alloy...etc.
Suitable for drilling with 5XD depth.

P H M K S

P H M K S

DIN 6537L Standard Length

Dc m7	Lc mm	L mm	d h6	D462TX AlTiSiN	D464TX AlTiSiN
3	28	66	6	•	•
3.1	28	66	6	•	•
3.2	28	66	6	•	•
3.3	28	66	6	•	•
3.4	28	66	6	•	•
3.5	28	66	6	•	•
3.6	28	66	6	•	•
3.7	28	66	6	•	•
3.8	36	74	6	•	•
3.9	36	74	6	•	•
4	36	74	6	•	•
4.1	36	74	6	•	•
4.2	36	74	6	•	•
4.3	36	74	6	•	•
4.4	36	74	6	•	•
4.5	36	74	6	•	•
4.6	36	74	6	•	•
4.7	36	74	6	•	•
4.8	44	82	6	•	•
4.9	44	82	6	•	•
5	44	82	6	•	•
5.1	44	82	6	•	•
5.2	44	82	6	•	•
5.3	44	82	6	•	•
5.4	44	82	6	•	•
5.5	44	82	6	•	•
5.6	44	82	6	•	•
5.7	44	82	6	•	•
5.8	44	82	6	•	•
5.9	44	82	6	•	•
6	44	82	6	•	•
6.1	53	91	8	•	•
6.2	53	91	8	•	•
6.3	53	91	8	•	•
6.4	53	91	8	•	•
6.5	53	91	8	•	•
6.6	53	91	8	•	•
6.7	53	91	8	•	•

D462TX / D464TX

High Performance Drills/ Oil-Feed High Performance Drills

Dc m7	**Lc** mm	**L** mm	**d** h6	D462TX AlTiSiN	D464TX AlTiSiN	
6.8	53	91	8	•	•	
6.9	53	91	8	•	•	
7	53	91	8	•	•	
7.1	53	91	8	•	•	
7.2	53	91	8	•	•	
7.3	53	91	8	•	•	
7.4	53	91	8	•	•	
7.5	53	91	8	•	•	
7.6	53	91	8	•	•	
7.7	53	91	8	•	•	
7.8	53	91	8	•	•	
7.9	53	91	8	•	•	
8	53	91	8	•	•	
8.1	61	103	10	•	•	
8.2	61	103	10	•	•	
8.3	61	103	10	•	•	
8.4	61	103	10	•	•	
8.5	61	103	10	•	•	
8.6	61	103	10	•	•	
8.7	61	103	10	•	•	
8.8	61	103	10	•	•	
8.9	61	103	10	•	•	
9	61	103	10	•	•	
9.1	61	103	10	•	•	
9.2	61	103	10	•	•	
9.3	61	103	10	•	•	
9.4	61	103	10	•	•	
9.5	61	103	10	•	•	
9.6	61	103	10	•	•	
9.7	61	103	10	•	•	
9.8	61	103	10	•	•	
9.9	61	103	10	•	•	
10	61	103	10	•	•	
10.2	71	118	12	•	•	
10.5	71	118	12	•	•	
10.8	71	118	12	•	•	
11	71	118	12	•	•	
11.5	71	118	12	•	•	
12	71	118	12	•	•	
12.5	77	124	14	•	•	
13	77	124	14	•	•	
13.5	77	124	14	•	•	
14	77	124	14	•	•	
14.5	83	133	16	•	•	
15	83	133	16	•	•	
15.5	83	133	16	•	•	
16	83	133	16	•	•	
16.5	93	143	18	•	•	
17	93	143	18	•	•	
17.5	93	143	18	•	•	
18	93	143	18	•	•	
18.5	101	153	20	•	•	
19	101	153	20	•	•	
19.5	101	153	20	•	•	
20	101	153	20	•	•	

Please refer to page P429 for parameters.

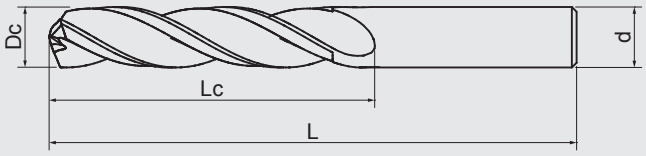
D415

High Performance 3-Flute Drills

DIN 5XD Drills-3 Flutes Designed with high chip evacuating flutes.

To provide higher drilling and milling rate and improve stability on drilling performance.

Suitable for drilling with 5XD depth.





VHM Carbide | Uncoated Bright | 5XD | 3 | DIN 6539 | 135° | AL, Cu, Copper

Improved strength design for cutting different steels below 48HRC, cast iron, aluminium and copper. Application for drill positioning and chamfering.

P
K
N

Standard Length

Dc h7	Lc mm	L mm	D415 Bright
3	22	46	•
3.1	24	49	•
3.2	24	49	•
3.3	24	49	•
3.4	27	52	•
3.5	27	52	•
3.6	27	52	•
3.7	27	52	•
3.8	30	55	•
3.9	30	55	•
4	30	55	•
4.1	30	55	•
4.2	30	55	•
4.3	32	58	•
4.4	32	58	•
4.5	32	58	•
4.6	32	58	•
4.7	32	58	•
4.8	35	62	•
4.9	35	62	•
5	35	62	•
5.1	35	62	•
5.2	35	62	•
5.3	35	62	•
5.4	39	66	•
5.5	39	66	•
5.6	39	66	•
5.7	39	66	•
5.8	39	66	•
5.9	39	66	•
6	39	66	•
6.1	42	70	•
6.2	42	70	•
6.3	42	70	•
6.4	42	70	•
6.5	42	70	•
6.6	42	70	•
6.7	42	70	•
6.8	45	74	•
6.9	45	74	•

High Performance 3-Flute Drills

Dc h7	Lc mm	L mm	D415 Bright		
7	45	74	•		
7.1	45	74	•		
7.2	45	74	•		
7.3	45	74	•		
7.4	45	74	•		
7.5	45	74	•		
7.6	48	79	•		
7.7	48	79	•		
7.8	48	79	•		
7.9	48	79	•		
8	48	79	•		
8.1	48	79	•		
8.2	48	79	•		
8.3	48	79	•		
8.4	48	79	•		
8.5	48	79	•		
8.6	52	84	•		
8.7	52	84	•		
8.8	52	84	•		
8.9	52	84	•		
9	52	84	•		
9.1	52	84	•		
9.2	52	84	•		
9.3	52	84	•		
9.4	52	84	•		
9.5	52	84	•		
9.6	55	89	•		
9.7	55	89	•		
9.8	55	89	•		
9.9	55	89	•		
10	55	89	•		
10.2	55	89	•		
10.5	55	89	•		
10.8	55	89	•		
11	60	95	•		
11.5	60	95	•		
11.8	65	102	•		
12	65	102	•		
12.5	65	102	•		
13	65	102	•		

※Non-stock item, MOQ 10 PCS

Please refer to page P430 for parameters.

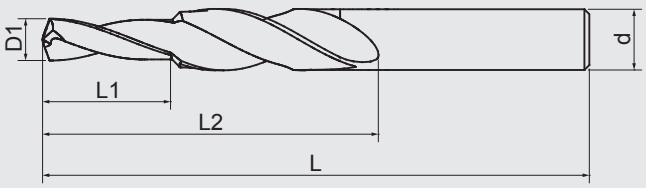
D419FT

Combined Drill and Chamfer Tool

140° Step Drills.

Design for pre-drilling diameter of Metric Thread, and drilling with chamfering 90° at once.

Good wear resistance and lubricating effect with Nano multilayer coating.





VHM Carbide | AlTiCrN FT | 2 | 90° D2 D1 | 140° | Steel <48HRC

Application for drilling steels below 48HRC, cast iron...and etc.

P
H
M
K

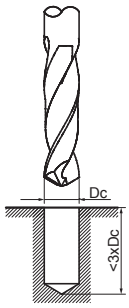
DIN 6527 Standard Length

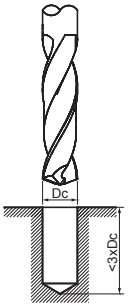
For thread size	D1 mm	L1 mm	L2 mm	L mm	d h6	D419FT AlTiCrN		
M 3	2.5	8.8	28	66	6	•		
M 4	3.3	11.4	28	66	6	•		
M 5	4.2	13.6	28	66	6	•		
M 6	5	16.5	41	79	8	•		
M 8	6.8	21	47	89	10	•		
M10	8.5	25.5	55	102	12	•		
M12	10.2	30	60	107	14	•		

Please refer to page P430 for parameters.

Cutting Conditions

D412
D430FN
D413
D433FN





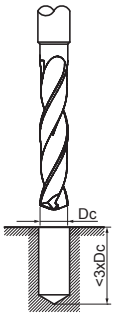
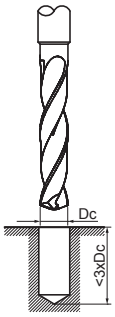




		D412		D430FN		D413		D433FN	
		cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)	cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)	cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)	cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)
P	Carbon Steel Materials								
	GR1 Carbon Steel			80	0.023xDc			80	0.023xDc
	GR2 <24HRC Low-alloyed Steel			80	0.023xDc			80	0.023xDc
	GR3 <30HRC Hi-alloyed Steel			70	0.021xDc			70	0.021xDc
H	Hardened Steel Materials								
	GR4 30~38HRC Hardened Steel			50	0.020xDc			50	0.020xDc
	GR5 38~48HRC Hardened Steel			40	0.015xDc			40	0.015xDc
M	Stainless Steel Materials								
	GR8-1 Ferritic、Martensitic								
	GR8-2 Austenitic								
	GR8-3 Austenitic-ferritic								
	GR8-4 Austenitic-ferritic Heat-resistant								
K	Cast Iron Materials								
	GR9-1 Grey cast iron	40	0.008xDc	80	0.023xDc	40	0.008xDc	80	0.023xDc
	GR9-2 Nodular cast iron	40	0.008xDc	80	0.023xDc	40	0.008xDc	80	0.023xDc
N	Aluminium Steel Materials								
	GR10-1 Wrought Aluminium alloys	200	0.01xDc			200	0.01xDc		
	GR10-2 Aluminium cast alloys <10%	200	0.01xDc			200	0.01xDc		
	GR10-3 Aluminium cast alloys >10%	180	0.01xDc			180	0.01xDc		
	Copper Steel Materials								
	GR11-1 Pure Copper	60	0.01xDc			60	0.01xDc		
	GR11-2 Brass	60	0.01xDc			60	0.01xDc		
	GR11-2 Bronze	60	0.01xDc			60	0.01xDc		
	Copper Steel Materials								
	GR12 Plastics	100	0.01xDc			100	0.01xDc		
	GR13 FRP CFRP Composite Material	80	0.01xDc			80	0.01xDc		

※All cutting data serve for orientation only and should be adapted individually to the technical conditions on location .
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

Cutting Conditions

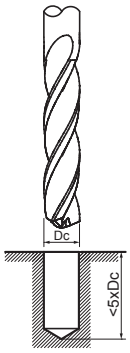
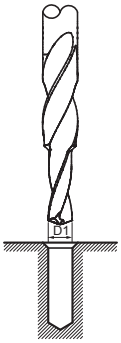
		D431FT / D461TX		D435FT / D463TX		D432FT / D462TX		D436FT / D464TX	
D431FT D461TX D463TX D435FT D432FT D462TX D464TX D436FT									
		cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)	cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)	cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)	cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)
P	Carbon Steel Materials								
	GR1 Carbon Steel	80	0.023xDc	100	0.023xDc	70	0.023xDc	100	0.023xDc
	GR2 <24HRC Low-alloyed Steel	80	0.023xDc	100	0.023xDc	70	0.023xDc	100	0.023xDc
	GR3 <30HRC Hi-alloyed Steel	70	0.021xDc	90	0.021xDc	60	0.021xDc	90	0.021xDc
H	Hardened Steel Materials								
	GR4 30~38HRC Hardened Steel	50	0.020xDc	50	0.020xDc	40	0.020xDc	50	0.020xDc
	GR5 38~48HRC Hardened Steel	40	0.015xDc	40	0.015xDc	30	0.015xDc	40	0.015xDc
M	Stainless Steel Materials								
	GR8-1 Ferritic、Martensitic			50	0.013xDc			50	0.013xDc
	GR8-2 Austenitic			50	0.013xDc			50	0.013xDc
	GR8-3 Austenitic-ferritic			50	0.013xDc			50	0.013xDc
	GR8-4 Austenitic-ferritic Heat-resistant			40	0.012xDc			40	0.012xDc
K	Cast Iron Materials								
	GR9-1 Grey cast iron	80	0.023xDc	100	0.023xDc	70	0.023xDc	100	0.023xDc
	GR9-2 Nodular cast iron	80	0.023xDc	100	0.023xDc	70	0.023xDc	100	0.023xDc
N	Aluminium Steel Materials								
	GR10-1 Wrought Aluminium alloys								
	GR10-2 Aluminium cast alloys <10%								
	GR10-3 Aluminium cast alloys >10%								
	Copper Steel Materials								
	GR11-1 Pure Copper								
	GR11-2 Brass								
	GR11-2 Bronze								

※All cutting data serve for orientation only and should be adapted individually to the technical conditions on location .

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

Cutting Conditions

D437FT
D415
D419FT

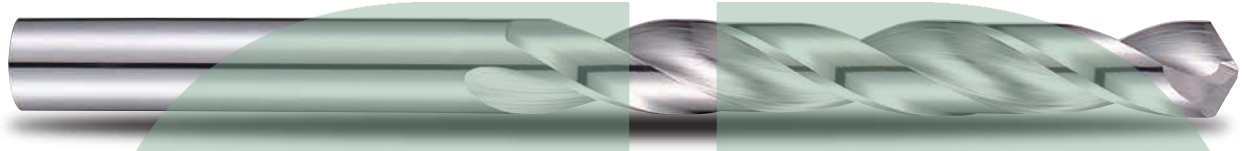
		D437FT		D415		D419FT	
							
		cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)	cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)	cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)
P	Carbon Steel Materials						
	GR1 Carbon Steel	100	0.023xDc			80	0.02xDc
	GR2 <24HRC Low-alloyed Steel	100	0.023xDc			80	0.02xDc
	GR3 <30HRC Hi-alloyed Steel	90	0.021xDc			70	0.015xDc
H	Hardened Steel Materials						
	GR4 30~38HRC Hardened Steel	50	0.020xDc			50	0.015xDc
	GR5 38~48HRC Hardened Steel	40	0.015xDc			40	0.01xDc
M	Stainless Steel Materials						
	GR8-1 Ferritic、Martensitic	50	0.013xDc				
	GR8-2 Austenitic	50	0.013xDc				
	GR8-3 Austenitic-ferritic	50	0.013xDc				
	GR8-4 Austenitic-ferritic Heat-resistant	40	0.012xDc				
K	Cast Iron Materials						
	GR9-1 Grey cast iron	100	0.023xDc			80	0.02xDc
	GR9-2 Nodular cast iron	100	0.023xDc			80	0.02xDc
N	Aluminium Steel Materials						
	GR10-1 Wrought Aluminium alloys			120	0.03xDc		
	GR10-2 Aluminium cast alloys <10%			120	0.02xDc		
	GR10-3 Aluminium cast alloys >10%			120	0.015xDc		
	Copper Steel Materials						
	GR11-1 Pure Copper			80	0.02xDc		
	GR11-2 Brass			80	0.02xDc		
	GR11-2 Bronze			80	0.02xDc		

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.



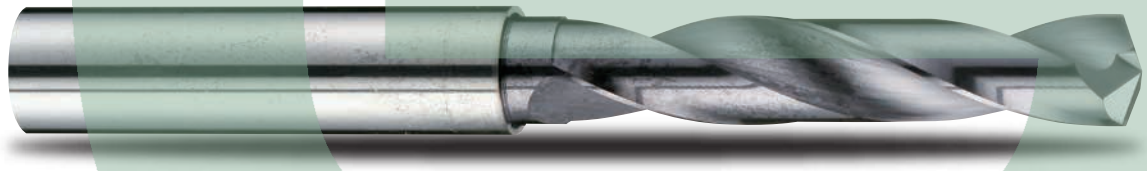
D903
NC Spot Drills

Can be used at higher speeds and feeds, compatible with other carbide tools. Suitable for Steels, Cast Iron, Aluminium, Stainless Steels, Plastics, Bronze and High Temp Alloys.



D453
Jobber Drills

Provide superior wear resistance. Use in lower tensile strength materials such as Cast Iron, Cast Aluminium, Bronze, Copper, Zinc, Brass, Rubber and Plastics, Composite...etc. Also can be applied for drilling with Steel as work material.



D457FT
High Performance Drills

Provide superior wear resistance. For use Stainless Steels, Steels, Nickel-based High-Temperature Alloys and Titanium Alloys.



D458FT
Oil-Feed High Performance Drills

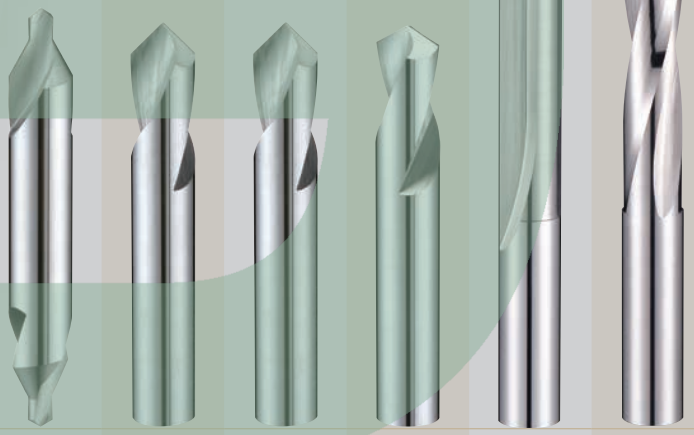
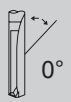
Provide superior wear resistance. For use Stainless Steels, Steels, Nickel-based High-Temperature Alloys and Titanium Alloys.



ANSI DRILL



Drills · Reamers

Page	435	436	436	436	437	439
Appearance						
Code No	D908	D901	D903	D913	D451	D452
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
Coating	Uncoated Bright	Uncoated Bright	Uncoated Bright	Uncoated Bright	Uncoated Bright	Uncoated Bright
Helix Angle					 0°	 15°
No.of Flutes	 2	 2	 2	 2	 2	 2

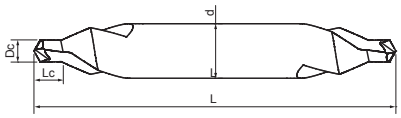
441	445	447	448	450
				
D453	**D457FT-4**	**D458FT-3**	**D458FT-5**	**D458FT-7**
MG Carbide	**MG Carbide**	**MG Carbide**	**MG Carbide**	**MG Carbide**
Uncoated Bright	**AlTiCrN FT**	**AlTiCrN FT**	**AlTiCrN FT**	**AlTiCrN FT**
 30°	 4XD	 3XD	 5XD	 7XD
 2	 2	 2	 2	 2

Combined Drills & Countersinks
60° Countersink Angle and Plain Short

MG Carbide | Uncoated Bright | 2

Code No: D908-DC





Work Material

P	H	M	K	N	S
●	●	○	●	●	○

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics
- **S** High Temp Alloys

Tolerance: DC

All Sizes: h7

Feature of product:

Provide superior wear resistance. Can withstand the highest cutting temperatures in low tensile and highly abrasive materials which suitable for Steels, Bronze, Copper, Rubber, Aluminium, Cast Iron, Stainless Steels...etc.

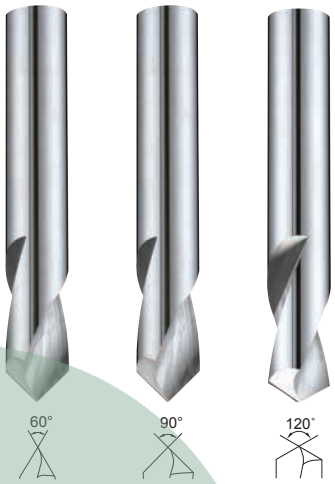
Standard Length

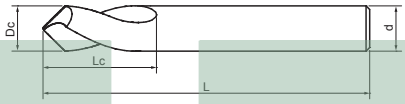
Size No.	Dc h7	Lc h7	L Inch	d h6	Bright D908
#0	1/32	1/32	1-1/4	1/8	●
#1	3/64	3/64	1-1/4	1/8	●
#2	5/64	5/64	1-7/8	3/16	●
#3	7/64	7/64	2	1/4	●
#4	1/8	1/8	2-1/2	5/16	●
#5	3/16	3/16	3	7/16	●
#6	7/32	7/32	3	1/2	●
#7	1/4	1/4	3-1/4	5/8	●
#8	5/16	5/16	3-1/2	3/4	●

NC Spot Drills
60°&90°&120° Point

MG Carbide | Uncoated Bright | 2

Code No: D901-DC-60°
Code No: D903-DC-90°
Code No: D913-DC-120°





Work Material

P	H	M	K	N	S
●	●	○	●	●	○

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics
- **S** High Temp Alloys

Tolerance: DC

All Sizes: +0/-0.001"

Feature of product:

Can be used at higher speeds and feeds, compatible with other carbide tools.

Suitable for Steels, Cast Iron, Aluminium, Stainless Steels, Plastics, Bronze and High Temp Alloys.

Standard Length

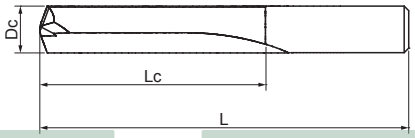
Dc 0 -0.001"	Lc Inch	L Inch	d h6	Bright D901	Bright D903	Bright D913
1/8	5/8	2	1/8	●	●	●
3/16	3/4	2	3/16	●	●	●
1/4	3/4	2-1/2	1/4	●	●	●
5/16	1	2-1/2	5/16	●	●	●
3/8	1	3	3/8	●	●	●
7/16	1	3	7/16	●	●	●
1/2	1-1/4	3	1/2	●	●	●
5/8	1-1/4	3	5/8	●	●	●
3/4	1-3/4	4	3/4	●	●	●
7/8	1-3/4	4	7/8	●	●	●
1	1-3/4	4	1	●	●	●

Straight Flute Drills
140° Point and Straight Flute

MG Carbide | Uncoated Bright | 0° | 2

Code No: D451-DC





Work Material

P	H	M	K	N	S
	●	●			●

H	<56HRC Hardened Steel
M	Stainless Steel
S	High Temp Alloys

Tolerance: DC

All Sizes: h7

Feature of product:

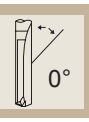
140° point and straight flute give this drill strength and rigidity.

Recommended for drilling in hard and high strength materials such as Heat treated Steel Alloys, <HRC56, Nickel-chrome Steel, Stainless Steels, Bearing Steels and High Temp Alloys.

Standard Length

Dc h7	Dec. Equiv. Inch	Lc Inch	L Inch	Bright D451
3/64	0.0469	1/2	1-1/2	●
1/16	0.0625	5/8	1-5/8	●
5/64	0.0781	11/16	1-11/16	●
3/32	0.0938	3/4	1-3/4	●
7/64	0.1094	13/16	1-13/16	●
1/8	0.1250	7/8	1-7/8	●
9/64	0.1406	15/16	2	●
5/32	0.1562	1	2-1/16	●
11/64	0.1719	1-1/16	2-1/8	●
3/16	0.1875	1-1/8	2-3/16	●
13/64	0.2031	1-3/16	2-1/4	●
7/32	0.2188	1-1/4	2-3/8	●
15/64	0.2344	1-5/16	2-7/16	●
1/4	0.2500	1-3/8	2-1/2	●
17/64	0.2656	1-7/16	2-5/8	●
9/32	0.2812	1-1/2	2-11/16	●
19/64	0.2969	1-9/16	2-3/4	●
5/16	0.3125	1-5/8	2-13/16	●
21/64	0.3281	1-11/16	3	●
11/32	0.3438	1-11/16	3	●
23/64	0.3594	1-3/4	3-1/16	●
3/8	0.3750	1-13/16	3-1/8	●
25/64	0.3906	1-7/8	3-1/4	●
13/32	0.4062	1-15/16	3-5/16	●
27/64	0.4219	2	3-3/8	●
7/16	0.4375	2-1/16	3-7/16	●
29/64	0.4531	2-1/8	3-9/16	●
15/32	0.4688	2-1/8	3-5/8	●
31/64	0.4844	2-3/16	3-11/16	●
1/2	0.5000	2-1/4	3-3/4	●
#60	0.0400	1/2	1-1/2	●
#59	0.0410	1/2	1-1/2	●
#58	0.0420	1/2	1-1/2	●
#57	0.0430	1/2	1-1/2	●
#56	0.0465	1/2	1-1/2	●
#55	0.0520	1/2	1-1/2	●
#54	0.0550	1/2	1-1/2	●
#53	0.0595	1/2	1-1/2	●
#52	0.0635	11/16	1-11/16	●
#51	0.0670	11/16	1-11/16	●
#50	0.0700	11/16	1-11/16	●
#49	0.0730	11/16	1-11/16	●
#48	0.0760	11/16	1-11/16	●
#47	0.0785	3/4	1-3/4	●
#46	0.0810	3/4	1-3/4	●
#45	0.0820	3/4	1-3/4	●
#44	0.0860	3/4	1-3/4	●
#43	0.0890	3/4	1-3/4	●

Straight Flute Drills
140° Point and Straight Flute

MG Carbide | Uncoated Bright |  |  | 

Code No: D451-DC

Work Material

P	H	M	K	N	S
	●	●			●

H <56HRC Hardened Steel

M Stainless Steel

S High Temp Alloys

Tolerance: DC

All Sizes: h7

Feature of product:

140° point and straight flute give this drill strength and rigidity.

Recommended for drilling in hard and high strength materials such as Heat treated Steel Alloys, <HRC56, Nickel-chrome Steel, Stainless Steels, Bearing Steels and High Temp Alloys.

Standard Length

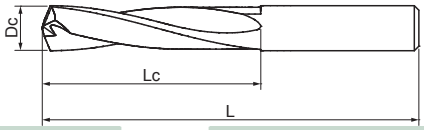
Dc h7	Dec. Equiv. Inch	Lc Inch	L Inch	Bright D451
#42	0.0935	3/4	1-3/4	●
#41	0.0960	13/16	1-13/16	●
#40	0.0980	13/16	1-13/16	●
#39	0.0995	13/16	1-13/16	●
#38	0.1015	13/16	1-13/16	●
#37	0.1040	13/16	1-13/16	●
#36	0.1065	13/16	1-13/16	●
#35	0.1100	7/8	1-7/8	●
#34	0.1110	7/8	1-7/8	●
#33	0.1130	7/8	1-7/8	●
#32	0.1160	7/8	1-7/8	●
#31	0.1200	7/8	1-7/8	●
#30	0.1285	15/16	1-15/16	●
#29	0.1360	15/16	1-15/16	●
#28	0.1405	15/16	1-15/16	●
#27	0.1440	1	2-1/16	●
#26	0.1470	1	2-1/16	●
#25	0.1495	1	2-1/16	●
#24	0.1520	1	2-1/16	●
#23	0.1540	1	2-1/16	●
#22	0.1570	1-1/16	2-1/8	●
#21	0.1590	1-1/16	2-1/8	●
#20	0.1610	1-1/16	2-1/8	●
#19	0.1660	1-1/16	2-1/8	●
#18	0.1695	1-1/16	2-1/8	●
#17	0.1730	1-1/8	2-3/16	●
#16	0.1770	1-1/8	2-3/16	●
#15	0.1800	1-1/8	2-3/16	●
#14	0.1820	1-1/8	2-3/16	●
#13	0.1850	1-1/8	2-3/16	●
#12	0.1890	1-3/16	2-1/4	●
#11	0.1910	1-3/16	2-1/4	●
#10	0.1935	1-3/16	2-1/4	●
#9	0.1960	1-3/16	2-1/4	●
#8	0.1990	1-3/16	2-1/4	●
#7	0.2010	1-3/16	2-1/4	●
#6	0.2040	1-1/4	2-3/8	●
#5	0.2055	1-1/4	2-3/8	●
#4	0.2090	1-1/4	2-3/8	●
#3	0.2130	1-1/4	2-3/8	●
#2	0.2210	1-5/16	2-7/16	●
#1	0.2280	1-5/16	2-7/16	●
A	0.2340	1-5/16	2-7/16	●
B	0.2380	1-3/8	2-1/2	●
C	0.2420	1-3/8	2-1/2	●
D	0.2460	1-3/8	2-1/2	●
E	0.2500	1-3/8	2-1/2	●
F	0.2570	1-7/16	2-5/8	●
G	0.2610	1-7/16	2-5/8	●
H	0.2660	1-1/2	2-11/16	●
I	0.2720	1-1/2	2-11/16	●
J	0.2770	1-1/2	2-11/16	●
K	0.2810	1-1/2	2-11/16	●
L	0.2900	1-9/16	2-3/4	●
M	0.2950	1-9/16	2-3/4	●
N	0.3020	1-5/8	2-13/16	●
O	0.3160	1-11/16	2-15/16	●
P	0.3230	1-11/16	2-15/16	●
Q	0.3320	1-11/16	3	●
R	0.3390	1-11/16	3	●
S	0.3480	1-3/4	3-1/16	●
T	0.3580	1-3/4	3-1/16	●
U	0.3680	1-13/16	3-1/8	●
V	0.3770	1-7/8	3-1/4	●
W	0.3860	1-7/8	3-1/4	●
X	0.3970	1-15/16	3-5/16	●

Slow Spiral Screw Machine Drills
135° Self-Centering Split Point

MG Carbide | Uncoated Bright | 15° | 2

Code No: D452-DC





Work Material

P	H	M	K	N	S
●	●	●	○		●

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel

Tolerance: DC

All Sizes: h7

Feature of product:

Provide superior wear resistance.

For use Stainless Steels, Nickelbased and Titanium Alloys, Aluminium, Cast Iron, Bronze and Magnesium.

Standard Length

Dc h7	Dec. Equiv. Inch	Lc Inch	L Inch	Bright D452
1/32	0.0312	3/8	1-1/8	●
3/64	0.0469	1/2	1-1/2	●
1/16	0.0625	5/8	1-5/8	●
5/64	0.0781	11/16	1-11/16	●
3/32	0.0938	3/4	1-3/4	●
7/64	0.1094	13/16	1-3/16	●
1/8	0.1250	7/8	1-7/8	●
9/64	0.1406	15/16	1-15/16	●
5/32	0.1562	1	2-1/16	●
11/64	0.1719	1-1/16	2-1/8	●
3/16	0.1875	1-1/8	2-3/16	●
13/64	0.2031	1-3/16	2-1/4	●
7/32	0.2188	1-1/4	2-3/8	●
15/64	0.2344	1-5/16	2-7/16	●
1/4	0.2500	1-3/8	2-1/2	●
17/64	0.2656	1-7/16	2-5/8	●
9/32	0.2812	1-1/2	2-11/16	●
19/64	0.2969	1-9/16	2-3/4	●
5/16	0.3125	1-5/8	2-13/16	●
21/64	0.3281	1-11/16	2-15/16	●
11/32	0.3438	1-11/16	2-15/16	●
23/64	0.3594	1-3/4	3-1/16	●
3/8	0.3750	1-13/16	3-1/8	●
25/64	0.3906	1-7/8	3-1/4	●
13/32	0.4063	1-15/16	3-5/16	●
27/64	0.4219	2	3-3/8	●
7/16	0.4375	2-1/16	3-7/16	●
29/64	0.4531	2-1/8	3-9/16	●
15/32	0.4688	2-1/8	3-5/8	●
31/64	0.4844	2-3/16	3-11/16	●
1/2	0.5000	2-1/4	3-3/4	●
17/32	0.5312	2-3/8	3-7/8	●
9/16	0.5625	2-1/2	4	●
5/8	0.6250	2-3/4	4-1/4	●
3/4	0.7500	3-1/8	5	●
#53	0.0595	1/2	1-1/2	●
#52	0.0635	11/16	1-11/16	●
#51	0.0670	11/16	1-11/16	●
#50	0.0700	11/16	1-11/16	●
#49	0.0730	11/16	1-11/16	●
#48	0.0760	11/16	1-11/16	●
#47	0.0785	3/4	1-3/4	●
#46	0.0810	3/4	1-3/4	●
#45	0.0820	3/4	1-3/4	●
#44	0.0860	3/4	1-3/4	●
#43	0.0890	3/4	1-3/4	●
#42	0.0935	3/4	1-3/4	●
#41	0.0960	13/16	1-13/16	●
#40	0.0980	13/16	1-13/16	●
#39	0.0995	13/16	1-13/16	●

Slow Spiral Screw Machine Drills
135° Self-Centering Split Point

MG Carbide | Uncoated Bright | 15° | 2 | 135°

Code No: D452-DC

Work Material

P	H	M	K	N	S
●	●	●	○		●

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel

Tolerance: DC

All Sizes: h7

Feature of product:

Provide superior wear resistance.

For use Stainless Steels, Nickelbased and Titanium Alloys, Aluminium, Cast Iron, Bronze and Magnesium.

Standard Length

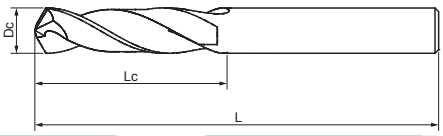
Dc h7	Dec. Equiv. Inch	Lc Inch	L Inch	Bright D452
#38	0.1015	13/16	1-13/16	●
#37	0.1040	13/16	1-13/16	●
#36	0.1065	13/16	1-13/16	●
#35	0.1100	7/8	1-7/8	●
#34	0.1110	7/8	1-7/8	●
#33	0.1130	7/8	1-7/8	●
#32	0.1160	7/8	1-7/8	●
#31	0.1200	7/8	1-7/8	●
#30	0.1285	15/16	1-15/16	●
#29	0.1360	15/16	1-15/16	●
#28	0.1405	15/16	1-15/16	●
#27	0.1440	1	2-1/16	●
#26	0.1470	1	2-1/16	●
#25	0.1495	1	2-1/16	●
#24	0.1520	1	2-1/16	●
#23	0.1540	1	2-1/16	●
#22	0.1570	1-1/16	2-1/8	●
#21	0.1590	1-1/16	2-1/8	●
#20	0.1610	1-1/16	2-1/8	●
#19	0.1660	1-1/16	2-1/8	●
#18	0.1695	1-1/16	2-1/8	●
#17	0.1730	1-1/8	2-3/16	●
#16	0.1770	1-1/8	2-3/16	●
#15	0.1800	1-1/8	2-3/16	●
#14	0.1820	1-1/8	2-3/16	●
#13	0.1850	1-1/8	2-3/16	●
#12	0.1890	1-3/16	2-1/4	●
#11	0.1910	1-3/16	2-1/4	●
#10	0.1935	1-3/16	2-1/4	●
#9	0.1960	1-3/16	2-1/4	●
#8	0.1990	1-3/16	2-1/4	●
#7	0.2010	1-3/16	2-1/4	●
#6	0.2040	1-1/4	2-3/8	●
#5	0.2055	1-1/4	2-3/8	●
#4	0.2090	1-1/4	2-3/8	●
#3	0.2130	1-1/4	2-3/8	●
#2	0.2210	1-5/16	2-7/16	●
#1	0.2280	1-5/16	2-7/16	●
A	0.2340	1-5/16	2-7/16	●
B	0.2380	1-3/8	2-1/2	●
C	0.2420	1-3/8	2-1/2	●
D	0.2460	1-3/8	2-1/2	●
E	0.2500	1-3/8	2-1/2	●
F	0.2570	1-7/16	2-5/8	●
G	0.2610	1-7/16	2-5/8	●
H	0.2660	1-1/2	2-11/16	●
I	0.2720	1-1/2	2-11/16	●
J	0.2770	1-1/2	2-11/16	●
K	0.2810	1-1/2	2-11/16	●
L	0.2900	1-9/16	2-3/4	●
M	0.2950	1-9/16	2-3/4	●
N	0.3020	1-5/8	2-13/16	●
O	0.3160	1-11/16	2-15/16	●
P	0.3230	1-11/16	2-15/16	●
Q	0.3320	1-11/16	3	●
R	0.3390	1-11/16	3	●
S	0.3480	1-3/4	3-1/16	●
T	0.3580	1-3/4	3-1/16	●
U	0.3680	1-13/16	3-1/8	●
V	0.3770	1-7/8	3-1/4	●
W	0.3860	1-7/8	3-1/4	●
X	0.3970	1-15/16	3-5/16	●
Y	0.4040	1-15/16	3-5/16	●
Z	0.4130	2	3-3/8	●

Jobber Drills
118° Point for Quick Penetration

MG Carbide | Uncoated Bright | 30° | 2

Code No: D453-DC





Work Material

P	H	M	K	N	S
○			●	●	

- **P** Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics
- **N** FRP CFRP Composite Material

Tolerance: DC

All Sizes: h7

Feature of product:

Provide superior wear resistance.

Use in lower tensile strength materials such as Cast Iron, Cast Aluminium, Bronze, Copper, Zinc, Brass, Rubber and Plastics, Composite...etc. Also can be applied for drilling with Steel as work material.

Standard Length

Dc h7	Dec. Equiv. Inch	Lc Inch	L Inch	Bright D453
1/64	0.0156	3/16	3/4	●
1/32	0.0312	5/16	1-1/4	●
3/64	0.0469	3/4	1-1/2	●
1/16	0.0625	3/4	1-1/2	●
5/64	0.0781	7/8	1-3/4	●
3/32	0.0938	1	2	●
7/64	0.1094	1-1/4	2-1/4	●
1/8	0.1250	1-1/4	2-1/4	●
9/64	0.1406	1-3/8	2-1/2	●
5/32	0.1562	1-3/8	2-1/2	●
11/64	0.1719	1-5/8	2-3/4	●
3/16	0.1875	1-5/8	2-3/4	●
13/64	0.2031	1-3/4	3	●
7/32	0.2188	1-3/4	3	●
15/64	0.2344	2	3-1/4	●
1/4	0.2500	2	3-1/4	●
17/64	0.2656	2-1/8	3-1/2	●
9/32	0.2812	2-1/8	3-1/2	●
19/64	0.2969	2-3/8	3-3/4	●
5/16	0.3125	2-3/8	3-3/4	●
21/64	0.3281	2-1/2	4	●
11/32	0.3438	2-1/2	4	●
23/64	0.3594	2-1/2	4-1/4	●
3/8	0.3750	2-3/4	4-1/4	●
25/64	0.3906	2-7/8	4-1/2	●
13/32	0.4062	2-7/8	4-1/2	●
27/64	0.4219	2-7/8	4-1/2	●
7/16	0.4375	2-7/8	4-1/2	●
29/64	0.4531	3	4-3/4	●
15/32	0.4688	3	4-3/4	●
31/64	0.4844	3	4-3/4	●
1/2	0.5000	3	4-3/4	●
17/32	0.5312	3-1/4	5	●
9/16	0.5625	3-1/4	5	●
5/8	0.6250	3-1/2	5-1/4	●
3/4	0.7500	3-7/8	5-3/4	●
#80	0.0135	3/16	3/4	●
#79	0.0145	3/16	3/4	●

Jobber Drills
118° Point for Quick Penetration

MG Carbide | Uncoated Bright | 30° | 2 | 118°

Code No: D453-DC

Work Material

P	H	M	K	N	S
○			●	●	

- **P** Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics
- **N** FRP CFRP Composite Material

Tolerance: DC

All Sizes: h7

Feature of product:

Provide superior wear resistance.

Use in lower tensile strength materials such as Cast Iron, Cast Aluminium, Bronze, Copper, Zinc, Brass, Rubber and Plastics, Composite...etc. Also can be applied for drilling with Steel as work material.

Standard Length

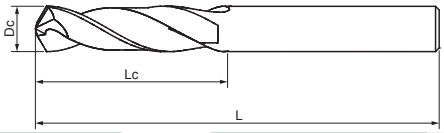
Dc h7	Dec. Equiv. Inch	Lc Inch	L Inch	Bright D453	Dc h7	Dec. Equiv. Inch	Lc Inch	L Inch	Bright D453
#78	0.0160	3/16	3/4	●	#26	0.1470	1-3/8	2-1/2	●
#77	0.0180	3/16	3/4	●	#25	0.1495	1-3/8	2-1/2	●
#76	0.0200	1/4	7/8	●	#24	0.1520	1-3/8	2-1/2	●
#75	0.0210	1/4	7/8	●	#23	0.1540	1-3/8	2-1/2	●
#74	0.0225	1/4	7/8	●	#22	0.1570	1-3/8	2-1/2	●
#73	0.0240	1/4	7/8	●	#21	0.1590	1-3/8	2-1/2	●
#72	0.0250	5/16	1	●	#20	0.1610	1-3/8	2-1/2	●
#71	0.0260	5/16	1	●	#19	0.1660	1-5/8	2-3/4	●
#70	0.0280	5/16	1	●	#18	0.1695	1-5/8	2-3/4	●
#69	0.0292	5/16	1	●	#17	0.1730	1-5/8	2-3/4	●
#68	0.0310	3/8	1-1/8	●	#16	0.1770	1-5/8	2-3/4	●
#67	0.0320	3/8	1-1/8	●	#15	0.1800	1-5/8	2-3/4	●
#66	0.0330	3/8	1-1/8	●	#14	0.1820	1-5/8	2-3/4	●
#65	0.0350	3/8	1-1/8	●	#13	0.1850	1-5/8	2-3/4	●
#64	0.0360	5/8	1-1/4	●	#12	0.1890	1-5/8	2-3/4	●
#63	0.0370	5/8	1-1/4	●	#11	0.1910	1-5/8	2-3/4	●
#62	0.0380	1/2	1-1/4	●	#10	0.1935	1-5/8	2-3/4	●
#61	0.0390	1/2	1-1/4	●	#9	0.1960	1-3/4	3	●
#60	0.0400	3/4	1-1/2	●	#8	0.1990	1-3/4	3	●
#59	0.0410	3/4	1-1/2	●	#7	0.2010	1-3/4	3	●
#58	0.0420	3/4	1-1/2	●	#6	0.2040	1-3/4	3	●
#57	0.0430	3/4	1-1/2	●	#5	0.2055	1-3/4	3	●
#56	0.0465	3/4	1-1/2	●	#4	0.2090	1-3/4	3	●
#55	0.0520	3/4	1-1/2	●	#3	0.2130	1-3/4	3	●
#54	0.0550	3/4	1-1/2	●	#2	0.2210	1-3/4	3	●
#53	0.0595	3/4	1-1/2	●	#1	0.2280	1-3/4	3	●
#52	0.0635	3/4	1-1/2	●	A	0.2340	2	3-1/4	●
#51	0.0670	3/4	1-1/2	●	B	0.2380	2	3-1/4	●
#50	0.0700	7/8	1-3/4	●	C	0.2420	2	3-1/4	●
#49	0.0730	7/8	1-3/4	●	D	0.2460	2	3-1/4	●
#48	0.0760	7/8	1-3/4	●	E	0.2500	2	3-1/4	●
#47	0.0785	7/8	1-3/4	●	F	0.2570	2	3-1/4	●
#46	0.0810	7/8	1-3/4	●	G	0.2610	2-1/8	3-1/2	●
#45	0.0820	7/8	1-3/4	●	H	0.2660	2-1/8	3-1/2	●
#44	0.0860	1	2	●	I	0.2720	2-1/8	3-1/2	●
#43	0.0890	1	2	●	J	0.2770	2-1/8	3-1/2	●
#42	0.0935	1	2	●	K	0.2810	2-1/8	3-1/2	●
#41	0.0960	1	2	●	L	0.2900	2-1/8	3-1/2	●
#40	0.0980	1	2	●	M	0.2950	2-3/8	3-3/4	●
#39	0.0995	1-1/4	2-1/4	●	N	0.3020	2-3/8	3-3/4	●
#38	0.1015	1-1/4	2-1/4	●	O	0.3160	2-3/8	3-3/4	●
#37	0.1040	1-1/4	2-1/4	●	P	0.3230	2-3/8	3-3/4	●
#36	0.1065	1-1/4	2-1/4	●	Q	0.3320	2-1/2	4	●
#35	0.1100	1-1/4	2-1/4	●	R	0.3390	2-1/2	4	●
#34	0.1110	1-1/4	2-1/4	●	S	0.3480	2-1/2	4	●
#33	0.1130	1-1/4	2-1/4	●	T	0.3580	2-1/2	4-1/4	●
#32	0.1160	1-1/4	2-1/4	●	U	0.3680	2-3/4	4-1/4	●
#31	0.1200	1-1/4	2-1/4	●	V	0.3770	2-3/4	4-1/4	●
#30	0.1285	1-1/4	2-1/4	●	W	0.3860	2-7/8	4-1/2	●
#29	0.1360	1-3/8	2-1/2	●	X	0.3970	2-7/8	4-1/2	●
#28	0.1405	1-3/8	2-1/2	●	Y	0.4040	2-7/8	4-1/2	●
#27	0.1440	1-3/8	2-1/2	●	Z	0.4130	2-7/8	4-1/2	●

Jobber Drills
118° Point for Quick Penetration

MG Carbide | Uncoated Bright | 30° | 2 | 公制 mm METRIC

Code No: D453-DC





Work Material

P	H	M	K	N	S
○			●	●	

- **P** Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics
- **N** FRP CFRP Composite Material

Tolerance: DC

All Sizes: h7

Feature of product:

Provide superior wear resistance.

Use in lower tensile strength materials such as Cast Iron, Cast Aluminium, Bronze, Copper, Zinc, Brass, Rubber and Plastics, Composite...etc. Also can be applied for drilling with Steel as work material.

Standard Length

Dc h7	Lc mm	L mm	Bright D453
0.5	6	30	●
0.6	6	30	●
0.7	8	30	●
0.8	10	30	●
0.9	16	38	●
1	19	38	●
1.1	19	38	●
1.2	19	38	●
1.3	19	38	●
1.4	19	38	●
1.5	19	38	●
1.6	19	38	●
1.7	19	38	●
1.8	22	44	●
1.9	22	44	●
2	22	44	●
2.1	22	44	●
2.2	25	51	●
2.3	25	51	●
2.4	25	51	●
2.5	25	51	●
2.6	32	57	●
2.7	32	57	●
2.8	32	57	●
2.9	32	57	●
3	32	57	●
3.1	32	57	●
3.2	32	57	●
3.3	35	64	●
3.4	35	64	●
3.5	35	64	●
3.6	35	64	●
3.7	35	64	●
3.8	35	64	●
3.9	35	64	●
4	35	64	●
4.1	35	64	●
4.2	35	64	●
4.3	41	70	●
4.4	41	70	●
4.5	41	70	●
4.6	41	70	●

Jobber Drills
118° Point for Quick Penetration

MG Carbide | Uncoated Bright | 30° | 2 | 公制 mm METRIC

Code No: D453-DC

Work Material

P	H	M	K	N	S
○			●	●	

- **P** Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics
- **N** FRP CFRP Composite Material

Tolerance: DC

All Sizes: h7

Feature of product:

Provide superior wear resistance.

Use in lower tensile strength materials such as Cast Iron, Cast Aluminium, Bronze, Copper, Zinc, Brass, Rubber and Plastics, Composite...etc. Also can be applied for drilling with Steel as work material.

Standard Length

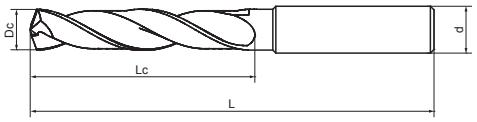
Dc h7	Lc mm	L mm	Bright D453
4.7	41	70	●
4.8	41	70	●
4.9	41	70	●
5	44	76	●
5.1	44	76	●
5.2	44	76	●
5.3	44	76	●
5.4	44	76	●
5.5	44	76	●
5.6	44	76	●
5.7	44	76	●
5.8	44	76	●
5.9	51	83	●
6	51	83	●
6.1	51	83	●
6.2	51	83	●
6.3	51	83	●
6.4	51	83	●
6.5	51	83	●
6.6	54	89	●
6.7	54	89	●
6.8	54	89	●
6.9	54	89	●
7	54	89	●
7.1	54	89	●
7.2	54	89	●
7.3	54	89	●
7.4	54	89	●
7.5	60	95	●
7.6	60	95	●
7.7	60	95	●
7.8	60	95	●
7.9	60	95	●
8	60	95	●
8.1	60	95	●
8.2	60	95	●
8.3	64	102	●
8.4	64	102	●
8.5	64	102	●
8.6	64	102	●
8.7	64	102	●
8.8	64	102	●
8.9	64	102	●
9	64	102	●
9.1	64	102	●
9.2	70	108	●
9.3	70	108	●
9.4	70	108	●
9.5	70	108	●
9.6	73	114	●
9.7	73	114	●
9.8	73	114	●
9.9	73	114	●
10	73	114	●
10.5	73	114	●
11	73	114	●
11.5	76	121	●
12	76	121	●

High Performance Drills
140° Self-Centering Point / 4xDiameter

MG Carbide | AlTiCrN FT | 4XD | 2

Code No: D457FT-4-Dc





Work Material

P	H	M	K	N	S
●	●	○	●		○

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Tolerance: DC

All Sizes: h7

Feature of product:

Good wear resistance.

Application for drilling steels as stainless steel, iron, nickle, high temperature alloy, and titanium alloy.

Standard Length

Dc h7	Dec. Equiv. Inch	Lc Inch	L Inch	d Inch	Bright D457FT-4
3/64	0.0469	0.352	1-1/2	1/8	●
#55	0.0520	0.387	1-1/2	1/8	●
#54	0.0550	0.406	1-1/2	1/8	●
#53	0.0595	0.435	1-1/2	1/8	●
1/16	0.0625	0.453	1-1/2	1/8	●
#52	0.0635	0.456	1-1/2	1/8	●
#50	0.0700	0.499	2	1/8	●
#49	0.0730	0.516	2	1/8	●
#48	0.0760	0.532	2	1/8	●
5/64	0.0781	0.542	2	1/8	●
#46	0.0810	0.557	2	1/8	●
#45	0.0820	0.559	2	1/8	●
#44	0.0860	0.581	2	1/8	●
#43	0.0890	0.595	2	1/8	●
#42	0.0935	0.619	2	1/8	●
3/32	0.0938	0.616	2	1/8	●
#41	0.0960	0.624	2	1/8	●
#40	0.0980	0.631	2	1/8	●
#39	0.0995	0.634	2	1/8	●
#38	0.1015	0.641	2	1/8	●
#37	0.1040	0.650	2	1/8	●
#36	0.1065	0.659	2	1/8	●
7/64	0.1094	0.670	2	1/8	●
#32	0.1160	0.704	2	1/8	●
#31	0.1200	0.728	2	1/8	●
1/8	0.1250	0.750	2	1/8	●
#30	0.1285	0.763	2	3/16	●
#29	0.1360	0.799	2	3/16	●
#28	0.1405	0.817	2	3/16	●
9/64	0.1406	0.808	2	3/16	●
#25	0.1495	0.850	2-1/2	3/16	●
5/32	0.1562	0.879	2-1/2	3/16	●
#21	0.1590	0.884	2-1/2	3/16	●
#20	0.1610	0.805	2-1/2	3/16	●
11/64	0.1719	0.860	2-1/2	3/16	●
#16	0.1770	0.885	2-1/2	3/16	●

High Performance Drills
140° Self-Centering Point / 4xDiameter

MG Carbide | AlTiCrN FT | 4XD | 2

Code No: D457FT-4-Dc

Work Material

P	H	M	K	N	S
●	●	●	○		●

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Tolerance: DC

All Sizes: h7

Feature of product:

Good wear resistance.

Application for drilling steels as stainless steel, iron, nickle, high temperature alloy, and titanium alloy.

Standard Length

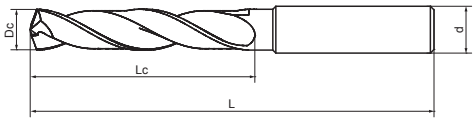
Dc h7	Dec. Equiv. Inch	Lc Inch	L Inch	d Inch	Bright D457FT-4
3/16	0.1875	0.938	2-1/2	3/16	●
#11	0.1910	0.955	2-1/2	1/4	●
#10	0.1935	0.968	2-1/2	1/4	●
#7	0.2010	1.005	2-1/2	1/4	●
13/64	0.2031	1.016	2-1/2	1/4	●
#5	0.2055	1.028	2-1/2	1/4	●
#3	0.2130	1.065	2-1/2	1/4	●
7/32	0.2188	1.094	2-1/2	1/4	●
15/64	0.2344	1.172	2-1/2	1/4	●
1/4	0.2500	1.250	2-1/2	1/4	●
F	0.2570	1.285	3	5/16	●
17/64	0.2656	1.328	3	5/16	●
I	0.2720	1.360	3	5/16	●
9/32	0.2812	1.406	3	5/16	●
19/64	0.2969	1.484	3	5/16	●
5/16	0.3125	1.563	3	5/16	●
21/64	0.3281	1.575	3	3/8	●
Q	0.3320	1.594	3	3/8	●
11/32	0.3438	1.650	3	3/8	●
23/64	0.3594	1.725	3	3/8	●
U	0.3680	1.766	3	3/8	●
3/8	0.3750	1.800	3	3/8	●
25/64	0.3906	1.900	4	7/16	●
13/32	0.4062	1.869	4	7/16	●
27/64	0.4219	1.941	4	7/16	●
7/16	0.4375	2.013	4	7/16	●
29/64	0.4531	1.994	4	1/2	●
31/64	0.4844	2.131	4	1/2	●
1/2	0.5000	2.200	4	1/2	●
33/64	0.5156	2.269	4	9/16	●
17/32	0.5313	2.338	4	9/16	●
35/64	0.5469	2.406	4	9/16	●
9/16	0.5625	2.475	4	9/16	●
37/64	0.5781	2.544	5	5/8	●
19/32	0.5938	2.613	5	5/8	●
5/8	0.6250	2.750	5	5/8	●
21/32	0.6562	2.671	5	3/4	●
11/16	0.6875	2.798	5	3/4	●
3/4	0.7500	3.053	5	3/4	●

Oil-Feed High Performance Drills
140° 3xDiameter

MG Carbide | AlTiCrN FT | 3XD | 2

Code No: D458FT-3-Dc





Work Material

P	H	M	K	N	S
●	●	●	●		●

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Tolerance: DC

All Sizes: h7

Feature of product:

Good wear resistance.

Application for drilling steels as stainless steel, iron, nickle, high temperature alloy, and titanium alloy.

Standard Length

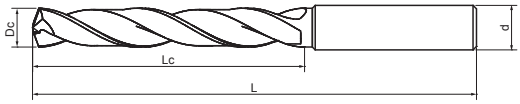
Dc h7	Dec. Equiv. Inch	Lc mm	L mm	d mm	Bright D458FT-3
1/16	0.0625	5.9	60	3	●
3/32	0.0938	8.9	60	3	●
#40	0.0980	9.4	60	3	●
#36	0.1065	10.1	60	3	●
7/64	0.1094	10.4	60	3	●
#32	0.1160	11.1	60	3	●
#31	0.1200	10.3	60	3	●
1/8	0.1250	11.9	60	3	●
#30	0.1285	12.2	62	4	●
#29	0.1360	13.0	62	4	●
9/64	0.1406	13.4	62	4	●
5/32	0.1562	14.9	62	4	●
11/64	0.1719	16.4	64	5	●
3/16	0.1875	17.9	64	5	●
13/64	0.2031	19.3	66	6	●
7/32	0.2188	20.8	66	6	●
1/4	0.2500	23.8	76	8	●
9/32	0.2812	26.8	76	8	●
5/16	0.3125	29.8	76	8	●
11/32	0.3438	32.7	89	10	●
3/8	0.3750	35.7	89	10	●
7/16	0.4375	41.7	102	12	●
1/2	0.5000	47.6	102	14	●
5/8	0.6250	59.5	110	16	●
3/4	0.7500	71.4	128	20	●

Oil-Feed High Performance Drills
140° 5xDiameter

MG Carbide | AlTiCrN FT | 5XD | 2

Code No: D458FT-5-Dc





Work Material

P	H	M	K	N	S
●	●	●	●		●

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Tolerance: DC

All Sizes: h7

Feature of product:

Good wear resistance.

Application for drilling steels as stainless steel, iron, nickle, high temperature alloy, and titanium alloy.

Standard Length

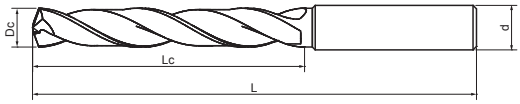
Dc h7	Dec. Equiv. Inch	Lc mm	L mm	d mm	Bright D458FT-5
1/16	0.0625	9.9	68	3	●
#50	0.0700	12.5	68	3	●
#43	0.0890	14.1	68	3	●
3/32	0.0938	14.9	68	3	●
#40	0.0980	15.6	68	3	●
#36	0.1065	16.9	68	3	●
7/64	0.1094	17.4	68	3	●
#32	0.1160	18.4	68	3	●
#31	0.1200	19.1	68	3	●
1/8	0.1250	19.8	68	3	●
#30	0.1285	20.4	72	4	●
#29	0.1360	21.6	72	4	●
9/64	0.1406	22.3	72	4	●
#25	0.1495	23.7	72	4	●
5/32	0.1562	24.8	72	4	●
#21	0.1590	25.3	82	5	●
11/64	0.1719	27.3	82	5	●
#16	0.1770	28.1	82	5	●
3/16	0.1875	29.8	82	5	●
#7	0.2010	31.9	82	6	●
13/64	0.2031	32.2	82	6	●
#3	0.2130	33.8	82	6	●
7/32	0.2188	34.7	82	6	●
1/4	0.2500	39.7	96	8	●
F	0.2570	40.8	96	8	●
I	0.2720	43.2	96	8	●
9/32	0.2812	44.6	96	8	●
5/16	0.3125	49.6	96	8	●
Q	0.3320	52.7	110	10	●
11/32	0.3438	54.6	110	10	●
U	0.3680	58.4	110	10	●
3/8	0.3750	59.5	110	10	●

Oil-Feed High Performance Drills
140° 5XDiameter

MG Carbide | AlTiCrN FT | 5XD | 2

Code No: D458FT-5-Dc





Work Material

P	H	M	K	N	S
●	●	●	●		●

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Tolerance: DC

All Sizes: h7

Feature of product:

Good wear resistance.

Application for drilling steels as stainless steel, iron, nickle, high temperature alloy, and titanium alloy.

Standard Length

Dc h7	Dec. Equiv. Inch	Lc mm	L mm	d mm	Bright D458FT-5
25/64	0.3906	62.0	110	10	●
27/64	0.4219	67.0	132	12	●
7/16	0.4375	69.5	132	12	●
29/64	0.4531	73.4	132	12	●
1/2	0.5000	79.4	138	14	●
9/16	0.5625	89.3	150	16	●
5/8	0.6250	99.2	150	16	●
3/4	0.7500	119.1	178	20	●

Oil-Feed High Performance Drills
140° 7xDiameter

MG Carbide | AlTiCrN FT | 7XD | 2

Code No: D458FT-7-Dc





Work Material

P	H	M	K	N	S
●	●	●	●		●

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **S** Titanium
- **S** Nickel
- **S** High Temp Alloys

Tolerance: DC

All Sizes: h7

Feature of product:

Good wear resistance.

Application for drilling steels as stainless steel, iron, nickle, high temperature alloy, and titanium alloy.

Standard Length

Dc h7	Dec. Equiv. Inch	Lc mm	L mm	d mm	Bright D458FT-7
1/16	0.0625	13.9	76	3	●
3/32	0.0938	20.9	76	3	●
#40	0.0980	21.8	76	3	●
#36	0.1065	23.7	76	3	●
7/64	0.1094	24.3	76	3	●
#31	0.1200	26.7	76	3	●
1/8	0.1250	27.8	76	3	●
#30	0.1285	28.5	81	4	●
#29	0.1360	30.2	81	4	●
9/64	0.1406	31.2	81	4	●
5/32	0.1562	34.7	81	4	●
11/64	0.1719	38.9	96	5	●
3/16	0.1875	41.7	96	5	●
13/64	0.2031	45.1	96	6	●
7/32	0.2188	48.6	96	6	●
1/4	0.2500	55.6	116	8	●
9/32	0.2812	62.5	116	8	●
5/16	0.3125	69.4	116	8	●
3/8	0.3750	83.3	140	10	●
7/16	0.4375	97.2	162	12	●
1/2	0.5000	111.1	164	14	●
9/16	0.5625	125.0	190	16	●
5/8	0.6250	138.9	190	16	●



R318

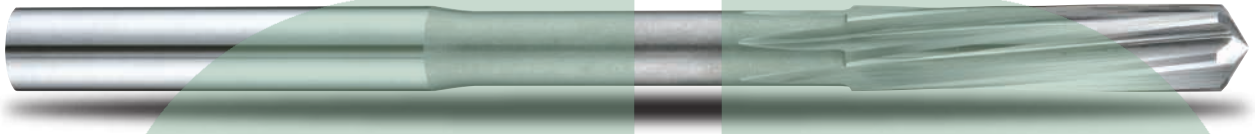
High Precision NC Machine Reamers In Steps of 0.01mm / For Lathe

Designed with left helix and right cutting flutes with unequal flute design.

Downward chip evacuation. Application for reaming different steels below 48HRC, stainless steel, cast iron, aluminium,copper...and etc.

Accuracy tolerance: 0/+0.004mm.





R319

High Precision NC Machine Reamers In Steps of 0.01mm

Designed with left helix and right cutting flutes with unequal flute design.

Downward chip evacuation. Application for reaming different steels below 48HRC, stainless steel, cast iron, aluminium,copper...and etc.

Accuracy tolerance: 0/+0.004mm.





R329

High Precision NC Machine Reamers (End Cutting)

Designed with right helix and right cutting flutes.

Upward chip evacuation. Application for reaming different steels below 48HRC, stainless steel, cast iron, aluminium,copper...and etc.

Designed with the function of end cutting. With internal coolant for even out the residual left in the bottom of the hole.Accuracy tolerance: H7 (m5) 0/+0.004mm



R212TX

NC Machine Reamers (High Hardness·Difficult To Cut Material·Coolant Hole)

Designed with left helix and right cutting flutes with unequal flute design.

Downward chip evacuation. Application for reaming different steels below 62HRC, stainless steel, High temp alloys, cast iron, copper...and etc.

Extremely high reaming life with coolant holes for blade cooling.

Nano multilayer coating AlTiSiN with superior wear resistance is suitable for high hardness materials reaming.

Accuracy tolerance: H7 (m5) 0/+0.004mm



DIN REAMER



Reamers

Page	455	458	461	461	463	463
Appearance						
Code No	R208TX	R212TX	R214TX	R216TX	IMS..R215 IMS..R215TX	IMS..R217TX
Carbide	VHM Carbide	VHM Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
Coating	AlTiSiN	AlTiSiN	AlTiSiN TX	AlTiSiN TX	AlTiSiN TX	AlTiSiN TX
Helix Angle						
No.of Flutes						

Steel, Cast Iron, Stainless, Aluminium, Copper

465	467	469	473	477	479	481	483	487	489	490
										
R300	**R301**	**R307**	**R308**	**R318**	**R319**	**R320**	**R328**	**R329**	**R302**	**R303**
VHM Carbide	**VHM Carbide**	**VHM Carbide**	**VHM Carbide**	**VHM Carbide**	**VHM Carbide**	**VHM Carbide**	**VHM Carbide**	**VHM Carbide**	**VHM Carbide**	**HM Carbide Tipped**
Uncoated Bright	**Uncoated Bright**	**Uncoated Bright**	**Uncoated Bright**	**Uncoated Bright**	**Uncoated Bright**	**Uncoated Bright**	**Uncoated Bright**	**Uncoated Bright**	**Uncoated Bright**	**Uncoated Bright**
 0°	 L 7°	 0°	 L 7°	 L 7°	 L 7°	 L 35°	 R 30°	 R 30°	 L 7°	 L 7°
										

R208TX

NC Machine Reamers (High Hardness)

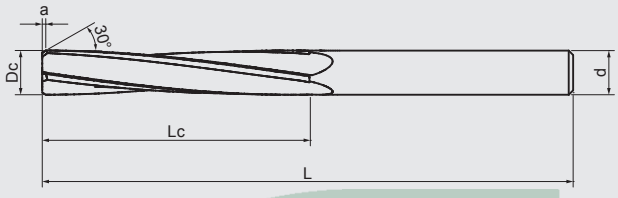
Designed with right helix and right cutting flutes with equal flute design, which is easy for regrinding.

Upward chip evacuation.

Application for reaming different steels below 62HRC, stainless steel, cast iron, copper...and etc.

Nano multilayer coating AlTiSiN with superior wear resistance is suitable for high hardness materials reaming.

Accuracy tolerance: H7 (m5)
0/+0.004mm





VHM Carbide | AlTiSiN | R 8° | Z | Steel, Hardened Steel, Cast Iron, Stainless Steel | Through Hole ☑ | Blind Hole ☑

P H M K

Tolerance regulation

Dc size (mm)		Reamer Dc tolerance (mm)		Grind Dc tolerance (mm)		
Above	Under	m5(JIS)	H7(DIN 1420)	Min	Mid	Max
-	3	+0.002/+0.006	+0.004/+0.008	+0.004	+0.005	+0.006
3	6	+0.004/+0.009	+0.005/+0.010	+0.005	+0.007	+0.009
6	10	+0.006/+0.012	+0.006/+0.012	+0.007	+0.009	+0.011
10	18	+0.007/+0.015	+0.008/+0.015	+0.009	+0.011	+0.013
18	30	+0.008/+0.017	+0.009/+0.017	+0.011	+0.013	+0.015

Standard Length

Code No. R208TX-Dc

Dc mm	Tolerance mm	Lc mm	L mm	a mm	d h5	Z teeth	R208TX AlTiSiN
2.97	0/+0.004	40	80	0.4	4	4	•
2.98	0/+0.004	40	80	0.4	4	4	•
2.99	0/+0.004	40	80	0.4	4	4	•
3	H7	40	80	0.4	4	4	•
3.01	0/+0.004	40	80	0.4	4	4	•
3.02	0/+0.004	40	80	0.4	4	4	•
3.03	0/+0.004	40	80	0.4	4	4	•
3.1	H7	40	80	0.4	4	4	•
3.2	H7	40	80	0.4	4	4	•
3.3	H7	40	80	0.4	4	4	•
3.4	H7	40	80	0.4	4	4	•
3.5	H7	40	80	0.4	4	4	•
3.6	H7	40	80	0.5	4	4	•
3.7	H7	40	80	0.5	4	4	•
3.8	H7	40	80	0.5	4	4	•
3.9	H7	40	80	0.5	4	4	•
3.97	0/+0.004	40	80	0.5	4	4	•
3.98	0/+0.004	40	80	0.5	4	4	•
3.99	0/+0.004	40	80	0.5	4	4	•
4	H7	40	80	0.5	4	4	•
4.01	0/+0.004	40	80	0.5	4	4	•
4.02	0/+0.004	40	80	0.5	4	4	•
4.03	0/+0.004	40	80	0.5	4	4	•
4.1	H7	40	80	0.5	6	4	•
4.2	H7	40	80	0.5	6	4	•
4.3	H7	40	80	0.5	6	4	•
4.4	H7	40	80	0.5	6	4	•
4.5	H7	40	80	0.5	6	4	•
4.6	H7	40	80	0.6	6	4	•
4.7	H7	40	80	0.6	6	4	•
4.8	H7	40	80	0.6	6	4	•
4.9	H7	40	80	0.6	6	4	•
4.97	0/+0.004	40	80	0.6	6	4	•
4.98	0/+0.004	40	80	0.6	6	4	•

NC Machine Reamers (High Hardness)

Dc mm	Tolerance mm	Lc mm	L mm	a mm	d h5	Z teeth	R208TX AlTiSiN		
4.99	0/+0.004	40	80	0.6	6	4	•		
5	H7	40	80	0.6	6	4	•		
5.01	0/+0.004	40	80	0.6	6	4	•		
5.02	0/+0.004	40	80	0.6	6	4	•		
5.03	0/+0.004	40	80	0.6	6	4	•		
5.1	H7	50	100	0.6	6	4	•		
5.2	H7	50	100	0.6	6	4	•		
5.3	H7	50	100	0.6	6	4	•		
5.4	H7	50	100	0.6	6	4	•		
5.5	H7	50	100	0.6	6	4	•		
5.6	H7	50	100	0.6	6	4	•		
5.7	H7	50	100	0.6	6	4	•		
5.8	H7	50	100	0.6	6	4	•		
5.9	H7	50	100	0.6	6	4	•		
5.97	0/+0.004	50	100	0.6	6	4	•		
5.98	0/+0.004	50	100	0.6	6	4	•		
5.99	0/+0.004	50	100	0.6	6	4	•		
6	H7	50	100	0.6	6	4	•		
6.01	0/+0.004	50	100	0.6	6	4	•		
6.02	0/+0.004	50	100	0.6	6	4	•		
6.03	0/+0.004	50	100	0.6	6	4	•		
6.1	H7	50	100	0.8	8	4	•		
6.2	H7	50	100	0.8	8	4	•		
6.3	H7	50	100	0.8	8	4	•		
6.4	H7	50	100	0.8	8	4	•		
6.5	H7	50	100	0.8	8	4	•		
6.6	H7	50	100	0.8	8	4	•		
6.7	H7	50	100	0.8	8	4	•		
6.8	H7	50	100	0.8	8	4	•		
6.9	H7	50	100	0.8	8	4	•		
7	H7	50	100	0.8	8	4	•		
7.1	H7	50	100	0.8	8	4	•		
7.2	H7	50	100	0.8	8	4	•		
7.3	H7	50	100	0.8	8	4	•		
7.4	H7	50	100	0.8	8	4	•		
7.5	H7	50	100	0.8	8	4	•		
7.6	H7	50	100	0.8	8	4	•		
7.7	H7	50	100	0.8	8	4	•		
7.8	H7	50	100	0.8	8	4	•		
7.9	H7	50	100	0.8	8	4	•		
7.97	0/+0.004	50	100	0.8	8	4	•		
7.98	0/+0.004	50	100	0.8	8	4	•		
7.99	0/+0.004	50	100	0.8	8	4	•		
8	H7	50	100	0.8	8	4	•		
8.01	0/+0.004	50	100	0.8	8	4	•		
8.02	0/+0.004	50	100	0.8	8	4	•		
8.03	0/+0.004	50	100	0.8	8	4	•		
8.1	H7	60	120	1	10	4	•		
8.2	H7	60	120	1	10	4	•		
8.3	H7	60	120	1	10	4	•		
8.4	H7	60	120	1	10	4	•		
8.5	H7	60	120	1	10	4	•		
8.6	H7	60	120	1	10	4	•		
8.7	H7	60	120	1	10	4	•		
8.8	H7	60	120	1	10	4	•		
8.9	H7	60	120	1	10	4	•		
9	H7	60	120	1	10	4	•		
9.1	H7	60	120	1	10	4	•		
9.2	H7	60	120	1	10	4	•		
9.3	H7	60	120	1	10	4	•		
9.4	H7	60	120	1	10	4	•		
9.5	H7	60	120	1	10	4	•		
9.6	H7	60	120	1	10	4	•		
9.7	H7	60	120	1	10	4	•		

R208TX

NC Machine Reamers (High Hardness)

Dc mm	Tolerance mm	Lc mm	L mm	a mm	d h5	Z teeth	R208TX AlTiSiN		
9.8	H7	60	120	1	10	4	•		
9.9	H7	60	120	1	10	4	•		
9.97	0/+0.004	60	120	1	10	4	•		
9.98	0/+0.004	60	120	1	10	4	•		
9.99	0/+0.004	60	120	1	10	4	•		
10	H7	60	120	1	10	4	•		
10.01	0/+0.004	60	120	1	10	4	•		
10.02	0/+0.004	60	120	1	10	4	•		
10.03	0/+0.004	60	120	1	10	4	•		
10.1	H7	70	140	1.2	12	4	•		
10.2	H7	70	140	1.2	12	4	•		
10.3	H7	70	140	1.2	12	4	•		
10.4	H7	70	140	1.2	12	4	•		
10.5	H7	70	140	1.2	12	4	•		
10.6	H7	70	140	1.2	12	4	•		
10.7	H7	70	140	1.2	12	4	•		
10.8	H7	70	140	1.2	12	4	•		
10.9	H7	70	140	1.2	12	4	•		
11	H7	70	140	1.2	12	4	•		
11.1	H7	70	140	1.2	12	4	•		
11.2	H7	70	140	1.2	12	4	•		
11.3	H7	70	140	1.2	12	4	•		
11.4	H7	70	140	1.2	12	4	•		
11.5	H7	70	140	1.2	12	4	•		
11.6	H7	70	140	1.2	12	4	•		
11.7	H7	70	140	1.2	12	4	•		
11.8	H7	70	140	1.2	12	4	•		
11.9	H7	70	140	1.2	12	4	•		
11.97	0/+0.004	70	140	1.2	12	4	•		
11.98	0/+0.004	70	140	1.2	12	4	•		
11.99	0/+0.004	70	140	1.2	12	4	•		
12	H7	70	140	1.2	12	4	•		
12.01	0/+0.004	70	140	1.2	12	4	•		
12.02	0/+0.004	70	140	1.2	12	4	•		
12.03	0/+0.004	70	140	1.2	12	4	•		

Please refer to page P493 for parameters.

NC Machine Reamers (Difficult To Cut Material • Coolant Hole)

Designed with left helix and right cutting flutes with unequal flute design.

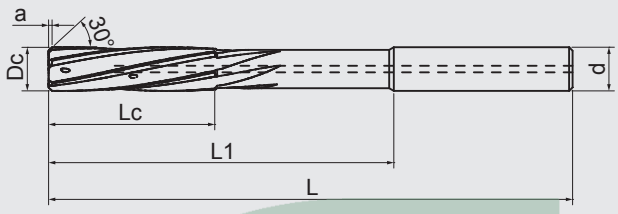
Downward chip evacuation.

Application for reaming different steels below 62HRC, stainless steel, High temp alloys, cast iron, copper...and etc.

Extremely high reaming life with coolant holes for blade cooling.

Nano multilayer coating AlTiSiN with superior wear resistance is suitable for high hardness materials reaming.

Accuracy tolerance: H7 (m5)
0/+0.004mm





VHM Carbide | AlTiSiN | L 12° | Z | Steel, Cast Iron, Stainless Steel, Difficult To Cut Material | Through Hole ☑ | Blind Hole ☒

Tolerance regulation

Dc size (mm)		Reamer Dc tolerance (mm)		Grind Dc tolerance (mm)		
Above	Under	m5(JIS)	H7(DIN 1420)	Min	Mid	Max
-	3	+0.002/+0.006	+0.004/+0.008	+0.004	+0.005	+0.006
3	6	+0.004/+0.009	+0.005/+0.010	+0.005	+0.007	+0.009
6	10	+0.006/+0.012	+0.006/+0.012	+0.007	+0.009	+0.011
10	18	+0.007/+0.015	+0.008/+0.015	+0.009	+0.011	+0.013
18	30	+0.008/+0.017	+0.009/+0.017	+0.011	+0.013	+0.015

P
H
M
K

Standard Length

Code No. R212TX-Dc

Dc mm	Tolerance mm	Lc mm	L1 mm	L mm	a mm	d h5	Z teeth	R212TX AlTiSiN
2.97	0/+0.004	20	42	80	0.4	4	4	•
2.98	0/+0.004	20	42	80	0.4	4	4	•
2.99	0/+0.004	20	42	80	0.4	4	4	•
3	H7	20	42	80	0.4	4	4	•
3.01	0/+0.004	20	42	80	0.4	4	4	•
3.02	0/+0.004	20	42	80	0.4	4	4	•
3.03	0/+0.004	20	42	80	0.4	4	4	•
3.1	H7	20	42	80	0.4	4	4	•
3.2	H7	20	42	80	0.4	4	4	•
3.3	H7	20	42	80	0.4	4	4	•
3.4	H7	20	42	80	0.4	4	4	•
3.5	H7	20	42	80	0.4	4	4	•
3.6	H7	20	42	80	0.5	4	4	•
3.7	H7	20	42	80	0.5	4	4	•
3.8	H7	20	42	80	0.5	4	4	•
3.9	H7	20	42	80	0.5	4	4	•
3.97	0/+0.004	20	42	80	0.5	4	4	•
3.98	0/+0.004	20	42	80	0.5	4	4	•
3.99	0/+0.004	20	42	80	0.5	4	4	•
4	H7	20	42	80	0.5	4	4	•
4.01	0/+0.004	20	42	80	0.5	4	4	•
4.02	0/+0.004	20	42	80	0.5	4	4	•
4.03	0/+0.004	20	42	80	0.5	4	4	•
4.1	H7	20	42	80	0.5	6	4	•
4.2	H7	20	42	80	0.5	6	4	•
4.3	H7	20	42	80	0.5	6	4	•
4.4	H7	20	42	80	0.5	6	4	•
4.5	H7	20	42	80	0.5	6	4	•
4.6	H7	20	42	80	0.6	6	4	•
4.7	H7	20	42	80	0.6	6	4	•
4.8	H7	20	42	80	0.6	6	4	•
4.9	H7	20	42	80	0.6	6	4	•
4.97	0/+0.004	20	42	80	0.6	6	4	•
4.98	0/+0.004	20	42	80	0.6	6	4	•

R212TX

NC Machine Reamers (Difficult To Cut Material • Coolant Hole)

Dc mm	Tolerance mm	Lc mm	L1 mm	L mm	a mm	d h5	Z teeth	R212TX AlTiSiN		
4.99	0/+0.004	20	42	80	0.6	6	4	•		
5	H7	20	42	80	0.6	6	4	•		
5.01	0/+0.004	20	42	80	0.6	6	4	•		
5.02	0/+0.004	20	42	80	0.6	6	4	•		
5.03	0/+0.004	20	42	80	0.6	6	4	•		
5.1	H7	25	52	100	0.6	6	6	•		
5.2	H7	25	52	100	0.6	6	6	•		
5.3	H7	25	52	100	0.6	6	6	•		
5.4	H7	25	52	100	0.6	6	6	•		
5.5	H7	25	52	100	0.6	6	6	•		
5.6	H7	25	52	100	0.6	6	6	•		
5.7	H7	25	52	100	0.6	6	6	•		
5.8	H7	25	52	100	0.6	6	6	•		
5.9	H7	25	52	100	0.6	6	6	•		
5.97	0/+0.004	25	52	100	0.6	6	6	•		
5.98	0/+0.004	25	52	100	0.6	6	6	•		
5.99	0/+0.004	25	52	100	0.6	6	6	•		
6	H7	25	52	100	0.6	6	6	•		
6.01	0/+0.004	25	52	100	0.6	6	6	•		
6.02	0/+0.004	25	52	100	0.6	6	6	•		
6.03	0/+0.004	25	52	100	0.6	6	6	•		
6.1	H7	25	52	100	0.8	8	6	•		
6.2	H7	25	52	100	0.8	8	6	•		
6.3	H7	25	52	100	0.8	8	6	•		
6.4	H7	25	52	100	0.8	8	6	•		
6.5	H7	25	52	100	0.8	8	6	•		
6.6	H7	25	52	100	0.8	8	6	•		
6.7	H7	25	52	100	0.8	8	6	•		
6.8	H7	25	52	100	0.8	8	6	•		
6.9	H7	25	52	100	0.8	8	6	•		
7	H7	25	52	100	0.8	8	6	•		
7.1	H7	25	52	100	0.8	8	6	•		
7.2	H7	25	52	100	0.8	8	6	•		
7.3	H7	25	52	100	0.8	8	6	•		
7.4	H7	25	52	100	0.8	8	6	•		
7.5	H7	25	52	100	0.8	8	6	•		
7.6	H7	25	52	100	0.8	8	6	•		
7.7	H7	25	52	100	0.8	8	6	•		
7.8	H7	25	52	100	0.8	8	6	•		
7.9	H7	25	52	100	0.8	8	6	•		
7.97	0/+0.004	25	52	100	0.8	8	6	•		
7.98	0/+0.004	25	52	100	0.8	8	6	•		
7.99	0/+0.004	25	52	100	0.8	8	6	•		
8	H7	25	52	100	0.8	8	6	•		
8.01	0/+0.004	25	52	100	0.8	8	6	•		
8.02	0/+0.004	25	52	100	0.8	8	6	•		
8.03	0/+0.004	25	52	100	0.8	8	6	•		
8.1	H7	30	62	120	1	10	6	•		
8.2	H7	30	62	120	1	10	6	•		
8.3	H7	30	62	120	1	10	6	•		
8.4	H7	30	62	120	1	10	6	•		
8.5	H7	30	62	120	1	10	6	•		
8.6	H7	30	62	120	1	10	6	•		
8.7	H7	30	62	120	1	10	6	•		
8.8	H7	30	62	120	1	10	6	•		
8.9	H7	30	62	120	1	10	6	•		
9	H7	30	62	120	1	10	6	•		
9.1	H7	30	62	120	1	10	6	•		
9.2	H7	30	62	120	1	10	6	•		
9.3	H7	30	62	120	1	10	6	•		
9.4	H7	30	62	120	1	10	6	•		
9.5	H7	30	62	120	1	10	6	•		
9.6	H7	30	62	120	1	10	6	•		
9.7	H7	30	62	120	1	10	6	•		

R212TX

NC Machine Reamers (Difficult To Cut Material • Coolant Hole)

Dc mm	Tolerance mm	Lc mm	L1 mm	L mm	a mm	d h5	Z teeth	R212TX AlTiSiN		
9.8	H7	30	62	120	1	10	6	•		
9.9	H7	30	62	120	1	10	6	•		
9.97	0/+0.004	30	62	120	1	10	6	•		
9.98	0/+0.004	30	62	120	1	10	6	•		
9.99	0/+0.004	30	62	120	1	10	6	•		
10	H7	30	62	120	1	10	6	•		
10.01	0/+0.004	30	62	120	1	10	6	•		
10.02	0/+0.004	30	62	120	1	10	6	•		
10.03	0/+0.004	30	62	120	1	10	6	•		
10.1	H7	35	72	140	1.2	12	6	•		
10.2	H7	35	72	140	1.2	12	6	•		
10.3	H7	35	72	140	1.2	12	6	•		
10.4	H7	35	72	140	1.2	12	6	•		
10.5	H7	35	72	140	1.2	12	6	•		
10.6	H7	35	72	140	1.2	12	6	•		
10.7	H7	35	72	140	1.2	12	6	•		
10.8	H7	35	72	140	1.2	12	6	•		
10.9	H7	35	72	140	1.2	12	6	•		
11	H7	35	72	140	1.2	12	6	•		
11.1	H7	35	72	140	1.2	12	6	•		
11.2	H7	35	72	140	1.2	12	6	•		
11.3	H7	35	72	140	1.2	12	6	•		
11.4	H7	35	72	140	1.2	12	6	•		
11.5	H7	35	72	140	1.2	12	6	•		
11.6	H7	35	72	140	1.2	12	6	•		
11.7	H7	35	72	140	1.2	12	6	•		
11.8	H7	35	72	140	1.2	12	6	•		
11.9	H7	35	72	140	1.2	12	6	•		
11.97	0/+0.004	35	72	140	1.2	12	6	•		
11.98	0/+0.004	35	72	140	1.2	12	6	•		
11.99	0/+0.004	35	72	140	1.2	12	6	•		
12	H7	35	72	140	1.2	12	6	•		
12.01	0/+0.004	35	72	140	1.2	12	6	•		
12.02	0/+0.004	35	72	140	1.2	12	6	•		
12.03	0/+0.004	35	72	140	1.2	12	6	•		

※ Non-stock item, MOQ 10 PCS

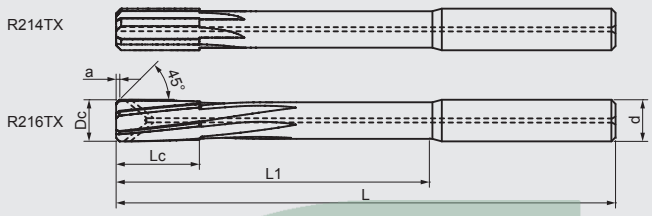
Please refer to page P493 for parameters.

R214TX / R216TX

High Performance NC Machine Reamers (Coolant Hole)

Code No. R214TX
Designed with straight flute and right cutting flute.
Applicable to through hole and blind hole reaming.
Application for reaming different steels below 56HRC, stainless steel, cast iron, copper...and etc.
Features high concentricity and internal cooling holes, making it applicable for HPC (High-Performance Cutting) efficiency machining.

Code No. R216TX
Designed with left helix and right cutting flutes with unequal flute design.
Downward chip evacuation is suitable for through hole reaming.
Application for reaming different steels below 56HRC, stainless steel, cast iron, copper...and etc.
Features high concentricity and internal cooling holes, making it applicable for HPC (High-Performance Cutting) efficiency machining.





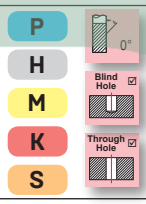


MG Carbide | **AlTiSiN TX** | Z | Steel, Cast Iron, Stainless Steel, Copper

Accuracy tolerance: H7 (m5) 0/+0.004mm

Tolerance regulation

Dc size (mm)		Reamer Dc tolerance (mm)		Grind Dc tolerance (mm)		
Above	Under	m5(JIS)	H7(DIN 1420)	Min	Mid	Max
-	3	+0.002/+0.006	+0.004/+0.008	+0.004	+0.005	+0.006
3	6	+0.004/+0.009	+0.005/+0.010	+0.005	+0.007	+0.009
6	10	+0.006/+0.012	+0.006/+0.012	+0.007	+0.009	+0.011
10	18	+0.007/+0.015	+0.008/+0.015	+0.009	+0.011	+0.013
18	30	+0.008/+0.017	+0.009/+0.017	+0.011	+0.013	+0.015





Standard Length — Code No. R214TX-Dc / R216TX-Dc

Dc mm	Tolerance mm	Lc mm	L1 mm	L mm	a mm	d h5	Z teeth	R214TX AlTiSiN	R216TX AlTiSiN
3.97	+0.004	12	34	75	0.4	6	4	•	•
3.98	+0.004	12	34	75	0.4	6	4	•	•
3.99	+0.004	12	34	75	0.4	6	4	•	•
4	H7	12	34	75	0.4	6	4	•	•
4.01	+0.004	12	34	75	0.4	6	4	•	•
4.02	+0.004	12	34	75	0.4	6	4	•	•
4.03	+0.004	12	34	75	0.4	6	4	•	•
4.04~4.96	+0.004	12	34	75	0.4	6	4	•	•
4.97	+0.004	12	35	75	0.5	6	4	•	•
4.98	+0.004	12	35	75	0.5	6	4	•	•
4.99	+0.004	12	35	75	0.5	6	4	•	•
5	H7	12	35	75	0.5	6	4	•	•
5.01	+0.004	12	35	75	0.5	6	4	•	•
5.02	+0.004	12	35	75	0.5	6	4	•	•
5.03	+0.004	12	35	75	0.5	6	4	•	•
5.04~5.96	+0.004	12	35	75	0.5	6	4	•	•
5.97	+0.004	12	35	75	0.5	6	4	•	•
5.98	+0.004	12	35	75	0.5	6	4	•	•
5.99	+0.004	12	35	75	0.5	6	4	•	•
6	H7	12	35	75	0.5	6	4	•	•
6.01	+0.004	12	35	75	0.5	6	4	•	•
6.02	+0.004	12	35	75	0.5	6	4	•	•
6.03	+0.004	12	35	75	0.5	6	4	•	•
6.04~6.99	+0.004	16	59	100	0.6	8	6	•	•
7	H7	16	59	100	0.6	8	6	•	•
7.01~7.96	+0.004	16	60	100	0.6	8	6	•	•

R214TX / R216TX

High Performance NC Machine Reamers (Coolant Hole)

Dc mm	Tolerance mm	Lc mm	L1 mm	L mm	a mm	d h5	Z teeth	R214TX AlTiSiN	R216TX AlTiSiN	
7.97	+0.004	16	60	100	0.6	8	6	•	•	
7.98	+0.004	16	60	100	0.6	8	6	•	•	
7.99	+0.004	16	60	100	0.6	8	6	•	•	
8	H7	16	60	100	0.6	8	6	•	•	
8.01	+0.004	16	60	100	0.6	8	6	•	•	
8.02	+0.004	16	60	100	0.6	8	6	•	•	
8.03	+0.004	16	60	100	0.6	8	6	•	•	
8.04~8.99	+0.004	20	75	120	0.8	10	6	•	•	
9	H7	20	75	120	0.8	10	6	•	•	
9.01~9.96	+0.004	20	76	120	0.8	10	6	•	•	
9.97	+0.004	20	76	120	0.8	10	6	•	•	
9.98	+0.004	20	76	120	0.8	10	6	•	•	
9.99	+0.004	20	76	120	0.8	10	6	•	•	
10	H7	20	76	120	0.8	10	6	•	•	
10.01	+0.004	20	76	120	0.8	10	6	•	•	
10.02	+0.004	20	76	120	0.8	10	6	•	•	
10.03	+0.004	20	76	120	0.8	10	6	•	•	
10.04~10.99	+0.004	20	70	120	1	12	6	•	•	
11	H7	20	70	120	1	12	6	•	•	
11.01~11.96	+0.004	20	70	120	1	12	6	•	•	
11.97	+0.004	20	71	120	1	12	6	•	•	
11.98	+0.004	20	71	120	1	12	6	•	•	
11.99	+0.004	20	71	120	1	12	6	•	•	
12	H7	20	71	120	1	12	6	•	•	
12.01	+0.004	20	71	120	1	12	6	•	•	
12.02	+0.004	20	71	120	1	12	6	•	•	
12.03	+0.004	20	71	120	1	12	6	•	•	

※ Non-stock item, MOQ 10 PCS

Please refer to page P493 for parameters.

Interchangeable High Performance NC Machine Reamers (Coolant Hole)

Code No. R215 / R215TX

Downward chip evacuation is suitable for through hole and blind hole reaming.

Applicable to through hole and blind hole reaming.

Application for reaming different steels below 48HRC, stainless steel, cast iron, aluminium, copper...and etc.

Features high concentricity and internal cooling holes, making it applicable for HPC (High-Performance Cutting) efficiency machining.

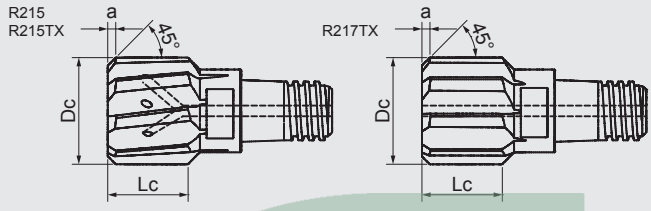
Code No. R217TX

Designed with left helix and right cutting flutes with unequal flute design.

Downward chip evacuation is suitable for through hole reaming.

Application for reaming different steels below 56HRC, stainless steel, cast iron...and etc.

Features high concentricity and internal cooling holes, making it applicable for HPC (High-Performance Cutting) efficiency machining.



MG Carbide | **Uncoated Bright** | **AlTiSiN TX** | Z | Steel, Cast Iron, Stainless Steel, Copper

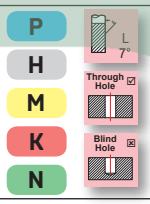


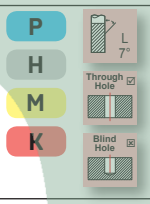


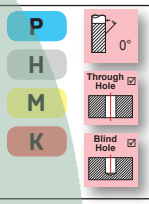


Tolerance regulation

Dc size (mm)		Reamer Dc tolerance (mm)		Grind Dc tolerance (mm)		
Above	Under	m5(JIS)	H7(DIN 1420)	Min	Mid	Max
-	3	+0.002/+0.006	+0.004/+0.008	+0.004	+0.005	+0.006
3	6	+0.004/+0.009	+0.005/+0.010	+0.005	+0.007	+0.009
6	10	+0.006/+0.012	+0.006/+0.012	+0.007	+0.009	+0.011
10	18	+0.007/+0.015	+0.008/+0.015	+0.009	+0.011	+0.013
18	30	+0.008/+0.017	+0.009/+0.017	+0.011	+0.013	+0.015







Standard Length

Dc mm	Lc mm	a mm	Z teeth	Shank size	Code No. IMS..R215 Bright	Shank size	Code No. IMS..R215TX AlTiSiN	Shank size	Code No. IMS..R217TX AlTiSiN
10	10	1	6	IMS10R16..	•	IMS10R16..	•	-	
11	10	1	6	IMS10R16..	•	IMS10R16..	•	-	
12	10	1.3	6	IMS10R16..	•	IMS10R16..	•	-	
13	10	1.3	6	IMS12R16..	•	IMS12R16..	•	-	
14	12	1.3	6	IMS12R16..	•	IMS12R16..	•	IMS10R16..	•
15	12	1.5	6	IMS12R16..	•	IMS12R16..	•	IMS10R16..	•
16	12	1.5	6	IMS12R16..	•	IMS12R16..	•	IMS10R16..	•
17	12	1.5	8	IMS16R20..	•	IMS16R20..	•	IMS12R16..	•
18	15	1.5	8	IMS16R20..	•	IMS16R20..	•	IMS12R16..	•
19	15	1.5	8	IMS16R20..	•	IMS16R20..	•	IMS12R16..	•
20	15	1.5	8	IMS16R20..	•	IMS16R20..	•	IMS12R16..	•
21	15	1.5	8	IMS16R20..	•	IMS16R20..	•	IMS12R16..	•
22	15	1.5	8	IMS20R25..	•	IMS20R25..	•	IMS16R20..	•
23	15	1.5	8	IMS20R25..	•	IMS20R25..	•	IMS16R20..	•
24	15	1.5	8	IMS20R25..	•	IMS20R25..	•	IMS16R20..	•
25	15	1.5	8	IMS20R25..	•	IMS20R25..	•	IMS16R20..	•
26	15	1.5	8	IMS20R25..	•	IMS20R25..	•	IMS20R25..	•

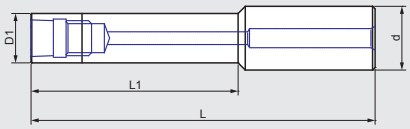
Please refer to page P493 for parameters.

Interchangeable Multi-Purpose Steel Shanks

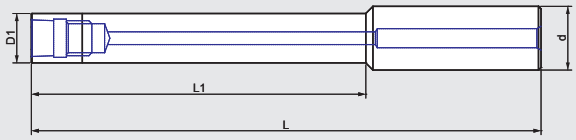




Picture 1



Picture 2

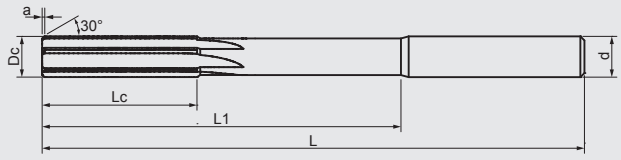


Code No.	Straight cutting flute size range IMS..-R215TX	Bevel blade size range IMS..-R217TX	D1 mm	L1 mm	L mm	d h6	Price	Picture	Cutter	Insert tool
IMS10R16090035	10 ~ 12.7	14 ~ 16.2	9.5	35	90	16	•	1	IMS10R..	IMP10-TW
IMS10R16120065	10 ~ 12.7	14 ~ 16.2	9.5	65	120	16	•	2	IMS10R..	IMP10-TW
IMS12R16100047	12.71 ~ 17.2	16.21 ~ 21.2	11.5	47	100	16	•	1	IMS12R..	IMP12-TW
IMS12R16140087	12.71 ~ 17.2	16.21 ~ 21.2	11.5	87	140	16	•	2	IMS12R..	IMP12-TW
IMS16R20108065	17.21 ~ 21.2	21.21 ~ 25.2	15.5	65	108	20	•	1	IMS16R..	IMP16-TW
IMS16R20160105	17.21 ~ 21.2	21.21 ~ 25.2	15.5	105	160	20	•	2	IMS16R..	IMP16-TW
IMS20R25140078	21.21 ~ 26.2	25.21 ~ 30.2	19.5	78	140	25	•	1	IMS20R..	IMP20-TW
IMS20R25200138	21.21 ~ 26.2	25.21 ~ 30.2	19.5	138	200	25	•	2	IMS20R..	IMP20-TW

R300

Machine Reamers

Designed with straight cutting flutes.
Applicable to blind hole reaming.
Application for reaming different steels below 48HRC, stainless steel, cast iron, aluminium, copper...and etc.
Accuracy tolerance: H7 (m5)





VHM Carbide | Uncoated Bright | 0° | Z | Steel, Cast Iron, Stainless Steel, AL, Copper | Through Hole ☑ | Blind Hole ☑

Tolerance regulation

Dc size (mm)		Reamer Dc tolerance (mm)		Grind Dc tolerance (mm)		
Above	Under	m5(JIS)	H7(DIN 1420)	Min	Mid	Max
-	3	+0.002/+0.006	+0.004/+0.008	+0.004	+0.005	+0.006
3	6	+0.004/+0.009	+0.005/+0.010	+0.005	+0.007	+0.009
6	10	+0.006/+0.012	+0.006/+0.012	+0.007	+0.009	+0.011
10	18	+0.007/+0.015	+0.008/+0.015	+0.009	+0.011	+0.013
18	30	+0.008/+0.017	+0.009/+0.017	+0.011	+0.013	+0.015

P
H
M
K
N

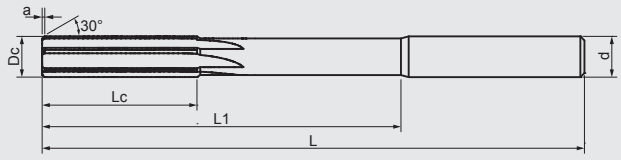
Standard Length — Code No. R300-Dc

Dc H7	Lc mm	L1 mm	L mm	d mm	a mm	Z teeth	R300 Bright
1	6	15	34	1	0.2	4	•
1.5	8	18	40	1.5	0.2	4	•
2	11	24	49	2	0.3	4	•
2.5	14	29	57	2.5	0.3	4	•
3	15	36	61	3	0.4	4	•
3.5	18	41	70	3.5	0.4	4	•
4	19	44	75	4	0.5	4	•
4.5	21	48	80	4.5	0.5	4	•
5	23	53	86	5	0.6	6	•
5.5	26	58	93	5.5	0.6	6	•
6	26	58	93	6	0.6	6	•
6.5	28	64	101	6.5	0.8	6	•
7	31	70	109	7	0.8	6	•
7.5	31	70	109	7.5	0.8	6	•
8	33	76	117	8	1.0	6	•
8.5	33	76	117	8.5	1.0	6	•
9	36	82	125	9	1.0	6	•
9.5	36	82	125	9.5	1.0	6	•
10	38	88	133	10	1.0	6	•
11	41	97	142	11	1.2	6	•
12	44	106	151	12	1.2	6	•

Please refer to page P493 for parameters.

Machine Reamers

Designed with straight flute and right cutting flute.
Applicable to blind hole reaming.
Application for reaming different steels below 48HRC, stainless steel, cast iron, aluminium, copper...and etc.
Accuracy tolerance: H7 (m5)





HM Carbide | **Uncoated Bright** | 0° | Z | **Steel** Cast Iron Stainless Steel AL, Copper | Through Hole ☑ | Blind Hole ☑

Tolerance regulation

Dc size (mm)		Reamer Dc tolerance (mm)		Grind Dc tolerance (mm)		
Above	Under	m5(JIS)	H7(DIN 1420)	Min	Mid	Max
-	3	+0.002/+0.006	+0.004/+0.008	+0.004	+0.005	+0.006
3	6	+0.004/+0.009	+0.005/+0.010	+0.005	+0.007	+0.009
6	10	+0.006/+0.012	+0.006/+0.012	+0.007	+0.009	+0.011
10	18	+0.007/+0.015	+0.008/+0.015	+0.009	+0.011	+0.013
18	30	+0.008/+0.017	+0.009/+0.017	+0.011	+0.013	+0.015

P **H** **M** **K** **N**

Standard Length — Code No. R300-Dc

Dc H7	Lc mm	L mm	d mm	a mm	Z teeth	R300 Bright
10-HM	38	133	10	1.0	6	•
11-HM	41	142	11	1.2	6	•
12-HM	44	151	12	1.2	6	•
13-HM	44	151	12	1.2	6	•
14-HM	47	160	14	1.2	6	•
15-HM	50	162	14	1.2	6	•
16-HM	52	170	16	1.2	6	•
18-HM	56	182	16	1.2	6	•
20-HM	60	195	16	1.2	6	•

Please refer to page P493 for parameters.
※Offer valid while stocks last

R301

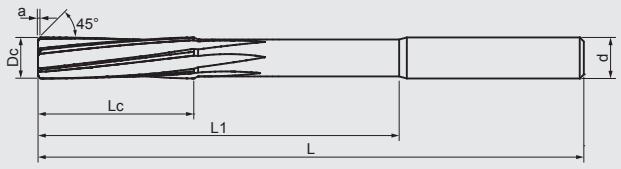
Machine Reamers

Designed with left helix and right cutting flutes with unequal flute design.

Downward chip evacuation.

Application for reaming different steels below 48HRC, stainless steel, cast iron, aluminium, copper...and etc.

Accuracy tolerance: H7 (m5)





VHM Carbide | **Uncoated Bright** | L 7° | Z | **Steel** Cast Iron Stainless Steel AL, Copper | Through Hole ☑ | Blind Hole ☒

Tolerance regulation

Dc size (mm)		Reamer Dc tolerance (mm)		Grind Dc tolerance (mm)		
Above	Under	m5(JIS)	H7(DIN 1420)	Min	Mid	Max
-	3	+0.002/+0.006	+0.004/+0.008	+0.004	+0.005	+0.006
3	6	+0.004/+0.009	+0.005/+0.010	+0.005	+0.007	+0.009
6	10	+0.006/+0.012	+0.006/+0.012	+0.007	+0.009	+0.011
10	18	+0.007/+0.015	+0.008/+0.015	+0.009	+0.011	+0.013
18	30	+0.008/+0.017	+0.009/+0.017	+0.011	+0.013	+0.015

P **H** **M** **K** **N**

Standard Length

Code No. R301-Dc

Dc H7	Lc mm	L1 mm	L mm	d mm	a mm	Z teeth	R301 Bright
1	6	15	34	1	0.1	4	•
1.5	8	18	40	1.5	0.15	4	•
2	11	24	49	2	0.2	4	•
2.5	14	29	57	2.5	0.25	4	•
3	15	36	61	3	0.3	4	•
3.5	18	41	70	3.5	0.3	4	•
4	19	44	75	4	0.4	4	•
4.5	21	48	80	4.5	0.4	4	•
5	23	53	86	5	0.5	6	•
5.5	26	58	93	5.5	0.5	6	•
6	26	58	93	6	0.5	6	•
6.5	28	64	101	6.5	0.6	6	•
7	31	70	109	7	0.6	6	•
7.5	31	70	109	7.5	0.6	6	•
8	33	76	117	8	0.6	6	•
8.5	33	76	117	8.5	0.8	6	•
9	36	82	125	9	0.8	6	•
9.5	36	82	125	9.5	0.8	6	•
10	38	88	133	10	0.8	6	•
11	41	97	142	11	1.0	6	•
12	44	106	151	12	1.0	6	•
14	47	111	160	14	1.0	6	•
16	52	121	170	16	1.0	6	•

Please refer to page P494 for parameters.

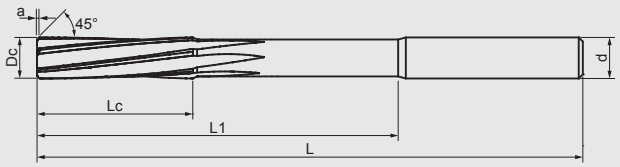
Machine Reamers

Designed with left helix and right cutting flutes with unequal flute design.

Downward chip evacuation.

Application for reaming different steels below 48HRC, stainless steel, cast iron, aluminium, copper...and etc.

Accuracy tolerance: H7 (m5)





HM Carbide | **Uncoated Bright** | L 7° | Z | **Steel** Cast Iron Stainless Steel AL, Copper | Through Hole ☑ | Blind Hole ☒

Tolerance regulation

Dc size (mm)		Reamer Dc tolerance (mm)		Grind Dc tolerance (mm)		
Above	Under	m5(JIS)	H7(DIN 1420)	Min	Mid	Max
-	3	+0.002/+0.006	+0.004/+0.008	+0.004	+0.005	+0.006
3	6	+0.004/+0.009	+0.005/+0.010	+0.005	+0.007	+0.009
6	10	+0.006/+0.012	+0.006/+0.012	+0.007	+0.009	+0.011
10	18	+0.007/+0.015	+0.008/+0.015	+0.009	+0.011	+0.013
18	30	+0.008/+0.017	+0.009/+0.017	+0.011	+0.013	+0.015

P **H** **M** **K** **N**

Standard Length

Code No. R301-Dc

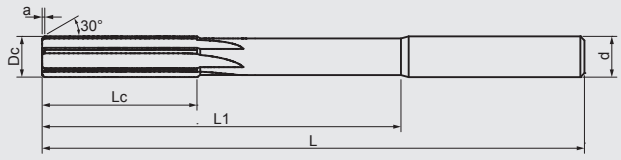
Dc H7	Lc mm	L mm	d mm	a mm	Z teeth	R301 Bright
10-HM	38	133	10	0.8	6	•
10.5-HM	38	133	10	0.8	6	•
11-HM	41	142	11	1.0	6	•
11.5-HM	41	142	11	1.0	6	•
12-HM	44	151	12	1.0	6	•
12.5-HM	44	151	12	1.0	6	•
13-HM	44	151	12	1.0	6	•
13.5-HM	47	160	12	1.0	6	•
14-HM	47	160	14	1.0	6	•
14.5-HM	50	162	14	1.0	6	•
15-HM	50	162	14	1.0	6	•
15.5-HM	52	170	14	1.0	6	•
16-HM	52	170	16	1.0	6	•
17-HM	54	175	16	1.0	6	•
18-HM	56	182	16	1.0	6	•
19-HM	58	189	16	1.0	6	•
20-HM	60	195	16	1.0	6	•

Please refer to page P494 for parameters.

※Offer valid while stocks last

NC Machine Reamers

Designed with straight flute and right cutting flute.
Applicable to blind hole reaming.
Application for reaming different steels below 48HRC, stainless steel, cast iron, aluminium, copper...and etc.
Accuracy tolerance: H7 (m5)
0/+0.004mm





VHM Carbide | Uncoated Bright | 0° | Z | Steel, Cast Iron, Stainless Steel, AL, Copper | Through Hole ☑ | Blind Hole ☑

Tolerance regulation

Dc size (mm)		Reamer Dc tolerance (mm)		Grind Dc tolerance (mm)		
Above	Under	m5(JIS)	H7(DIN 1420)	Min	Mid	Max
-	3	+0.002/+0.006	+0.004/+0.008	+0.004	+0.005	+0.006
3	6	+0.004/+0.009	+0.005/+0.010	+0.005	+0.007	+0.009
6	10	+0.006/+0.012	+0.006/+0.012	+0.007	+0.009	+0.011
10	18	+0.007/+0.015	+0.008/+0.015	+0.009	+0.011	+0.013
18	30	+0.008/+0.017	+0.009/+0.017	+0.011	+0.013	+0.015

P
H
M
K
N

Standard Length (Dc=d)

Code No. R307-Dc

Dc mm	Tolerance mm	Lc mm	L1 mm	L mm	a mm	Z teeth	R307 Bright
0.98	0/+0.004	6	15	34	0.2	4	•
0.99	0/+0.004	6	15	34	0.2	4	•
1	H7	6	15	34	0.2	4	•
1.01	0/+0.004	6	15	34	0.2	4	•
1.02	0/+0.004	6	15	34	0.2	4	•
1.03	0/+0.004	6	15	34	0.2	4	•
1.1	H7	7	16	36	0.2	4	•
1.2	H7	7	16	36	0.2	4	•
1.3	H7	7	16	36	0.2	4	•
1.4	H7	8	18	40	0.2	4	•
1.48	0/+0.004	8	18	40	0.2	4	•
1.49	0/+0.004	8	18	40	0.2	4	•
1.5	H7	8	18	40	0.2	4	•
1.51	0/+0.004	8	18	40	0.2	4	•
1.52	0/+0.004	8	18	40	0.2	4	•
1.53	0/+0.004	8	18	40	0.2	4	•
1.6	H7	9	20	43	0.3	4	•
1.7	H7	9	20	43	0.3	4	•
1.8	H7	10	22	46	0.3	4	•
1.9	H7	10	22	46	0.3	4	•
1.98	0/+0.004	11	24	49	0.3	4	•
1.99	0/+0.004	11	24	49	0.3	4	•
2	H7	11	24	49	0.3	4	•
2.01	0/+0.004	11	24	49	0.3	4	•
2.02	0/+0.004	11	24	49	0.3	4	•
2.03	0/+0.004	11	24	49	0.3	4	•
2.1	H7	11	24	49	0.3	4	•
2.2	H7	12	25	53	0.3	4	•
2.3	H7	12	25	53	0.3	4	•
2.4	H7	14	29	57	0.3	4	•
2.48	0/+0.004	14	29	57	0.3	4	•
2.49	0/+0.004	14	29	57	0.3	4	•
2.5	H7	14	29	57	0.3	4	•
2.51	0/+0.004	14	29	57	0.3	4	•
2.52	0/+0.004	14	29	57	0.3	4	•
2.53	0/+0.004	14	29	57	0.3	4	•

NC Machine Reamers

Dc mm	Tolerance mm	Lc mm	L1 mm	L mm	a mm	Z teeth	R307 Bright		
2.6	H7	14	29	57	0.3	4	•		
2.7	H7	15	33	61	0.3	4	•		
2.8	H7	15	33	61	0.3	4	•		
2.9	H7	15	36	61	0.3	4	•		
2.95	0/+0.004	15	36	61	0.4	4	•		
2.96	0/+0.004	15	36	61	0.4	4	•		
2.97	0/+0.004	15	36	61	0.4	4	•		
2.98	0/+0.004	15	36	61	0.4	4	•		
2.99	0/+0.004	15	36	61	0.4	4	•		
3	H7	15	36	61	0.4	4	•		
3.01	0/+0.004	15	36	61	0.4	4	•		
3.02	0/+0.004	15	36	61	0.4	4	•		
3.03	0/+0.004	15	36	61	0.4	4	•		
3.04	0/+0.004	15	36	61	0.4	4	•		
3.05	0/+0.004	15	36	61	0.4	4	•		
3.1	H7	16	36	65	0.4	4	•		
3.2	H7	16	36	65	0.4	4	•		
3.3	H7	16	36	65	0.4	4	•		
3.4	H7	18	41	70	0.4	4	•		
3.5	H7	18	41	70	0.4	4	•		
3.6	H7	18	41	70	0.5	4	•		
3.7	H7	18	41	70	0.5	4	•		
3.8	H7	19	44	75	0.5	4	•		
3.9	H7	19	44	75	0.5	4	•		
3.95	0/+0.004	19	44	75	0.5	4	•		
3.96	0/+0.004	19	44	75	0.5	4	•		
3.97	0/+0.004	19	44	75	0.5	4	•		
3.98	0/+0.004	19	44	75	0.5	4	•		
3.99	0/+0.004	19	44	75	0.5	4	•		
4	H7	19	44	75	0.5	4	•		
4.01	0/+0.004	19	44	75	0.5	4	•		
4.02	0/+0.004	19	44	75	0.5	4	•		
4.03	0/+0.004	19	44	75	0.5	4	•		
4.04	0/+0.004	19	44	75	0.5	4	•		
4.05	0/+0.004	19	44	75	0.5	4	•		
4.1	H7	19	44	75	0.5	4	•		
4.2	H7	19	44	75	0.5	4	•		
4.3	H7	21	48	80	0.5	4	•		
4.4	H7	21	48	80	0.5	4	•		
4.5	H7	21	48	80	0.5	4	•		
4.6	H7	21	48	80	0.6	6	•		
4.7	H7	21	48	80	0.6	6	•		
4.8	H7	23	53	86	0.6	6	•		
4.9	H7	23	53	86	0.6	6	•		
4.95	0/+0.004	23	53	86	0.6	6	•		
4.96	0/+0.004	23	53	86	0.6	6	•		
4.97	0/+0.004	23	53	86	0.6	6	•		
4.98	0/+0.004	23	53	86	0.6	6	•		
4.99	0/+0.004	23	53	86	0.6	6	•		
5	H7	23	53	86	0.6	6	•		
5.01	0/+0.004	23	53	86	0.6	6	•		
5.02	0/+0.004	23	53	86	0.6	6	•		
5.03	0/+0.004	23	53	86	0.6	6	•		
5.04	0/+0.004	23	53	86	0.6	6	•		
5.05	0/+0.004	23	53	86	0.6	6	•		
5.1	H7	23	53	86	0.6	6	•		
5.2	H7	23	53	86	0.6	6	•		
5.3	H7	23	53	86	0.6	6	•		
5.4	H7	26	58	93	0.6	6	•		
5.5	H7	26	58	93	0.6	6	•		
5.6	H7	26	58	93	0.6	6	•		
5.7	H7	26	58	93	0.6	6	•		
5.8	H7	26	58	93	0.6	6	•		
5.9	H7	26	58	93	0.6	6	•		

R307

NC Machine Reamers

Dc mm	Tolerance mm	Lc mm	L1 mm	L mm	a mm	Z teeth	R307 Bright		
5.95	0/+0.004	26	58	93	0.6	6	•		
5.96	0/+0.004	26	58	93	0.6	6	•		
5.97	0/+0.004	26	58	93	0.6	6	•		
5.98	0/+0.004	26	58	93	0.6	6	•		
5.99	0/+0.004	26	58	93	0.6	6	•		
6	H7	26	58	93	0.6	6	•		
6.01	0/+0.004	26	58	93	0.6	6	•		
6.02	0/+0.004	26	58	93	0.6	6	•		
6.03	0/+0.004	26	58	93	0.6	6	•		
6.04	0/+0.004	26	58	93	0.6	6	•		
6.05	0/+0.004	26	58	93	0.6	6	•		
6.1	H7	28	64	101	0.8	6	•		
6.2	H7	28	64	101	0.8	6	•		
6.3	H7	28	64	101	0.8	6	•		
6.4	H7	28	64	101	0.8	6	•		
6.5	H7	28	64	101	0.8	6	•		
6.6	H7	28	64	101	0.8	6	•		
6.7	H7	28	64	101	0.8	6	•		
6.8	H7	31	70	109	0.8	6	•		
6.9	H7	31	70	109	0.8	6	•		
6.95	0/+0.004	31	70	109	0.8	6	•		
6.96	0/+0.004	31	70	109	0.8	6	•		
6.97	0/+0.004	31	70	109	0.8	6	•		
6.98	0/+0.004	31	70	109	0.8	6	•		
6.99	0/+0.004	31	70	109	0.8	6	•		
7	H7	31	70	109	0.8	6	•		
7.01	0/+0.004	31	70	109	0.8	6	•		
7.02	0/+0.004	31	70	109	0.8	6	•		
7.03	0/+0.004	31	70	109	0.8	6	•		
7.04	0/+0.004	31	70	109	0.8	6	•		
7.05	0/+0.004	31	70	109	0.8	6	•		
7.1	H7	31	70	109	0.8	6	•		
7.2	H7	31	70	109	0.8	6	•		
7.3	H7	31	70	109	0.8	6	•		
7.4	H7	31	70	109	0.8	6	•		
7.5	H7	31	70	109	0.8	6	•		
7.6	H7	33	76	117	0.8	6	•		
7.7	H7	33	76	117	0.8	6	•		
7.8	H7	33	76	117	0.8	6	•		
7.9	H7	33	76	117	0.8	6	•		
7.95	0/+0.004	33	76	117	0.8	6	•		
7.96	0/+0.004	33	76	117	0.8	6	•		
7.97	0/+0.004	33	76	117	0.8	6	•		
7.98	0/+0.004	33	76	117	0.8	6	•		
7.99	0/+0.004	33	76	117	0.8	6	•		
8	H7	33	76	117	0.8	6	•		
8.01	0/+0.004	33	76	117	0.8	6	•		
8.02	0/+0.004	33	76	117	0.8	6	•		
8.03	0/+0.004	33	76	117	0.8	6	•		
8.04	0/+0.004	33	76	117	0.8	6	•		
8.05	0/+0.004	33	76	117	0.8	6	•		
8.1	H7	33	76	117	1.0	6	•		
8.2	H7	33	76	117	1.0	6	•		
8.3	H7	33	76	117	1.0	6	•		
8.4	H7	33	76	117	1.0	6	•		
8.5	H7	33	76	117	1.0	6	•		
8.6	H7	36	82	125	1.0	6	•		
8.7	H7	36	82	125	1.0	6	•		
8.8	H7	36	82	125	1.0	6	•		
8.9	H7	36	82	125	1.0	6	•		
8.95	0/+0.004	36	82	125	1.0	6	•		
8.96	0/+0.004	36	82	125	1.0	6	•		
8.97	0/+0.004	36	82	125	1.0	6	•		
8.98	0/+0.004	36	82	125	1.0	6	•		

NC Machine Reamers

Dc mm	Tolerance mm	Lc mm	L1 mm	L mm	a mm	Z teeth	R307 Bright		
8.99	0/+0.004	36	82	125	1.0	6	•		
9	H7	36	82	125	1.0	6	•		
9.01	0/+0.004	36	82	125	1.0	6	•		
9.02	0/+0.004	36	82	125	1.0	6	•		
9.03	0/+0.004	36	82	125	1.0	6	•		
9.04	0/+0.004	36	82	125	1.0	6	•		
9.05	0/+0.004	36	82	125	1.0	6	•		
9.1	H7	36	82	125	1.0	6	•		
9.2	H7	36	82	125	1.0	6	•		
9.3	H7	36	82	125	1.0	6	•		
9.4	H7	36	82	125	1.0	6	•		
9.5	H7	36	82	125	1.0	6	•		
9.6	H7	38	88	133	1.0	6	•		
9.7	H7	38	88	133	1.0	6	•		
9.8	H7	38	88	133	1.0	6	•		
9.9	H7	38	88	133	1.0	6	•		
9.95	0/+0.004	38	88	133	1.0	6	•		
9.96	0/+0.004	38	88	133	1.0	6	•		
9.97	0/+0.004	38	88	133	1.0	6	•		
9.98	0/+0.004	38	88	133	1.0	6	•		
9.99	0/+0.004	38	88	133	1.0	6	•		
10	H7	38	88	133	1.0	6	•		
10.01	0/+0.004	38	88	133	1.0	6	•		
10.02	0/+0.004	38	88	133	1.0	6	•		
10.03	0/+0.004	38	88	133	1.0	6	•		
10.04	0/+0.004	38	88	133	1.0	6	•		
10.05	0/+0.004	38	88	133	1.0	6	•		
10.1	H7	38	88	133	1.2	6	•		
10.2	H7	38	88	133	1.2	6	•		
10.3	H7	38	88	133	1.2	6	•		
10.4	H7	38	88	133	1.2	6	•		
10.5	H7	38	88	133	1.2	6	•		
10.6	H7	38	88	133	1.2	6	•		
10.7	H7	41	97	142	1.2	6	•		
10.8	H7	41	97	142	1.2	6	•		
10.9	H7	41	97	142	1.2	6	•		
11	H7	41	97	142	1.2	6	•		
11.1	H7	41	97	142	1.2	6	•		
11.2	H7	41	97	142	1.2	6	•		
11.3	H7	41	97	142	1.2	6	•		
11.4	H7	41	97	142	1.2	6	•		
11.5	H7	41	97	142	1.2	6	•		
11.6	H7	41	97	142	1.2	6	•		
11.7	H7	41	97	142	1.2	6	•		
11.8	H7	41	97	142	1.2	6	•		
11.9	H7	44	106	151	1.2	6	•		
11.95	0/+0.004	44	106	151	1.2	6	•		
11.96	0/+0.004	44	106	151	1.2	6	•		
11.97	0/+0.004	44	106	151	1.2	6	•		
11.98	0/+0.004	44	106	151	1.2	6	•		
11.99	0/+0.004	44	106	151	1.2	6	•		
12	H7	44	106	151	1.2	6	•		
12.01	0/+0.004	44	106	151	1.2	6	•		
12.02	0/+0.004	44	106	151	1.2	6	•		
12.03	0/+0.004	44	106	151	1.2	6	•		
12.04	0/+0.004	44	106	151	1.2	6	•		
12.05	0/+0.004	44	106	151	1.2	6	•		

Please refer to page P493 for parameters.

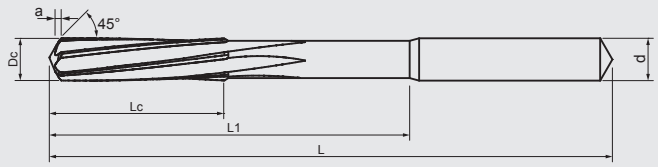
NC Machine Reamers

Designed with left helix and right cutting flutes with unequal flute design.

Downward chip evacuation.

Application for reaming different steels below 48HRC, stainless steel, cast iron, aluminium, copper...and etc.

Accuracy tolerance: H7 (m5)
0/+0.004mm





VHM Carbide | **Uncoated Bright** | L 7° | Z | **Steel** Cast Iron Stainless Steel AL, Copper | Through Hole ☑ | Blind Hole ☒

Tolerance regulation

Dc size (mm)		Reamer Dc tolerance (mm)		Grind Dc tolerance (mm)		
Above	Under	m5(JIS)	H7(DIN 1420)	Min	Mid	Max
-	3	+0.002/+0.006	+0.004/+0.008	+0.004	+0.005	+0.006
3	6	+0.004/+0.009	+0.005/+0.010	+0.005	+0.007	+0.009
6	10	+0.006/+0.012	+0.006/+0.012	+0.007	+0.009	+0.011
10	18	+0.007/+0.015	+0.008/+0.015	+0.009	+0.011	+0.013
18	30	+0.008/+0.017	+0.009/+0.017	+0.011	+0.013	+0.015

P **H** **M** **K** **N**

Standard Length (Dc=d)

Code No. R308-Dc

Dc mm	Tolerance mm	Lc mm	L1 mm	L mm	a mm	Z teeth	R308 Bright
0.98	0/+0.004	6	15	34	0.1	4	•
0.99	0/+0.004	6	15	34	0.1	4	•
1	H7	6	15	34	0.1	4	•
1.01	0/+0.004	6	15	34	0.1	4	•
1.02	0/+0.004	6	15	34	0.1	4	•
1.03	0/+0.004	6	15	34	0.1	4	•
1.1	H7	7	16	36	0.1	4	•
1.2	H7	7	16	36	0.1	4	•
1.3	H7	7	16	36	0.15	4	•
1.4	H7	8	18	40	0.15	4	•
1.48	0/+0.004	8	18	40	0.15	4	•
1.49	0/+0.004	8	18	40	0.15	4	•
1.5	H7	8	18	40	0.15	4	•
1.51	0/+0.004	8	18	40	0.15	4	•
1.52	0/+0.004	8	18	40	0.15	4	•
1.53	0/+0.004	8	18	40	0.15	4	•
1.6	H7	9	20	43	0.2	4	•
1.7	H7	9	20	43	0.2	4	•
1.8	H7	10	22	46	0.2	4	•
1.9	H7	10	22	46	0.2	4	•
1.98	0/+0.004	11	24	49	0.2	4	•
1.99	0/+0.004	11	24	49	0.2	4	•
2	H7	11	24	49	0.2	4	•
2.01	0/+0.004	11	24	49	0.2	4	•
2.02	0/+0.004	11	24	49	0.2	4	•
2.03	0/+0.004	11	24	49	0.2	4	•
2.1	H7	11	24	49	0.25	4	•
2.2	H7	12	25	53	0.25	4	•
2.3	H7	12	25	53	0.25	4	•
2.4	H7	14	29	57	0.25	4	•
2.48	0/+0.004	14	29	57	0.25	4	•
2.49	0/+0.004	14	29	57	0.25	4	•
2.5	H7	14	29	57	0.25	4	•
2.51	0/+0.004	14	29	57	0.25	4	•
2.52	0/+0.004	14	29	57	0.25	4	•
2.53	0/+0.004	14	29	57	0.25	4	•

NC Machine Reamers

Dc mm	Tolerance mm	Lc mm	L1 mm	L mm	a mm	Z teeth	R308 Bright		
2.6	H7	14	29	57	0.25	4	•		
2.7	H7	15	33	61	0.25	4	•		
2.8	H7	15	33	61	0.25	4	•		
2.9	H7	15	36	61	0.25	4	•		
2.95	0/+0.004	15	36	61	0.3	4	•		
2.96	0/+0.004	15	36	61	0.3	4	•		
2.97	0/+0.004	15	36	61	0.3	4	•		
2.98	0/+0.004	15	36	61	0.3	4	•		
2.99	0/+0.004	15	36	61	0.3	4	•		
3	H7	15	36	61	0.3	4	•		
3.01	0/+0.004	15	36	61	0.3	4	•		
3.02	0/+0.004	15	36	61	0.3	4	•		
3.03	0/+0.004	15	36	61	0.3	4	•		
3.04	0/+0.004	15	36	61	0.3	4	•		
3.05	0/+0.004	15	36	61	0.3	4	•		
3.1	H7	16	36	65	0.3	4	•		
3.2	H7	16	36	65	0.3	4	•		
3.3	H7	16	36	65	0.3	4	•		
3.4	H7	18	41	70	0.3	4	•		
3.5	H7	18	41	70	0.3	4	•		
3.6	H7	18	41	70	0.4	4	•		
3.7	H7	18	41	70	0.4	4	•		
3.8	H7	19	44	75	0.4	4	•		
3.9	H7	19	44	75	0.4	4	•		
3.95	0/+0.004	19	44	75	0.4	4	•		
3.96	0/+0.004	19	44	75	0.4	4	•		
3.97	0/+0.004	19	44	75	0.4	4	•		
3.98	0/+0.004	19	44	75	0.4	4	•		
3.99	0/+0.004	19	44	75	0.4	4	•		
4	H7	19	44	75	0.4	4	•		
4.01	0/+0.004	19	44	75	0.4	4	•		
4.02	0/+0.004	19	44	75	0.4	4	•		
4.03	0/+0.004	19	44	75	0.4	4	•		
4.04	0/+0.004	19	44	75	0.4	4	•		
4.05	0/+0.004	19	44	75	0.4	4	•		
4.1	H7	19	44	75	0.4	4	•		
4.2	H7	19	44	75	0.4	4	•		
4.3	H7	21	48	80	0.4	4	•		
4.4	H7	21	48	80	0.4	4	•		
4.5	H7	21	48	80	0.4	4	•		
4.6	H7	21	48	80	0.5	6	•		
4.7	H7	21	48	80	0.5	6	•		
4.8	H7	23	53	86	0.5	6	•		
4.9	H7	23	53	86	0.5	6	•		
4.95	0/+0.004	23	53	86	0.5	6	•		
4.96	0/+0.004	23	53	86	0.5	6	•		
4.97	0/+0.004	23	53	86	0.5	6	•		
4.98	0/+0.004	23	53	86	0.5	6	•		
4.99	0/+0.004	23	53	86	0.5	6	•		
5	H7	23	53	86	0.5	6	•		
5.01	0/+0.004	23	53	86	0.5	6	•		
5.02	0/+0.004	23	53	86	0.5	6	•		
5.03	0/+0.004	23	53	86	0.5	6	•		
5.04	0/+0.004	23	53	86	0.5	6	•		
5.05	0/+0.004	23	53	86	0.5	6	•		
5.1	H7	23	53	86	0.5	6	•		
5.2	H7	23	53	86	0.5	6	•		
5.3	H7	23	53	86	0.5	6	•		
5.4	H7	26	58	93	0.5	6	•		
5.5	H7	26	58	93	0.5	6	•		
5.6	H7	26	58	93	0.5	6	•		
5.7	H7	26	58	93	0.5	6	•		
5.8	H7	26	58	93	0.5	6	•		
5.9	H7	26	58	93	0.5	6	•		

R308

NC Machine Reamers

Dc mm	Tolerance mm	Lc mm	L1 mm	L mm	a mm	Z teeth	R308 Bright		
5.95	0/+0.004	26	58	93	0.5	6	•		
5.96	0/+0.004	26	58	93	0.5	6	•		
5.97	0/+0.004	26	58	93	0.5	6	•		
5.98	0/+0.004	26	58	93	0.5	6	•		
5.99	0/+0.004	26	58	93	0.5	6	•		
6	H7	26	58	93	0.5	6	•		
6.01	0/+0.004	26	58	93	0.5	6	•		
6.02	0/+0.004	26	58	93	0.5	6	•		
6.03	0/+0.004	26	58	93	0.5	6	•		
6.04	0/+0.004	26	58	93	0.5	6	•		
6.05	0/+0.004	26	58	93	0.5	6	•		
6.1	H7	28	64	101	0.6	6	•		
6.2	H7	28	64	101	0.6	6	•		
6.3	H7	28	64	101	0.6	6	•		
6.4	H7	28	64	101	0.6	6	•		
6.5	H7	28	64	101	0.6	6	•		
6.6	H7	28	64	101	0.6	6	•		
6.7	H7	28	64	101	0.6	6	•		
6.8	H7	31	70	109	0.6	6	•		
6.9	H7	31	70	109	0.6	6	•		
6.95	0/+0.004	31	70	109	0.6	6	•		
6.96	0/+0.004	31	70	109	0.6	6	•		
6.97	0/+0.004	31	70	109	0.6	6	•		
6.98	0/+0.004	31	70	109	0.6	6	•		
6.99	0/+0.004	31	70	109	0.6	6	•		
7	H7	31	70	109	0.6	6	•		
7.01	0/+0.004	31	70	109	0.6	6	•		
7.02	0/+0.004	31	70	109	0.6	6	•		
7.03	0/+0.004	31	70	109	0.6	6	•		
7.04	0/+0.004	31	70	109	0.6	6	•		
7.05	0/+0.004	31	70	109	0.6	6	•		
7.1	H7	31	70	109	0.6	6	•		
7.2	H7	31	70	109	0.6	6	•		
7.3	H7	31	70	109	0.6	6	•		
7.4	H7	31	70	109	0.6	6	•		
7.5	H7	31	70	109	0.6	6	•		
7.6	H7	33	76	117	0.6	6	•		
7.7	H7	33	76	117	0.6	6	•		
7.8	H7	33	76	117	0.6	6	•		
7.9	H7	33	76	117	0.6	6	•		
7.95	0/+0.004	33	76	117	0.6	6	•		
7.96	0/+0.004	33	76	117	0.6	6	•		
7.97	0/+0.004	33	76	117	0.6	6	•		
7.98	0/+0.004	33	76	117	0.6	6	•		
7.99	0/+0.004	33	76	117	0.6	6	•		
8	H7	33	76	117	0.6	6	•		
8.01	0/+0.004	33	76	117	0.6	6	•		
8.02	0/+0.004	33	76	117	0.6	6	•		
8.03	0/+0.004	33	76	117	0.6	6	•		
8.04	0/+0.004	33	76	117	0.6	6	•		
8.05	0/+0.004	33	76	117	0.6	6	•		
8.1	H7	33	76	117	0.8	6	•		
8.2	H7	33	76	117	0.8	6	•		
8.3	H7	33	76	117	0.8	6	•		
8.4	H7	33	76	117	0.8	6	•		
8.5	H7	33	76	117	0.8	6	•		
8.6	H7	36	82	125	0.8	6	•		
8.7	H7	36	82	125	0.8	6	•		
8.8	H7	36	82	125	0.8	6	•		
8.9	H7	36	82	125	0.8	6	•		
8.95	0/+0.004	36	82	125	0.8	6	•		
8.96	0/+0.004	36	82	125	0.8	6	•		
8.97	0/+0.004	36	82	125	0.8	6	•		
8.98	0/+0.004	36	82	125	0.8	6	•		

NC Machine Reamers

Dc mm	Tolerance mm	Lc mm	L1 mm	L mm	a mm	Z teeth	R308 Bright		
8.99	0/+0.004	36	82	125	0.8	6	•		
9	H7	36	82	125	0.8	6	•		
9.01	0/+0.004	36	82	125	0.8	6	•		
9.02	0/+0.004	36	82	125	0.8	6	•		
9.03	0/+0.004	36	82	125	0.8	6	•		
9.04	0/+0.004	36	82	125	0.8	6	•		
9.05	0/+0.004	36	82	125	0.8	6	•		
9.1	H7	36	82	125	0.8	6	•		
9.2	H7	36	82	125	0.8	6	•		
9.3	H7	36	82	125	0.8	6	•		
9.4	H7	36	82	125	0.8	6	•		
9.5	H7	36	82	125	0.8	6	•		
9.6	H7	38	88	133	0.8	6	•		
9.7	H7	38	88	133	0.8	6	•		
9.8	H7	38	88	133	0.8	6	•		
9.9	H7	38	88	133	0.8	6	•		
9.95	0/+0.004	38	88	133	0.8	6	•		
9.96	0/+0.004	38	88	133	0.8	6	•		
9.97	0/+0.004	38	88	133	0.8	6	•		
9.98	0/+0.004	38	88	133	0.8	6	•		
9.99	0/+0.004	38	88	133	0.8	6	•		
10	H7	38	88	133	0.8	6	•		
10.01	0/+0.004	38	88	133	0.8	6	•		
10.02	0/+0.004	38	88	133	0.8	6	•		
10.03	0/+0.004	38	88	133	0.8	6	•		
10.04	0/+0.004	38	88	133	0.8	6	•		
10.05	0/+0.004	38	88	133	0.8	6	•		
10.1	H7	38	88	133	1.0	6	•		
10.2	H7	38	88	133	1.0	6	•		
10.3	H7	38	88	133	1.0	6	•		
10.4	H7	38	88	133	1.0	6	•		
10.5	H7	38	88	133	1.0	6	•		
10.6	H7	38	88	133	1.0	6	•		
10.7	H7	41	97	142	1.0	6	•		
10.8	H7	41	97	142	1.0	6	•		
10.9	H7	41	97	142	1.0	6	•		
11	H7	41	97	142	1.0	6	•		
11.1	H7	41	97	142	1.0	6	•		
11.2	H7	41	97	142	1.0	6	•		
11.3	H7	41	97	142	1.0	6	•		
11.4	H7	41	97	142	1.0	6	•		
11.5	H7	41	97	142	1.0	6	•		
11.6	H7	41	97	142	1.0	6	•		
11.7	H7	41	97	142	1.0	6	•		
11.8	H7	41	97	142	1.0	6	•		
11.9	H7	44	106	151	1.0	6	•		
11.95	0/+0.004	44	106	151	1.0	6	•		
11.96	0/+0.004	44	106	151	1.0	6	•		
11.97	0/+0.004	44	106	151	1.0	6	•		
11.98	0/+0.004	44	106	151	1.0	6	•		
11.99	0/+0.004	44	106	151	1.0	6	•		
12	H7	44	106	151	1.0	6	•		
12.01	0/+0.004	44	106	151	1.0	6	•		
12.02	0/+0.004	44	106	151	1.0	6	•		
12.03	0/+0.004	44	106	151	1.0	6	•		
12.04	0/+0.004	44	106	151	1.0	6	•		
12.05	0/+0.004	44	106	151	1.0	6	•		

Please refer to page P494 for parameters.

R318

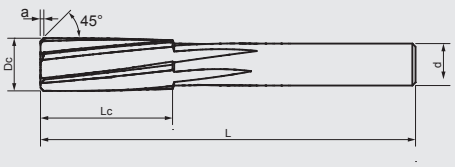
High Precision NC Machine Reamers In Steps of 0.01mm For Automatic Lathes

Designed with left helix and right cutting flutes with unequal flute design.

Downward chip evacuation.

Application for reaming different steels below 48HRC, stainless steel, cast iron, aluminium, copper...and etc.

Accuracy tolerance: 0/+0.004mm.





VHM Carbide | Uncoated Bright | L 7° | Z | Steel, Cast Iron, Stainless Steel, AL, Copper | Through Hole ☑ | Blind Hole ☒

Accuracy tolerance: 0/+0.004mm.

P H M K N

Stub Length

Code No. R318-Dc

Dc +0.004 -0	Lc mm	L mm	d mm	a mm	Z teeth	R318 Bright
1.98~1.99	18	50	1.5	0.2	4	•
2.00	18	50	1.5	0.2	4	•
2.01~2.03	18	50	1.5	0.2	4	•
2.04~2.12	18	50	1.5	0.25	4	•
2.13~2.19	18	50	2	0.25	4	•
2.20	18	50	2	0.25	4	•
2.21~2.36	18	50	2	0.25	4	•
2.37~2.49	18	50	2	0.25	4	•
2.50	18	50	2	0.25	4	•
2.51~2.65	18	50	2	0.25	4	•
2.66~2.79	20	56	2.5	0.25	6	•
2.80	20	56	2.5	0.25	6	•
2.81~2.90	20	56	2.5	0.25	6	•
2.91~2.99	20	56	2.5	0.3	6	•
3.00	20	56	2.5	0.3	6	•
3.01~3.03	20	56	2.5	0.3	6	•
3.04~3.19	20	56	2.5	0.3	6	•
3.20	20	56	3	0.3	6	•
3.21~3.35	20	56	3	0.3	6	•
3.36~3.49	20	56	3	0.3	6	•
3.50	20	56	3	0.3	6	•
3.51~3.60	20	56	3	0.4	6	•
3.61~3.75	20	56	3	0.4	6	•
3.76~3.90	20	56	3.5	0.4	6	•
3.91~3.99	20	56	3.5	0.4	6	•
4.00	20	56	3.5	0.4	6	•
4.01~4.09	20	56	3.5	0.4	6	•
4.10~4.25	20	56	3.5	0.4	6	•
4.26~4.49	22	63	4	0.4	6	•
4.50	22	63	4	0.4	6	•
4.51~4.60	22	63	4	0.5	6	•
4.61~4.75	22	63	4	0.5	6	•
4.76~4.90	22	63	4	0.5	6	•
4.91~4.99	22	63	4	0.5	6	•
5.00	22	63	4	0.5	6	•
5.01~5.10	22	63	4	0.5	6	•

High Precision NC Machine Reamers In Steps of 0.01mm For Automatic Lathes

Dc +0.004 -0	Lc mm	L mm	d mm	a mm	Z teeth	R318 Bright		
5.11~5.30	22	63	4	0.5	6	•		
5.31~5.40	22	63	5	0.5	6	•		
5.41~5.49	22	63	5	0.5	6	•		
5.50	22	63	5	0.5	6	•		
5.51~5.60	22	63	5	0.5	6	•		
5.61~5.80	22	63	5	0.5	6	•		
5.81~5.90	22	63	5	0.5	6	•		
5.91~5.99	22	63	5	0.5	6	•		
6.00	22	63	5	0.5	6	•		
6.01~6.03	22	63	5	0.5	6	•		
6.04~6.30	22	63	5	0.6	6	•		
6.31~6.49	22	63	5	0.6	6	•		
6.50	22	63	5	0.6	6	•		
6.51~6.70	22	63	5	0.6	6	•		
6.71~6.80	25	71	6	0.6	6	•		
6.81~6.99	25	71	6	0.6	6	•		
7.00	25	71	6	0.6	6	•		
7.01~7.10	25	71	6	0.6	6	•		
7.11~7.30	25	71	6	0.6	6	•		
7.31~7.49	25	71	6	0.6	6	•		
7.50	25	71	6	0.6	6	•		
7.51~7.60	25	71	6	0.6	6	•		
7.61~7.80	25	71	6	0.6	6	•		
7.81~7.90	25	71	6	0.6	6	•		
7.91~7.99	25	71	6	0.6	6	•		
8.00	25	71	6	0.6	6	•		
8.01~8.09	25	71	6	0.6	6	•		
8.10~8.30	25	71	6	0.8	6	•		
8.31~8.49	25	71	6	0.8	6	•		
8.50	25	71	6	0.8	6	•		
8.51~8.60	25	71	8	0.8	6	•		
8.61~8.80	25	71	8	0.8	6	•		
8.81~8.99	25	71	8	0.8	6	•		
9.00	25	71	8	0.8	6	•		
9.01~9.10	25	71	8	0.8	6	•		
9.11~9.30	25	71	8	0.8	6	•		
9.31~9.49	25	71	8	0.8	6	•		
9.50	25	71	8	0.8	6	•		
9.51~9.69	25	71	8	0.8	6	•		
9.70~9.85	25	71	8	0.8	6	•		
9.86~9.90	25	71	8	0.8	6	•		
9.91~9.99	25	71	8	0.8	6	•		
10.00	25	71	8	0.8	6	•		
10.01~10.05	25	71	8	0.8	6	•		
10.06~10.20	25	71	8	1.0	6	•		
10.21~10.49	25	71	8	1.0	6	•		
10.50	25	71	8	1.0	6	•		
10.51~10.60	25	71	8	1.0	6	•		
10.61~10.79	28	80	10	1.0	6	•		
10.80~10.99	28	80	10	1.0	6	•		
11.00	28	80	10	1.0	6	•		
11.01~11.06	28	80	10	1.0	6	•		
11.07~11.39	28	80	10	1.0	6	•		
11.40~11.49	28	80	10	1.0	6	•		
11.50	28	80	10	1.0	6	•		
11.51~11.80	28	80	10	1.0	6	•		
11.81~11.90	28	80	10	1.0	6	•		
11.91~11.99	28	80	10	1.0	6	•		
12.00	28	80	10	1.0	6	•		
12.01~12.05	28	80	10	1.0	6	•		

Please refer to page P494 for parameters.

R319

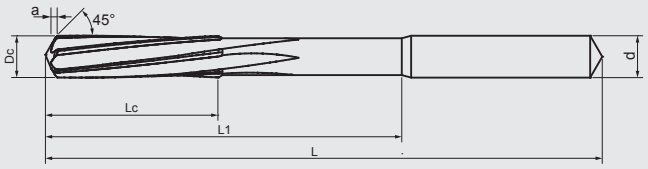
High Precision NC Machine Reamers In Steps of 0.01mm

Designed with left helix and right cutting flutes with unequal flute design.

Downward chip evacuation.

Application for reaming different steels below 48HRC, stainless steel, cast iron, aluminium, copper...and etc.

Accuracy tolerance: 0/+0.004mm.





VHM Carbide | Uncoated Bright | L 7° | Z | Steel, Cast Iron, Stainless Steel, AL, Copper | Through Hole ☑ | Blind Hole ☒

Accuracy tolerance: 0/+0.004mm.

P
H
M
K
N

Standard Length

Code No. R319-Dc

Dc +0.004 -0	Lc mm	L1 mm	L mm	d h5	a mm	Z teeth	R319 Bright
0.98~0.99	6	18	50	4	0.1	3	•
1.00	6	18	50	4	0.1	3	•
1.01~1.02	6	18	50	4	0.1	3	•
1.03~1.10	9	18	50	4	0.1	3	•
1.11~1.19	9	18	50	4	0.1	3	•
1.20	9	18	50	4	0.1	3	•
1.21~1.30	9	18	50	4	0.15	3	•
1.31~1.39	9	18	50	4	0.15	3	•
1.40	9	18	50	4	0.15	3	•
1.41~1.42	9	18	50	4	0.15	3	•
1.43~1.49	9	18	50	4	0.15	3	•
1.50	9	18	50	4	0.15	3	•
1.51~1.53	10	18	50	4	0.15	3	•
1.54~1.59	10	18	50	4	0.2	3	•
1.60	10	18	50	4	0.2	3	•
1.61~1.70	10	18	50	4	0.2	3	•
1.71~1.79	10	19	50	4	0.2	4	•
1.80	11	19	50	4	0.2	4	•
1.81~1.90	11	19	50	4	0.2	4	•
1.91~1.99	12	19	50	4	0.2	4	•
2.00	12	19	50	4	0.2	4	•
2.01~2.03	12	19	50	4	0.2	4	•
2.04~2.12	12	19	50	4	0.25	4	•
2.13~2.19	12	19	50	4	0.25	4	•
2.20	12	19	50	4	0.25	4	•
2.21~2.36	12	19	50	4	0.25	4	•
2.37~2.49	16	29	60	4	0.25	4	•
2.50	16	29	60	4	0.25	4	•
2.51~2.65	16	29	60	4	0.25	4	•
2.66~2.79	17	33	65	4	0.25	6	•
2.80	17	33	65	4	0.25	6	•
2.81~2.90	17	33	65	4	0.25	6	•
2.91~2.99	17	33	65	4	0.3	6	•
3.00	17	33	65	4	0.3	6	•
3.01~3.03	17	33	65	4	0.3	6	•
3.04~3.19	18	33	65	4	0.3	6	•
3.20	18	33	65	4	0.3	6	•
3.21~3.35	18	33	65	4	0.3	6	•
3.36~3.49	18	43	75	4	0.3	6	•
3.50	18	43	75	4	0.3	6	•
3.51~3.60	18	43	75	4	0.3	6	•
3.61~3.75	18	43	75	4	0.3	6	•

High Precision NC Machine Reamers In Steps of 0.01mm

Dc +0.004 -0	Lc mm	L1 mm	L mm	d h5	a mm	Z teeth	R319 Bright		
3.76~3.90	19	43	75	4	0.3	6	•		
3.91~3.99	19	43	75	4	0.4	6	•		
4.00	19	43	75	4	0.4	6	•		
4.01~4.09	19	43	75	4	0.4	6	•		
4.10~4.25	19	43	75	4	0.4	6	•		
4.26~4.49	21	49	80	6	0.4	6	•		
4.50	21	49	80	6	0.4	6	•		
4.51~4.60	21	49	80	6	0.5	6	•		
4.61~4.75	21	49	80	6	0.5	6	•		
4.76~4.90	23	52	93	6	0.5	6	•		
4.91~4.99	23	52	93	6	0.5	6	•		
5.00	23	52	93	6	0.5	6	•		
5.01~5.10	23	52	93	6	0.5	6	•		
5.11~5.30	23	52	93	6	0.5	6	•		
5.31~5.40	26	53	93	6	0.5	6	•		
5.41~5.49	26	53	93	6	0.5	6	•		
5.50	26	53	93	6	0.5	6	•		
5.51~5.60	26	53	93	6	0.5	6	•		
5.61~5.80	26	53	93	6	0.5	6	•		
5.81~5.90	26	53	93	6	0.5	6	•		
5.91~5.99	26	53	93	6	0.5	6	•		
6.00	26	53	93	6	0.5	6	•		
6.01~6.03	26	53	93	6	0.5	6	•		
6.04~6.30	28	61	101	8	0.6	6	•		
6.31~6.49	28	61	101	8	0.6	6	•		
6.50	28	61	101	8	0.6	6	•		
6.51~6.70	28	61	101	8	0.6	6	•		
6.71~6.80	31	68	109	8	0.6	6	•		
6.81~6.99	31	68	109	8	0.6	6	•		
7.00	31	68	109	8	0.6	6	•		
7.01~7.10	31	68	109	8	0.6	6	•		
7.11~7.30	31	68	109	8	0.6	6	•		
7.31~7.49	31	68	109	8	0.6	6	•		
7.50	31	68	109	8	0.6	6	•		
7.51~7.60	33	77	117	8	0.6	6	•		
7.61~7.80	33	77	117	8	0.6	6	•		
7.81~7.90	33	77	117	8	0.6	6	•		
7.91~7.99	33	77	117	8	0.6	6	•		
8.00	33	77	117	8	0.6	6	•		
8.01~8.09	33	77	117	8	0.6	6	•		
8.10~8.30	33	77	117	8	0.8	6	•		
8.31~8.49	33	77	117	8	0.8	6	•		
8.50	33	77	117	8	0.8	6	•		
8.51~8.60	36	80	125	10	0.8	6	•		
8.61~8.80	36	80	125	10	0.8	6	•		
8.81~8.99	36	80	125	10	0.8	6	•		
9.00	36	80	125	10	0.8	6	•		
9.01~9.10	36	80	125	10	0.8	6	•		
9.11~9.30	36	80	125	10	0.8	6	•		
9.31~9.49	36	80	125	10	0.8	6	•		
9.50	36	80	125	10	0.8	6	•		
9.51~9.69	38	88	133	10	0.8	6	•		
9.70~9.85	38	88	133	10	0.8	6	•		
9.86~9.90	38	88	133	10	0.8	6	•		
9.91~9.99	38	88	133	10	0.8	6	•		
10.00	38	88	133	10	0.8	6	•		
10.01~10.05	38	88	133	10	0.8	6	•		
10.06~10.20	38	88	133	10	1.0	6	•		
10.21~10.49	38	88	133	10	1.0	6	•		
10.50	38	88	133	10	1.0	6	•		
10.51~10.60	38	88	133	10	1.0	6	•		
10.61~10.79	41	97	142	10	1.0	6	•		
10.80~10.99	41	97	142	10	1.0	6	•		
11.00	41	97	142	10	1.0	6	•		
11.01~11.06	41	97	142	10	1.0	6	•		
11.07~11.39	41	97	142	10	1.0	6	•		
11.40~11.49	41	97	142	10	1.0	6	•		
11.50	41	97	142	10	1.0	6	•		
11.51~11.80	41	97	142	10	1.0	6	•		
11.81~11.90	44	100	151	12	1.0	6	•		
11.91~11.99	44	100	151	12	1.0	6	•		
12.00	44	100	151	12	1.0	6	•		
12.01~12.05	44	100	151	12	1.0	6	•		

Please refer to page P494 for parameters.

R320

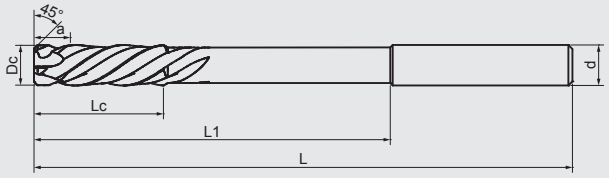
High Precision NC Machine Reamers (With Milling Cutting Edge)

Designed with left helix and right cutting flutes with unequal flute design.

Downward chip evacuation.

Application for reaming different steels below 48HRC, stainless steel, cast iron, aluminium, copper...and etc.

Accuracy tolerance: H7 (m5)
0/+0.004mm





VHM Carbide | **Uncoated Bright** | L 35° | Z | **Steel** Cast Iron Stainless Steel AL, Copper | Through Hole ☑ | Blind Hole ☒

Tolerance regulation

Dc size (mm)		Reamer Dc tolerance (mm)		Grind Dc tolerance (mm)		
Above	Under	m5(JIS)	H7(DIN 1420)	Min	Mid	Max
-	3	+0.002/+0.006	+0.004/+0.008	+0.004	+0.005	+0.006
3	6	+0.004/+0.009	+0.005/+0.010	+0.005	+0.007	+0.009
6	10	+0.006/+0.012	+0.006/+0.012	+0.007	+0.009	+0.011
10	18	+0.007/+0.015	+0.008/+0.015	+0.009	+0.011	+0.013
18	30	+0.008/+0.017	+0.009/+0.017	+0.011	+0.013	+0.015

P **H** **M** **K** **N**

Stub Length — Code No. R320-Dc

Dc +0.004 -0	Tolerance mm	Lc mm	L1 mm	L mm	d h6	a mm	Z teeth	R320 Bright
2.95	0/+0.004	20	33	61	3	4	3	•
2.96	0/+0.004	20	33	61	3	4	3	•
2.97	0/+0.004	20	33	61	3	4	3	•
2.98	0/+0.004	20	33	61	3	4	3	•
2.99	0/+0.004	20	33	61	3	4	3	•
3	H7	20	33	61	3	4	3	•
3.01	0/+0.004	20	33	61	3	4	3	•
3.02	0/+0.004	20	33	61	3	4	3	•
3.03	0/+0.004	20	33	61	3	4	3	•
3.04	0/+0.004	20	33	61	3	4	3	•
3.05	0/+0.004	20	33	61	3	4	3	•
3.95	0/+0.004	22	43	75	4	5	3	•
3.96	0/+0.004	22	43	75	4	5	3	•
3.97	0/+0.004	22	43	75	4	5	3	•
3.98	0/+0.004	22	43	75	4	5	3	•
3.99	0/+0.004	22	43	75	4	5	3	•
4	H7	22	43	75	4	5	3	•
4.01	0/+0.004	22	43	75	4	5	3	•
4.02	0/+0.004	22	43	75	4	5	3	•
4.03	0/+0.004	22	43	75	4	5	3	•
4.04	0/+0.004	22	43	75	4	5	3	•
4.05	0/+0.004	22	43	75	4	5	3	•
4.95	0/+0.004	24	52	86	5	5	3	•
4.96	0/+0.004	24	52	86	5	5	3	•
4.97	0/+0.004	24	52	86	5	5	3	•
4.98	0/+0.004	24	52	86	5	5	3	•
4.99	0/+0.004	24	52	86	5	5	3	•
5	H7	24	52	86	5	5	3	•
5.01	0/+0.004	24	52	86	5	5	3	•
5.02	0/+0.004	24	52	86	5	5	3	•
5.03	0/+0.004	24	52	86	5	5	3	•
5.04	0/+0.004	24	52	86	5	5	3	•
5.05	0/+0.004	24	52	86	5	5	3	•
5.95	0/+0.004	26	52	93	6	6	4	•
5.96	0/+0.004	26	52	93	6	6	4	•
5.97	0/+0.004	26	52	93	6	6	4	•

High Precision NC Machine Reamers (With Milling Cutting Edge)

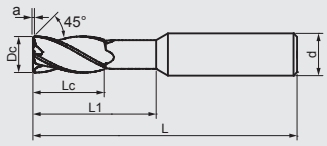
Dc +0.004 -0	Tolerance mm	Lc mm	L1 mm	L mm	d h6	a mm	Z teeth	R320 Bright		
5.98	0/+0.004	26	52	93	6	6	4	•		
5.99	0/+0.004	26	52	93	6	6	4	•		
6	H7	26	52	93	6	6	4	•		
6.01	0/+0.004	26	52	93	6	6	4	•		
6.02	0/+0.004	26	52	93	6	6	4	•		
6.03	0/+0.004	26	52	93	6	6	4	•		
6.04	0/+0.004	26	52	93	6	6	4	•		
6.05	0/+0.004	26	52	93	6	6	4	•		
6.95	0/+0.004	26	68	109	8	6	4	•		
6.96	0/+0.004	26	68	109	8	6	4	•		
6.97	0/+0.004	26	68	109	8	6	4	•		
6.98	0/+0.004	26	68	109	8	6	4	•		
6.99	0/+0.004	26	68	109	8	6	4	•		
7	H7	26	68	109	8	6	4	•		
7.01	0/+0.004	26	68	109	8	6	4	•		
7.02	0/+0.004	26	68	109	8	6	4	•		
7.03	0/+0.004	26	68	109	8	6	4	•		
7.04	0/+0.004	26	68	109	8	6	4	•		
7.05	0/+0.004	26	68	109	8	6	4	•		
7.95	0/+0.004	28	77	117	8	7	4	•		
7.96	0/+0.004	28	77	117	8	7	4	•		
7.97	0/+0.004	28	77	117	8	7	4	•		
7.98	0/+0.004	28	77	117	8	7	4	•		
7.99	0/+0.004	28	77	117	8	7	4	•		
8	H7	28	77	117	8	7	4	•		
8.01	0/+0.004	28	77	117	8	7	4	•		
8.02	0/+0.004	28	77	117	8	7	4	•		
8.03	0/+0.004	28	77	117	8	7	4	•		
8.04	0/+0.004	28	77	117	8	7	4	•		
8.05	0/+0.004	28	77	117	8	7	4	•		
8.95	0/+0.004	28	80	125	10	7	4	•		
8.96	0/+0.004	28	80	125	10	7	4	•		
8.97	0/+0.004	28	80	125	10	7	4	•		
8.98	0/+0.004	28	80	125	10	7	4	•		
8.99	0/+0.004	28	80	125	10	7	4	•		
9	H7	28	80	125	10	7	4	•		
9.01	0/+0.004	28	80	125	10	7	4	•		
9.02	0/+0.004	28	80	125	10	7	4	•		
9.03	0/+0.004	28	80	125	10	7	4	•		
9.04	0/+0.004	28	80	125	10	7	4	•		
9.05	0/+0.004	28	80	125	10	7	4	•		
9.95	0/+0.004	32	88	133	10	8	4	•		
9.96	0/+0.004	32	88	133	10	8	4	•		
9.97	0/+0.004	32	88	133	10	8	4	•		
9.98	0/+0.004	32	88	133	10	8	4	•		
9.99	0/+0.004	32	88	133	10	8	4	•		
10	H7	32	88	133	10	8	4	•		
10.01	0/+0.004	32	88	133	10	8	4	•		
10.02	0/+0.004	32	88	133	10	8	4	•		
10.03	0/+0.004	32	88	133	10	8	4	•		
10.04	0/+0.004	32	88	133	10	8	4	•		
10.05	0/+0.004	32	88	133	10	8	4	•		
11.95	0/+0.004	32	100	151	12	8	4	•		
11.96	0/+0.004	32	100	151	12	8	4	•		
11.97	0/+0.004	32	100	151	12	8	4	•		
11.98	0/+0.004	32	100	151	12	8	4	•		
11.99	0/+0.004	32	100	151	12	8	4	•		
12	H7	32	100	151	12	8	4	•		
12.01	0/+0.004	32	100	151	12	8	4	•		
12.02	0/+0.004	32	100	151	12	8	4	•		
12.03	0/+0.004	32	100	151	12	8	4	•		
12.04	0/+0.004	32	100	151	12	8	4	•		
12.05	0/+0.004	32	100	151	12	8	4	•		

Please refer to page P494 for parameters.

R328

High Precision NC Machine Reamers (End Cutting)

Designed with right helix and right cutting flutes.
Upward chip evacuation.
Application for reaming different steels below 48HRC, stainless steel, cast iron, aluminium, copper...and etc.
Designed with the function of end cutting.
At quiescent point, the end cutting is equipped with cutting function for even out completely the residual left in the bottom of the hole and calibrate well deviation.
Accuracy tolerance: H7 (m5)
0/+0.004mm





VHM Carbide | Uncoated Bright | R 30° | Steel, Cast Iron, Stainless Steel, AL, Copper | Through Hole ☑ | Blind Hole ☑

Tolerance regulation

Dc size (mm)		Reamer Dc tolerance (mm)		Grind Dc tolerance (mm)		
Above	Under	m5(JIS)	H7(DIN 1420)	Min	Mid	Max
-	3	+0.002/+0.006	+0.004/+0.008	+0.004	+0.005	+0.006
3	6	+0.004/+0.009	+0.005/+0.010	+0.005	+0.007	+0.009
6	10	+0.006/+0.012	+0.006/+0.012	+0.007	+0.009	+0.011
10	18	+0.007/+0.015	+0.008/+0.015	+0.009	+0.011	+0.013
18	30	+0.008/+0.017	+0.009/+0.017	+0.011	+0.013	+0.015

P
H
M
K
N

Stub Length

Code No. R328-Dc

Dc mm	Tolerance mm	Lc mm	L1 mm	L mm	d h5	a mm	Z teeth	R328 Bright
0.98	0/+0.004	2	10	50	4	0.05	4	•
0.99	0/+0.004	2	10	50	4	0.05	4	•
1	H7	2	10	50	4	0.05	4	•
1.01	0/+0.004	2	10	50	4	0.05	4	•
1.02	0/+0.004	2	10	50	4	0.05	4	•
1.03	0/+0.004	2	10	50	4	0.05	4	•
1.1	H7	2	10	50	4	0.05	4	•
1.2	H7	2	10	50	4	0.05	4	•
1.3	H7	2	10	50	4	0.05	4	•
1.4	H7	2	10	50	4	0.05	4	•
1.48	0/+0.004	2	10	50	4	0.05	4	•
1.49	0/+0.004	2	10	50	4	0.05	4	•
1.5	H7	2	10	50	4	0.05	4	•
1.51	0/+0.004	2	10	50	4	0.05	4	•
1.52	0/+0.004	2	10	50	4	0.05	4	•
1.53	0/+0.004	2	10	50	4	0.05	4	•
1.6	H7	2	10	50	4	0.1	4	•
1.7	H7	2	10	50	4	0.1	4	•
1.8	H7	2	10	50	4	0.1	4	•
1.9	H7	2	10	50	4	0.1	4	•
1.98	0/+0.004	4	10	50	4	0.1	4	•
1.99	0/+0.004	4	10	50	4	0.1	4	•
2	H7	4	10	50	4	0.1	4	•
2.01	0/+0.004	4	10	50	4	0.1	4	•
2.02	0/+0.004	4	10	50	4	0.1	4	•
2.03	0/+0.004	4	10	50	4	0.1	4	•
2.1	H7	4	10	50	4	0.1	4	•
2.2	H7	4	10	50	4	0.1	4	•
2.3	H7	4	10	50	4	0.1	4	•
2.4	H7	4	10	50	4	0.1	4	•
2.48	0/+0.004	4	10	50	4	0.1	4	•
2.49	0/+0.004	4	10	50	4	0.1	4	•
2.5	H7	4	10	50	4	0.1	4	•
2.51	0/+0.004	4	10	50	4	0.1	4	•
2.52	0/+0.004	4	10	50	4	0.1	4	•
2.53	0/+0.004	4	10	50	4	0.1	4	•

High Precision NC Machine Reamers (End Cutting)

Dc mm	Tolerance mm	Lc mm	L1 mm	L mm	d h5	a mm	Z teeth	R328 Bright		
2.6	H7	4	10	50	4	0.1	4	•		
2.7	H7	4	10	50	4	0.1	4	•		
2.8	H7	4	10	50	4	0.1	4	•		
2.9	H7	4	10	50	4	0.1	4	•		
2.95	0/+0.004	6	15	50	4	0.1	4	•		
2.96	0/+0.004	6	15	50	4	0.1	4	•		
2.97	0/+0.004	6	15	50	4	0.1	4	•		
2.98	0/+0.004	6	15	50	4	0.1	4	•		
2.99	0/+0.004	6	15	50	4	0.1	4	•		
3	H7	6	15	50	4	0.1	4	•		
3.01	0/+0.004	6	15	50	4	0.1	4	•		
3.02	0/+0.004	6	15	50	4	0.1	4	•		
3.03	0/+0.004	6	15	50	4	0.1	4	•		
3.04	0/+0.004	6	15	50	4	0.1	4	•		
3.05	0/+0.004	6	15	50	4	0.1	4	•		
3.1	H7	6	15	50	4	0.1	4	•		
3.2	H7	6	15	50	4	0.1	4	•		
3.3	H7	6	15	50	4	0.1	4	•		
3.4	H7	6	15	50	4	0.1	4	•		
3.5	H7	6	15	50	4	0.1	4	•		
3.6	H7	6	15	50	4	0.15	4	•		
3.7	H7	6	15	50	4	0.15	4	•		
3.8	H7	6	15	50	4	0.15	4	•		
3.9	H7	6	15	50	4	0.15	4	•		
3.95	0/+0.004	8	15	50	6	0.15	4	•		
3.96	0/+0.004	8	15	50	6	0.15	4	•		
3.97	0/+0.004	8	15	50	6	0.15	4	•		
3.98	0/+0.004	8	15	50	6	0.15	4	•		
3.99	0/+0.004	8	15	50	6	0.15	4	•		
4	H7	8	15	50	6	0.15	4	•		
4.01	0/+0.004	8	15	50	6	0.15	4	•		
4.02	0/+0.004	8	15	50	6	0.15	4	•		
4.03	0/+0.004	8	15	50	6	0.15	4	•		
4.04	0/+0.004	8	15	50	6	0.15	4	•		
4.05	0/+0.004	8	15	50	6	0.15	4	•		
4.1	H7	8	15	50	6	0.15	4	•		
4.2	H7	8	15	50	6	0.15	4	•		
4.3	H7	8	15	50	6	0.15	4	•		
4.4	H7	8	15	50	6	0.15	4	•		
4.5	H7	8	15	50	6	0.15	4	•		
4.6	H7	8	15	50	6	0.15	4	•		
4.7	H7	8	15	50	6	0.15	4	•		
4.8	H7	8	15	50	6	0.15	4	•		
4.9	H7	8	15	50	6	0.15	4	•		
4.95	0/+0.004	10	20	50	6	0.2	4	•		
4.96	0/+0.004	10	20	50	6	0.2	4	•		
4.97	0/+0.004	10	20	50	6	0.2	4	•		
4.98	0/+0.004	10	20	50	6	0.2	4	•		
4.99	0/+0.004	10	20	50	6	0.2	4	•		
5	H7	10	20	50	6	0.2	4	•		
5.01	0/+0.004	10	20	50	6	0.2	4	•		
5.02	0/+0.004	10	20	50	6	0.2	4	•		
5.03	0/+0.004	10	20	50	6	0.2	4	•		
5.04	0/+0.004	10	20	50	6	0.2	4	•		
5.05	0/+0.004	10	20	50	6	0.2	4	•		
5.1	H7	10	20	50	6	0.2	4	•		
5.2	H7	10	20	50	6	0.2	4	•		
5.3	H7	10	20	50	6	0.2	4	•		
5.4	H7	10	20	50	6	0.2	4	•		
5.5	H7	10	20	50	6	0.2	4	•		
5.6	H7	10	20	50	6	0.2	4	•		
5.7	H7	10	20	50	6	0.2	4	•		
5.8	H7	10	20	50	6	0.2	4	•		
5.9	H7	10	20	50	6	0.2	4	•		

R328

High Precision NC Machine Reamers (End Cutting)

Dc mm	Tolerance mm	Lc mm	L1 mm	L mm	d h5	a mm	Z teeth	R328 Bright		
5.95	0/+0.004	12	25	60	8	0.2	4	•		
5.96	0/+0.004	12	25	60	8	0.2	4	•		
5.97	0/+0.004	12	25	60	8	0.2	4	•		
5.98	0/+0.004	12	25	60	8	0.2	4	•		
5.99	0/+0.004	12	25	60	8	0.2	4	•		
6	H7	12	25	60	8	0.2	4	•		
6.01	0/+0.004	12	25	60	8	0.2	4	•		
6.02	0/+0.004	12	25	60	8	0.2	4	•		
6.03	0/+0.004	12	25	60	8	0.2	4	•		
6.04	0/+0.004	12	25	60	8	0.2	4	•		
6.05	0/+0.004	12	25	60	8	0.2	4	•		
6.1	H7	12	25	60	8	0.2	4	•		
6.2	H7	12	25	60	8	0.2	4	•		
6.3	H7	12	25	60	8	0.2	4	•		
6.4	H7	12	25	60	8	0.2	4	•		
6.5	H7	12	25	60	8	0.2	4	•		
6.6	H7	12	25	60	8	0.2	4	•		
6.7	H7	12	25	60	8	0.2	4	•		
6.8	H7	12	25	60	8	0.2	4	•		
6.9	H7	12	25	60	8	0.2	4	•		
6.95	0/+0.004	14	25	60	8	0.25	4	•		
6.96	0/+0.004	14	25	60	8	0.25	4	•		
6.97	0/+0.004	14	25	60	8	0.25	4	•		
6.98	0/+0.004	14	25	60	8	0.25	4	•		
6.99	0/+0.004	14	25	60	8	0.25	4	•		
7	H7	14	25	60	8	0.25	4	•		
7.01	0/+0.004	14	25	60	8	0.25	4	•		
7.02	0/+0.004	14	25	60	8	0.25	4	•		
7.03	0/+0.004	14	25	60	8	0.25	4	•		
7.04	0/+0.004	14	25	60	8	0.25	4	•		
7.05	0/+0.004	14	25	60	8	0.25	4	•		
7.1	H7	14	25	60	8	0.25	4	•		
7.2	H7	14	25	60	8	0.25	4	•		
7.3	H7	14	25	60	8	0.25	4	•		
7.4	H7	14	25	60	8	0.25	4	•		
7.5	H7	14	25	60	8	0.25	4	•		
7.6	H7	14	25	60	8	0.25	4	•		
7.7	H7	14	25	60	8	0.25	4	•		
7.8	H7	14	25	60	8	0.25	4	•		
7.9	H7	14	25	60	8	0.25	4	•		
7.95	0/+0.004	16	30	75	10	0.25	4	•		
7.96	0/+0.004	16	30	75	10	0.25	4	•		
7.97	0/+0.004	16	30	75	10	0.25	4	•		
7.98	0/+0.004	16	30	75	10	0.25	4	•		
7.99	0/+0.004	16	30	75	10	0.25	4	•		
8	H7	16	30	75	10	0.25	4	•		
8.01	0/+0.004	16	30	75	10	0.25	4	•		
8.02	0/+0.004	16	30	75	10	0.25	4	•		
8.03	0/+0.004	16	30	75	10	0.25	4	•		
8.04	0/+0.004	16	30	75	10	0.25	4	•		
8.05	0/+0.004	16	30	75	10	0.25	4	•		
8.1	H7	16	30	75	10	0.25	4	•		
8.2	H7	16	30	75	10	0.25	4	•		
8.3	H7	16	30	75	10	0.25	4	•		
8.4	H7	16	30	75	10	0.25	4	•		
8.5	H7	16	30	75	10	0.25	4	•		
8.6	H7	16	30	75	10	0.25	4	•		
8.7	H7	16	30	75	10	0.25	4	•		
8.8	H7	16	30	75	10	0.25	4	•		
8.9	H7	16	30	75	10	0.25	4	•		
8.95	0/+0.004	18	30	75	10	0.3	4	•		
8.96	0/+0.004	18	30	75	10	0.3	4	•		
8.97	0/+0.004	18	30	75	10	0.3	4	•		
8.98	0/+0.004	18	30	75	10	0.3	4	•		

High Precision NC Machine Reamers (End Cutting)

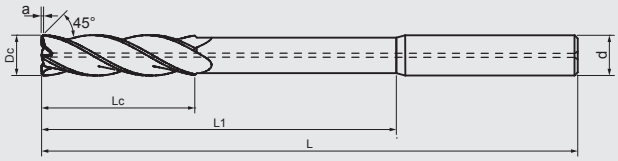
Dc mm	Tolerance mm	Lc mm	L1 mm	L mm	d h5	a mm	Z teeth	R328 Bright		
8.99	0/+0.004	18	30	75	10	0.3	4	•		
9	H7	18	30	75	10	0.3	4	•		
9.01	0/+0.004	18	30	75	10	0.3	4	•		
9.02	0/+0.004	18	30	75	10	0.3	4	•		
9.03	0/+0.004	18	30	75	10	0.3	4	•		
9.04	0/+0.004	18	30	75	10	0.3	4	•		
9.05	0/+0.004	18	30	75	10	0.3	4	•		
9.1	H7	18	30	75	10	0.3	4	•		
9.2	H7	18	30	75	10	0.3	4	•		
9.3	H7	18	30	75	10	0.3	4	•		
9.4	H7	18	30	75	10	0.3	4	•		
9.5	H7	18	30	75	10	0.3	4	•		
9.6	H7	18	30	75	10	0.3	4	•		
9.7	H7	18	30	75	10	0.3	4	•		
9.8	H7	18	30	75	10	0.3	4	•		
9.9	H7	18	30	75	10	0.3	4	•		
9.95	0/+0.004	20	35	75	12	0.3	4	•		
9.96	0/+0.004	20	35	75	12	0.3	4	•		
9.97	0/+0.004	20	35	75	12	0.3	4	•		
9.98	0/+0.004	20	35	75	12	0.3	4	•		
9.99	0/+0.004	20	35	75	12	0.3	4	•		
10	H7	20	35	75	12	0.3	4	•		
10.01	0/+0.004	20	35	75	12	0.3	4	•		
10.02	0/+0.004	20	35	75	12	0.3	4	•		
10.03	0/+0.004	20	35	75	12	0.3	4	•		
10.04	0/+0.004	20	35	75	12	0.3	4	•		
10.05	0/+0.004	20	35	75	12	0.3	4	•		
10.1	H7	20	35	75	12	0.3	4	•		
10.2	H7	20	35	75	12	0.3	4	•		
10.3	H7	20	35	75	12	0.3	4	•		
10.4	H7	20	35	75	12	0.3	4	•		
10.5	H7	20	35	75	12	0.3	4	•		
10.6	H7	20	35	75	12	0.3	4	•		
10.7	H7	20	35	75	12	0.3	4	•		
10.8	H7	20	35	75	12	0.3	4	•		
10.9	H7	20	35	75	12	0.3	4	•		
11	H7	22	35	75	12	0.35	4	•		
11.1	H7	22	35	75	12	0.35	4	•		
11.2	H7	22	35	75	12	0.35	4	•		
11.3	H7	22	35	75	12	0.35	4	•		
11.4	H7	22	35	75	12	0.35	4	•		
11.5	H7	22	35	75	12	0.35	4	•		
11.6	H7	22	35	75	12	0.35	4	•		
11.7	H7	22	35	75	12	0.35	4	•		
11.8	H7	22	35	75	12	0.35	4	•		
11.9	H7	22	35	75	12	0.35	4	•		
11.95	0/+0.004	24	35	75	12	0.35	4	•		
11.96	0/+0.004	24	35	75	12	0.35	4	•		
11.97	0/+0.004	24	35	75	12	0.35	4	•		
11.98	0/+0.004	24	35	75	12	0.35	4	•		
11.99	0/+0.004	24	35	75	12	0.35	4	•		
12	H7	24	35	75	12	0.35	4	•		
12.01	0/+0.004	24	35	75	12	0.35	4	•		
12.02	0/+0.004	24	35	75	12	0.35	4	•		
12.03	0/+0.004	24	35	75	12	0.35	4	•		
12.04	0/+0.004	24	35	75	12	0.35	4	•		
12.05	0/+0.004	24	35	75	12	0.35	4	•		

Please refer to page P494 for parameters.

R329

High Precision NC Machine Reamers (End Cutting)

Designed with right helix and right cutting flutes.
Upward chip evacuation.
Application for reaming different steels below 48HRC, stainless steel, cast iron, aluminium, copper...and etc.
Designed with the function of end cutting.
With internal coolant for even out the residual left in the bottom of the hole.
Accuracy tolerance: H7 (m5)
0/+0.004mm





VHM Carbide | Uncoated Bright | R 30° | Steel, Cast Iron, Stainless Steel, AL, Copper | Through Hole ☑ | Blind Hole ☑

Tolerance regulation

Dc size (mm)		Reamer Dc tolerance (mm)		Grind Dc tolerance (mm)		
Above	Under	m5(JIS)	H7(DIN 1420)	Min	Mid	Max
-	3	+0.002/+0.006	+0.004/+0.008	+0.004	+0.005	+0.006
3	6	+0.004/+0.009	+0.005/+0.010	+0.005	+0.007	+0.009
6	10	+0.006/+0.012	+0.006/+0.012	+0.007	+0.009	+0.011
10	18	+0.007/+0.015	+0.008/+0.015	+0.009	+0.011	+0.013
18	30	+0.008/+0.017	+0.009/+0.017	+0.011	+0.013	+0.015

P
H
M
K
N

Standard Length — Code No. R329-Dc

Dc +0.004 -0	Tolerance mm	Lc mm	L1 mm	L mm	d h5	a mm	Z teeth	R329 Bright
2.95	0/+0.004	15	33	61	3	0.1	4	•
2.96	0/+0.004	15	33	61	3	0.1	4	•
2.97	0/+0.004	15	33	61	3	0.1	4	•
2.98	0/+0.004	15	33	61	3	0.1	4	•
2.99	0/+0.004	15	33	61	3	0.1	4	•
3	H7	15	33	61	3	0.1	4	•
3.01	0/+0.004	15	33	61	3	0.1	4	•
3.02	0/+0.004	15	33	61	3	0.1	4	•
3.03	0/+0.004	15	33	61	3	0.1	4	•
3.04	0/+0.004	15	33	61	3	0.1	4	•
3.05	0/+0.004	15	33	61	3	0.1	4	•
3.95	0/+0.004	19	43	75	4	0.15	4	•
3.96	0/+0.004	19	43	75	4	0.15	4	•
3.97	0/+0.004	19	43	75	4	0.15	4	•
3.98	0/+0.004	19	43	75	4	0.15	4	•
3.99	0/+0.004	19	43	75	4	0.15	4	•
4	H7	19	43	75	4	0.15	4	•
4.01	0/+0.004	19	43	75	4	0.15	4	•
4.02	0/+0.004	19	43	75	4	0.15	4	•
4.03	0/+0.004	19	43	75	4	0.15	4	•
4.04	0/+0.004	19	43	75	4	0.15	4	•
4.05	0/+0.004	19	43	75	4	0.15	4	•
4.95	0/+0.004	23	52	86	5	0.2	4	•
4.96	0/+0.004	23	52	86	5	0.2	4	•
4.97	0/+0.004	23	52	86	5	0.2	4	•
4.98	0/+0.004	23	52	86	5	0.2	4	•
4.99	0/+0.004	23	52	86	5	0.2	4	•
5	H7	23	52	86	5	0.2	4	•
5.01	0/+0.004	23	52	86	5	0.2	4	•
5.02	0/+0.004	23	52	86	5	0.2	4	•
5.03	0/+0.004	23	52	86	5	0.2	4	•
5.04	0/+0.004	23	52	86	5	0.2	4	•
5.05	0/+0.004	23	52	86	5	0.2	4	•
5.95	0/+0.004	26	52	93	6	0.2	4	•
5.96	0/+0.004	26	52	93	6	0.2	4	•
5.97	0/+0.004	26	52	93	6	0.2	4	•

High Precision NC Machine Reamers (End Cutting)

Dc $^{+0.004}_{-0}$	Tolerance mm	Lc mm	L1 mm	L mm	d h5	a mm	Z teeth	R329 Bright		
5.98	0/+0.004	26	52	93	6	0.2	4	•		
5.99	0/+0.004	26	52	93	6	0.2	4	•		
6	H7	26	52	93	6	0.2	4	•		
6.01	0/+0.004	26	52	93	6	0.2	4	•		
6.02	0/+0.004	26	52	93	6	0.2	4	•		
6.03	0/+0.004	26	52	93	6	0.2	4	•		
6.04	0/+0.004	26	52	93	6	0.2	4	•		
6.05	0/+0.004	26	52	93	6	0.2	4	•		
6.95	0/+0.004	31	68	109	8	0.25	4	•		
6.96	0/+0.004	31	68	109	8	0.25	4	•		
6.97	0/+0.004	31	68	109	8	0.25	4	•		
6.98	0/+0.004	31	68	109	8	0.25	4	•		
6.99	0/+0.004	31	68	109	8	0.25	4	•		
7	H7	31	68	109	8	0.25	4	•		
7.01	0/+0.004	31	68	109	8	0.25	4	•		
7.02	0/+0.004	31	68	109	8	0.25	4	•		
7.03	0/+0.004	31	68	109	8	0.25	4	•		
7.04	0/+0.004	31	68	109	8	0.25	4	•		
7.05	0/+0.004	31	68	109	8	0.25	4	•		
7.95	0/+0.004	33	77	117	8	0.25	4	•		
7.96	0/+0.004	33	77	117	8	0.25	4	•		
7.97	0/+0.004	33	77	117	8	0.25	4	•		
7.98	0/+0.004	33	77	117	8	0.25	4	•		
7.99	0/+0.004	33	77	117	8	0.25	4	•		
8	H7	33	77	117	8	0.25	4	•		
8.01	0/+0.004	33	77	117	8	0.25	4	•		
8.02	0/+0.004	33	77	117	8	0.25	4	•		
8.03	0/+0.004	33	77	117	8	0.25	4	•		
8.04	0/+0.004	33	77	117	8	0.25	4	•		
8.05	0/+0.004	33	77	117	8	0.25	4	•		
8.95	0/+0.004	36	80	125	10	0.3	4	•		
8.96	0/+0.004	36	80	125	10	0.3	4	•		
8.97	0/+0.004	36	80	125	10	0.3	4	•		
8.98	0/+0.004	36	80	125	10	0.3	4	•		
8.99	0/+0.004	36	80	125	10	0.3	4	•		
9	H7	36	80	125	10	0.3	4	•		
9.01	0/+0.004	36	80	125	10	0.3	4	•		
9.02	0/+0.004	36	80	125	10	0.3	4	•		
9.03	0/+0.004	36	80	125	10	0.3	4	•		
9.04	0/+0.004	36	80	125	10	0.3	4	•		
9.05	0/+0.004	36	80	125	10	0.3	4	•		
9.95	0/+0.004	38	88	133	10	0.3	4	•		
9.96	0/+0.004	38	88	133	10	0.3	4	•		
9.97	0/+0.004	38	88	133	10	0.3	4	•		
9.98	0/+0.004	38	88	133	10	0.3	4	•		
9.99	0/+0.004	38	88	133	10	0.3	4	•		
10	H7	38	88	133	10	0.3	4	•		
10.01	0/+0.004	38	88	133	10	0.3	4	•		
10.02	0/+0.004	38	88	133	10	0.3	4	•		
10.03	0/+0.004	38	88	133	10	0.3	4	•		
10.04	0/+0.004	38	88	133	10	0.3	4	•		
10.05	0/+0.004	38	88	133	10	0.3	4	•		
11.95	0/+0.004	44	100	151	12	0.35	4	•		
11.96	0/+0.004	44	100	151	12	0.35	4	•		
11.97	0/+0.004	44	100	151	12	0.35	4	•		
11.98	0/+0.004	44	100	151	12	0.35	4	•		
11.99	0/+0.004	44	100	151	12	0.35	4	•		
12	H7	44	100	151	12	0.35	4	•		
12.01	0/+0.004	44	100	151	12	0.35	4	•		
12.02	0/+0.004	44	100	151	12	0.35	4	•		
12.03	0/+0.004	44	100	151	12	0.35	4	•		
12.04	0/+0.004	44	100	151	12	0.35	4	•		
12.05	0/+0.004	44	100	151	12	0.35	4	•		

Please refer to page P494 for parameters.

R302

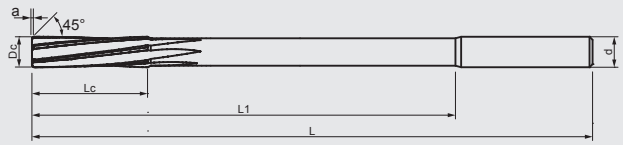
Machine Reamers

Designed with left helix and right cutting flutes with unequal flute design.

Downward chip evacuation.

Application for reaming different steels below 48HRC, stainless steel, cast iron, aluminium, copper...and etc.

Accuracy tolerance: H7 (m5)





VHM Carbide | **Uncoated Bright** | L 7° | Z | **Steel** Cast Iron Stainless Steel AL, Copper | Through Hole ☑ | Blind Hole ☒

Tolerance regulation

Dc size (mm)		Reamer Dc tolerance (mm)		Grind Dc tolerance (mm)		
Above	Under	m5(JIS)	H7(DIN 1420)	Min	Mid	Max
-	3	+0.002/+0.006	+0.004/+0.008	+0.004	+0.005	+0.006
3	6	+0.004/+0.009	+0.005/+0.010	+0.005	+0.007	+0.009
6	10	+0.006/+0.012	+0.006/+0.012	+0.007	+0.009	+0.011
10	18	+0.007/+0.015	+0.008/+0.015	+0.009	+0.011	+0.013
18	30	+0.008/+0.017	+0.009/+0.017	+0.011	+0.013	+0.015

P **H** **M** **K** **N**

Long Length

Code No. R302-Dc

Dc H7	Lc mm	L1 mm	L mm	d mm	a mm	Z teeth	R302 Bright
3	15	72	100	3	0.3	4	•
3.5	18	83	112	3.5	0.3	4	•
4	19	88	119	4	0.4	4	•
4.5	21	94	126	4.5	0.4	4	•
5	23	99	132	5	0.5	6	•
6	26	104	139	6	0.5	6	•
7	31	117	156	7	0.6	6	•
8	33	124	165	8	0.6	6	•
9	36	132	175	9	0.8	6	•
10	38	139	184	10	0.8	6	•
12	44	160	205	12	1.0	6	•
10-HM	38	139	184	10	0.8	6	•
11-HM	41	147	195	10	1.0	6	•
13-HM	44	159	205	10	1.2	6	•
14-HM	47	161	214	12.5	1.2	6	•
16-HM	50	166	220	12.5	1.5	6	•
17-HM	54	174	235	14	1.5	6	•
18-HM	56	177	241	14	1.5	6	•
19-HM	58	181	247	16	1.5	6	•

Please refer to page P494 for parameters.

※HM series offer valid while stocks last

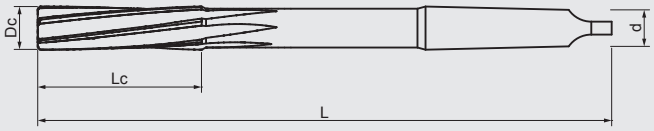
Machine Reamers

Designed with left helix and right cutting flutes with unequal flute design.

Downward chip evacuation.

Application for reaming different steels below 48HRC, stainless steel, cast iron, aluminium, copper...and etc.

Accuracy tolerance: H7 (m5)





HM Carbide Tipped | **Uncoated Bright** | L 7° | Z | **Steel** Cast Iron Stainless Steel AL, Copper | Through Hole ☑ | Blind Hole ☒

Tolerance regulation

Dc size (mm)		Reamer Dc tolerance (mm)		Grind Dc tolerance (mm)		
Above	Under	m5(JIS)	H7(DIN 1420)	Min	Mid	Max
3	6	+0.004/+0.009	+0.005/+0.010	+0.005	+0.007	+0.009
6	10	+0.006/+0.012	+0.006/+0.012	+0.007	+0.009	+0.011
10	18	+0.007/+0.015	+0.008/+0.015	+0.009	+0.011	+0.013
18	30	+0.008/+0.017	+0.009/+0.017	+0.011	+0.013	+0.015
30	50	+0.009/+0.020	+0.012/+0.021	+0.013	+0.016	+0.019

P
H
M
K
N

Standard Length

Code No. R303-Dc

Dc H7	Lc mm	L mm	d M.T.	Z teeth	R303 Bright
11	41	175	1	6	•
12	44	182	1	6	•
13	44	182	1	6	•
14	47	189	1	6	•
15	50	204	2	6	•
17	54	214	2	6	•
18	56	219	2	6	•
19	58	223	2	6	•
22	64	237	2	6	•
24	68	268	3	8	•
25	68	268	3	8	•
26	70	273	3	8	•
28	71	277	3	8	•
30	73	281	3	8	•
32	77	317	4	8	•
35	78	321	4	8	•
36	79	325	4	8	•
38	81	329	4	8	•

Please refer to page P494 for parameters.

※HM series offer valid while stocks last

Reamers Series Machine Reamers



R208TX NC Machine Reamers (High Hardness)

Designed with right helix and right cutting flutes with equal flute design, which is easy for regrinding.
Upward chip evacuation.
Application for reaming different steels below 62HRC, stainless steel, cast iron, copper...and etc.
Nano multilayer coating AlTiSiN with superior wear resistance is suitable for high hardness materials reaming.
Accuracy tolerance: H7 (m5)
0/+0.004mm



R212TX NC Machine Reamers (High Hardness • Difficult To Cut Material • Coolant Hole)

Designed with left helix and right cutting flutes with unequal flute design.
Downward chip evacuation.
Application for reaming different steels below 62HRC, stainless steel, High temp alloys, cast iron, copper...and etc.
Extremely high reaming life with coolant holes for blade cooling.
Nano multilayer coating AlTiSiN with superior wear resistance is suitable for high hardness materials reaming.
Accuracy tolerance: H7 (m5)
0/+0.004mm



R319 High Precision NC Machine Reamers In Steps of 0.01mm

Designed with left helix and right cutting flutes with unequal flute design.
Downward chip evacuation.
Application for reaming different steels below 48HRC, stainless steel, cast iron, aluminium, copper...and etc.
Accuracy tolerance: 0/+0.004mm.

Reamers Series Machine Reamers

Feature of Reamers Helix

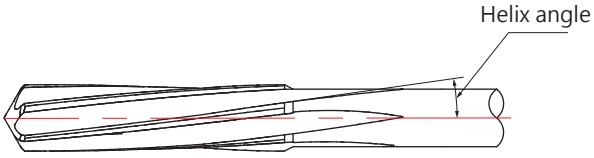
- Designed with straight cutting flutes.

  Straight cutting flute regrinding is generally easier and more economical than helix flute.
  It is commonly used and suitable for processing both through holes and blind holes.



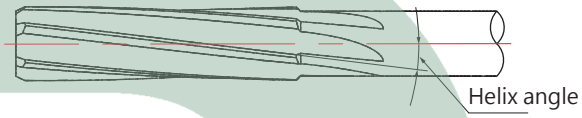
- Designed with left helix and right cutting flutes.

  The finishing effect of spiral reamers is greater than that of straight reamers, which can improve surface roughness.
  However, they have poorer cutting force and require a smaller allowance for hole diameter.
  The chip removal direction is forward, which minimizes impact on already reamed hole walls.
  They are not suitable for processing blind holes.



- Designed with right helix and right cutting flutes.

  The finishing effect of right -hand spiral reamers is slightly inferior to that of left -hand spiral reamers.
  However, they provide better cutting force and allow for a larger hole diameter allowance.
  The chip removal direction is backward, which can affect the walls of already reamed holes.
  They are suitable for processing both through holes and blind holes.



Reamers Tolerance

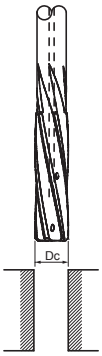
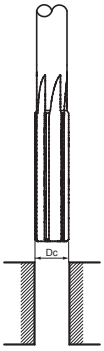
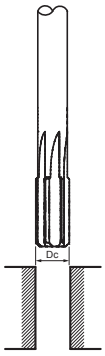
For hole diameter tolerance requirements, the preferred options are generally tolerance classes H7 and H8.
Reamers are produced according to the tolerance range of DIN 1420 H7 (Please refer Table 1), so the reamed holes should fall within the corresponding tolerance range for normal use of the reamer.
However, it is important to consider that the size of the reamed hole depends on the reamer diameter tolerance as well as other factors, such as the angles on the cutting edges, chamfering of the reamer, workpiece clamping, reamer installation offset, machine condition, lubrication, and the characteristics of the material being processed.

Table 1: Tolerance Ranges for Hole Fits and Reamer Diameter Tolerances.

Dc size (mm)		Reamer Dc tolerance (mm)		Reamers tolerance (mm)		Tolerance of hole (mm)	
Above	Under	Min	Max	m5 (JIS)	H7 (DIN 1420)	H7	H8
-	3	+0.004	+0.006	+0.002/+0.006	+0.004/+0.008	0/+0.010	0/+0.014
3	6	+0.005	+0.009	+0.004/+0.009	+0.005/+0.010	0/+0.012	0/+0.018
6	10	+0.007	+0.011	+0.006/+0.012	+0.006/+0.012	0/+0.015	0/+0.022
10	18	+0.009	+0.013	+0.007/+0.015	+0.008/+0.015	0/+0.018	0/+0.027
18	30	+0.011	+0.015	+0.008/+0.017	+0.009/+0.017	0/+0.021	0/+0.033
30	50	+0.013	+0.019	+0.009/+0.020	+0.012/+0.021	0/+0.025	0/+0.039

Cutting Conditions

R208TX
R212TX
R214TX
R216TX
R215
R215TX
R217TX
R300
R307

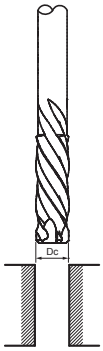
		R208TX		R212TX		R300 / R307		R214TX / R217TX		R215 / R215TX / R216TX	
											
		cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)	cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)	cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)	cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)	cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)
P	Carbon Steel Materials										
	GR1 Carbon Steel	15	0.008xDc	15	0.008xDc	15	0.008×Dc	60~120	0.06×Dc	60~120	0.06×Dc
	GR2 <24HRC Low-alloyed Steel	15	0.008xDc	15	0.008xDc	15	0.008×Dc	60~120	0.05×Dc	60~120	0.05×Dc
	GR3 <30HRC HI-alloyed Steel	12	0.006xDc	12	0.006xDc	12	0.006×Dc	50~100	0.04×Dc	50~100	0.04×Dc
H	Hardened Steel Materials										
	GR4 30~38HRC Hardened Steel	8	0.005xDc	8	0.005xDc	8	0.005×Dc	30~50	0.01×Dc	30~50	0.01×Dc
	GR5 38~48HRC Hardened Steel	6	0.003xDc	6	0.003xDc	5	0.003×Dc	20~30	0.005×Dc	20~30	0.005×Dc
	GR6 48~55HRC Hardened Steel	5	0.002xDc	5	0.002xDc						
	GR7 55~68HRC Hardened Steel	4	0.001xDc	4	0.001xDc						
M	Stainless Steel Materials										
	GR8-1 Ferritic、Martensitic	12	0.006xDc	12	0.006xDc	12	0.006×Dc	30~40	0.03×Dc	30~40	0.03×Dc
	GR8-2 Austenitic	12	0.006xDc	12	0.006xDc	12	0.006×Dc	25~30	0.03×Dc	25~30	0.03×Dc
	GR8-3 Austenitic-ferritic	12	0.006xDc	12	0.006xDc	12	0.006×Dc	20~25	0.02×Dc	20~25	0.02×Dc
	GR8-4 Austenitic-ferritic Heat-resistant	8	0.004xDc	8	0.004xDc	8	0.004×Dc	15~20	0.01×Dc	15~20	0.01×Dc
K	Cast Iron Materials										
	GR9-1 Grey cast iron	15	0.009xDc	15	0.009xDc	15	0.006×Dc	60~120	0.05×Dc	60~120	0.05×Dc
	GR9-2 Nodular cast iron	15	0.009xDc	15	0.009xDc	15	0.006×Dc	60~120	0.05×Dc	60~120	0.05×Dc
N	Aluminium Steel Materials										
	GR10-1 Wrought Aluminium alloys					20	0.006×Dc			150~200	0.08×Dc
	GR10-2 Aluminium cast alloys <10%					20	0.006×Dc			140~180	0.08×Dc
	GR10-3 Aluminium cast alloys >10%					20	0.006×Dc			130~160	0.07×Dc
	Copper Steel Materials										
	GR11-1 Pure Copper					15	0.006×Dc			150~200	0.08×Dc
	GR11-2 Brass					15	0.006×Dc			140~180	0.08×Dc
	GR11-2 Bronze					15	0.006×Dc			130~160	0.07×Dc

※All cutting data serve for orientation only and should be adapted individually to the technical conditions on location .

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

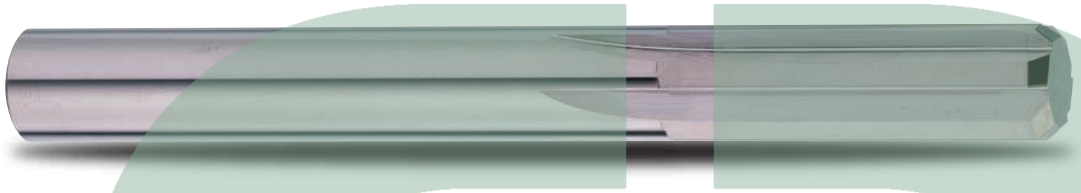
Cutting Conditions

R308
R318
R319
R320
R328
R329
R301
R302
R303

		R308 / R318 / R319		R320		R328 / R329		R301 / R302		R303	
											
		cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)	cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)	cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)	cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)	cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)
P	Carbon Steel Materials										
	GR1 Carbon Steel	15	0.008×Dc	15	0.008×Dc	15	0.008×Dc	15	0.008×Dc	15	0.008×Dc
	GR2 <24HRC Low-alloyed Steel	15	0.008×Dc	15	0.008×Dc	15	0.008×Dc	15	0.008×Dc	15	0.008×Dc
	GR3 <30HRC HI-alloyed Steel	12	0.006×Dc	12	0.006×Dc	12	0.006×Dc	12	0.006×Dc	12	0.006×Dc
H	Hardened Steel Materials										
	GR4 30~38HRC Hardened Steel	8	0.005×Dc	8	0.005×Dc	8	0.005×Dc	8	0.005×Dc	8	0.005×Dc
	GR5 38~48HRC Hardened Steel	5	0.003×Dc	5	0.003×Dc	5	0.003×Dc	5	0.003×Dc	5	0.003×Dc
	GR6 48~55HRC Hardened Steel										
	GR7 55~68HRC Hardened Steel										
M	Stainless Steel Materials										
	GR8-1 Ferritic、Martensitic	12	0.006×Dc	12	0.006×Dc	12	0.006×Dc	12	0.006×Dc	12	0.006×Dc
	GR8-2 Austenitic	12	0.006×Dc	12	0.006×Dc	12	0.006×Dc	12	0.006×Dc	12	0.006×Dc
	GR8-3 Austenitic-ferritic	12	0.006×Dc	12	0.006×Dc	12	0.006×Dc	12	0.006×Dc	12	0.006×Dc
	GR8-4 Austenitic-ferritic Heat-resistant	8	0.004×Dc	8	0.004×Dc	8	0.004×Dc	8	0.004×Dc	8	0.004×Dc
K	Cast Iron Materials										
	GR9-1 Grey cast iron	15	0.006×Dc	15	0.006×Dc	15	0.009×Dc	15	0.006×Dc	15	0.009×Dc
	GR9-2 Nodular cast iron	15	0.006×Dc	15	0.006×Dc	15	0.009×Dc	15	0.006×Dc	15	0.009×Dc
N	Aluminium Steel Materials										
	GR10-1 Wrought Aluminium alloys	20	0.006×Dc	20	0.006×Dc	20	0.006×Dc	20	0.006×Dc	20	0.006×Dc
	GR10-2 Aluminium cast alloys <10%	20	0.006×Dc	20	0.006×Dc	20	0.006×Dc	20	0.006×Dc	20	0.006×Dc
	GR10-3 Aluminium cast alloys >10%	20	0.006×Dc	20	0.006×Dc	20	0.006×Dc	20	0.006×Dc	20	0.006×Dc
	Copper Steel Materials										
	GR11-1 Pure Copper	15	0.006×Dc	15	0.006×Dc	15	0.006×Dc	15	0.006×Dc	15	0.006×Dc
	GR11-2 Brass	15	0.006×Dc	15	0.006×Dc	15	0.006×Dc	15	0.006×Dc	15	0.006×Dc
	GR11-2 Bronze	15	0.006×Dc	15	0.006×Dc	15	0.006×Dc	15	0.006×Dc	15	0.006×Dc

※All cutting data serve for orientation only and should be adapted individually to the technical conditions on location .

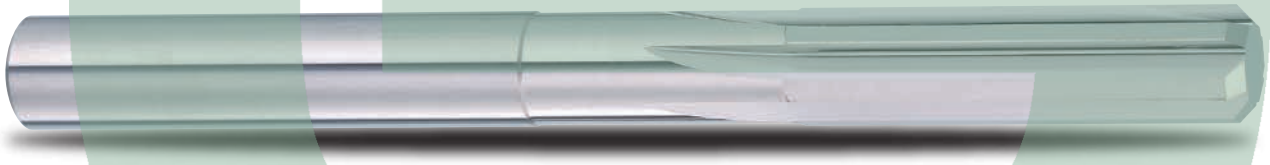
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.



R391

NC Machine Reamers

Provides excellent wear resistance.Can withstand in low tension and high wear resistant materials Subject to the highest cutting temperatures, such as bronze, copper, rubber, aluminum, cast iron and steel, etc....



R392

High Precision Machine Reamers

Provides excellent wear resistance. Can withstand in low tension and high wear resistant materials The highest cutting temperature, such as: bronze, copper, rubberPlastic, aluminum, cast iron and steel, etc.



ANSI REAMER



Reamers

Page	499	501	503
Appearance			
Code No	**R391** METRIC	**R391** INCHES	**R392** INCHES
Carbide	**MG Carbide**	**MG Carbide**	**MG Carbide**
Coating	**Uncoated Bright**	**Uncoated Bright**	**Uncoated Bright**
Helix Angle	 0°	 0°	 0°
No.of Flutes	 Z	 Z	 Z

ANSI

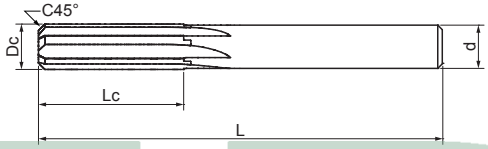
NC Machine Reamers

4&6 Flute Straight Shank Chucking Reamers

MG Carbide | Uncoated Bright | 0° | Z | mm METRIC

Code No: R391-DC





Work Material

P	H	M	K	N	S
●	○	○	●	●	

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics

Tolerance: DC

+0.004/+0.008: 0.5~3.0
+0.005/+0.010: 3.0~6.0
+0.006/+0.012: 6.0~10
+0.008/+0.015: 10~18

Feature of product:

Provide superior wear resistance.

Can withstand the highest cutting temperatures in low tensile and highly abrasive materials such as Bronze, Copper, Rubber, Aluminium, Cast Iron, and Steel... etc.

Standard Length

Dc H7	Lc mm	L mm	d mm	Z teeth	Bright R391
0.5	5	38	0.40	4	●
0.6	5	38	0.50	4	●
0.7	5	38	0.60	4	●
0.8	6	38	0.70	4	●
0.9	6	38	0.80	4	●
1	6	38	0.80	4	●
1.1	10	38	1.00	4	●
1.2	10	38	1.04	4	●
1.3	10	38	1.04	4	●
1.4	10	38	1.32	4	●
1.5	10	38	1.32	4	●
1.6	10	38	1.32	4	●
1.7	13	44	1.59	4	●
1.8	13	44	1.59	4	●
1.9	13	44	1.59	4	●
2	13	44	1.59	4	●
2.1	13	51	1.98	4	●
2.2	13	51	1.98	4	●
2.3	13	51	1.98	4	●
2.4	13	51	1.98	4	●
2.5	16	57	2.38	4	●
2.6	16	57	2.38	4	●
2.7	16	57	2.38	4	●
2.8	16	57	2.38	4	●
2.9	16	57	2.78	4	●
3	16	57	2.78	4	●
3.1	16	57	2.78	4	●
3.2	16	57	2.78	4	●
3.3	19	64	2.78	4	●
3.4	19	64	2.78	4	●
3.5	19	64	2.78	4	●
3.6	19	64	2.78	4	●
3.7	19	64	3.57	4	●
3.8	19	64	3.57	4	●

NC Machine Reamers

4&6 Flute Straight Shank Chucking Reamers

MG Carbide | Uncoated Bright | 0° | Z | mm METRIC

Code No: R391-DC

Work Material

P	H	M	K	N	S
●	○	○	●	●	

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics

Tolerance: DC

+0.004/+0.008: 0.5~3.0
+0.005/+0.010: 3.0~6.0
+0.006/+0.012: 6.0~10
+0.008/+0.015: 10~18

Feature of product:

Provide superior wear resistance.

Can withstand the highest cutting temperatures in low tensile and highly abrasive materials such as Bronze, Copper, Rubber, Aluminium, Cast Iron, and Steel... etc.

Standard Length

Dc H7	Lc mm	L mm	d mm	Z teeth	Bright R391	Dc H7	Lc mm	L mm	d mm	Z teeth	Bright R391
3.9	19	64	3.57	4	●	8.5	32	89	7.94	6	●
4	19	64	3.57	4	●	8.6	32	89	7.94	6	●
4.1	22	70	3.97	4	●	8.7	32	89	7.94	6	●
4.2	22	70	3.97	4	●	8.8	32	89	7.94	6	●
4.3	22	70	3.97	4	●	8.9	32	89	7.94	6	●
4.4	22	70	3.97	4	●	9	32	89	7.94	6	●
4.5	22	70	4.37	4	●	9.1	32	89	7.94	6	●
4.6	22	70	4.37	4	●	9.2	32	89	9.13	6	●
4.7	22	70	4.37	4	●	9.3	32	89	9.13	6	●
4.8	22	70	4.37	4	●	9.4	32	89	9.13	6	●
4.9	22	70	4.76	4	●	9.5	32	89	9.13	6	●
5	25	76	4.76	4	●	9.6	32	89	9.13	6	●
5.1	25	76	4.76	4	●	9.7	32	89	9.13	6	●
5.2	25	76	4.76	4	●	9.8	32	89	9.13	6	●
5.3	25	76	4.76	4	●	9.9	32	89	9.53	6	●
5.4	25	76	4.76	4	●	10	32	89	9.53	6	●
5.5	25	76	4.76	4	●	10.1	32	89	9.53	6	
5.6	25	76	4.76	4	●	10.2	32	89	9.53	6	
5.7	25	76	5.56	4	●	10.3	32	89	9.53	6	
5.8	25	76	5.56	4	●	10.4	32	89	9.53	6	
5.9	25	76	5.56	4	●	10.5	32	89	9.53	6	●
6	25	76	5.56	4	●	10.6	35	102	9.53	6	
6.1	25	76	5.56	4	●	10.7	35	102	9.53	6	
6.2	25	76	5.56	4	●	10.8	35	102	9.53	6	
6.3	25	76	5.56	4	●	10.9	35	102	9.53	6	
6.4	25	76	5.56	4	●	11	35	102	9.53	6	●
6.5	29	83	6.35	6	●	11.1	35	102	9.53	6	
6.6	29	83	6.35	6	●	11.2	35	102	9.53	6	
6.7	29	83	6.35	6	●	11.3	35	102	9.53	6	
6.8	29	83	6.35	6	●	11.4	35	102	9.53	6	
6.9	29	83	6.35	6	●	11.5	35	102	9.53	6	●
7	29	83	6.35	6	●	11.6	35	102	11.11	6	
7.1	29	83	6.35	6	●	11.7	35	102	11.11	6	
7.2	29	83	6.35	6	●	11.8	35	102	11.11	6	
7.3	29	83	7.14	6	●	11.9	35	102	11.11	6	
7.4	29	83	7.14	6	●	12	35	102	11.11	6	●
7.5	29	83	7.14	6	●	12.1	38	102	11.11	6	
7.6	29	83	7.14	6	●	12.2	38	102	11.11	6	
7.7	29	83	7.14	6	●	12.3	38	102	11.11	6	
7.8	29	83	7.14	6	●	12.4	38	102	11.11	6	
7.9	29	83	7.14	6	●	12.5	38	102	11.11	6	●
8	29	83	7.14	6	●	12.6	38	102	11.11	6	
8.1	32	89	7.94	6	●	12.7	38	102	11.11	6	
8.2	32	89	7.94	6	●	12.8	38	102	11.11	6	
8.3	32	89	7.94	6	●	12.9	38	102	11.11	6	
8.4	32	89	7.94	6	●	13	38	102	11.11	6	●

Please refer to page P502 for parameters.

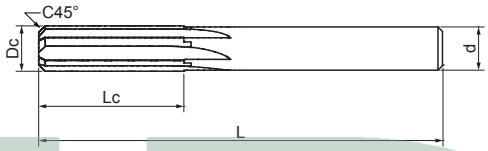
NC Machine Reamers

4&6 Flute Straight Shank Chucking Reamers

MG Carbide | Uncoated Bright | 0° | Z

Code No: R391-DC





Work Material

P	H	M	K	N	S
●	○	○	●	●	

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics

Tolerance: DC

+0.0001/+0.0003: 1/32"~1/4"
+0.0001/+0.0004: 1/4"~1/2"

Feature of product:

Provide superior wear resistance.

Can withstand the highest cutting temperatures in low tensile and highly abrasive materials such as Bronze, Copper, Rubber, Aluminium, Cast Iron, and Steel... etc.

Standard Length

Dc			Lc		L		d		Z	Bright
Dec.Equiv.	Inch	mm	Inch	mm	Inch	mm	Inch	mm	teeth	R391
0.0313	1/32	0.795	1/4	6.35	1-1/2	38.10	0.0260	0.66	4	●
0.0469	3/64	1.191	3/8	9.53	1-1/2	38.10	0.0410	1.04	4	●
0.0625	1/16	1.588	3/8	9.53	1-1/2	38.10	0.0520	1.32	4	●
0.0781	5/64	1.984	1/2	12.70	1-3/4	44.45	0.0625	1.59	4	●
0.0938	3/32	2.383	1/2	12.70	2	50.80	0.0781	1.98	4	●
0.1094	7/64	2.779	5/8	15.88	2-1/4	57.15	0.0938	2.38	4	●
0.1250	1/8	3.175	5/8	15.88	2-1/4	57.15	0.1094	2.78	4	●
0.1406	9/64	3.571	3/4	19.05	2-1/2	63.50	0.1250	3.18	4	●
0.1562	5/32	3.967	3/4	19.05	2-1/2	63.50	0.1406	3.57	4	●
0.1719	11/64	4.366	7/8	22.23	2-3/4	69.85	0.1562	3.97	4	●
0.1875	3/16	4.763	7/8	22.23	2-3/4	69.85	0.1719	4.37	4	●
0.2031	13/64	5.159	1	25.40	3	76.20	0.1875	4.76	4	●
0.2188	7/32	5.558	1	25.40	3	76.20	0.1875	4.76	4	●
0.2344	15/64	5.954	1	25.40	3	76.20	0.2188	5.56	4	●
0.2500	1/4	6.350	1	25.40	3	76.20	0.2188	5.56	4	●
0.2656	17/64	6.746	1-1/8	28.58	3-1/4	82.55	0.2500	6.35	6	●
0.2812	9/32	7.142	1-1/8	28.58	3-1/4	82.55	0.2500	6.35	6	●
0.2969	19/64	7.541	1-1/8	28.58	3-1/4	82.55	0.2812	7.14	6	●
0.3125	5/16	7.938	1-1/8	28.58	3-1/4	82.55	0.2812	7.14	6	●
0.3281	21/64	8.334	1-1/4	31.75	3-1/2	88.90	0.3125	7.94	6	●
0.3438	11/32	8.733	1-1/4	31.75	3-1/2	88.90	0.3125	7.94	6	●
0.3594	23/64	9.129	1-1/4	31.75	3-1/2	88.90	0.3125	7.94	6	●
0.3750	3/8	9.525	1-1/4	31.75	3-1/2	88.90	0.3594	9.13	6	●
0.3906	25/64	9.921	1-1/4	31.75	3-1/2	88.90	0.3750	9.53	6	●
0.4062	13/32	10.317	1-1/4	31.75	3-1/2	88.90	0.3750	9.53	6	●
0.4219	27/64	10.716	1-3/8	34.93	4	101.60	0.3750	9.53	6	●
0.4375	7/16	11.113	1-3/8	34.93	4	101.60	0.3750	9.53	6	●
0.4531	29/64	11.509	1-3/8	34.93	4	101.60	0.4375	11.11	6	●
0.4688	15/32	11.908	1-3/8	34.93	4	101.60	0.4375	11.11	6	●
0.4844	31/64	12.304	1-1/2	38.10	4	101.60	0.4375	11.11	6	●
0.5000	1/2	12.700	1-1/2	38.10	4	101.60	0.4375	11.11	6	●
0.0400	#60	1.016	1/4	6.35	1-1/2	38.10	0.0360	0.91	4	●
0.0410	#59	1.041	1/4	6.35	1-1/2	38.10	0.0360	0.91	4	●
0.0420	#58	1.067	3/8	9.53	1-1/2	38.10	0.0380	0.97	4	●
0.0430	#57	1.092	3/8	9.53	1-1/2	38.10	0.0380	0.97	4	●
0.0465	#56	1.181	3/8	9.53	1-1/2	38.10	0.0410	1.04	4	●
0.0520	#55	1.321	3/8	9.53	1-1/2	38.10	0.0410	1.04	4	●
0.0550	#54	1.397	3/8	9.53	1-1/2	38.10	0.0520	1.32	4	●
0.0595	#53	1.511	3/8	9.53	1-1/2	38.10	0.0520	1.32	4	●
0.0635	#52	1.613	3/8	9.53	1-1/2	38.10	0.0520	1.32	4	●
0.0670	#51	1.702	1/2	12.70	1-3/4	44.45	0.0625	1.59	4	●
0.0700	#50	1.778	1/2	12.70	1-3/4	44.45	0.0625	1.59	4	●
0.0730	#49	1.854	1/2	12.70	1-3/4	44.45	0.0625	1.59	4	●
0.0760	#48	1.930	1/2	12.70	1-3/4	44.45	0.0625	1.59	4	●
0.0785	#47	1.994	1/2	12.70	1-3/4	44.45	0.0625	1.59	4	●
0.0810	#46	2.057	1/2	12.70	1-3/4	44.45	0.0625	1.59	4	●
0.0820	#45	2.083	1/2	12.70	2	50.80	0.0781	1.98	4	●
0.0860	#44	2.184	1/2	12.70	2	50.80	0.0781	1.98	4	●
0.0890	#43	2.261	1/2	12.70	2	50.80	0.0781	1.98	4	●
0.0935	#42	2.375	1/2	12.70	2	50.80	0.0781	1.98	4	●

NC Machine Reamers

4&6 Flute Straight Shank Chucking Reamers

MG Carbide | Uncoated Bright | 0° | Z

Code No: R391-DC

Work Material

P	H	M	K	N	S
●	○	○	●	●	

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics

Tolerance: DC

+0.0001/+0.0003: 1/32"~1/4"
+0.0001/+0.0004: 1/4"~1/2"

Feature of product:

Provide superior wear resistance.

Can withstand the highest cutting temperatures in low tensile and highly abrasive materials such as Bronze, Copper, Rubber, Aluminium, Cast Iron, and Steel... etc.

Standard Length

Dc			Lc		L		d		Z	Bright
Dec.Equiv.	Inch	mm	Inch	mm	Inch	mm	Inch	mm	teeth	R391
0.0960	#41	2.438	1/2	12.70	2	50.80	0.0781	1.98	4	●
0.0980	#40	2.489	5/8	15.88	2-1/4	57.15	0.0938	2.38	4	●
0.0995	#39	2.527	5/8	15.88	2-1/4	57.15	0.0938	2.38	4	●
0.1015	#38	2.578	5/8	15.88	2-1/4	57.15	0.0938	2.38	4	●
0.1040	#37	2.642	5/8	15.88	2-1/4	57.15	0.0938	2.38	4	●
0.1065	#36	2.705	5/8	15.88	2-1/4	57.15	0.0938	2.38	4	●
0.1100	#35	2.794	5/8	15.88	2-1/4	57.15	0.0938	2.38	4	●
0.1110	#34	2.819	5/8	15.88	2-1/4	57.15	0.0938	2.38	4	●
0.1130	#33	2.870	5/8	15.88	2-1/4	57.15	0.0938	2.38	4	●
0.1160	#32	2.946	5/8	15.88	2-1/4	57.15	0.1094	2.78	4	●
0.1200	#31	3.048	5/8	15.88	2-1/4	57.15	0.1094	2.78	4	●
0.1285	#30	3.264	5/8	15.88	2-1/4	57.15	0.1094	2.78	4	●
0.1360	#29	3.454	3/4	19.05	2-1/2	63.50	0.1250	3.18	4	●
0.1405	#28	3.569	3/4	19.05	2-1/2	63.50	0.1250	3.18	4	●
0.1440	#27	3.658	3/4	19.05	2-1/2	63.50	0.1250	3.18	4	●
0.1470	#26	3.734	3/4	19.05	2-1/2	63.50	0.1406	3.57	4	●
0.1495	#25	3.797	3/4	19.05	2-1/2	63.50	0.1406	3.57	4	●
0.1520	#24	3.861	3/4	19.05	2-1/2	63.50	0.1406	3.57	4	●
0.1540	#23	3.912	3/4	19.05	2-1/2	63.50	0.1406	3.57	4	●
0.1570	#22	3.988	3/4	19.05	2-1/2	63.50	0.1406	3.57	4	●
0.1590	#21	4.039	3/4	19.05	2-1/2	63.50	0.1406	3.57	4	●
0.1610	#20	4.089	7/8	22.23	2-3/4	69.85	0.1562	3.97	4	●
0.1660	#19	4.216	7/8	22.23	2-3/4	69.85	0.1562	3.97	4	●
0.1695	#18	4.305	7/8	22.23	2-3/4	69.85	0.1562	3.97	4	●
0.1730	#17	4.394	7/8	22.23	2-3/4	69.85	0.1562	3.97	4	●
0.1770	#16	4.496	7/8	22.23	2-3/4	69.85	0.1719	4.37	4	●
0.1800	#15	4.572	7/8	22.23	2-3/4	69.85	0.1719	4.37	4	●
0.1820	#14	4.623	7/8	22.23	2-3/4	69.85	0.1719	4.37	4	●
0.1850	#13	4.699	7/8	22.23	2-3/4	69.85	0.1719	4.37	4	●
0.1890	#12	4.801	7/8	22.23	2-3/4	69.85	0.1719	4.37	4	●
0.1910	#11	4.851	7/8	22.23	2-3/4	69.85	0.1719	4.37	4	●
0.1935	#10	4.915	1	25.40	3	76.20	0.1875	4.76	4	●
0.1960	#9	4.978	1	25.40	3	76.20	0.1875	4.76	4	●
0.1990	#8	5.055	1	25.40	3	76.20	0.1875	4.76	4	●
0.2010	#7	5.105	1	25.40	3	76.20	0.1875	4.76	4	●
0.2040	#6	5.182	1	25.40	3	76.20	0.1875	4.76	4	●
0.2055	#5	5.220	1	25.40	3	76.20	0.1875	4.76	4	●
0.2090	#4	5.309	1	25.40	3	76.20	0.1875	4.76	4	●
0.2130	#3	5.410	1	25.40	3	76.20	0.1875	4.76	4	●
0.2210	#2	5.613	1	25.40	3	76.20	0.1875	4.76	4	●
0.2280	#1	5.791	1	25.40	3	76.20	0.2188	5.56	4	●
0.2340	A	5.944	1	25.40	3	76.20	0.2188	5.56	4	●
0.2380	B	6.045	1	25.40	3	76.20	0.2188	5.56	4	●
0.2420	C	6.147	1	25.40	3	76.20	0.2188	5.56	4	●
0.2460	D	6.248	1	25.40	3	76.20	0.2188	5.56	4	●
0.2500	E	6.350	1	25.40	3	76.20	0.2188	5.56	4	●
0.2570	F	6.528	1-1/8	28.58	3-1/4	82.55	0.2500	6.35	6	●
0.2610	G	6.629	1-1/8	28.58	3-1/4	82.55	0.2500	6.35	6	●
0.2660	H	6.756	1-1/8	28.58	3-1/4	82.55	0.2500	6.35	6	●
0.2720	I	6.909	1-1/8	28.58	3-1/4	82.55	0.2500	6.35	6	●
0.2770	J	7.036	1-1/8	28.58	3-1/4	82.55	0.2500	6.35	6	●
0.2810	K	7.137	1-1/8	28.58	3-1/4	82.55	0.2500	6.35	6	●
0.2900	L	7.366	1-1/8	28.58	3-1/4	82.55	0.2812	7.14	6	●
0.2950	M	7.493	1-1/8	28.58	3-1/4	82.55	0.2812	7.14	6	●
0.3020	N	7.671	1-1/8	28.58	3-1/4	82.55	0.2812	7.14	6	●
0.3160	O	8.026	1-1/8	28.58	3-1/4	82.55	0.2812	7.14	6	●
0.3230	P	8.204	1-1/4	31.75	3-1/2	88.90	0.3125	7.94	6	●
0.3320	Q	8.433	1-1/4	31.75	3-1/2	88.90	0.3125	7.94	6	●
0.3390	R	8.611	1-1/4	31.75	3-1/2	88.90	0.3125	7.94	6	●
0.3480	S	8.839	1-1/4	31.75	3-1/2	88.90	0.3125	7.94	6	●
0.3580	T	9.093	1-1/4	31.75	3-1/2	88.90	0.3125	7.94	6	●
0.3680	U	9.347	1-1/4	31.75	3-1/2	88.90	0.3594	9.13	6	●
0.3770	V	9.576	1-1/4	31.75	3-1/2	88.90	0.3594	9.13	6	●
0.3860	W	9.804	1-1/4	31.75	3-1/2	88.90	0.3594	9.13	6	●
0.3970	X	10.084	1-1/4	31.75	3-1/2	88.90	0.3750	9.53	6	●
0.4040	Y	10.262	1-1/4	31.75	3-1/2	88.90	0.3750	9.53	6	●
0.4130	Z	10.490	1-1/4	31.75	3-1/2	88.90	0.3750	9.53	6	●

Please refer to page P502 for parameters.

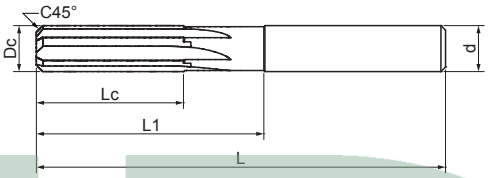
High Precision Machine Reamers

4&6 Flute Straight Shank Chucking Reamers

MG Carbide | Uncoated Bright | 0° | Z

Code No: R392-DC





Work Material

P	H	M	K	N	S
●	○	○	●	●	

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
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- **N** Plastics

Tolerance: DC

+0.0001/+0.0003: 1/32"~1/4"
+0.0001/+0.0004: 1/4"~1/2"

Feature of product:

Provide superior wear resistance.

Can withstand the highest cutting temperatures in low tensile and highly abrasive materials such as Bronze, Copper, Rubber, Aluminium, Cast Iron, and Steel... etc.

Standard Length (Dc=d)

Dc			Lc		L1		L		Z	Bright
Dec.Equiv.	Inch	mm	Inch	mm	Inch	mm	Inch	mm	teeth	R392
0.0350		0.889	1/4	6.35	1/2	12.70	1-1/2	38.10	4	●
0.0355		0.902	1/4	6.35	1/2	12.70	1-1/2	38.10	4	●
0.0360		0.914	1/4	6.35	1/2	12.70	1-1/2	38.10	4	●
0.0365		0.927	1/4	6.35	1/2	12.70	1-1/2	38.10	4	●
0.0370		0.940	1/4	6.35	1/2	12.70	1-1/2	38.10	4	●
0.0375		0.953	1/4	6.35	1/2	12.70	1-1/2	38.10	4	●
0.0380		0.965	1/4	6.35	1/2	12.70	1-1/2	38.10	4	●
0.0385		0.978	1/4	6.35	1/2	12.70	1-1/2	38.10	4	●
0.0390		0.991	1/4	6.35	1/2	12.70	1-1/2	38.10	4	●
0.0395		1.003	1/4	6.35	1/2	12.70	1-1/2	38.10	4	●
0.0400	#60	1.016	1/4	6.35	1/2	12.70	1-1/2	38.10	4	●
0.0405		1.029	1/4	6.35	1/2	12.70	1-1/2	38.10	4	●
0.0410	#59	1.041	1/4	6.35	1/2	12.70	1-1/2	38.10	4	●
0.0415		1.054	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0420	#58	1.067	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0425		1.080	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0430	#57	1.092	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0435		1.105	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0440		1.118	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0445		1.130	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0450		1.143	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0455		1.156	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0460		1.168	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0465	#56	1.181	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0470		1.194	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0475		1.207	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0480		1.219	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0485		1.232	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0490		1.245	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0495		1.257	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0500		1.270	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0505		1.283	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0510		1.295	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0515		1.308	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0520	#55	1.321	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0525		1.334	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0530		1.346	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0535		1.359	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0540		1.372	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0545		1.384	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0550	#54	1.397	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0555		1.410	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●

High Precision Machine Reamers

4&6 Flute Straight Shank Chucking Reamers

MG Carbide | Uncoated Bright | 0° | Z

Code No: R392-DC

Work Material

P	H	M	K	N	S
●	○	○	●	●	

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics

Tolerance: DC

+0.0001/+0.0003: 1/32"~1/4"
+0.0001/+0.0004: 1/4"~1/2"

Feature of product:

Provide superior wear resistance.

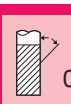
Can withstand the highest cutting temperatures in low tensile and highly abrasive materials such as Bronze, Copper, Rubber, Aluminium, Cast Iron, and Steel... etc.

Standard Length (Dc=d)

Dc			Lc		L1		L		Z	Bright
Dec.Equiv.	Inch	mm	Inch	mm	Inch	mm	Inch	mm	teeth	R392
0.0560		1.422	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0565		1.435	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0570		1.448	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0575		1.461	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0580		1.473	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0585		1.486	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0590		1.499	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0595	#53	1.511	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0600		1.524	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0605		1.537	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0610		1.549	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0615		1.562	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0620		1.575	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0625	1/16	1.588	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0630		1.600	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0635	#52	1.613	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0640		1.626	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0645		1.638	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0650		1.651	3/8	9.53	5/8	15.88	1-1/2	38.10	4	●
0.0655		1.664	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0660		1.676	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0665		1.689	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0670	#51	1.702	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0675		1.715	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0680		1.727	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0685		1.740	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0690		1.753	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0695		1.765	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0700	#50	1.778	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0705		1.791	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0710		1.803	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0715		1.816	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0720		1.829	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0725		1.842	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0730	#49	1.854	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0735		1.867	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0740		1.880	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0745		1.892	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0750		1.905	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0755		1.918	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0760	#48	1.930	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0765		1.943	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0770		1.956	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0775		1.969	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0780		1.981	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0785	#47	1.994	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0790		2.007	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0795		2.019	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0800		2.032	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0805		2.045	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0810	#46	2.057	1/2	12.70	7/8	22.23	1-3/4	44.45	4	●
0.0815		2.070	1/2	12.70	7/8	22.23	2	44.45	4	●
0.0820	#45	2.083	1/2	12.70	7/8	22.23	2	50.80	4	●
0.0825		2.096	1/2	12.70	7/8	22.23	2	50.80	4	●
0.0830		2.108	1/2	12.70	7/8	22.23	2	50.80	4	●
0.0835		2.121	1/2	12.70	7/8	22.23	2	50.80	4	●
0.0840		2.134	1/2	12.70	7/8	22.23	2	50.80	4	●
0.0845		2.146	1/2	12.70	7/8	22.23	2	50.80	4	●

High Precision Machine Reamers

4&6 Flute Straight Shank Chucking Reamers

MG Carbide | Uncoated Bright |  0° |  Z

Code No: R392-DC

Standard Length (Dc=d)

Dc			Lc		L1		L		Z	Bright
Dec.Equiv.	Inch	mm	Inch	mm	Inch	mm	Inch	mm	teeth	R392
0.0850		2.159	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0855		2.172	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0860	#44	2.184	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0865		2.197	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0870		2.210	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0875		2.223	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0880		2.235	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0885		2.248	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0890	#43	2.261	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0895		2.273	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0900		2.286	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0905		2.299	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0910		2.311	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0915		2.324	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0918		2.332	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0920		2.337	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0925		2.350	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0930		2.362	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0933		2.370	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0935	#42	2.375	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0940		2.388	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0945		2.400	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0950		2.413	1/2	12.70	7/8	22.23	2	50.80	4	•
0.0955		2.426	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.0960	#41	2.438	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.0965		2.451	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.0970		2.464	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.0975		2.477	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.0980	#40	2.489	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.0985		2.502	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.0990		2.515	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.0995	#39	2.527	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1000		2.540	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1005		2.553	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1010		2.565	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1015	#38	2.578	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1020		2.591	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1025		2.604	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1030		2.616	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1035		2.629	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1040	#37	2.642	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1045		2.654	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1050		2.667	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1055		2.680	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1060		2.692	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1065	#36	2.705	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1070		2.718	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1075		2.731	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1080		2.743	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1085		2.756	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1090		2.769	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1095		2.781	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1100	#35	2.794	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1105		2.807	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1110	#34	2.819	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1115		2.832	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1120		2.845	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1125		2.858	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•

Work Material

P	H	M	K	N	S
●	○	○	●	●	

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics

Tolerance: DC

+0.0001/+0.0003: 1/32"~1/4"
+0.0001/+0.0004: 1/4"~1/2"

Feature of product:

Provide superior wear resistance.

Can withstand the highest cutting temperatures in low tensile and highly abrasive materials such as Bronze, Copper, Rubber, Aluminium, Cast Iron, and Steel... etc.

High Precision Machine Reamers

4&6 Flute Straight Shank Chucking Reamers

MG Carbide | Uncoated Bright | 0° | Z

Code No: R392-DC

Standard Length (Dc=d)

Dc			Lc		L1		L		Z	Bright
Dec.Equiv.	Inch	mm	Inch	mm	Inch	mm	Inch	mm	teeth	R392
0.1130	#33	2.870	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1135		2.883	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1140		2.896	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1145		2.908	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1150		2.921	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1155		2.934	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1160	#32	2.946	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1165		2.959	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1170		2.972	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1175		2.985	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1180		2.997	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1185		3.010	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1190		3.023	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1195		3.035	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1200	#31	3.048	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1205		3.061	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1210		3.073	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1215		3.086	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1220		3.099	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1225		3.112	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1230		3.124	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1235		3.137	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1240		3.150	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1245		3.162	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1250	1/8	3.175	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1255		3.188	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1260		3.200	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1265		3.213	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1270		3.226	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1275		3.239	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1280		3.251	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1285	#30	3.264	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1290		3.277	5/8	15.88	1-1/8	28.58	2-1/4	57.15	4	•
0.1295		3.289	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1300		3.302	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1305		3.315	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1310		3.327	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1315		3.340	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1320		3.353	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1325		3.366	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1330		3.378	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1335		3.391	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1340		3.404	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1345		3.416	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1350		3.429	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1355		3.442	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1360	#29	3.454	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1365		3.467	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1370		3.480	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1375		3.493	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1380		3.505	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1385		3.518	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1390		3.531	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1395		3.543	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1400		3.556	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1405	#28	3.569	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1410		3.581	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1415		3.594	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•

Work Material

P	H	M	K	N	S
●	○	○	●	●	

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics

Tolerance: DC

+0.0001/+0.0003: 1/32"~1/4"
+0.0001/+0.0004: 1/4"~1/2"

Feature of product:

Provide superior wear resistance.

Can withstand the highest cutting temperatures in low tensile and highly abrasive materials such as Bronze, Copper, Rubber, Aluminium, Cast Iron, and Steel... etc.

High Precision Machine Reamers

4&6 Flute Straight Shank Chucking Reamers

MG Carbide | Uncoated Bright | 0° | Z

Code No: R392-DC

Standard Length (Dc=d)

Dc			Lc		L1		L		Z	Bright
Dec.Equiv.	Inch	mm	Inch	mm	Inch	mm	Inch	mm	teeth	R392
0.1420		3.607	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1425		3.620	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1430		3.632	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1435		3.645	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1440	#27	3.658	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1445		3.670	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1450		3.683	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1455		3.696	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1460		3.708	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1465		3.721	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1470	#26	3.734	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1475		3.747	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1480		3.759	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1485		3.772	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1490		3.785	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1495	#25	3.797	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1500		3.810	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1505		3.823	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1510		3.835	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1515		3.848	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1520	#24	3.861	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1525		3.874	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1530		3.886	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1535		3.899	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1540	#23	3.912	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1545		3.924	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1550		3.937	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1555		3.950	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1560		3.962	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1565		3.975	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1570	#22	3.988	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1575		4.001	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1580		4.013	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1585		4.026	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1590	#21	4.039	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1595		4.051	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1600		4.064	3/4	19.05	1-1/4	31.75	2-1/2	63.50	4	•
0.1605		4.077	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1610	#20	4.089	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1615		4.102	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1620		4.115	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1625		4.128	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1630		4.140	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1635		4.153	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1640		4.166	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1645		4.178	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1650		4.191	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1660	#19	4.216	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1665		4.229	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1670		4.242	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1675		4.255	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1680		4.267	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1685		4.280	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1690		4.293	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1695	#18	4.305	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1700		4.318	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1705		4.331	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1710		4.343	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•

Work Material

P	H	M	K	N	S
●	○	○	●	●	

- **P** Steel
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Tolerance: DC

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+0.0001/+0.0004: 1/4"~1/2"

Feature of product:

Provide superior wear resistance.

Can withstand the highest cutting temperatures in low tensile and highly abrasive materials such as Bronze, Copper, Rubber, Aluminium, Cast Iron, and Steel... etc.

High Precision Machine Reamers

4&6 Flute Straight Shank Chucking Reamers

MG Carbide | Uncoated Bright | 0° | Z

Code No: R392-DC

Standard Length (Dc=d)

Dc			Lc		L1		L		Z	Bright
Dec.Equiv.	Inch	mm	Inch	mm	Inch	mm	Inch	mm	teeth	R392
0.1715		4.356	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1720		4.369	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1725		4.382	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1730	#17	4.394	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1735		4.407	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1740		4.420	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1745		4.432	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1750		4.445	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1755		4.458	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1760		4.470	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1765		4.483	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1770	#16	4.496	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1775		4.509	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1780		4.521	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1785		4.534	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1790		4.547	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1795		4.559	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1800	#15	4.572	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1805		4.585	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1810		4.597	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1815		4.610	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1820	#14	4.623	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1825		4.636	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1830		4.648	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1835		4.661	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1840		4.674	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1845		4.686	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1850	#13	4.699	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1855		4.712	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1860		4.724	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1865		4.737	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1870		4.750	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1875	3/16	4.763	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1880		4.775	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1885		4.788	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1890	#12	4.801	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1895		4.813	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1900		4.826	7/8	22.23	1-1/2	38.10	2-3/4	69.85	4	•
0.1905		4.839	1	25.40	1-5/8	41.28	3	76.20	4	•
0.1910	#11	4.851	1	25.40	1-5/8	41.28	3	76.20	4	•
0.1915		4.864	1	25.40	1-5/8	41.28	3	76.20	4	•
0.1920		4.877	1	25.40	1-5/8	41.28	3	76.20	4	•
0.1925		4.890	1	25.40	1-5/8	41.28	3	76.20	4	•
0.1930		4.902	1	25.40	1-5/8	41.28	3	76.20	4	•
0.1935	#10	4.915	1	25.40	1-5/8	41.28	3	76.20	4	•
0.1940		4.928	1	25.40	1-5/8	41.28	3	76.20	4	•
0.1945		4.940	1	25.40	1-5/8	41.28	3	76.20	4	•
0.1950		4.953	1	25.40	1-5/8	41.28	3	76.20	4	•
0.1955		4.966	1	25.40	1-5/8	41.28	3	76.20	4	•
0.1960	#9	4.978	1	25.40	1-5/8	41.28	3	76.20	4	•
0.1965		4.991	1	25.40	1-5/8	41.28	3	76.20	4	•
0.1970		5.004	1	25.40	1-5/8	41.28	3	76.20	4	•
0.1975		5.017	1	25.40	1-5/8	41.28	3	76.20	4	•
0.1980		5.029	1	25.40	1-5/8	41.28	3	76.20	4	•
0.1985		5.042	1	25.40	1-5/8	41.28	3	76.20	4	•
0.1990		5.055	1	25.40	1-5/8	41.28	3	76.20	4	•
0.1995		5.067	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2000		5.080	1	25.40	1-5/8	41.28	3	76.20	4	•

Work Material

P	H	M	K	N	S
●	○	○	●	●	

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- **H** <48HRC Hardened Steel
- **M** Stainless Steel
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Tolerance: DC

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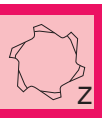
Feature of product:

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High Precision Machine Reamers

4&6 Flute Straight Shank Chucking Reamers

MG Carbide | Uncoated Bright |  | 

Code No: R392-DC

Standard Length (Dc=d)

Dc			Lc		L1		L		Z	Bright
Dec.Equiv.	Inch	mm	Inch	mm	Inch	mm	Inch	mm	teeth	R392
0.2005		5.093	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2010	#7	5.105	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2015		5.118	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2020		5.131	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2025		5.144	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2030		5.156	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2035		5.169	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2040	#6	5.182	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2045		5.194	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2050		5.207	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2055	#5	5.220	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2060		5.232	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2065		5.245	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2070		5.258	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2075		5.271	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2080		5.283	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2085		5.296	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2090	#4	5.309	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2095		5.321	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2100		5.334	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2105		5.347	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2110		5.359	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2115		5.372	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2120		5.385	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2125		5.398	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2130	#3	5.410	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2135		5.423	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2140		5.436	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2145		5.448	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2150		5.461	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2155		5.474	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2160		5.486	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2165		5.499	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2170		5.512	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2175		5.525	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2180		5.537	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2185		5.550	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2190		5.563	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2195		5.575	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2200		5.588	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2205		5.601	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2210	#2	5.613	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2215		5.626	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2220		5.639	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2225		5.652	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2230		5.664	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2235		5.677	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2240		5.690	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2245		5.702	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2250		5.715	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2255		5.728	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2260		5.740	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2265		5.753	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2270		5.766	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2275		5.779	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2280	#1	5.791	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2285		5.804	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2290		5.817	1	25.40	1-5/8	41.28	3	76.20	4	•

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High Precision Machine Reamers

4&6 Flute Straight Shank Chucking Reamers

MG Carbide | Uncoated Bright | 0° | Z

Code No: R392-DC

Standard Length (Dc=d)

Dc			Lc		L1		L		Z	Bright
Dec.Equiv.	Inch	mm	Inch	mm	Inch	mm	Inch	mm	teeth	R392
0.2295		5.829	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2300		5.842	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2305		5.855	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2310		5.867	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2315		5.880	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2320		5.893	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2325		5.906	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2330		5.918	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2335		5.931	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2340	A	5.944	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2345		5.956	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2350		5.969	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2355		5.982	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2360		5.994	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2365		6.007	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2370		6.020	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2375		6.033	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2380	B	6.045	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2385		6.058	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2390		6.071	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2395		6.083	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2400		6.096	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2405		6.109	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2410		6.121	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2415		6.134	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2420	C	6.147	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2425		6.160	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2430		6.172	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2435		6.185	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2440		6.198	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2445		6.210	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2450		6.223	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2455		6.236	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2460	D	6.248	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2465		6.261	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2470		6.274	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2475		6.287	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2480		6.299	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2485		6.312	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2490		6.325	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2495		6.337	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2500	1/4-E	6.350	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2505		6.363	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2510		6.375	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2515		6.388	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2520		6.401	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2525		6.414	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2530		6.426	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2540		6.452	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2550		6.477	1	25.40	1-5/8	41.28	3	76.20	4	•
0.2560		6.502	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2570	F	6.528	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2580		6.553	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2590		6.579	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2600		6.604	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2610	G	6.629	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2620		6.655	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2630		6.680	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•

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MG Carbide | Uncoated Bright | 0° | Z

Code No: R392-DC

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Dc			Lc		L1		L		Z	Bright
Dec.Equiv.	Inch	mm	Inch	mm	Inch	mm	Inch	mm	teeth	R392
0.2640		6.706	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2650		6.731	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2660	H	6.756	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2670		6.782	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2680		6.807	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2690		6.833	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2700		6.858	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2710		6.883	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2720	I	6.909	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2730		6.934	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2740		6.960	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2750		6.985	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2760		7.010	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2770	J	7.036	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2780		7.061	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2790		7.087	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2800		7.112	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2810	K	7.137	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2820		7.163	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2830		7.188	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2840		7.214	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2850		7.239	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2860		7.264	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2870		7.290	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2890		7.341	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2900	L	7.366	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2910		7.391	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2920		7.417	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2930		7.442	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2940		7.468	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2950	M	7.493	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2960		7.518	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2970		7.544	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2980		7.569	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.2990		7.595	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.3000		7.620	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.3010		7.645	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.3020	N	7.671	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.3030		7.696	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.3040		7.722	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.3050		7.747	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.3060		7.772	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.3070		7.798	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.3080		7.823	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.3090		7.849	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.3100		7.874	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.3110		7.899	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.3120		7.925	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.3125	5/16	7.938	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.3130		7.950	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.3140		7.976	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.3150		8.001	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.3160	O	8.026	1-1/8	28.58	1-7/8	47.63	3-1/4	82.55	6	•
0.3170		8.052	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3180		8.077	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3190		8.103	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3200		8.128	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3210		8.153	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•

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Dec.Equiv.	Inch	mm	Inch	mm	Inch	mm	Inch	mm	teeth	R392
0.3220		8.179	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3230	P	8.204	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3240		8.230	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3250		8.255	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3260		8.280	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3270		8.306	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3280		8.331	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3290		8.357	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3300		8.382	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3310		8.407	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3320	Q	8.433	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3330		8.458	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3340		8.484	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3350		8.509	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3360		8.534	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3370		8.560	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3380		8.585	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3390	R	8.611	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3400		8.636	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3410		8.661	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3420		8.687	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3430		8.712	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3440		8.738	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3450		8.763	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3460		8.788	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3470		8.814	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3480	S	8.839	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3490		8.865	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3500		8.890	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3510		8.915	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3520		8.941	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3530		8.966	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3540		8.992	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3550		9.017	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3560		9.042	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3580	T	9.093	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3590		9.119	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3600		9.144	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3610		9.169	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3620		9.195	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3630		9.220	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3640		9.246	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3650		9.271	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3660		9.296	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3670		9.322	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3680	U	9.347	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3690		9.373	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3700		9.398	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3710		9.423	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3720		9.449	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3750	3/8	9.525	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3755		9.538	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3765		9.563	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3770	V	9.576	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3780		9.601	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3790		9.627	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3800		9.652	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3810		9.677	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•

Work Material

P	H	M	K	N	S
●	○	○	●	●	

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics

Tolerance: DC

+0.0001/+0.0003: 1/32"~1/4"
+0.0001/+0.0004: 1/4"~1/2"

Feature of product:

Provide superior wear resistance.

Can withstand the highest cutting temperatures in low tensile and highly abrasive materials such as Bronze, Copper, Rubber, Aluminium, Cast Iron, and Steel... etc.

High Precision Machine Reamers

4&6 Flute Straight Shank Chucking Reamers

MG Carbide | Uncoated Bright | 0° | Z

Code No: R392-DC

Standard Length (Dc=d)

Dc			Lc		L1		L		Z	Bright
Dec.Equiv.	Inch	mm	Inch	mm	Inch	mm	Inch	mm	teeth	R392
0.3820		9.703	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3830		9.728	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3850		9.779	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3860	W	9.804	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3900		9.906	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3910		9.931	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3930		9.982	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3940		10.008	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3950		10.033	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3960		10.058	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.3970	X	10.084	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.4000		10.160	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.4040	Y	10.262	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.4050		10.287	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.4060		10.312	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.4100		10.414	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.4110		10.439	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.4120		10.465	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.4130	Z	10.490	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.4150		10.541	1-1/4	31.75	2	50.80	3-1/2	88.90	6	•
0.4290		10.897	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4300		10.922	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4320		10.973	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4330		10.998	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4350		11.049	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4360		11.074	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4380		11.125	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4390		11.151	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4400		11.176	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4410		11.201	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4420		11.227	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4430		11.252	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4450		11.303	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4460		11.328	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4480		11.379	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4500		11.430	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4520		11.481	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4600		11.684	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4690		11.913	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4700		11.938	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4710		11.963	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4720		11.989	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4730		12.014	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4740		12.040	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4750		12.065	1-3/8	34.93	2-1/8	53.98	4	101.60	6	•
0.4800		12.192	1-1/2	38.10	2-1/4	57.15	4	101.60	6	•
0.4900		12.446	1-1/2	38.10	2-1/4	57.15	4	101.60	6	•
0.4910		12.471	1-1/2	38.10	2-1/4	57.15	4	101.60	6	•
0.4950		12.573	1-1/2	38.10	2-1/4	57.15	4	101.60	6	•
0.4960		12.598	1-1/2	38.10	2-1/4	57.15	4	101.60	6	•
0.5000	1/2	12.700	1-1/2	38.10	2-1/4	57.15	4	101.60	6	•
0.5005		12.713	1-1/2	38.10	2-1/4	57.15	4	101.60	6	•
0.5020		12.751	1-1/2	38.10	2-1/4	57.15	4	101.60	6	•
0.5030		12.776	1-1/2	38.10	2-1/4	57.15	4	101.60	6	•
0.5040		12.802	1-1/2	38.10	2-1/4	57.15	4	101.60	6	•
0.5050		12.827	1-1/2	38.10	2-1/4	57.15	4	101.60	6	•

Please refer to page P502 for parameters.

Work Material

P	H	M	K	N	S
●	○	○	●	●	

- **P** Steel
- **H** <48HRC Hardened Steel
- **M** Stainless Steel
- **K** Cast Iron
- **N** Aluminium
- **N** Copper
- **N** Plastics

Tolerance: DC

+0.0001/+0.0003: 1/32"~1/4"
+0.0001/+0.0004: 1/4"~1/2"

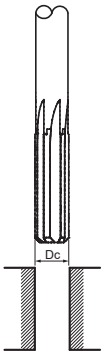
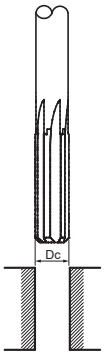
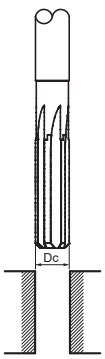
Feature of product:

Provide superior wear resistance.

Can withstand the highest cutting temperatures in low tensile and highly abrasive materials such as Bronze, Copper, Rubber, Aluminium, Cast Iron, and Steel... etc.

Cutting Conditions

R391
R392

		R391		R391		R392	
							
		cutting speed Vc (m/min)	feed per tooth Fn (mm/rev)	Cutting speed Vc (ft/min)	feed per tooth Fn (inch/rev)	Cutting speed Vc (ft/min)	feed per tooth Fn (inch/rev)
P	Carbon Steel Materials						
	GR1 Carbon Steel	15	0.008×Dc	50	0.008×Dc	50	0.008×Dc
	GR2 <24HRC Low-alloyed Steel	15	0.008×Dc	50	0.008×Dc	50	0.008×Dc
	GR3 <30HRC Hi-alloyed Steel	12	0.006×Dc	40	0.006×Dc	40	0.006×Dc
H	Hardened Steel Materials						
	GR4 30~38HRC Hardened Steel	8	0.005×Dc	26	0.005×Dc	26	0.005×Dc
	GR5 38~48HRC Hardened Steel	5	0.003×Dc	16	0.003×Dc	16	0.003×Dc
M	Stainless Steel Materials						
	GR8-1 Ferritic、Martensitic	12	0.006×Dc	40	0.006×Dc	40	0.006×Dc
	GR8-2 Austenitic	12	0.006×Dc	40	0.006×Dc	40	0.006×Dc
	GR8-3 Austenitic-ferritic	12	0.006×Dc	40	0.006×Dc	40	0.006×Dc
	GR8-4 Austenitic-ferritic Heat-resistant	8	0.004×Dc	26	0.004×Dc	26	0.004×Dc
K	Cast Iron Materials						
	GR9-1 Grey cast iron	15	0.006×Dc	50	0.006×Dc	50	0.006×Dc
	GR9-2 Nodular cast iron	15	0.006×Dc	50	0.006×Dc	50	0.006×Dc
N	Aluminium Steel Materials						
	GR10-1 Wrought Aluminium alloys	20	0.006×Dc	65	0.006×Dc	65	0.006×Dc
	GR10-2 Aluminium cast alloys <10%	20	0.006×Dc	65	0.006×Dc	65	0.006×Dc
	GR10-3 Aluminium cast alloys >10%	20	0.006×Dc	65	0.006×Dc	65	0.006×Dc
	Copper Steel Materials						
	GR11-1 Pure Copper	15	0.006×Dc	50	0.006×Dc	50	0.006×Dc
	GR11-2 Brass	15	0.006×Dc	50	0.006×Dc	50	0.006×Dc
	GR11-2 Bronze	15	0.006×Dc	50	0.006×Dc	50	0.006×Dc

※All cutting data serve for orientation only and should be adapted individually to the technical conditions on location .

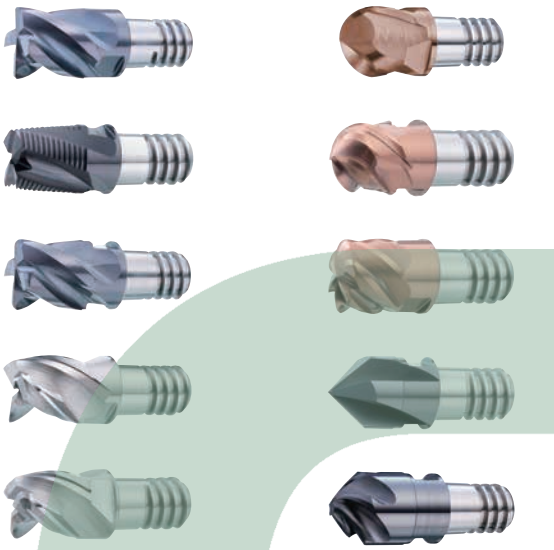
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower than the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

IMP Series Interchangeable Multi-Purpose End Mills Cutter And Shank

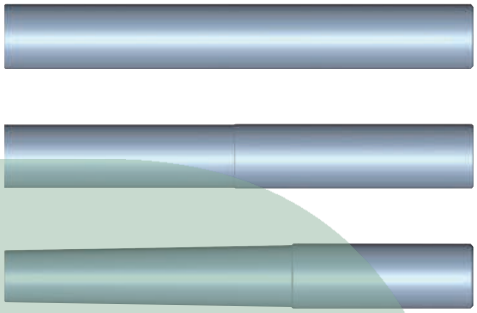
7leaders® The Art of Cutting

Tools Part

Cutter



Shank



±0.01mm Runout Tolerance

Code No.

◆ Cutter

IMP10 - B252 FX 1600 16 R05

① ② ③ ④ ⑤ ⑥

① Pair with Shank	② Series	③ Coating	④ Dc	⑤ Lc	⑥ Edge
			Example: Dc 16mm → 1600 Dc 15.88mm → 1588	Example: Lc 4mm → 04 Lc 10mm → 10	A Angle R Corner Radius

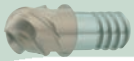
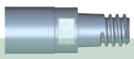
◆ Shank

IMP10 U 10 070 015

① ② ③ ④ ⑤

① Pair with Cutter	② Type	③ d	④ L	⑤ L1
	S Straight U Neck A Conical Neck			

Index

	Code No.	Appearance	Flute	Product Name	Page
Interchangeable End Mill	IMP..-E140FX		4	Interchangeable Multipurpose End Mills	517
	IMP..-F608FX		4	Interchangeable Roughing End Mills	517
	IMP..-B252FX		4	Interchangeable Multipurpose End Mills With Corner Radius	518
	IMP..-E143		3	Interchangeable End Mills For Aluminium	519
	IMP..-E145		3	Interchangeable End Mills For Aluminium With Corner Radius	519
	IMP..-B262TX		2	Interchangeable Ball Nose End Mills	520
	IMP..-B254TX		4	Interchangeable Ball Nose End Mills	520
	IMP..-F678TX		6	Interchangeable High Feed End Mills	521
	IMP..-MG			Interchangeable Blank Cutter Heads	521
	IMP..-E109FX		4	Interchangeable End Mills For Chamfering 90°	522
	IMP..-E151FX		5	Interchangeable End Mills For Chamfering 90°	522
	IMP..S			Interchangeable Multi-Purpose End Mill Shanks	523
	IMP..U			Interchangeable Multi-Purpose End Mill Shanks	524
	IMP..A			Interchangeable Multi-Purpose End Mill Shanks	524
	TW0525NM			Torque Wrench	525
	IMP..-TW			Open Ended Insert Tool	525

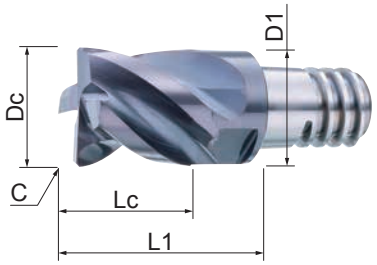
IMP..-E140FX

Interchangeable Multipurpose End Mills

Multipurpose End Mills- 4 Flutes
Effectively decrease the vibration by various helix geometry and unequal flutes designs.
Big chip breaker is designed to reach high removal rate for various work materials.
Nano multilayer coating AlCrN is suitable for carbon steel, alloy steel and stainless steel with impurities and sticky materials.

P	H	M	K	N	S
●	●	●	●	○	○

MG Carbide | AlCrN FX | 38° 41° | 4 | N 75° | 0.25~0.6 45°



Code No.	Dc 0 -0.03	C mm	Lc mm	L1 mm	D1 mm	Z	AlCrN FX
IMP10-E140FX100010	10	0.25	10	16	9.7	4	●
IMP12-E140FX120012	12	0.3	12	19	11.7	4	●
IMP16-E140FX160016	16	0.4	16	24	15.5	4	●
IMP20-E140FX200020	20	0.5	20	30	19.5	4	●
IMP25-E140FX250025	25	0.6	25	37.5	24.5	4	●

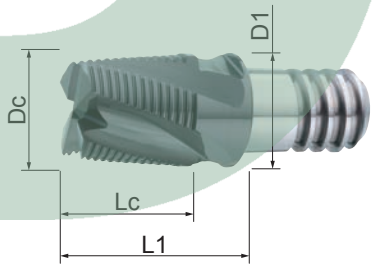
IMP..-F608FX

Interchangeable Roughing End Mills

Roughing End Mills – 4 Flutes
Fine tooth staggered chip breaker design on cutting flutes are good for chip breaking.
Application for roughing cutting process.
Good wear resistance and lubricating effect with Nano multilayer coating.

P	H	M	K	N	S
●	●	○	●		

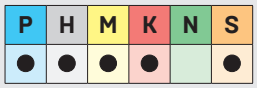
MG Carbide | AlCrN FX | 20° | 4 | HR | 0.5~0.6 45°

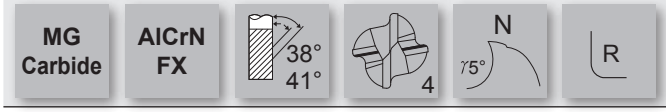


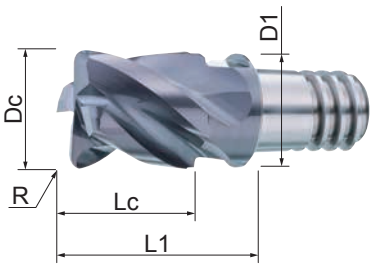
Code No.	Dc h10	Lc mm	L1 mm	D1 mm	C mm	Z	AlCrN FX
IMP10-F608FX100010	10	10	16	9.7	0.5	4	●
IMP12-F608FX120012	12	12	19	11.7	0.5	4	●
IMP16-F608FX160016	16	16	24	15.5	0.5	4	●
IMP20-F608FX200020	20	20	30	19.5	0.5	4	●
IMP25-F608FX250025	25	25	37.5	24.5	0.6	4	●

Interchangeable Multipurpose End Mills With Corner Radius

Multipurpose End Mills with Corner Radius- 4 Flutes
Effectively decrease the vibration by various helix geometry and unequal flutes designs.
Big chip breaker is designed to reach high removal rate for various work materials.
Cutting edge with corner radius design and nano multilayer coating AlCrN are suitable for carbon steel, alloy steel and stainless steel with impurities and sticky materials.
Suitable for various kinds of work materials from the end of roughing to finishing.







Code No.	Dc 0 -0.03	R ±0.01	Lc mm	L1 mm	D1 mm	Z	AlCrN FX
IMP10-B252FX100010R05	10	0.5	10	16	9.7	4	•
IMP10-B252FX100010R10	10	1	10	16	9.7	4	•
IMP10-B252FX100010R20	10	2	10	16	9.7	4	•
IMP10-B252FX100010R30	10	3	10	16	9.7	4	•
IMP12-B252FX120012R05	12	0.5	12	19	11.7	4	•
IMP12-B252FX120012R10	12	1	12	19	11.7	4	•
IMP12-B252FX120012R20	12	2	12	19	11.7	4	•
IMP12-B252FX120012R30	12	3	12	19	11.7	4	•
IMP16-B252FX160016R05	16	0.5	16	24	15.5	4	•
IMP16-B252FX160016R10	16	1	16	24	15.5	4	•
IMP16-B252FX160016R20	16	2	16	24	15.5	4	•
IMP16-B252FX160016R30	16	3	16	24	15.5	4	•
IMP20-B252FX200020R05	20	0.5	20	30	19.5	4	•
IMP20-B252FX200020R10	20	1	20	30	19.5	4	•
IMP20-B252FX200020R20	20	2	20	30	19.5	4	•
IMP20-B252FX200020R30	20	3	20	30	19.5	4	•
IMP25-B252FX250025R10	25	1	25	37.5	24.5	4	•
IMP25-B252FX250025R20	25	2	25	37.5	24.5	4	•
IMP25-B252FX250025R30	25	3	25	37.5	24.5	4	•

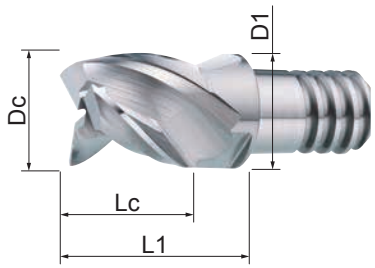
IMP..-E143

Interchangeable End Mills For Aluminium

End Mills for Aluminium- 3 Flutes
Design with sharp cutting edge, high removal cutting geometry, and fine grinding smooth surface to prevent sticking problem.
Higher finishing of cutting edge to have better surface roughness after processing.
Application for roughing and finishing in various Aluminium.

P	H	M	K	N	S
				●	

MG Carbide | Uncoated Bright | 40° | 3 | N γ20° | 90°



Code No.	Dc 0 -0.03	Lc mm	L1 mm	D1 mm	Z	Uncoated Bright
IMP10-E143100015	10	15	21	9.7	3	●
IMP12-E143120018	12	18	25	11.7	3	●
IMP16-E143160024	16	24	32	15.5	3	●
IMP20-E143200030	20	30	40	19.5	3	●
IMP25-E143250037	25	37.5	50	24.5	3	●

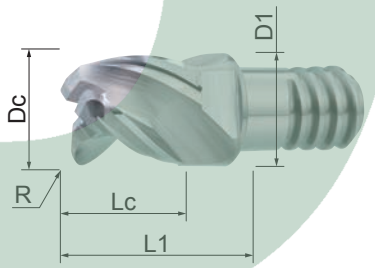
IMP..-E145

Interchangeable End Mills For Aluminium With Corner Radius

End Mills with Corner Radius for Aluminium- 3 Flutes.
Design with sharp cutting edge, high removal cutting geometry, and fine grinding smooth surface to prevent sticking problem.
Higher finishing of cutting edge to have better surface roughness after processing.
With corner Radius to enhance tool life.
Application for roughing and finishing in various Aluminium.

P	H	M	K	N	S
				●	

MG Carbide | Uncoated Bright | 40° | 3 | N γ20° | R

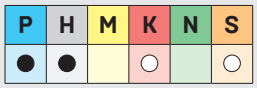


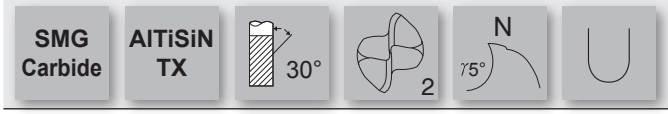
Code No.	Dc 0 -0.03	R ±0.01	Lc mm	L1 mm	D1 mm	Z	Uncoated Bright
IMP10-E145100015R10	10	1	15	21	9.7	3	●
IMP10-E145100015R20	10	2	15	21	9.7	3	●
IMP12-E145120018R10	12	1	18	25	11.7	3	●
IMP12-E145120018R20	12	2	18	25	11.7	3	●
IMP12-E145120018R30	12	3	18	25	11.7	3	●
IMP16-E145160024R10	16	1	24	32	15.5	3	●
IMP16-E145160024R20	16	2	24	32	15.5	3	●
IMP16-E145160024R30	16	3	24	32	15.5	3	●
IMP16-E145160024R40	16	4	24	32	15.5	3	●
IMP20-E145200030R10	20	1	30	40	19.5	3	●
IMP20-E145200030R20	20	2	30	40	19.5	3	●
IMP20-E145200030R30	20	3	30	40	19.5	3	●
IMP20-E145200030R40	20	4	30	40	19.5	3	●
IMP25-E145250037R10	25	1	37.5	50	24.5	3	●
IMP25-E145250037R30	25	3	37.5	50	24.5	3	●
IMP25-E145250037R50	25	5	37.5	50	24.5	3	●

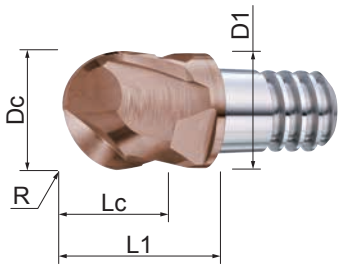
IMP..-B262TX

Interchangeable Ball Nose End Mills

Ball Nose End Mills- 2 Flutes
S shape ball nose geometry enable to keep tool life longer.
High radius precision of ball nose suitable to work on high hardness and high precision mold process.
Nano multilayer coating enables to enhance lubrication and wear resistance.





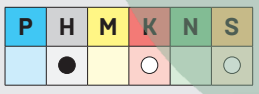


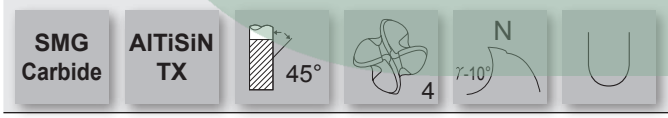
Code No.	Dc 0 -0.03	R ±0.01	Lc mm	L1 mm	D1 mm	Z	AlTiSiN TX
IMP10-B262TX100007	10	5	7.5	13.5	9.7	3	•
IMP12-B262TX120009	12	6	9	16	11.7	3	•
IMP16-B262TX160012	16	8	12	20	15.5	3	•
IMP20-B262TX200015	20	10	15	25	19.5	3	•

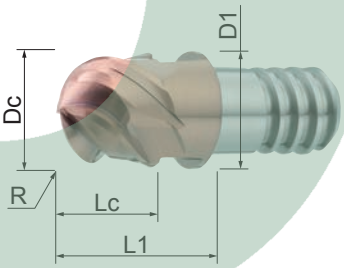
IMP..-B254TX

Interchangeable Ball Nose End Mills

Ball Nose End Mills- 4 Flutes
S shape ball nose geometry enable to keep tool life longer.
High radius precision of ball nose suitable to work on high hardness and high precision mold process.
Nano multilayer coating enables to enhance lubrication and wear resistance.







Code No.	Dc 0 -0.03	R ±0.01	Lc mm	L1 mm	D1 mm	Z	AlTiSiN TX
IMP12-B254TX120009	12	6	9	16	11.7	4	•
IMP16-B254TX160012	16	8	12	20	15.5	4	•
IMP20-B254TX200015	20	10	15	25	19.5	4	•

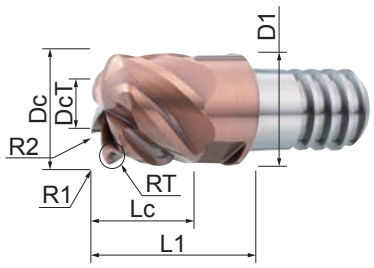
IMP..-F678TX

Interchangeable High Feed End Mills

High Feed End Mills – 6 Flutes
Design with Special R curvature.
Widely used for 3D surface roughing.
Nano multilayer coating enables to enhance lubrication and wear resistance.
Suitable for high speed cutting of low to medium hardness steel materials.

P	H	M	K	N	S
	●		○		

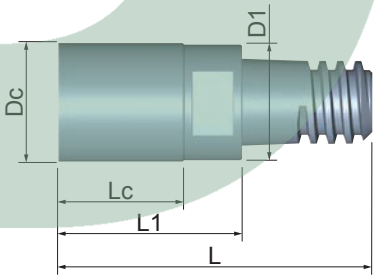
SMG Carbide | AlTiSiN TX | 45° | 6 | N γ-10° | R



Code No.	Dc 0 -0.03	RT mm	DcT mm	R1 mm	R2 mm	Lc mm	L1 mm	D1 mm	Z	AlTiSiN TX
IMP12-F678TX120009R15	12	1.5	6	1.2	7	9	16	11.7	6	●
IMP16-F678TX160012R20	16	2	8	1.6	9.5	12	20	15.5	6	●
IMP20-F678TX200015R25	20	2.5	10	2	12	15	25	19.5	6	●

IMP..-MG

Interchangeable Blank Cutter Heads



Code No.	Dc mm	Lc mm	L1 mm	D1 mm	L mm	Blank UMG
IMP10-100027MG	10	10	16	9.7	27	●
IMP12-120032MG	12	12	19	11.7	32	●
IMP16-160041MG	16	16	24	15.5	41	●
IMP20-200052MG	20	20	30	19.5	52	●
IMP25-250065MG	25	25	37.5	24.5	65	●

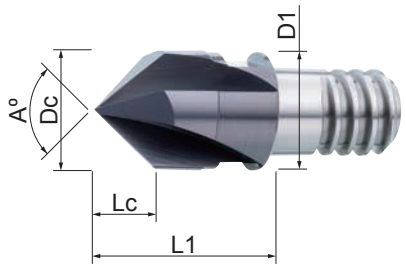
IMP..-E109FX

Interchangeable End Mills For Chamfering 90°

End Mills for Chamfering 90°- 4 Flutes
Suitable for drilling, tappering, countersinking, NC Spot drilling and frame milling.

P	H	M	K	N	S
●	●	○	●	●	

MG Carbide | AlCrN FX | 0° | 4 | 90°



Code No.	Dc 0 -0.03	Lc mm	L1 mm	D1 mm	A A°	Z	AlCrN FX
IMP10-E109FX100005A090	10	5	16	9.7	90	4	●
IMP12-E109FX120006A090	12	6	19	11.7	90	4	●
IMP16-E109FX160008A090	16	8	24	15.5	90	4	●
IMP20-E109FX200010A090	20	10	30	19.5	90	4	●
IMP25-E109FX250012A090	25	12.5	37.5	24.5	90	4	●

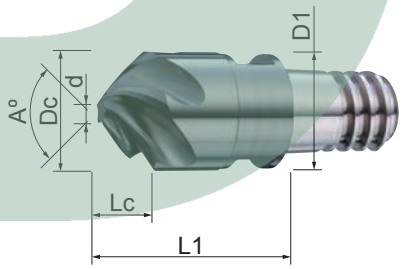
IMP..-E151FX

Interchangeable End Mills For Chamfering 90°

End Mills for Chamfering 90°- 5 Flutes
With Helix cutting edge design, reduce vibration during cutting process.
Sharp cutting edge could get better surface roughness and reduce burrs.
Apply AlTiCrN coating type to enhance tool life and gain better cutting efficiency of cutting tools.

P	H	M	K	N	S
●	○	○	●	●	

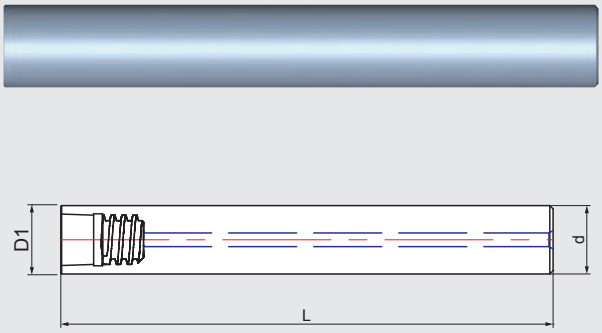
MG Carbide | AlCrN FX | 45° | 5 | 90°



Code No.	Dc 0 -0.03	d mm	Lc mm	L1 mm	D1 mm	A A°	Z	AlCrN FX
IMP10-E151FX100003A090	10	2.5	3.75	16	9.7	90	3	●
IMP12-E151FX120004A090	12	3	4.5	19	11.7	90	3	●
IMP16-E151FX160005A090	16	4	6	24	15.5	90	3	●
IMP20-E151FX200007A090	20	5	7.5	30	19.5	90	3	●
IMP25-E151FX250009 A090	25	6.25	9.37	37.5	24.5	90	3	●

IMP..S

Interchangeable Multi-Purpose End Mill Shanks

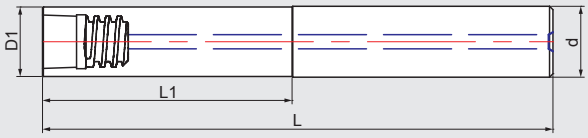


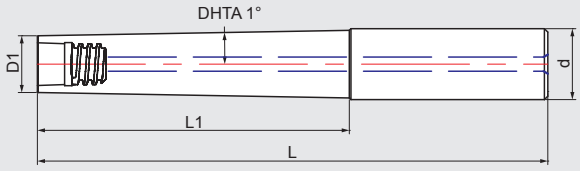
Code No.	D1 mm	L1 mm	DHTA mm	L mm	d h6	Price	Cutter	Insert tool
IMP10S10070000	10	-	-	70	10	•	IMP10·····	IMP10-TW
IMP10S10090000	10	-	-	90	10	•	IMP10·····	IMP10-TW
IMP10S10110000	10	-	-	110	10	•	IMP10·····	IMP10-TW
IMP12S12080000	12	-	-	80	12	•	IMP12·····	IMP12-TW
IMP12S12100000	12	-	-	100	12	•	IMP12·····	IMP12-TW
IMP12S12130000	12	-	-	130	12	•	IMP12·····	IMP12-TW
IMP16S16090000	16	-	-	90	16	•	IMP16·····	IMP16-TW
IMP16S16120000	16	-	-	120	16	•	IMP16·····	IMP16-TW
IMP16S16150000	16	-	-	150	16	•	IMP16·····	IMP16-TW
IMP20S20100000	20	-	-	100	20	•	IMP20·····	IMP20-TW
IMP20S20140000	20	-	-	140	20	•	IMP20·····	IMP20-TW
IMP20S20180000	20	-	-	180	20	•	IMP20·····	IMP20-TW
IMP25S25110000	25	-	-	110	25	•	IMP25·····	IMP25-TW
IMP25S25160000	25	-	-	160	25	•	IMP25·····	IMP25-TW
IMP25S25210000	25	-	-	210	25	•	IMP25·····	IMP25-TW

Interchangeable Multi-Purpose End Mill Shanks









Code No.	D1 mm	L1 mm	DHTA mm	L mm	d h6	Price	Picture	Cutter	Insert tool
IMP10U10070015	9.7	15	-	70	10	•	1	IMP10·····	IMP10-TW
IMP10U10090035	9.7	35	-	90	10	•	1	IMP10·····	IMP10-TW
IMP10U10110055	9.7	55	-	110	10	•	1	IMP10·····	IMP10-TW
IMP10A12110055	9.7	55	1°	110	12	•	2	IMP10·····	IMP10-TW
IMP12U12080018	11.7	18	-	80	12	•	1	IMP12·····	IMP12-TW
IMP12U12100038	11.7	38	-	100	12	•	1	IMP12·····	IMP12-TW
IMP12U12130068	11.7	68	-	130	12	•	1	IMP12·····	IMP12-TW
IMP12A16130068	11.7	68	1°	130	16	•	2	IMP12·····	IMP12-TW
IMP16U16090024	15.5	24	-	90	16	•	1	IMP16·····	IMP16-TW
IMP16U16120054	15.5	54	-	120	16	•	1	IMP16·····	IMP16-TW
IMP16U16150084	15.5	84	-	150	16	•	1	IMP16·····	IMP16-TW
IMP16A20150084	15.5	84	1°	150	20	•	2	IMP16·····	IMP16-TW
IMP20U20100030	19.5	30	-	100	20	•	1	IMP20·····	IMP20-TW
IMP20U20140070	19.5	70	-	140	20	•	1	IMP20·····	IMP20-TW
IMP20U20180110	19.5	110	-	180	20	•	1	IMP20·····	IMP20-TW
IMP20A25180110	19.5	110	1°	180	25	•	2	IMP20·····	IMP20-TW
IMP25U25110038	24.5	38	-	110	25	•	1	IMP25·····	IMP25-TW
IMP25U25160088	24.5	88	-	160	25	•	1	IMP25·····	IMP25-TW
IMP25U25210138	24.5	138	-	210	25	•	1	IMP25·····	IMP25-TW

TW0525NM

Torque Wrench



Code No.	Price NT.
TW0525NM	•

IMP..-TW

OPEN ENDED INSERT TOOL

Code No.	Torque (N.m)	Price
IMP10-TW	3	•
IMP12-TW	6	•
IMP16-TW	8	•
IMP20-TW	12	•
IMP25-TW	16	•

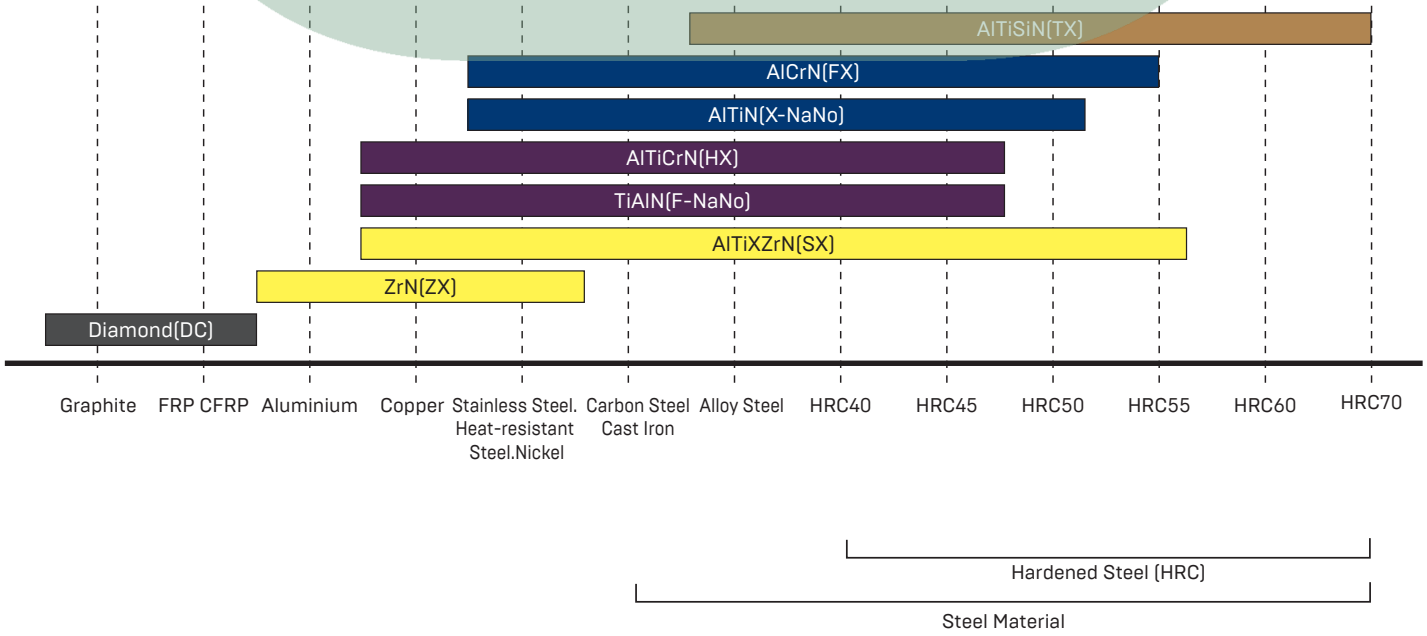


Features of Coating

Type	Color	(HV) Hardness	(μm) Thickness	Coefficient of Friction	(°C) Heat resistance	Cutting Tools Material	Application
AlTiSiN (TX)	Tan	4300	1~3	0.3	1200	Solid Carbide	Hardened steel.
AlCrN (FX)	Blue black	3800	1~3	0.3	1100	Solid Carbide	Carbon steel, Alloyed steel, Hardened steel, Cast iron.
AlTiXZrN (SX)	Yellow brown	3800	1~4	0.4	800	Solid Carbide	Carbon steel, Alloyed steel, Stainless steel, Cast iron.
AlTiCrN (HX)	Purple black	3800	1~4	0.25	800	Solid Carbide	Carbon steel, Alloyed steel, Stainless steel, Cast iron.
ZrN (ZX)	Yellow brown	2800	1~4	0.5	550	Solid Carbide	Aluminium, Copper, Stainless steel, Titanium, Hard-cut material.
Diamond (DC)	Black	9000	6~13	0.15	600	Solid Carbide	Graphite.
TiN (N)	Golden	2400	1~7	0.35	600	HSS	General steel, Wear parts.
TiCN (C)	Blue gray	2800	1~4	0.2	400	HSS	General steel, Wear parts.

Usage of each coating for Milling Steel

Cutting Tools Material:Solid Carbide



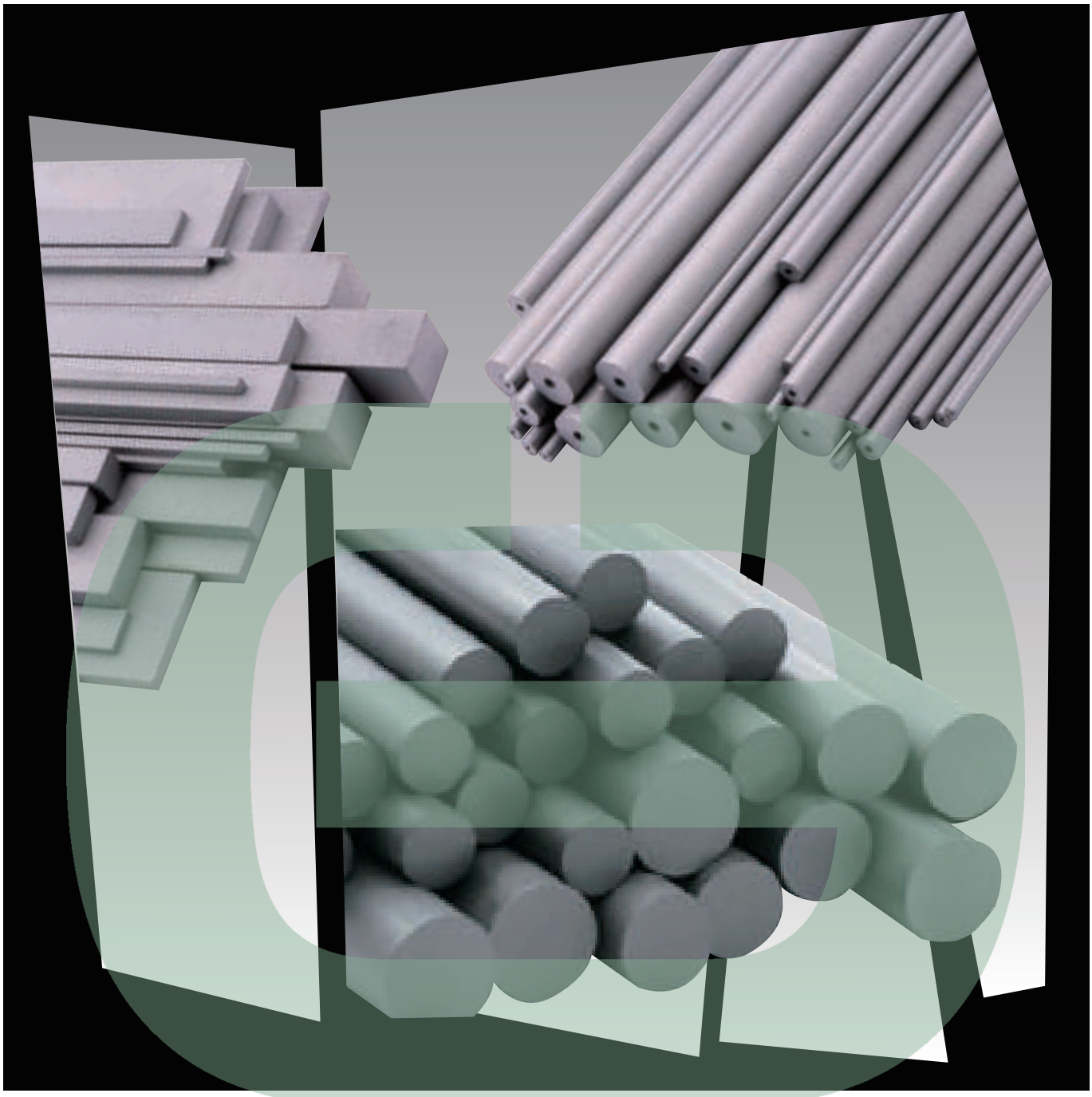
Technical Data - Materials

	Materials Groups		N/mm2	HB	JIS	DIN
P	GR.1	Non-alloyed Steel	≦700	≦210	SS330 SS400 SS490 S10C S15C S20C S25C S30C S35C S40C S45C S50C S55C S58C SUM22 SUM22L SUM24 SUM25 SK3 SUP4	RST37-1 St37-3 St37-2 9SMn28 9SMnPb28 9SMnPb36 Ck15 Ck25 CK30 Ck45 Cf53C10 C15 C20 C22C35 C45 C55 C60 Ck55 Ck60 C105W1 C105W1
	GR.2	<24HRC Low-alloyed Steel	700-1000	210-300	SCR415 SCR420 SCR430 SCR440 SCR445 SCM420 SCM415 SCM430 SCM440 SKI SK2 SK3 SK5 SK6 SK7	St.44-2 St.52-3 100Cr6 21NiCrMo2 40NiCrMo22 17CrNiMo6 15Cr3 42Cr3 55Cr3 15CrMo5 36NiCr6 14NiCr10 34Cr4 41Cr4 16MnCr5 25CrMo4 34CrMo4 41CrMo4 42CrMo4 32CrMo12 50CrV4 41CrAlMo7 100Cr6 105WCr6
	GR.3	<30HRC Hi-alloyed Steel	>1000	>300	SKD1 SKD2 SKD3 SKD4 SKD11 SKD12 SKD61 P20 P21 P30 SUP3 SUP4 SUP6 SUP3 SUP6 SUP7 SUP9 SUP10 SKH2 SKH3 SKH52 SKH55	X210Cr12 X40CrMoV5 1 X100CrMoV5 1 X210CrW12 45WCrV7 X30WCrV9 3 X30WCrV9 3KU X165CrMoV12 X45GrSi93 S6-5-2 S6/5/2 S6/5/2/5 S2/9/2 X210Cr12 G
H	GR.4	30~38HRC Hardened Steel				
	GR.5	38~48HRC Hardened Steel				
	GR.6	48~56HRC Hardened Steel				
	GR.7	56~68HRC Hardened Steel				
M	GR.8	Stainless Steel	500~ 950	250~320	SUS301 SUS302 SUS303 SUS304 SUS316 SUS321 SUS410 SUS416 SUS420 SUS420J2 SUS430 SUS431 SUS440	X12CrNi17-7 X12CrNi18-8 X10CrNiS18-9 X5CrNi18-10 X5CrMo17-12-2 X6CrNiTi18-10 X10Cr13 X12CrS13 X30Cr13 X12CrMoS17 X20CrNi17-2 X65CrMo14
K	GR.9	Cast Iron		180-280	FC100 FC150 FC200 FC250 FC300 FC350 FCD400 FCD500 FCD600 FCD700 FCMB310 FCMW330 FCMW370 FCMP490 FCMP540 FCMP590 FCMP690	GG10 GG15 GG20 GG25 GG30 GG35 GGG40 GGG50 GGG60 GGG70 GTS-35 GTS-45 GTS-55 GTS-65 GTS65-02 GTS-70-02
N	GR.10	Aluminium		Si<10%	A1050 A1080 A2014 A3003 A5052 A6061 A7075 MP1	A199 ,5 A199.8 AlMnCu AlCuSiMn AiMgSiCu AlZnMgCu4.5 MgAl3Zn G-AlSi5Mg
				Si>10%	A1050 A1080 A2014 A3003 A5052 A6061 A7075 MP1	GD-AlSi12 GD-AlSi10Mg G-AlSi10Mg AlSi17C4 AlSi21CuNiMg AlSi25CuNiMg
	GR.11	Copper		<250	C1220P C3710P C2400P C5210P C3602BE C3601BE C3604BE C3771BE C4622BE C4430P C6711P BC3 BC6	CuZn36Pb3 CuZn39Pb2 CuZn39Pb3 CuZn40Pb2 CuZn28Sn1 CuZn38Si1 CuZn15 CuZn36 CuZn40 ZCuZn10Zn2 CuAl5 CuAl8Fe3 CuAl10Ni5Fe4 CuBe2F40 CuSi3Mn G-CuSn5ZnPb G-CuSn10Zn
				>250	C1700P C1720P C5212P C6782BE	CuBe1.7 F55 CuBe1.7 F110 CuBe2 F70 CuBe2 F125 CuZn40A11 CuAl11Ni6Fe5 AMPCO 20
	GR.12	Plastics			PP PS POM PC PA PMMA TFE CTFE	
	GR.13	FRP CFRP Composite Material			GFK KFK AFK	
	GR.14	Graphite				
S	GR.15	Titanium	700~ 1250	210~370	TP(TR)270H© TP(TR)340H© TP(TR)550H(C) TP(TR)480H© TP(TR)270Pd© TP(TR)340Pd TP(TR)550Pd© TP(TR)480Pd© TAP6400	Ti 1 Ti 2 Ti 3 Ti 4 Ti 1 Pd Ti 2 Pd Ti 3 Pd Ti99.7 Ti99.8 TiAl6V4 TiAl6V4ELI TiAl5Sn2.5 TiAl4Mo4Sn4Si0.5 TiCu2
	GR.16	Nickel	900~ 1200	260~350	Incoloy 800 Incoloy825 I Inconel 400 nconel 625 Inconel 600 Inconel 700 Inconel 713 Inconel 718 Haynes 600 Hastelloy C Nimocast PD36 Nimonic PE13 Nimonic 901 Nimonic 75 Rene 95 ,Monet400, Mar-M432, Waspaloy ,Jessop G64 AirResist213 Jetalloy209	
	GR.17	High Temp Alloys	900- 1400	210-400	SUH309 SUH310 SUH330 SUH1 SUH31 SUH35 SUH321 SUH430 SUH420J1	X15CrNiSi20-12 X15CrNiSi25-20 X45CrSi9-3 X45CrNiW18-9 X53CrMnNiN21-9 X10CrNiTi18-9 X6Cr17 X20Cr13

AISI/SAE	BS	GB
1010 1015 1020 1025 1030 1035 1040 1045 1050 1055 1060 W1 W210 1213 12L13 12L14	230M07 080M15 060A35 080M46 060A35 080M46 060A52 070M55 080A62 070M55 080 A 62 060A 96 BW 1A BW2	Q215AF Q235A~D 10 15 20 25 30 35 40 45 50 55 60 Y12 Y15pb
9840 4340 5132 5140 5115 4130 4137, 4135 4140, 4142 4140 L3 L6 ASTM A350LF5 8620 8740 5010 5140 5155 9262 52100	708M40 708M40 722M24 735A50 805M20 311-TYPE7 820A16 523M15 527A60 534 A99 4360 43C 4360 50B	15Cr 20Cr 30Cr 40Cr 45Cr 20CrMo 15CrMo 30CrMo 42CrMo
D3 H13 A2 S1 H21 HW3 D3 M2 M35 M7 HNV3	BD3 BH13 BA2 BS1 BH21 401S45 4959BA2 BM2 BM35	Cr12 C12MoV Cr12MoV1 CrMo1v 4Cr5MoSiV1 W18Cr4V W18Cr4V5Co5 W6Mo5Cr4V2Co5 W6MoCr4V3 55CrMnA 85 60Si2Mn 50CrVa
AISI301 AISI302 AISI303 AISI304 AISI316 AISI321 AISI410 AISI416 AISI420 AISI430 AISI431 AISI440	430S15 410S21 420S45 431S29 430S17 304S11 303S21 304C12 321S12 316S16 317S12 403S17	1Cr17Ni7 1Cr18Ni9 Y1Cr18Ni9 0Cr18Ni9 0Cr17Ni12Mo2 0Cr18Ni11Ti 1Cr13 Y1Cr13 3Cr13 1Cr17 7Cr17 2Cr13 Y3Cr13
No20B No25B No30B No35B No45B No50B 60-40-18 80-55-06 A43D2 100-70-03 32510 40010 50005 70003 A220-70003 A220- 80002	Grade150 Grade220 Grade260 Grade300 Grade350 Grade400 SNG420/12 SNG500/7 SNG600/3 SNG700/2 8290/6 B340/12 P440/7 P510/4 P570/3 P690/2	HT-100 HT-150 HT-200 HT-250 HT-300 HT350 QT400-15 QT450-10 QT500-7 QT600-3 QT700-2 KTH-330-08 KTZ-450-06 KTZ-550-04 KTZ-700- 02
2014 3003 5052 6061 7075 AZ31C A296.0 A331.1	LM4 LM12 LM16 LM21 LM22 LM24 LM25 LM27	L1 L3 LD10 LF2 LF21 LD2 LC4 LC9
S12A SC84A SC102A AA336 A332 B26M520.0	LM5 LM6 LM9 LM13 LM28 LM29 LM30	ZL104 Y104 Y102 ZL102 ZL301
C36000 C37700 C44300 C46200 C83600 C90500 CT-00 10-N 75Cu-5Al 77CU-15Pb-7Sn-1Fe 1C Am CDA544 CDA65600	CA104 CZ121 CZ122 CZ108 CZ114 CDA544 CDA65600 CDA656	ZCuSn5Pb5Zn5 G-CuSn10Z HPb 61-1 HPb 59-1 HSn 62-1
C17000 C17200		QBe1.7 QBe2 HAl 60-1-1
AMS R54520 AMS R56400 AMS R56401 Gr.1 Gr.2 Gr.3 Gr.4 Gr.11 Gr.7 Gr.5	TA14/17 TA10-13 TA28 TA11	TA0 TA1 TA2 TA3 TA9 TC4
AISI309 AISA310 HNV3 EV9 AISI321 AISI430 AISI420	330C11 Hr5.203-4 3146-3 HR8 3072-76 Hr401.601	2Cr23Ni13 2Cr25Ni20 4Cr9Si2 5Cr21Mn9Ni4N 0Cr18Ni11Ti 1Cr17 2Cr13

Tungsten Carbide Rods

ETM Tungsten Carbide Rods



7-Leaders Corp. established in 1990, and cooperates with ETM Swiss tungsten carbide rods manufacturer by marketing with our brand.

Since with the founding of our manufacturing technology, our core business has been the production of solid carbide cutting tools.

We designed and equipped with various innovative grinding facilities, designed and produced various type of innovative cutting tools.

Together with many years of experience and the integration of high-tech machinery, provide high quality products to fulfill our customers' needs.

We focus on improving the precision and accuracy of cutting tools, combining excellent quality of carbide material, become the best business partner for high-demand customers.

Our Quality Management - 7-Leaders Corp. ensures that the products given to customer can maintain the stability of uniform quality through the complete manufacturing process.

In addition, each of our employees has been fully trained and knows how to achieve consistent standard specifications. Every year, we have passed the quality management system certification ISO 9001:2015.

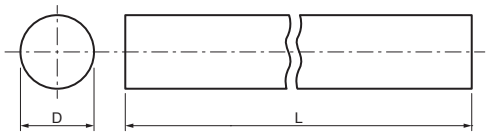
Through the years, our products line extends from solid carbide rods to a complete line of solid carbide cutting tools.

Our extruded sintered tungsten carbide products include:

- Tungsten Carbide solid rods
- Tungsten Carbide tubes
- Tungsten Carbide rods with coolant holes
- Tungsten Carbide precision ground engraving blanks

Our customized ground tungsten carbide rods allow our customer to optimize their production process and to minimize their production costs.

Tungsten Carbide Rods



Code No.	D mm	L mm	Tol mm	M609 SMG	M610 UMG	M612 UMG
RR 3.3×330L	3.3	330	-0.05/+0.15	●	○	●
RR 4.3×330L	4.3	330	-0.05/+0.15	●	○	●
RR 5.3×330L	5.3	330	-0.05/+0.15	●	○	●
RR 6.3×330L	6.3	330	-0.05/+0.20	●	○	●
RR 8.3×330L	8.3	330	-0.05/+0.20	●	○	●
RR 10.3×330L	10.3	330	-0.05/+0.20	●	○	●
RR 12.3×330L	12.3	330	-0.05/+0.25	●	○	●
RR 14.3×330L	14.3	330	-0.05/+0.25	●	○	●
RR 16.3×330L	16.3	330	-0.05/+0.30	●	○	●
RR 18.3×330L	18.3	330	-0.05/+0.30	●	○	●
RR 20.3×330L	20.3	330	-0.05/+0.30	●	○	●
RR 25.3×330L	25.3	330	-0.05/+0.40	●	○	●

○ Non-stock items

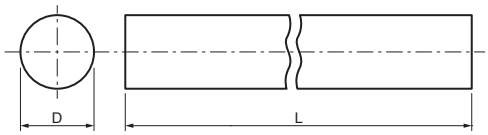


M609: The outstanding super ultrafine 0.2um grade with 9% Cobalt content is for high-performance applications. This is made of superfine tungsten carbide with grain sizes that significantly surpassing the hardness of any other grades and maintaining high wear resistance and considerable toughness. This grade is applied in hardened steels, high strength aluminium alloys, as well as new composite materials.

M610: A top ultrafine carbide 0.4um grade. High hardness and high wear resistance with sufficient toughness are achieved by combination of 10% Cobalt content. It is recommended for milling in high hardened and tempered steels, such as cast steels, tempered alloys and tool steels.

M612: Premium ultrafine carbide 0.4um grade for milling tools, with 12% Cobalt content is responsible for a high toughness. Good impact strength and TRS is the essential advantage of this ultrafine grade. It can be applied to rotating tools, and machining of medium and high hardness steel materials, mold steels, titanium alloys, high temperature alloys, stainless steels as well as glass-fiber reinforced plastics.

Tungsten Carbide Rods



Code No.	D mm	L mm	Tol mm	M100 MG	M210 MG	M212 MG
RR 1.2×330L	1.2	330	-0.05/+0.15	•	•	
RR 1.6×330L	1.6	330	-0.05/+0.15	•	•	
RR 1.8×330L	1.8	330	-0.05/+0.15	•	•	
RR 2.3×330L	2.3	330	-0.05/+0.15	•	•	
RR 2.8×330L	2.8	330	-0.05/+0.15	•	•	
RR 3.3×330L	3.3	330	-0.05/+0.15	•	•	•
RR 3.5×330L	3.5	330	-0.05/+0.15	•	•	
RR 3.8×330L	3.8	330	-0.05/+0.15	•	•	
RR 4.3×330L	4.3	330	-0.05/+0.15	•	•	•
RR 4.8×330L	4.8	330	-0.05/+0.15	•	•	
RR 5.3×330L	5.3	330	-0.05/+0.15	•	•	
RR 5.8×330L	5.8	330	-0.05/+0.15	•	•	
RR 6.3×330L	6.3	330	-0.05/+0.20	•	•	•
RR 6.7×330L	6.7	330	-0.05/+0.20	•	•	
RR 7.3×330L	7.3	330	-0.05/+0.20	•	•	
RR 7.8×330L	7.8	330	-0.05/+0.20	•	•	
RR 8.3×330L	8.3	330	-0.05/+0.20	•	•	•
RR 8.8×330L	8.8	330	-0.05/+0.20	•	•	
RR 9.3×330L	9.3	330	-0.05/+0.20	•	•	
RR 9.8×330L	9.8	330	-0.05/+0.20	•	•	
RR 10.3×330L	10.3	330	-0.05/+0.20	•	•	•
RR 10.8×330L	10.8	330	-0.05/+0.20	•	•	
RR 11.3×330L	11.3	330	-0.05/+0.25	•	•	
RR 11.8×330L	11.8	330	-0.05/+0.25	•	•	
RR 12.3×330L	12.3	330	-0.05/+0.25	•	•	•
RR 12.8×330L	12.8	330	-0.05/+0.25	•	•	
RR 13.3×330L	13.3	330	-0.05/+0.25	•	•	
RR 14.3×330L	14.3	330	-0.05/+0.25	•	•	
RR 14.8×330L	14.8	330	-0.05/+0.25	•	•	
RR 15.3×330L	15.3	330	-0.05/+0.30	•	•	
RR 15.8×330L	15.8	330	-0.05/+0.30	•	•	
RR 16.3×330L	16.3	330	-0.05/+0.30	•	•	•
RR 17.3×330L	17.3	330	-0.05/+0.30	•	•	
RR 18.3×330L	18.3	330	-0.05/+0.30	•	•	
RR 19.3×330L	19.3	330	-0.05/+0.30	•	•	
RR 20.3×330L	20.3	330	-0.05/+0.30	•	•	•
RR 20.8×330L	20.8	330	-0.05/+0.40	•	•	
RR 21.3×330L	21.3	330	-0.05/+0.40	•	•	
RR 21.8×330L	21.8	330	-0.05/+0.40	•	•	
RR 22.3×330L	22.3	330	-0.05/+0.40	•	•	
RR 23.3×330L	23.3	330	-0.05/+0.40	•	•	
RR 24.3×330L	24.3	330	-0.05/+0.40	•	•	
RR 25.3×330L	25.3	330	-0.05/+0.40	•	•	•
RR 25.8×330L	25.8	330	-0.05/+0.40	•	•	
RR 26.3×330L	26.3	330	-0.05/+0.40	•	•	
RR 28.3×330L	28.3	330	-0.05/+0.40	•	•	
RR 30.3×330L	30.3	330	-0.05/+0.40	•	•	
RR 32.6×330L	32.6	330	-0.05/+0.40	•	•	

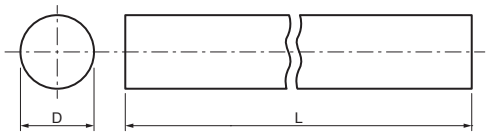


M100: Universal micro grain 0.8um grade, combined with 6% Cobalt content, is a premium material with excellent high wear resistance. Suitable for reaming, and milling of carbon fiber, glass fiber, composites materials, and graphite etc. Especially adopt with diamond coating.

M210: Universal micro grain 0.8um grade with 10% Cobalt content shows a good TRS. It can be applied to rotating tools, and has an excellent performance on general carbon steel, alloy steel, cast iron, copper, aluminum alloys, stainless steel, and titanium alloys.

M212: Universal micro grain 0.8um grade with 12% Cobalt content shows high hardness and superior toughness. It is particularly suitable as cutting tools for carbon steel, alloy steel, high temperature alloys, stainless steel, nickel alloys, titanium alloys and difficult to-cut materials, due to its high stability cutting edge.

Tungsten Carbide Rods



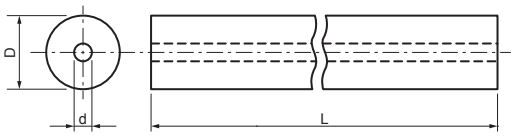
Code No.	D mm	L mm	Tol mm	M409 MG	M412 MG
RR 4.3×330L	4.3	330	-0.05/+0.15	•	•
RR 6.3×330L	6.3	330	-0.05/+0.20	•	•
RR 8.3×330L	8.3	330	-0.05/+0.20	•	•
RR 10.3×330L	10.3	330	-0.05/+0.20	•	•
RR 12.3×330L	12.3	330	-0.05/+0.25	•	•
RR 14.3×330L	14.3	330	-0.05/+0.25	•	•
RR 16.3×330L	16.3	330	-0.05/+0.30	•	•
RR 18.3×330L	18.3	330	-0.05/+0.30	•	•
RR 20.3×330L	20.3	330	-0.05/+0.30	•	•



M409: Nanocrystalline ~1.2µm grade, combined with 9% Cobalt content. With its cutting edge strength and wear resistance - coupled with its temperature resistance – this grade is primarily aimed for rough grinding, or drills for difficult-tocut materials.

M412: Nanocrystalline ~1.2µm grade, combined with 12% Cobalt content. The exceptional transverse strength pair with high fracture toughness predestines, this fine grade for the application of difficult-to-cut materials. Highly use in interrupted roughing cutting applications.

Tungsten Carbide Tubes

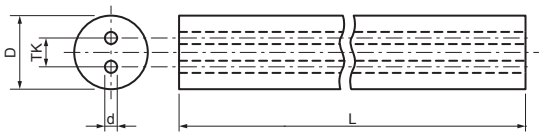


Code No.	D mm mm	d mm Tol 0/-0.1	L mm Tol ±5.0	Tol mm	M210 MG
RO 3.3×0.2×330L	3.3	0.2	330	-0.05/+0.15	•
RO 3.3×0.3×330L	3.3	0.3	330	-0.05/+0.15	•
RO 3.3×0.4×330L	3.3	0.4	330	-0.05/+0.15	•
RO 3.3×0.5×330L	3.3	0.5	330	-0.05/+0.15	•
RO 3.3×0.6×330L	3.3	0.6	330	-0.05/+0.15	•
RO 3.3×0.8×330L	3.3	0.8	330	-0.05/+0.15	•
RO 3.3×1.0×330L	3.3	1.0	330	-0.05/+0.15	•
RO 4.3×0.2×330L	4.3	0.2	330	-0.05/+0.15	•
RO 4.3×0.3×330L	4.3	0.3	330	-0.05/+0.15	•
RO 4.3×0.4×330L	4.3	0.4	330	-0.05/+0.15	•
RO 4.3×0.5×330L	4.3	0.5	330	-0.05/+0.15	•
RO 4.3×0.6×330L	4.3	0.6	330	-0.05/+0.15	•
RO 4.3×0.8×330L	4.3	0.8	330	-0.05/+0.15	•
RO 4.3×1.0×330L	4.3	1.0	330	-0.05/+0.15	•
RO 6.3×0.3×330L	6.3	0.3	330	-0.05/+0.20	•
RO 6.3×0.4×330L	6.3	0.4	330	-0.05/+0.20	•
RO 6.3×0.5×330L	6.3	0.5	330	-0.05/+0.20	•
RO 6.3×0.6×330L	6.3	0.6	330	-0.05/+0.20	•
RO 6.3×0.8×330L	6.3	0.8	330	-0.05/+0.20	•
RO 6.3×1.0×330L	6.3	1.0	330	-0.05/+0.20	•
RO 6.3×1.5×330L	6.3	1.5	330	-0.05/+0.20	•
RO 6.3×2.0×330L	6.3	2.0	330	-0.05/+0.20	•
RO 8.3×1.0×330L	8.3	1.0	330	-0.05/+0.20	•
RO 8.3×1.5×330L	8.3	1.5	330	-0.05/+0.20	•
RO 8.3×2.0×330L	8.3	2.0	330	-0.05/+0.20	•
RO 10.3×1.0×330L	10.3	1.0	330	-0.05/+0.20	•
RO 10.3×1.5×330L	10.3	1.5	330	-0.05/+0.20	•
RO 10.3×2.0×330L	10.3	2.0	330	-0.05/+0.20	•
RO 12.3×1.5×330L	12.3	1.5	330	-0.05/+0.25	•
RO 12.3×2.0×330L	12.3	2.0	330	-0.05/+0.25	•
RO 12.3×2.5×330L	12.3	2.5	330	-0.05/+0.25	•
RO 12.3×3.0×330L	12.3	3.0	330	-0.05/+0.25	•



M210: Universal micro grain 0.8um grade with 10% Cobalt content shows a good TRS and wear resistance.

Tungsten Carbide Rods With Two Straight Coolant Holes

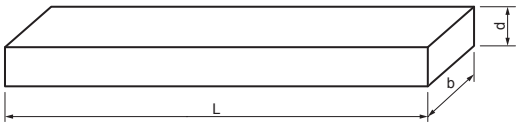


Code No.	D mm	TK mm	d mm	L mm Tol ±5.0	D mm Tol	M100 MG
RS 4.3-TK 1.5-d0.9×310L M100	4.3	1.5	0.9	310	-0.05/+0.15	•
RS 8.3-TK 4.0-d0.9×310L M100	8.3	4.0	0.9	310	-0.05/+0.20	•
RS 8.3-TK 4.0-d1.2×310L M100	8.3	4.0	1.2	310	-0.05/+0.20	•
RS 11.3-TK 3.5-d1.5×310L M100	11.3	3.5	1.5	310	-0.05/+0.25	•
RS 11.3-TK 5.0-d2.0×310L M100	11.3	5.0	2.0	310	-0.05/+0.25	•
RS 12.3-TK 6.2-d2.0×310L M100	12.3	6.2	2.0	310	-0.05/+0.25	•
RS 13.3-TK 3.5-d1.5×310L M100	13.3	3.5	1.5	310	-0.05/+0.25	•
RS 13.3-TK 6.2-d2.0×310L M100	13.3	6.2	2.0	310	-0.05/+0.25	•
RS 15.3-TK 2.6-d0.9×310L M100	15.3	5.0	2.0	310	-0.05/+0.30	•
RS 15.3-TK 5.0-d2.0×310L M100	15.3	2.6	0.9	310	-0.05/+0.30	•
RS 16.3-TK 8.0-d2.0×310L M100	16.3	8.0	2.0	310	-0.05/+0.30	•
RS 17.3-TK 6.2-d2.0×310L M100	17.3	6.2	2.0	310	-0.05/+0.30	•
RS 18.3-TK 6.2-d2.0×310L M100	18.3	6.2	2.0	310	-0.05/+0.30	•
RS 18.3-TK 9.0-d2.0×310L M100	18.3	9.0	2.0	310	-0.05/+0.30	•
RS 19.3-TK 6.2-d2.0×310L M100	19.3	6.2	2.0	310	-0.05/+0.30	•
RS 19.3-TK 9.0-d2.0×310L M100	19.3	9.0	2.0	310	-0.05/+0.30	•
RS 20.3-TK10.0-d2.5×310L M100	20.3	10.0	2.5	310	-0.05/+0.30	•

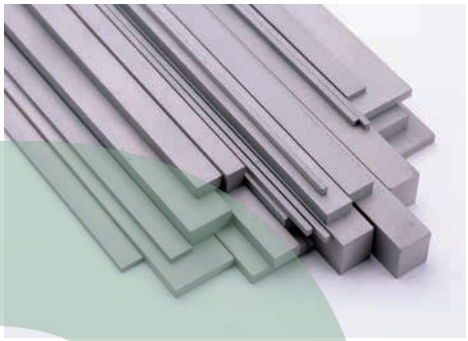


M100: Universal micro grain 0.8um grade, combined with 6% Cobalt content, is a premium material with excellent high wear resistance, suitable for reaming and straight flue drill materials.

Tungsten Carbide Strips



Code No.	d mm Tol +0.2/+0.5	b mm Tol +0.2/+0.5	L mm Tol ±5.0	M100 MG	M210 MG
TS 1× 1×330L	1	1	330	•	•
TS 2× 2×330L	2	2	330	•	•
TS 3× 3×330L	3	3	330	•	•
TS 4× 4×330L	4	4	330	•	•
TS 5× 5×330L	5	5	330	•	•
TS 6× 6×330L	6	6	330	•	•
TS 7× 7×330L	7	7	330	•	•
TS 8× 8×330L	8	8	330	•	•
TS 10×10×330L	10	10	330	•	•
TS 12×12×330L	12	12	330	•	•



M100: Universal micro grain 0.8um grade, combined with 6% Cobalt content, is a premium material with excellent high wear resistance. Suitable for reaming, and milling of carbon fiber, glass fiber, composites materials, and graphite etc. Especially adopt with diamond coating.

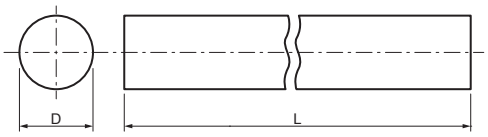
M210: Universal micro grain 0.8um grade with 10% Cobalt content shows a good TRS. It can be applied to rotating tools, and has an excellent performance on general carbon steel, alloy steel, cast iron, copper, aluminum alloys, stainless steel, and titanium alloys.

Tungsten Carbide Strips

Code No.	d mm Tol +0.2/+0.5	b mm Tol +0.2/+0.5	L mm Tol ±5.0	M100 MG	M210 MG
TS 1× 3×330L	1	3	330	•	•
TS 1× 4×330L	1	4	330	•	•
TS 1.5×3×330L	1.5	3	330	•	•
TS 1.5×4×330L	1.5	4	330	•	•
TS 1.5×8×330L	1.5	8	330	•	•
TS 2× 3×330L	2	3	330	•	•
TS 3×20×330L	3	20	330	•	•
TS 3×22×330L	3	22	330	•	•
TS 4× 8×330L	4	8	330	•	•
TS 4×10×330L	4	10	330	•	•
TS 4×12×330L	4	12	330	•	•
TS 4×13×330L	4	13	330	•	•
TS 4×15×330L	4	15	330	•	•
TS 4×18×330L	4	18	330	•	•
TS 4×20×330L	4	20	330	•	•
TS 4×22×330L	4	22	330	•	•
TS 4×25×330L	4	25	330	•	•
TS 4×35×330L	4	35	330	•	•
TS 5×16×330L	5	16	330	•	•
TS 5×18×330L	5	18	330	•	•
TS 5×22×330L	5	22	330	•	•
TS 5×25×330L	5	25	330	•	•
TS 6×16×330L	6	16	330	•	•

※Some specifications are 310L. ※Offer valid while stocks last.

Engraving Blanks Precision Ground





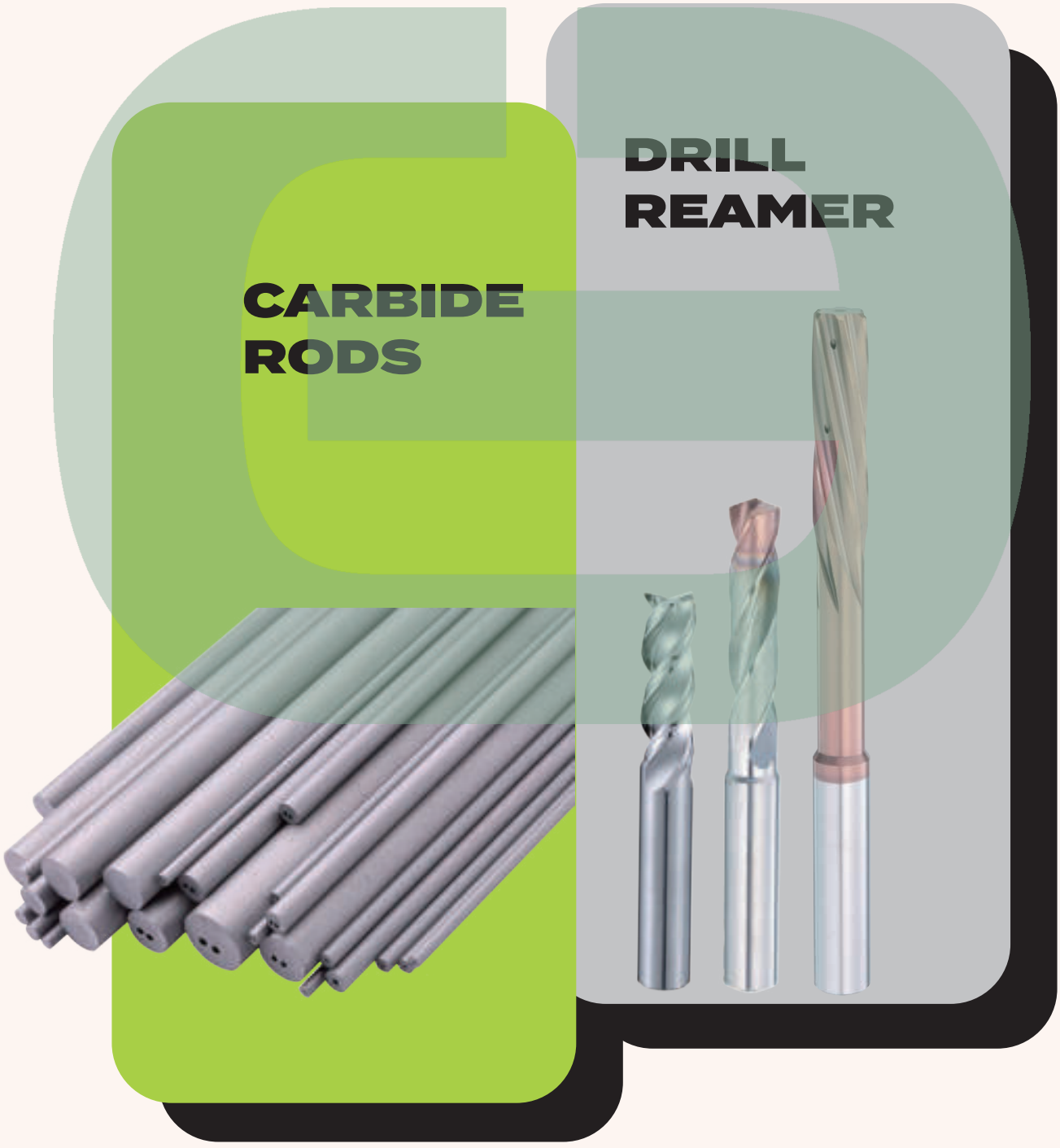
Code No.	D mm Tol h6	L mm Tol ±1.0	M210 MG
RG 3.0 100L	3	100	•
RG 4.0 100L	4	100	•
RG 5.0 100L	5	100	•
RG 6.0 100L	6	100	•
RG 8.0 100L	8	100	•
RG 10.0 100L	10	100	•
RG 12.0 100L	12	100	•

M210: Universal micro grain 0.8um grade with 10% Cobalt content shows a good TRS. It can be applied to rotating tools, and has an excellent performance on general carbon steel, alloy steel, cast iron, copper, aluminum alloys, stainless steel, and titanium alloys.

WIN-WIN COOPERATION

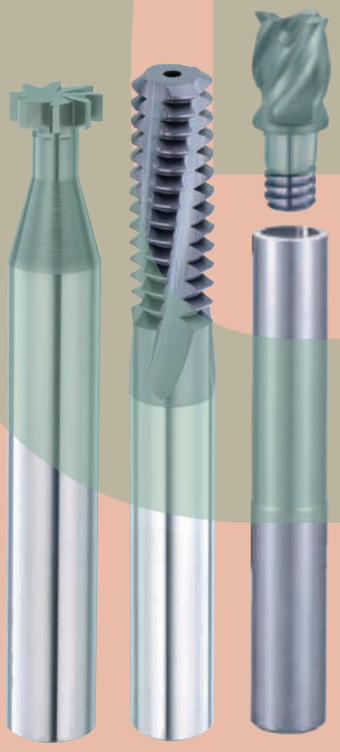
Focused on High-End Products Only

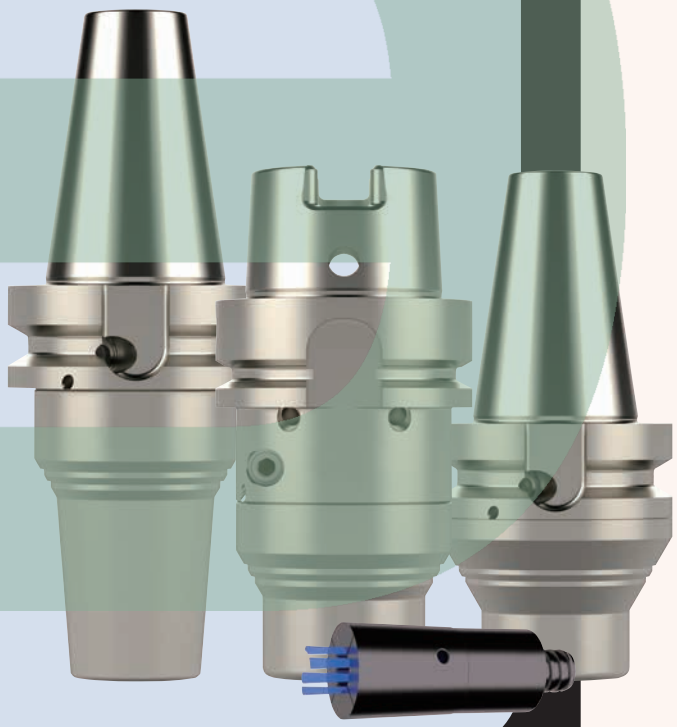
7Leaders focuses solely on producing high-quality products. If you are looking for such products, we are the best choice for you.



APC PRECISION CHUCK

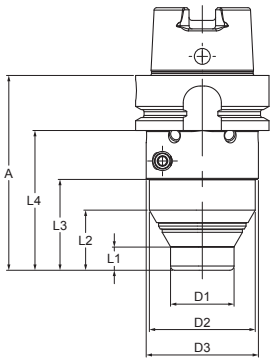
END MILLS





HSK Made In Germany

1. Precision Chuck APC, DIN 69893 (ISO 12164) with fine balancing holes 6×M6.
2. Easy exchange of tools by setting of hex-key, no maintenance required.
3. Chuck surface with special antirust coating.
4. System-Runout-Accuracy 3 µm at 2.5×D.



APC 14

HSK50 A 2 - 14 mm

Code No.	A	L1	L2	L3	L4	D1	D2	D3	Balanced	kg	Price
HSK50-APC14-101	101	11	28	43	75	30	50	53	20.000 G=2.5	1.1	•
HSK63 A											
HSK63-APC14-92	92	11	28	43	66	30	50	53	20.000 G=2.5	1.3	•



APC 20

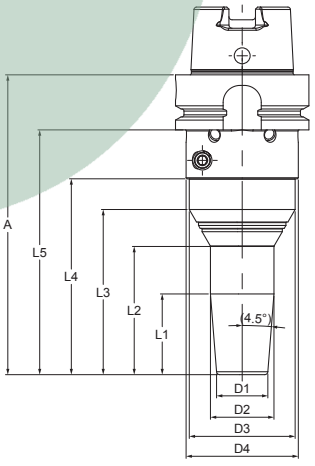
HSK50 A 2 - 20 mm

Code No.	A	L1	L2	L3	L4	D1	D2	D3	Balanced	kg	Price
HSK50-APC20-101	101	20	31	56	75	40	53		20.000 G=2.5	1.1	•
HSK63 A											
HSK63-APC20-92	92	20	31		66	40	53		20.000 G=2.5	1.3	•
HSK100 A											
HSK100-APC20-100	100	18	38	43	71	40	63	70	20.000 G=2.5	3.8	•



HSK AXIS-5 Made In Germany

1. Precision Chuck APC, DIN 69893 (ISO 12164) with fine balancing holes 6×M6.
2. Slim line with 4.5° especially for 5-axis operations. Easy exchange of tools by setting of hex-key, no maintenance required.
3. Chuck surface with special antirust coating.
4. System-Runout-Accuracy 3 µm at 2.5×D.



APC 20 Slim5

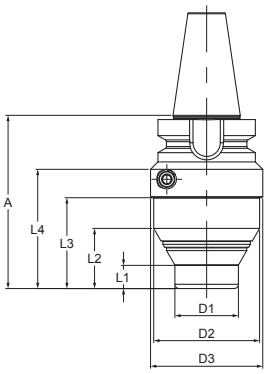
HSK63 A Slim5 2 - 20mm

Code No.	A	L1	L2	L3	L4	L5	D1	D2	D3	D4	Balanced	kg	Price
HSK63-APC20-120	120		44	54	71	94	32	39	50	53	20.000 G=2.5	1.5	•
HSK63-APC20-142	142	51	69	78	93	116	32	40	50	53	20.000 G=2.5	1.6	•
HSK63-APC20-178	178	51	94	103	129	152	32	40	50	53	20.000 G=2.5	2.1	•



BT Made In Germany

1. Precision Chuck APC, ISO 7388-2 (JIS B 6339)
2. Easy exchange of tools by setting of hex-key, no maintenance required.
3. Chuck surface with special antirust coating.
4. System-Runout-Accuracy 3 µm at 2.5×D.



APC 14

BT30 2 - 14 mm

Code No.	A	L1	L2	L3	L4	D1	D2	D3	Balanced	kg	Price
BT30-APC14-82	82	11	28	43	56	30	50	53	20.000 G=2.5	0.9	•
BT40											
BT40-APC14-70	70	11	28		43	30	50		20.000 G=2.5	1.2	•



APC 20

BT30 2 - 20 mm

Code No.	A	L1	L2	L3	L4	D1	D2	D3	Balanced	kg	Price
BT30-APC20-82	82	20	31		56	40	53		20.000 G=2.5	0.9	•
BT40											
BT40-APC20-70	70	18	38			40	63		20.000 G=2.5	1.4	•
BT50											
BT50-APC20-81	81	18	38		43	40	63		20.000 G=2.5	4.2	•



APC 20

BT40 2 - 20 mm

Code No.	A	L1	L2	L3	L4	D1	D2	D3	Balanced	kg	Price
BT40-APC20-120	120	48	68			40	63		20.000 G=2.5	1.8	•
BT50											
BT50-APC20-131	131	48	68		93	40	63		20.000 G=2.5	4.6	•



APC 25

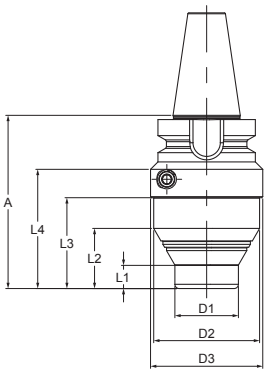
BT50 16 - 32 mm

Code No.	A	L1	L2	L3	L4	D1	D2	D3	Balanced	kg	Price
BT50-APC25-121	121				83	70			20.000 G=2.5	4.6	•



BT Made In Germany

1. Precision Chuck APC, ISO 7388-2 (JIS B 6339)
2. Easy exchange of tools by setting of hex-key, no maintenance required.
3. Chuck surface with special antirust coating.
4. System-Runout-Accuracy 3 µm at 2.5×D.



APC 20

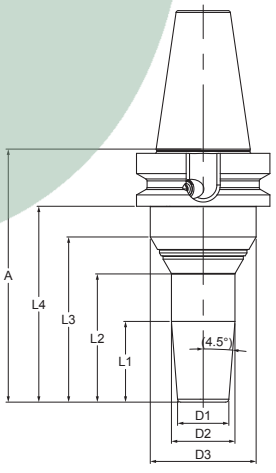
BT40 2 - 20 mm

Code No.	A	L1	L2	L3	L4	D1	D2	D3	Balanced	kg	Price
BT40-APC20-70	70	18	38			40	63		20.000 G=2.5	1.4	•



BT AXIS-5 Made In Germany

1. Precision Chuck APC, ISO 7388-2 (JIS B 6339)
2. Slim line with 4.5° especially for 5-axis operations. Easy exchange of tools by setting of hex-key, no maintenance required.
3. Chuck surface with special antirust coating.
4. System-Runout-Accuracy 3 µm at 2.5×D.



APC 20 Slim5

BT40 Slim5 2 - 20mm

Code No.	A	L1	L2	L3	L4	D1	D2	D3	Balanced	kg	Price
BT40-APC20-98	98		44	54	71	32	39	50	20.000 G=2.5	1.5	•
BT40-APC20-120	120	51	69	78	93	32	40	50	20.000 G=2.5	1.6	•
BT40-APC20-157	157	51	94	103	129	32	40	50	20.000 G=2.5	2.0	•



APC14

1. Special Coating. No maintenance required. Integrated, fine adjustable length stop.
2. Clamping of tool shanks corresponding to DIN 1835 A, B and DIN 6535 HB, HA.

Cooling around



d	Code No.	Price
3.0	APC14-03	●
4.0	APC14-04	●
5.0	APC14-05	●
6.0	APC14-06	●
8.0	APC14-08	●
10.0	APC14-10	●
12.0	APC14-12	●

Cooling around 2.0



d	Code No.	Price
3.0		
4.0		
5.0		
6.0	APC14-06X	○
8.0	APC14-08X	○
10.0	APC14-10X	○
12.0	APC14-12X	○

Side fixed type



d	Code No.	Price
3.0		
4.0		
5.0		
6.0	APC14-06PC	○
8.0	APC14-08PC	○
10.0	APC14-10PC	○
12.0	APC14-12PC	○

Center outlet



d	Code No.	Price
3.0	APC14-03T	○
4.0	APC14-04T	○
5.0	APC14-05T	○
6.0	APC14-06T	○
8.0	APC14-08T	○
10.0	APC14-10T	○
12.0	APC14-12T	○

APC20

1. Special Coating. No maintenance required. Integrated, fine adjustable length stop.
2. Clamping of tool shanks corresponding to DIN 1835 A, B and DIN 6535 HB, HA.

Cooling around



d	Code No.	Price
3.0	APC20-03	●
4.0	APC20-04	●
5.0	APC20-05	●
6.0	APC20-06	●
7.0	APC20-07	●
8.0	APC20-08	●
9.0	APC20-09	●
10.0	APC20-10	●
11.0	APC20-11	●
12.0	APC20-12	●
13.0	APC20-13	●
14.0	APC20-14	●
15.0	APC20-15	●
16.0	APC20-16	●
17.0	APC20-17	●
18.0	APC20-18	●
20.0	APC20-20	●

Cooling around 2.0



d	Code No.	Price
3.0		
4.0		
5.0		
6.0	APC20-06X	○
7.0		
8.0	APC20-08X	○
9.0		
10.0	APC20-10X	○
11.0		
12.0	APC20-12X	○
13.0		
14.0	APC20-14X	○
15.0		
16.0	APC20-16X	○
17.0		
18.0		
20.0		

Side fixed type



d	Code No.	Price
3.0		
4.0		
5.0		
6.0	APC20-06PL	●
7.0		
8.0	APC20-08PL	●
9.0		
10.0	APC20-10PL	●
11.0		
12.0	APC20-12PL	●
13.0		
14.0	APC20-14PL	●
15.0		
16.0	APC20-16PL	●
17.0		
18.0		
20.0		

Center outlet



d	Code No.	Price
3.0	APC20-03T	●
4.0	APC20-04T	●
5.0	APC20-05T	●
6.0	APC20-06T	●
7.0	APC20-07T	●
8.0	APC20-08T	●
9.0	APC20-09T	●
10.0	APC20-10T	●
11.0	APC20-11T	●
12.0	APC20-12T	●
13.0	APC20-13T	●
14.0	APC20-14T	●
15.0	APC20-15T	●
16.0	APC20-16T	●
17.0	APC20-17T	○
18.0	APC20-18T	○
20.0	APC20-20T	○

APC25

1. Special Coating. No maintenance required. Integrated, fine adjustable length stop.
2. Clamping of tool shanks corresponding to DIN 1835 A, B and DIN 6535 HB, HA.

Cooling around



d	Code No.	Price
16.0	APC25-16	●
18.0	APC25-18	●
20.0	APC25-20	●
22.0	APC25-22	○
25.0	APC25-25	●
32.0	APC25-32	○

Side fixed type



d	Code No.	Price
16.0	APC25-16PL	●
18.0	APC25-18PL	●
20.0	APC25-20PL	●
22.0		
25.0	APC25-25PL	●
32.0		

MQL

HSK63A/HSK100A

d	Code No.	Price
4-6	T-1C/T-2C	●
8	T-1C/T-2C	●
10	T-1C/T-2C	●
12	T-1C/T-2C	●
14	T-1C/T-2C	●
16	T-1C/T-2C	●



Spanner

SP13902S

Code No.	German system	Made in Taiwan
SP13902S		●
SP13902	●	



APC Powergrip Collet Chuck made in Germany sales with 7Leaders brand.

With several years of experience, we have established an after-sales service department. Regardless of whether you purchased a product from Germany APC or 7Leaders brand, we are glad to provide maintenance services.

Hardness Conversion Table

HRC	HB	HV10	N/mm²
	71	75	240
	76	80	255
	81	85	270
	86	90	285
	90	95	305
	95	100	320
	100	105	335
	105	110	350
	109	115	370
	114	120	385
	119	125	400
	124	130	415
	128	135	430
	133	140	450
	138	145	465
	143	150	480
	147	155	495
	152	160	510
	157	165	530
	162	170	545
	166	175	560
	171	180	575
	176	185	595
	181	190	610
	185	195	625
	190	200	640
	195	205	660
	199	210	675
	204	215	690
	209	220	705
	214	225	720
	219	230	740
	223	235	755
	228	240	770
	233	245	785
22	238	250	800
23	242	255	820
24	247	260	835
25	255	268	860
26	258	272	870
27	266	280	900

HRC	HB	HV10	N/mm²
28	273	287	920
29	278	293	940
30	287	302	970
31	295	310	995
32	301	317	1020
33	311	327	1050
34	319	336	1080
35	328	345	1110
36	337	355	1140
37	346	364	1170
38	354	373	1200
39	363	382	1230
40	372	392	1260
41	383	403	1300
42	393	413	1330
43	402	423	1360
44	413	434	1400
45	424	446	1440
46	435	458	1480
47	449	473	1530
48	460	484	1570
49	472	497	1620
50	488	514	1680
51	501	527	1730
52	517	544	1790
53	532	560	1845
54	549	578	1910
55	567	596	1980
56	584	615	2050
57	607	639	2140
58	622	655	
59		675	
60		698	
61		720	
62		745	
63		773	
64		800	
65		829	
66		864	
67		900	
68		940	

ISO Tolerance measure table (µm)

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

7leaders®

The Art of Cutting

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