7leaders™

The Art of Cutting

END MILLS

DRILLS

REAMERS

7leaders™

The Art of Cutting

通用立銑刀　Universal End Mills　汎用エンドミル

形状 Appearance	訂購編號 Code−No	明細 Specification			被切削材 Work Material						頁次 Page
					P	H	M	K	N	S	
	E172	MG Carbide	Uncoated Blank	30°	●			○	●		P3、5
	E182 E185	MG Carbide	Uncoated Blank	30°	●			○	●		P4、5
	E187	MG Carbide	Uncoated Blank	30°	●			○	●		P4
	E113F	MG Carbide	TiAlN F-NaNo	35°	●	●	○	●	○		P6
	E102F	MG Carbide	TiAlN F-NaNo	35°	●	●	○	●	○		P7
	E112F	MG Carbide	TiAlN F-NaNo	35°	●	●	○	●	○		P8
	E122F	MG Carbide	TiAlN F-NaNo	35°	●	●	○	●	○		P9
	E125F E127F	MG Carbide	TiAlN F-NaNo	35°	●	●	○	●	○		P10
	E162X	UMG Carbide	AlTiCrN X	35°	●	●		○			P11
	E163X	UMG Carbide	AlTiCrN X	35°	●	●		○			P11
	E107X	MG Carbide	AlTiCrN X	30°	●	●	○	●	●		P12

超微粒鎢鋼通用立銑刀

Universal End Mills

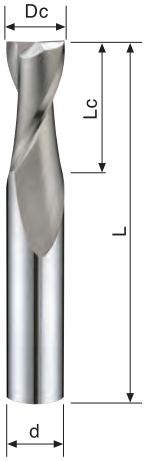
N P < 30HRC

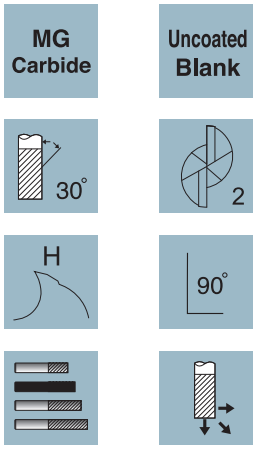
超硬汎用エンドミル

Code No. E172-Dc

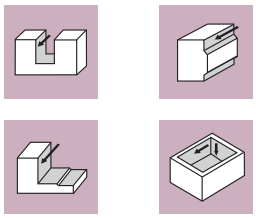
Dc h10	Lc mm	L mm	d h6	Blank E172	TiAlN E172F
0.2	0.5	38	3	●	○
0.3	0.8	38	3	●	○
0.4	1.0	38	3	●	○
0.5	1.2	38	3	●	○
0.6	1.5	38	3	●	○
0.7	1.8	38	3	●	○
0.8	2.0	38	3	●	○
0.9	2.5	38	3	●	○
1.0	3.0	38	3	●	○
1.5	5.0	38	3	●	○
2.0	6.0	38	3	●	○
2.5	7.0	38	3	●	○
3.0	9.0	38	3	●	○
3.5	12.0	50	4	●	○
4.0	14.0	50	4	●	○
4.5	14.0	50	5	●	○
5.0	16.0	50	5	●	○
5.5	16.0	50	6	●	○
6.0	20.0	63	6	●	○
6.5	20.0	63	8	●	○
7.0	20.0	63	8	●	○
7.5	20.0	63	8	●	○
8.0	20.0	63	8	●	○
8.5	22.0	72	10	●	○
9.0	22.0	72	10	●	○
9.5	22.0	72	10	●	○
10.0	22.0	72	10	●	○
11.0	26.0	75	12	●	○
12.0	26.0	75	12	●	○
13.0	32.0	89	14	●	○
14.0	32.0	89	14	●	○
15.0	32.0	89	16	●	○
16.0	32.0	89	16	●	○
17.0	38.0	100	18	●	○
18.0	38.0	100	18	●	○
20.0	38.0	100	20	●	○

○ 淺色：可訂購規格，無現貨
○ The light color: On request, no stock
○ 弊社又は代理店へお聞き下さい





Type of Operation



Work Material

P	H	M	K	N	S
●			○	●	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-100 fz.161

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-100 fz.161

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-80 fz.161

GR.9 鑄鐵 Cast Iron
Vc.80-120 fz.161

GR.10 鋁 Aluminium
Vc.150-200 fz.161

GR.11 銅 Copper
Vc.100-150 fz.161

GR.12 塑膠 Plastics
Vc.60-80 fz.161

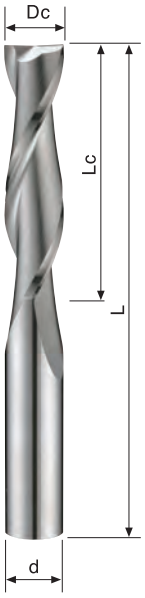
超微粒鎢鋼通用立銑刀
Universal End Mills

N P < 30HRC

超硬汎用エンドミル

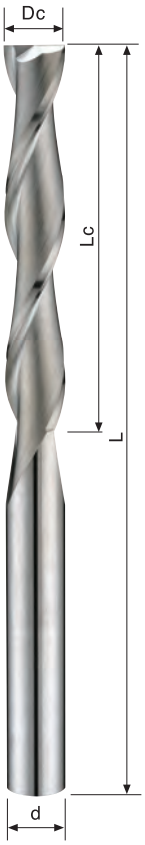
Code No. E182-Dc

Dc h10	Lc mm	L mm	d h6	Blank E182	TiAlN E182F
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	●	○



Code No. E185-Dc

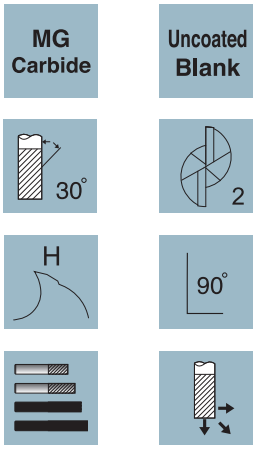
Dc h10	Lc mm	L mm	d h6	Blank E185	TiAlN E185F
3	25	75	3	●	○
4	28	75	4	●	○
5	32	75	5	●	○
6	38	100	6	●	○
8	42	100	8	●	○
10	45	100	10	●	○
12	75	150	12	●	○
14	80	150	14	●	○
16	80	150	16	●	○
20	80	150	20	●	○



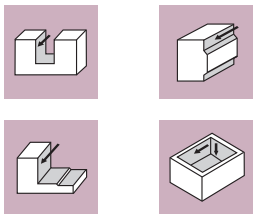
Code No. E187-Dc

Dc h10	Lc mm	L mm	d h6	Blank E187	TiAlN E187F
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	●	○

○ 淺色：可訂購規格，無現貨
○ The light color: On request, no stock
○ 弊社又は代理店へお聞き下さい



Type of Operation



Work Material

P	H	M	K	N	S
●			○	●	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.60-80 fz.161

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.60-80 fz.161

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.30-60 fz.161

GR.9 鑄鐵 Cast Iron
Vc.60-100 fz.161

GR.10 鋁 Aluminium
Vc.120-150 fz.161

GR.11 銅 Copper
Vc.80-120 fz.161

GR.12 塑膠 Plastics
Vc.40-60 fz.161

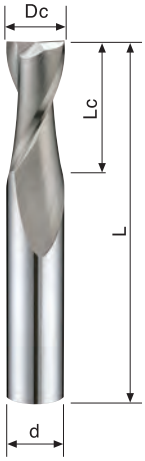
超微粒鎢鋼通用立銑刀
Universal End Mills

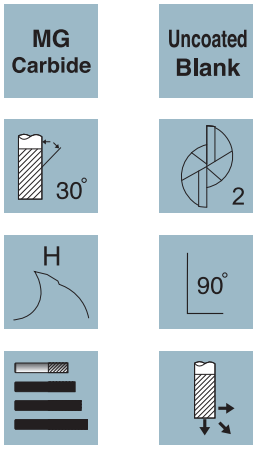
N P < 30HRC

超硬汎用エンドミル

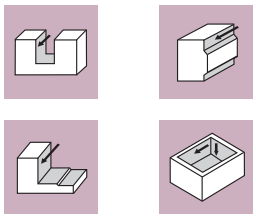
Code No. E172-Dc

Dc h10	Lc Inch	L Inch	d h6	Blank E172	TiAlN E172F
1/32	3/32	1-1/2	1/8	●	○
3/64	9/64	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	5/16	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	7/8	2-1/2	3/8	●	○
7/16	1	3	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	●	○



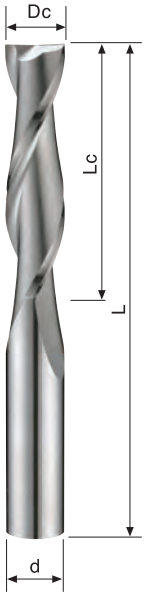


Type of Operation



Code No. E182-Dc

Dc h10	Lc Inch	L Inch	d h6	Blank E182	TiAlN E182F
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	●	○



Work Material

P	H	M	K	N	S
●			○	●	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.60-100 fz.161

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.60-100 fz.161

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.30-80 fz.161

GR.9 鑄鐵 Cast Iron
Vc.60-120 fz.161

GR.10 鋁 Aluminium
Vc.120-200 fz.161

GR.11 銅 Copper
Vc.80-150 fz.161

GR.12 塑膠 Plastics
Vc.40-80 fz.161

Code No. E185-Dc

Dc h10	Lc Inch	L Inch	d h6	Blank E185	TiAlN E185F
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	●	○

○ 淺色：可訂購規格，無現貨
○ The light color: On request, no stock
○ 弊社又は代理店へお聞き下さい

超微粒鎢鋼塗層通用立銑刀

Universal End Mills

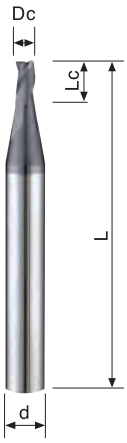
K P H < 48HRC

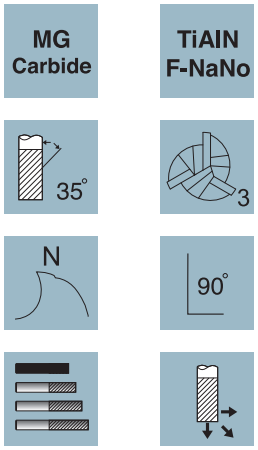
Universal

超硬汎用エンドミル

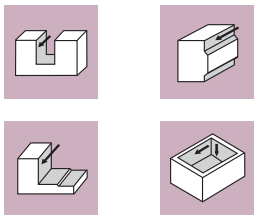
Code No. E113F-Dc

Dc h10	Lc mm	L mm	d h6	TiAlN E113F
2.0	3	50	6	●
2.5	4	50	6	●
3.0	5	50	6	●
3.5	6	50	6	●
4.0	6	50	6	●
5.0	8	50	6	●
6.0	10	50	6	●
8.0	12	50	8	●
10.0	15	50	10	●





Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.60-100 fz.P161

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.60-100 fz.P161

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.50-80 fz.P161

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.30-60 fz.P161

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.20-40 fz.P161

GR.8 不銹鋼 Stainless Steel
Vc.30-60 fz.P161

GR.9 鑄鐵 Cast Iron
Vc.80-120 fz.P161

GR.11 銅 Copper
Vc.100-160 fz.P161

超微粒鎢鋼塗層通用立銑刀

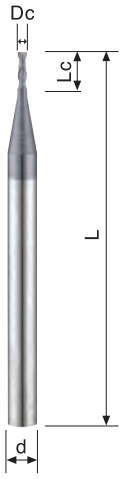
Universal End Mills

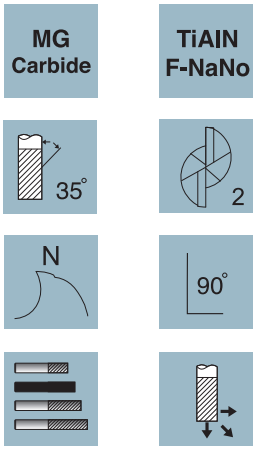
K P H < 48HRC

超硬汎用エンドミル

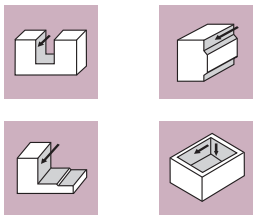
Code No. E102F-Dc

Dc h10	Lc mm	L mm	d h6	TiAlN E102F
0.2	0.5	38	3	●
0.3	0.8	38	3	●
0.4	1.0	38	3	●
0.5	1.2	38	3	●
0.6	1.5	38	3	●
0.7	1.8	38	3	●
0.8	2.0	38	3	●
0.9	2.5	38	3	●
1.0	3.0	38	3	●
1.1	3.0	38	3	●
1.2	4.0	38	3	●
1.3	4.0	38	3	●
1.4	4.0	38	3	●
1.5	5.0	38	3	●
1.6	5.0	38	3	●
1.7	5.0	38	3	●
1.8	5.0	38	3	●
1.9	5.0	38	3	●
2.0	6.0	38	3	●
2.1	6.0	38	3	●
2.2	6.0	38	3	●
2.3	6.0	38	3	●
2.4	8.0	38	3	●
2.5	8.0	38	3	●
2.6	8.0	38	3	●
2.7	8.0	38	3	●
2.8	8.0	38	3	●
2.9	8.0	38	3	●
3.0	8.0	38	3	●
3.0A	8.0	50	3	●





Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-120 fz.P161

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-120 fz.P161

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-100 fz.P161

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.40-80 fz.P161

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.30-60 fz.P161

GR.8 不銹鋼 Stainless Steel
Vc.40-60 fz.P161

GR.9 鑄鐵 Cast Iron
Vc.100-140 fz.P161

GR.11 銅 Copper
Vc.120-180 fz.P161

超微粒鎢鋼塗層通用立銑刀

Universal End Mills

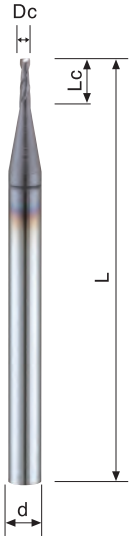
K P H < 48HRC

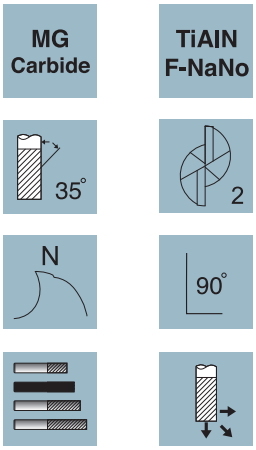
Universal

超硬汎用エンドミル

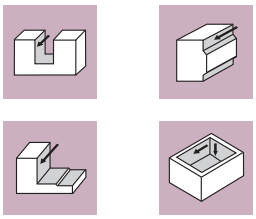
Code No. E112F-Dc

Dc h10	Lc mm	L mm	d h6	TiAlN E112F
0.2	0.5	50	4	●
0.3	0.8	50	4	●
0.4	1.0	50	4	●
0.5	1.2	50	4	●
0.6	1.5	50	4	●
0.7	1.8	50	4	●
0.8	2.0	50	4	●
0.9	2.5	50	4	●
1.0	3.0	50	4	●
1.1	3.0	50	4	●
1.2	4.0	50	4	●
1.3	4.0	50	4	●
1.4	4.0	50	4	●
1.5	5.0	50	4	●
1.6	5.0	50	4	●
1.7	5.0	50	4	●
1.8	5.0	50	4	●
1.9	5.0	50	4	●
2.0	6.0	50	4	●
2.1	6.0	50	4	●
2.2	6.0	50	4	●
2.3	6.0	50	4	●
2.4	8.0	50	4	●
2.5	8.0	50	4	●
2.6	8.0	50	4	●
2.7	8.0	50	4	●
2.8	8.0	50	4	●
2.9	8.0	50	4	●
3.0	8.0	50	4	●
3.1	10.0	50	4	●
3.2	10.0	50	4	●
3.3	10.0	50	4	●
3.4	10.0	50	4	●
3.5	10.0	50	4	●
3.6	10.0	50	4	●
3.7	10.0	50	4	●
3.8	11.0	50	4	●
3.9	11.0	50	4	●
4.0	11.0	50	4	●
4.1	11.0	50	5	●
4.2	11.0	50	5	●
4.3	11.0	50	5	●
4.4	11.0	50	5	●
4.5	11.0	50	5	●
4.6	11.0	50	5	●
4.7	11.0	50	5	●
4.8	13.0	50	5	●
4.9	13.0	50	5	●
5.0	13.0	50	5	●
5.1	13.0	50	6	●
5.2	13.0	50	6	●
5.3	13.0	50	6	●
5.4	13.0	50	6	●
5.5	13.0	50	6	●
5.6	16.0	50	6	●
5.7	16.0	50	6	●
5.8	16.0	50	6	●
5.9	16.0	50	6	●
6.0	16.0	50	6	●
6.0A	20.0	60	6	●





Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	●	○	

GR.1 非合金鋼鐵 **Non-alloyed steel**
Vc.80-120 fz.P161

GR.2 低合金鋼鐵<24HRC **Low-alloyed Steel**
Vc.80-120 fz.P161

GR.3 高合金鋼鐵<30HRC **Hi-alloyed Steel**
Vc.60-100 fz.P161

GR.4 硬化鋼30~38HRC **Hardened Steel**
Vc.40-80 fz.P161

GR.5 硬化鋼38~48HRC **Hardened Steel**
Vc.30-60 fz.P161

GR.8 不銹鋼 **Stainless Steel**
Vc.40-60 fz.P161

GR.9 鑄鐵 **Cast Iron**
Vc.100-140 fz.P161

GR.11 銅 **Copper**
Vc.120-180 fz.P161

超微粒鎢鋼塗層通用立銑刀

Universal End Mills

K P H < 48HRC

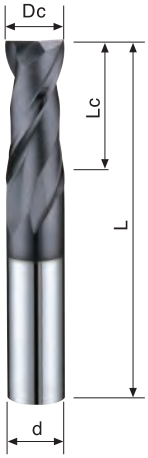
超硬汎用エンドミル

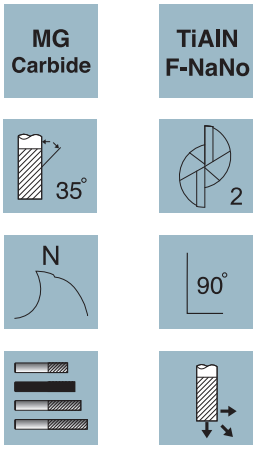
Code No. E122F-Dc

Dc h10	Lc mm	L mm	d h6	TiAlN E122F
1.0	3	50	4	●
1.5	5	50	4	●
2.0	6	50	4	●
2.5	8	50	4	●
3.0A	8	50	4	●
4.0A	11	50	4	●
3.0	8	50	6	●
3.5	10	50	6	●
4.0	11	50	6	●
4.5	11	50	6	●
5.0	13	50	6	●
5.5	13	50	6	●
6.0	16	50	6	●
6.5	16	60	8	●
7.0	20	60	8	●
7.5	20	60	8	●
8.0	20	60	8	●
8.5	20	72	10	●
9.0	22	72	10	●
9.5	22	72	10	●
10.0	22	72	10	●
10.5	26	75	12	●
11.0	26	75	12	●
12.0	26	75	12	●
13.0	32	90	16	●
14.0	32	90	16	●
15.0	32	90	16	●
16.0	38	100	16	●
17.0	38	100	20	●
18.0	38	100	20	●
19.0	38	100	20	●
20.0	38	100	20	●

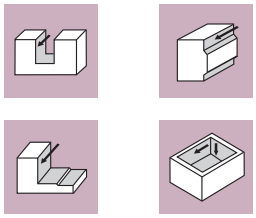
Code No. E122F-Dc

Dc h10	Lc mm	L mm	d h6	TiAlN E122F
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	●





Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-120 fz.P161

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-120 fz.P161

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-100 fz.P161

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.40-80 fz.P161

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.30-60 fz.P161

GR.8 不銹鋼 Stainless Steel
Vc.40-60 fz.P161

GR.9 鑄鐵 Cast Iron
Vc.100-140 fz.P161

GR.11 銅 Copper
Vc.120-180 fz.P161

超微粒鎢鋼塗層通用立銑刀

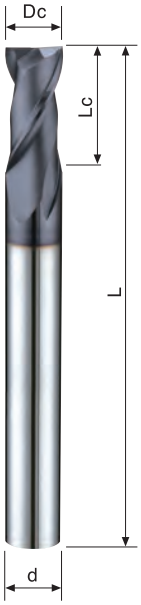
Universal End Mills

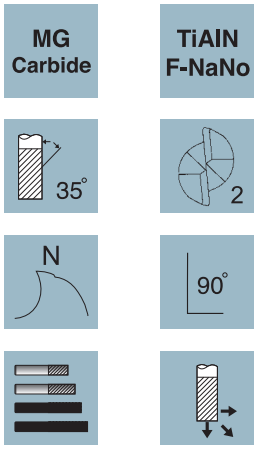
K P H < 48HRC

超硬汎用エンドミル

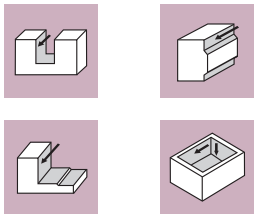
Code No. E125F-Dc

Dc h10	Lc mm	L mm	d h6	TiAlN E125F
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	●
11	35	110	12	●
12	35	110	12	●
14	40	120	16	●
16	50	140	16	●
20	55	160	20	●



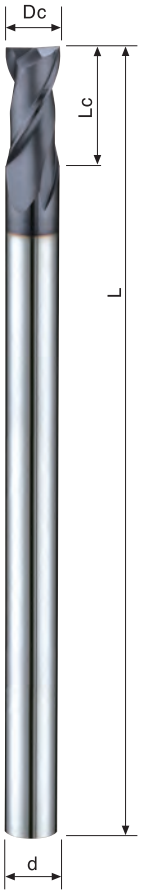


Type of Operation



Code No. E127F-Dc

Dc h10	Lc mm	L mm	d h6	TiAlN E127F
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	35	180	12	●
16	50	210	16	●
20	55	210	20	●



Work Material

P	H	M	K	N	S
●	●	○	●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.60-100 fz.P161

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.60-100 fz.P161

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.50-80 fz.P161

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.30-60 fz.P161

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.20-40 fz.P161

GR.8 不銹鋼 Stainless Steel
Vc.30-60 fz.P161

GR.9 鑄鐵 Cast Iron
Vc.80-120 fz.P161

GR.11 銅 Copper
Vc.100-160 fz.P161

極超微粒鎢鋼塗層通用立銑刀

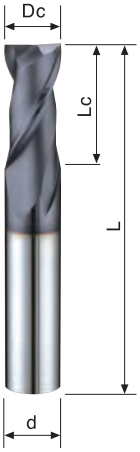
Universal End Mills

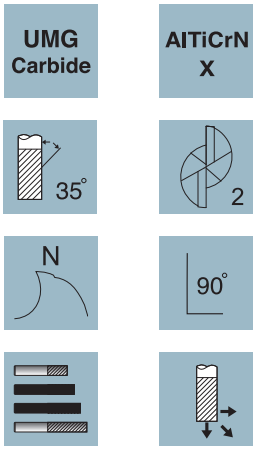
P H < 56HRC

極超硬汎用エンドミル

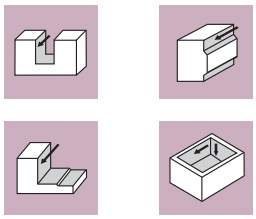
Code No. E162X-Dc

Dc h10	Lc mm	L mm	d h6	AlTiCrN E162X
0.3	0.8	50	4	●
0.4	1.0	50	4	●
0.5	1.2	50	4	●
0.6	1.5	50	4	●
0.8	2.0	50	4	●
1.0	3.0	50	4	●
1.5	5.0	50	4	●
2.0	6.0	50	4	●
2.5	8.0	50	4	●
3.0 A	8.0	50	4	●
4.0 A	11.0	50	4	●
3.0	8.0	50	6	●
3.5	10.0	50	6	●
4.0	11.0	50	6	●
4.5	11.0	50	6	●
5.0	13.0	50	6	●
5.5	13.0	50	6	●
6.0	16.0	50	6	●
7.0	20.0	60	8	●
8.0	20.0	60	8	●
9.0	22.0	72	10	●
10.0	22.0	72	10	●
11.0	26.0	75	12	●
12.0	26.0	75	12	●
14.0	32.0	90	16	●
16.0	38.0	100	16	●
18.0	38.0	100	20	●
20.0	38.0	100	20	●





Type of Operation



Work Material

P	H	M	K	N	S
●	●		○		

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.100-120 fz.P161

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.100-120 fz.P161

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.80-100 fz.P161

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.60-80 fz.P161

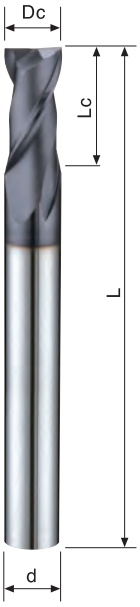
GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-60 fz.P161

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.25-40 fz.P161

GR.9 鑄鐵 Cast Iron
Vc.120-140 fz.P161

Code No. E163X-Dc

Dc h10	Lc mm	L mm	d h6	AlTiCrN E163X
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	●
11	35	110	12	●
12	35	110	12	●
14	40	120	16	●
16	50	140	16	●
20	55	160	20	●



超微粒鎢鋼塗層90°倒角銑刀

Chamfering Mills

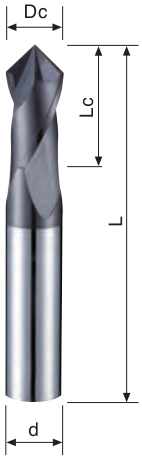
N K P H < 48HRC

Universal

超硬面取り・V溝用エンドミル

Code No. E107X-Dc

Dc h10	Lc mm	L mm	d h6	AlTiCrN E107X
3	6	50	3	●
4	8	50	4	●
6	12	50	6	●
8	16	60	8	●
10	20	72	10	●
12	24	75	12	●



MG Carbide

AlTiCrN X

30°

2

N

90°

Type of Operation

Work Material

P	H	M	K	N	S
●	●	○	●	●	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-100 fz.P161

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-100 fz.P161

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.70-90 fz.P161

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.70-90 fz.P161

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.50-70 fz.P161

GR.8 不銹鋼 Stainless Steel
Vc.60-80 fz.P161

GR.9 鑄鐵 Cast Iron
Vc.80-100 fz.P161

GR.10 鋁 Aluminium
Vc.120-150 fz.P161

GR.11 銅 Copper
Vc.100-120 fz.P161

7leaders™

The Art of Cutting

精加工立銑刀　Finishing End Mills　仕上げ用エンドミル

形状 Appearance	訂購編號 Code-No	明細 Specification			被切削材 Work Material						頁次 Page
					P	H	M	K	N	S	
	E174	MG Carbide	Uncoated Blank	30°	●			○	●		P15、17
	E184 E186	MG Carbide	Uncoated Blank	30°	●			○	●		P16、17
	E188	MG Carbide	Uncoated Blank	30°	●			○	●		P16
	E104F	MG Carbide	TiAlN F-NaNo	35°	●	●	○	●	○		P18
	E114F	MG Carbide	TiAlN F-NaNo	35°	●	●	○	●	○		P19
	E124F	MG Carbide	TiAlN F-NaNo	35°	●	●	○	●	○		P20
	E126F E128F	MG Carbide	TiAlN F-NaNo	35°	●	●	○	●	○		P21
	E144X	MG Carbide	AlTiCrN X	45°	●	●	●	○			P22
	E146X	MG Carbide	AlTiCrN X	45°	●	●	●	○			P22
	E164X	UMG Carbide	AlTiCrN X	35°	●	●		○			P23
	E165X	UMG Carbide	AlTiCrN X	35°	●	●		○			P23
	E166EX	UMG Carbide	AlTiSiN EX	45°		●		○			P24
	E167EX	UMG Carbide	AlTiSiN EX	45°		●		○			P24

超微粒鎢鋼精加工立銑刀

Finishing End Mills

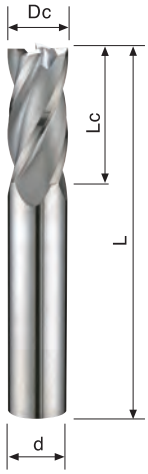
N P < 30HRC

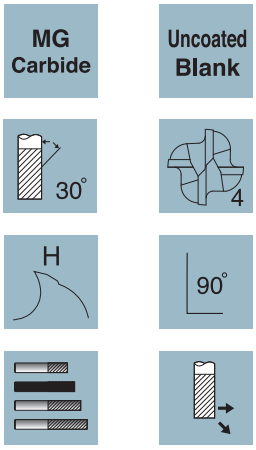
超硬仕上げ用エンドミル

Code No. E174-Dc

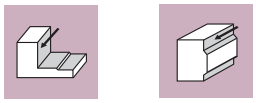
Dc h10	Lc mm	L mm	d h6	Blank E174	TiAlN E174F
1.0	3	38	3	●	○
1.5	5	38	3	●	○
2.0	6	38	3	●	○
2.5	7	38	3	●	○
3.0	9	38	3	●	○
3.5	12	50	4	●	○
4.0	14	50	4	●	○
4.5	14	50	5	●	○
5.0	16	50	5	●	○
5.5	16	50	6	●	○
6.0	20	63	6	●	○
6.5	20	63	8	●	○
7.0	20	63	8	●	○
7.5	20	63	8	●	○
8.0	20	63	8	●	○
8.5	22	72	10	●	○
9.0	22	72	10	●	○
9.5	22	72	10	●	○
10.0	22	72	10	●	○
11.0	26	75	12	●	○
12.0	26	75	12	●	○
13.0	32	89	14	●	○
14.0	32	89	14	●	○
15.0	32	89	16	●	○
16.0	32	89	16	●	○
17.0	38	100	18	●	○
18.0	38	100	18	●	○
20.0	38	100	20	●	○

○ 淺色：可訂購規格，無現貨
○ The light color: On request, no stock
○ 弊社又は代理店へお聞き下さい





Type of Operation



Work Material

P	H	M	K	N	S
●			○	●	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-100 fz.P162

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-100 fz.P162

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-80 fz.P162

GR.9 鑄鐵 Cast Iron
Vc.80-120 fz.P162

GR.10 鋁 Aluminium
Vc.150-200 fz.P162

GR.11 銅 Copper
Vc.100-150 fz.P162

GR.12 塑膠 Plastics
Vc.60-80 fz.P162

超微粒鎢鋼精加工立銑刀

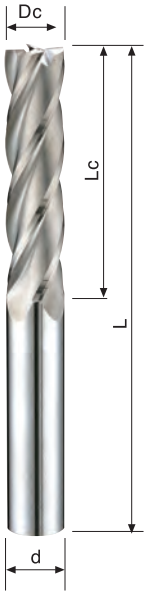
Finishing End Mills

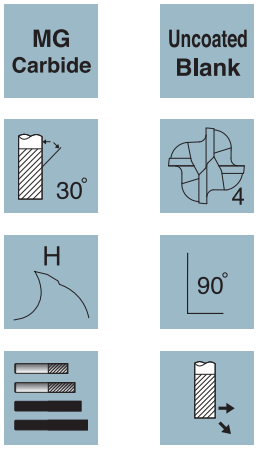
N P < 30HRC

超硬仕上げ用エンドミル

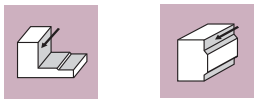
Code No. E184-Dc

Dc h10	Lc mm	L mm	d h6	Blank 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	●	○



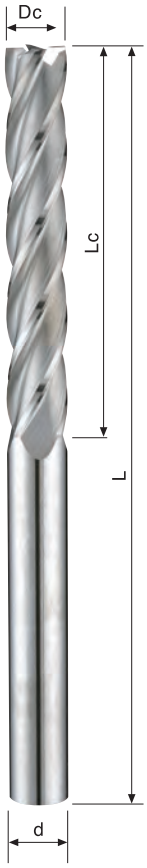


Type of Operation



Code No. E186-Dc

Dc h10	Lc mm	L mm	d h6	Blank 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	●	○



Work Material

P	H	M	K	N	S
●			○	●	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.60-80 fz.P162

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.60-80 fz.P162

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.30-60 fz.P162

GR.9 鑄鐵 Cast Iron
Vc.60-100 fz.P162

GR.10 鋁 Aluminium
Vc.120-150 fz.P162

GR.11 銅 Copper
Vc.80-120 fz.P162

GR.12 塑膠 Plastics
Vc.40-60 fz.P162

Code No. E188-Dc

Dc h10	Lc mm	L mm	d h6	Blank 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	●	○

○ 淺色：可訂購規格，無現貨
○ The light color: On request, no stock
○ 弊社又は代理店へお聞き下さい

超微粒鎢鋼精加工立銑刀

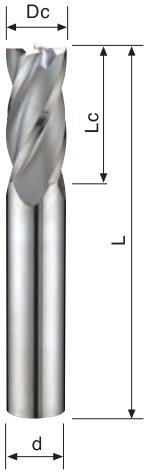
Finishing End Mills

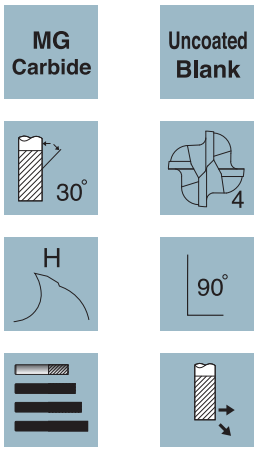
N P < 30HRC

超硬仕上げ用エンドミル

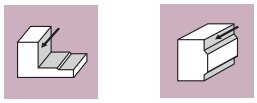
Code No. E174-Dc

Dc h10	Lc Inch	L Inch	d h6	Blank E174	TiAlN E174F
1/16	3/16	1-1/2	1/8	●	○
5/64	1/4	1-1/2	1/8	●	○
3/32	5/16	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	7/8	2-1/2	3/8	●	○
7/16	1	3	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	●	○





Type of Operation



Work Material

P	H	M	K	N	S
●			○	●	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.60-100 fz.P162

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.60-100 fz.P162

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.30-80 fz.P162

GR.9 鑄鐵 Cast Iron
Vc.60-120 fz.P162

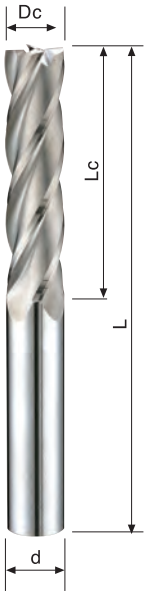
GR.10 鋁 Aluminium
Vc.120-200 fz.P162

GR.11 銅 Copper
Vc.80-150 fz.P162

GR.12 塑膠 Plastics
Vc.40-80 fz.P162

Code No. E184-Dc

Dc h10	Lc Inch	L Inch	d h6	Blank 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	●	○



Code No. E186-Dc

Dc h10	Lc Inch	L Inch	d h6	Blank 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	●	○

○ 淺色：可訂購規格，無現貨
○ The light color: On request, no stock
○ 弊社又は代理店へお聞き下さい

超微粒鎢鋼塗層精加工立銑刀

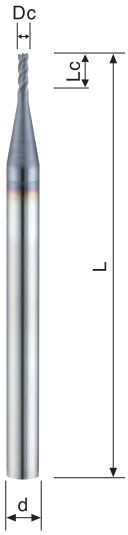
Finishing End Mills

K P H < 48HRC

超硬仕上げ用エンドミル

Code No. E104F-Dc

Dc h10	Lc mm	L mm	d h6	TiAlN E104F
1.0	3.0	38	3	●
1.1	3.0	38	3	●
1.2	4.0	38	3	●
1.3	4.0	38	3	●
1.4	4.0	38	3	●
1.5	5.0	38	3	●
1.6	5.0	38	3	●
1.7	5.0	38	3	●
1.8	5.0	38	3	●
1.9	5.0	38	3	●
2.0	6.0	38	3	●
2.1	6.0	38	3	●
2.2	6.0	38	3	●
2.3	6.0	38	3	●
2.4	8.0	38	3	●
2.5	8.0	38	3	●
2.6	8.0	38	3	●
2.7	8.0	38	3	●
2.8	8.0	38	3	●
2.9	8.0	38	3	●
3.0	8.0	38	3	●
3.0A	8.0	50	3	●



MG Carbide

TiAlN F-NaNo

35°

4

N

90°

Type of Operation

Work Material

P	H	M	K	N	S
●	●	○	●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-120 fz.P162

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-120 fz.P162

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-100 fz.P162

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.40-80 fz.P162

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.30-60 fz.P162

GR.8 不銹鋼 Stainless Steel
Vc.40-60 fz.P162

GR.9 鑄鐵 Cast Iron
Vc.100-140 fz.P162

GR.11 銅 Copper
Vc.120-180 fz.P162

超微粒鎢鋼塗層精加工立銑刀

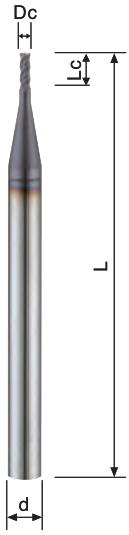
Finishing End Mills

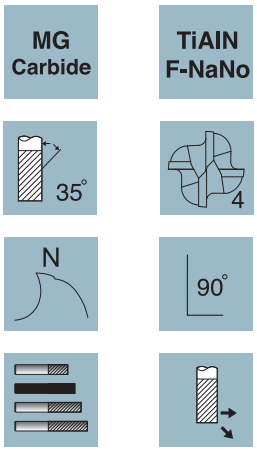
K P H < 48HRC

超硬仕上げ用エンドミル

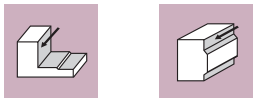
Code No. E114F-Dc

Dc h10	Lc mm	L mm	d h6	TiAlN E114F
1.0	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	●
2.0	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	●
3.0	8	50	4	●
3.1	10	50	4	●
3.2	10	50	4	●
3.3	10	50	4	●
3.4	10	50	4	●
3.5	10	50	4	●
3.6	10	50	4	●
3.7	10	50	4	●
3.8	11	50	4	●
3.9	11	50	4	●
4.0	11	50	4	●
4.1	11	50	5	●
4.2	11	50	5	●
4.3	11	50	5	●
4.4	11	50	5	●
4.5	11	50	5	●
4.6	11	50	5	●
4.7	11	50	5	●
4.8	13	50	5	●
4.9	13	50	5	●
5.0	13	50	5	●
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	●
6.0	16	50	6	●
6.0A	20	60	6	●





Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-120 fz.P162

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-120 fz.P162

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-100 fz.P162

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.40-80 fz.P162

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.30-60 fz.P162

GR.8 不銹鋼 Stainless Steel
Vc.40-60 fz.P162

GR.9 鑄鐵 Cast Iron
Vc.100-140 fz.P162

GR.11 銅 Copper
Vc.120-180 fz.P162

超微粒鎢鋼塗層精加工立銑刀

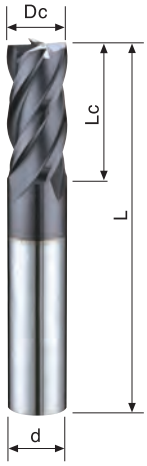
Finishing End Mills

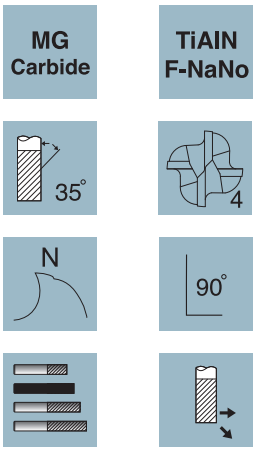
K P H < 48HRC

超硬仕上げ用エンドミル

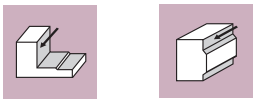
Code No. E124F-Dc

Dc h10	Lc mm	L mm	d h6	TiAlN E124F
1.0	3	50	4	●
1.5	5	50	4	●
2.0	6	50	4	●
2.5	8	50	4	●
3.0A	8	50	4	●
4.0A	11	50	4	●
3.0	8	50	6	●
3.5	10	50	6	●
4.0	11	50	6	●
4.5	11	50	6	●
5.0	13	50	6	●
5.5	13	50	6	●
6.0	16	50	6	●
6.5	16	60	8	●
7.0	20	60	8	●
7.5	20	60	8	●
8.0	20	60	8	●
8.5	20	72	10	●
9.0	22	72	10	●
9.5	22	72	10	●
10.0	22	72	10	●
10.5	26	75	12	●
11.0	26	75	12	●
12.0	26	75	12	●
13.0	32	90	16	●
14.0	32	90	16	●
15.0	32	90	16	●
16.0	38	100	16	●
17.0	38	100	20	●
18.0	38	100	20	●
19.0	38	100	20	●
20.0	38	100	20	●





Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-120 fz.P162

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-120 fz.P162

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-100 fz.P162

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.40-80 fz.P162

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.30-60 fz.P162

GR.8 不銹鋼 Stainless Steel
Vc.40-60 fz.P162

GR.9 鑄鐵 Cast Iron
Vc.100-140 fz.P162

GR.11 銅 Copper
Vc.120-180 fz.P162

Code No. E124F-Dc

Dc h10		Lc mm	L mm	d h6	TiAlN E124F
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	●

超微粒鎢鋼塗層精加工立銑刀

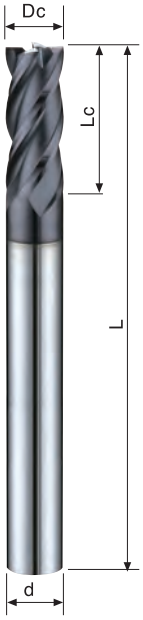
Finishing End Mills

K P H < 48HRC

超硬仕上げ用エンドミル

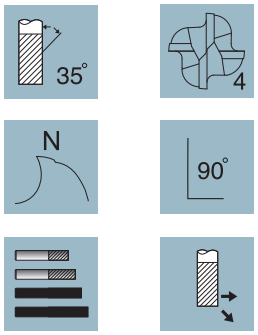
Code No. E126F-Dc

Dc h10	Lc mm	L mm	d h6	TiAlN E126F
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	●
11	35	110	12	●
12	35	110	12	●
14	40	120	16	●
16	50	140	16	●
20	55	160	20	●

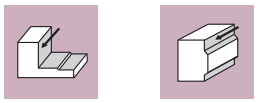


MG Carbide

TiAlN F-NaNo



Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.60-100 fz.P162

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.60-100 fz.P162

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.50-80 fz.P162

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.30-60 fz.P162

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.20-40 fz.P162

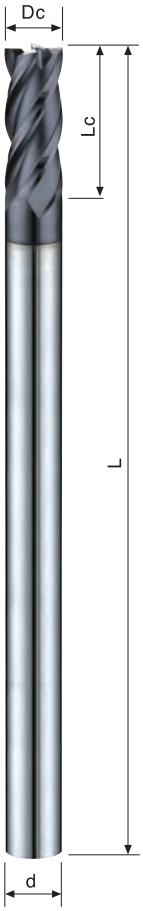
GR.8 不銹鋼 Stainless Steel
Vc.30-60 fz.P162

GR.9 鑄鐵 Cast Iron
Vc.80-120 fz.P162

GR.11 銅 Copper
Vc.100-160 fz.P162

Code No. E128F-Dc

Dc h10	Lc mm	L mm	d h6	TiAlN E128F
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	35	180	12	●
16	50	210	16	●
20	55	210	20	●



超微粒鎢鋼塗層精加工立銑刀

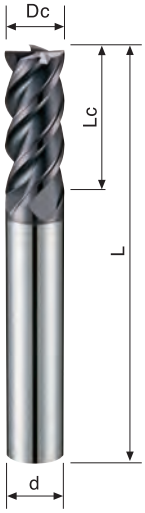
Finishing End Mills

M P H < 48HRC

超硬仕上げ用エンドミル

Code No. E144X-Dc

Dc h10	Lc mm	L mm	d h6	AlTiCrN E144X
1.0	3	50	4	●
1.5	5	50	4	●
2.0	6	50	4	●
2.5	8	50	4	●
3.0 A	8	50	4	●
4.0 A	11	50	4	●
3.0	8	50	6	●
4.0	11	50	6	●
5.0	13	50	6	●
6.0	16	50	6	●
7.0	20	60	8	●
8.0	20	60	8	●
9.0	25	72	10	●
10.0	25	72	10	●
12.0	30	75	12	●
14.0	40	100	16	●
16.0	45	100	16	●
20.0	50	110	20	●



MG Carbide

AlTiCrN X

45°

4

N

90°

Type of Operation

Work Material

P	H	M	K	N	S
●	●	●	○		

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-120 fz.P162

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-120 fz.P162

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-100 fz.P162

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.40-80 fz.P162

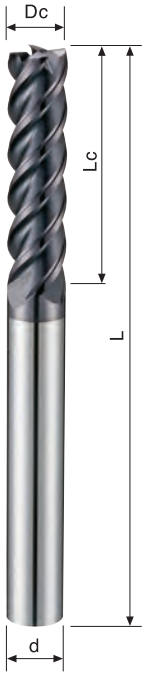
GR.5 硬化鋼38~48HRC Hardened Steel
Vc.30-60 fz.P162

GR.8 不銹鋼 Stainless Steel
Vc.40-80 fz.P162

GR.9 鑄鐵 Cast Iron
Vc.100-140 fz.P162

Code No. E146X-Dc

Dc h10	Lc mm	L mm	d h6	AlTiCrN E146X
3	15	80	4	●
4	20	80	4	●
5	25	100	6	●
6	30	100	6	●
8	35	100	8	●
10	40	100	10	●
12	45	110	12	●
14	55	150	16	●
16	60	150	16	●
20	65	150	20	●



極超微粒鎢鋼塗層精加工立銑刀

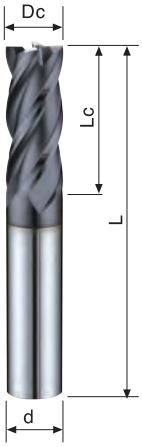
Finishing End Mills

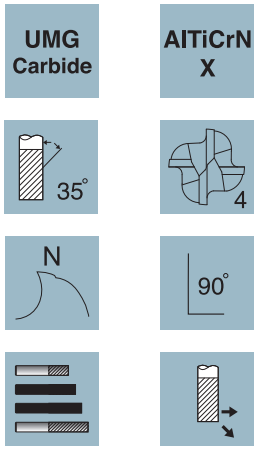
P H < 56HRC

極超硬仕上げ用エンドミル

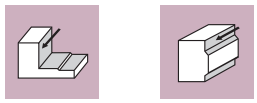
Code No. E164X-Dc

Dc h10	Lc mm	L mm	d h6	AlTiCrN E164X
1.0	3	50	4	●
1.5	5	50	4	●
2.0	6	50	4	●
2.5	8	50	4	●
3.0 A	8	50	4	●
4.0 A	11	50	4	●
3.0	8	50	6	●
3.5	10	50	6	●
4.0	11	50	6	●
4.5	11	50	6	●
5.0	13	50	6	●
5.5	13	50	6	●
6.0	16	50	6	●
7.0	20	60	8	●
8.0	20	60	8	●
9.0	22	72	10	●
10.0	22	72	10	●
11.0	26	75	12	●
12.0	26	75	12	●
14.0	32	90	16	●
16.0	38	100	16	●
18.0	38	100	20	●
20.0	38	100	20	●





Type of Operation



Work Material

P	H	M	K	N	S
●	●		○		

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.100-120 fz.P162

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.100-120 fz.P162

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.80-100 fz.P162

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.60-80 fz.P162

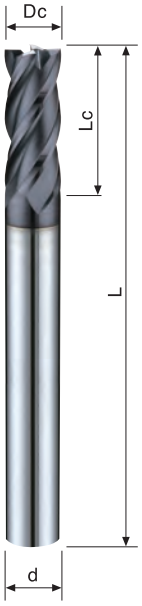
GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-60 fz.P162

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.25-40 fz.P162

GR.9 鑄鐵 Cast Iron
Vc.120-140 fz.P162

Code No. E165X-Dc

Dc h10	Lc mm	L mm	d h6	AlTiCrN E165X
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	●
11	35	110	12	●
12	35	110	12	●
14	40	120	16	●
16	50	140	16	●
20	55	160	20	●

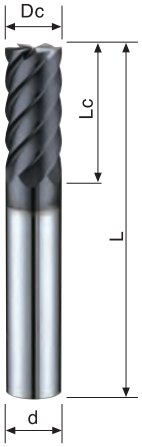


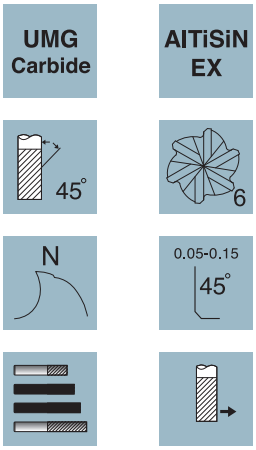
H 30-68HRC

極超硬仕上げ用エンドミル

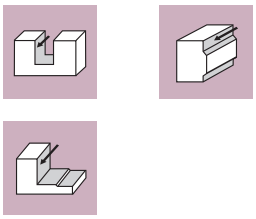
Code No. E166EX-Dc

Dc h10	Lc mm	L mm	d h6	NO.of Flute	AlTiSiN E166EX
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	●





Type of Operation



Work Material

P	H	M	K	N	S
	●		○		

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.120-140 fz.P162

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.100-120 fz.P162

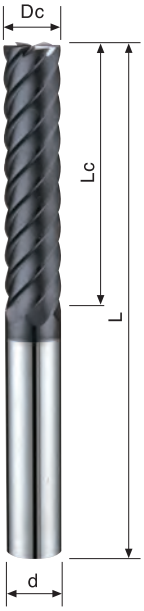
GR.6 硬化鋼48~56HRC Hardened Steel
Vc.80-100 fz.P162

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.50-80 fz.P162

GR.9 鑄鐵 Cast Iron
Vc.120-160 fz.P162

Code No. E167EX-Dc

Dc h10	Lc mm	L mm	d h6	NO.of Flute	AlTiSiN E167EX
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	●



7leaders™

The Art of Cutting

圓頭立銑刀　Ball Nose End Mills　ボールエンドミル

形状 Appearance	訂購編號 Code-No	明細 Specification			被切削材 Work Material						頁次 Page
					P	H	M	K	N	S	
	B212	MG Carbide	Uncoated Blank	30°	●			○	●		P27
	B280 B282	MG Carbide	Uncoated Blank	30°	●			○	●		P28
	B214	MG Carbide	Uncoated Blank	30°	●			○	●		P29
	B281 B284	MG Carbide	Uncoated Blank	30°	●			○	●		P30
	B202F	MG Carbide	TiAlN F-NaNo	30°	●	●	○	●	○		P31
	B221F	MG Carbide	TiAlN F-NaNo	30°	●	●	○	●	○		P32
	B222F	MG Carbide	TiAlN F-NaNo	30°	●	●	○	●	○		P33
	B232F B242F	MG Carbide	TiAlN F-NaNo	30°	●	●	○	●	○		P34
	B262X	UMG Carbide	AlTiCrN X	30°	●	●		○			P35
	B263X B264X	UMG Carbide	AlTiCrN X	30°	●	●		○			P36
	B251EX	UMG Carbide	AlTiSiN EX	25°		●					P37
	B261EX	UMG Carbide	AlTiSiN EX	15°		●		○			P38
	B254GX	UMG Carbide	AlTiSiN GX	30°		●		○			P39
	B250EX	UMG Carbide	AlTiSiN EX	30°	●	●		○			P40

Ball Nose

超微粒鎢鋼圓頭立銑刀

Ball Nose End Mills

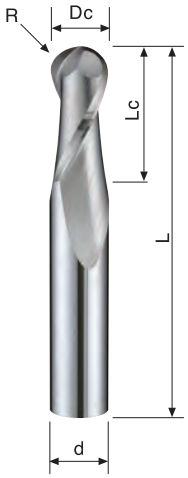
N P < 30HRC

超硬ボールエンドミル

Code No. B212-Dc

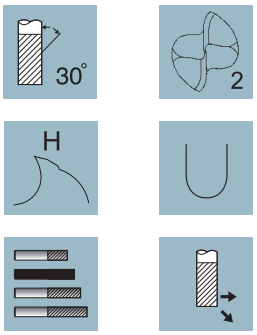
Dc h10	R ±0.01	Lc mm	L mm	d h6	Blank B212	TiAlN B212F
0.2	0.10R	0.4	38	3	●	○
0.3	0.15R	0.6	38	3	●	○
0.4	0.20R	0.8	38	3	●	○
0.5	0.25R	1.0	38	3	●	○
0.6	0.30R	1.2	38	3	●	○
0.7	0.35R	1.4	38	3	●	○
0.8	0.40R	1.6	38	3	●	○
0.9	0.45R	2.0	38	3	●	○
1.0	0.50R	3.0	38	3	●	○
1.5	0.75R	5.0	38	3	●	○
2.0	1.00R	6.0	38	3	●	○
2.5	1.25R	7.0	38	3	●	○
3.0	1.50R	9.0	38	3	●	○
3.5	1.75R	12.0	50	4	●	○
4.0	2.00R	14.0	50	4	●	○
4.5	2.25R	16.0	50	5	●	○
5.0	2.50R	16.0	50	5	●	○
5.5	2.75R	16.0	50	6	●	○
6.0	3.00R	20.0	63	6	●	○
6.5	3.25R	20.0	63	8	●	○
7.0	3.50R	20.0	63	8	●	○
7.5	3.75R	20.0	63	8	●	○
8.0	4.00R	20.0	63	8	●	○
8.5	4.25R	22.0	72	10	●	○
9.0	4.50R	22.0	72	10	●	○
9.5	4.75R	22.0	72	10	●	○
10.0	5.00R	22.0	72	10	●	○
11.0	5.50R	26.0	75	12	●	○
12.0	6.00R	26.0	75	12	●	○
13.0	6.50R	32.0	89	14	●	○
14.0	7.00R	32.0	89	14	●	○
15.0	7.50R	32.0	89	16	●	○
16.0	8.00R	32.0	89	16	●	○
17.0	8.50R	38.0	100	18	●	○
18.0	9.00R	38.0	100	18	●	○
20.0	10.00R	38.0	100	20	●	○

○ 淺色：可訂購規格，無現貨
○ The light color: On request, no stock
○ 弊社又は代理店へお聞き下さい

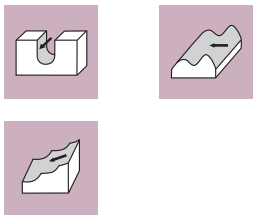


MG Carbide

Uncoated Blank



Type of Operation



Work Material

P	H	M	K	N	S
●			○	●	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-120 fz.P163-4

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-120 fz.P163-4

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-100 fz.P163-4

GR.9 鑄鐵 Cast Iron
Vc.100-140 fz.P163-4

GR.10 鋁 Aluminium
Vc.180-300 fz.P163-4

GR.11 銅 Copper
Vc.120-160 fz.P163-4

GR.12 塑膠 Plastics
Vc.80-120 fz.P163-4

超微粒鎢鋼圓頭立銑刀

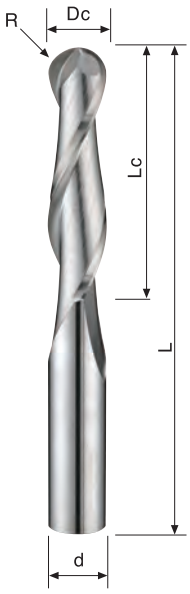
Ball Nose End Mills

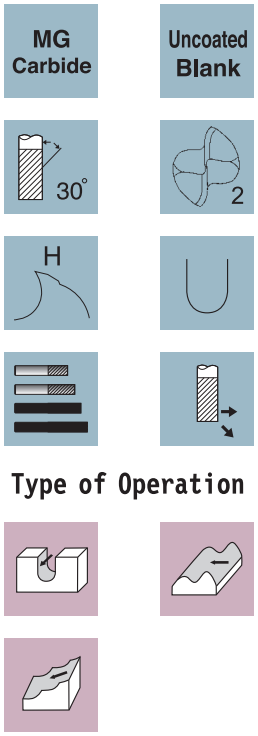
N P < 30HRC

超硬ボールエンドミル

Code No. B280-Dc

Dc h10	R ±0.01	Lc mm	L mm	d h6	Blank B280	TiAlN B280F
3	1.5R	20	57	3	●	○
4	2.0R	20	57	4	●	○
5	2.5R	25	63	5	●	○
6	3.0R	28	75	6	●	○
7	3.5R	30	75	8	●	○
8	4.0R	30	75	8	●	○
9	4.5R	32	75	10	●	○
10	5.0R	32	75	10	●	○
12	6.0R	50	100	12	●	○
14	7.0R	57	127	14	●	○
16	8.0R	57	127	16	●	○
20	10.0R	57	127	20	●	○

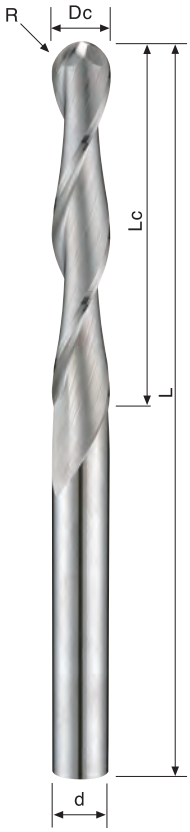




Code No. B282-Dc

Dc h10	R ±0.01	Lc mm	L mm	d h6	Blank B282	TiAlN B282F
3	1.5R	25	75	3	●	○
4	2.0R	28	75	4	●	○
5	2.5R	32	75	5	●	○
6	3.0R	38	100	6	●	○
8	4.0R	42	100	8	●	○
10	5.0R	45	100	10	●	○
12	6.0R	75	150	12	●	○
14	7.0R	80	150	14	●	○
16	8.0R	80	150	16	●	○
20	10.0R	80	150	20	●	○

○ 淺色：可訂購規格，無現貨
○ The light color: On request, no stock
○ 弊社又は代理店へお聞き下さい



Work Material

P	H	M	K	N	S
●			○	●	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.60-100 fz.P163-4

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.60-100 fz.P163-4

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.40-80 fz.P163-4

GR.9 鑄鐵 Cast Iron
Vc.80-120 fz.P163-4

GR.10 鋁 Aluminium
Vc.150-200 fz.P163-4

GR.11 銅 Copper
Vc.100-120 fz.P163-4

GR.12 塑膠 Plastics
Vc.60-100 fz.P163-4

超微粒鎢鋼圓頭立銑刀

Ball Nose End Mills

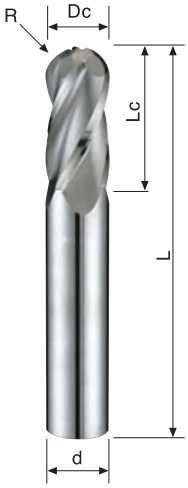
N P < 30HRC

超硬ボールエンドミル

Code No. B214-Dc

Dc h10	R ±0.01	Lc mm	L mm	d h6	Blank B214	TiAlN B214F
1.0	0.50R	3	38	3	●	○
1.5	0.75R	5	38	3	●	○
2.0	1.00R	6	38	3	●	○
2.5	1.25R	7	38	3	●	○
3.0	1.50R	9	38	3	●	○
3.5	1.75R	12	50	4	●	○
4.0	2.00R	14	50	4	●	○
4.5	2.25R	16	50	5	●	○
5.0	2.50R	16	50	5	●	○
5.5	2.75R	16	50	6	●	○
6.0	3.00R	20	63	6	●	○
6.5	3.25R	20	63	8	●	○
7.0	3.50R	20	63	8	●	○
7.5	3.75R	20	63	8	●	○
8.0	4.00R	20	63	8	●	○
8.5	4.25R	22	72	10	●	○
9.0	4.50R	22	72	10	●	○
9.5	4.75R	22	72	10	●	○
10.0	5.00R	22	72	10	●	○
11.0	5.50R	26	75	12	●	○
12.0	6.00R	26	75	12	●	○
13.0	6.50R	32	89	14	●	○
14.0	7.00R	32	89	14	●	○
15.0	7.50R	32	89	16	●	○
16.0	8.00R	32	89	16	●	○
17.0	8.50R	38	100	18	●	○
18.0	9.00R	38	100	18	●	○
20.0	10.00R	38	100	20	●	○

○ 淺色：可訂購規格，無現貨
○ The light color: On request, no stock
○ 弊社又は代理店へお聞き下さい



MG Carbide

Uncoated Blank

30°

4

H

Type of Operation

Work Material

P	H	M	K	N	S
●			○	●	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-120 fz.P163-4

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-120 fz.P163-4

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-100 fz.P163-4

GR.9 鑄鐵 Cast Iron
Vc.100-140 fz.P163-4

GR.10 鋁 Aluminium
Vc.180-300 fz.P163-4

GR.11 銅 Copper
Vc.120-160 fz.P163-4

GR.12 塑膠 Plastics
Vc.80-120 fz.P163-4

超微粒鎢鋼圓頭立銑刀

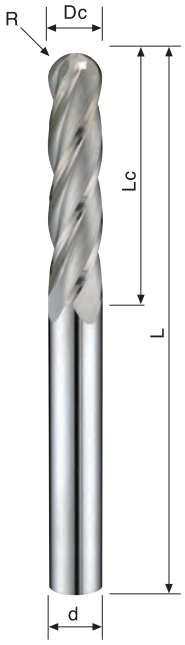
Ball Nose End Mills

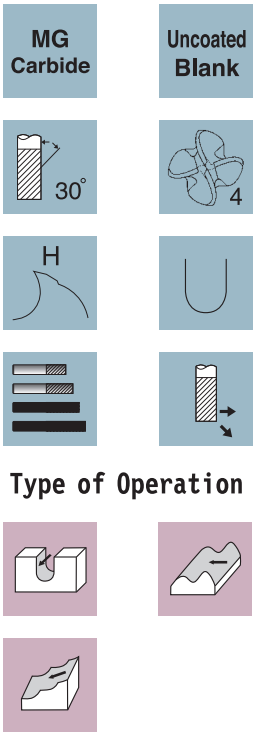
N P < 30HRC

超硬ボールエンドミル

Code No. B281-Dc

Dc h10	R ±0.01	Lc mm	L mm	d h6	Blank B281	TiAlN B281F
3	1.5R	20	57	3	●	○
4	2.0R	20	57	4	●	○
5	2.5R	25	63	5	●	○
6	3.0R	28	75	6	●	○
7	3.5R	30	75	8	●	○
8	4.0R	30	75	8	●	○
9	4.5R	32	75	10	●	○
10	5.0R	32	75	10	●	○
12	6.0R	50	100	12	●	○
14	7.0R	57	127	14	●	○
16	8.0R	57	127	16	●	○
20	10.0R	57	127	20	●	○

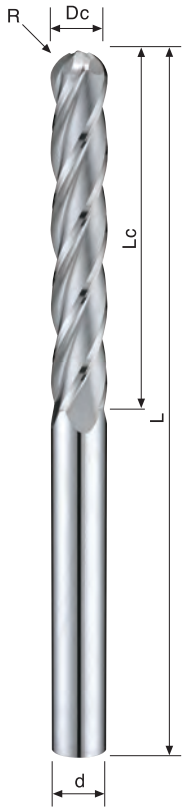




Code No. B284-Dc

Dc h10	R ±0.01	Lc mm	L mm	d h6	Blank B284	TiAlN B284F
3	1.5R	25	75	3	●	○
4	2.0R	28	75	4	●	○
5	2.5R	32	75	5	●	○
6	3.0R	38	100	6	●	○
8	4.0R	42	100	8	●	○
10	5.0R	45	100	10	●	○
12	6.0R	75	150	12	●	○
14	7.0R	80	150	14	●	○
16	8.0R	80	150	16	●	○
20	10.0R	80	150	20	●	○

○ 淺色：可訂購規格，無現貨
○ The light color: On request, no stock
○ 弊社又は代理店へお聞き下さい



Work Material

P	H	M	K	N	S
●			○	●	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.60-100 fz.P163-4

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.60-100 fz.P163-4

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.40-80 fz.P163-4

GR.9 鑄鐵 Cast Iron
Vc.80-120 fz.P163-4

GR.10 鋁 Aluminium
Vc.150-200 fz.P163-4

GR.11 銅 Copper
Vc.100-120 fz.P163-4

GR.12 塑膠 Plastics
Vc.60-100 fz.P163-4

超微粒鎢鋼塗層圓頭立銑刀

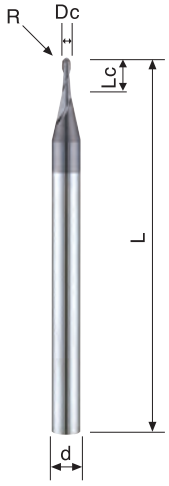
Ball Nose End Mills

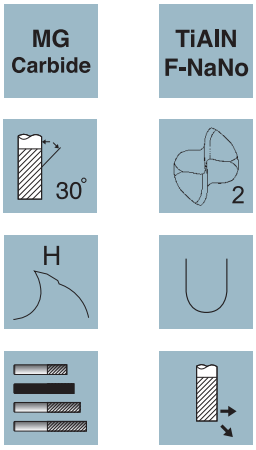
K P H < 48HRC

超硬ボールエンドミル

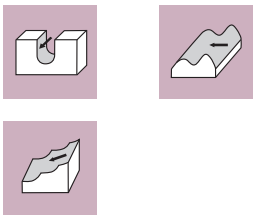
Code No. B202F-DC

Dc h10	R ±0.01	Lc mm	L mm	d h6	TiAlN B202F
0.2	0.10R	0.4	38	3	●
0.3	0.15R	0.6	38	3	●
0.4	0.20R	0.8	38	3	●
0.5	0.25R	1.0	38	3	●
0.6	0.30R	1.2	38	3	●
0.7	0.35R	1.4	38	3	●
0.8	0.40R	1.6	38	3	●
0.9	0.45R	1.8	38	3	●
1.0	0.50R	2.0	38	3	●
1.1	0.55R	2.2	38	3	●
1.2	0.60R	2.4	38	3	●
1.4	0.70R	2.8	38	3	●
1.5	0.75R	3.0	38	3	●
1.6	0.80R	3.2	38	3	●
1.8	0.90R	3.6	38	3	●
2.0	1.00R	4.0	38	3	●
2.5	1.25R	5.0	38	3	●
3.0	1.50R	6.0	38	3	●
3.0A	1.50R	6.0	50	3	●





Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.100-140 fz.P163-4

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.100-140 fz.P163-4

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.80-120 fz.P163-4

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.70-100 fz.P163-4

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.50-80 fz.P163-4

GR.8 不銹鋼 Stainless Steel
Vc.60-90 fz.P163-4

GR.9 鑄鐵 Cast Iron
Vc.120-160 fz.P163-4

GR.11 銅 Copper
Vc.140-200 fz.P163-4

超微粒鎢鋼塗層圓頭立銑刀

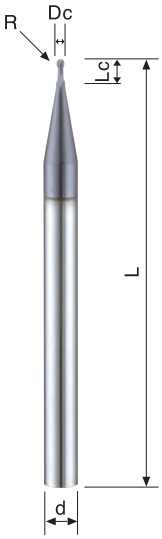
Ball Nose End Mills

K P H < 48HRC

超硬ボールエンドミル

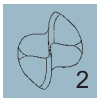
Code No. B221F-Dc

Dc h10	R ±0.01	Lc mm	L mm	d h6	TiAlN B221F
0.2	0.10R	0.4	50	4	●
0.3	0.15R	0.6	50	4	●
0.4	0.20R	0.8	50	4	●
0.5	0.25R	1.0	50	4	●
0.6	0.30R	1.2	50	4	●
0.7	0.35R	1.4	50	4	●
0.8	0.40R	1.6	50	4	●
0.9	0.45R	1.8	50	4	●
1.0	0.50R	2.0	50	4	●
1.1	0.55R	2.2	50	4	●
1.2	0.60R	2.4	50	4	●
1.4	0.70R	2.8	50	4	●
1.5	0.75R	3.0	50	4	●
1.6	0.80R	3.2	50	4	●
1.8	0.90R	3.6	50	4	●
2.0	1.00R	4.0	50	4	●
2.5	1.25R	5.0	50	4	●
3.0	1.50R	6.0	50	4	●
3.5	1.75R	8.0	50	4	●
4.0	2.00R	8.0	50	4	●
4.5	2.25R	10.0	50	5	●
5.0	2.50R	10.0	50	5	●
5.5	2.75R	12.0	50	6	●
6.0	3.00R	12.0	50	6	●
6.0A	3.00R	12.0	60	6	●

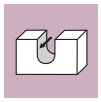


MG Carbide

TiAlN F-NaNo



Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.100-140 fz.P163-4

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.100-140 fz.P163-4

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.80-120 fz.P163-4

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.70-100 fz.P163-4

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.50-80 fz.P163-4

GR.8 不銹鋼 Stainless Steel
Vc.60-90 fz.P163-4

GR.9 鑄鐵 Cast Iron
Vc.120-160 fz.P163-4

GR.11 銅 Copper
Vc.140-200 fz.P163-4

超微粒鎢鋼塗層圓頭立銑刀

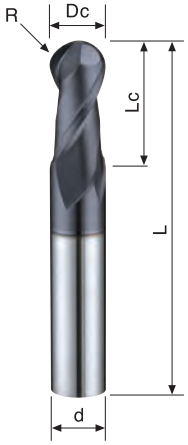
Ball Nose End Mills

K P H < 48HRC

超硬ボールエンドミル

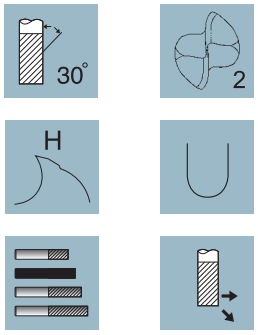
Code No. B222F-Dc

Dc h10	R ±0.01	Lc mm	L mm	d h6	TiAlN B222F
1.0	0.50R	2	50	4	●
1.5	0.75R	3	50	4	●
2.0	1.00R	4	50	4	●
2.5	1.25R	5	50	4	●
3.0A	1.50R	6	50	4	●
4.0A	2.00R	8	50	4	●
3.0	1.50R	6	50	6	●
3.5	1.75R	8	50	6	●
4.0	2.00R	8	50	6	●
4.5	2.25R	10	50	6	●
5.0	2.50R	10	50	6	●
5.5	2.75R	12	50	6	●
6.0	3.00R	12	50	6	●
6.5	3.25R	14	60	8	●
7.0	3.50R	14	60	8	●
7.5	3.75R	14	60	8	●
8.0	4.00R	14	60	8	●
8.5	4.25R	18	72	10	●
9.0	4.50R	18	72	10	●
9.5	4.75R	18	72	10	●
10.0	5.00R	18	72	10	●
11.0	5.50R	22	75	12	●
12.0	6.00R	22	75	12	●
13.0	6.50R	26	90	16	●
14.0	7.00R	26	90	16	●
15.0	7.50R	30	90	16	●
16.0	8.00R	30	100	16	●
17.0	8.50R	34	100	20	●
18.0	9.00R	34	100	20	●
19.0	9.50R	38	100	20	●
20.0	10.00R	38	100	20	●

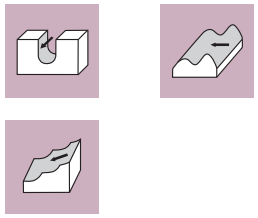


MG Carbide

TiAlN F-NaNo



Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.100-140 fz.P163-4

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.100-140 fz.P163-4

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.80-120 fz.P163-4

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.70-100 fz.P163-4

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.50-80 fz.P163-4

GR.8 不銹鋼 Stainless Steel
Vc.60-90 fz.P163-4

GR.9 鑄鐵 Cast Iron
Vc.120-160 fz.P163-4

GR.11 銅 Copper
Vc.140-200 fz.P163-4

超微粒鎢鋼塗層圓頭立銑刀

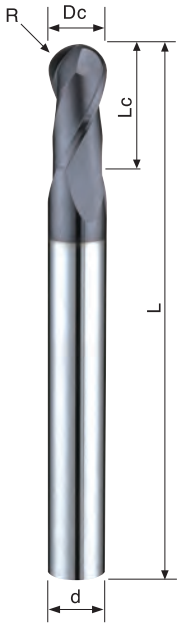
Ball Nose End Mills

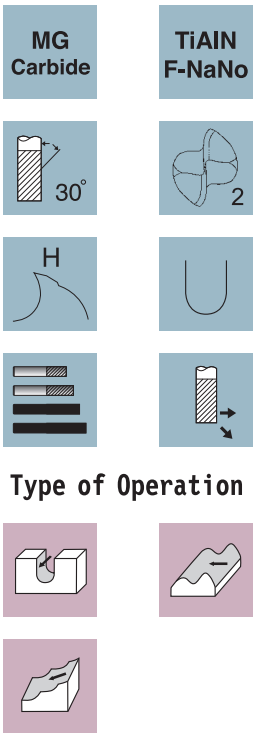
K P H < 48HRC

超硬ボールエンドミル

Code No. B232F-Dc

Dc h10	R ±0.01	Lc mm	L mm	d h6	TiAlN B232F
1.0	0.50R	2	50	6	●
1.5	0.75R	3	50	6	●
2.0	1.00R	4	60	6	●
2.5	1.25R	5	60	6	●
3.0	1.50R	6	70	6	●
4.0	2.00R	8	70	6	●
5.0	2.50R	10	80	6	●
6.0	3.00R	12	80	6	●
7.0	3.50R	14	100	8	●
8.0	4.00R	14	100	8	●
9.0	4.50R	18	100	10	●
10.0	5.00R	18	100	10	●
12.0	6.00R	22	110	12	●
14.0	7.00R	26	120	16	●
16.0	8.00R	30	140	16	●
20.0	10.00R	38	160	20	●

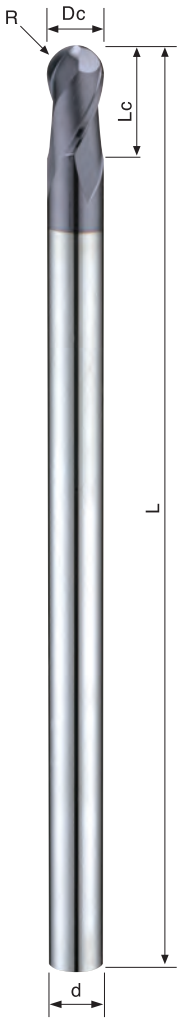




Type of Operation

Code No. B242F-Dc

Dc h10	R ±0.01	Lc mm	L mm	d h6	TiAlN B242F
1	0.5R	2	70	3	●
2	1.0R	4	70	3	●
3	1.5R	6	80	4	●
4	2.0R	8	80	4	●
5	2.5R	10	100	6	●
6	3.0R	12	100	6	●
8	4.0R	14	130	8	●
10	5.0R	18	160	10	●
12	6.0R	22	180	12	●
16	8.0R	30	210	16	●
20	10.0R	38	210	20	●



Work Material

P	H	M	K	N	S
●	●	○	●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-120 fz.P163-4

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-120 fz.P163-4

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-100 fz.P163-4

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.50-90 fz.P163-4

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-70 fz.P163-4

GR.8 不銹鋼 Stainless Steel
Vc.50-80 fz.P163-4

GR.9 鑄鐵 Cast Iron
Vc.100-140 fz.P163-4

GR.11 銅 Copper
Vc.120-180 fz.P163-4

極超微粒鎢鋼塗層圓頭立銑刀

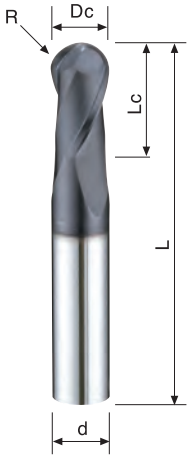
Ball Nose End Mills

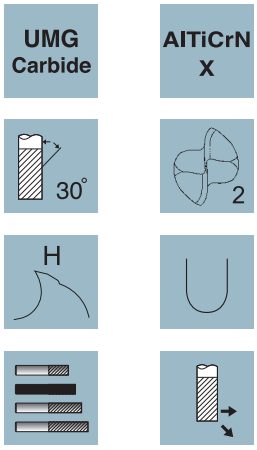
P H < 56HRC

極超硬ボールエンドミル

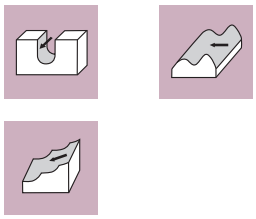
Code No. B262X-Dc

Dc h10	R ±0.01	Lc mm	L mm	d h6	AlTiCrN B262X
0.3	0.15R	0.6	50	4	●
0.4	0.20R	0.8	50	4	●
0.5	0.25R	1.0	50	4	●
0.6	0.30R	1.2	50	4	●
0.8	0.40R	1.6	50	4	●
1.0	0.50R	2.0	50	4	●
1.5	0.75R	3.0	50	4	●
2.0	1.00R	4.0	50	4	●
2.5	1.25R	5.0	50	4	●
3.0 A	1.50R	6.0	50	4	●
4.0 A	2.00R	8.0	50	4	●
3.0	1.50R	6.0	50	6	●
4.0	2.00R	8.0	50	6	●
5.0	2.50R	10.0	50	6	●
6.0	3.00R	12.0	50	6	●
7.0	3.50R	14.0	60	8	●
8.0	4.00R	14.0	60	8	●
9.0	4.50R	18.0	72	10	●
10.0	5.00R	18.0	72	10	●
12.0	6.00R	22.0	75	12	●
14.0	7.00R	26.0	90	16	●
16.0	8.00R	30.0	100	16	●
20.0	10.00R	38.0	100	20	●





Type of Operation



Work Material

P	H	M	K	N	S
●	●		○		

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.120-160 fz.P163-4

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.100-140 fz.P163-4

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.80-120 fz.P163-4

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.60-90 fz.P163-4

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.40-70 fz.P163-4

GR.9 鑄鐵 Cast Iron
Vc.140-180 fz.P163-4

極超微粒鎢鋼塗層圓頭立銑刀

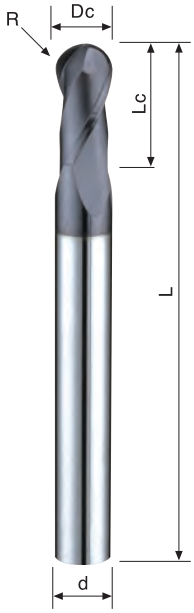
Ball Nose End Mills

P H < 56HRC

極超硬ボールエンドミル

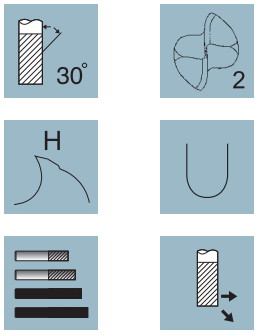
Code No. B263X-Dc

Dc h10	R ±0.01	Lc mm	L mm	d h6	AlTiCrN B263X
1.0	0.50R	2	50	6	●
1.5	0.75R	3	50	6	●
2.0	1.00R	4	60	6	●
2.5	1.25R	5	60	6	●
3.0	1.50R	6	70	6	●
4.0	2.00R	8	70	6	●
5.0	2.50R	10	80	6	●
6.0	3.00R	12	80	6	●
7.0	3.50R	14	100	8	●
8.0	4.00R	14	100	8	●
9.0	4.50R	18	100	10	●
10.0	5.00R	18	100	10	●
12.0	6.00R	22	110	12	●
14.0	7.00R	26	120	16	●
16.0	8.00R	30	140	16	●
20.0	10.00R	38	160	20	●

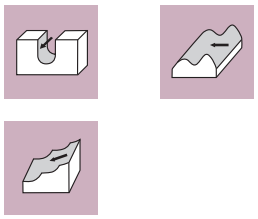


UMG Carbide

AlTiCrN X



Type of Operation



Work Material

P	H	M	K	N	S
●	●		○		

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.100-140 fz.P163-4

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.80-120 fz.P163-4

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.60-100 fz.P163-4

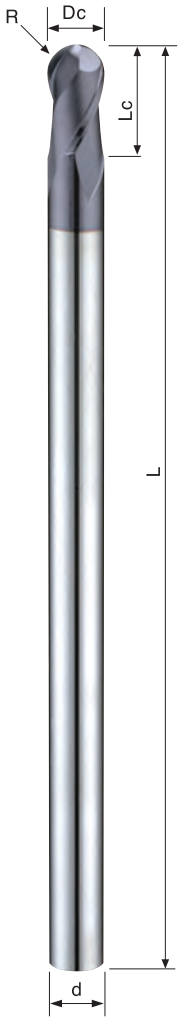
GR.5 硬化鋼38~48HRC Hardened Steel
Vc.50-80 fz.P163-4

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.30-60 fz.P163-4

GR.9 鑄鐵 Cast Iron
Vc.120-160 fz.P163-4

Code No. B264X-Dc

Dc h10	R ±0.01	Lc mm	L mm	d h6	AlTiCrN B264X
1	0.5R	2	70	3	●
2	1.0R	4	70	3	●
3	1.5R	6	80	4	●
4	2.0R	8	80	4	●
5	2.5R	10	100	6	●
6	3.0R	12	100	6	●
8	4.0R	14	130	8	●
10	5.0R	18	160	10	●
12	6.0R	22	180	12	●
16	8.0R	30	210	16	●
20	10.0R	38	210	20	●



極超微粒鎢鋼塗層圓頭立銑刀

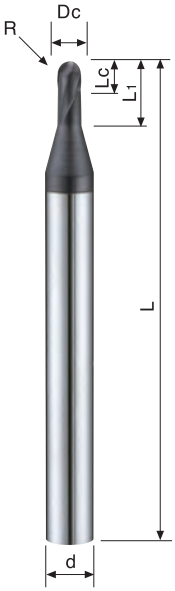
Ball Nose End Mills

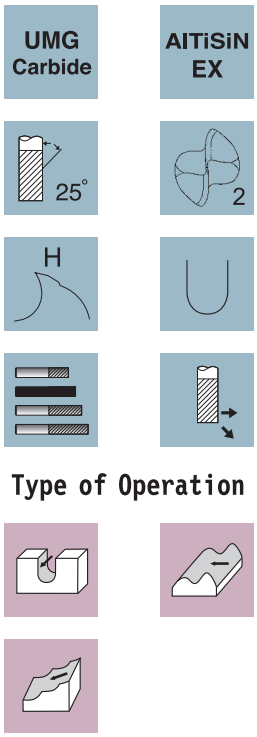
H 48-68HRC

極超硬ボールエンドミル

Code No. B251EX-Dc

Dc h10	R ±0.01	Lc mm	L mm	d h6	L1 mm	AlTiSiN B251EX
0.3	0.15R	0.3	50	4	0.8	●
0.4	0.20R	0.4	50	4	1.0	●
0.5	0.25R	0.5	50	4	1.3	●
0.6	0.30R	0.6	50	4	1.5	●
0.8	0.40R	0.8	50	4	2.0	●
1.0	0.50R	1.0	50	4	2.5	●
1.5	0.75R	1.5	50	4	3.8	●
2.0	1.00R	2.0	50	6	5.0	●
3.0	1.50R	3.0	60	6	8.0	●
4.0	2.00R	4.0	60	6	10.0	●
5.0	2.50R	5.0	60	6	12.0	●
6.0	3.00R	6.0	60	6	15.0	●





Type of Operation

Work Material

P	H	M	K	N	S
	●				

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.60-150 fz.P163-4

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.40-120 fz.P163-4

極超微粒鎢鋼塗層圓頭立銑刀

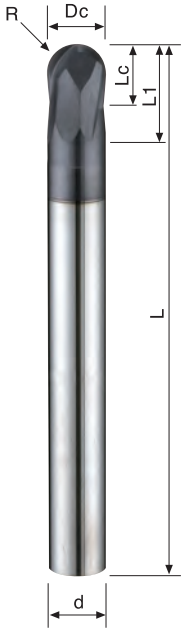
Ball Nose End Mills

H 48-68HRC

極超硬ボールエンドミル

Code No. B261EX-Dc

Dc h10	R ±0.01	Lc mm	L mm	d h6	L1 mm	AlTiSiN B261EX
1.0	0.50R	1.0	50	4	2	●
1.5	0.75R	1.5	50	4	3	●
2.0	1.00R	2.0	60	6	4	●
3.0	1.50R	3.0	70	6	6	●
4.0	2.00R	4.0	70	6	8	●
5.0	2.50R	5.0	80	6	10	●
6.0	3.00R	6.0	80	6	12	●
8.0	4.00R	8.0	100	8	16	●
10.0	5.00R	10.0	100	10	20	●
12.0	6.00R	12.0	110	12	24	●



UMG Carbide

AlTiSiN EX

15°

2

H

Type of Operation

Work Material

P	H	M	K	N	S
	●		○		

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.160-220 fz.P163-4

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.100-160 fz.P163-4

GR.9 鑄鐵 Cast Iron
Vc.160-180 fz.P163-4

極超微粒鎢鋼塗層4刃圓頭立銑刀

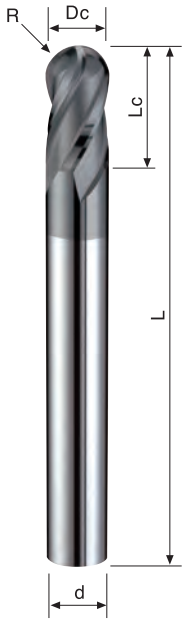
Ball Nose End Mills - 4 Flutes

H 30-68HRC

極超硬ボールエンドミル 4枚刃

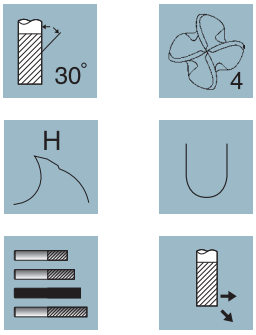
Code No. B254GX-Dc

Dc h10	R ±0.01	Lc mm	L mm	d h6	AlTiSiN B254GX
3	1.5R	6	70	6	●
4	2.0R	8	70	6	●
5	2.5R	10	80	6	●
6	3.0R	12	80	6	●
8	4.0R	14	100	8	●
10	5.0R	18	100	10	●
12	6.0R	22	110	12	●
16	8.0R	30	140	16	●
20	10.0R	38	160	20	●

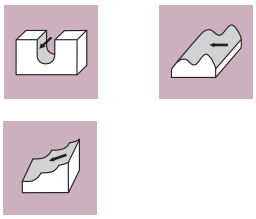


UMG Carbide

AlTiSiN GX



Type of Operation



Work Material

P	H	M	K	N	S
	●		○		

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.160-180 fz.P163-4

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.130-150 fz.P163-4

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.100-120 fz.P163-4

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.80-100 fz.P163-4

GR.9 鑄鐵 Cast Iron
Vc.210-230 fz.P163-4

極超微粒鎢鋼塗層圓頭立銑刀

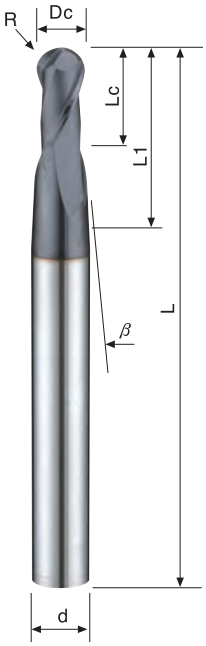
Ball Nose End Mills

P H < 56HRC

極超硬ボールエンドミル

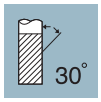
Code No. B250EX-R×β

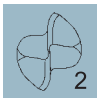
R ±0.01	β on Side	Lc mm	L mm	d h6	L1 mm	AlTiSiN B250EX
0.5R	1° 30'	2	60	6	23	●
0.5R	5°	2	60	6	23	●
0.5R	3°	2	80	6	42	●
1.0R	1° 30'	4	60	6	23	●
1.0R	5°	4	60	6	23	●
1.0R	3°	4	80	6	41	●
1.5R	3°	6	70	6	32	●
1.5R	1° 30'	6	90	6	52	●
2.0R	3°	8	70	6	28	●
2.0R	1° 30'	8	90	6	49	●
2.5R	3°	10	90	8	41	●
2.5R	1° 30'	10	110	8	61	●
3.0R	3°	12	90	8	34	●
3.0R	1° 30'	12	110	8	53	●
4.0R	3°	14	100	10	36	●
4.0R	1° 30'	14	120	10	55	●
5.0R	3°	18	110	12	40	●
5.0R	1° 30'	18	130	12	59	●
6.0R	3°	22	140	16	63	●
6.0R	1° 30'	22	160	16	83	●



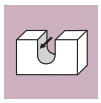
UMG Carbide

AlTiSiN EX





Type of Operation



Work Material

P	H	M	K	N	S
●	●		○		

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.100-140 fz.P163-4

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.80-120 fz.P163-4

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.60-100 fz.P163-4

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.50-80 fz.P163-4

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.30-60 fz.P163-4

GR.9 鑄鐵 Cast Iron
Vc.120-160 fz.P163-4

7leaders™

The Art of Cutting

深溝立銑刀　End Mills For Rib Processing　リブ用エンドミル

形状 Appearance	訂購編號 Code-No	明細 Specification			被切削材 Work Material						頁次 Page
					P	H	M	K	N	S	
	F692GX	UMG Carbide	AlTiSiN GX	30°	●	●		○	○		P43、44
	F690GX	UMG Carbide	AlTiSiN GX	30°	●	●		○	○		P45、46
	F695GX	UMG Carbide	AlTiSiN GX	30°	●	●		○	○		P47、48
	F694GX	UMG Carbide	AlTiSiN GX	30°	●	●		○	○		P49
	F691GX	UMG Carbide	AlTiSiN GX	30°	●	●		○	○		P50

極超微粒鎢鋼塗層深溝立銑刀

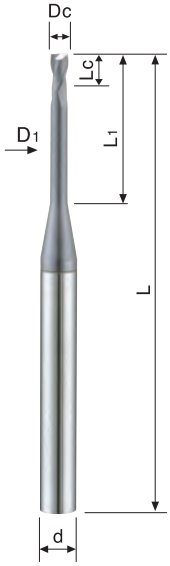
End Mills For Rib Processing

P H < 68HRC

極超硬リブ用エンドミル

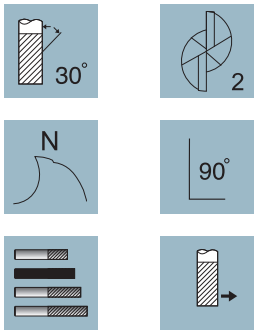
Code No. F692GX-Dc×L1

Dc +0 -0.02	L1 mm	Lc mm	L mm	d h5	D1 mm	AlTiSiN F692GX
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	1.5	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	●
0.5	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	1.0	50	4	0.65	●
0.7	4	1.0	50	4	0.65	●
0.7	6	1.0	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	●
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	●
1.0	4	1.5	50	4	0.95	●
1.0	6	1.5	50	4	0.95	●
1.0	8	1.5	50	4	0.95	●
1.0	10	1.5	50	4	0.95	●
1.0	12	1.5	50	4	0.95	●
1.0	14	1.5	50	4	0.95	●
1.0	16	1.5	50	4	0.95	●
1.0	18	1.5	60	4	0.95	●
1.0	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	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	●

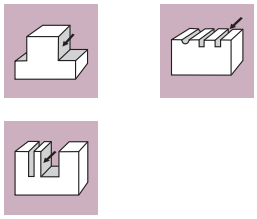


UMG Carbide

AlTiSiN GX



Type of Operation



Work Material

P	H	M	K	N	S
●	●		○	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.60-80 fz.P161

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.60-80 fz.P161

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.50-60 fz.P161

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.40-60 fz.P161

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-50 fz.P161

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.30-50 fz.P161

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.30-40 fz.P161

GR.9 鑄鐵 Cast Iron
Vc.80-100 fz.P161

GR.11 銅 Copper
Vc.100-120 fz.P161

極超微粒鎢鋼塗層深溝立銑刀

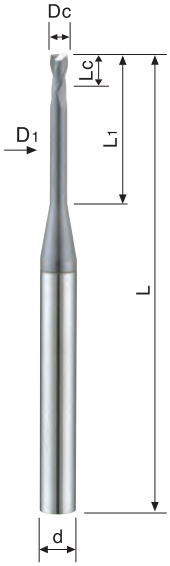
End Mills For Rib Processing

P H < 68HRC

極超硬リブ用エンドミル

Code No. F692GX-Dc×L1

Dc +0 -0.02	L1 mm	Lc mm	L mm	d h5	D1 mm	AlTiSiN F692GX
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	●
1.6	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	●
2.0	6	3.0	50	4	1.95	●
2.0	8	3.0	50	4	1.95	●
2.0	10	3.0	50	4	1.95	●
2.0	12	3.0	50	4	1.95	●
2.0	14	3.0	50	4	1.95	●
2.0	16	3.0	50	4	1.95	●
2.0	18	3.0	60	4	1.95	●
2.0	20	3.0	60	4	1.95	●
2.0	25	3.0	60	4	1.95	●
2.0	30	3.0	70	4	1.95	●
2.5	8	3.7	50	4	2.40	●
2.5	10	3.7	50	4	2.40	●
2.5	12	3.7	50	4	2.40	●
2.5	14	3.7	50	4	2.40	●
2.5	16	3.7	60	4	2.40	●
2.5	18	3.7	60	4	2.40	●
2.5	20	3.7	60	4	2.40	●
2.5	25	3.7	70	4	2.40	●
2.5	30	3.7	70	4	2.40	●
3.0	8	4.5	50	6	2.85	●
3.0	10	4.5	50	6	2.85	●
3.0	12	4.5	50	6	2.85	●
3.0	14	4.5	60	6	2.85	●
3.0	16	4.5	60	6	2.85	●
3.0	18	4.5	60	6	2.85	●
3.0	20	4.5	60	6	2.85	●
3.0	25	4.5	70	6	2.85	●
3.0	30	4.5	70	6	2.85	●
3.0	35	4.5	80	6	2.85	●
4.0	12	6.0	60	6	3.85	●
4.0	16	6.0	60	6	3.85	●
4.0	20	6.0	70	6	3.85	●
4.0	25	6.0	70	6	3.85	●
4.0	30	6.0	80	6	3.85	●
4.0	35	6.0	80	6	3.85	●
4.0	40	6.0	90	6	3.85	●
4.0	45	6.0	100	6	3.85	●
4.0	50	6.0	100	6	3.85	●



UMG Carbide

AlTiSiN GX

30°

2

N

90°

Type of Operation

Work Material

P	H	M	K	N	S
●	●		○	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.60-80 fz.P161

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.60-80 fz.P161

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.50-60 fz.P161

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.40-60 fz.P161

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-50 fz.P161

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.30-50 fz.P161

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.30-40 fz.P161

GR.9 鑄鐵 Cast Iron
Vc.80-100 fz.P161

GR.11 銅 Copper
Vc.100-120 fz.P161

極超微粒鎢鋼塗層深溝環面立銑刀

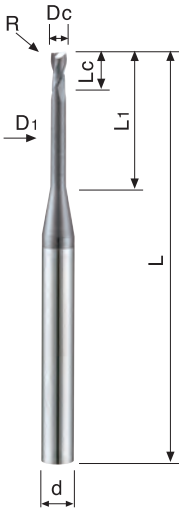
Toric End Mills For Rib Processing

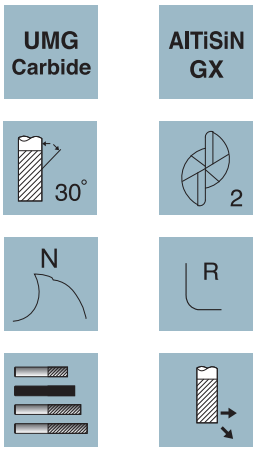
P H < 68HRC

極超硬エンドミル・リブ加工用

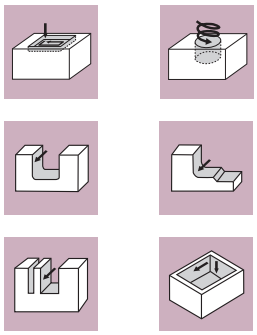
Code No. F690GX-Dc×R×L1

Dc +0 -0.02	R ±0.005	L1 mm	Lc mm	L mm	d h5	D1 mm	AlTiSiN F690GX
0.5	R0.05	2	0.4	50	4	0.45	●
0.5	R0.05	3	0.4	50	4	0.45	●
0.5	R0.05	4	0.4	50	4	0.45	●
0.5	R0.05	5	0.4	50	4	0.45	●
0.5	R0.05	6	0.4	50	4	0.45	●
0.5	R0.1	2	0.4	50	4	0.45	●
0.5	R0.1	3	0.4	50	4	0.45	●
0.5	R0.1	4	0.4	50	4	0.45	●
0.5	R0.1	5	0.4	50	4	0.45	●
0.5	R0.1	6	0.4	50	4	0.45	●
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	●
0.8	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	R0.2	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	●
1.0	R0.1	4	0.8	50	4	0.95	●
1.0	R0.1	6	0.8	50	4	0.95	●
1.0	R0.1	8	0.8	50	4	0.95	●
1.0	R0.1	10	0.8	50	4	0.95	●
1.0	R0.1	12	0.8	50	4	0.95	●
1.0	R0.2	4	0.8	50	4	0.95	●
1.0	R0.2	6	0.8	50	4	0.95	●
1.0	R0.2	8	0.8	50	4	0.95	●
1.0	R0.2	10	0.8	50	4	0.95	●
1.0	R0.2	12	0.8	50	4	0.95	●
1.0	R0.3	4	0.8	50	4	0.95	●
1.0	R0.3	6	0.8	50	4	0.95	●
1.0	R0.3	8	0.8	50	4	0.95	●
1.0	R0.3	10	0.8	50	4	0.95	●
1.0	R0.3	12	0.8	50	4	0.95	●
1.2	R0.2	6	1.0	50	4	1.15	●
1.2	R0.2	8	1.0	50	4	1.15	●
1.2	R0.2	10	1.0	50	4	1.15	●
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	●
2.0	R0.2	6	1.6	50	4	1.95	●
2.0	R0.2	8	1.6	50	4	1.95	●
2.0	R0.2	10	1.6	50	4	1.95	●
2.0	R0.2	12	1.6	50	4	1.95	●
2.0	R0.2	16	1.6	50	4	1.95	●
2.0	R0.2	20	1.6	60	4	1.95	●





Type of Operation



Work Material

P	H	M	K	N	S
●	●		○	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.60-80 fz.P161

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.60-80 fz.P161

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.50-60 fz.P161

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.40-60 fz.P161

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-50 fz.P161

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.30-50 fz.P161

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.30-40 fz.P161

GR.9 鑄鐵 Cast Iron
Vc.80-100 fz.P161

GR.11 銅 Copper
Vc.100-120 fz.P161

極超微粒鎢鋼塗層深溝環面立銑刀

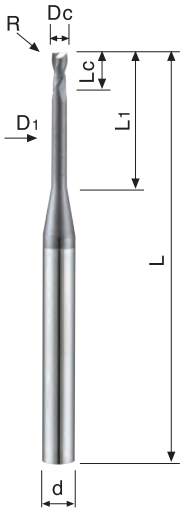
Toric End Mills For Rib Processing

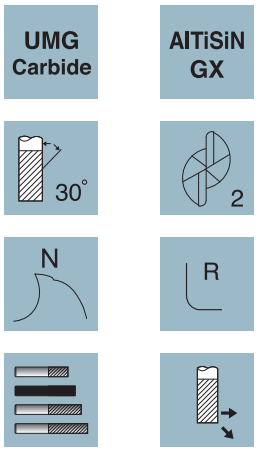
P H < 68HRC

極超硬エンドミル・リブ加工用

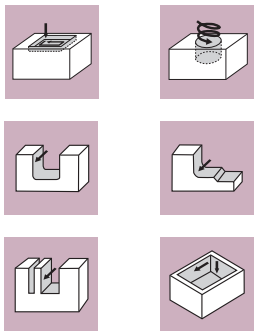
Code No. F690GX-Dc×R×L1

Dc +0 -0.02	R ±0.005	L1 mm	Lc mm	L mm	d h5	D1 mm	AlTiSiN F690GX
2.0	R0.3	6	1.6	50	4	1.95	●
2.0	R0.3	8	1.6	50	4	1.95	●
2.0	R0.3	10	1.6	50	4	1.95	●
2.0	R0.3	12	1.6	50	4	1.95	●
2.0	R0.3	16	1.6	50	4	1.95	●
2.0	R0.3	20	1.6	60	4	1.95	●
2.0	R0.5	6	1.6	50	4	1.95	●
2.0	R0.5	8	1.6	50	4	1.95	●
2.0	R0.5	10	1.6	50	4	1.95	●
2.0	R0.5	12	1.6	50	4	1.95	●
2.0	R0.5	16	1.6	50	4	1.95	●
2.0	R0.5	20	1.6	60	4	2.85	●
3.0	R0.2	8	2.5	50	6	2.85	●
3.0	R0.2	12	2.5	50	6	2.85	●
3.0	R0.2	16	2.5	60	6	2.85	●
3.0	R0.2	20	2.5	60	6	2.85	●
3.0	R0.2	25	2.5	70	6	2.85	●
3.0	R0.2	30	2.5	70	6	2.85	●
3.0	R0.3	8	2.5	50	6	2.85	●
3.0	R0.3	12	2.5	50	6	2.85	●
3.0	R0.3	16	2.5	60	6	2.85	●
3.0	R0.3	20	2.5	60	6	2.85	●
3.0	R0.3	25	2.5	70	6	2.85	●
3.0	R0.3	30	2.5	70	6	2.85	●
3.0	R0.5	8	2.5	50	6	2.85	●
3.0	R0.5	12	2.5	50	6	2.85	●
3.0	R0.5	16	2.5	60	6	2.85	●
3.0	R0.5	20	2.5	60	6	2.85	●
3.0	R0.5	25	2.5	70	6	2.85	●
3.0	R0.5	30	2.5	70	6	2.85	●
4.0	R0.2	12	4.0	60	6	3.85	●
4.0	R0.2	16	4.0	60	6	3.85	●
4.0	R0.2	20	4.0	70	6	3.85	●
4.0	R0.2	25	4.0	70	6	3.85	●
4.0	R0.2	30	4.0	80	6	3.85	●
4.0	R0.2	40	4.0	90	6	3.85	●
4.0	R0.3	12	4.0	60	6	3.85	●
4.0	R0.3	16	4.0	60	6	3.85	●
4.0	R0.3	20	4.0	70	6	3.85	●
4.0	R0.3	25	4.0	70	6	3.85	●
4.0	R0.3	30	4.0	80	6	3.85	●
4.0	R0.3	40	4.0	90	6	3.85	●
4.0	R0.5	12	4.0	60	6	3.85	●
4.0	R0.5	16	4.0	60	6	3.85	●
4.0	R0.5	20	4.0	70	6	3.85	●
4.0	R0.5	25	4.0	70	6	3.85	●
4.0	R0.5	30	4.0	80	6	3.85	●
4.0	R0.5	40	4.0	90	6	3.85	●
4.0	R1.0	12	4.0	60	6	3.85	●
4.0	R1.0	16	4.0	60	6	3.85	●
4.0	R1.0	20	4.0	70	6	3.85	●
4.0	R1.0	25	4.0	70	6	3.85	●
4.0	R1.0	30	4.0	80	6	3.85	●
4.0	R1.0	40	4.0	90	6	3.85	●





Type of Operation



Work Material

P	H	M	K	N	S
●	●		○	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.60-80 fz.P161

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.60-80 fz.P161

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.50-60 fz.P161

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.40-60 fz.P161

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-50 fz.P161

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.30-50 fz.P161

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.30-40 fz.P161

GR.9 鑄鐵 Cast Iron
Vc.80-100 fz.P161

GR.11 銅 Copper
Vc.100-120 fz.P161

極超微粒鎢鋼塗層深溝圓頭立銑刀

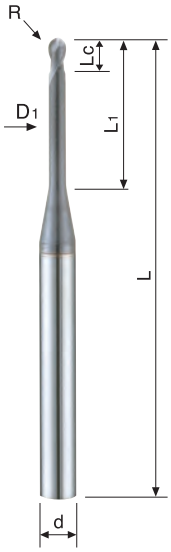
Ball Nose End Mills For Rib Processing

P H < 68HRC

極超硬リブボール用エンドミル

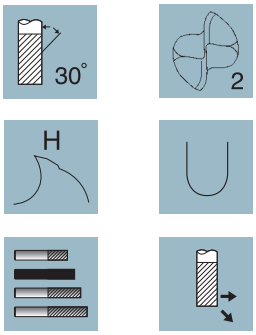
Code No. F695GX-R×L1

R ±0.01	L1 mm	Lc mm	L mm	d h5	D1 mm	AlTiSiN F695GX
0.15R	1	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	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	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	●
0.3 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	●
0.4 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	●
0.5 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	●
0.6 R	4	1.0	50	4	1.15	●
0.6 R	6	1.0	50	4	1.15	●
0.6 R	8	1.0	50	4	1.15	●
0.6 R	10	1.0	50	4	1.15	●
0.6 R	12	1.0	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	●
0.75R	16	1.2	50	4	1.45	●
0.75R	20	1.2	60	4	1.45	●

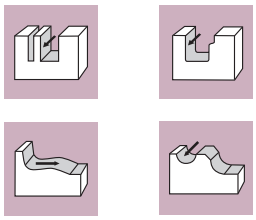


UMG Carbide

AlTiSiN GX



Type of Operation



Work Material

P	H	M	K	N	S
●	●		○	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.50-65 fz.P163-4

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.50-56 fz.P163-4

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.40-55 fz.P163-4

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.40-50 fz.P163-4

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.30-40 fz.P163-4

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.25-30 fz.P163-4

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.25-30 fz.P163-4

GR.9 鑄鐵 Cast Iron
Vc.40-60 fz.P163-4

GR.11 銅 Copper
Vc.60-65 fz.P163-4

極超微粒鎢鋼塗層深溝圓頭立銑刀

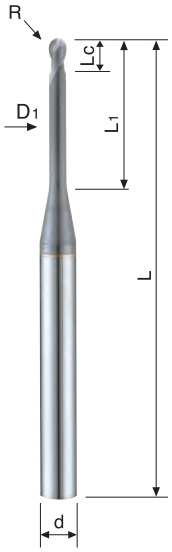
Ball Nose End Mills For Rib Processing

P H < 68HRC

極超硬リブボール用エンドミル

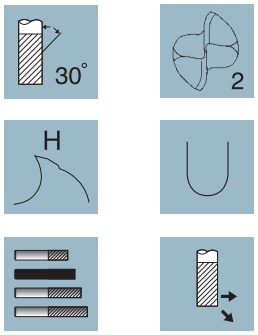
Code No. F695GX-R×L1

R ±0.01	L1 mm	Lc mm	L mm	d h5	D1 mm	AlTiSiN F695GX
1.0 R	4	1.6	50	4	1.95	●
1.0 R	6	1.6	50	4	1.95	●
1.0 R	8	1.6	50	4	1.95	●
1.0 R	10	1.6	50	4	1.95	●
1.0 R	12	1.6	50	4	1.95	●
1.0 R	16	1.6	50	4	1.95	●
1.0 R	20	1.6	60	4	1.95	●
1.0 R	25	1.6	60	4	1.95	●
1.0 R	30	1.6	70	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	●
2.0 R	8	3.2	60	6	3.85	●
2.0 R	10	3.2	60	6	3.85	●
2.0 R	12	3.2	60	6	3.85	●
2.0 R	16	3.2	60	6	3.85	●
2.0 R	20	3.2	70	6	3.85	●
2.0 R	25	3.2	70	6	3.85	●
2.0 R	30	3.2	80	6	3.85	●
2.0 R	35	3.2	80	6	3.85	●
2.0 R	40	3.2	90	6	3.85	●
2.0 R	45	3.2	100	6	3.85	●
2.0 R	50	3.2	100	6	3.85	●

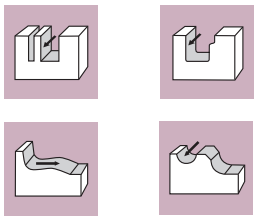


UMG Carbide

AlTiSiN GX



Type of Operation



Work Material

P	H	M	K	N	S
●	●		○	○	

GR.1	非合金鋼鐵 Non-alloyed steel	Vc.50-65 fz.P163-4
GR.2	低合金鋼鐵<24HRC Low-alloyed Steel	Vc.50-56 fz.P163-4
GR.3	高合金鋼鐵<30HRC Hi-alloyed Steel	Vc.40-55 fz.P163-4
GR.4	硬化鋼30~38HRC Hardened Steel	Vc.40-50 fz.P163-4
GR.5	硬化鋼38~48HRC Hardened Steel	Vc.30-40 fz.P163-4
GR.6	硬化鋼48~56HRC Hardened Steel	Vc.25-30 fz.P163-4
GR.7	硬化鋼56~68HRC Hardened Steel	Vc.25-30 fz.P163-4
GR.9	鑄鐵 Cast Iron	Vc.40-60 fz.P163-4
GR.11	銅 Copper	Vc.60-65 fz.P163-4

極超微粒鎢鋼塗層深溝立銑刀

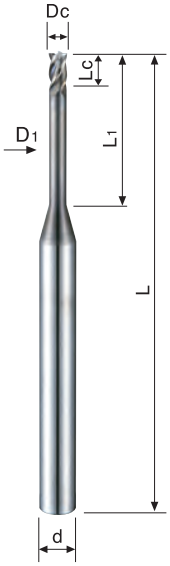
End Mills For Rib Processing

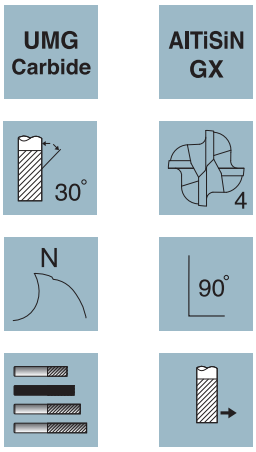
P H < 68HRC

極超硬リブ用エンドミル

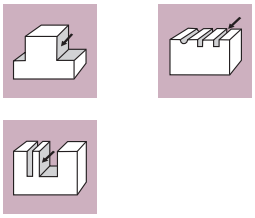
Code No. F694GX-Dc×L1

Dc +0 -0.02	L1 mm	Lc mm	L mm	d h5	D1 mm	AlTiSiN F694GX
1.0	4	1.5	50	4	0.95	●
1.0	6	1.5	50	4	0.95	●
1.0	8	1.5	50	4	0.95	●
1.0	10	1.5	50	4	0.95	●
1.0	12	1.5	50	4	0.95	●
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	●
2.0	6	3.0	50	4	1.95	●
2.0	8	3.0	50	4	1.95	●
2.0	10	3.0	50	4	1.95	●
2.0	12	3.0	50	4	1.95	●
2.0	16	3.0	50	4	1.95	●
2.0	20	3.0	60	4	1.95	●
2.0	25	3.0	60	4	1.95	●
2.0	30	3.0	70	4	1.95	●
3.0	10	4.5	50	6	2.85	●
3.0	12	4.5	50	6	2.85	●
3.0	16	4.5	60	6	2.85	●
3.0	20	4.5	60	6	2.85	●
3.0	25	4.5	70	6	2.85	●
3.0	30	4.5	70	6	2.85	●
4.0	12	6.0	60	6	3.85	●
4.0	16	6.0	60	6	3.85	●
4.0	20	6.0	70	6	3.85	●
4.0	25	6.0	70	6	3.85	●
4.0	30	6.0	80	6	3.85	●





Type of Operation



Work Material

P	H	M	K	N	S
●	●		○	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.60-80 fz.P162

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.60-80 fz.P162

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.50-60 fz.P162

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.40-60 fz.P162

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-50 fz.P162

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.30-50 fz.P162

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.30-40 fz.P162

GR.9 鑄鐵 Cast Iron
Vc.80-100 fz.P162

GR.11 銅 Copper
Vc.100-120 fz.P162

極超微粒鎢鋼塗層深溝立銑刀

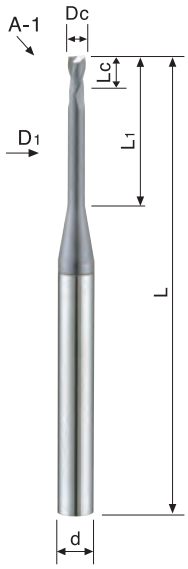
End Mills For Rib Processing

P H < 68HRC

極超硬リブ用エンドミル

Code No. F691GX-Dc×L1

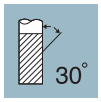
Dc +0 -0.02	L1 mm	Lc mm	L mm	d h5	D1 mm	AlTiSiN F691GX
0.5	2	0.7	50	4	0.45	●
0.5	4	0.7	50	4	0.45	●
0.5	6	0.7	50	4	0.45	●
0.6	2	0.9	50	4	0.55	●
0.6	4	0.9	50	4	0.55	●
0.6	6	0.9	50	4	0.55	●
0.7	2	1.0	50	4	0.65	●
0.7	4	1.0	50	4	0.65	●
0.7	6	1.0	50	4	0.65	●
0.8	4	1.2	50	4	0.75	●
0.8	6	1.2	50	4	0.75	●
0.8	8	1.2	50	4	0.75	●
1.0	6	1.5	50	4	0.95	●
1.0	8	1.5	50	4	0.95	●
1.0	10	1.5	50	4	0.95	●
1.0	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	●
2.0	6	3.0	50	4	1.95	●
2.0	8	3.0	50	4	1.95	●
2.0	10	3.0	50	4	1.95	●
2.0	12	3.0	50	4	1.95	●
2.0	14	3.0	50	4	1.95	●
2.0	16	3.0	50	4	1.95	●
2.0	20	3.0	60	4	1.95	●
2.5	8	3.7	50	4	2.40	●
2.5	10	3.7	50	4	2.40	●
2.5	12	3.7	50	4	2.40	●
2.5	16	3.7	60	4	2.40	●
3.0	12	4.5	50	6	2.85	●
3.0	14	4.5	60	6	2.85	●
3.0	16	4.5	60	6	2.85	●
3.0	18	4.5	60	6	2.85	●
3.0	20	4.5	60	6	2.85	●
3.0	25	4.5	70	6	2.85	●



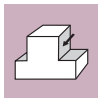
尖角
Sharp Corner edge
A-1

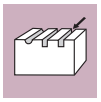
UMG Carbide

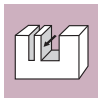
AlTiSiN GX



Type of Operation







Work Material

P	H	M	K	N	S
●	●		○	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.60-80 fz.P161

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.60-80 fz.P161

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.50-60 fz.P161

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.40-60 fz.P161

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-50 fz.P161

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.30-50 fz.P161

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.30-40 fz.P161

GR.9 鑄鐵 Cast Iron
Vc.80-100 fz.P161

GR.11 銅 Copper
Vc.100-120 fz.P161

7leaders™

The Art of Cutting

R角立銑刀　**End Mills With Corner Radius**　Rコーナーエンドミル

形狀 Appearance	訂購編號 Code-No	明細 Specification			被切削材 Work Material						頁次 Page
					P	H	M	K	N	S	
	B255X	UMG Carbide	AlTiN X	30°	●	●	○	●	○		P53
	B257X	UMG Carbide	AlTiN X	30°	●	●	○	●	○		P53
	B256X	UMG Carbide	AlTiN X	30°	●	●	○	●	○		P54
	B258X	UMG Carbide	AlTiN X	30°	●	●	○	●	○		P54
	B265X	UMG Carbide	AlTiCrN X	30°	●	●	○	●	○		P55
	B267X	UMG Carbide	AlTiCrN X	30°	●	●	○	●	○		P55
	B266X	UMG Carbide	AlTiCrN X	30°	●	●	○	●	○		P56
	B268X	UMG Carbide	AlTiCrN X	30°	●	●	○	●	○		P56
	B252GX	UMG Carbide	AlTiSiN GX	35° 38°	●	●	○	●	○		P57
	B269EX	UMG Carbide	AlTiSiN EX	45°		●		○			P58
	B270EX	UMG Carbide	AlTiSiN EX	45°	●	●		○			P59
	B271GX	UMG Carbide	AlTiSiN GX	0°		●		●			P60
	E105X	UMG Carbide	AlTiCrN X	30°	●	●		○	○		P61、62

Corner Radius

極超微粒鎢鋼塗層R角立銑刀

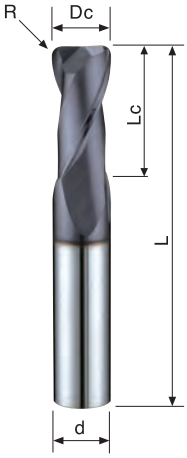
End Mills With Corner Radius

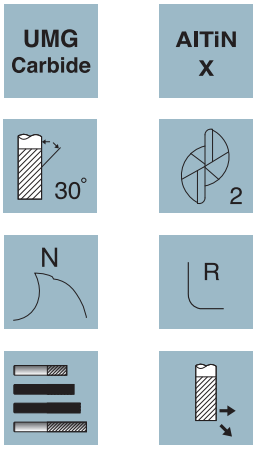
K P H < 52HRC

極超硬Rコーナーエンドミル

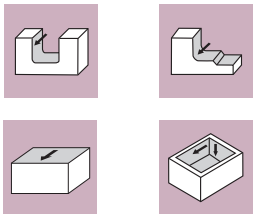
Code No. B255X-Dc×R

Dc h10	R ±0.01	Lc mm	L mm	d h6	AlTiN B255X
4	R0.2	11	50	6	●
4	R0.5	11	50	6	●
6	R0.3	16	50	6	●
6	R0.5	16	50	6	●
6	R1.0	16	50	6	●
8	R0.3	20	60	8	●
8	R0.5	20	60	8	●
8	R1.0	20	60	8	●
10	R0.5	22	72	10	●
10	R1.0	22	72	10	●
10	R2.0	22	72	10	●
12	R0.5	26	75	12	●
12	R1.0	26	75	12	●
12	R2.0	26	75	12	●





Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-100 fz.P161

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-100 fz.P161

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-80 fz.P161

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.50-70 fz.P161

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-60 fz.P161

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.25-40 fz.P161

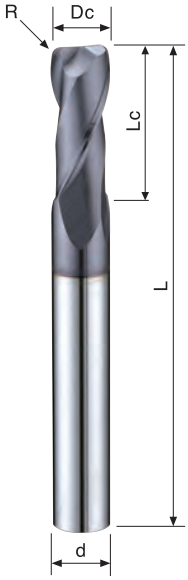
GR.8 不銹鋼 Stainless Steel
Vc.40-60 fz.P161

GR.9 鑄鐵 Cast Iron
Vc.80-100 fz.P161

GR.11 銅 Copper
Vc.150-200 fz.P161

Code No. B257X-Dc×R

Dc h10	R ±0.01	Lc mm	L mm	d h6	AlTiN B257X
4	R0.2	15	60	4	●
4	R0.5	15	60	4	●
6	R0.3	20	80	6	●
6	R0.5	20	80	6	●
6	R1.0	20	80	6	●
8	R0.3	25	100	8	●
8	R0.5	25	100	8	●
8	R1.0	25	100	8	●
10	R0.5	30	100	10	●
10	R1.0	30	100	10	●
10	R2.0	30	100	10	●
12	R0.5	35	110	12	●
12	R1.0	35	110	12	●
12	R2.0	35	110	12	●



極超微粒鎢鋼塗層R角立銑刀

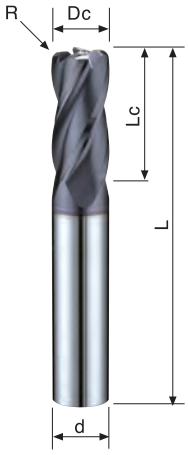
End Mills With Corner Radius

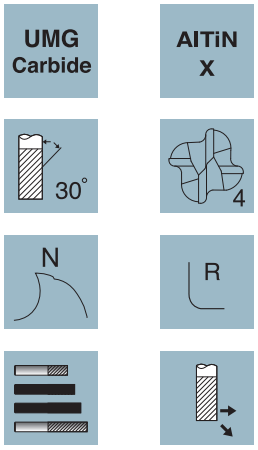
K P H < 52HRC

極超硬Rコーナーエンドミル

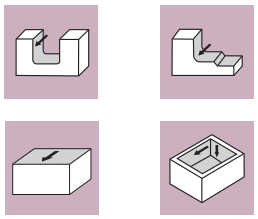
Code No. B256X-Dc×R

Dc h10	R ±0.01	Lc mm	L mm	d h6	AlTiN B256X
4	R0.2	11	50	6	●
4	R0.5	11	50	6	●
6	R0.3	16	50	6	●
6	R0.5	16	50	6	●
6	R1.0	16	50	6	●
8	R0.3	20	60	8	●
8	R0.5	20	60	8	●
8	R1.0	20	60	8	●
10	R0.5	22	72	10	●
10	R1.0	22	72	10	●
10	R2.0	22	72	10	●
12	R0.5	26	75	12	●
12	R1.0	26	75	12	●
12	R2.0	26	75	12	●





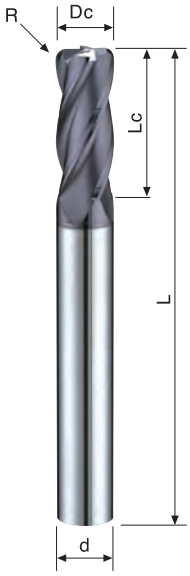
Type of Operation



Corner Radius

Code No. B258X-Dc×R

Dc h10	R ±0.01	Lc mm	L mm	d h6	AlTiN B258X
4	R0.2	15	60	4	●
4	R0.5	15	60	4	●
6	R0.3	20	80	6	●
6	R0.5	20	80	6	●
6	R1.0	20	80	6	●
8	R0.3	25	100	8	●
8	R0.5	25	100	8	●
8	R1.0	25	100	8	●
10	R0.5	30	100	10	●
10	R1.0	30	100	10	●
10	R2.0	30	100	10	●
12	R0.5	35	110	12	●
12	R1.0	35	110	12	●
12	R2.0	35	110	12	●



Work Material

P	H	M	K	N	S
●	●	○	●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-100 fz.P162

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-100 fz.P162

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-80 fz.P162

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.50-70 fz.P162

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-60 fz.P162

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.25-40 fz.P162

GR.8 不銹鋼 Stainless Steel
Vc.40-60 fz.P162

GR.9 鑄鐵 Cast Iron
Vc.80-100 fz.P162

GR.11 銅 Copper
Vc.150-200 fz.P162

極超微粒鎢鋼塗層R角立銑刀

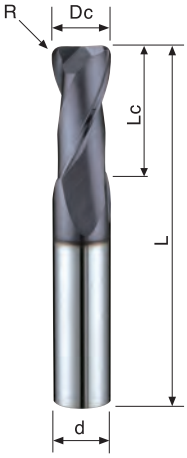
End Mills With Corner Radius

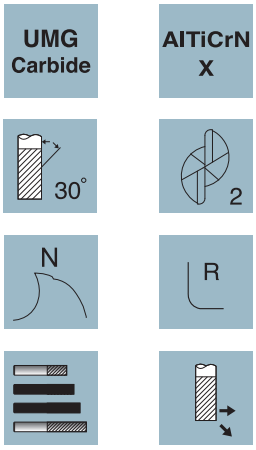
K P H < 56HRC

極超硬Rコーナーエンドミル

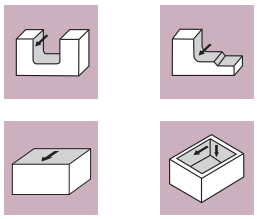
Code No. B265X-Dc×R

Dc h10	R ±0.01	Lc mm	L mm	d h6	AlTiCrN B265X
3	R0.2	8	50	6	●
3	R0.3	8	50	6	●
3	R0.5	8	50	6	●
4	R0.2	11	50	6	●
4	R0.3	11	50	6	●
4	R0.5	11	50	6	●
5	R0.3	13	50	6	●
5	R0.5	13	50	6	●
6	R0.3	16	50	6	●
6	R0.5	16	50	6	●
6	R1.0	16	50	6	●
6	R1.5	16	50	6	●
8	R0.3	20	60	8	●
8	R0.5	20	60	8	●
8	R1.0	20	60	8	●
8	R1.5	20	60	8	●
8	R2.0	20	60	8	●
10	R0.3	22	72	10	●
10	R0.5	22	72	10	●
10	R1.0	22	72	10	●
10	R1.5	22	72	10	●
10	R2.0	22	72	10	●
10	R3.0	22	72	10	●
12	R0.5	26	75	12	●
12	R1.0	26	75	12	●
12	R1.5	26	75	12	●
12	R2.0	26	75	12	●
12	R3.0	26	75	12	●





Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-100 fz.P161

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-100 fz.P161

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-80 fz.P161

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.50-70 fz.P161

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-60 fz.P161

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.25-40 fz.P161

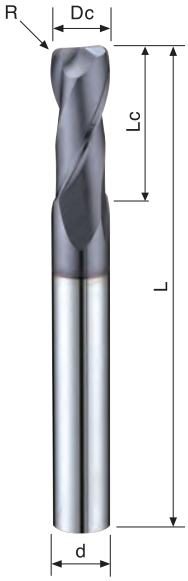
GR.8 不銹鋼 Stainless Steel
Vc.40-60 fz.P161

GR.9 鑄鐵 Cast Iron
Vc.80-100 fz.P161

GR.11 銅 Copper
Vc.150-200 fz.P161

Code No. B267X-Dc×R

Dc h10	R ±0.01	Lc mm	L mm	d h6	AlTiCrN B267X
3	R0.2	10	50	3	●
3	R0.5	10	50	3	●
4	R0.2	15	60	4	●
4	R0.5	15	60	4	●
6	R0.3	20	80	6	●
6	R0.5	20	80	6	●
6	R1.0	20	80	6	●
6	R1.5	20	80	6	●
8	R0.3	25	100	8	●
8	R0.5	25	100	8	●
8	R1.0	25	100	8	●
8	R1.5	25	100	8	●
8	R2.0	25	100	8	●
10	R0.3	30	100	10	●
10	R0.5	30	100	10	●
10	R1.0	30	100	10	●
10	R1.5	30	100	10	●
10	R2.0	30	100	10	●
12	R0.5	35	110	12	●
12	R1.0	35	110	12	●
12	R1.5	35	110	12	●
12	R2.0	35	110	12	●



極超微粒鎢鋼塗層R角立銑刀

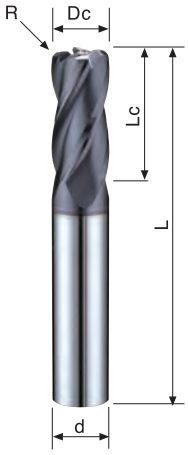
End Mills With Corner Radius

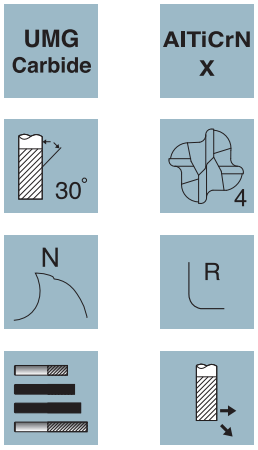
K P H < 56HRC

極超硬Rコーナーエンドミル

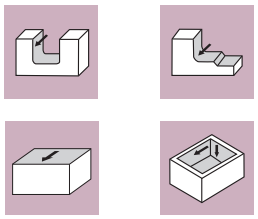
Code No. B266X-Dc×R

Dc h10	R ±0.01	Lc mm	L mm	d h6	AlTiCrN B266X
3	R0.2	8	50	6	●
3	R0.3	8	50	6	●
3	R0.5	8	50	6	●
4	R0.2	11	50	6	●
4	R0.3	11	50	6	●
4	R0.5	11	50	6	●
5	R0.3	13	50	6	●
5	R0.5	13	50	6	●
6	R0.3	16	50	6	●
6	R0.5	16	50	6	●
6	R1.0	16	50	6	●
6	R1.5	16	50	6	●
8	R0.3	20	60	8	●
8	R0.5	20	60	8	●
8	R1.0	20	60	8	●
8	R1.5	20	60	8	●
8	R2.0	20	60	8	●
10	R0.3	22	72	10	●
10	R0.5	22	72	10	●
10	R1.0	22	72	10	●
10	R1.5	22	72	10	●
10	R2.0	22	72	10	●
10	R3.0	22	72	10	●
12	R0.5	26	75	12	●
12	R1.0	26	75	12	●
12	R1.5	26	75	12	●
12	R2.0	26	75	12	●
12	R3.0	26	75	12	●





Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-100 fz.P162

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-100 fz.P162

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-80 fz.P162

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.50-70 fz.P162

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-60 fz.P162

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.25-40 fz.P162

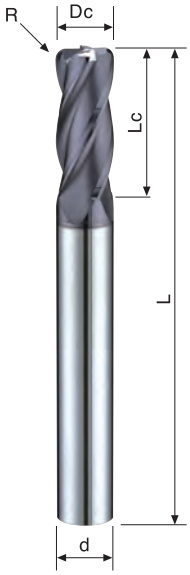
GR.8 不銹鋼 Stainless Steel
Vc.40-60 fz.P162

GR.9 鑄鐵 Cast Iron
Vc.80-100 fz.P162

GR.11 銅 Copper
Vc.150-200 fz.P162

Code No. B268X-Dc×R

Dc h10	R ±0.01	Lc mm	L mm	d h6	AlTiCrN B268X
3	R0.2	10	50	3	●
3	R0.5	10	50	3	●
4	R0.2	15	60	4	●
4	R0.5	15	60	4	●
6	R0.3	20	80	6	●
6	R0.5	20	80	6	●
6	R1.0	20	80	6	●
6	R1.5	20	80	6	●
8	R0.3	25	100	8	●
8	R0.5	25	100	8	●
8	R1.0	25	100	8	●
8	R1.5	25	100	8	●
8	R2.0	25	100	8	●
10	R0.3	30	100	10	●
10	R0.5	30	100	10	●
10	R1.0	30	100	10	●
10	R1.5	30	100	10	●
10	R2.0	30	100	10	●
12	R0.5	35	110	12	●
12	R1.0	35	110	12	●
12	R1.5	35	110	12	●
12	R2.0	35	110	12	●



極超微粒鎢鋼塗層R角立銑刀

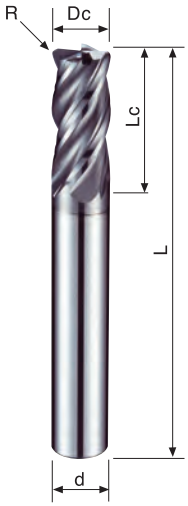
End Mills With Corner Radius

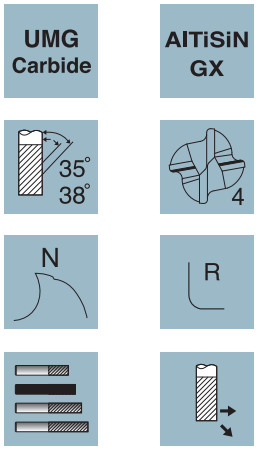
K P H < 68HRC

極超硬Rコーナーエンドミル

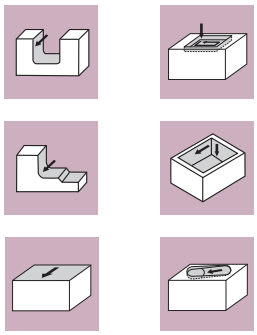
Code No. B252GX-Dc×R

Dc h10	R ±0.01	Lc mm	L mm	d h6	AlTiSiN B252GX
4	R0.2	11	50	6	●
4	R0.5	11	50	6	●
6	R0.3	16	50	6	●
6	R0.5	16	50	6	●
6	R1.0	16	50	6	●
8	R0.3	20	60	8	●
8	R0.5	20	60	8	●
8	R1.0	20	60	8	●
10	R0.5	22	72	10	●
10	R1.0	22	72	10	●
10	R2.0	22	72	10	●
12	R0.5	26	75	12	●
12	R1.0	26	75	12	●
12	R2.0	26	75	12	●





Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.100-120 fz.P162

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.100-120 fz.P162

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.80-100 fz.P162

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.60-80 fz.P162

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-60 fz.P162

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.30-40 fz.P162

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.20-30 fz.P162

GR.8 不銹鋼 Stainless Steel
Vc.40-60 fz.P162

GR.9 鑄鐵 Cast Iron
Vc.100-120 fz.P162

GR.11 銅 Copper
Vc.150-200 fz.P162

極超微粒鎢鋼塗層R角立銑刀

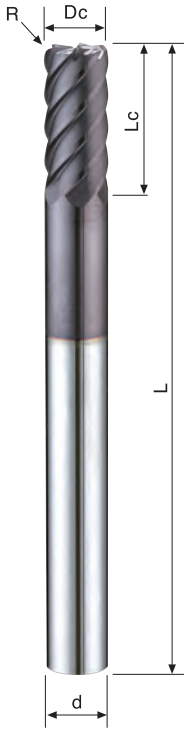
End Mills With Corner Radius

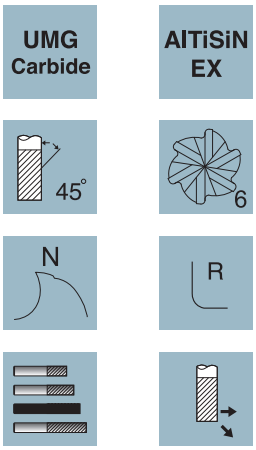
H 30-68HRC

極超硬Rコーナーエンドミル

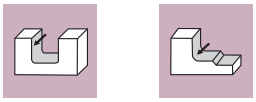
Code No. B269EX-Dc×R

Dc h10	R ±0.01	Lc mm	L mm	d h6	AlTiSiN B269EX
6	R0.5	16	80	6	●
6	R1.0	16	80	6	●
8	R0.5	20	100	8	●
8	R1.0	20	100	8	●
10	R0.5	22	100	10	●
10	R1.0	22	100	10	●
12	R0.5	26	110	12	●
12	R1.0	26	110	12	●
16	R1.0	38	140	16	●
16	R2.0	38	140	16	●
20	R1.0	38	160	20	●
20	R2.0	38	160	20	●





Type of Operation



Work Material

P	H	M	K	N	S
	●		○		

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.120-140 fz.P162

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.100-120 fz.P162

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.80-100 fz.P162

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.50-80 fz.P162

GR.9 鑄鐵 Cast Iron
Vc.120-160 fz.P162

極超微粒鎢鋼塗層R角立銑刀

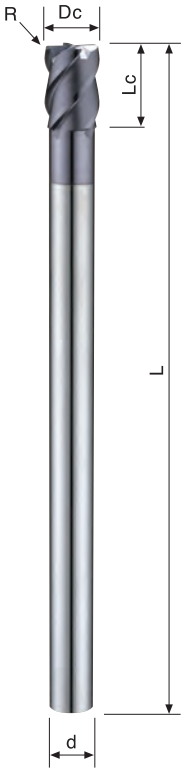
End Mills With Corner Radius

P H < 68HRC

極超硬Rコーナーエンドミル

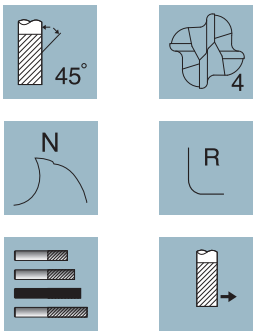
Code No. B270EX-Dc×R

Dc h10	R ±0.01	Lc mm	L mm	d h6	AlTiSiN B270EX
10	R0.5	15	130	8	●
10	R1.0	15	130	8	●
12	R0.5	18	150	10	●
12	R1.0	18	150	10	●
14	R0.5	21	160	12	●
14	R1.0	21	160	12	●
18	R0.5	27	180	16	●
18	R1.0	27	180	16	●

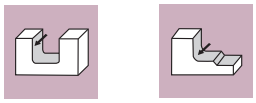


UMG Carbide

AlTiSiN EX



Type of Operation



Work Material

P	H	M	K	N	S
●	●		○		

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-100 fz.P162

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.70-80 fz.P162

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-70 fz.P162

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.50-60 fz.P162

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-50 fz.P162

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.30-40 fz.P162

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.20-30 fz.P162

GR.9 鑄鐵 Cast Iron
Vc.120-160 fz.P162

極超微粒鎢鋼塗層高效能R角立銑刀

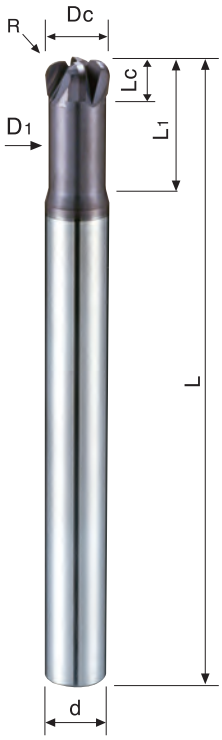
End Mills With Corner Radius

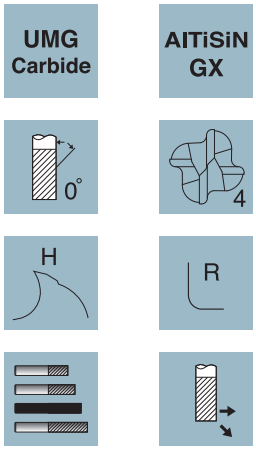
K | H 30-68HRC

極超硬Rコーナーエンドミル

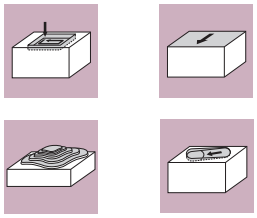
Code No. B271GX-Dc

Dc h10	R ±0.01	Lc mm	L mm	d h6	L1 mm	D1 mm	AlTiSiN B271GX
3	R0.75	1.5	70	6	6	2.7	●
4	R1.0	2.0	70	6	8	3.6	●
5	R1.2	2.5	80	6	10	4.5	●
6	R1.5	3.0	80	6	12	5.4	●
8	R2.0	4.0	100	8	16	7.2	●
10	R2.0	5.0	100	10	20	9.0	●
12	R3.0	6.0	110	12	24	11.0	●





Type of Operation



Work Material

P	H	M	K	N	S
	●		●		

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.70-80 fz.P162

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.60-70 fz.P162

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.40-50 fz.P162

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.25-30 fz.P162

GR.9 鑄鐵 Cast Iron
Vc.100-120 fz.P162

極超微粒鎢鋼塗層斜度立銑刀

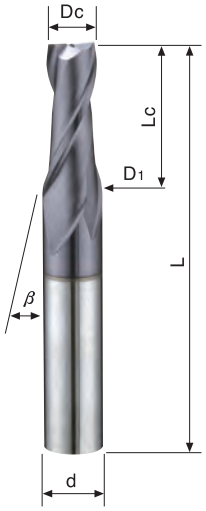
Taper End Mills

P H < 56HRC

極超硬テーパエンドミル

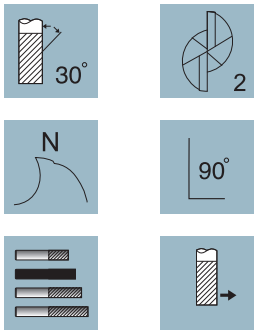
Code No. E105X-Dc×β

Dc h10	β on Side	D1 mm	Lc mm	L mm	d h6	AlTiCrN E105X
1.0	30'	1.07	4	50	4	●
1.0	1°	1.14	4	50	4	●
1.0	1°30'	1.21	4	50	4	●
1.0	2°	1.28	4	50	4	●
1.0	2°30'	1.35	4	50	4	●
1.0	3°	1.42	4	50	4	●
1.0	4°	1.56	4	50	4	●
1.0	5°	1.70	4	50	4	●
1.0	6°	1.84	4	50	4	●
1.0	7°	1.98	4	50	4	●
1.0	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°	2.20	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	●
2.0	30'	2.10	6	50	4	●
2.0	1°	2.21	6	50	4	●
2.0	1°30'	2.31	6	50	4	●
2.0	2°	2.41	6	50	4	●
2.0	2°30'	2.52	6	50	4	●
2.0	3°	2.62	6	50	4	●
2.0	4°	2.84	6	50	4	●
2.0	5°	3.05	6	50	4	●
2.0	6°	3.26	6	50	4	●
2.0	7°	3.47	6	50	4	●
2.0	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'	3.20	8	50	4	●
2.5	3°	3.33	8	50	4	●
2.5	4°	3.62	8	50	4	●
2.5	5°	3.90	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	●
3.0	30'	3.17	10	50	6	●
3.0	1°	3.35	10	50	6	●
3.0	1°30'	3.52	10	50	6	●
3.0	2°	3.69	10	50	6	●
3.0	2°30'	3.87	10	50	6	●
3.0	3°	4.05	10	50	6	●
3.0	4°	4.40	10	50	6	●
3.0	5°	4.75	10	50	6	●
3.0	6°	5.10	10	50	6	●
3.0	7°	5.46	10	50	6	●
3.0	10°	6.53	10	60	8	●

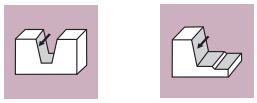


UMG Carbide

AlTiCrN X



Type of Operation



Work Material

P	H	M	K	N	S
●	●		○	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.50-70 fz.P161

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.50-70 fz.P161

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.40-60 fz.P161

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.40-60 fz.P161

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.30-40 fz.P161

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.25-30 fz.P161

GR.9 鑄鐵 Cast Iron
Vc.60-80 fz.P161

GR.10 鋁 Aluminium
Vc.100-120 fz.P161

GR.11 銅 Copper
Vc.70-90 fz.P161

極超微粒鎢鋼塗層斜度立銑刀

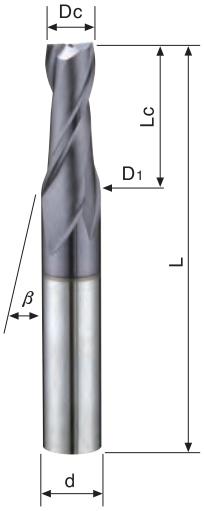
Taper End Mills

P H < 56HRC

極超硬テーパエンドミル

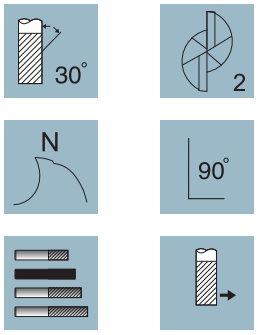
Code No. E105X-Dc×β

Dc h10	β on Side	D1 mm	Lc mm	L mm	d h6	AlTiCrN E105X
4.0	30'	4.26	15	50	6	●
4.0	1°	4.52	15	50	6	●
4.0	1°30'	4.79	15	50	6	●
4.0	2°	5.04	15	50	6	●
4.0	2°30'	5.31	15	50	6	●
4.0	3°	5.57	15	50	6	●
4.0	4°	6.10	15	60	8	●
4.0	5°	6.62	15	60	8	●
4.0	6°	7.15	15	60	8	●
4.0	7°	7.68	15	60	8	●
4.0	10°	9.30	15	70	10	●
5.0	30'	5.34	20	60	6	●
5.0	1°	5.70	20	60	6	●
5.0	1°30'	6.00	20	60	6	●
5.0	2°	6.39	20	60	8	●
5.0	2°30'	6.75	20	60	8	●
5.0	3°	7.10	20	60	8	●
5.0	4°	7.80	20	60	8	●
5.0	5°	8.50	20	70	10	●
5.0	6°	9.20	20	70	10	●
5.0	7°	9.91	20	70	10	●
5.0	10°	12.00	20	75	12	●
6.0	30'	6.35	20	60	8	●
6.0	1°	6.70	20	60	8	●
6.0	1°30'	7.05	20	60	8	●
6.0	2°	7.40	20	60	8	●
6.0	2°30'	7.75	20	60	8	●
6.0	3°	8.00	20	60	8	●
6.0	4°	8.80	20	70	10	●
6.0	5°	9.50	20	70	10	●
6.0	6°	10.20	20	75	12	●
6.0	7°	10.91	20	75	12	●
6.0	10°	13.05	20	75	12	●
8.0	30'	8.44	25	70	10	●
8.0	1°	8.87	25	70	10	●
8.0	1°30'	9.31	25	70	10	●
8.0	2°	9.74	25	70	10	●
8.0	2°30'	10.00	25	70	10	●
8.0	3°	10.62	25	75	12	●
8.0	5°	12.37	25	90	12	●
10.0	30'	10.61	35	90	10	●
10.0	1°	11.22	35	90	10	●
10.0	1°30'	11.83	35	90	10	●
10.0	2°	12.44	35	90	12	●
10.0	2°30'	13.06	35	90	12	●
10.0	3°	13.67	35	90	12	●
10.0	5°	16.00	35	100	16	●

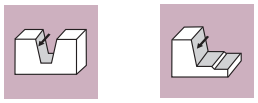


UMG Carbide

AlTiCrN X



Type of Operation



Work Material

P	H	M	K	N	S
●	●		○	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.50-70 fz.P161

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.50-70 fz.P161

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.40-60 fz.P161

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.40-60 fz.P161

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.30-40 fz.P161

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.25-30 fz.P161

GR.9 鑄鐵 Cast Iron
Vc.60-80 fz.P161

GR.10 鋁 Aluminium
Vc.100-120 fz.P161

GR.11 銅 Copper
Vc.70-90 fz.P161

7leaders™

The Art of Cutting

形狀 Appearance	訂購編號 Code-No	明細 Specification			被切削材 Work Material						頁次 Page
					P	H	M	K	N	S	
	E133	MG Carbide	Uncoated Blank	45°					●		P65
	E135 E136	MG Carbide	Uncoated Blank	45°					●		P66
	E137	MG Carbide	Uncoated Blank	45°					●		P66
	E132	UMG Carbide	Uncoated Blank	30°					●		P67
	E134	UMG Carbide	Uncoated Blank	30°					●		P67
	E143	MG Carbide	Uncoated Blank	40°					●		P68
	E145	MG Carbide	Uncoated Blank	40°					●		P69
	E192	MG Carbide	Uncoated Blank	55°					●		P70
	E193	MG Carbide	Uncoated Blank	50°					●		P71
	F622	UMG Carbide	Uncoated Blank	25°					●		P72
	E105	UMG Carbide	Uncoated Blank	30°					●		P73、74
	E195R	MG Carbide	Uncoated Blank	30°					●		P75
	E195L	MG Carbide	Uncoated Blank	30°					●		P75
	E189R	MG Carbide	Uncoated Blank	21°					●		P76
	E189L	MG Carbide	Uncoated Blank	21°					●		P76
	E190 E191	MG Carbide							●		P77
	E196 E197	MG Carbide							●		P78
	E198 E199	MG Carbide							●		P79

AL PVC
CU FRP

超微粒鎢鋼鋁用立銑刀

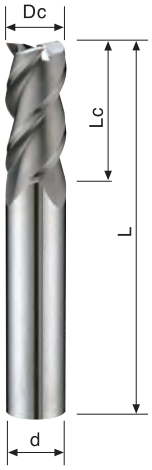
End Mills For Aluminum

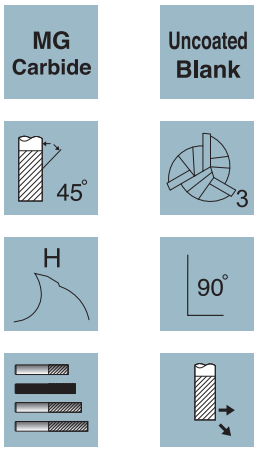
N Aluminium

超硬アルミ用エンドミル

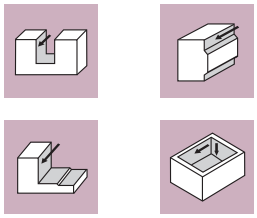
Code No. E133-Dc

Dc h10	Lc mm	L mm	d h6	Blank E133
1.0	3	38	3	●
1.5	5	38	3	●
2.0	6	38	3	●
2.5	7	38	3	●
3.0	9	38	3	●
4.0	14	50	4	●
5.0	16	50	5	●
6.0	20	63	6	●
7.0	20	63	8	●
8.0	20	63	8	●
9.0	22	72	10	●
10.0	22	72	10	●
12.0	26	75	12	●
14.0	32	89	14	●
16.0	32	89	16	●
18.0	38	100	18	●
20.0	38	100	20	●





Type of Operation



Work Material

P	H	M	K	N	S
				●	

GR.10 鋁 Aluminium
Vc.150-200 fz.P161

GR.11 銅 Copper
Vc.100-150 fz.P161

GR.12 塑膠 Plastics
Vc.60-80 fz.P161

超微粒鎢鋼鋁用立銑刀

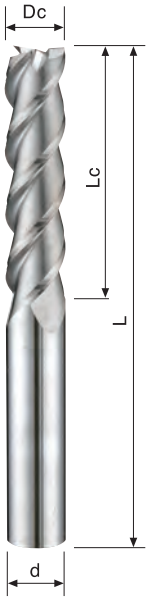
End Mills For Aluminum

N Aluminium

超硬アルミ用エンドミル

Code No. E135-Dc

Dc h10	Lc mm	L mm	d h6	Blank 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	●



MG Carbide

Uncoated Blank

45°

3

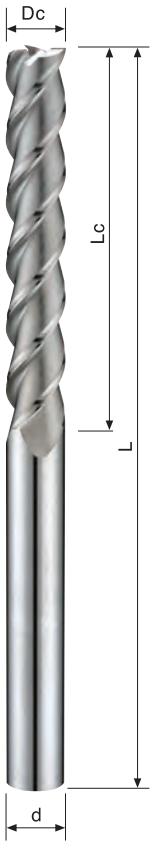
H

90°

Type of Operation

Code No. E136-Dc

Dc h10	Lc mm	L mm	d h6	Blank 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	●



Work Material

P	H	M	K	N	S
				●	

GR.10 鋁 Aluminium
Vc.120-150 fz.P161

GR.11 銅 Copper
Vc.80-120 fz.P161

GR.12 塑膠 Plastics
Vc.40-60 fz.P161

Code No. E137-Dc

Dc h10	Lc mm	L mm	d h6	Blank E137
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	●

超微粒鎢鋼鋁用立銑刀

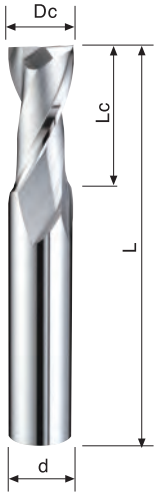
End Mills For Aluminium

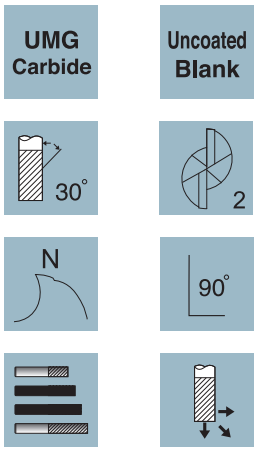
N Aluminium

超硬アルミ用エンドミル

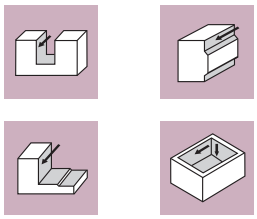
Code No. E132-Dc

Dc h10	Lc mm	L mm	d h6	Blank 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	●



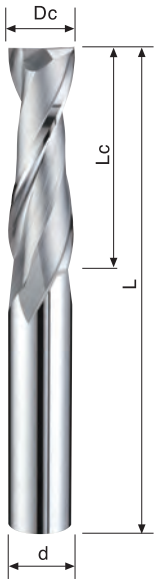


Type of Operation



Code No. E134-Dc

Dc h10	Lc mm	L mm	d h6	Blank 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	●



Work Material

P	H	M	K	N	S
				●	

GR.10 鋁 **Aluminium**
Vc.120-160 fz.P161

GR.11 銅 **Copper**
Vc.80-120 fz.P161

超微粒鎢鋼鋁用立銑刀

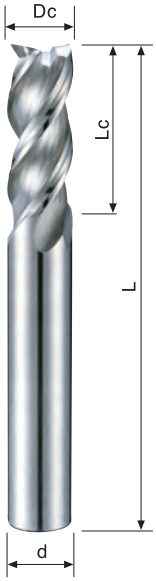
End Mills For Aluminium

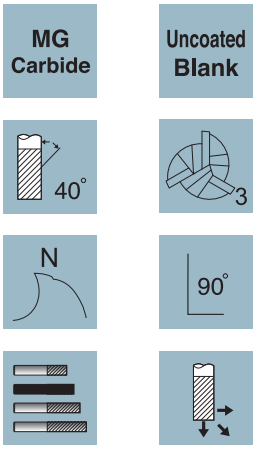
N Aluminium

超硬アルミ用エンドミル

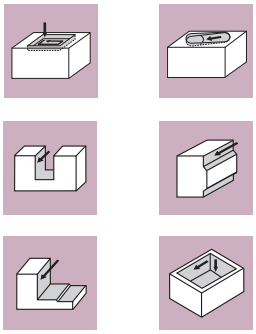
Code No. E143-Dc

Dc h10	Lc mm	L mm	d h6	Blank E143
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	●





Type of Operation



Work Material

P	H	M	K	N	S
				●	

GR.10 鉛 Aluminium
Vc.180-220 fz.P161

GR.11 銅 Copper
Vc.80-120 fz.P161

AL PVC Cu FRP

超微粒鎢鋼鋁用立銑刀

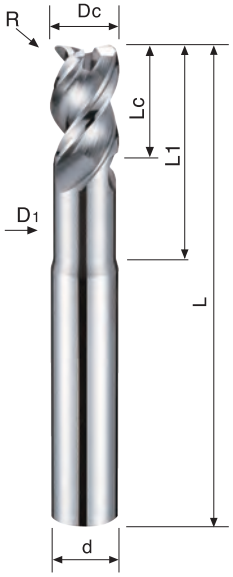
End Mills For Aluminium

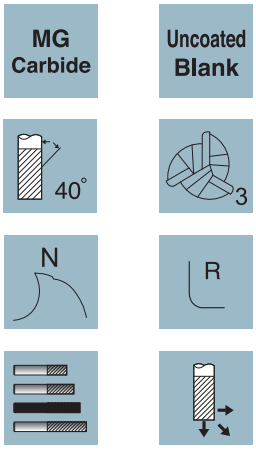
N Aluminium

超硬アルミ用エンドミル

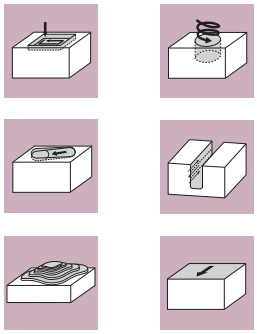
Code No. E145-Dc×R

Dc h10	R 0/+0.02	Lc mm	L mm	d h6	L1 mm	D1 mm	Blank E145
3	R0.5	4.5	50	6	9	2.8	●
4	R0.5	6.0	50	6	12	3.7	●
5	R0.5	7.5	60	6	15	4.6	●
6	R0.5	9.0	60	6	18	5.5	●
6	R1.0	9.0	60	6	18	5.5	●
8	R0.5	12.0	70	8	24	7.4	●
8	R1.0	12.0	70	8	24	7.4	●
10	R0.5	15.0	80	10	30	9.2	●
10	R1.0	15.0	80	10	30	9.2	●
12	R0.5	18.0	90	12	36	11.0	●
12	R1.0	18.0	90	12	36	11.0	●





Type of Operation



Work Material

P	H	M	K	N	S
				●	

GR.10 鋁 Aluminium
Vc.180-220 fz.P161

GR.11 銅 Copper
Vc.80-120 fz.P161

超微粒鎢鋼鋁用立銑刀

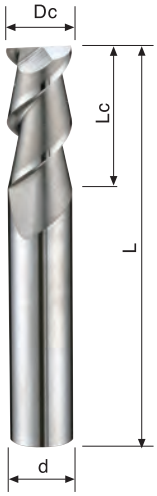
End Mills For Aluminium

N Aluminium

超硬アルミ用エンドミル

Code No. E192-Dc

Dc h10	Lc mm	L mm	d h6	Blank E192
3	9	38	3	●
4	14	50	4	●
5	16	50	5	●
6	20	63	6	●
8	22	63	8	●
10	30	72	10	●
12	30	75	12	●
16	40	100	16	●
20	45	100	20	●



MG Carbide

Uncoated Blank

55°

2

W

90°

Type of Operation

Work Material

P	H	M	K	N	S
				●	

GR.10 鉛 Aluminium

Vc.150-200 fz.P161

AL PVC Cu FRP

超微粒鎢鋼鋁用立銑刀

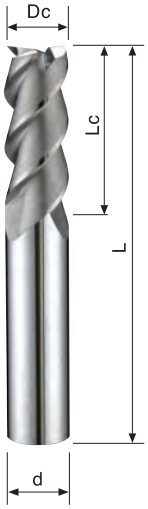
End Mills For Aluminium

N Aluminium

超硬アルミ用エンドミル

Code No. E193-Dc

Dc h10	Lc mm	L mm	d h6	Blank E193
3	9	50	6	●
4	14	50	6	●
5	16	50	6	●
6	20	63	6	●
8	22	63	8	●
10	30	72	10	●
12	30	75	12	●
16	40	100	16	●
20	45	100	20	●



MG Carbide

Uncoated Blank

50°

3

W

90°

Type of Operation

Work Material

P	H	M	K	N	S
				●	

GR.10 鉛 Aluminium

Vc.150-200 fz.P161

極超微粒鎢鋼銅用深溝圓頭立銑刀

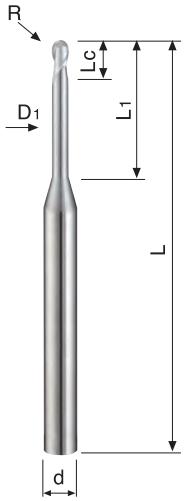
Ball Nose End Mills For Copper

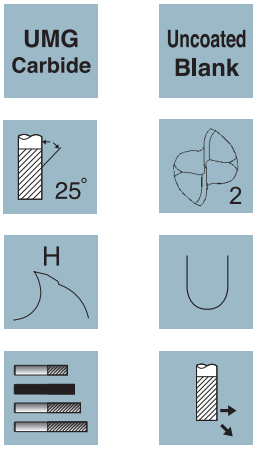
N Copper

極超硬銅用リブボール用エンドミル

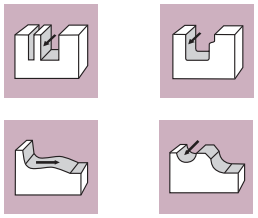
Code No. F622-R×L1

R ±0.01	L1 mm	Lc mm	L mm	d h6	D1 mm	Blank F622
0.25R	2	0.7	50	4	0.45	●
0.25R	4	0.7	50	4	0.45	●
0.25R	6	0.7	50	4	0.45	●
0.3 R	2	0.9	50	4	0.55	●
0.3 R	4	0.9	50	4	0.55	●
0.3 R	6	0.9	50	4	0.55	●
0.4 R	6	1.2	50	4	0.75	●
0.4 R	8	1.2	50	4	0.75	●
0.5 R	6	1.5	50	4	0.95	●
0.5 R	8	1.5	50	4	0.95	●
0.5 R	10	1.5	50	4	0.95	●
0.5 R	12	1.5	50	4	0.95	●
0.5 R	16	1.5	50	4	0.95	●
0.6 R	8	1.8	50	4	1.15	●
0.6 R	12	1.8	50	4	1.15	●
0.75R	6	2.3	50	4	1.45	●
0.75R	8	2.3	50	4	1.45	●
0.75R	12	2.3	50	4	1.45	●
0.75R	16	2.3	50	4	1.45	●
0.75R	20	2.3	60	4	1.45	●
1.0 R	8	3.0	50	4	1.95	●
1.0 R	12	3.0	50	4	1.95	●
1.0 R	16	3.0	50	4	1.95	●
1.0 R	20	3.0	60	4	1.95	●
1.0 R	25	3.0	60	4	1.95	●
1.5 R	10	4.5	50	6	2.85	●
1.5 R	16	4.5	60	6	2.85	●
1.5 R	20	4.5	60	6	2.85	●
1.5 R	25	4.5	70	6	2.85	●
1.5 R	30	4.5	70	6	2.85	●





Type of Operation



Work Material

P	H	M	K	N	S
				●	

GR.10 鉛 Aluminium
Vc.100-150 fz.P163-4

GR.11 銅 Copper
Vc.60-65 fz.P163-4

AL PVC Cu FRP

極超微粒鎢鋼銅用斜度立銑刀

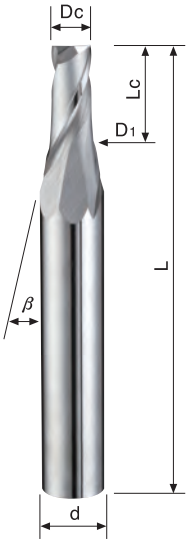
Taper End Mills For Copper

N Copper

極超硬銅用テーパエンドミル

Code No. E105-Dc×β

Dc h10	β on Side	D1 mm	Lc mm	L mm	d h6	Blank E105
1.0	30'	1.07	4	50	4	●
1.0	1°	1.14	4	50	4	●
1.0	1°30'	1.21	4	50	4	●
1.0	2°	1.28	4	50	4	●
1.0	2°30'	1.35	4	50	4	●
1.0	3°	1.42	4	50	4	●
1.0	4°	1.56	4	50	4	●
1.0	5°	1.70	4	50	4	●
1.0	6°	1.84	4	50	4	●
1.0	7°	1.98	4	50	4	●
1.0	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°	2.20	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	●
2.0	30'	2.10	6	50	4	●
2.0	1°	2.21	6	50	4	●
2.0	1°30'	2.31	6	50	4	●
2.0	2°	2.41	6	50	4	●
2.0	2°30'	2.52	6	50	4	●
2.0	3°	2.62	6	50	4	●
2.0	4°	2.84	6	50	4	●
2.0	5°	3.05	6	50	4	●
2.0	6°	3.26	6	50	4	●
2.0	7°	3.47	6	50	4	●
2.0	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'	3.20	8	50	4	●
2.5	3°	3.33	8	50	4	●
2.5	4°	3.62	8	50	4	●
2.5	5°	3.90	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	●
3.0	30'	3.17	10	50	6	●
3.0	1°	3.35	10	50	6	●
3.0	1°30'	3.52	10	50	6	●
3.0	2°	3.69	10	50	6	●
3.0	2°30'	3.87	10	50	6	●
3.0	3°	4.05	10	50	6	●
3.0	4°	4.40	10	50	6	●
3.0	5°	4.75	10	50	6	●
3.0	6°	5.10	10	50	6	●
3.0	7°	5.46	10	50	6	●
3.0	10°	6.53	10	60	8	●



UMG Carbide

Uncoated Blank

30°

2

N

90°

Type of Operation

Work Material

P	H	M	K	N	S
				●	

GR.10 鉛 Aluminium
Vc.100-120 fz.P161

GR.11 銅 Copper
Vc.70-90 fz.P161

極超微粒鎢鋼銅用斜度立銑刀

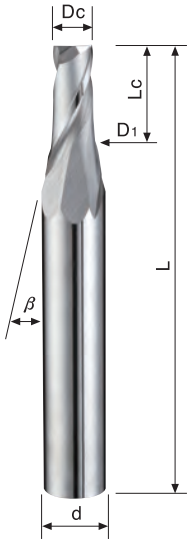
Taper End Mills For Copper

N Copper

極超硬銅用テーパエンドミル

Code No. E105-Dc×β

Dc h10	β on Side	D1 mm	Lc mm	L mm	d h6	Blank E105
4.0	30'	4.26	15	50	6	●
4.0	1°	4.52	15	50	6	●
4.0	1°30'	4.79	15	50	6	●
4.0	2°	5.04	15	50	6	●
4.0	2°30'	5.31	15	50	6	●
4.0	3°	5.57	15	50	6	●
4.0	4°	6.10	15	60	8	●
4.0	5°	6.62	15	60	8	●
4.0	6°	7.15	15	60	8	●
4.0	7°	7.68	15	60	8	●
4.0	10°	9.30	15	70	10	●
5.0	30'	5.34	20	60	6	●
5.0	1°	5.70	20	60	6	●
5.0	1°30'	6.00	20	60	6	●
5.0	2°	6.39	20	60	8	●
5.0	2°30'	6.75	20	60	8	●
5.0	3°	7.10	20	60	8	●
5.0	4°	7.80	20	60	8	●
5.0	5°	8.50	20	70	10	●
5.0	6°	9.20	20	70	10	●
5.0	7°	9.91	20	70	10	●
5.0	10°	12.00	20	75	12	●
6.0	30'	6.35	20	60	8	●
6.0	1°	6.70	20	60	8	●
6.0	1°30'	7.05	20	60	8	●
6.0	2°	7.40	20	60	8	●
6.0	2°30'	7.75	20	60	8	●
6.0	3°	8.00	20	60	8	●
6.0	4°	8.80	20	70	10	●
6.0	5°	9.50	20	70	10	●
6.0	6°	10.20	20	75	12	●
6.0	7°	10.91	20	75	12	●
6.0	10°	13.05	20	75	12	●
8.0	30'	8.44	25	70	10	●
8.0	1°	8.87	25	70	10	●
8.0	1°30'	9.31	25	70	10	●
8.0	2°	9.74	25	70	10	●
8.0	2°30'	10.00	25	70	10	●
8.0	3°	10.62	25	75	12	●
8.0	5°	12.37	25	90	12	●
10.0	30'	10.61	35	90	10	●
10.0	1°	11.22	35	90	10	●
10.0	1°30'	11.83	35	90	10	●
10.0	2°	12.44	35	90	12	●
10.0	2°30'	13.06	35	90	12	●
10.0	3°	13.67	35	90	12	●
10.0	5°	16.00	35	100	16	●



UMG Carbide

Uncoated Blank

30°

2

N

90°

Type of Operation

Work Material

P	H	M	K	N	S
				●	

GR.10 鉛 Aluminium
Vc.100-120 fz.P161

GR.11 銅 Copper
Vc.70-90 fz.P161

AL PVC Cu FRP

超微粒鎢鋼鋁用立銑刀

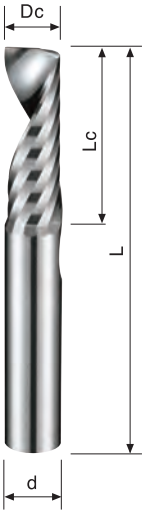
End Mills For Aluminium

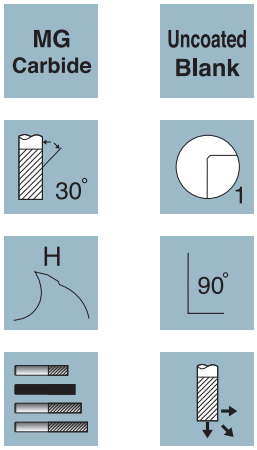
N Aluminium

超硬アルミ用エンドミル

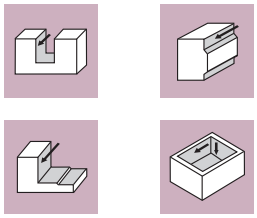
Code No. E195R-Dc

Dc h10	Lc mm	L mm	d h6	Blank 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	●





Type of Operation



Code No. E195L-Dc

Dc h10	Lc mm	L mm	d h6	Blank 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	●

Work Material

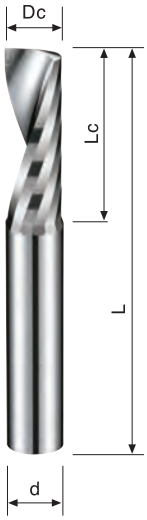
P	H	M	K	N	S
				●	

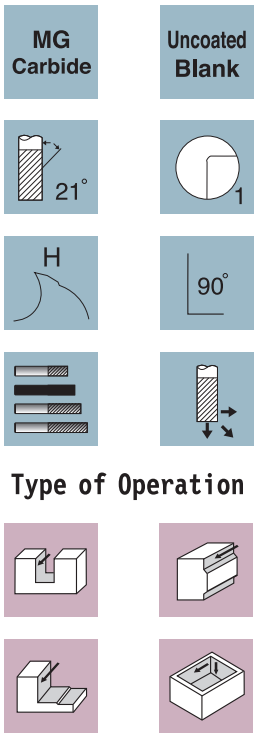
GR.10 鉛 Aluminium
Vc,200-250 fz,P161

超硬用プラスチックエンドミル

Code No. E189R-Dc

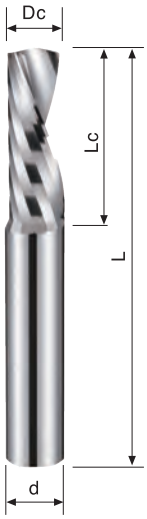
Dc h10	Lc mm	L mm	d h6	Blank E189R
3	12	50	3	●
4	15	50	4	●
6	20	63	6	●
8	25	63	8	●
10	30	72	10	●
12	38	75	12	●





Code No. E189L-Dc

Dc h10	Lc mm	L mm	d h6	Blank 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	●



Work Material

P	H	M	K	N	S
				●	

GR.12 塑膠 Plastics
Vc.150-200 fz.P161

超微粒鎢鋼玻璃纖維用起槽刀

Routers For Fiberglass

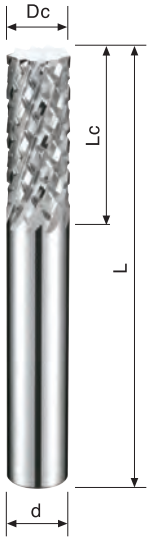
N FRP

超硬溝加工用カッター・ファイバーグラス加工用

Code No. E190-Dc

Dc h10	Lc mm	L mm	d h6	Blank E190
6	20	63	6	○
8	25	63	8	○
10	30	72	10	○
12	38	75	12	○

○ 淺色：可訂購規格，無現貨
○ The light color: On request, no stock
○ 弊社又は代理店へお聞き下さい



No
End cut

MG
Carbide

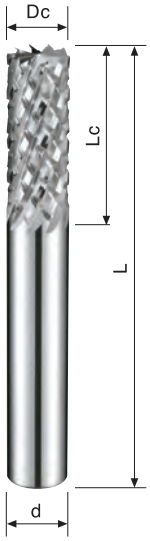
Work Material

P	H	M	K	N	S
				●	

GR.13 複合材料FRP Composite Material
Vc.250-300 fz.P161

Code No. E191-Dc

Dc h10	Lc mm	L mm	d h6	Blank E191
6	20	63	6	●
8	25	63	8	●
10	30	72	10	●
12	38	75	12	●



Burr
End cut

超微粒鎢鋼玻璃纖維用起槽刀

Routers For Fiberglass

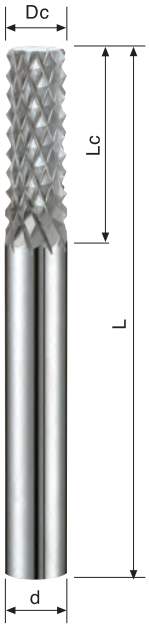
N FRP

超硬溝加工用カッター・ファイバーグラス加工用

Code No. E196-Dc

Dc h10	Lc mm	L mm	d h6	Blank E196
3	12	38	3	○
4	15	50	4	○
6	18	50	6	○
8	22	60	8	○
10	30	72	10	○
12	30	75	12	○

○ 淺色：可訂購規格，無現貨
○ The light color: On request, no stock
○ 弊社又は代理店へお聞き下さい



No
End cut

MG
Carbide

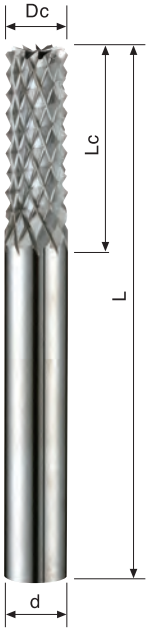
Work Material

P	H	M	K	N	S
				●	

GR.13 複合材料FRP Composite Material
Vc.250-300 fz.P161

Code No. E197-Dc

Dc h10	Lc mm	L mm	d h6	Blank E197
3	12	38	3	●
4	15	50	4	●
6	18	50	6	●
8	22	60	8	●
10	30	72	10	●
12	30	75	12	●



Burr
End cut

AL PVC
Cu FRP

超微粒鎢鋼玻璃纖維用起槽刀

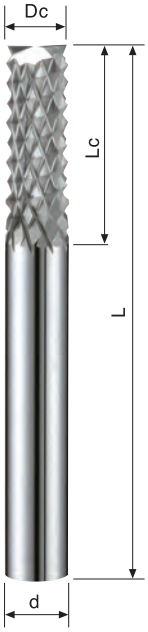
Routers For Fiberglass

N FRP

超硬溝加工用カッター・ファイバーグラス加工用

Code No. E198-Dc

Dc h10	Lc mm	L mm	d h6	Blank E198
3	12	38	3	●
4	15	50	4	●
6	18	50	6	●
8	22	60	8	●
10	30	72	10	●
12	30	75	12	●



End Mill
End cut

MG
Carbide

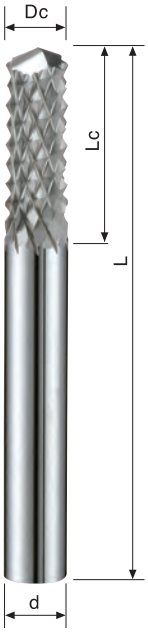
Work Material

P	H	M	K	N	S
				●	

GR.13 複合材料FRP Composite Material
Vc.250-300 fz.P161

Code No. E199-Dc

Dc h10	Lc mm	L mm	d h6	Blank E199
3	12	38	3	●
4	15	50	4	●
6	18	50	6	●
8	22	60	8	●
10	30	72	10	●
12	30	75	12	●



135°
Drill Point

7leaders™
The Art of Cutting

高效率立銑刀　High Performance End Mills　高効率エンドミル

形狀 Appearance	訂購編號 Code-No	明細 Specification			被切削材 Work Material						頁次 Page
					P	H	M	K	N	S	
	F636GX	UMG Carbide	AlTiSiN GX	38° 41°	●	●	○	○		○	P83
	F634GX	UMG Carbide	AlTiSiN GX	38° 41°	●	●	○	○		○	P84
	F670GX	UMG Carbide	AlTiSiN GX	38° 41°	●	●	○	○		○	P85
	F602GX	UMG Carbide	AlTiSiN GX	35° 38°	●	●		○			P86
	F603GX	UMG Carbide	AlTiSiN GX	35° 38°	●	●		○			P87
	F604GX F606GX	UMG Carbide	AlTiSiN GX	35° 38°	●	●	○	○		○	P88
	F674GX	UMG Carbide	AlTiSiN GX	42° 45°	●	●	○	○		○	P89
	F640GX	UMG Carbide	AlTiSiN GX	55°	○	●					P90
	F660GX F661GX	UMG Carbide	AlTiSiN GX	55°		●		○			P91
	F608HX F609HX	UMG Carbide	AlTiCrN HX	20°	●	●		●		○	P92
	F630GX	UMG Carbide	AlTiSiN GX	30°	●	●		○		○	P93
	F676GX	UMG Carbide	AlTiSiN GX	0°	●	●					P94
	F621HX	UMG Carbide	AlTiCrN HX	30°	●	●		○			P95
	F601HX	UMG Carbide	AlTiCrN HX	30°	●	●		○			P96
	F610HX	UMG Carbide	AlTiCrN HX	40°	●	●	○	○		○	P97
	F612GX F617GX	UMG Carbide	AlTiSiN GX	38° 41°	●	●	○	○		○	P98
	F632GX F633GX	UMG Carbide	AlTiSiN GX	55°	●	●					P99
	F635GX F637GX F639GX	UMG Carbide	AlTiSiN GX	55°	●	●					P100
	F615GX F619GX	UMG Carbide	AlTiSiN GX	30° 33°		●		○			P101

P181~190 HPC/HSC專用的強力夾頭，提供高效率切削和高速精銑切削，沒有任何偏擺或鬆脫的現象。

P181~190 Power chucks specially designed for HPC/HSC provide effective cutting and high-speed precise cutting without deflection or loosening.

P181~190 HPC/HSC専用の強力チャック、高効率・高速仕上切削時に、振れや緩みの現象が発生しません

高效率立銑刀 High Performance End Mills 高効率エンドミル

形狀 Appearance	訂購編號 Code-No	明細 Specification			被切削材 Work Material						頁次 Page
					P	H	M	K	N	S	
	F613GX F614GX	UMG Carbide	AlTiSiN GX	45°		●		○			P102
	F623HX F624HX	UMG Carbide	AlTiCrN HX	30°	●	●		○			P103
	F625GX F626GX	UMG Carbide	AlTiSiN GX	30°		●		○			P104
	F651SX	UMG Carbide	one AlTiCrN SX	36° 39°			●			○	P105
	F652SX	UMG Carbide	one AlTiCrN SX	36° 39°			●			○	P106
	F653SX	UMG Carbide	one AlTiCrN SX	36° 39°			●			○	P107
	F605	UMG Carbide	Uncoated Blank	30° 33°					●		P108
	F600	UMG Carbide	Uncoated Blank	40°					●		P109
	F631	UMG Carbide	Uncoated Blank	42° 45°					●		P110
	F607	UMG Carbide	Uncoated Blank	42° 45°					●		P111
	F642	UMG Carbide	Uncoated Blank	40°					●		P112
	F647	UMG Carbide	Uncoated Blank	40°					●		P113
	F618 F620	UMG Carbide	Uncoated Blank	40°					●		P114
	F680DC	MG Carbide	Diamond DC	30°					●		P115
	F685DC	MG Carbide	Diamond DC	30°					●		P116
	F645TX	UMG Carbide	AlCrSiN TX	45°			○			●	P117
	F665TX	UMG Carbide	AlCrSiN TX	45°			○			●	P118
	F667TX	UMG Carbide	AlCrSiN TX	55°			○			●	P119
	F668T X	UMG Carbide	AlCrSiN TX	45°			○			●	P120

P181~190 HPC/HSC專用的強力夾頭，提供高效率切削和高速精銑切削，沒有任何偏擺或鬆脫的現象。

P181~190 Power chucks specially designed for HPC/HSC provide effective cutting and high-speed precise cutting without deflection or loosening.

P181~190 HPC/HSC専用の強力チャック、高効率・高速仕上切削時に、振れや緩みの現象が発生しません

HPC

極超微粒鎢鋼塗層高效率立銑刀

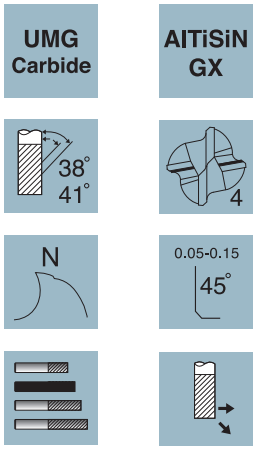
High Performance End Mills

P H < 56HRC

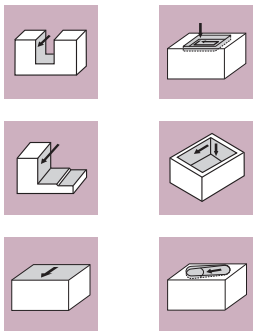
極超硬高効率エンドミル

Code No. F636GX-Dc

Dc h10	Lc mm	L mm	d h5	AlTiSiN F636GX
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	●



Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	○		○

GR.1 非合金鋼鐵 **Non-alloyed steel**
Vc.160-200 fz.P165

GR.2 低合金鋼鐵<24HRC **Low-alloyed Steel**
Vc.160-200 fz.P165

GR.3 高合金鋼鐵<30HRC **Hi-alloyed Steel**
Vc.100-150 fz.P165

GR.4 硬化鋼30~38HRC **Hardened Steel**
Vc.80-120 fz.P165

GR.5 硬化鋼38~48HRC **Hardened Steel**
Vc.60-100 fz.P165

GR.6 硬化鋼48~56HRC **Hardened Steel**
Vc.40-70 fz.P165

GR.8 不銹鋼 **Stainless Steel**
Vc.40-80 fz.P165

GR.9 鑄鐵 **Cast Iron**
Vc.140-180 fz.P165

GR.15 鈦合金 **Titanium**
Vc.60-90 fz.P165

GR.17 耐熱鋼 **Heat-resistant Steel**
Vc.30-50 fz.P165

極超微粒鎢鋼塗層高效率立銑刀

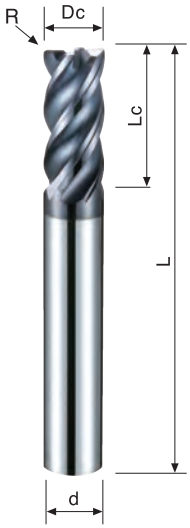
High Performance End Mills

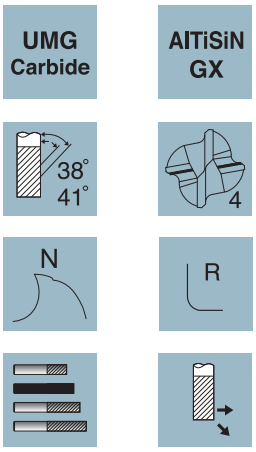
P H < 56HRC

極超硬高効率エンドミル

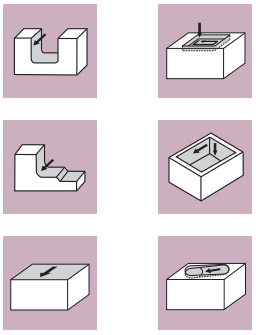
Code No. F634GX-Dc×R

Dc h10	R 0/+0.02	Lc mm	L mm	d h5	AlTiSiN F634GX
3	0.2	8	57	6	●
4	0.2	11	57	6	●
5	0.2	13	57	6	●
6	0.2	13	57	6	●
8	0.2	19	63	8	●
10	0.2	22	72	10	●
12	0.2	26	83	12	●
16	0.2	32	92	16	●
20	0.2	38	104	20	●
3	0.5	8	57	6	●
4	0.5	11	57	6	●
5	0.5	13	57	6	●
6	0.5	13	57	6	●
8	0.5	19	63	8	●
10	0.5	22	72	10	●
12	0.5	26	83	12	●
16	0.5	32	92	16	●
20	0.5	38	104	20	●





Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	○		○

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.160-200 fz.P165

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.160-200 fz.P165

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.100-150 fz.P165

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.80-120 fz.P165

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.60-100 fz.P165

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.40-70 fz.P165

GR.8 不銹鋼 Stainless Steel
Vc.40-80 fz.P165

GR.9 鑄鐵 Cast Iron
Vc.140-180 fz.P165

GR.15 鈦合金 Titanium
Vc.60-90 fz.P165

GR.17 耐熱鋼 Heat-resistant Steel
Vc.30-50 fz.P165

極超微粒鎢鋼塗層高效率立銑刀

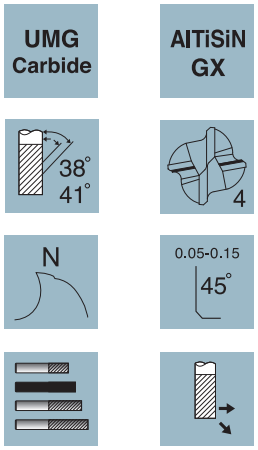
High Performance End Mills

P H < 56HRC

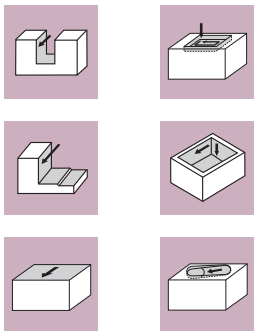
極超硬高効率エンドミル

Code No. F670GX-Dc

Dc h10	Lc mm	L mm	d h5	AlTiSiN F670GX
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	●



Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	○		○

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.180-200 fz.P165

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.180-200 fz.P165

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.120-150 fz.P165

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.100-120 fz.P165

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.80-100 fz.P165

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.50-70 fz.P165

GR.8 不銹鋼 Stainless Steel
Vc.60-80 fz.P165

GR.9 鑄鐵 Cast Iron
Vc.160-180 fz.P165

GR.15 鈦合金 Titanium
Vc.70-90 fz.P165

GR.17 耐熱鋼 Heat-resistant Steel
Vc.40-50 fz.P165

極超微粒鎢鋼塗層高效率立銑刀

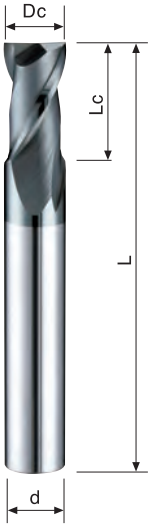
High Performance End Mills

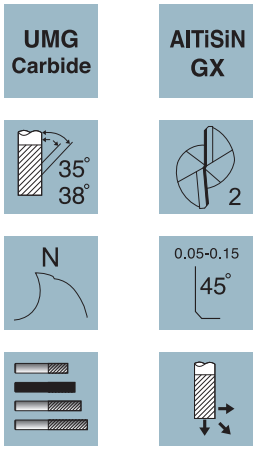
P H < 68HRC

極超硬高効率エンドミル

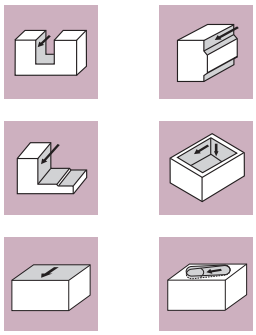
Code No. F602GX-Dc

Dc h10	Lc mm	L mm	d h5	AlTiSiN F602GX
1	2	50	4	●
1.5	4	50	4	●
2	6	50	4	●
2.5	7	50	4	●
3	7	57	6	●
4	8	57	6	●
5	10	57	6	●
6	10	57	6	●
8	16	63	8	●
10	19	72	10	●
12	22	83	12	●





Type of Operation



Work Material

P	H	M	K	N	S
●	●		○		

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.100-120 fz.P165

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.100-120 fz.P165

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.80-100 fz.P165

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.60-80 fz.P165

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-60 fz.P165

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.25-40 fz.P165

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.20-30 fz.P165

GR.9 鑄鐵 Cast Iron
Vc.120-160 fz.P165

HPC

極超微粒鎢鋼塗層高效率立銑刀

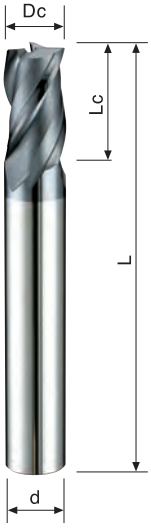
High Performance End Mills

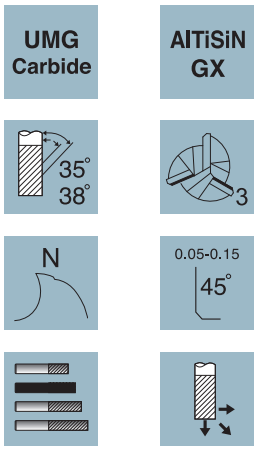
P H < 68HRC

極超硬高効率エンドミル

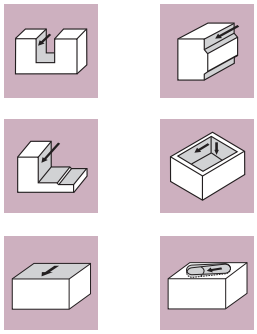
Code No. F603GX-Dc

Dc h10	Lc mm	L mm	d h5	AlTiSiN F603GX
1	2	50	4	●
1.5	4	50	4	●
2	6	50	4	●
2.5	7	50	4	●
3	7	57	6	●
4	8	57	6	●
5	10	57	6	●
6	10	57	6	●
8	16	63	8	●
10	19	72	10	●
12	22	83	12	●





Type of Operation



Work Material

P	H	M	K	N	S
●	●		○		

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.100-120 fz.P165

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.100-120 fz.P165

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.80-100 fz.P165

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.60-80 fz.P165

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-60 fz.P165

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.25-40 fz.P165

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.20-30 fz.P165

GR.9 鑄鐵 Cast Iron
Vc.120-160 fz.P165

極超微粒鎢鋼塗層高效率立銑刀

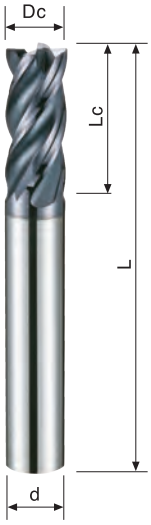
High Performance End Mills

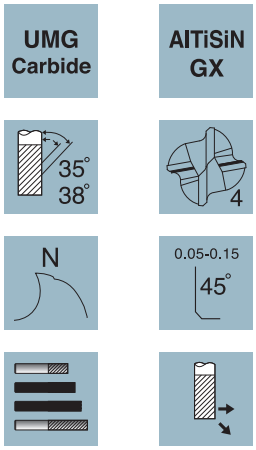
P H < 68HRC

極超硬高効率エンドミル

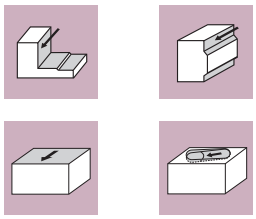
Code No. F604GX-Dc

Dc h10	Lc mm	L mm	d h5	AlTiSiN F604GX
1	3	50	4	●
1.5	5	50	4	●
2	7	50	4	●
2.5	8	50	4	●
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	●



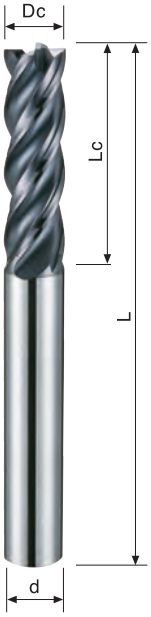


Type of Operation



Code No. F606GX-Dc

Dc h10	Lc mm	L mm	d h5	AlTiSiN F606GX
3	12	63	6	●
4	17	63	6	●
5	19	63	6	●
6	19	63	6	●
8	28	72	8	●
10	34	84	10	●
12	40	97	12	●
16	48	108	16	●
20	56	122	20	●



Work Material

P	H	M	K	N	S
●	●	○	○		○

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.120-160 fz.P165

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.120-160 fz.P165

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.100-120 fz.P165

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.80-100 fz.P165

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.60-80 fz.P165

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.40-60 fz.P165

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.20-40 fz.P165

GR.8 不銹鋼 Stainless Steel
Vc.50-70 fz.P165

GR.9 鑄鐵 Cast Iron
Vc.120-140 fz.P165

GR.15 鈦合金 Titanium
Vc.60-80 fz.P165

GR.17 耐熱鋼 Heat-resistant Steel
Vc.30-40 fz.P165

極超微粒鎢鋼塗層高效率立銑刀

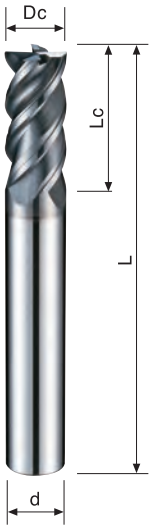
High Performance End Mills

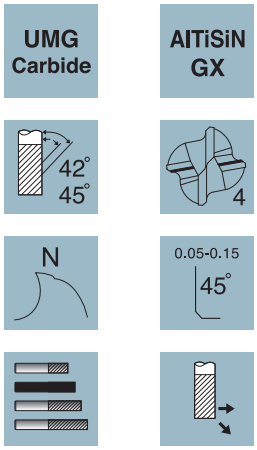
P H < 68HRC

極超硬高効率エンドミル

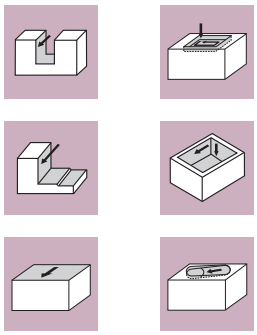
Code No. F674GX-Dc

Dc h10	Lc mm	L mm	d h5	AlTiSiN F674GX
6	13	57	6	●
8	19	63	8	●
10	22	72	10	●
12	26	83	12	●
16	32	92	16	●
20	38	104	20	●





Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	○		○

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.200-220 fz.P165

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.200-220 fz.P165

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.140-160 fz.P165

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.120-160 fz.P165

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.100-120 fz.P165

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.50-80 fz.P165

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.30-50 fz.P165

GR.8 不銹鋼 Stainless Steel
Vc.60-90 fz.P165

GR.9 鑄鐵 Cast Iron
Vc.180-200 fz.P165

GR.15 鈦合金 Titanium
Vc.80-100 fz.P165

GR.17 耐熱鋼 Heat-resistant Steel
Vc.40-60 fz.P165

極超微粒鎢鋼塗層高效率立銑刀

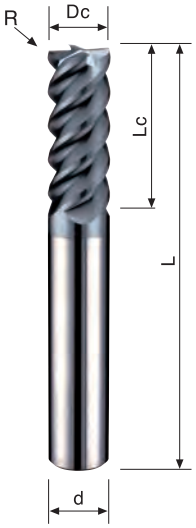
High Performance End Mills

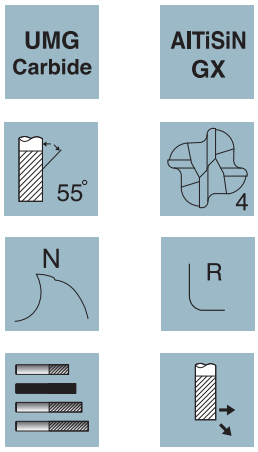
H < 68HRC

極超硬高効率エンドミル

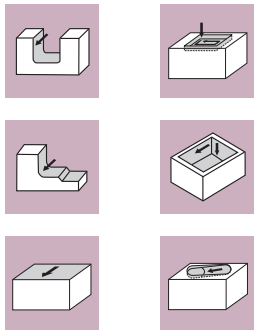
Code No. F640GX-Dc×R

Dc h10	R 0/+0.02	Lc mm	L mm	d h5	AlTiSiN F640GX
3	0.2	8	57	6	●
4	0.2	11	57	6	●
5	0.2	13	57	6	●
6	0.2	13	57	6	●
8	0.2	19	63	8	●
10	0.2	22	72	10	●
12	0.2	26	83	12	●
16	0.2	32	92	16	●
20	0.2	38	104	20	●
3	0.5	8	57	6	●
4	0.5	11	57	6	●
5	0.5	13	57	6	●
6	0.5	13	57	6	●
8	0.5	19	63	8	●
10	0.5	22	72	10	●
12	0.5	26	83	12	●
16	0.5	32	92	16	●
20	0.5	38	104	20	●





Type of Operation



Work Material

P	H	M	K	N	S
○	●				

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.180-200 fz.P165

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.150-180 fz.P165

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.120-150 fz.P165

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.100-120 fz.P165

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.50-60 fz.P165

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.30-40 fz.P165

HPC

極超微粒鎢鋼塗層高效率立銑刀

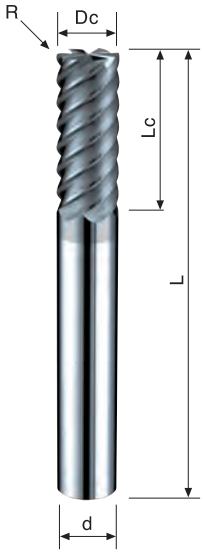
High Performance End Mills

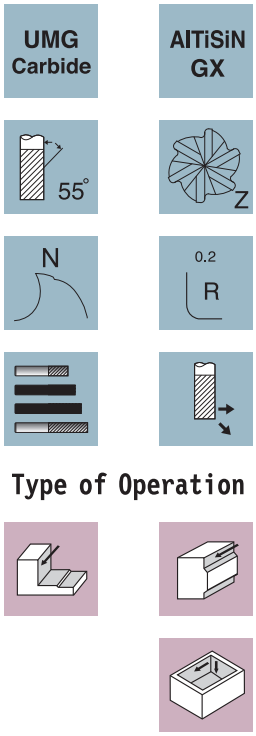
H 48~68HRC

極超硬高効率エンドミル

Code No. F660GX-Dc

Dc h10	Lc mm	L mm	d h5	Z	AlTiSiN F660GX
6	13	57	6	6	●
8	19	63	8	6	●
10	22	72	10	6	●
12	26	83	12	6	●
16	32	92	16	8	●
20	38	104	20	10	●

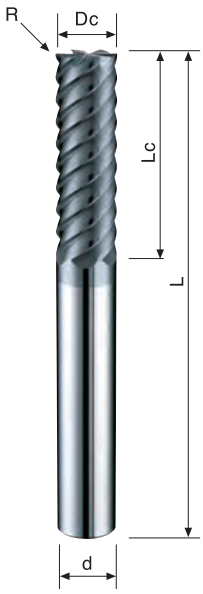




Type of Operation

Code No. F661GX-Dc

Dc h10	Lc mm	L mm	d h5	Z	AlTiSiN F661GX
6	19	63	6	6	●
8	28	72	8	6	●
10	34	84	10	6	●
12	40	97	12	6	●
16	48	108	16	8	●
20	56	122	20	10	●



Work Material

P	H	M	K	N	S
	●		○		

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.60-100 fz.P165

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.30-60 fz.P165

GR.9 鑄鐵 Cast Iron
Vc.120-180 fz.P165

極超微粒鎢鋼塗層高效率粗加工立銑刀

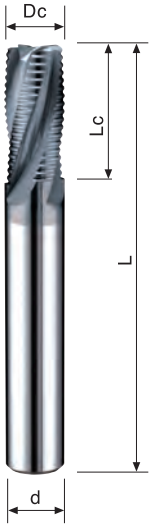
High Performance Roughing End Mills

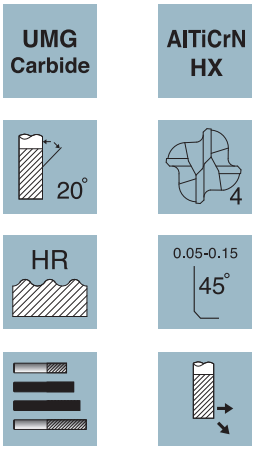
K P H < 56HRC

極超硬高効率ラフィングエンドミル

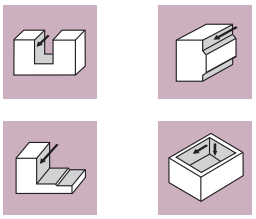
Code No. F608HX-Dc

Dc h10	Lc mm	L mm	d h5	Z	AlTiCrN F608HX
6	13	57	6	3	●
8	19	63	8	3	●
10	22	72	10	4	●
12	26	83	12	4	●
14	26	83	14	4	●
16	32	92	16	4	●
18	32	92	18	4	●
20	38	104	20	4	●



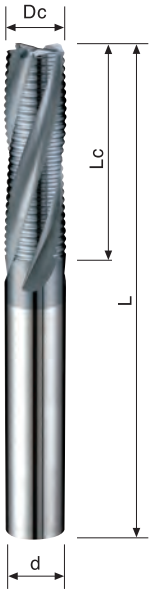


Type of Operation



Code No. F609HX-Dc

Dc h10	Lc mm	L mm	d h5	Z	AlTiCrN F609HX
6	19	63	6	3	●
8	28	72	8	3	●
10	34	84	10	4	●
12	40	97	12	4	●
16	48	108	16	4	●
20	56	122	20	4	●



Work Material

P	H	M	K	N	S
●	●		●		○

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.100-120 fz.P165

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.100-120 fz.P165

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-80 fz.P165

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.40-60 fz.P165

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.30-40 fz.P165

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.20-30 fz.P165

GR.9 鑄鐵 Cast Iron
Vc.120-160 fz.P165

GR.15 鈦合金 Titanium
Vc.30-40 fz.P165

HPC

極超微粒鎢鋼塗層高效率粗加工立銑刀

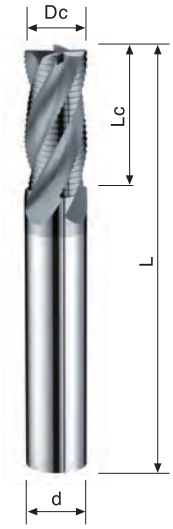
High Performance Roughing End Mills

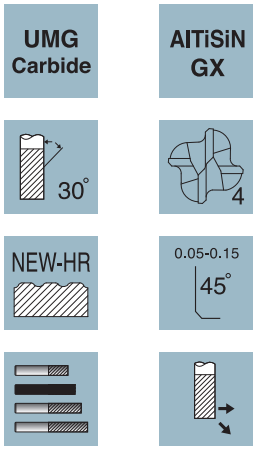
P H < 68HRC

極超硬高効率ラフィングエンドミル

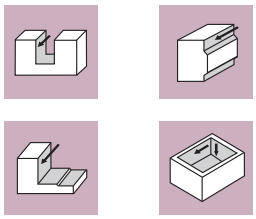
Code No. F630GX-Dc

Dc h10	Lc mm	L mm	d h5	Z	AlTiSiN F630GX
6	13	57	6	3	●
8	19	63	8	3	●
10	22	72	10	4	●
12	26	83	12	4	●
16	32	92	16	4	●
20	38	104	20	4	●





Type of Operation



Work Material

P	H	M	K	N	S
●	●		○		○

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.120-160 fz.P165

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.120-160 fz.P165

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.80-100 fz.P165

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.60-80 fz.P165

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-60 fz.P165

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.25-40 fz.P165

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.20-30 fz.P165

GR.9 鑄鐵 Cast Iron
Vc.120-160 fz.P165

GR.15 鈦合金 Titanium
Vc.30-40 fz.P165

極超微粒鎢鋼塗層高進給立銑刀

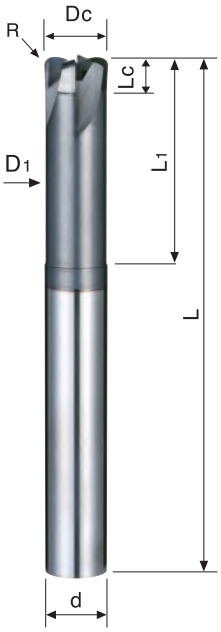
High Feed End Mills

P H < 68HRC

極超硬高送りエンドミル

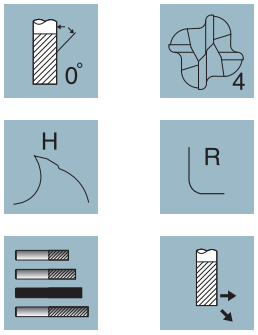
Code No. F676GX-Dc

Dc h10	Progrmmable Radius	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiSiN F676GX
3	0.37	2	70	6	12	2.7	●
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	5.6	●
8	0.98	4	80	8	30	7.6	●
10	1.23	5	90	10	35	9.6	●
12	1.65	6	100	12	40	11.6	●

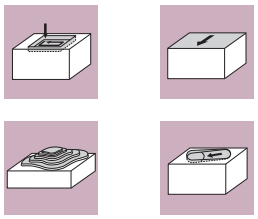


UMG Carbide

AlTiSiN GX



Type of Operation



Work Material

P	H	M	K	N	S
●	●				

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.250-300 fz.P166

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.250-300 fz.P166

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.180-200 fz.P166

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.160-180 fz.P166

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.100-120 fz.P166

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.80-100 fz.P166

HFC

極超微粒鎢鋼塗層高效率立銑刀

High Performance End Mills

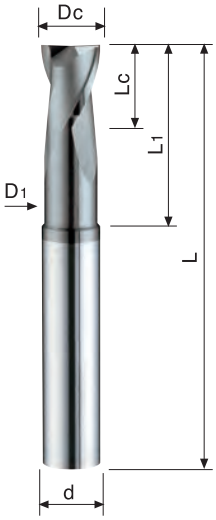
P H < 56HRC

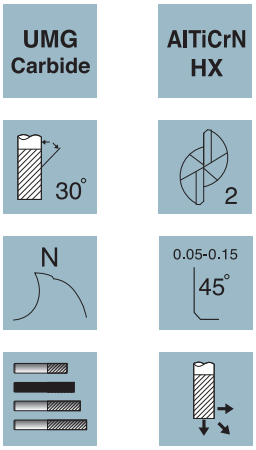
極超硬高効率エンドミル

Code No. F621HX-Dc

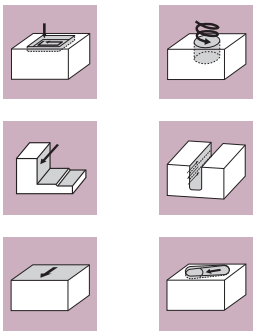
Dc h10	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiCrN F621HX
3.0	4.0	57	6	9	2.8	●
4.0	5.0	57	6	12	3.7	●
5.0	6.0	57	6	15	4.6	●
6.0	7.0	57	6	20	5.5	●
8.0	9.0	63	8	26	7.4	●
10.0	11.0	72	10	31	9.2	●
12.0	13.0	83	12	37	11.0	●
16.0	15.0	92	16	43	15.0	●

※停止生產，售完為止
※Limited quantity, production discounted.
※生産停止、売切り次第販売停止





Type of Operation



Work Material

P	H	M	K	N	S
●	●		○		

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.160-180 fz.P165

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.160-180 fz.P165

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.100-120 fz.P165

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.80-100 fz.P165

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.60-80 fz.P165

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.40-60 fz.P165

GR.9 鑄鐵 Cast Iron
Vc.140-160 fz.P165

極超微粒鎢鋼塗層高效率立銑刀

High Performance End Mills

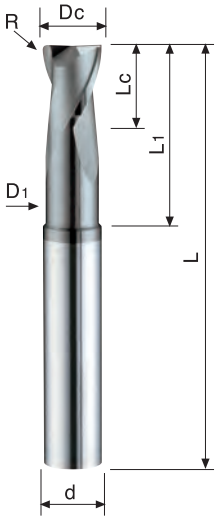
P H < 56HRC

極超硬高効率エンドミル

Code No. F601HX-Dc

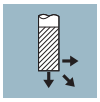
Dc h10	R 0/+0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiCrN F601HX
3.0	R0.1	4.0	57	6	9	2.8	●
4.0	R0.1	5.0	57	6	12	3.7	●
5.0	R0.2	6.0	57	6	15	4.6	●
6.0	R0.2	7.0	57	6	20	5.5	●
8.0	R0.2	9.0	63	8	26	7.4	●
10.0	R0.2	11.0	72	10	31	9.2	●
12.0	R0.3	13.0	83	12	37	11.0	●
16.0	R0.3	17.0	92	16	43	15.0	●

※停止生產，售完為止
※Limited quantity, production discounted.
※生産停止、売切り次第販売停止

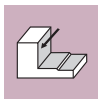


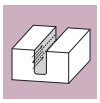
UMG Carbide

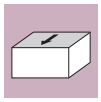
AlTiCrN HX



Type of Operation







Work Material

P	H	M	K	N	S
●	●		○		

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.160-180 fz.P165

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.160-180 fz.P165

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.100-120 fz.P165

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.80-100 fz.P165

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.60-80 fz.P165

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.40-60 fz.P165

GR.9 鑄鐵 Cast Iron
Vc.140-160 fz.P165

HPC

極超微粒鎢鋼塗層高效率立銑刀

High Performance End Mills

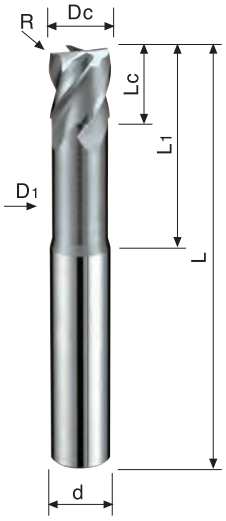
P H < 56HRC

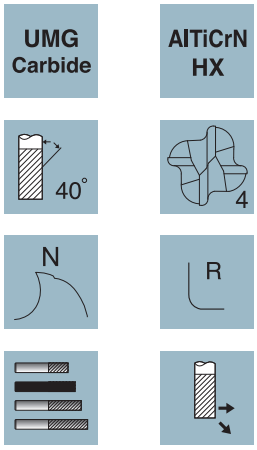
極超硬高効率エンドミル

Code No. F610HX-Dc

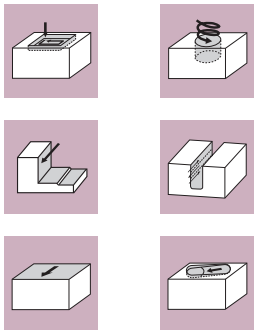
Dc h10	R 0/+0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiCrN F610HX
3	R0.1	4	57	6	9	2.8	●
4	R0.1	5	57	6	12	3.7	●
5	R0.2	6	57	6	15	4.6	●
6	R0.2	7	57	6	20	5.5	●
8	R0.2	9	63	8	26	7.4	●
10	R0.2	11	72	10	31	9.2	●
12	R0.3	13	83	12	37	11.0	●
16	R0.3	17	92	16	43	15.0	●
20	R0.3	21	104	20	53	19.0	●

※停止生產，售完為止
※Limited quantity, production discounted.
※生産停止、売切り次第販売停止





Type of Operation



Work Material

P	H	M	K	N	S
●	●	○	○		○

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.180-200 fz.P165

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.180-200 fz.P165

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.120-150 fz.P165

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.100-120 fz.P165

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.80-100 fz.P165

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.50-70 fz.P165

GR.8 不銹鋼 Stainless Steel
Vc.60-80 fz.P165

GR.9 鑄鐵 Cast Iron
Vc.160-180 fz.P165

GR.15 鈦合金 Titanium
Vc.70-90 fz.P165

GR.17 耐熱鋼 Heat-resistant Steel
Vc.40-50 fz.P165

極超微粒鎢鋼塗層高效率立銑刀

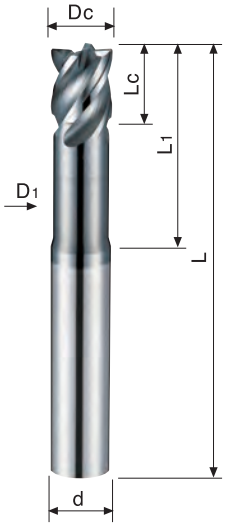
High Performance End Mills

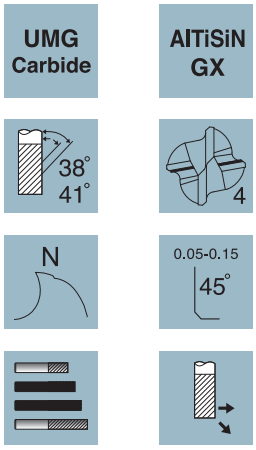
P H < 56HRC

極超硬高効率エンドミル

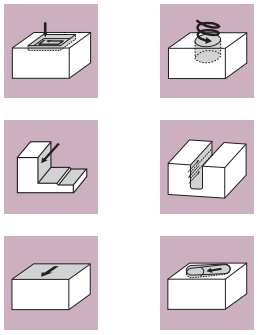
Code No. F612GX-Dc

Dc h10	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiSiN F612GX
3	4	57	6	9	2.8	●
4	5	57	6	12	3.7	●
5	6	57	6	15	4.6	●
6	7	57	6	20	5.5	●
8	9	63	8	26	7.4	●
10	11	72	10	31	9.2	●
12	13	83	12	37	11.0	●
16	17	92	16	43	15.0	●
20	21	104	20	53	19.0	●



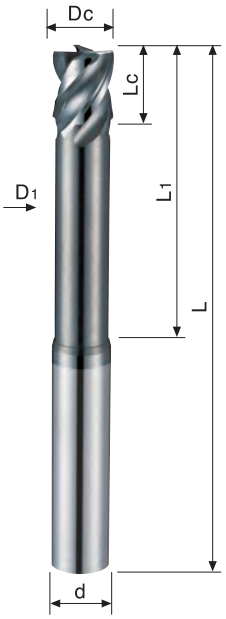


Type of Operation



Code No. F617GX-Dc

Dc h10	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiSiN F617GX
6	7	70	6	33	5.5	●
8	9	80	8	43	7.4	●
10	11	90	10	49	9.2	●
12	13	100	12	54	11.0	●
16	17	115	16	66	15.0	●
20	21	130	20	79	19.0	●



Work Material

P	H	M	K	N	S
●	●	○	○		○

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.180-200 fz.P165

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.180-200 fz.P165

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.120-150 fz.P165

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.100-120 fz.P165

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.80-100 fz.P165

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.50-70 fz.P165

GR.8 不銹鋼 Stainless Steel
Vc.60-80 fz.P165

GR.9 鑄鐵 Cast Iron
Vc.160-180 fz.P165

GR.15 鈦合金 Titanium
Vc.70-90 fz.P165

GR.17 耐熱鋼 Heat-resistant Steel
Vc.40-50 fz.P165

極超微粒鎢鋼塗層高效率立銑刀

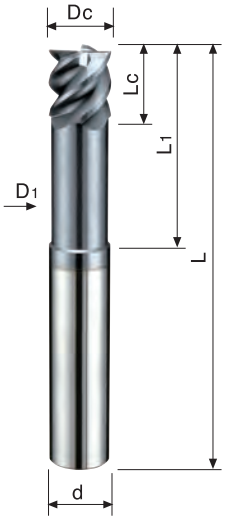
High Performance End Mills

P H < 68HRC

極超硬高効率エンドミル

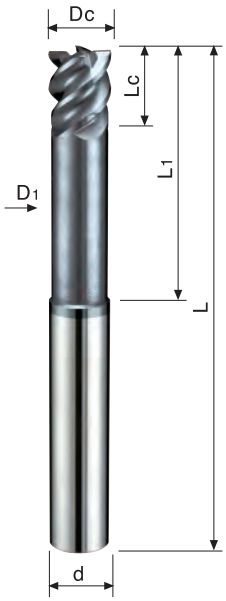
Code No. F632GX-Dc

Dc h10	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiSiN F632GX
3	4	57	6	9	2.8	●
4	5	57	6	12	3.7	●
5	6	57	6	15	4.6	●
6	7	57	6	20	5.5	●
8	9	63	8	26	7.4	●
10	11	72	10	31	9.2	●
12	13	83	12	37	11.0	●
16	17	92	16	43	15.0	●
20	21	104	20	53	19.0	●



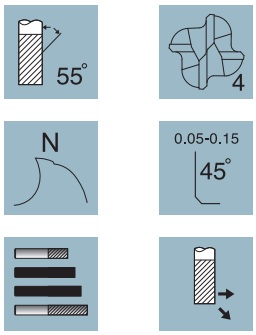
Code No. F633GX-Dc

Dc h10	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiSiN F633GX
6	7	70	6	33	5.5	●
8	9	80	8	43	7.4	●
10	11	90	10	49	9.2	●
12	13	100	12	54	11.0	●
16	17	115	16	66	15.0	●
20	21	130	20	79	19.0	●

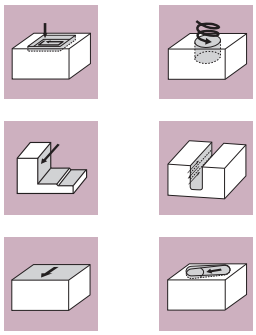


UMG Carbide

AlTiSiN GX



Type of Operation



Work Material

P	H	M	K	N	S
●	●				

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.140-160 fz.P165

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.120-150 fz.P165

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.100-120 fz.P165

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.80-100 fz.P165

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.40-60 fz.P165

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.20-30 fz.P165

極超微粒鎢鋼塗層高效率立銑刀

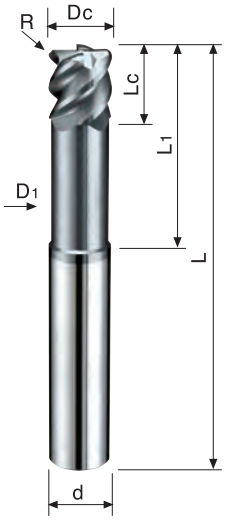
High Performance End Mills

P H < 68HRC

極超硬高効率エンドミル

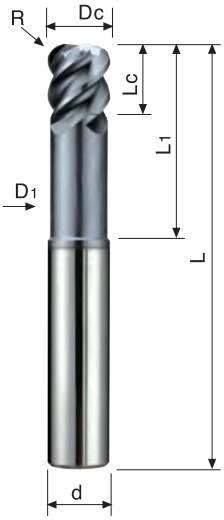
Code No. F635GX-Dc

Dc h10	R 0/+0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiSiN F635GX
6	R1.0	7	57	6	20	5.5	●
8	R1.0	9	63	8	26	7.4	●
10	R1.5	11	72	10	31	9.2	●
12	R1.5	13	83	12	37	11.0	●
16	R1.5	17	92	16	43	15.0	●



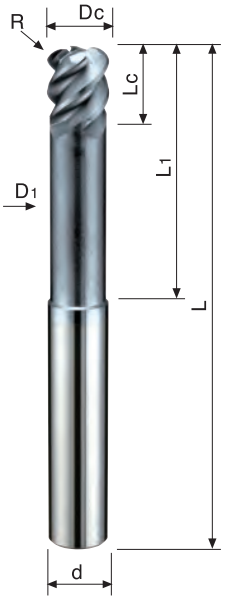
Code No. F637GX-Dc

Dc h10	R 0/+0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiSiN F637GX
6	R1.5	7	57	6	20	5.5	●
8	R2.0	9	63	8	26	7.4	●
10	R2.5	11	72	10	31	9.2	●
12	R3.0	13	83	12	37	11.0	●
16	R3.5	17	92	16	43	15.0	●
20	R4.0	21	104	20	53	19.0	●



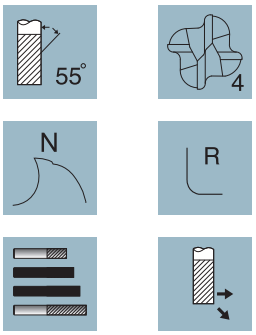
Code No. F639GX-Dc

Dc h10	R 0/+0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiSiN F639GX
6	R1.5	7	70	6	33	5.5	●
8	R2.0	9	80	8	43	7.4	●
10	R2.5	11	90	10	49	9.2	●
12	R3.0	13	100	12	54	11.0	●
16	R3.5	17	115	16	66	15.0	●
20	R4.0	17	130	20	79	19.0	●

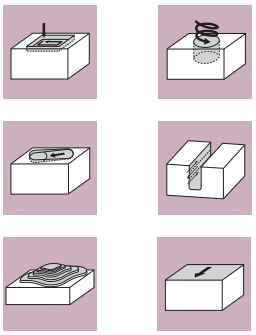


UMG Carbide

AlTiSiN GX



Type of Operation



Work Material

P	H	M	K	N	S
●	●				

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.140-160 fz.P165

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.120-150 fz.P165

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.100-120 fz.P165

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.80-100 fz.P165

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.40-60 fz.P165

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.20-30 fz.P165

HPC

極超微粒鎢鋼塗層高效率環面立銑刀

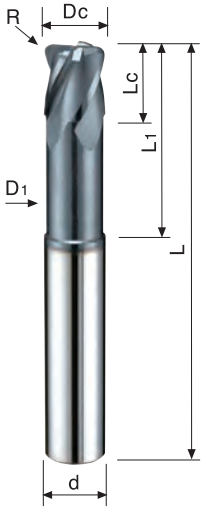
High Performance Toric End Mills

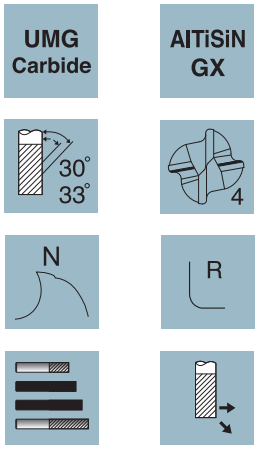
H < 56HRC

極超硬高効率コーナーRエンドミル

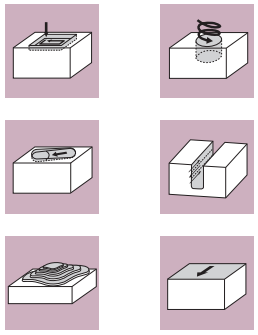
Code No. F615GX-Dc×R

Dc h10	R 0/+0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiSiN F615GX
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	R1.0	5	57	6	16	3.7	●
6	R0.5	7	57	6	20	5.5	●
6	R1.0	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	R1.0	9	63	8	26	7.4	●
8	R1.5	9	63	8	26	7.4	●
8	R2.0	9	63	8	26	7.4	●
10	R0.5	11	72	10	31	9.2	●
10	R1.0	11	72	10	31	9.2	●
10	R1.5	11	72	10	31	9.2	●
10	R2.0	11	72	10	31	9.2	●
10	R2.5	11	72	10	31	9.2	●
12	R0.5	13	83	12	37	11.0	●
12	R1.0	13	83	12	37	11.0	●
12	R1.5	13	83	12	37	11.0	●
12	R2.0	13	83	12	37	11.0	●
12	R3.0	13	83	12	37	11.0	●
16	R2.0	17	92	16	43	15.0	●
16	R4.0	17	92	16	43	15.0	●





Type of Operation

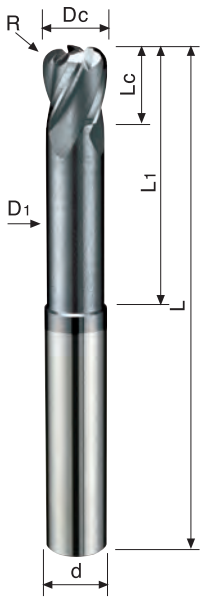


Work Material

P	H	M	K	N	S
	●		○		

Code No. F619GX-Dc×R

Dc h10	R 0/+0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiSiN F619GX
6	R1.5	7	70	6	33	5.5	●
8	R2.0	9	80	8	43	7.4	●
10	R2.5	11	90	10	49	9.2	●
12	R3.0	13	100	12	54	11.0	●
16	R4.0	17	115	16	66	15.0	●



GR.4 硬化鋼30~38HRC Hardened Steel
Vc.180-200 fz.P167

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.150-180 fz.P167

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.120-150 fz.P167

GR.9 鑄鐵 Cast Iron
Vc.220-250 fz.P167

極超微粒鎢鋼塗層高效率環面立銑刀

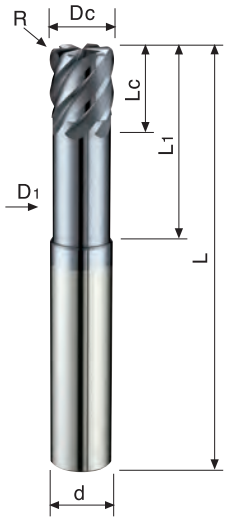
High Performance Toric End Mills

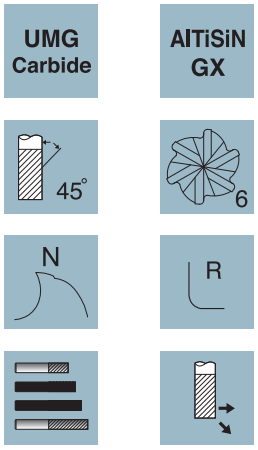
H < 68HRC

極超硬高効率コーナーRエンドミル

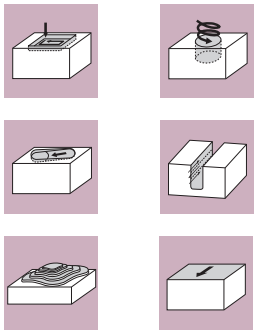
Code No. F613GX-Dc×R

Dc h10	R 0/+0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	Z	AlTiSiN F613GX
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	11.0	6	●
6	R1.0	7	57	6	20	5.5	6	●
8	R1.0	9	63	8	26	7.4	6	●
10	R1.0	11	72	10	31	9.2	6	●
12	R1.0	13	83	12	37	11.0	6	●



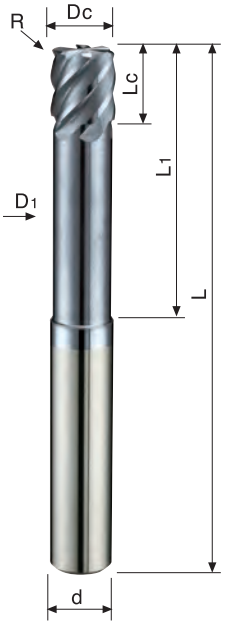


Type of Operation



Code No. F614GX-Dc×R

Dc h10	R 0/+0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	Z	AlTiSiN F614GX
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	11.0	6	●
6	R1.0	7	70	6	33	5.5	6	●
8	R1.0	9	80	8	43	7.4	6	●
10	R1.0	11	90	10	49	9.2	6	●
12	R1.0	13	100	12	54	11.0	6	●



Work Material

P	H	M	K	N	S
	●		○		

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.180-200 fz.P167

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.150-180 fz.P167

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.120-150 fz.P167

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.60-80 fz.P167

GR.9 鑄鐵 Cast Iron
Vc.220-250 fz.P167

HSC

極超微粒鎢鋼塗層高效率圓頭立銑刀

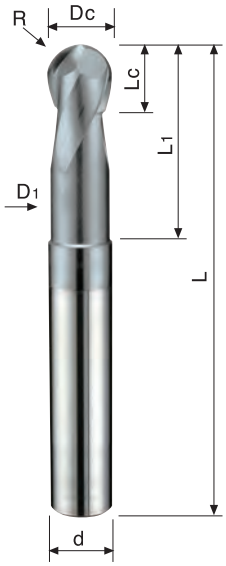
High Performance Ball Nose End Mills

P H < 56HRC

極超硬高効率ボールエンドミル

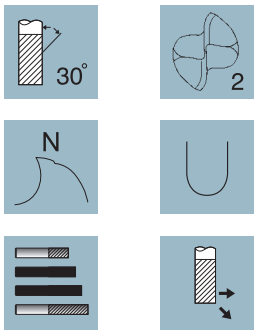
Code No. F623HX-Dc

Dc h9	R ±0.01	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiCrN F623HX
1	0.5R	1	50	6	3	0.95	●
1.5	0.75R	2	50	6	4	1.4	●
2	1.0R	3	57	6	6	1.9	●
3	1.5R	4	57	6	9	2.8	●
4	2.0R	5	57	6	12	3.7	●
5	2.5R	6	57	6	15	4.6	●
6	3.0R	7	57	6	20	5.5	●
8	4.0R	9	63	8	26	7.4	●
10	5.0R	11	72	10	31	9.2	●
12	6.0R	13	83	12	37	11.0	●

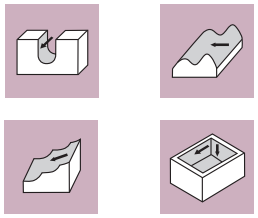


UMG Carbide

AlTiCrN HX

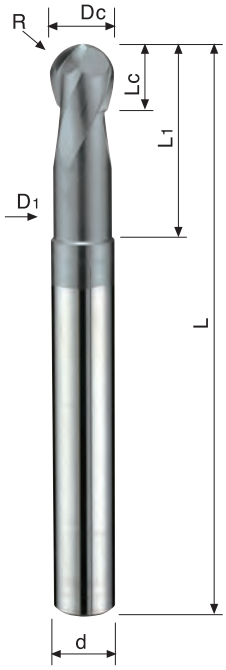


Type of Operation



Code No. F624HX-Dc

Dc h9	R ±0.01	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiCrN F624HX
3	1.5R	4	70	6	9	2.8	●
4	2.0R	5	70	6	12	3.7	●
5	2.5R	6	80	6	15	4.6	●
6	3.0R	7	80	6	20	5.5	●
8	4.0R	9	100	8	26	7.4	●
10	5.0R	11	100	10	31	9.2	●
12	6.0R	13	110	12	37	11.0	●



Work Material

P	H	M	K	N	S
●	●		○		

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.250-300 fz.P164

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.220-250 fz.P164

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.200-220 fz.P164

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.180-200 fz.P164

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.160-180 fz.P164

GR.9 鑄鐵 Cast Iron
Vc.250-280 fz.P164

極超微粒鎢鋼塗層高效率圓頭立銑刀

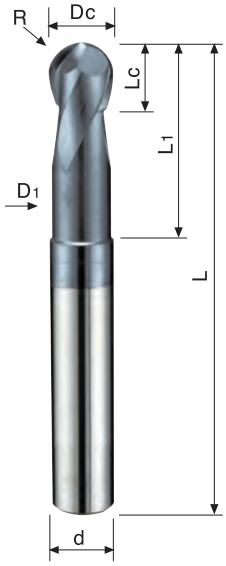
High Performance Ball Nose End Mills

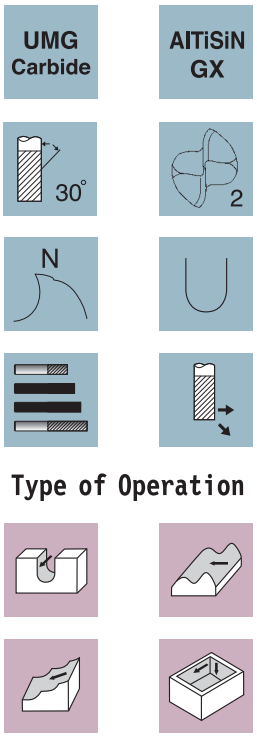
H 48-68HRC

極超硬高効率ボールエンドミル

Code No. F625GX-Dc

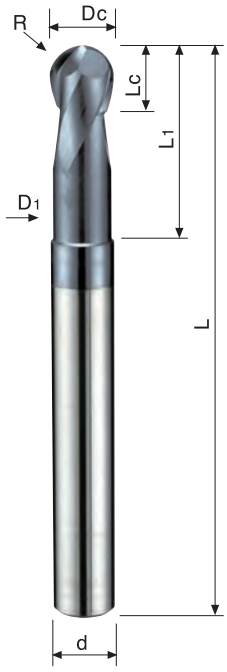
Dc h9	R ±0.01	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiSiN F625GX
1	0.5R	1	50	6	3	0.95	●
1.5	0.75R	2	50	6	4	1.4	●
2	1.0R	3	57	6	6	1.9	●
3	1.5R	4	57	6	9	2.8	●
4	2.0R	5	57	6	12	3.7	●
5	2.5R	6	57	6	15	4.6	●
6	3.0R	7	57	6	20	5.5	●
8	4.0R	9	63	8	26	7.4	●
10	5.0R	11	72	10	31	9.2	●
12	6.0R	13	83	12	37	11.0	●





Code No. F626GX-Dc

Dc h9	R ±0.01	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiSiN F626GX
3	1.5R	4	70	6	9	2.8	●
4	2.0R	5	70	6	12	3.7	●
5	2.5R	6	80	6	15	4.6	●
6	3.0R	7	80	6	20	5.5	●
8	4.0R	9	100	8	26	7.4	●
10	5.0R	11	100	10	31	9.2	●
12	6.0R	13	110	12	37	11.0	●



Work Material

P	H	M	K	N	S
	●		○		

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.160-180 fz.P164

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.60-80 fz.P164

GR.9 鑄鐵 Cast Iron
Vc.280-320 fz.P164

HSC

極超微粒鎢鋼塗層高效率立銑刀

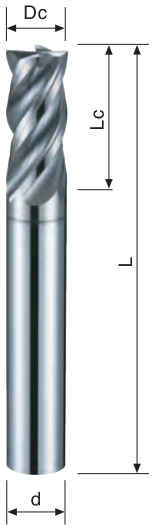
High Performance End Mills

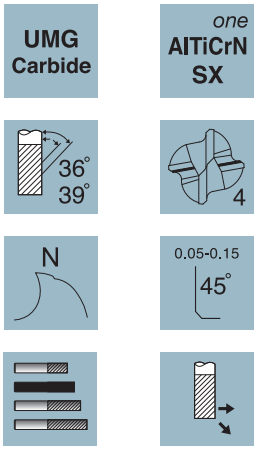
M Stainless

極超硬高効率エンドミル

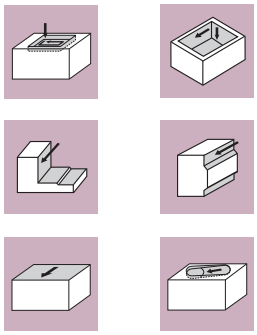
Code No. F651SX-Dc

Dc h10	Lc mm	L mm	d h5	AlTiCrN F651SX
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	●





Type of Operation



Work Material

P	H	M	K	N	S
		●			○

GR.8 不銹鋼 **Stainless Steel**
Vc.80-100 fz.P165

GR.15 鈦合金 **Titanium**
Vc.60-80 fz.P165

GR.16 鎳 **Nickel**
Vc.40-60 fz.P165

GR.17 耐熱鋼 **Heat-resistant Steel**
Vc.50-70 fz.P165

極超微粒鎢鋼塗層高效率立銑刀

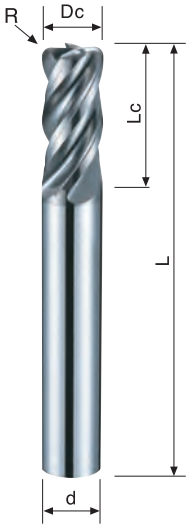
High Performance End Mills

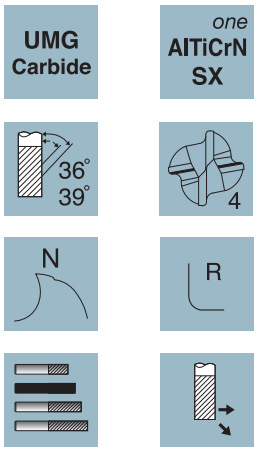
M Stainless

極超硬高効率エンドミル

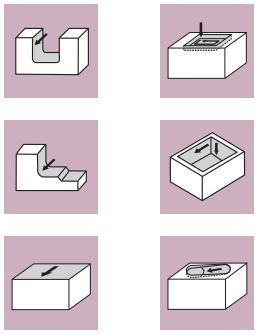
Code No. F652SX-Dc×R

Dc h10	R 0/+0.02	Lc mm	L mm	d h5	AlTiCrN F652SX
3	0.2	8	57	6	●
4	0.2	11	57	6	●
5	0.2	13	57	6	●
6	0.2	13	57	6	●
8	0.2	19	63	8	●
10	0.2	22	72	10	●
12	0.2	26	83	12	●
16	0.2	32	92	16	●
20	0.2	38	104	20	●
3	0.5	8	57	6	●
4	0.5	11	57	6	●
5	0.5	13	57	6	●
6	0.5	13	57	6	●
8	0.5	19	63	8	●
10	0.5	22	72	10	●
12	0.5	26	83	12	●
16	0.5	32	92	16	●
20	0.5	38	104	20	●
6	1.0	13	57	6	●
8	1.0	19	63	8	●
10	1.0	22	72	10	●
12	1.0	26	83	12	●
16	1.0	32	92	16	●
20	1.0	38	104	20	●
6	2.0	13	57	6	●
8	2.0	19	63	8	●
10	2.0	22	72	10	●
12	2.0	26	83	12	●
16	2.0	32	92	16	●
20	2.0	38	104	20	●





Type of Operation



Work Material

P	H	M	K	N	S
		●			○

GR.8 不銹鋼 Stainless Steel
Vc.80-100 fz.P165

GR.15 鈦合金 Titanium
Vc.60-80 fz.P165

GR.16 鎳 Nickel
Vc.40-60 fz.P165

GR.17 耐熱鋼 Heat-resistant Steel
Vc.50-70 fz.P165

HPC

極超微粒鎢鋼塗層高效率立銑刀

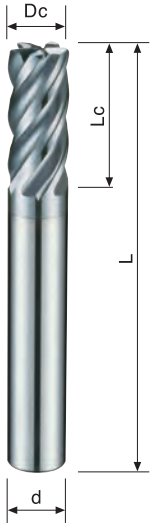
High Performance End Mills

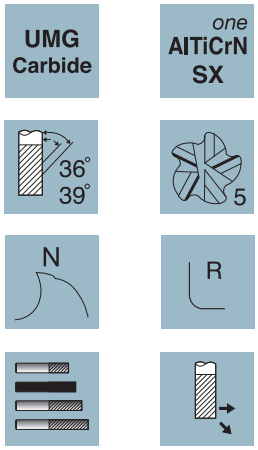
M Stainless

極超硬高効率エンドミル

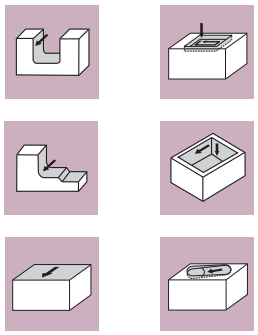
Code No. F653SX-Dc×R

Dc h10	R 0/+0.02	Lc mm	L mm	d h5	AlTiCrN F653SX
3	0.5	8	57	6	●
4	0.5	11	57	6	●
5	0.5	13	57	6	●
6	0.5	13	57	6	●
8	0.5	19	63	8	●
10	0.5	22	72	10	●
12	0.5	26	83	12	●
16	0.5	32	92	92	●
20	0.5	38	104	104	●





Type of Operation



Work Material

P	H	M	K	N	S
		●			○

GR.8 不銹鋼 Stainless Steel
Vc.80-100 fz.P165

GR.15 鈦合金 Titanium
Vc.60-80 fz.P165

GR.16 鎳 Nickel
Vc.40-60 fz.P165

GR.17 耐熱鋼 Heat-resistant Steel
Vc.50-70 fz.P165

極超微粒鎢鋼高效率立銑刀

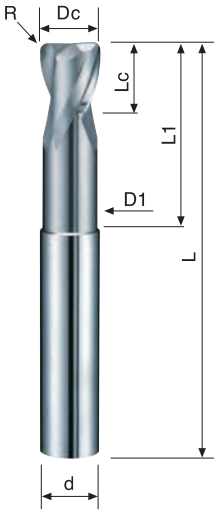
High Performance End Mills

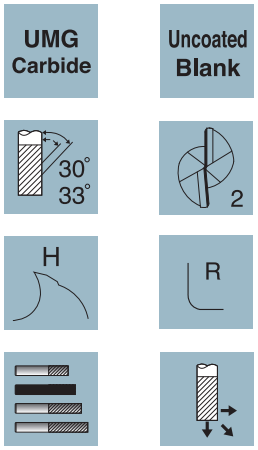
N Aluminium

極超硬高効率エンドミル

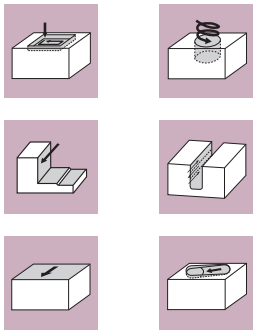
Code No. F605-Dc×R

Dc h10	R 0/+0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	Blank F605
3	R0.5	4	57	6	9	2.8	●
4	R0.5	5	57	6	12	3.7	●
5	R0.5	6	57	6	15	4.6	●
6	R0.5	7	57	6	20	5.5	●
6	R1.0	7	57	6	20	5.5	●
8	R0.5	9	63	8	26	7.4	●
8	R1.0	9	63	8	26	7.4	●
10	R1.0	11	72	10	31	9.2	●
10	R1.5	11	72	10	31	9.2	●
12	R1.0	13	83	12	37	11.0	●
12	R1.5	13	83	12	37	11.0	●
16	R2.0	17	92	16	43	15.0	●
20	R2.0	21	104	20	53	19.0	●





Type of Operation



Work Material

P	H	M	K	N	S
				●	

GR.10 鉛 Aluminium
Vc.300-800 fz.P165

GR.11 銅 Copper
Vc.200-600 fz.P165

HPC

極超微粒鎢鋼高效率立銑刀

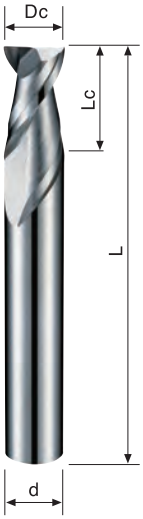
High Performance End Mills

N Aluminium

極超硬高効率エンドミル

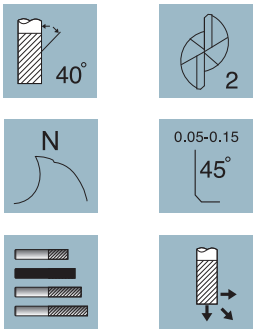
Code No. F600-Dc

Dc h10	Lc mm	L mm	d h5	Blank F600
3	7	57	6	●
4	8	57	6	●
5	10	57	6	●
6	10	57	6	●
8	16	63	8	●
10	19	72	10	●
12	22	83	12	●

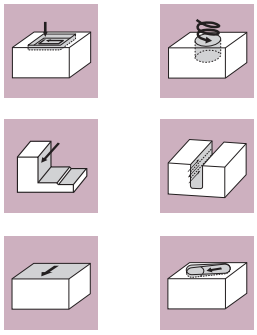


UMG Carbide

Uncoated Blank



Type of Operation



Work Material

P	H	M	K	N	S
				●	

GR.10 鉛 Aluminium
Vc.300-800 fz.P165

GR.11 銅 Copper
Vc.200-600 fz.P165

極超微粒鎢鋼高效率立銑刀

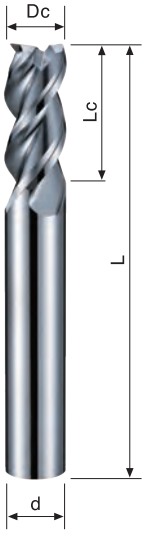
High Performance End Mills

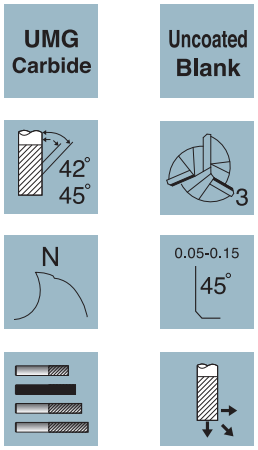
N Aluminium

極超硬高効率エンドミル

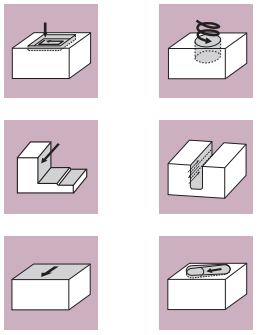
Code No. F631-Dc

Dc h10	Lc mm	L mm	d h5	Blank F631
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	●





Type of Operation



Work Material

P	H	M	K	N	S
				●	

GR.10 鉛 Aluminium
Vc.300-800 fz.P165

GR.11 銅 Copper
Vc.300-600 fz.P165

HPC

極超微粒鎢鋼高效率立銑刀

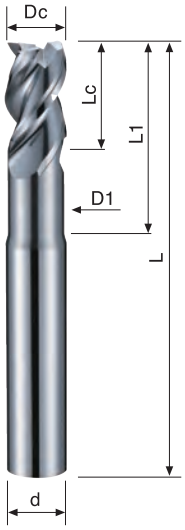
High Performance End Mills

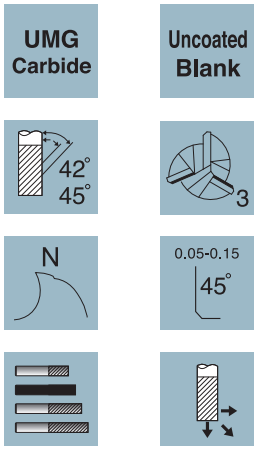
N Aluminium

極超硬高効率エンドミル

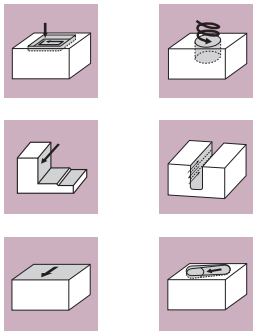
Code No. F607-Dc

Dc h10	Lc mm	L mm	d h5	L1 mm	D1 mm	Blank F607
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	11.0	●





Type of Operation



Work Material

P	H	M	K	N	S
				●	

GR.10 鉛 Aluminium
Vc.300-800 fz.P165

GR.11 銅 Copper
Vc.300-600 fz.P165

極超微粒鎢鋼高效率粗加工立銑刀

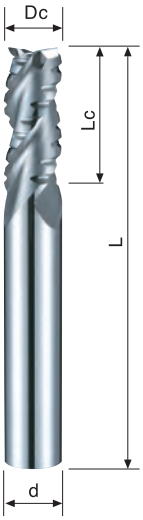
High Performance Roughing End Mills

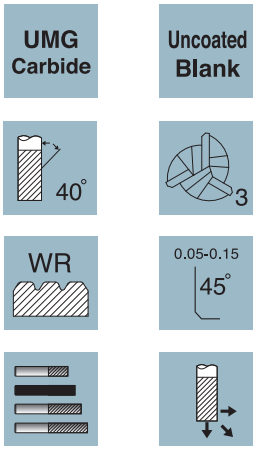
N Aluminium

極超硬高効率ラフィングエンドミル

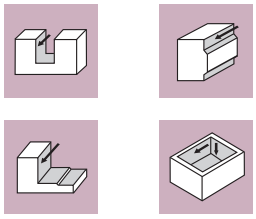
Code No. F642-Dc

Dc h10	Lc mm	L mm	d h5	Blank F642
6	13	57	6	●
8	19	63	8	●
10	22	72	10	●
12	26	83	12	●
16	32	92	16	●
20	38	104	20	●





Type of Operation



Work Material

P	H	M	K	N	S
				●	

GR.10 鉛 Aluminium
Vc.200-450 fz.P165

GR.11 銅 Copper
Vc.100-300 fz.P165

HPC

極超微粒鎢鋼高效率立銑刀

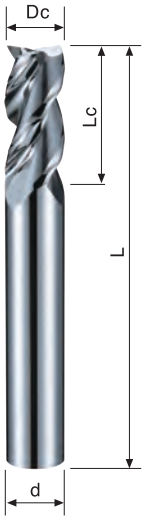
High Performance End Mills

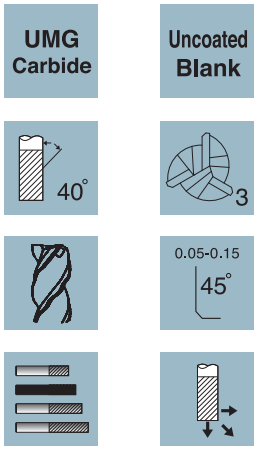
N Aluminium

極超硬高効率エンドミル

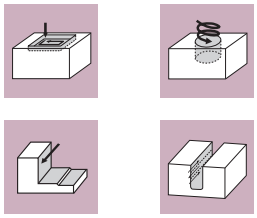
Code No. F647-Dc

Dc h10	Lc mm	L mm	d h5	Blank F647
6	13	57	6	●
8	19	63	8	●
10	22	72	10	●
12	26	83	12	●





Type of Operation



Work Material

P	H	M	K	N	S
				●	

GR.10 鋁 Aluminium

Vc.200-300 fz.P165

極超微粒鎢鋼高效率圓頭立銑刀

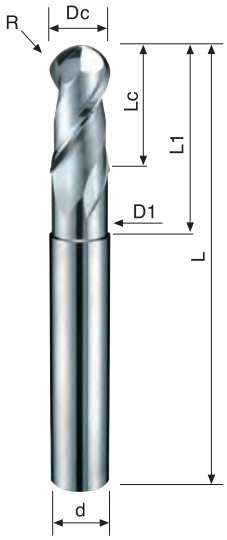
High Performance Ball Nose End Mills

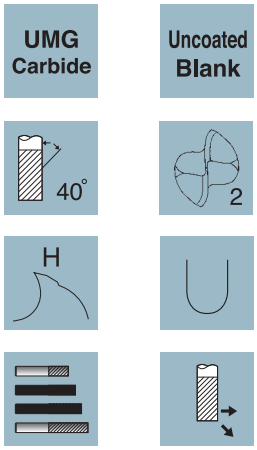
N Aluminium

極超硬高効率ボールエンドミル

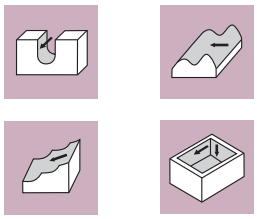
Code No. F618-Dc

Dc h9	R ±0.01	Lc mm	L mm	d h5	L1 mm	D1 mm	Blank F618
3	1.5R	6	57	6	9	2.8	●
4	2.0R	8	57	6	12	3.7	●
5	2.5R	10	57	6	15	4.6	●
6	3.0R	12	57	6	20	5.5	●
8	4.0R	16	63	8	26	7.4	●
10	5.0R	20	72	10	31	9.2	●
12	6.0R	24	83	12	37	11.0	●



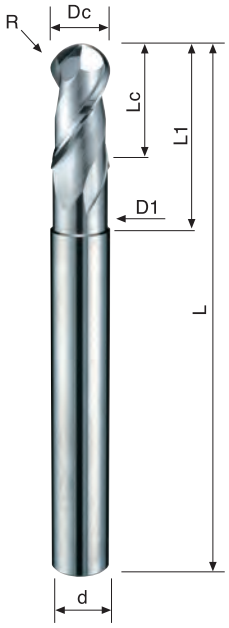


Type of Operation



Code No. F620-Dc

Dc h9	R ±0.01	Lc mm	L mm	d h5	L1 mm	D1 mm	Blank F620
3	1.5R	6	70	6	9	2.8	●
4	2.0R	8	70	6	12	3.7	●
5	2.5R	10	80	6	15	4.6	●
6	3.0R	12	80	6	20	5.5	●
8	4.0R	16	100	8	26	7.4	●
10	5.0R	20	100	10	31	9.2	●
12	6.0R	24	110	12	37	11.0	●



Work Material

P	H	M	K	N	S
				●	

GR.10 鋁 Aluminium
Vc.400-800 fz.P164

GR.11 銅 Copper
Vc.300-600 fz.P164

HPC

超微粒鎢鋼鑽石塗層高效率立銑刀

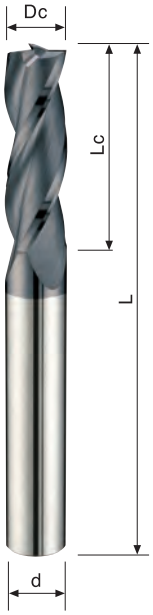
High Performance End Mills

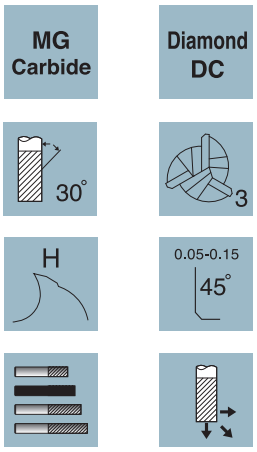
N Graphite

超硬高効率エンドミル

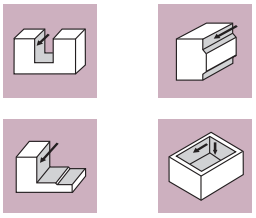
Code No. F680DC-Dc

Dc h10	Lc mm	L mm	d h5	Diamond F680DC
1	4	38	3	●
1.5	6	38	3	●
2	8	38	3	●
3	12	38	3	●
4	14	50	4	●
5	16	50	5	●
6	22	65	6	●
8	28	80	8	●
10	32	100	10	●
12	38	100	12	●





Type of Operation



Work Material

P	H	M	K	N	S
				●	

GR.14 石墨 Graphite

Vc.700-1000 fz.P165

超微粒鎢鋼鑽石塗層高效率圓頭立銑刀

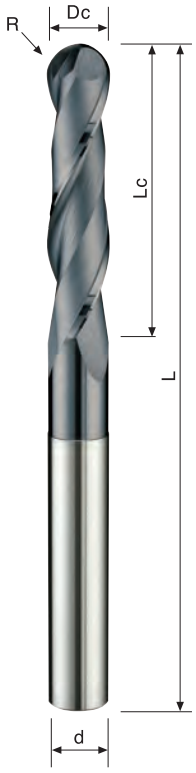
High Performance Ball Nose End Mills

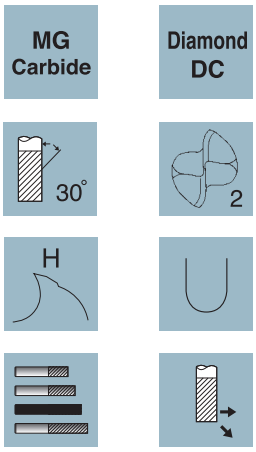
N Graphite

超硬高効率ボールエンドミル

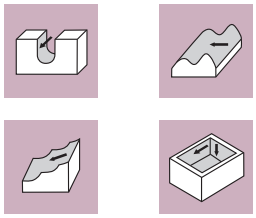
Code No. F685DC-Dc

Dc h10	R 0/+0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	Diamond F685DC
2	1R	10	80	4	20	1.9	●
3	1.5R	15	80	4	25	2.9	●
4	2R	20	80	4	30	3.9	●
5	2.5R	30	100	6	50	4.8	●
6	3R	30	100	6	50	5.8	●
8	4R	40	110	8	60	7.8	●
10	5R	50	120	10	70	9.7	●
12	6R	55	130	12	75	11.7	●





Type of Operation



Work Material

P	H	M	K	N	S
				●	

GR.14 石墨 Graphite

Vc.800-1000 fz.P164

HPC

極超微粒鎢鋼塗層高效率立銑刀

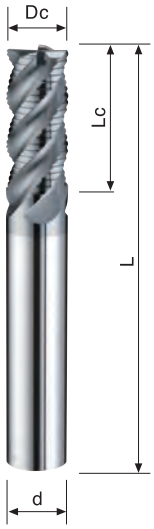
High Performance End Mills

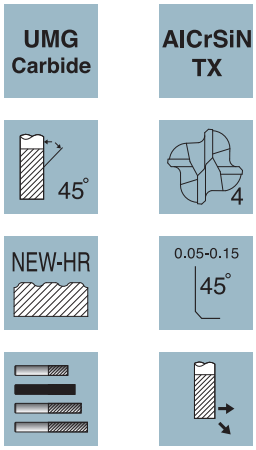
S Titanium

極超硬高効率エンドミル

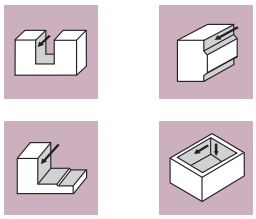
Code No. F645TX-Dc

Dc h10	Lc mm	L mm	d h5	Z	AlCrSiN F645TX
6	13	57	6	4	●
8	19	63	8	4	●
10	22	72	10	4	●
12	26	83	12	4	●
16	32	92	16	4	●
20	38	104	20	4	●





Type of Operation



Work Material

P	H	M	K	N	S
		○			●

GR.8 不銹鋼 **Stainless Steel**
Vc.50-70 fz.P165

GR.15 鈦合金 **Titanium**
Vc.40-60 fz.P165

極超微粒鎢鋼塗層高效率立銑刀

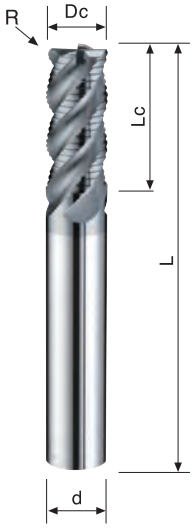
High Performance End Mills

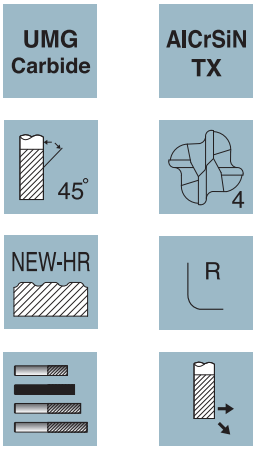
S Titanium

極超硬高効率エンドミル

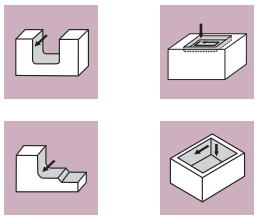
Code No. F665TX-Dc×R

Dc h10	R 0/+0.02	Lc mm	L mm	d h5	Z	AlCrSiN F665TX
6	R2.0	13	57	6	4	●
8	R2.0	19	63	8	4	●
10	R2.0	22	72	10	4	●
12	R2.0	26	83	12	4	●
16	R2.0	32	92	16	4	●
20	R2.0	38	104	20	4	●





Type of Operation



Work Material

P	H	M	K	N	S
		○			●

GR.8 不銹鋼 **Stainless Steel**
Vc.50-70 fz.165

GR.15 鈦合金 **Titanium**
Vc.40-70 fz.165

HPC

極超微粒鎢鋼塗層高效率立銑刀

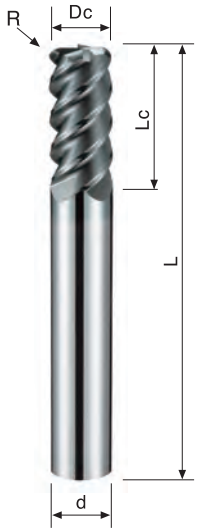
High Performance End Mills

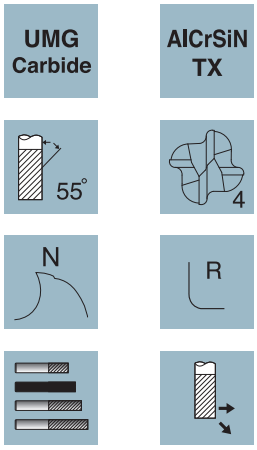
S Titanium

極超硬高効率エンドミル

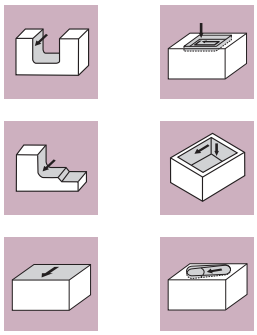
Code No. F667TX-Dc×R

Dc h10	R 0/+0.02	Lc mm	L mm	d h5	AlCrSiN F667TX
6	R2.0	13	57	6	●
8	R2.0	19	63	8	●
10	R2.0	22	72	10	●
12	R2.0	26	83	12	●
16	R2.0	32	92	16	●
20	R2.0	38	104	20	●





Type of Operation



Work Material

P	H	M	K	N	S
		○			●

GR.8 不銹鋼 **Stainless Steel**
Vc.40-80 fz.P165

GR.15 鈦合金 **Titanium**
Vc.70-90 fz.P165

極超微粒鎢鋼塗層高效率立銑刀

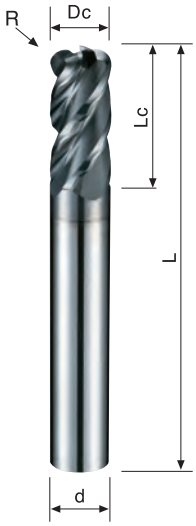
High Performance Roughing End Mills

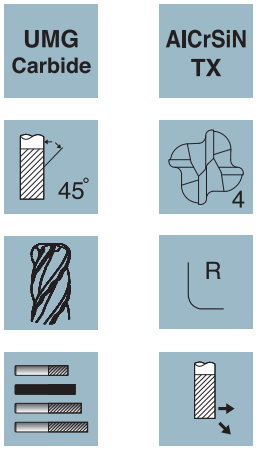
S Titanium

極超硬高効率ラフィングエンドミル

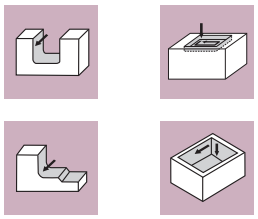
Code No. F668TX-Dc×R

Dc h10	R 0/+0.02	Lc mm	L mm	d h5	Z	AlCrSiN F668TX
10	R3.0	22	72	10	4	●
12	R3.0	26	83	12	4	●
16	R3.0	32	92	16	4	●
20	R3.0	38	104	20	4	●





Type of Operation



Work Material

P	H	M	K	N	S
		○			●

GR.8 不銹鋼 **Stainless Steel**
Vc.50-70 fz.P165

GR.15 鈦合金 **Titanium**
Vc.40-60 fz.P165

HPC

7leaders™

The Art of Cutting

鑽頭 Drills ドリル

形狀 Appearance	訂購編號 Code-No	明細 Specification			被切削材 Work Material						頁次 Page
					P	H	M	K	N	S	
	D903 D904	MG Carbide	Uncoated Blank	D	●	●	○	●	○	○	P123
	D913 D914	MG Carbide	Uncoated Blank	D	●	●	○	●	○	○	P124
	D908	MG Carbide	Uncoated Blank	60°	●	●	○	●	○		P125
	D400	MG Carbide	Uncoated Blank	5XD	○			○	●		P126
	D412	MG Carbide	Uncoated Blank	3XD	○			○	●		P127
	D413	MG Carbide	Uncoated Blank	5XD	○			○	●		P128
	D430FN	MG Carbide	TiAlN F-NaNo	3XD	●	●	○	●			P129
	D433FN	MG Carbide	TiAlN F-NaNo	5XD	●	●	○	●			P130
	D421FN	MG Carbide	TiAlN F-NaNo	5XD	●	●	○	●		○	P131
	D422	MG Carbide	Uncoated Blank	5XD					●		P132
	D431FT	UMG Carbide	TiAlN F-TOP	3XD	●	●	○			○	P133 P134
	D432FT	UMG Carbide	TiAlN F-TOP	5XD	●	●	○			○	P135 P136
	D435FT	UMG Carbide	TiAlN F-TOP	3XD	●	●	○			○	P137 P138
	D436FT	UMG Carbide	TiAlN F-TOP	5XD	●	●	○			○	P139 P140
	D437FT	UMG Carbide	TiAlN F-TOP	8XD	●	●	○			○	P141 P142
	D441FT D442FT D443FT	UMG Carbide	TiAlN F-TOP	12XD 16XD 20XD	●	○	○	●			P143
	D419FT	UMG Carbide	TiAlN F-TOP	90° D2 D1	●	●	○	●	○		P144
	D402	MG Carbide	Uncoated Blank	5XD		●		●			P145
	D405	MG Carbide	Uncoated Blank	5XD		●		●			P146

Drills

超微粒鎢鋼NC定點鑽頭90°

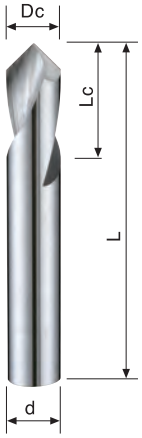
NC Spot Drills / 90°

K P H < 48HRC

超硬NC用スポットドリル・90度

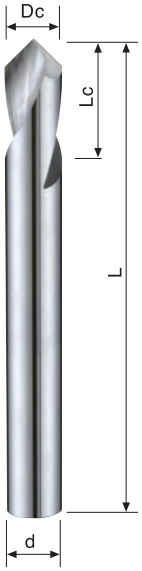
Code No. D903-Dc

Dc h6	Lc mm	L mm	d h6	Blank D903
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	●



Code No. D904-Dc

Dc h6	Lc mm	L mm	d h6	Blank D904
6	20	100	6	●
8	25	125	8	●
10	25	150	10	●
12	30	150	12	●
16	35	150	16	●
20	40	150	20	●



MG Carbide

Uncoated Blank

D

2

7Leaders Standard

90°

Work Material

P	H	M	K	N	S
●	●	○	●	○	○

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.50-60 f.P168

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.50-60 f.P168

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.40-50 f.P168

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.40-50 f.P168

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.30-40 f.P168

GR.8 不銹鋼 Stainless Steel
Vc.20-30 f.P168

GR.9 鑄鐵 Cast Iron
Vc.60-70 f.P168

GR.11 銅 Copper
Vc.80-100 f.P168

GR.15 鈦合金 Titanium
Vc.20-40 f.P168

GR.16 鎳 Nickel
Vc.15-20 f.P168

超微粒鎢鋼NC定點鑽頭120°

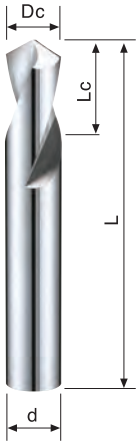
NC Spot Drills / 120°

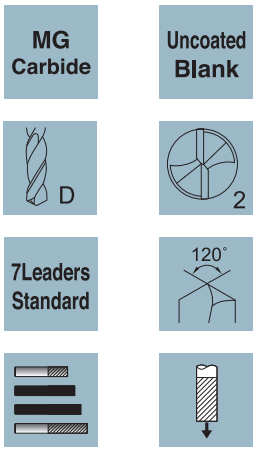
K P H < 48HRC

超硬NC用スポットドリル・120度

Code No. D913-Dc

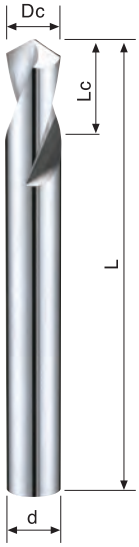
Dc h6	Lc mm	L mm	d h6	Blank D913
3	10	38	3	●
4	12	50	4	●
5	15	50	5	●
6	20	60	6	●
8	25	60	8	●
10	25	72	10	●
12	30	75	12	●
16	35	100	16	●
20	40	100	20	●





Code No. D914-Dc

Dc h6	Lc mm	L mm	d h6	Blank D914
6	20	100	6	●
8	25	125	8	●
10	25	150	10	●
12	30	150	12	●
16	35	150	16	●
20	40	150	20	●



Work Material

P	H	M	K	N	S
●	●	○	●	○	○

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.50-60 f.P168

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.50-60 f.P168

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.40-50 f.P168

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.40-50 f.P168

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.30-40 f.P168

GR.8 不銹鋼 Stainless Steel
Vc.20-30 f.P168

GR.9 鑄鐵 Cast Iron
Vc.60-70 f.P168

GR.11 銅 Copper
Vc.80-100 f.P168

GR.15 鈦合金 Titanium
Vc.20-40 f.P168

GR.16 鎳 Nickel
Vc.15-20 f.P168

超微粒鎢鋼中心鑽頭

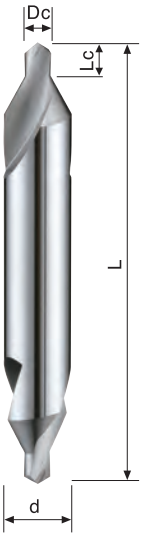
Combined Drill and Countersink

K P H < 48HRC

超硬センタードリル

Code No. D908-Dc

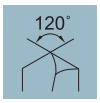
Dc h7	Lc mm	L mm	d h6	Blank D908
0.50	0.8	38	3	●
0.80	1.1	38	3	●
1.00	1.3	38	3	●
1.25	1.6	38	3	●
1.60	2.0	38	4	●
2.00	2.5	50	5	●
2.50	3.1	50	6	●
3.15	3.9	63	8	●
4.00	5.0	66	10	●
5.00	6.3	73	12	●



MG Carbide

Uncoated Blank

DIN 333



Work Material

P	H	M	K	N	S
●	●	○	●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.30-40 f.P168

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.30-40 f.P168

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.20-30 f.P168

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.10-20 f.P168

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.10-20 f.P168

GR.8 不銹鋼 Stainless Steel
Vc.15-25 f.P168

GR.9 鑄鐵 Cast Iron
Vc.40-50 f.P168

GR.10 鋁 Aluminium
Vc.80-100 f.P168

GR.11 銅 Copper
Vc.60-80 f.P168

超微粒鎢鋼微小徑鑽頭

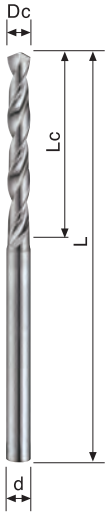
Micro Precision Drills

N AL, Cu, PVC, CFRP

超硬マイクロドリル

Code No. D400-Dc

Dc h7	Lc mm	L mm	d h6	Blank D400
0.30	1.9	25	1.00	●
0.35	2.4	25	1.00	●
0.40	3.0	25	1.00	●
0.45	3.0	25	1.00	●
0.50	3.4	25	1.00	●
0.55	3.9	25	1.00	●
0.60	3.9	25	1.00	●
0.65	4.2	25	1.00	●
0.70	4.8	25	1.00	●
0.75	4.8	25	1.00	●
0.80	5.3	25	1.50	●
0.85	5.3	25	1.50	●
0.90	6.0	25	1.50	●
0.95	6.0	25	1.50	●
1.00	6.8	25	1.50	●
1.05	6.8	25	1.50	●
1.10	7.6	25	1.50	●
1.15	7.6	25	1.50	●
1.20	8.5	25	1.50	●
1.25	8.5	25	1.50	●
1.30	8.5	25	1.50	●
1.35	9.5	25	1.50	●
1.40	9.5	25	1.50	●



MG Carbide

Uncoated Blank

5XD

2

DIN 1899

130°

Work Material

P	H	M	K	N	S
○			○	●	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.60-80 f.P168

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.60-80 f.P168

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.50-70 f.P168

GR.9 鑄鐵 Cast Iron
Vc.30-50 f.P168

GR.10 鋁 Aluminium
Vc.100-120 f.P168

GR.11 銅 Copper
Vc.80-100 f.P168

GR.12 塑膠 Plastics
Vc.25-50 f.P168

GR.13 複合材料 CFRP Composite Material
Vc.30-60 f.P168

超微粒鎢鋼鑽頭

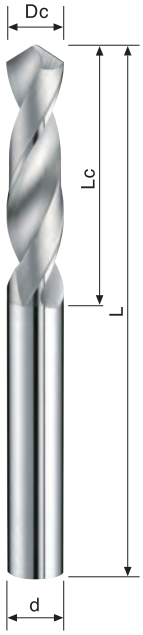
Twist Drills

N AL, Cu, PVC, CFRP

超硬ドリル

Code No. D412-Dc

Dc h7	Lc mm	L mm	Blank D412	Dc h7	Lc mm	L mm	Blank D412
1.00	6	26	●	5.00	26	62	●
1.05	6	26	●	5.10	26	62	●
1.10	7	28	●	5.20	26	62	●
1.15	7	28	●	5.30	26	62	●
1.20	8	30	●	5.40	28	66	●
1.25	8	30	●	5.50	28	66	●
1.30	8	30	●	5.60	28	66	●
1.35	9	32	●	5.70	28	66	●
1.40	9	32	●	5.80	28	66	●
1.45	9	32	●	5.90	28	66	●
1.50	9	32	●	6.00	28	66	●
1.55	10	34	●	6.10	31	70	●
1.60	10	34	●	6.20	31	70	●
1.65	10	34	●	6.30	31	70	●
1.70	10	34	●	6.40	31	70	●
1.75	11	36	●	6.50	31	70	●
1.80	11	36	●	6.60	31	70	●
1.85	11	36	●	6.70	31	70	●
1.90	11	36	●	6.80	34	74	●
1.95	12	38	●	6.90	34	74	●
2.00	12	38	●	7.00	34	74	●
2.05	12	38	●	7.10	34	74	●
2.10	12	38	●	7.20	34	74	●
2.15	13	40	●	7.30	34	74	●
2.20	13	40	●	7.40	34	74	●
2.25	13	40	●	7.50	34	74	●
2.30	13	40	●	7.60	37	79	●
2.35	13	40	●	7.70	37	79	●
2.40	14	43	●	7.80	37	79	●
2.45	14	43	●	7.90	37	79	●
2.50	14	43	●	8.00	37	79	●
2.55	14	43	●	8.10	37	79	●
2.60	14	43	●	8.20	37	79	●
2.65	14	43	●	8.30	37	79	●
2.70	16	46	●	8.40	37	79	●
2.75	16	46	●	8.50	37	79	●
2.80	16	46	●	8.60	40	84	●
2.85	16	46	●	8.70	40	84	●
2.90	16	46	●	8.80	40	84	●
2.95	16	46	●	8.90	40	84	●
3.00	16	46	●	9.00	40	84	●
3.10	18	49	●	9.10	40	84	●
3.20	18	49	●	9.20	40	84	●
3.30	18	49	●	9.30	40	84	●
3.40	20	52	●	9.40	40	84	●
3.50	20	52	●	9.50	40	84	●
3.60	20	52	●	9.60	43	89	●
3.70	20	52	●	9.70	43	89	●
3.80	22	55	●	9.80	43	89	●
3.90	22	55	●	9.90	43	89	●
4.00	22	55	●	10.00	43	89	●
4.10	22	55	●	10.20	43	89	●
4.20	22	55	●	10.50	43	89	●
4.30	24	58	●	10.80	47	95	●
4.40	24	58	●	11.00	47	95	●
4.50	24	58	●	11.50	47	95	●
4.60	24	58	●	12.00	51	102	●
4.70	24	58	●	12.50	51	102	●
4.80	26	62	●	13.00	51	102	●
4.90	26	62	●				



MG Carbide

Uncoated Blank

3XD

2

DIN 6539

118°

Work Material

P	H	M	K	N	S
○			○	●	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.60-80 f.P168

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.60-80 f.P168

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.50-70 f.P168

GR.9 鑄鐵 Cast Iron
Vc.30-50 f.P168

GR.10 鋁 Aluminium
Vc.100-120 f.P168

GR.11 銅 Copper
Vc.80-100 f.P168

GR.12 塑膠 Plastics
Vc.25-50 f.P168

GR.13 複合材料 CFRP Composite Material
Vc.30-60 f.P168

超微粒鎢鋼鑽頭

Twist Drills

N AL, Cu, PVC, CFRP

超硬ドリル

Code No. D413-Dc

Dc h7	Lc mm	L mm	Blank D413	Dc h7	Lc mm	L mm	Blank D413
1.0	12	34	●	6.6	63	101	●
1.1	14	36	●	6.7	63	101	●
1.2	16	38	●	6.8	69	109	●
1.3	16	38	●	6.9	69	109	●
1.4	18	40	●	7.0	69	109	●
1.5	18	40	●	7.1	69	109	●
1.6	20	43	●	7.2	69	109	●
1.7	20	43	●	7.3	69	109	●
1.8	22	46	●	7.4	69	109	●
1.9	22	46	●	7.5	69	109	●
2.0	24	49	●	7.6	75	117	●
2.1	24	49	●	7.7	75	117	●
2.2	27	53	●	7.8	75	117	●
2.3	27	53	●	7.9	75	117	●
2.4	30	57	●	8.0	75	117	●
2.5	30	57	●	8.1	75	117	●
2.6	30	57	●	8.2	75	117	●
2.7	33	61	●	8.3	75	117	●
2.8	33	61	●	8.4	75	117	●
2.9	33	61	●	8.5	75	117	●
3.0	33	61	●	8.6	81	125	●
3.1	36	65	●	8.7	81	125	●
3.2	36	65	●	8.8	81	125	●
3.3	36	65	●	8.9	81	125	●
3.4	39	70	●	9.0	81	125	●
3.5	39	70	●	9.1	81	125	●
3.6	39	70	●	9.2	81	125	●
3.7	39	70	●	9.3	81	125	●
3.8	43	75	●	9.4	81	125	●
3.9	43	75	●	9.5	81	125	●
4.0	43	75	●	9.6	87	133	●
4.1	43	75	●	9.7	87	133	●
4.2	43	75	●	9.8	87	133	●
4.3	47	80	●	9.9	87	133	●
4.4	47	80	●	10.0	87	133	●
4.5	47	80	●	10.2	87	133	●
4.6	47	80	●	10.5	87	133	●
4.7	47	80	●	10.8	94	142	●
4.8	52	86	●	11.0	94	142	●
4.9	52	86	●	11.5	94	142	●
5.0	52	86	●	12.0	101	151	●
5.1	52	86	●	12.5	101	151	●
5.2	52	86	●	13.0	101	151	●
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	●				
6.0	57	93	●				
6.1	63	101	●				
6.2	63	101	●				
6.3	63	101	●				
6.4	63	101	●				
6.5	63	101	●				

MG Carbide

Uncoated Blank

5XD

2

DIN 338

118°

Work Material

P	H	M	K	N	S
○			○	●	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.60-80 f.P168

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.60-80 f.P168

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.50-70 f.P168

GR.9 鑄鐵 Cast Iron
Vc.30-50 f.P168

GR.10 鋁 Aluminium
Vc.100-120 f.P168

GR.11 銅 Copper
Vc.80-100 f.P168

GR.12 塑膠 Plastics
Vc.25-50 f.P168

GR.13 複合材料 CFRP Composite Material
Vc.30-60 f.P168

超微粒鎢鋼塗層高速鑽頭

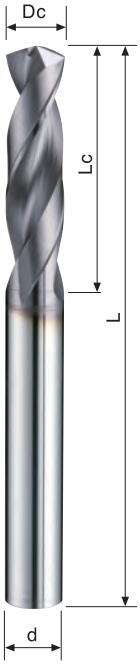
High Performance Drills

K P H < 48HRC

超硬ドリル・高速加工用

Code No. D430FN-Dc

Dc h7	Lc mm	L mm	TiAlN D430FN	Dc h7	Lc mm	L mm	TiAlN D430FN
2.0	12	38	●	7.6	37	79	●
2.1	12	38	●	7.7	37	79	●
2.2	13	40	●	7.8	37	79	●
2.3	13	40	●	7.9	37	79	●
2.4	14	43	●	8.0	37	79	●
2.5	14	43	●	8.1	37	79	●
2.6	14	43	●	8.2	37	79	●
2.7	16	46	●	8.3	37	79	●
2.8	16	46	●	8.4	37	79	●
2.9	16	46	●	8.5	37	79	●
3.0	16	46	●	8.6	40	84	●
3.1	18	49	●	8.7	40	84	●
3.2	18	49	●	8.8	40	84	●
3.3	18	49	●	8.9	40	84	●
3.4	20	52	●	9.0	40	84	●
3.5	20	52	●	9.1	40	84	●
3.6	20	52	●	9.2	40	84	●
3.7	20	52	●	9.3	40	84	●
3.8	22	55	●	9.4	40	84	●
3.9	22	55	●	9.5	40	84	●
4.0	22	55	●	9.6	43	89	●
4.1	22	55	●	9.7	43	89	●
4.2	22	55	●	9.8	43	89	●
4.3	24	58	●	9.9	43	89	●
4.4	24	58	●	10.0	43	89	●
4.5	24	58	●	10.2	43	89	●
4.6	24	58	●	10.5	43	89	●
4.7	24	58	●	10.8	47	95	●
4.8	26	62	●	11.0	47	95	●
4.9	26	62	●	11.5	47	95	●
5.0	26	62	●	12.0	51	102	●
5.1	26	62	●	12.5	51	102	●
5.2	26	62	●	13.0	51	102	●
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	●				
6.0	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	●				
7.0	34	74	●				
7.1	34	74	●				
7.2	34	74	●				
7.3	34	74	●				
7.4	34	74	●				
7.5	34	74	●				



MG Carbide

TiAlN F-NaNo

3XD

2

DIN 6539

140°

Work Material

P	H	M	K	N	S
●	●	○	●		

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-100 f.P169

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-100 f.P169

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-80 f.P169

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.50-60 f.P169

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-50 f.P169

GR.8 不銹鋼 Stainless Steel
Vc.40-60 f.P169

GR.9 鑄鐵 Cast Iron
Vc.80-100 f.P169

超微粒鎢鋼塗層高速鑽頭

High Performance Drills

K P H < 48HRC

超硬ドリル・高速加工用

Code No. D433FN-Dc

Dc h7	Lc mm	L mm	TiAlN D433FN
2.0	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	●
3.0	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	●
4.0	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	●
5.0	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	●
6.0	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	●
7.0	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	●
8.0	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	●
9.0	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	●
10.0	87	133	●
10.2	87	133	●
10.5	87	133	●
10.8	94	142	●
11.0	94	142	●
11.5	94	142	●
12.0	101	151	●
12.5	101	151	●
13.0	101	151	●

MG Carbide

TiAlN F-NaNo

5XD

2

DIN 338

140°

Work Material

P	H	M	K	N	S
●	●	○	●		

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-100 f.P169

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-100 f.P169

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-80 f.P169

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.50-60 f.P169

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-50 f.P169

GR.8 不銹鋼 Stainless Steel
Vc.40-60 f.P169

GR.9 鑄鐵 Cast Iron
Vc.80-100 f.P169

超微粒鎢鋼塗層3刃鑽頭

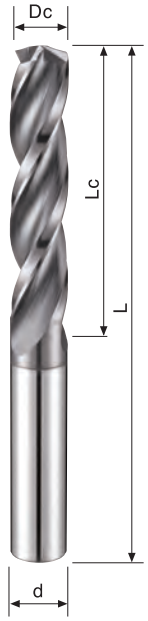
3-Flute Drills

K P H < 48HRC

超硬ドリル・3枚刃

Code No. D421FN-Dc

Dc h7	Lc mm	L mm	Blank D421FN	Dc h7	Lc mm	L mm	TiAlN D421FN
3.0	22	46	●	8.6	52	84	●
3.1	24	49	●	8.7	52	84	●
3.2	24	49	●	8.8	52	84	●
3.3	24	49	●	8.9	52	84	●
3.4	27	52	●	9.0	52	84	●
3.5	27	52	●	9.1	52	84	●
3.6	27	52	●	9.2	52	84	●
3.7	27	52	●	9.3	52	84	●
3.8	30	55	●	9.4	52	84	●
3.9	30	55	●	9.5	52	84	●
4.0	30	55	●	9.6	55	89	●
4.1	30	55	●	9.7	55	89	●
4.2	30	55	●	9.8	55	89	●
4.3	32	58	●	9.9	55	89	●
4.4	32	58	●	10.0	55	89	●
4.5	32	58	●	10.2	55	89	●
4.6	32	58	●	10.5	55	89	●
4.7	32	58	●	10.8	60	95	●
4.8	35	62	●	11.0	60	95	●
4.9	35	62	●	11.5	60	95	●
5.0	35	62	●	12.0	65	102	●
5.1	35	62	●	12.5	65	102	●
5.2	35	62	●	13.0	65	102	●
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	●				
6.0	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	●				
7.0	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	●				
8.0	48	79	●				
8.1	48	79	●				
8.2	48	79	●				
8.3	48	79	●				
8.4	48	79	●				
8.5	48	79	●				



MG Carbide

TiAlN F-NaNo

5XD

3

DIN 6539

150°

Work Material

P	H	M	K	N	S
●	●	○	●		○

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-100 f.P169

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-100 f.P169

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-80 f.P169

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.50-60 f.P169

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-50 f.P169

GR.8 不銹鋼 Stainless Steel
Vc.40-60 f.P169

GR.9 鑄鐵 Cast Iron
Vc.80-100 f.P169

GR.15 鈦合金 Titanium
Vc.30-40 f.P169

GR.16 鎳 Nickel
Vc.20-30 f.P169

超微粒鎢鋼3刃鑽頭

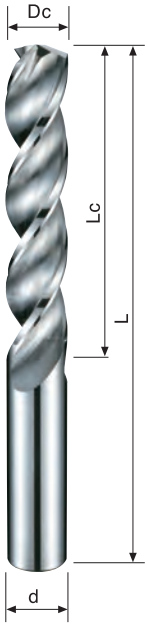
3-Flute Drills

N Aluminium

超硬ドリル・3枚刃

Code No. D422-Dc

Dc h7	Lc mm	L mm	Blank D422
3.0	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	●
4.0	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	●
5.0	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	●
6.0	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	●
7.0	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	●
8.0	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	●
9.0	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	●
10.0	55	89	●
10.2	55	89	●
10.5	55	89	●
10.8	60	95	●
11.0	60	95	●
11.5	60	95	●
12.0	65	102	●
12.5	65	102	●
13.0	65	102	●



MG Carbide

Uncoated Blank

5XD

3

DIN 6539

135°

Work Material

P	H	M	K	N	S
				●	

GR.10 鉛 Aluminium
Vc.120-150 f.P169

GR.11 銅 Copper
Vc.80-100 f.P169

Drills

極超微粒鎢鋼塗層高速鑽頭

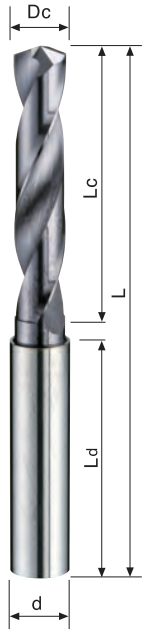
High Performance Drills

P H < 56HRC

極超硬ドリル・高速加工用

Code No. D431FT-Dc

Dc m7	Lc mm	L mm	d h6	Ld mm	TiAlN D431FT
3.0	20	62	6	36	●
3.1	20	62	6	36	●
3.2	20	62	6	36	●
3.3	20	62	6	36	●
3.4	20	62	6	36	●
3.5	20	62	6	36	●
3.6	20	62	6	36	●
3.7	20	62	6	36	●
3.8	24	66	6	36	●
3.9	24	66	6	36	●
4.0	24	66	6	36	●
4.1	24	66	6	36	●
4.2	24	66	6	36	●
4.3	24	66	6	36	●
4.4	24	66	6	36	●
4.5	24	66	6	36	●
4.6	24	66	6	36	●
4.7	24	66	6	36	●
4.8	28	66	6	36	●
4.9	28	66	6	36	●
5.0	28	66	6	36	●
5.1	28	66	6	36	●
5.2	28	66	6	36	●
5.3	28	66	6	36	●
5.4	28	66	6	36	●
5.5	28	66	6	36	●
5.6	28	66	6	36	●
5.7	28	66	6	36	●
5.8	28	66	6	36	●
5.9	28	66	6	36	●
6.0	28	66	6	36	●
6.1	34	79	8	36	●
6.2	34	79	8	36	●
6.3	34	79	8	36	●
6.4	34	79	8	36	●
6.5	34	79	8	36	●
6.6	34	79	8	36	●
6.7	34	79	8	36	●
6.8	34	79	8	36	●
6.9	34	79	8	36	●
7.0	34	79	8	36	●
7.1	41	79	8	36	●
7.2	41	79	8	36	●
7.3	41	79	8	36	●
7.4	41	79	8	36	●
7.5	41	79	8	36	●
7.6	41	79	8	36	●
7.7	41	79	8	36	●
7.8	41	79	8	36	●
7.9	41	79	8	36	●
8.0	41	79	8	36	●
8.1	47	89	10	40	●
8.2	47	89	10	40	●
8.3	47	89	10	40	●
8.4	47	89	10	40	●
8.5	47	89	10	40	●



UMG Carbide

TiAlN F-TOP

3XD

2

DIN 6537K

140°

Work Material

P	H	M	K	N	S
●	●	○			○

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-100 f.P169

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-100 f.P169

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-80 f.P169

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.50-60 f.P169

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-50 f.P169

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.20-30 f.P169

GR.8 不銹鋼 Stainless Steel
Vc.40-60 f.P169

GR.15 鈦合金 Titanium
Vc.40-50 f.P169

GR.16 鎳 Nickel
Vc.20-40 f.P169

GR.17 耐熱鋼 Heat-resistant Steel
Vc.30-50 f.P169

極超微粒鎢鋼塗層高速鑽頭

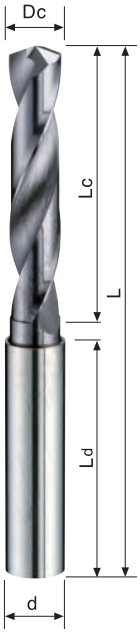
High Performance Drills

P H < 56HRC

極超硬ドリル・高速加工用

Code No. D431FT-Dc

Dc m7	Lc mm	L mm	d h6	Ld mm	TiAlN D431FT
8.6	47	89	10	40	●
8.7	47	89	10	40	●
8.8	47	89	10	40	●
8.9	47	89	10	40	●
9.0	47	89	10	40	●
9.1	47	89	10	40	●
9.2	47	89	10	40	●
9.3	47	89	10	40	●
9.4	47	89	10	40	●
9.5	47	89	10	40	●
9.6	47	89	10	40	●
9.7	47	89	10	40	●
9.8	47	89	10	40	●
9.9	47	89	10	40	●
10.0	47	89	10	40	●
10.2	55	102	12	45	●
10.5	55	102	12	45	●
10.8	55	102	12	45	●
11.0	55	102	12	45	●
11.5	55	102	12	45	●
12.0	55	102	12	45	●
12.5	60	107	14	45	●
13.0	60	107	14	45	●
13.5	60	107	14	45	●
14.0	60	107	14	45	●
14.5	65	115	16	48	●
15.0	65	115	16	48	●
15.5	65	115	16	48	●
16.0	65	115	16	48	●
16.5	73	123	18	48	●
17.0	73	123	18	48	●
17.5	73	123	18	48	●
18.0	73	123	18	48	●
18.5	79	131	20	50	●
19.0	79	131	20	50	●
19.5	79	131	20	50	●
20.0	79	131	20	50	●



UMG Carbide

TiAlN F-TOP

3XD

2

DIN 6537K

140°

Work Material

P	H	M	K	N	S
●	●	○			○

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-100 f.P169

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-100 f.P169

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-80 f.P169

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.50-60 f.P169

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-50 f.P169

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.20-30 f.P169

GR.8 不銹鋼 Stainless Steel
Vc.40-60 f.P169

GR.15 鈦合金 Titanium
Vc.40-50 f.P169

GR.16 鎳 Nickel
Vc.20-40 f.P169

GR.17 耐熱鋼 Heat-resistant Steel
Vc.30-50 f.P169

極超微粒鎢鋼塗層高速鑽頭

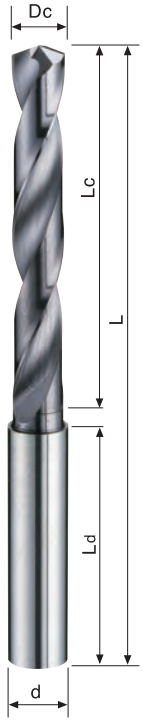
High Performance Drills

P H < 56HRC

極超硬ドリル・高速加工用

Code No. D432FT-Dc

Dc m7	Lc mm	L mm	d h6	Ld mm	TiAlN D432FT
3.0	28	66	6	36	●
3.1	28	66	6	36	●
3.2	28	66	6	36	●
3.3	28	66	6	36	●
3.4	28	66	6	36	●
3.5	28	66	6	36	●
3.6	28	66	6	36	●
3.7	28	66	6	36	●
3.8	36	74	6	36	●
3.9	36	74	6	36	●
4.0	36	74	6	36	●
4.1	36	74	6	36	●
4.2	36	74	6	36	●
4.3	36	74	6	36	●
4.4	36	74	6	36	●
4.5	36	74	6	36	●
4.6	36	74	6	36	●
4.7	36	74	6	36	●
4.8	44	82	6	36	●
4.9	44	82	6	36	●
5.0	44	82	6	36	●
5.1	44	82	6	36	●
5.2	44	82	6	36	●
5.3	44	82	6	36	●
5.4	44	82	6	36	●
5.5	44	82	6	36	●
5.6	44	82	6	36	●
5.7	44	82	6	36	●
5.8	44	82	6	36	●
5.9	44	82	6	36	●
6.0	44	82	6	36	●
6.1	53	91	8	36	●
6.2	53	91	8	36	●
6.3	53	91	8	36	●
6.4	53	91	8	36	●
6.5	53	91	8	36	●
6.6	53	91	8	36	●
6.7	53	91	8	36	●
6.8	53	91	8	36	●
6.9	53	91	8	36	●
7.0	53	91	8	36	●
7.1	53	91	8	36	●
7.2	53	91	8	36	●
7.3	53	91	8	36	●
7.4	53	91	8	36	●
7.5	53	91	8	36	●
7.6	53	91	8	36	●
7.7	53	91	8	36	●
7.8	53	91	8	36	●
7.9	53	91	8	36	●
8.0	53	91	8	36	●
8.1	61	103	10	40	●
8.2	61	103	10	40	●
8.3	61	103	10	40	●
8.4	61	103	10	40	●
8.5	61	103	10	40	●



UMG Carbide

TiAlN F-TOP

5XD

2

DIN 6537L

140°

Work Material

P	H	M	K	N	S
●	●	○			○

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-100 f.P169

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-100 f.P169

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-80 f.P169

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.50-60 f.P169

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-50 f.P169

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.20-30 f.P169

GR.8 不銹鋼 Stainless Steel
Vc.40-60 f.P169

GR.15 鈦合金 Titanium
Vc.40-50 f.P169

GR.16 鎳 Nickel
Vc.20-40 f.P169

GR.17 耐熱鋼 Heat-resistant Steel
Vc.30-50 f.P169

極超微粒鎢鋼塗層高速鑽頭

High Performance Drills

P H < 56HRC

極超硬ドリル・高速加工用

Code No. D432FT-Dc

Dc m7	Lc mm	L mm	d h6	Ld mm	TiAlN D432FT
8.6	61	103	10	40	●
8.7	61	103	10	40	●
8.8	61	103	10	40	●
8.9	61	103	10	40	●
9.0	61	103	10	40	●
9.1	61	103	10	40	●
9.2	61	103	10	40	●
9.3	61	103	10	40	●
9.4	61	103	10	40	●
9.5	61	103	10	40	●
9.6	61	103	10	40	●
9.7	61	103	10	40	●
9.8	61	103	10	40	●
9.9	61	103	10	40	●
10.0	61	103	10	40	●
10.2	71	118	12	45	●
10.5	71	118	12	45	●
10.8	71	118	12	45	●
11.0	71	118	12	45	●
11.5	71	118	12	45	●
12.0	71	118	12	45	●
12.5	77	124	14	45	●
13.0	77	124	14	45	●
13.5	77	124	14	45	●
14.0	77	124	14	45	●
14.5	83	133	16	48	●
15.0	83	133	16	48	●
15.5	83	133	16	48	●
16.0	83	133	16	48	●
16.5	93	143	18	48	●
17.0	93	143	18	48	●
17.5	93	143	18	48	●
18.0	93	143	18	48	●
18.5	101	153	20	50	●
19.0	101	153	20	50	●
19.5	101	153	20	50	●
20.0	101	153	20	50	●

UMG Carbide

TiAlN F-TOP

5XD

2

DIN 6537L

140°

Work Material

P	H	M	K	N	S
●	●	○			○

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-100 f.P169

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.80-100 f.P169

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.60-80 f.P169

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.50-60 f.P169

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.40-50 f.P169

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.20-30 f.P169

GR.8 不銹鋼 Stainless Steel
Vc.40-60 f.P169

GR.15 鈦合金 Titanium
Vc.40-50 f.P169

GR.16 鎳 Nickel
Vc.20-40 f.P169

GR.17 耐熱鋼 Heat-resistant Steel
Vc.30-50 f.P169

極超微粒鎢鋼塗層内冷高速鑽頭

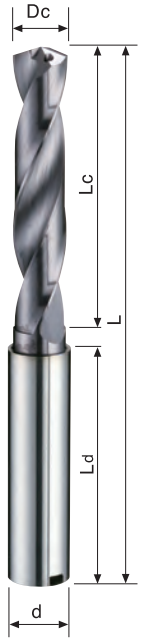
Oil-Feed High Performance Drills

P H < 56HRC

極超硬ドリル・オイルホイル付け

Code No. D435FT-Dc

Dc m7	Lc mm	L mm	d h6	Ld mm	TiAlN D435FT
3.0	20	62	6	36	●
3.1	20	62	6	36	●
3.2	20	62	6	36	●
3.3	20	62	6	36	●
3.4	20	62	6	36	●
3.5	20	62	6	36	●
3.6	20	62	6	36	●
3.7	20	62	6	36	●
3.8	24	66	6	36	●
3.9	24	66	6	36	●
4.0	24	66	6	36	●
4.1	24	66	6	36	●
4.2	24	66	6	36	●
4.3	24	66	6	36	●
4.4	24	66	6	36	●
4.5	24	66	6	36	●
4.6	24	66	6	36	●
4.7	24	66	6	36	●
4.8	28	66	6	36	●
4.9	28	66	6	36	●
5.0	28	66	6	36	●
5.1	28	66	6	36	●
5.2	28	66	6	36	●
5.3	28	66	6	36	●
5.4	28	66	6	36	●
5.5	28	66	6	36	●
5.6	28	66	6	36	●
5.7	28	66	6	36	●
5.8	28	66	6	36	●
5.9	28	66	6	36	●
6.0	28	66	6	36	●
6.1	34	79	8	36	●
6.2	34	79	8	36	●
6.3	34	79	8	36	●
6.4	34	79	8	36	●
6.5	34	79	8	36	●
6.6	34	79	8	36	●
6.7	34	79	8	36	●
6.8	34	79	8	36	●
6.9	34	79	8	36	●
7.0	34	79	8	36	●
7.1	41	79	8	36	●
7.2	41	79	8	36	●
7.3	41	79	8	36	●
7.4	41	79	8	36	●
7.5	41	79	8	36	●
7.6	41	79	8	36	●
7.7	41	79	8	36	●
7.8	41	79	8	36	●
7.9	41	79	8	36	●
8.0	41	79	8	36	●
8.1	47	89	10	40	●
8.2	47	89	10	40	●
8.3	47	89	10	40	●
8.4	47	89	10	40	●
8.5	47	89	10	40	●



UMG Carbide

TiAlN F-TOP

3XD

2

DIN 6537K

140°

Work Material

P	H	M	K	N	S
●	●	○			○

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.100-120 f.P169

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.100-120 f.P169

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.80-100 f.P169

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.60-80 f.P169

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.50-60 f.P169

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.25-35 f.P169

GR.8 不銹鋼 Stainless Steel
Vc.50-60 f.P169

GR.15 鈦合金 Titanium
Vc.30-50 f.P169

GR.16 鎳 Nickel
Vc.25-45 f.P169

GR.17 耐熱鋼 Heat-resistant Steel
Vc.40-60 f.P169

極超微粒鎢鋼塗層内冷高速鑽頭

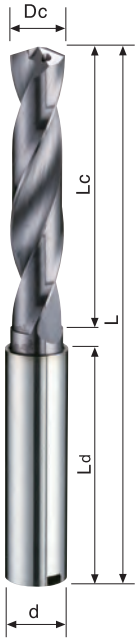
Oil-Feed High Performance Drills

P H < 56HRC

極超硬ドリル・オイルホイル付け

Code No. D435FT-Dc

Dc m7	Lc mm	L mm	d h6	Ld mm	TiAlN D435FT
8.6	47	89	10	40	●
8.7	47	89	10	40	●
8.8	47	89	10	40	●
8.9	47	89	10	40	●
9.0	47	89	10	40	●
9.1	47	89	10	40	●
9.2	47	89	10	40	●
9.3	47	89	10	40	●
9.4	47	89	10	40	●
9.5	47	89	10	40	●
9.6	47	89	10	40	●
9.7	47	89	10	40	●
9.8	47	89	10	40	●
9.9	47	89	10	40	●
10.0	47	89	10	40	●
10.2	55	102	12	45	●
10.5	55	102	12	45	●
10.8	55	102	12	45	●
11.0	55	102	12	45	●
11.5	55	102	12	45	●
12.0	55	102	12	45	●
12.5	60	107	14	45	●
13.0	60	107	14	45	●
13.5	60	107	14	45	●
14.0	60	107	14	45	●
14.5	65	115	16	48	●
15.0	65	115	16	48	●
15.5	65	115	16	48	●
16.0	65	115	16	48	●
16.5	73	123	18	48	●
17.0	73	123	18	48	●
17.5	73	123	18	48	●
18.0	73	123	18	48	●
18.5	79	131	20	50	●
19.0	79	131	20	50	●
19.5	79	131	20	50	●
20.0	79	131	20	50	●



UMG Carbide

TiAlN F-TOP

3XD

2

DIN 6537K

140°

Work Material

P	H	M	K	N	S
●	●	○			○

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.100-120 f.P169

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.100-120 f.P169

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.80-100 f.P169

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.60-80 f.P169

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.50-60 f.P169

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.25-35 f.P169

GR.8 不銹鋼 Stainless Steel
Vc.50-60 f.P169

GR.15 鈦合金 Titanium
Vc.30-50 f.P169

GR.16 鎳 Nickel
Vc.25-45 f.P169

GR.17 耐熱鋼 Heat-resistant Steel
Vc.40-60 f.P169

極超微粒鎢鋼塗層内冷高速鑽頭

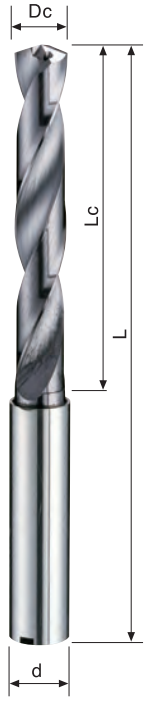
Oil-Feed High Performance Drills

P H < 56HRC

極超硬ドリル・オイルホイル付け

Code No. D436FT-Dc

Dc m7	Lc mm	L mm	d h6	Ld mm	TiAlN D436FT
3.0	28	66	6	36	●
3.1	28	66	6	36	●
3.2	28	66	6	36	●
3.3	28	66	6	36	●
3.4	28	66	6	36	●
3.5	28	66	6	36	●
3.6	28	66	6	36	●
3.7	28	66	6	36	●
3.8	36	74	6	36	●
3.9	36	74	6	36	●
4.0	36	74	6	36	●
4.1	36	74	6	36	●
4.2	36	74	6	36	●
4.3	36	74	6	36	●
4.4	36	74	6	36	●
4.5	36	74	6	36	●
4.6	36	74	6	36	●
4.7	36	74	6	36	●
4.8	44	82	6	36	●
4.9	44	82	6	36	●
5.0	44	82	6	36	●
5.1	44	82	6	36	●
5.2	44	82	6	36	●
5.3	44	82	6	36	●
5.4	44	82	6	36	●
5.5	44	82	6	36	●
5.6	44	82	6	36	●
5.7	44	82	6	36	●
5.8	44	82	6	36	●
5.9	44	82	6	36	●
6.0	44	82	6	36	●
6.1	53	91	8	36	●
6.2	53	91	8	36	●
6.3	53	91	8	36	●
6.4	53	91	8	36	●
6.5	53	91	8	36	●
6.6	53	91	8	36	●
6.7	53	91	8	36	●
6.8	53	91	8	36	●
6.9	53	91	8	36	●
7.0	53	91	8	36	●
7.1	53	91	8	36	●
7.2	53	91	8	36	●
7.3	53	91	8	36	●
7.4	53	91	8	36	●
7.5	53	91	8	36	●
7.6	53	91	8	36	●
7.7	53	91	8	36	●
7.8	53	91	8	36	●
7.9	53	91	8	36	●
8.0	53	91	8	36	●
8.1	61	103	10	40	●
8.2	61	103	10	40	●
8.3	61	103	10	40	●
8.4	61	103	10	40	●
8.5	61	103	10	40	●



UMG Carbide

TiAlN F-TOP

5XD

2

DIN 6537L

140°

Work Material

P	H	M	K	N	S
●	●	○			○

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.100-120 f.P169

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.100-120 f.P169

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.80-100 f.P169

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.60-80 f.P169

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.50-60 f.P169

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.25-35 f.P169

GR.8 不銹鋼 Stainless Steel
Vc.50-60 f.P169

GR.15 鈦合金 Titanium
Vc.30-50 f.P169

GR.16 鎳 Nickel
Vc.25-45 f.P169

GR.17 耐熱鋼 Heat-resistant Steel
Vc.40-60 f.P169

極超微粒鎢鋼塗層内冷高速鑽頭

Oil-Feed High Performance Drills

P H < 56HRC

極超硬ドリル・オイルホイル付け

Code No. D436FT-Dc

Dc m7	Lc mm	L mm	d h6	Ld mm	TiAlN D436FT
8.6	61	103	10	40	●
8.7	61	103	10	40	●
8.8	61	103	10	40	●
8.9	61	103	10	40	●
9.0	61	103	10	40	●
9.1	61	103	10	40	●
9.2	61	103	10	40	●
9.3	61	103	10	40	●
9.4	61	103	10	40	●
9.5	61	103	10	40	●
9.6	61	103	10	40	●
9.7	61	103	10	40	●
9.8	61	103	10	40	●
9.9	61	103	10	40	●
10.0	61	103	10	40	●
10.2	71	118	12	45	●
10.5	71	118	12	45	●
10.8	71	118	12	45	●
11.0	71	118	12	45	●
11.5	71	118	12	45	●
12.0	71	118	12	45	●
12.5	77	124	14	45	●
13.0	77	124	14	45	●
13.5	77	124	14	45	●
14.0	77	124	14	45	●
14.5	83	133	16	48	●
15.0	83	133	16	48	●
15.5	83	133	16	48	●
16.0	83	133	16	48	●
16.5	93	143	18	48	●
17.0	93	143	18	48	●
17.5	93	143	18	48	●
18.0	93	143	18	48	●
18.5	101	153	20	50	●
19.0	101	153	20	50	●
19.5	101	153	20	50	●
20.0	101	153	20	50	●

UMG Carbide

TiAlN F-TOP

5XD

2

DIN 6537L

140°

Work Material

P	H	M	K	N	S
●	●	○			○

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.100-120 f.P169

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.100-120 f.P169

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.80-100 f.P169

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.60-80 f.P169

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.50-60 f.P169

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.25-35 f.P169

GR.8 不銹鋼 Stainless Steel
Vc.50-60 f.P169

GR.15 鈦合金 Titanium
Vc.30-50 f.P169

GR.16 鎳 Nickel
Vc.25-45 f.P169

GR.17 耐熱鋼 Heat-resistant Steel
Vc.40-60 f.P169

極超微粒鎢鋼塗層内冷高速鑽頭

Oil-Feed High Performance Drills

P H < 56HRC

極超硬ドリル・オイルホイル付け

Code No. D437FT-Dc

Dc m7	Lc mm	L mm	d h6	Ld mm	TiAlN D437FT
3.0	34	74	6	36	●
3.1	34	74	6	36	●
3.2	34	74	6	36	●
3.3	34	74	6	36	●
3.4	34	74	6	36	●
3.5	34	74	6	36	●
3.6	34	74	6	36	●
3.7	34	74	6	36	●
3.8	45	85	6	36	●
3.9	45	85	6	36	●
4.0	45	85	6	36	●
4.1	45	85	6	36	●
4.2	45	85	6	36	●
4.3	45	85	6	36	●
4.4	45	85	6	36	●
4.5	45	85	6	36	●
4.6	45	85	6	36	●
4.7	45	85	6	36	●
4.8	57	97	6	36	●
4.9	57	97	6	36	●
5.0	57	97	6	36	●
5.1	57	97	6	36	●
5.2	57	97	6	36	●
5.3	57	97	6	36	●
5.4	57	97	6	36	●
5.5	57	97	6	36	●
5.6	57	97	6	36	●
5.7	57	97	6	36	●
5.8	57	97	6	36	●
5.9	57	97	6	36	●
6.0	57	97	6	36	●
6.1	66	106	8	36	●
6.2	66	106	8	36	●
6.3	66	106	8	36	●
6.4	66	106	8	36	●
6.5	66	106	8	36	●
6.6	66	106	8	36	●
6.7	66	106	8	36	●
6.8	66	106	8	36	●
6.9	66	106	8	36	●
7.0	66	106	8	36	●
7.1	76	116	8	36	●
7.2	76	116	8	36	●
7.3	76	116	8	36	●
7.4	76	116	8	36	●
7.5	76	116	8	36	●
7.6	76	116	8	36	●
7.7	76	116	8	36	●
7.8	76	116	8	36	●
7.9	76	116	8	36	●
8.0	76	116	8	36	●
8.1	95	139	10	40	●
8.2	95	139	10	40	●
8.3	95	139	10	40	●
8.4	95	139	10	40	●
8.5	95	139	10	40	●

UMG Carbide

TiAlN F-TOP

8XD

2

7Leaders Standard

140°

Work Material

P	H	M	K	N	S
●	●	○			○

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.100-120 f.P169

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.100-120 f.P169

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.80-100 f.P169

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.60-80 f.P169

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.50-60 f.P169

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.25-35 f.P169

GR.8 不銹鋼 Stainless Steel
Vc.50-60 f.P169

GR.15 鈦合金 Titanium
Vc.30-50 f.P169

GR.16 鎳 Nickel
Vc.25-45 f.P169

GR.17 耐熱鋼 Heat-resistant Steel
Vc.40-60 f.P169

極超微粒鎢鋼塗層内冷高速鑽頭

Oil-Feed High Performance Drills

P H < 56HRC

極超硬ドリル・オイルホイル付け

Code No. D437FT-Dc

Dc m7	Lc mm	L mm	d h6	Ld mm	TiAlN D437FT
8.6	95	139	10	40	●
8.7	95	139	10	40	●
8.8	95	139	10	40	●
8.9	95	139	10	40	●
9.0	95	139	10	40	●
9.1	95	139	10	40	●
9.2	95	139	10	40	●
9.3	95	139	10	40	●
9.4	95	139	10	40	●
9.5	95	139	10	40	●
9.6	95	139	10	40	●
9.7	95	139	10	40	●
9.8	95	139	10	40	●
9.9	95	139	10	40	●
10.0	95	139	10	40	●
10.2	114	163	12	45	●
10.5	114	163	12	45	●
10.8	114	163	12	45	●
11.0	114	163	12	45	●
11.5	114	163	12	45	●
12.0	114	163	12	45	●
12.5	133	182	14	45	●
13.0	133	182	14	45	●
13.5	133	182	14	45	●
14.0	133	182	14	45	●
14.5	152	204	16	48	●
15.0	152	204	16	48	●
15.5	152	204	16	48	●
16.0	152	204	16	48	●
16.5	171	223	18	48	●
17.0	171	223	18	48	●
17.5	171	223	18	48	●
18.0	171	223	18	48	●
18.5	190	244	20	50	●
19.0	190	244	20	50	●
19.5	190	244	20	50	●
20.0	190	244	20	50	●

UMG Carbide

TiAlN F-TOP

8XD

2

7Leaders Standard

140°

Work Material

P	H	M	K	N	S
●	●	○			○

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.100-120 f.P169

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.100-120 f.P169

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.80-100 f.P169

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.60-80 f.P169

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.50-60 f.P169

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.25-35 f.P169

GR.8 不銹鋼 Stainless Steel
Vc.50-60 f.P169

GR.15 鈦合金 Titanium
Vc.30-50 f.P169

GR.16 鎳 Nickel
Vc.25-45 f.P169

GR.17 耐熱鋼 Heat-resistant Steel
Vc.40-60 f.P169

極超微粒鎢鋼塗層内冷高速鑽頭

Oil-Feed High Performance Drills

K P < 48HRC

極超硬ドリル・オイルホイル付け

Code No. D441FT-Dc

Dc m7	Lc mm	L mm	d h6	Ld mm	12XD D441FT
3.0	54	92	6	36	○
3.5	54	92	6	36	○
4.0	64	102	6	36	○
4.5	64	102	6	36	○
5.0	83	121	6	36	○
5.5	83	121	6	36	○
6.0	83	121	6	36	○
6.5	110	148	8	36	○
7.0	110	148	8	36	○
8.0	110	148	8	36	○
8.5	138	180	10	40	○
9.0	138	180	10	40	○
10.0	138	180	10	40	○
11.0	158	206	12	45	○
12.0	158	206	12	45	○

Code No. D442FT-Dc

Dc m7	Lc mm	L mm	d h6	Ld mm	16XD D442FT
3.0	57	100	6	36	○
3.5	78	120	6	36	○
4.0	78	120	6	36	○
4.5	100	140	6	36	○
5.0	100	140	6	36	○
5.5	110	150	6	36	○
6.0	120	160	6	36	○
6.5	135	175	8	36	○
7.0	135	175	8	36	○
8.0	152	192	8	36	○
8.5	162	206	10	40	○
9.0	162	206	10	40	○
10.0	180	224	10	40	○
11.0	198	247	12	45	○
12.0	216	265	12	45	○

Code No. D443FT-Dc

Dc m7	Lc mm	L mm	d h6	Ld mm	20XD D443FT
3.0	65	107	6	36	○
3.5	92	134	6	36	○
4.0	92	134	6	36	○
4.5	118	158	6	36	○
5.0	118	158	6	36	○
5.5	132	170	6	36	○
6.0	144	182	6	36	○
6.5	162	200	8	36	○
7.0	162	200	8	36	○
8.0	184	222	8	36	○
8.5	198	240	10	40	○
9.0	198	240	10	40	○
10.0	220	262	10	40	○
11.0	242	289	12	45	○
12.0	264	311	12	45	○

UMG Carbide

TiAlN F-TOP

12XD 16XD 20XD

2

7Leaders Standard

140°

Work Material

P	H	M	K	N	S
●	○	○	●		

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.80-100 f.P169

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.60-80 f.P169

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.40-60 f.P169

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.30-50 f.P169

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.25-40 f.P169

GR.8 不銹鋼 Stainless Steel
Vc.30-50 f.P169

GR.9 鑄鐵 Cast Iron
Vc.60-100 f.P169

○ 淺色：可訂購規格，無現貨
○ The light color: On request, no stock
○ 弊社又は代理店へお聞き下さい

極超微粒鎢鋼塗層階梯鑽頭

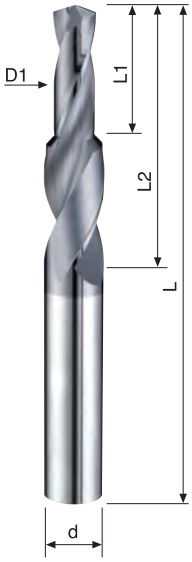
Combined Drill and Chamfer Tool

K P H < 48HRC

極超硬ドリル（コーティング／チャンファ付）

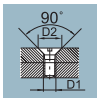
Code No. D419FT-thread

For thread size	D_1 mm	L_1 mm	L_2 mm	L mm	d h6	TiAlN D419FT
M 4	3.3	11.4	28	66	6	●
M 5	4.2	13.6	28	66	6	●
M 6	5.0	16.5	41	79	8	●
M 8	6.8	21.0	47	89	10	●
M10	8.5	25.5	55	102	12	●
M12	10.2	30.0	60	107	14	●
M14	12.0	34.5	65	115	16	●
M16	14.0	38.5	73	123	18	●

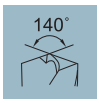


UMG Carbide

TiAlN F-TOP



7Leaders Standard



Work Material

P	H	M	K	N	S
●	●	○	●	○	

GR.1	非合金鋼鐵 Non-alloyed steel	Vc.60-80 f.P169
GR.2	低合金鋼鐵<24HRC Low-alloyed Steel	Vc.60-80 f.P169
GR.3	高合金鋼鐵<30HRC Hi-alloyed Steel	Vc.40-60 f.P169
GR.4	硬化鋼30~38HRC Hardened Steel	Vc.40-60 f.P169
GR.5	硬化鋼38~48HRC Hardened Steel	Vc.30-40 f.P169
GR.8	不銹鋼 Stainless Steel	Vc.40-50 f.P169
GR.9	鑄鐵 Cast Iron	Vc.80-100 f.P169
GR.10	鋁 Aluminium	Vc.100-120 f.P169
GR.11	銅 Copper	Vc.80-100 f.P169

鎢鋼焊刃鑽頭

Twist Drills

K H 30-68HRC

ドリル・ロウ付け

Code No. D402-Dc

Dc h8	Lc mm	L mm	Blank D402	Dc h8	Lc mm	L mm	Blank D402
2.0	24	49	●	7.6	75	117	●
2.1	24	49	●	7.7	75	117	●
2.2	27	53	●	7.8	75	117	●
2.3	27	53	●	7.9	75	117	●
2.4	30	57	●	8.0	75	117	●
2.5	30	57	●	8.1	75	117	●
2.6	30	57	●	8.2	75	117	●
2.7	33	61	●	8.3	75	117	●
2.8	33	61	●	8.4	75	117	●
2.9	33	61	●	8.5	75	117	●
3.0	33	61	●	8.6	81	125	●
3.1	36	65	●	8.7	81	125	●
3.2	36	65	●	8.8	81	125	●
3.3	36	65	●	8.9	81	125	●
3.4	39	70	●	9.0	81	125	●
3.5	39	70	●	9.1	81	125	●
3.6	39	70	●	9.2	81	125	●
3.7	39	70	●	9.3	81	125	●
3.8	43	75	●	9.4	81	125	●
3.9	43	75	●	9.5	81	125	●
4.0	43	75	●	9.6	87	133	●
4.1	43	75	●	9.7	87	133	●
4.2	43	75	●	9.8	87	133	●
4.3	47	80	●	9.9	87	133	●
4.4	47	80	●	10.0	87	133	●
4.5	47	80	●	10.2	87	133	●
4.6	47	80	●	10.5	87	133	●
4.7	47	80	●	11.0	94	142	●
4.8	52	86	●	11.5	94	142	●
4.9	52	86	●	12.0	101	151	●
5.0	52	86	●	12.5	101	151	●
5.1	52	86	●	13.0	101	151	●
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	●				
6.0	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	●				
7.0	69	109	●				
7.1	69	109	●				
7.2	69	109	●				
7.3	69	109	●				
7.4	69	109	●				
7.5	69	109	●				

MG Carbide

Uncoated Blank

5XD

2

DIN 338

118°

Work Material

P	H	M	K	N	S
	●		●		

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.15-25 f.P168

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.15-25 f.P168

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.15-25 f.P168

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.10-15 f.P168

GR.9 鑄鐵 Cast Iron
Vc.20-30 f.P168

鎢鋼焊刃鑽頭

Twist Drills

K H 30-68HRC

ドリル・ロウ付け

Code No. D405-Dc

Dc h8	Lc mm	L mm	d M.T.	Blank D405
13.0	101	182	1	●
13.5	108	189	1	●
14.0	108	189	1	●
14.5	114	212	2	●
15.0	114	212	2	●
15.5	120	218	2	●
16.0	120	218	2	●
16.5	125	223	2	●
17.0	125	223	2	●
17.5	130	228	2	●
18.0	130	228	2	●
18.5	135	233	2	●
19.0	135	233	2	●
19.5	140	238	2	●
20.0	140	238	2	●
20.5	145	243	2	●
21.0	145	243	2	●
21.5	150	248	2	●
22.0	150	248	2	●
22.5	155	253	2	●
23.0	155	253	2	●
23.5	155	276	3	●
24.0	160	281	3	●
24.5	160	281	3	●
25.0	160	281	3	●
26.0	165	286	3	●
27.0	170	291	3	●
28.0	170	291	3	●
29.0	175	296	3	●
30.0	175	296	3	●
31.0	180	301	3	●
32.0	185	334	4	●
33.0	185	334	4	●
34.0	190	339	4	●
35.0	190	339	4	●

MG Carbide

Uncoated Blank

5XD

2

DIN 345

118°

Work Material

P	H	M	K	N	S
	●		●		

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.15-25 f.P168

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.15-25 f.P168

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.15-25 f.P168

GR.7 硬化鋼56~68HRC Hardened Steel
Vc.10-15 f.P168

GR.9 鑄鐵 Cast Iron
Vc.20-30 f.P168

7leaders™

The Art of Cutting

形狀 Appearance	訂購編號 Code-No	明細 Specification			被切削材 Work Material						頁次 Page
					P	H	M	K	N	S	
	R300	MG Carbide	0	Z	●	●		●	○		P149
	R301	MG Carbide	7°	Z	●	●		●	○		P150
	R302	MG Carbide	7°	Z	●	●		●	○		P151
	R303	MG Carbide	7°	Z	●	●		●	○		P152
	R305	MG Carbide	45°	Z	●		○		●		P153
	R308	MG Carbide	7°	Z	●	●		●	○		P154、155
	R309	MG Carbide	7°	Z	●	●		●	○		P156
	M210-REB1	MG Carbide	0		●		○	●	●		P157
	M210-REB2	MG Carbide	0		●		○	●	●		P157
	M210-RRG	MG Carbide	0		●		○	●	●		P157
	M612-REB1	UMG Carbide	0		●	●				○	P158
	M612-REB2	UMG Carbide	0		●	●				○	P158
	M612-RRG	UMG Carbide	0		●	●				○	P158

Reamers

超微粒鎢鋼機械鉸刀

Machine Reamers

K P H < 56HRC

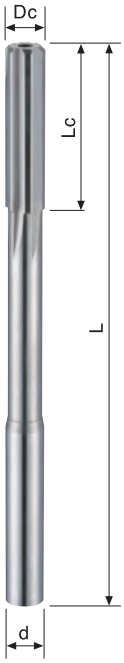
超硬マシンリーマ

Code No. R300-Dc

Dc H7	Lc mm	L mm	d mm	Z teeth	Blank R300
2.0	11	49	2.0	4	●
2.5	14	57	2.5	4	●
3.0	15	61	3.0	4	●
3.5	18	70	3.5	4	●
4.0	19	75	4.0	4	●
4.5	21	80	4.5	4	●
5.0	23	86	5.0	6	●
6.0	26	93	6.0	6	●
7.0	31	109	7.0	6	●
8.0	33	117	8.0	6	●
9.0	36	125	9.0	6	●
10.0	38	133	10.0	6	●
11.0	41	142	10.0	6	●
12.0	44	151	10.0	6	●
13.0	44	151	10.0	6	●
14.0	47	160	12.5	6	●
15.0	50	162	12.5	6	●
16.0	52	170	12.5	6	●
18.0	56	182	14.0	6	●
20.0	60	195	16.0	6	●

※2.0-9.5 全鎢鋼
2.0-9.5 Solid Carbide
2.0-9.5 ソリット超硬エンドミル

※10.0-20.0 焊刃鎢鋼
10.0-20.0 Carbide Tipped
10.0-20.0 ロー付け超硬エンドミル



Work Material

P	H	M	K	N	S
●	●		●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.10-18 f.P170

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.10-18 f.P170

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.8-15 f.P170

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.5-10 f.P170

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.5-8 f.P170

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.4-6 f.P170

GR.9 鑄鐵 Cast Iron
Vc.10-18 f.P170

GR.10 鋁 Aluminium
Vc.15-20 f.P170

GR.11 銅 Copper
Vc.15-25 f.P170

超微粒鎢鋼機械鉸刀

Machine Reamers

K P H < 56HRC

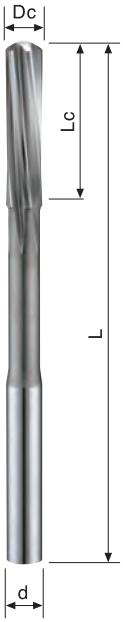
超硬マシンリーマ

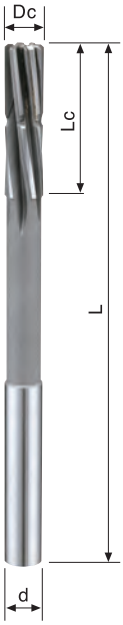
Code No. R301-Dc

Dc H7	Lc mm	L mm	d mm	Z teeth	Blank R301
2.0	11	49	2.0	4	●
2.5	14	57	2.5	4	●
3.0	15	61	3.0	4	●
3.5	18	70	3.5	4	●
4.0	19	75	4.0	4	●
4.5	21	80	4.5	4	●
5.0	23	86	5.0	6	●
5.5	26	93	5.5	6	●
6.0	26	93	6.0	6	●
6.5	28	101	6.5	6	●
7.0	31	109	7.0	6	●
7.5	31	109	7.5	6	●
8.0	33	117	8.0	6	●
8.5	33	117	8.5	6	●
9.0	36	125	9.0	6	●
9.5	36	125	9.5	6	●
10.0	38	133	10.0	6	●
10.5	38	133	10.0	6	●
11.0	41	142	10.0	6	●
11.5	41	142	10.0	6	●
12.0	44	151	10.0	6	●
12.5	44	151	10.0	6	●
13.0	44	151	10.0	6	●
13.5	47	160	12.5	6	●
14.0	47	160	12.5	6	●
14.5	50	162	12.5	6	●
15.0	50	162	12.5	6	●
15.5	52	170	12.5	6	●
16.0	52	170	12.5	6	●
17.0	54	175	14.0	6	●
18.0	56	182	14.0	6	●
19.0	58	189	16.0	6	●
20.0	60	195	16.0	6	●

※2.0-9.5 全鎢鋼
2.0-9.5 Solid Carbide
2.0-9.5 ソリット超硬エンドミル

※10.0-20.0 焊刃鎢鋼
10.0-20.0 Carbide Tipped
10.0-20.0 ロー付け超硬エンドミル





MG Carbide

Work Material

P	H	M	K	N	S
●	●		●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.10-18 f.P170

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.10-18 f.P170

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.8-15 f.P170

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.5-10 f.P170

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.5-8 f.P170

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.4-6 f.P170

GR.9 鑄鐵 Cast Iron
Vc.10-18 f.P170

GR.10 鋁 Aluminium
Vc.15-20 f.P170

GR.11 銅 Copper
Vc.15-25 f.P170

超微粒鎢鋼長柄機械鉸刀

Machine Reamers Long Length

K P H < 56HRC

超硬マシンリーマ・ロングシャンク

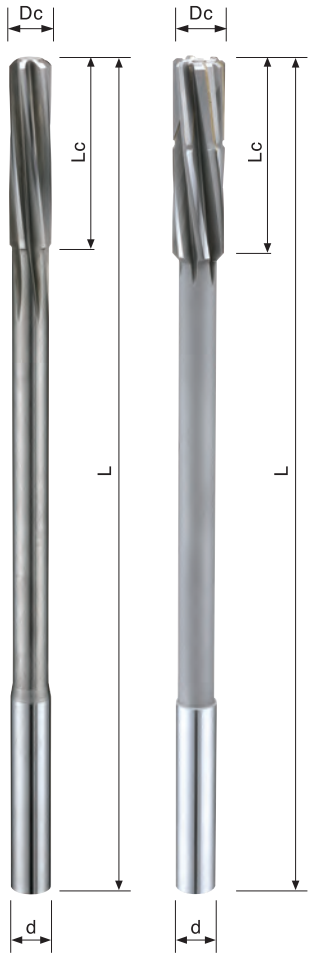
Code No. R302-Dc

Dc H7	Lc mm	L mm	d mm	Z teeth	Blank R302
3.0	15	100	3.0	4	●
3.5	18	112	3.5	4	●
4.0	19	119	4.0	4	●
4.5	21	126	4.5	4	●
5.0	23	132	5.0	6	●
6.0	26	139	6.0	6	●
7.0	31	156	7.0	6	●
8.0	33	165	8.0	6	●
9.0	36	175	9.0	6	●
10.0	38	184	10.0	6	●
11.0	41	195	10.0	6	○
12.0	44	205	10.0	6	●
13.0	44	205	10.0	6	○
14.0	47	214	12.5	6	●
15.0	50	220	12.5	6	○
16.0	52	227	12.5	6	●
17.0	54	235	14.0	6	○
18.0	56	241	14.0	6	●
19.0	58	247	16.0	6	○
20.0	60	254	16.0	6	●

※3.0-9.0 全鎢鋼
3.0-9.0 Solid Carbide
3.0-9.0 ソリット超硬エンドミル

※10.0-20.0 焊刃鎢鋼
10.0-20.0 Carbide Tipped
10.0-20.0 ロー付け超硬エンドミル

○ 淺色：可訂購規格，無現貨
○ The light color: On request, no stock
○ 弊社又は代理店へお聞き下さい



Work Material

P	H	M	K	N	S
●	●		●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.10-18 f.P170

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.10-18 f.P170

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.8-15 f.P170

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.5-10 f.P170

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.5-8 f.P170

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.4-6 f.P170

GR.9 鑄鐵 Cast Iron
Vc.10-18 f.P170

GR.10 鋁 Aluminium
Vc.15-20 f.P170

GR.11 銅 Copper
Vc.15-25 f.P170

超微粒鎢鋼斜柄機械鉸刀

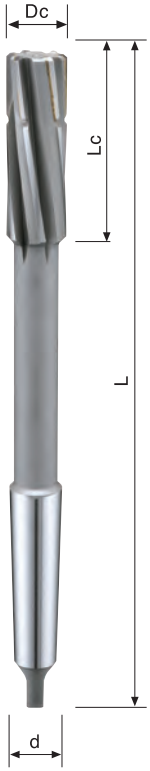
Machine Reamers Carbide Tipped

K P H < 56HRC

超硬マシンリーマ・テーパシャンク

Code No. R303-Dc

Dc H7	Lc mm	L mm	d M.T.	Z teeth	Blank R303
10.0	38	168	1	6	●
11.0	41	175	1	6	●
12.0	44	182	1	6	●
13.0	44	182	1	6	●
14.0	47	189	1	6	●
15.0	50	204	2	6	●
16.0	52	210	2	6	●
17.0	54	214	2	6	●
18.0	56	219	2	6	●
19.0	58	223	2	6	●
20.0	60	228	2	6	●
22.0	64	237	2	6	●
24.0	68	268	3	8	●
25.0	68	268	3	8	●
26.0	70	273	3	8	●
28.0	71	277	3	8	●
30.0	73	281	3	8	●
32.0	77	317	4	8	●
35.0	78	321	4	8	●
36.0	79	325	4	8	●
38.0	81	329	4	8	●
40.0	81	329	4	8	●



Work Material

P	H	M	K	N	S
●	●		●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.10-18 f.P170

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.10-18 f.P170

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.8-15 f.P170

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.5-10 f.P170

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.5-8 f.P170

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.4-6 f.P170

GR.9 鑄鐵 Cast Iron
Vc.10-18 f.P170

GR.10 鋁 Aluminium
Vc.15-20 f.P170

GR.11 銅 Copper
Vc.15-25 f.P170

超微粒鎢鋼高螺旋機械鉸刀

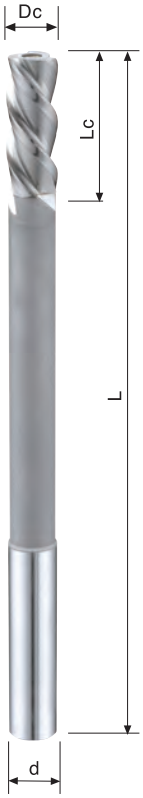
Machine Reamers 45º Left-Hand Spiral

N P < 30HRC

超硬スパイラルマシンリーマ

Code No. R305-Dc

Dc H7	Lc mm	L mm	d mm	Z teeth	Blank R305
3.0	20	105	3.0	3	●
3.5	20	105	3.5	3	●
4.0	20	105	4.0	3	●
4.5	20	105	4.5	3	●
5.0	25	130	5.0	3	●
5.5	25	130	5.5	3	●
6.0	25	130	6.0	3	●
6.5	25	130	6.5	3	●
7.0	25	130	7.0	3	●
8.0	25	130	8.0	3	●
9.0	30	150	10.0	3	●
10.0	30	150	10.0	3	●
11.0	30	170	12.0	3	●
12.0	30	170	12.0	3	●
13.0	35	170	12.0	3	●
14.0	35	210	16.0	3	●
15.0	35	210	16.0	4	●
16.0	35	210	16.0	4	●
20.0	35	260	20.0	4	●



Work Material

P	H	M	K	N	S
●		○		●	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.10-18 f.P170

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.10-18 f.P170

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.8-15 f.P170

GR.8 不銹鋼 Stainless Steel
Vc.5-10 f.P170

GR.10 鋁 Aluminium
Vc.20-25 f.P170

GR.11 銅 Copper
Vc.15-20 f.P170

超微粒鎢鋼機械鉸刀

Machine Reamers

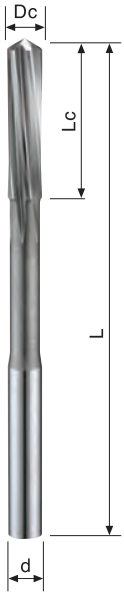
K P H < 56HRC

超硬マシンリーマ

Code No. R308-Dc

Dc H7	Lc mm	L mm	Z teeth	Blank R308
1.0	6	34	4	●
1.2	7	38	4	●
1.4	8	40	4	●
1.5	8	40	4	●
1.6	9	43	4	●
1.8	10	46	4	●
2.0	11	49	4	●
2.2	12	53	4	●
2.5	14	57	4	●
2.8	15	61	4	●
3.0	15	61	4	●
3.2	16	65	4	●
3.5	18	70	4	●
4.0	19	75	4	●
4.5	21	80	4	●
5.0	23	86	6	●
5.5	26	93	6	●
6.0	26	93	6	●
6.5	28	101	6	●
7.0	31	109	6	●
7.5	31	109	6	●
8.0	33	117	6	●
8.5	33	117	6	●
9.0	36	125	6	●
9.5	36	125	6	●
10.0	38	133	6	●
10.5	38	133	6	●
11.0	41	142	6	●
11.5	41	142	6	●
12.0	44	151	6	●

※Dc=d
※1.0-12.0 全鎢鋼
1.0-12.0 Solid Cardibe
1.0-12.0 ソリット超硬エンドミル



MG Carbide

Work Material

P	H	M	K	N	S
●	●		●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.10-18 f.P170

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.10-18 f.P170

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.8-15 f.P170

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.5-10 f.P170

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.5-8 f.P170

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.4-6 f.P170

GR.9 鑄鐵 Cast Iron
Vc.10-18 f.P170

GR.10 鋁 Aluminium
Vc.15-20 f.P170

GR.11 銅 Copper
Vc.15-25 f.P170

超微粒鎢鋼機械鉸刀，每0.1mm-尺寸

Machine Reamers In Steps of 0.1mm

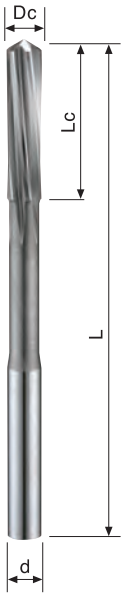
K P H < 56HRC

超硬マシンリーマ（0.1mm指定単位）

Code No. R308-Dc

Dc H7	Lc mm	L mm	Z teeth	Blank R308	Dc H7	Lc mm	L mm	Z teeth	Blank R308
1.0	6	34	4	●	7.0	31	109	6	●
1.1	7	36	4	●	7.1	31	109	6	●
1.2	7	38	4	●	7.2	31	109	6	●
1.3	7	38	4	●	7.3	31	109	6	●
1.4	8	40	4	●	7.4	31	109	6	●
1.5	8	40	4	●	7.5	31	109	6	●
1.6	9	43	4	●	7.6	33	117	6	●
1.7	9	43	4	●	7.7	33	117	6	●
1.8	10	46	4	●	7.8	33	117	6	●
1.9	10	46	4	●	7.9	33	117	6	●
2.0	11	49	4	●	8.0	33	117	6	●
2.1	11	49	4	●	8.1	33	117	6	●
2.2	12	53	4	●	8.2	33	117	6	●
2.3	12	53	4	●	8.3	33	117	6	●
2.4	14	57	4	●	8.4	33	117	6	●
2.5	14	57	4	●	8.5	33	117	6	●
2.6	14	57	4	●	8.6	36	125	6	●
2.7	15	61	4	●	8.7	36	125	6	●
2.8	15	61	4	●	8.8	36	125	6	●
2.9	15	61	4	●	8.9	36	125	6	●
3.0	15	61	4	●	9.0	36	125	6	●
3.1	16	65	4	●	9.1	36	125	6	●
3.2	16	65	4	●	9.2	36	125	6	●
3.3	16	65	4	●	9.3	36	125	6	●
3.4	18	70	4	●	9.4	36	125	6	●
3.5	18	70	4	●	9.5	36	125	6	●
3.6	18	70	4	●	9.6	38	133	6	●
3.7	18	70	4	●	9.7	38	133	6	●
3.8	19	75	4	●	9.8	38	133	6	●
3.9	19	75	4	●	9.9	38	133	6	●
4.0	19	75	4	●	10.0	38	133	6	●
4.1	19	75	4	●	10.1	38	133	6	●
4.2	19	75	4	●	10.2	38	133	6	●
4.3	21	80	4	●	10.3	38	133	6	●
4.4	21	80	4	●	10.4	38	133	6	●
4.5	21	80	4	●	10.5	38	133	6	●
4.6	21	80	6	●	10.6	38	133	6	●
4.7	21	80	6	●	10.7	41	142	6	●
4.8	23	86	6	●	10.8	41	142	6	●
4.9	23	86	6	●	10.9	41	142	6	●
5.0	23	86	6	●	11.0	41	142	6	●
5.1	23	86	6	●	11.1	41	142	6	●
5.2	23	86	6	●	11.2	41	142	6	●
5.3	23	86	6	●	11.3	41	142	6	●
5.4	26	93	6	●	11.4	41	142	6	●
5.5	26	93	6	●	11.5	41	142	6	●
5.6	26	93	6	●	11.6	41	142	6	●
5.7	26	93	6	●	11.7	41	142	6	●
5.8	26	93	6	●	11.8	41	142	6	●
5.9	26	93	6	●	11.9	44	151	6	●
6.0	26	93	6	●	12.0	44	151	6	●
6.1	28	101	6	●					
6.2	28	101	6	●					
6.3	28	101	6	●					
6.4	28	101	6	●					
6.5	28	101	6	●					
6.6	28	101	6	●					
6.7	31	101	6	●					
6.8	31	109	6	●					
6.9	31	109	6	●					

※Dc=d
※1.0-12.0 全鎢鋼
1.0-12.0 Solid Cardibe
1.0-12.0 ソリット超硬エンドミル



Work Material

P	H	M	K	N	S
●	●		●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.10-18 f.P170

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.10-18 f.P170

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.8-15 f.P170

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.5-10 f.P170

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.5-8 f.P170

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.4-6 f.P170

GR.9 鑄鐵 Cast Iron
Vc.10-18 f.P170

GR.10 鋁 Aluminium
Vc.15-20 f.P170

GR.11 銅 Copper
Vc.15-25 f.P170

超微粒鎢鋼NC機械鉸刀

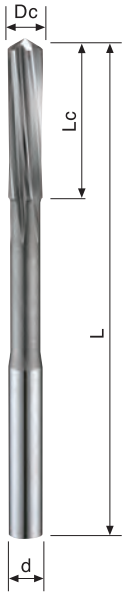
NC Machine Reamers

K P H < 56HRC

超硬NC用マシンリーマ

Code No. R309-Dc

Dc +0.003 -0	Lc mm	L mm	d h6	Z teeth	Blank R309
1.98	11	49	2	4	●
1.99	11	49	2	4	●
2.00	11	49	2	4	●
2.01	11	49	2	4	●
2.02	11	49	2	4	●
2.03	11	49	2	4	●
2.97	15	61	3	4	●
2.98	15	61	3	4	●
2.99	15	61	3	4	●
3.00	15	61	3	4	●
3.01	15	61	3	4	●
3.02	15	61	3	4	●
3.03	15	61	3	4	●
3.97	19	75	4	4	●
3.98	19	75	4	4	●
3.99	19	75	4	4	●
4.00	19	75	4	4	●
4.01	19	75	4	4	●
4.02	19	75	4	4	●
4.03	19	75	4	4	●
4.97	23	86	5	6	●
4.98	23	86	5	6	●
4.99	23	86	5	6	●
5.00	23	86	5	6	●
5.01	23	86	5	6	●
5.02	23	86	5	6	●
5.03	23	86	5	6	●
5.97	26	93	6	6	●
5.98	26	93	6	6	●
5.99	26	93	6	6	●
6.00	26	93	6	6	●
6.01	26	93	6	6	●
6.02	26	93	6	6	●
6.03	26	93	6	6	●
7.97	33	117	8	6	●
7.98	33	117	8	6	●
7.99	33	117	8	6	●
8.00	33	117	8	6	●
8.01	33	117	8	6	●
8.02	33	117	8	6	●
8.03	33	117	8	6	●
9.97	38	133	10	6	●
9.98	38	133	10	6	●
9.99	38	133	10	6	●
10.00	38	133	10	6	●
10.01	38	133	10	6	●
10.02	38	133	10	6	●
10.03	38	133	10	6	●
11.97	44	151	12	6	●
11.98	44	151	12	6	●
11.99	44	151	12	6	●
12.00	44	151	12	6	●
12.01	44	151	12	6	●
12.02	44	151	12	6	●
12.03	44	151	12	6	●



MG Carbide

Work Material

P	H	M	K	N	S
●	●		●	○	

GR.1 非合金鋼鐵 Non-alloyed steel
Vc.10-18 f.P170

GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
Vc.10-18 f.P170

GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
Vc.8-15 f.P170

GR.4 硬化鋼30~38HRC Hardened Steel
Vc.5-10 f.P170

GR.5 硬化鋼38~48HRC Hardened Steel
Vc.5-8 f.P170

GR.6 硬化鋼48~56HRC Hardened Steel
Vc.4-6 f.P170

GR.9 鑄鐵 Cast Iron
Vc.10-18 f.P170

GR.10 鋁 Aluminium
Vc.15-20 f.P170

GR.11 銅 Copper
Vc.15-25 f.P170

超微粒鎢鋼雕刻圓棒

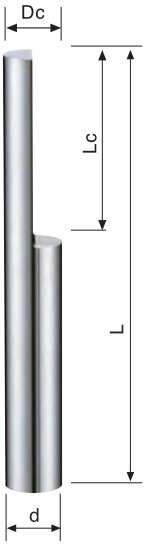
Engraving Blanks Precision Ground

K N P < 30HRC

超硬ブランク

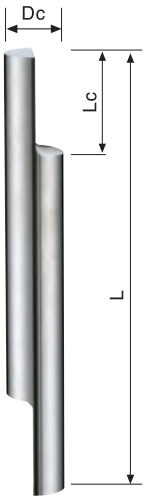
Code No. M210-REB1-Dc

Dc h6	Lc mm	L mm	d mm	M210 REB1
2.0	6	38	2.0	●
2.5	8	38	2.5	●
3.0	9	38	3.0	●
4.0	12	50	4.0	●
5.0	15	50	5.0	●
6.0	18	50	6.0	●
8.0	24	60	8.0	●
10.0	30	75	10.0	●
12.0	36	75	12.0	●



Code No. M210-REB2-Dc

Dc h6	Lc mm	L mm	d mm	M210 REB2
2.0	3	38	2.0	●
2.5	4	38	2.5	●
3.0	5	38	3.0	●
4.0	6	50	4.0	●
5.0	8	50	5.0	●
6.0	9	50	6.0	●
8.0	12	60	8.0	●
10.0	15	75	10.0	●
12.0	18	75	12.0	●



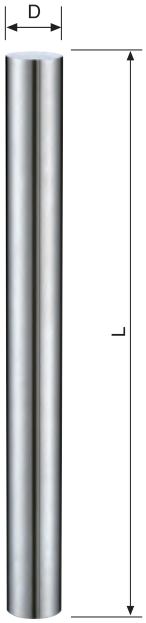
Work Material

P	H	M	K	N	S
●		○	●	●	

GR.1	非合金鋼鐵 Non-alloyed steel
GR.2	低合金鋼鐵<24HRC Low-alloyed Steel
GR.3	高合金鋼鐵<30HRC Hi-alloyed Steel
GR.8	不銹鋼 Stainless Steel
GR.9	鑄鐵 Cast Iron
GR.10	鋁 Aluminium
GR.11	銅 Copper

Code No. M210-RRG-D×L

D h6	L mm	M210 RRG
1.0	100	●
1.5	100	●
2.0	100	●
2.5	100	●
3.0	100	●
4.0	100	●
5.0	100	●
6.0	100	●
8.0	100	●
10.0	100	●
12.0	100	●



極超微粒鎢鋼雕刻圓棒

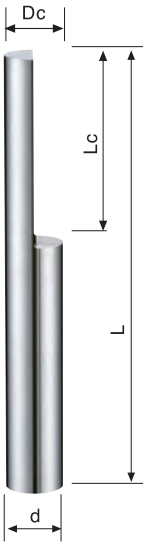
Engraving Blanks Precision Ground

P H < 56HRC

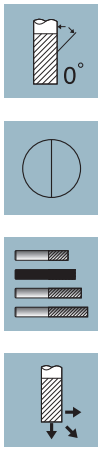
極超硬ブランク

Code No. M612-REB1-Dc

Dc h6	Lc mm	L mm	d mm	M612 REB1
3.0	9	38	3.0	●
4.0	12	50	4.0	●
5.0	15	50	5.0	●
6.0	18	50	6.0	●

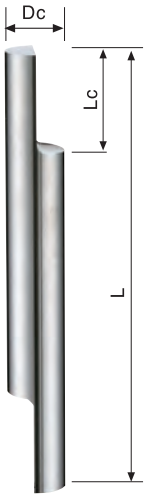


UMG Carbide



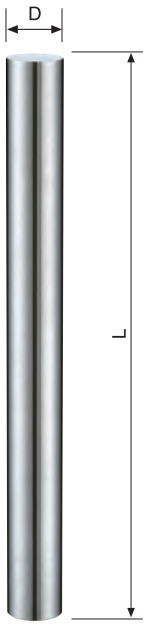
Code No. M612-REB2-Dc

Dc h6	Lc mm	L mm	d mm	M612 REB2
3.0	5	38	3.0	●
4.0	6	50	4.0	●
5.0	8	50	5.0	●
6.0	9	50	6.0	●



Code No. M612-RRG-D×L

D h6	L mm	M612 RRG
3.0	100	●
4.0	100	●
5.0	100	●
6.0	100	●
8.0	100	●
10.0	100	●
12.0	100	●
		●



Work Material

P	H	M	K	N	S
●	●				○

- GR.1 非合金鋼鐵 Non-alloyed steel
- GR.2 低合金鋼鐵<24HRC Low-alloyed Steel
- GR.3 高合金鋼鐵<30HRC Hi-alloyed Steel
- GR.4 硬化鋼30~38HRC Hardened Steel
- GR.5 硬化鋼38~48HRC Hardened Steel
- GR.6 硬化鋼48~56HRC Hardened Steel
- GR.15 鈦合金 Titanium
- GR.16 鎳 Nickel
- GR.17 耐熱鋼 Heat-resistant Steel

	Materials Groups		N/mm2	HB	JIS	DIN
P	GR.1	非合金鋼鐵 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	低合金鋼鐵<24HRC Low-alloyed Steel	700-1000	210-300	SCR415 SCR420 SCR430 SCR440 SCR445 SCM420 SCM415 SCM430 SCM440 SK1 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	高合金鋼鐵<30HRC Hi-alloyed Stee	＞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	硬化鋼 30~38HRC Hardened Steel				
	GR.5	硬化鋼 38~48HRC Hardened Steel				
	GR.6	硬化鋼 48~56HRC Hardened Steel				
	GR.7	硬化鋼 56~68HRC Hardened Steel				
M	GR.8	不銹鋼 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	鑄鐵 Cast Iron		180-280	FC100 FC150 FC200 FC250 FC300 FC350 FCD400 FCD500 FCD600 FCD700 FCMB31 0FCMW330 FCMW370 FCMP490 FCMP540 FCMP590 FCMP690	GG10 GG15 GG20 GG25 GG30 GG35 GGG40 GGG50 GGG60 GGG70 GTS-35 GTS-45 GTS-55 GTS-65 GTS-65-02 GTS-70-02
N	GR.10	鋁 Aluminium		Si<10%	A1050 A1080 A2014 A3003 A5052 A6061 A7075 MP1	A199,5 A199.8 AlMnCu AlCuSiMn AiMgSiCu AlZnMgCu4.5 MgA13Zn G-AlSi5Mg
				Si10%>	A1050 A1080 A2014 A3003 A5052 A6061 A7075 MP1	GD-AlSi12 GD-AlSi10Mg G-AlSi10Mg AlSi17C4 AlSi21CuNiMg AlSi25CuNiMg
	GR.11	銅 Copper		<250	C1220P C3710P C2400P C5210P C3602BE C3601BE C3604BE C3771BE C4622BE C4430P C6711P BC3 BC6	CuZn36Pb3 CuZn39Pb2 CuZn39Pb3 CuZn40Pb2 CuZn28Sn1 CuZn38Si1 CuZn15 CuZn36 CuZn40 ZCuSn10Zn2 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	塑膠 Plastics			PP PS POM PC PA PMMA TFE CTFE	
	GR.13	複合材料 FRP CFRP Composite Material			GFK KFK AFK	
	GR.14	石墨 Graphite				
S	GR.15	鈦合金 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	鎳 Nickel	900~1200	260~350	Incoloy 800 Incoloy 825 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	耐熱鋼 Heat-resistant Steel	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 534A99 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-700-2
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 HA1 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 ASIS420	330C11 Hr5.203-4 3146-3 HR8 3072-76 Hr401.601	2Cr23Ni13 2Cr25Ni20 4Cr9Si2 5Cr21Mn9Ni4N 0Cr18Ni11Ti 1Cr17 2Cr13

通用立銑刀 Universal End Mills 汎用エンドミル

fz= Feed Per Tooth

	Materials Groups		N/mm2	HB	Ø1	Ø2	Ø3	Ø4	Ø6	Ø8	Ø10	Ø12	Ø16	Ø20
P	GR.1	非合金鋼鐵 Non-alloyed steel	≦700	≦210	0.005/0.006	0.01-0.011	0.014-0.017	0.022-0.026	0.028-0.033	0.037-0.045	0.048-0.058	0.063-0.075	0.082-0.087	0.1-0.13
	GR.2	低合金鋼鐵<24HRC Low-alloyed Steel	700-1000	210-300	0.005/0.006	0.01-0.011	0.014-0.017	0.022-0.026	0.028-0.033	0.037-0.045	0.048-0.058	0.063-0.075	0.082-0.087	0.1-0.13
	GR.3	高合金鋼鐵<30HRC Hi-alloyed Stee	＞1000	＞300	0.00-0.005	0.007-0.009	0.011-0.014	0.016-0.02	0.021-0.027	0.028-0.035	0.035-0.045	0.048-0.058	0.065-0.075	0.08-0.1
H	GR.4	硬化鋼 30~38HRC Hardened Steel			0.00-0.005	0.007-0.009	0.011-0.014	0.016-0.02	0.021-0.027	0.028-0.035	0.035-0.045	0.048-0.058	0.065-0.075	0.08-0.1
	GR.5	硬化鋼 38~48HRC Hardened Steel			0.003	0.005	0.007	0.01	0.014	0.019	0.025	0.032	0.042	0.05
	GR.6	硬化鋼 48~56HRC Hardened Steel			0.002	0.003	0.005	0.007	0.09	0.012	0.016	0.02	0.03	0.04
	GR.7	硬化鋼 56~68HRC Hardened Steel			0.001	0.002	0.004	0.005	0.007	0.009	0.012	0.016	0.02	0.03
M	GR.8	不銹鋼 Stainless Steel	500~950	250~320	0.003-0.005	0.007-0.01	0.01-0.014	0.014-0.021	0.019-0.028	0.026-0.037	0.033-0.048	0.043-0.063	0.055-0.082	0.08-0.11
K	GR.9	鑄鐵 Cast Iron		180-280	0.004-0.006	0.008-0.011	0.012-0.017	0.017-0.025	0.022-0.033	0.03-0.045	0.039-0.058	0.051-0.075	0.067-0.097	0.09-0.13
N	GR.10	鋁 Aluminium		Si 0.5~12%	0.004-0.006	0.008-0.011	0.013-0.016	0.018-0.023	0.025-0.032	0.035-0.045	0.042-0.055	0.055-0.071	0.072-0.092	0.09-0.12
	GR.11	銅 Copper		180=250	0.003-0.006	0.006-0.011	0.009-0.016	0.014-0.023	0.018-0.031	0.025-0.042	0.032-0.055	0.041-0.071	0.055-0.092	0.07-0.12
	GR.12	塑膠 Plastics			0.005	0.01	0.015	0.022	0.029	0.04	0.052	0.068	0.087	0.11
	GR.13	複合材料 FRP CFRP Composite Material			0.005	0.01	0.015	0.022	0.029	0.04	0.052	0.068	0.087	0.11
	GR.14	石墨 Graphite			0.005-0.007	0.006-0.09	0.009-0.013	0.014-0.021	0.032-0.04	0.048-0.07	0.072-0.11	0.087-0.13	0.11-0.16	0.14-0.21
S	GR.15	鈦合金 Titanium	700~1250	210~370	0.003-0.005	0.006-0.01	0.009-0.015	0.013-0.022	0.017-0.029	0.023-0.04	0.03-0.051	0.039-0.067	0.051-0.087	0.07-0.012
	GR.16	鎳 Nickel	900~1200	260~350	0.003-0.004	0.005-0.008	0.008-0.013	0.012-0.018	0.016-0.024	0.021-0.033	0.027-0.042	0.035-0.055	0.046-0.072	0.06-0.09
	GR.17	耐熱鋼 Heat-resistant Steel	900-1400	210-400	0.003-0.004	0.007-0.008	0.01-0.013	0.014-0.018	0.019-0.024	0.026-0.033	0.033-0.042	0.043-0.055	0.056-0.072	0.08-0.1

精加工立銑刀 Finishing End Mills 仕上げ用エンドミル

fz= Feed Per Tooth

	Materials Groups		N/mm2	HB	Ø1	Ø2	Ø3	Ø4	Ø6	Ø8	Ø10	Ø12	Ø16	Ø20
P	GR.1	非合金鋼鐵 Non-alloyed steel	≦700	≦210	0.006~0.008	0.011-0.013	0.016-0.019	0.023-0.028	0.03-0.04	0.045-0.055	0.055-0.065	0.075-0.085	0.08-0.09	0.12-0.14
	GR.2	低合金鋼鐵<24HRC Low-alloyed Steel	700-1000	210-300	0.006~0.008	0.011-0.013	0.016-0.019	0.023-0.028	0.03-0.04	0.045-0.055	0.055-0.065	0.075-0.085	0.08-0.09	0.12-0.14
	GR.3	高合金鋼鐵<30HRC Hi-alloyed Stee	＞1000	＞300	0.005-0.007	0.009-0.011	0.014-0.017	0.022-0.026	0.026-0.037	0.037-0.052	0.05-0.06	0.07-0.08	0.07-0.08	0.1-0.12
H	GR.4	硬化鋼 30~38HRC Hardened Steel			0.005-0.007	0.009-0.011	0.014-0.017	0.022-0.026	0.026-0.037	0.037-0.052	0.05-0.06	0.07-0.08	0.07-0.08	0.1-0.12
	GR.5	硬化鋼 38~48HRC Hardened Steel			0.006	0.008	0.009	0.012	0.016	0.022	0.03	0.04	0.05	0.06
	GR.6	硬化鋼 48~56HRC Hardened Steel			0.004	0.005	0.007	0.01	0.013	0.017	0.02	0.03	0.04	0.05
	GR.7	硬化鋼 56~68HRC Hardened Steel			0.002	0.004	0.005	0.007	0.009	0.011	0.015	0.02	0.03	0.04
M	GR.8	不銹鋼 Stainless Steel	500~950	250~320	0.005-0.01	0.01-0.015	0.013-0.017	0.017-0.024	0.022-0.032	0.03-0.04	0.04-0.05	0.047-0.055	0.05-0.06	0.08-0.13
K	GR.9	鑄鐵 Cast Iron		180-280	0.006-0.009	0.011-0.016	0.017-0.022	0.022-0.03	0.029-0.036	0.037-0.055	0.052-0.063	0.06-0.08	0.07-0.09	0.12-0.15
N	GR.10	鋁 Aluminium		Si 0.5~12%	0.006-0.009	0.012-0.03	0.018-0.025	0.023-0.033	0.03-0.04	0.04-0.06	0.06-0.07	0.062-0.083	0.08-0.11	0.13-0.2
	GR.11	銅 Copper		180=250	0.005-0.009	0.001-0.03	0.015-0.024	0.02-0.03	0.025-0.035	0.03-0.05	0.04-0.06	0.055-0.075	0.06-0.08	0.07-0.18
	GR.12	塑膠 Plastics			0.007	0.012	0.017	0.025	0.032	0.045	0.06	0.07	0.095	0.13
	GR.13	複合材料 FRP CFRP Composite Material			0.007	0.012	0.017	0.025	0.032	0.045	0.06	0.07	0.095	0.13
	GR.14	石墨 Graphite			0.007-0.01	0.01-0.013	0.012-0.017	0.016-0.02	0.035-0.045	0.055-0.075	0.08-0.12	0.1-0.15	0.12-0.17	0.16-0.23
S	GR.15	鈦合金 Titanium	700~1250	210~370	0.005-0.007	0.008-0.013	0.012-0.017	0.015-0.025	0.02-0.032	0.03-0.045	0.038-0.05	0.045-0.07	0.065-0.094	0.08-0.13
	GR.16	鎳 Nickel	900~1200	260~350	0.004-0.006	0.007-0.01	0.01-0.015	0.014-0.022	0.018-0.028	0.025-0.04	0.03-0.045	0.04-0.06	0.06-0.08	0.07-0.1
	GR.17	耐熱鋼 Heat-resistant Steel	900-1400	210-400	0.005-0.0065	0.008-0.011	0.011-0.016	0.015-0.024	0.02-0.03	0.03-0.044	0.033-0.048	0.04-0.065	0.063-0.09	0.1-0.12

圓頭立銑刀 Ball Nose End Mills ボールエンドミル

Ap=0.03-0.05d Ae=0.2d fz= Feed Per Tooth

	Materials Groups		N/mm2	HB	Ø1	Ø2	Ø3	Ø4	Ø6	Ø8	Ø10	Ø12	Ø16	Ø20
P	GR.1	非合金鋼鐵 Non-alloyed steel	≦700	≦210	0.01~0.012	0.02~0.022	0.026~0.03	0.037~0.041	0.062~0.066	0.1~0.11	0.11~0.126	0.12~0.14	0.16~0.18	0.18~0.2
	GR.2	低合金鋼鐵<24HRC Low-alloyed Steel	700-1000	210-300	0.01~0.012	0.02~0.022	0.026~0.03	0.037~0.041	0.062~0.066	0.1~0.11	0.11~0.126	0.12~0.14	0.16~0.18	0.18~0.2
	GR.3	高合金鋼鐵<30HRC Hi-alloyed Stee	＞1000	＞300	0.008~0.01	0.018~0.02	0.026~0.028	0.035~0.039	0.059~0.063	0.08~0.09	0.09~0.11	0.1~0.12	0.14~0.16	0.16~0.18
H	GR.4	硬化鋼 30~38HRC Hardened Steel			0.008~0.01	0.018~0.02	0.026~0.028	0.035~0.039	0.059~0.063	0.08~0.09	0.09~0.11	0.1~0.12	0.14~0.16	0.16~0.18
	GR.5	硬化鋼 38~48HRC Hardened Steel			0.005~0.008	0.009~0.012	0.015~0.019	0.03~0.034	0.048~0.052	0.079~0.083	0.094~0.098	0.09~0.116	0.12~0.14	0.14~0.16
	GR.6	硬化鋼 48~56HRC Hardened Steel			0.006	0.01	0.016	0.028	0.046	0.07	0.088	0.1	0.12	0.13
	GR.7	硬化鋼 56~68HRC Hardened Steel			0.005	0.009	0.012	0.02	0.04	0.06	0.07	0.08	0.1	0.11
M	GR.8	不銹鋼 Stainless Steel	500~950	250~320	0.005~0.008	0.009~0.012	0.015~0.019	0.03~0.034	0.048~0.052	0.079~0.083	0.094~0.098	0.09~0.116	0.12~0.14	0.14~0.16
K	GR.9	鑄鐵 Cast Iron		180-280	0.01~0.012	0.02~0.022	0.026~0.03	0.037~0.041	0.062~0.066	0.1~0.11	0.11~0.126	0.12~0.14	0.16~0.18	0.18~0.2
N	GR.10	鋁 Aluminium		Si 0.5~12%	0.012~0.014	0.02~0.024	0.03~0.036	0.044~0.048	0.07~0.075	0.11~0.13	0.12~0.14	0.14~0.16	0.18~0.2	0.2~0.22
	GR.11	銅 Copper		180=250	0.01~0.012	0.018~0.022	0.028~0.032	0.04~0.044	0.065~0.07	0.1~0.12	0.11~0.13	0.12~0.14	0.16~0.18	0.18~0.2
	GR.12	塑膠 Plastics			0.015~0.023	0.03~0.037	0.05~0.065	0.06~.075	0.09~0.12	0.13~0.17	0.16~0.2	0.2~0.3	0.25~0.4	0.3~0.5
	GR.13	複合材料 FRP CFRP Composite Material			0.015~0.023	0.03~0.037	0.05~0.065	0.06~.075	0.09~0.12	0.13~0.17	0.16~0.2	0.2~0.3	0.25~0.4	0.3~0.5
	GR.14	石墨 Graphite			0.02~0.025	0.03~0.04	0.05~0.06	0.05~0.06	0.08~0.09	0.1~0.12	0.12~0.15	0.14~0.18	0.18~0.22	0.2~0.24
S	GR.15	鈦合金 Titanium	700~1250	210~370	0.005~0.008	0.009~0.012	0.015~0.019	0.03~0.034	0.048~0.052	0.079~0.083	0.094~0.098	0.09~0.116	0.12~0.14	0.14~0.16
	GR.16	鎳 Nickel	900~1200	260~350	0.006~0.008	0.08~0.01	0.012~0.014	0.025~0.028	0.044~0.048	0.07~0.075	0.08~0.085	0.08~0.1	0.1~0.12	0.11~0.13
	GR.17	耐熱鋼 Heat-resistant Steel	900-1400	210-400	0.006~0.008	0.08~0.01	0.012~0.014	0.025~0.028	0.044~0.048	0.07~0.075	0.08~0.085	0.08~0.1	0.1~0.12	0.11~0.13

高效率圓頭立銑刀 High Performance Ball Nose End Mills 高効率ボールエンドミル

HSC Ap=0.03d Ae=0.05d fz= Feed Per Tooth

	Materials Groups		N/mm2	HB	Ø1	Ø2	Ø3	Ø4	Ø6	Ø8	Ø10	Ø12	Ø16	Ø20
P	GR.1	非合金鋼鐵 Non-alloyed steel	≦700	≦210	0.02~0.03	0.05~0.055	0.07~0.084	0.09~0.102	0.12~0.13	0.12~0.13	0.13~0.16	0.13~0.16	0.14~0.17	0.14~0.17
	GR.2	低合金鋼鐵<24HRC Low-alloyed Steel	700-1000	210-300	0.02~0.03	0.05~0.055	0.07~0.084	0.09~0.102	0.12~0.13	0.12~0.13	0.13~0.16	0.13~0.16	0.14~0.17	0.14~0.17
	GR.3	高合金鋼鐵<30HRC Hi-alloyed Stee	＞1000	＞300	0.02~0.03	0.05~0.055	0.07~0.084	0.09~0.102	0.12~0.13	0.12~0.13	0.13~0.16	0.13~0.16	0.14~0.17	0.14~0.17
H	GR.4	硬化鋼 30~38HRC Hardened Steel			0.02~0.025	0.04~0.045	0.06~0.074	0.08~0.09	0.11~0.12	0.11~0.12	0.12~0.15	0.12~0.15	0.13~0.16	0.13~0.16
	GR.5	硬化鋼 38~48HRC Hardened Steel			0.02~0.025	0.04~0.045	0.06~0.074	0.08~0.09	0.11~0.12	0.11~0.12	0.12~0.15	0.12~0.15	0.13~0.16	0.13~0.16
	GR.6	硬化鋼 48~56HRC Hardened Steel			0.015~0.02	0.03~0.04	0.04~0.05	0.06~0.08	0.08~0.1	0.08~0.1	0.1~0.12	0.1~0.12	0.11~0.13	0.11~0.13
	GR.7	硬化鋼 56~68HRC Hardened Steel			0.015~0.02	0.03~0.04	0.04~0.05	0.06~0.08	0.08~0.1	0.08~0.1	0.1~0.12	0.1~0.12	0.11~0.13	0.11~0.13
M	GR.8	不銹鋼 Stainless Steel	500~950	250~320	0.02~0.025	0.04~0.045	0.06~0.074	0.08~0.09	0.11~0.12	0.11~0.12	0.12~0.15	0.12~0.15	0.13~0.16	0.13~0.16
K	GR.9	鑄鐵 Cast Iron		180-280	0.02~0.03	0.05~0.055	0.07~0.084	0.09~0.102	0.12~0.13	0.12~0.13	0.13~0.16	0.13~0.16	0.14~0.17	0.14~0.17
N	GR.10	鋁 Aluminium		Si 0.5~12%	0.03~0.05	0.05~0.07	0.06~0.09	0.12~0.15	0.15~0.2	0.18~0.24	0.22~0.26	0.25~0.3	0.28~0.32	0.3~0.35
	GR.11	銅 Copper		180=250	0.03~0.05	0.05~0.07	0.06~0.09	0.12~0.15	0.15~0.2	0.18~0.24	0.22~0.26	0.25~0.3	0.28~0.32	0.3~0.35
	GR.12	塑膠 Plastics			0.02~0.04	0.04~0.05	0.06~0.09	0.12~0.15	0.15~0.2	0.18~0.24	0.25~0.35	0.3~0.4	0.4~0.5	0.5~0.6
	GR.13	複合材料 FRP CFRP Composite Material			0.02~0.04	0.04~0.05	0.06~0.09	0.12~0.15	0.15~0.2	0.18~0.24	0.25~0.35	0.3~0.4	0.4~0.5	0.5~0.6
	GR.14	石墨 Graphite			0.04~0.08	0.06~0.08	0.1~0.12	0.1~0.13	0.15~0.18	0.2~0.23	0.24~0.28	0.26~0.3	0.3~0.33	0.32~0.36
S	GR.15	鈦合金 Titanium	700~1250	210~370	0.015~0.02	0.03~0.04	0.04~0.05	0.06~0.08	0.08~0.1	0.08~0.1	0.1~0.12	0.1~0.12	0.11~0.13	0.11~0.13
	GR.16	鎳 Nickel	900~1200	260~350	0.015~0.02	0.03~0.04	0.04~0.05	0.06~0.08	0.08~0.1	0.08~0.1	0.1~0.12	0.1~0.12	0.11~0.13	0.11~0.13
	GR.17	耐熱鋼 Heat-resistant Steel	900-1400	210-400	0.015~0.02	0.03~0.04	0.04~0.05	0.06~0.08	0.08~0.1	0.08~0.1	0.1~0.12	0.1~0.12	0.11~0.13	0.11~0.13

高效率立銑刀 High Performance End Mills 高効率エンドミル

HPC fz= Feed Per Tooth

	Materials Groups		N/mm2	HB	Ø1	Ø2	Ø3	Ø4	Ø6	Ø8	Ø10	Ø12	Ø16	Ø20
P	GR.1	非合金鋼鐵 Non-alloyed steel	≦700	≦210	0.008-0.012	0.01-0.014	0.015-0.02	0.025-0.03	0.03-0.05	0.04-0.05	0.06-0.08	0.07-0.09	0.11-0.14	0.12-0.15
	GR.2	低合金鋼鐵<24HRC Low-alloyed Steel	700-1000	210-300	0.008-0.012	0.01-0.014	0.015-0.02	0.025-0.03	0.03-0.05	0.04-0.05	0.06-0.08	0.07-0.09	0.11-0.14	0.12-0.15
	GR.3	高合金鋼鐵<30HRC Hi-alloyed Stee	＞1000	＞300	0.006-0.008	0.008-0.012	0.014-0.016	0.022-0.026	0.025-0.04	0.03-0.04	0.04-0.06	0.06-0.08	0.08-0.1	0.1-0.13
H	GR.4	硬化鋼 30~38HRC Hardened Steel			0.006-0.008	0.008-0.012	0.014-0.016	0.022-0.026	0.025-0.04	0.03-0.04	0.04-0.06	0.06-0.08	0.08-0.1	0.1-0.13
	GR.5	硬化鋼 38~48HRC Hardened Steel			0.005	0.008	0.012	0.015	0.02	0.025	0.035	0.05	0.06	0.08
	GR.6	硬化鋼 48~56HRC Hardened Steel			0.004	0.006	0.01	0.012	0.015	0.02	0.03	0.04	0.05	0.07
	GR.7	硬化鋼 56~68HRC Hardened Steel			0.002	0.004	0.008	0.01	0.012	0.015	0.024	0.03	0.04	0.06
M	GR.8	不銹鋼 Stainless Steel	500~950	250~320	0.004-0.006	0.08-0.012	0.012-0.016	0.018-0.025	0.022-0.03	0.04-0.06	0.05-0.07	0.06-0.09	0.08-0.1	0.09-0.15
K	GR.9	鑄鐵 Cast Iron		180-280	0.08-0.011	0.01-0.016	0.015-0.025	0.025-0.035	0.03-0.065	0.04-0.08	0.06-0.09	0.08-0.11	0.09-0.012	0.11-0.16
N	GR.10	鋁 Aluminium		Si 0.5~12%	0.008-0.01	0.0015-0.02	0.018-0.025	0.02-0.04	0.03-0.06	0.04-0.07	0.05-0.08	0.06-0.09	0.08-0.12	0.1-0.15
	GR.11	銅 Copper		180=250	0.006-0.008	0.008-0.012	0.012-0.02	0.012-0.025	0.015-0.04	0.02-0.05	0.03-0.06	0.04-0.07	0.06-0.01	0.08-0.12
	GR.12	塑膠 Plastics			0.005-0.01	0.01-0.02	0.01-0.03	0.02-0.04	0.04-0.06	0.05-0.08	0.06-0.1	0.1-0.14	0.1-0.16	0.15-0.2
	GR.13	複合材料 FRP CFRP Composite Material			0.005-0.01	0.01-0.02	0.01-0.03	0.02-0.04	0.04-0.06	0.05-0.08	0.06-0.1	0.1-0.14	0.1-0.16	0.15-0.2
	GR.14	石墨 Graphite			0.005-0.007	0.006-0.09	0.009-0.013	0.014-0.021	0.032-0.04	0.048-0.07	0.072-0.11	0.087-0.13	0.11-0.16	0.14-0.21
S	GR.15	鈦合金 Titanium	700~1250	210~370	0.005-0.007	0.008-0.012	0.011-0.017	0.015-0.024	0.019-0.031	0.025-0.05	0.03-0.05	0.04-0.07	0.06-0.09	0.08-0.013
	GR.16	鎳 Nickel	900~1200	260~350	0.005-0.006	0.007-0.01	0.01-0.015	0.014-0.02	0.018-0.026	0.024-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.07-0.1
	GR.17	耐熱鋼 Heat-resistant Steel	900-1400	210-400	0.005-0.006	0.009-0.01	0.012-0.015	0.016-0.02	0.021-0.026	0.028-0.035	0.035-0.05	0.05-0.06	0.06-0.085	0.09-0.12

高進給立銑刀　High Feed End Mills　高送りエンドミル

HFC　fz= Feed Per Tooth

	Materials Groups		N/mm2	HB	Ø1	Ø2	Ø3	Ø4	Ø6	Ø8	Ø10	Ø12	Ø16	Ø20
P	GR.1	非合金鋼鐵 Non-alloyed steel	≦700	≦210			0.05-0.1	0.09-0.15	0.13-0.22	0.16-0.3	0.22-0.4	0.25-0.45	0.3-0.6	0.4-0.75
	GR.2	低合金鋼鐵<24HRC Low-alloyed Steel	700-1000	210-300			0.05-0.1	0.09-0.15	0.13-0.22	0.16-0.3	0.22-0.4	0.25-0.45	0.3-0.6	0.4-0.75
	GR.3	高合金鋼鐵<30HRC Hi-alloyed Stee	＞1000	＞300			0.05-0.1	0.09-0.15	0.13-0.22	0.16-0.3	0.22-0.4	0.25-0.45	0.3-0.6	0.4-0.75
H	GR.4	硬化鋼 30~38HRC Hardened Steel					0.05-0.1	0.15-0.2	0.13-0.22	0.16-0.3	0.22-0.4	0.25-0.45	0.3-0.6	0.4-0.75
	GR.5	硬化鋼 38~48HRC Hardened Steel					0.05-0.1	0.15-0.2	0.13-0.22	0.16-0.3	0.22-0.4	0.25-0.45	0.3-0.6	0.4-0.75
	GR.6	硬化鋼 48~56HRC Hardened Steel					0.05-0.1	0.15-0.2	0.13-0.22	0.16-0.3	0.22-0.4	0.25-0.45	0.3-0.6	0.4-0.75
	GR.7	硬化鋼 56~68HRC Hardened Steel					0.05-0.1	0.15-0.2	0.13-0.22	0.16-0.3	0.22-0.4	0.25-0.45	0.3-0.6	0.4-0.75
M	GR.8	不銹鋼 Stainless Steel	500~950	250~320										
K	GR.9	鑄鐵 Cast Iron		180-280										
N	GR.10	鋁 Aluminium		Si 0.5~12%										
	GR.11	銅 Copper		180=250										
	GR.12	塑膠 Plastics												
	GR.13	複合材料 FRP CFRP Composite Material												
	GR.14	石墨 Graphite												
S	GR.15	鈦合金 Titanium	700~1250	210~370										
	GR.16	鎳 Nickel	900~1200	260~350										
	GR.17	耐熱鋼 Heat-resistant Steel	900-1400	210-400										

高效率立銑刀 High Performance End Mills 高効率エンドミル

HSC fz= Feed Per Tooth

	Materials Groups		N/mm2	HB	Ø1	Ø2	Ø3	Ø4	Ø6	Ø8	Ø10	Ø12	Ø16	Ø20
P	GR.1	非合金鋼鐵 Non-alloyed steel	≦700	≦210	0.008-0.01	0.011-0.013	0.016-0.019	0.023-0.028	0.032-0.039	0.044-0.052	0.057-0.068	0.074-0.088	0.096-0.114	0.125-0.149
	GR.2	低合金鋼鐵<24HRC Low-alloyed Steel	700-1000	210-300	0.008-0.01	0.011-0.013	0.016-0.019	0.023-0.028	0.032-0.039	0.044-0.052	0.057-0.068	0.074-0.088	0.096-0.114	0.125-0.149
	GR.3	高合金鋼鐵<30HRC Hi-alloyed Stee	＞1000	＞300	0.006-0.008	0.008-0.01	0.012-0.015	0.017-0.022	0.024-0.03	0.03-0.041	0.043-0.053	0.056-0.069	0.072-0.09	0.094-0.117
H	GR.4	硬化鋼 30~38HRC Hardened Steel			0.006-0.008	0.008-0.01	0.012-0.015	0.017-0.022	0.024-0.03	0.03-0.041	0.043-0.053	0.056-0.069	0.072-0.09	0.094-0.117
	GR.5	硬化鋼 38~48HRC Hardened Steel			0.005	0.007	0.011	0.016	0.022	0.03	0.04	0.05	0.066	0.086
	GR.6	硬化鋼 48~56HRC Hardened Steel			0.004	0.006	0.01	0.014	0.019	0.025	0.032	0.04	0.052	0.07
	GR.7	硬化鋼 56~68HRC Hardened Steel			0.002	0.005	0.009	0.012	0.016	0.02	0.025	0.03	0.04	0.055
M	GR.8	不銹鋼 Stainless Steel	500~950	250~320	0.005-0.006	0.07-0.09	0.011-0.013	0.016-0.019	0.022-0.026	0.03-0.036	0.039-0.046	0.051-0.06	0.066-0.078	0.086-0.102
K	GR.9	鑄鐵 Cast Iron		180-280	0.08-0.011	0.009-0.013	0.013-0.019	0.019-0.028	0.026-0.039	0.036-0.052	0.046-0.068	0.06-0.088	0.078-0.0114	0.104-0.149
N	GR.10	鋁 Aluminium		Si 0.5~12%	0.005	0.005	0.007	0.01	0.02	0.027	0.035	0.043	0.057	0.075
	GR.11	銅 Copper		180=250	0.006	0.006	0.009	0.012	0.024	0.03	0.037	0.045	0.06	0.08
	GR.12	塑膠 Plastics			0.005	0.007	0.01	0.014	0.025	0.035	0.042	0.05	0.065	0.08
	GR.13	複合材料 FRP CFRP Composite Material			0.008	0.011	0.017	0.025	0.035	0.047	0.061	0.079	0.102	0.133
	GR.14	石墨 Graphite			0.015	0.02	0.03	0.04	0.06	0.07	0.09	0.12	0.14	0.016
S	GR.15	鈦合金 Titanium	700~1250	210~370	0.005-0.008	0.007-0.011	0.01-0.017	0.015-0.025	0.02-0.035	0.027-0.047	0.036-0.061	0.046-0.079	0.06-0.1	0.08-0.013
	GR.16	鎳 Nickel	900~1200	260~350	0.004-0.006	0.006-0.009	0.009-0.014	0.013-0.02	0.018-0.028	0.025-0.038	0.032-0.05	0.042-0.065	0.054-0.084	0.07-0.11
	GR.17	耐熱鋼 Heat-resistant Steel	900-1400	210-400	0.005-0.007	0.009-0.011	0.014-0.016	0.016-0.023	0.022-0.032	0.03-0.044	0.039-0.057	0.06-0.074	0.065-0.095	0.085-0.125

鑽頭 Twist Drills ドリル

fn=Feed Per Revolution

	Materials Groups		N/mm2	HB	Ø1	Ø2	Ø3	Ø4	Ø6	Ø8	Ø10	Ø12	Ø16	Ø20
P	GR.1	非合金鋼鐵 Non-alloyed steel	≦700	≦210	0.015~0.02	0.02~0.03	0.03~0.05	0.045~0.07	0.065~0.1	0.085~0.125	0.1~0.155	0.13~0.19	0.13~0.24	0.15~0.25
	GR.2	低合金鋼鐵<24HRC Low-alloyed Steel	700-1000	210-300	0.015~0.02	0.02~0.03	0.03~0.05	0.045~0.07	0.065~0.1	0.085~0.125	0.1~0.155	0.13~0.19	0.13~0.24	0.15~0.25
	GR.3	高合金鋼鐵<30HRC Hi-alloyed Stee	＞1000	＞300	0.01~0.016	0.016~0.02	0.025~0.03	0.035~0.045	0.05~0.06	0.065~0.08	0.08~0.1	0.1~0.12	0.12~0.15	0.14~0.2
H	GR.4	硬化鋼 30~38HRC Hardened Steel			0.01~0.016	0.016~0.02	0.025~0.03	0.035~0.045	0.05~0.06	0.065~0.08	0.08~0.1	0.1~0.12	0.12~0.15	0.14~0.2
	GR.5	硬化鋼 38~48HRC Hardened Steel			0.005	0.01	0.015	0.022	0.031	0.04	0.05	0.06	0.075	0.09
	GR.6	硬化鋼 48~56HRC Hardened Steel												
	GR.7	硬化鋼 56~68HRC Hardened Steel												
M	GR.8	不銹鋼 Stainless Steel	500~950	250~320	0.01~0.015	0.016~0.023	0.025~0.035	0.035~0.05	0.05~0.07	0.065~0.09	0.08~0.12	0,1~0.14	0.12~0.175	0.135~0.2
K	GR.9	鑄鐵 Cast Iron		180-280	0.013~0.02	0.023~0.037	0.034~0.055	0.05~0.08	0.07~0.11	0.09~0.145	0.11~0.18	0.135~0.22	0.17~0.27	0.19~0.32
N	GR.10	鋁 Aluminium		Si 0.5~12%	0.015~0.025	0.03~0.051	0.045~0.076	0.066~0.11	0.092~0.154	0.12~0.2	0.15~0.25	0.18~0.3	0.225~0.375	0.25~0.4
	GR.11	銅 Copper		180=250	0.012~0.03	0.022~0.04	0.03~0.06	0.05~0.08	0.06~0.14	0.08~0.17	0.11~0.2	0.12~0.25	0.15~0.27	0.2~0.3
	GR.12	塑膠 Plastics			0.01~0.02	0.02~0.024	0.03~0.036	0.044~0.052	0.062~0.073	0.08~0.095	0.1~0.12	0.12~0.15	0.15~0.18	0.16~0.2
	GR.13	複合材料 FRP CFRP Composite Material			0.015~0.02	0.023~0.027	0.034~0.04	0.049~0.058	0.069~0.081	0.09~0.105	0.11~0.13	0.13~0.158	0.17~0.2	0.2~0.25
	GR.14	石墨 Graphite												
S	GR.15	鈦合金 Titanium	700~1250	210~370	0.01~0.016	0.02~0.029	0.03~0.044	0.044~0.063	0.062~0.088	0.08~0.115	0.1~0.144	0.12~0.173	0.15~0.216	0.18~0.25
	GR.16	鎳 Nickel	900~1200	260~350	0.008~0.014	0.019~0.024	0.03~0.04	0.04~0.05	0.06~0.075	0.075~0.095	0.095~0.12	0.11~0.145	0.14~0.17	0.16~0.2
	GR.17	耐熱鋼 Heat-resistant Steel	900-1400	210-400	0.01~0.02	0.02~0.03	0.25~0.045	0.036~0.066	0.05~0.071	0.065~0.12	0.08~0.15	0.098~0.18	0.122~0.225	0.14~0.26

高速鑽頭 High Performance Drills ドリル・高速加工用

fn=Feed Per Revolution

	Materials Groups		N/mm2	HB	Ø1	Ø2	Ø3	Ø4	Ø6	Ø8	Ø10	Ø12	Ø16	Ø20
P	GR.1	非合金鋼鐵 Non-alloyed steel	≦700	≦210	0.02~0.04	0.03~0.04	0.04~0.08	0.06~0.1	0.08~0.15	0.1~0.2	0.13~0.25	0.15~0.3	0.16~0.35	0.2~0.45
	GR.2	低合金鋼鐵<24HRC Low-alloyed Steel	700-1000	210-300	0.02~0.04	0.03~0.04	0.04~0.08	0.06~0.1	0.08~0.15	0.1~0.2	0.13~0.25	0.15~0.3	0.16~0.35	0.2~0.45
	GR.3	高合金鋼鐵<30HRC Hi-alloyed Stee	＞1000	＞300	0.015~0.025	0.02~0.035	0.03~0.06	0.04~0.07	0.06~0.09	0.08~0.14	0.01~0.16	0.12~0.2	0.14~0.25	0.16~0.3
H	GR.4	硬化鋼 30~38HRC Hardened Steel			0.015~0.025	0.02~0.035	0.03~0.06	0.04~0.07	0.06~0.09	0.08~0.14	0.01~0.16	0.12~0.2	0.14~0.25	0.16~0.3
	GR.5	硬化鋼 38~48HRC Hardened Steel			0.007	0.014	0.022	0.03	0.045	0.06	0.07	0.08	0.09	0.11
	GR.6	硬化鋼 48~56HRC Hardened Steel			0.005	0.01	0.015	0.025	0.035	0.04	0.05	0.06	0.075	0.09
	GR.7	硬化鋼 56~68HRC Hardened Steel												
M	GR.8	不銹鋼 Stainless Steel	500~950	250~320	0.014~0.017	0.025~0.03	0.04~0.05	0.05~0.07	0.09~0.11	0.11~0.15	0.13~0.17	0,15~0.19	0.17~0.22	0.2~0.25
K	GR.9	鑄鐵 Cast Iron		180-280	0.025~0.038	0.04~0.07	0.07~0.11	0.1~0.15	0.14~0.22	0.2~0.3	0.25~0.35	0.3~0.4	0.35~0.45	0.35~0.5
N	GR.10	鋁 Aluminium		Si 0.5~12%	0.03~0.04	0.05~0.08	0.08~0.12	0.11~0.16	0.15~0.23	0.22~0.32	0.27~0.38	0.32~0.42	0.37~0.48	0.37~0.55
	GR.11	銅 Copper		180=250	0.015~0.035	0.025~0.05	0.04~0.08	0.05~0.1	0.08~0.15	0.1~0.2	0.13~0.25	0.15~0.3	0.19~0.3	0.22~0.35
	GR.12	塑膠 Plastics			0.015~0.03	0.03~0.04	0.04~0.06	0.055~0.08	0.07~0.09	0.08~0.11	0.11~0.14	0.14~0.17	0.17~0.2	0.18~0.23
	GR.13	複合材料 FRP CFRP Composite Material			0.015~0.03	0.03~0.04	0.04~0.06	0.055~0.08	0.07~0.09	0.08~0.11	0.11~0.14	0.14~0.17	0.17~0.2	0.18~0.23
	GR.14	石墨 Graphite			0.015~0.03	0.03~0.04	0.04~0.06	0.055~0.08	0.07~0.09	0.08~0.11	0.11~0.14	0.14~0.17	0.17~0.2	0.18~0.23
S	GR.15	鈦合金 Titanium	700~1250	210~370	0.015~0.023	0.03~0.04	0.04~0.06	0.055~0.08	0.07~0.1	0.1~0.14	0.12~0.16	0.14~0.19	0.17~0.24	0.19~0.26
	GR.16	鎳 Nickel	900~1200	260~350	0.01~0.02	0.02~0.034	0.035~0.05	0.045~0.066	0.07~0.09	0.08~0.1	0.1~0.14	0.12~0.16	0.15~0.19	0.17~0.22
	GR.17	耐熱鋼 Heat-resistant Steel	900-1400	210-400	0.013~0.016	0.024~0.028	0.03~0.04	0.04~0.06	0.08~0.1	0.1~0.14	0.12~0.16	0,14~0.18	0.16~0.21	0.18~0.23

機械鉸刀 Machine Reamers マシンリーマ

Reamers fn=Feed Per Revolution

	Materials Groups		N/mm2	HB	Ø1	Ø2	Ø3	Ø4	Ø6	Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø30
P	GR.1	非合金鋼鐵 Non-alloyed steel	≦700	≦210	0.052~0.056	0.083~0.09	0.11~0.125	0.14~0.15	0.17~0.19	0.20~0.23	0.24~0.26	0.27~0.3	0.32~0.35	0.36~0.39	0.42~0.46	0.46~0.5
	GR.2	低合金鋼鐵<24HRC Low-alloyed Steel	700-1000	210-300	0.052~0.056	0.083~0.09	0.11~0.125	0.14~0.15	0.17~0.19	0.20~0.23	0.24~0.26	0.27~0.3	0.32~0.35	0.36~0.39	0.42~0.46	0.46~0.5
	GR.3	高合金鋼鐵<30HRC Hi-alloyed Stee	＞1000	＞300	0.034~0.044	0.055~0.07	0.078~0.1	0.09~0.12	0.12~0.15	0.14~0.18	0.16~0.20	0.18~0.23	0.21~0.27	0.24~0.31	0.28~0.36	0.30~0.39
H	GR.4	硬化鋼 30~38HRC Hardened Steel			0.034~0.044	0.055~0.07	0.078~0.1	0.09~0.12	0.12~0.15	0.14~0.18	0.16~0.20	0.18~0.23	0.21~0.27	0.24~0.31	0.28~0.36	0.30~0.39
	GR.5	硬化鋼 38~48HRC Hardened Steel			0.025	0.04	0.056	0.067	0.084	0.101	0.116	0.133	0.153	0.176	0.203	0.223
	GR.6	硬化鋼 48~56HRC Hardened Steel			0.015	0.024	0.034	0.04	0.05	0.06	0.07	0.08	0.092	0.106	0.122	0.134
	GR.7	硬化鋼 56~68HRC Hardened Steel														
M	GR.8	不銹鋼 Stainless Steel	500~950	250~320	0.03~0.045	0.05~0.07	0.07~0.1	0.08~0.12	0.10~0.15	0.12~0.18	0.14~0.20	0.16~0.23	0.19~0.27	0.22~0.31	0.25~0.36	0.27~0.39
K	GR.9	鑄鐵 Cast Iron		180-280	0.053~0.066	0.085~0.105	0.11~0.15	0.14~0.17	0.17~0.22	0.21~0.26	0.24~0.3	0.28~0.35	0.32~0.4	0.37~0.46	0.43~0.53	0.47~0.58
N	GR.10	鋁 Aluminium		Si 0.5~12%	0.06~0.085	0.095~0.135	0.13~0.19	0.16~0.23	0.2~0.285	0.24~0.34	0.275~0.39	0.32~0.45	0.36~0.52	0.42~0.6	0.48~0.68	0.53~0.73
	GR.11	銅 Copper		180=250	0.047~0.069	0.075~0.11	0.105~0.155	0.125~0.185	0.16~0.23	0.19~0.28	0.22~0.32	0.25~0.37	0.29~0.42	0.33~0.485	0.38~0.56	0.42~0.62
	GR.12	塑膠 Plastics			0.047	0.075	0.105	0.125	0.16	0.19	0.22	0.25	0.285	0.33	0.38	0.42
	GR.13	複合材料 FRP CFRP Composite Material			0.047	0.075	0.105	0.125	0.16	0.19	0.22	0.25	0.285	0.33	0.38	0.42
	GR.14	石墨 Graphite														
S	GR.15	鈦合金 Titanium	700~1250	210~370	0.019~0.028	0.03~0.045	0.042~0.063	0.05~0.076	0.063~0.095	0.076~0.113	0.09~0.13	0.1~0.15	0.115~0.17	0.13~0.2	0.15~0.23	0.167~0.25
	GR.16	鎳 Nickel	900~1200	260~350	0.019~0.028	0.03~0.045	0.042~0.063	0.05~0.076	0.063~0.095	0.075~0.115	0.09~0.13	0.1~0.15	0.115~0.175	0.13~0.2	0.15~0.23	0.17~0.25
	GR.17	耐熱鋼 Heat-resistant Steel	900-1400	210-400	0.031~0.044	0.05~0.07	0.07~0.01	0.085~0.12	0.105~0.15	0.125~0.18	0.145~0.2	0.167~0.235	0.19~0.27	0.22~0.31	0.25~0.355	0.28~0.39

硬度換算表　Hardness Conversion Table　硬度变换表

HRC	HB	HV10	N/mm²		HRC	HB	HV10	N/mm²
	71	75	240		28	273	287	920
	76	80	255		29	278	293	940
	81	85	270		30	287	302	970
	86	90	285		31	295	310	995
	90	95	305		32	301	317	1020
	95	100	320		33	311	327	1050
	100	105	335		34	319	336	1080
	105	110	350		35	328	345	1110
	109	115	370		36	337	355	1140
	114	120	385		37	346	364	1170
	119	125	400		38	354	373	1200
	124	130	415		39	363	382	1230
	128	135	430		40	372	392	1260
	133	140	450		41	383	403	1300
	138	145	465		42	393	413	1330
	143	150	480		43	402	423	1360
	147	155	495		44	413	434	1400
	152	160	510		45	424	446	1440
	157	165	530		46	435	458	1480
	162	170	545		47	449	473	1530
	166	175	560		48	460	484	1570
	171	180	575		49	472	497	1620
	176	185	595		50	488	514	1680
	181	190	610		51	501	527	1730
	185	195	625		52	517	544	1790
	190	200	640		53	532	560	1845
	195	205	660		54	549	578	1910
	199	210	675		55	567	596	1980
	204	215	690		56	584	615	2050
	209	220	705		57	607	639	2140
	214	225	720		58	622	655	
	219	230	740		59		675	
	223	235	755		60		698	
	228	240	770		61		720	
	233	245	785		62		745	
22	238	250	800		63		773	
23	242	255	820		64		800	
24	247	260	835		65		829	
25	255	268	860		66		864	
26	258	272	870		67		900	
27	266	280	900		68		940	

Metric MM

MM

$$Vc = \frac{\pi \times Dc \times N}{1000}$$

$$N = \frac{Vc \times 1000}{\pi \times Dc}$$

$$Vf = N \times Z \times fz$$

$$T = \frac{L}{Vf}$$

Vc=	切削速度 切削速度 Cutting Speed	m/min
Dc=	切削直徑 外径 Cutter Diameter	mm
N =	回轉速度 回転速度 RPM	rev/min
Vf=	每分鐘進給 送り速度 Feed Speed	mm/min
fz =	每刃進給 一刃送り量(mm/刃) Feed Per Tooth	mm/tooth
fn =	每轉進給 送り(mm/rev) Feed Per Revolution	mm/rev
Z =	刃數 刃数 Number of Flutes	Z
T =	切削時間 切削時間 Time of Cut In Minutes	mm
L =	切削長度 切削長さ Cut Length	mm
Ap=	軸向切削深度 軸方向切削深さ Axial depth of cut	mm
Ae=	切削寬度 切削幅 Radial depth of cut	mm

English INCH

INCH

$$Vc = \frac{\pi \times Dc \times N}{12}$$

$$N = \frac{Vc \times 12}{\pi \times Dc}$$

$$Vf = N \times Z \times fz$$

$$T = \frac{L}{Vf}$$

Vc=	切削速度 切削速度 Cutting Speed	inch/min
Dc=	切削直徑 外径 Cutter Diameter	inch
N =	回轉速度 回転速度 RPM	rev/min
Vf=	每分鐘進給 送り速度 Feed Speed	inch/min
fz =	每刃進給 一刃送り量(inch/刃) Feed Per Tooth	inch/tooth
fn =	每轉進給 送り(inch/rev) Feed Per Revolution	inch/rev
Z =	刃數 刃数 Number of Flutes	Z
T =	切削時間 切削時間 Time of Cut In Minutes	inch
L =	切削長度 切削長さ Cut Length	inch
Ap=	軸向切削深度 軸方向切削深さ Axial depth of cut	inch
Ae=	切削寬度 切削幅 Radial depth of cut	inch

RPM換算表 **RPM Conversion Table** RPM变换表

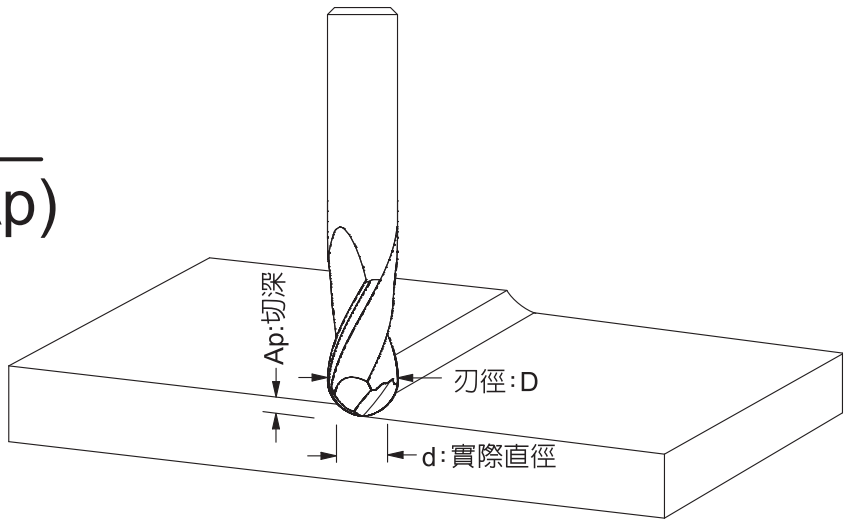
刃徑 Dia	VC 切削速度 m/min cutting speed															
D	20	30	40	50	60	70	80	90	100	120	140	150	180	200	250	300
0.2	31850	47770	63690	79620	95540	111460	127390	143310	159240	191080	222930	238850	286620	318470	398090	477710
0.3	21230	31850	42460	53080	63690	74310	84930	95540	106160	127390	148620	159240	191080	212310	265390	318470
0.4	15920	23890	31850	39810	47770	55730	63690	71660	79620	95540	111460	119430	143310	159240	199040	238850
0.5	12740	19110	25480	31850	38220	44590	50960	57320	63690	76430	89170	95540	114650	127390	159240	191080
0.6	10620	15920	21230	26540	31850	37150	42460	47770	53080	63690	74310	79620	95540	106160	132700	159240
0.7	9100	13650	18200	22750	27300	31850	36400	40950	45500	54600	63690	68240	81890	90990	113740	136490
0.8	7960	11940	15920	19900	23890	27870	31850	35830	39810	47770	55730	59710	71660	79620	99520	119430
0.9	7080	10620	14150	17690	21230	24770	28310	31850	35390	42460	49540	53080	63690	70770	88460	106160
1.0	6370	9550	12740	15920	19110	22290	25480	28660	31850	38220	44590	47770	57320	63690	79620	95540
1.2	5310	7960	10620	13270	15920	18580	21230	23890	26540	31850	37150	39810	47770	53080	66350	79620
1.5	4250	6370	8490	10620	12740	14860	16990	19110	21230	25480	29720	31850	38220	42460	53080	63690
1.8	3540	5310	7080	8850	10620	12380	14150	15920	17690	21230	24770	26540	31850	35390	44230	53080
2.0	3180	4780	6370	7960	9550	11150	12740	14330	15920	19110	22290	23890	28660	31850	39810	47770
2.2	2900	4340	5790	7240	8690	10130	11580	13030	14480	17370	20270	21710	26060	28950	36190	43430
2.5	2550	3820	5100	6370	7640	8920	10190	11460	12740	15290	17830	19110	22930	25480	31850	38220
2.8	2270	3410	4550	5690	6820	7960	9100	10240	11370	13650	15920	17060	20470	22750	28430	34120
3.0	2120	3180	4250	5310	6370	7430	8490	9550	10620	12740	14860	15920	19110	21230	26540	31850
3.5	1820	2730	3640	4550	5460	6370	7280	8190	9100	10920	12740	13650	16380	18200	22750	27300
4.0	1590	2390	3180	3980	4780	5570	6370	7170	7960	9550	11150	11940	14330	15920	19900	23890
4.5	1420	2120	2830	3540	4250	4950	5660	6370	7080	8490	9910	10620	12740	14150	17690	21230
5.0	1270	1910	2550	3180	3820	4460	5100	5730	6370	7640	8920	9550	11460	12740	15920	19110
5.5	1160	1740	2320	2900	3470	4050	4630	5210	5790	6950	8110	8690	10420	11580	14480	17370
6.0	1060	1590	2120	2650	3180	3720	4250	4780	5310	6370	7430	7960	9550	10620	13270	15920
6.5	980	1470	1960	2450	2940	3430	3920	4410	4900	5880	6860	7350	8820	9800	12250	14700
7.0	910	1360	1820	2270	2730	3180	3640	4090	4550	5460	6370	6820	8190	9100	11370	13650
7.5	850	1270	1700	2120	2550	2970	3400	3820	4250	5100	5940	6370	7640	8490	10620	12740
8.0	800	1190	1590	1990	2390	2790	3180	3580	3980	4780	5570	5970	7170	7960	9950	11940
8.5	750	1120	1500	1870	2250	2620	3000	3370	3750	4500	5250	5620	6740	7490	9370	11240
9.0	710	1060	1420	1770	2120	2480	2830	3180	3540	4250	4950	5310	6370	7080	8850	10620
9.5	670	1010	1340	1680	2010	2350	2680	3020	3350	4020	4690	5030	6030	6700	8380	10060
10	640	960	1270	1590	1910	2230	2550	2870	3180	3820	4460	4780	5730	6370	7960	9550
11	580	870	1160	1450	1740	2030	2320	2610	2900	3470	4050	4340	5210	5790	7240	8690
12	530	800	1060	1330	1590	1860	2120	2390	2650	3180	3720	3980	4780	5310	6630	7960
13	490	730	980	1220	1470	1710	1960	2200	2450	2940	3430	3670	4410	4900	6120	7350
14	450	680	910	1140	1360	1590	1820	2050	2270	2730	3180	3410	4090	4550	5690	6820
15	420	640	850	1060	1270	1490	1700	1910	2120	2550	2970	3180	3820	4250	5310	6370
16	400	600	800	1000	1190	1390	1590	1790	1990	2390	2790	2990	3580	3980	4980	5970
17	370	560	750	940	1120	1310	1500	1690	1870	2250	2620	2810	3370	3750	4680	5620
18	350	530	710	880	1060	1240	1420	1590	1770	2120	2480	2650	3180	3540	4420	5310
19	340	500	670	840	1010	1170	1340	1510	1680	2010	2350	2510	3020	3350	4190	5030
20	320	480	640	800	960	1110	1270	1430	1590	1910	2230	2390	2870	3180	3980	4780
21	300	450	610	760	910	1060	1210	1360	1520	1820	2120	2270	2730	3030	3790	4550
22	290	430	580	720	870	1010	1160	1300	1450	1740	2030	2170	2610	2900	3620	4340
23	280	420	550	690	830	970	1110	1250	1380	1660	1940	2080	2490	2770	3460	4150
24	270	400	530	660	800	930	1060	1190	1330	1590	1860	1990	2390	2650	3320	3980
25	250	380	510	640	760	890	1020	1150	1270	1530	1780	1910	2290	2550	3180	3820
26	240	370	490	610	730	860	980	1100	1220	1470	1710	1840	2200	2450	3060	3670
27	240	350	470	590	710	830	940	1060	1180	1420	1650	1770	2120	2360	2950	3540
28	230	340	450	570	680	800	910	1020	1140	1360	1590	1710	2050	2270	2840	3410
29	220	330	440	550	660	770	880	990	1100	1320	1540	1650	1980	2200	2750	3290
30	210	320	420	530	640	740	850	960	1060	1270	1490	1590	1910	2120	2650	3180
31	210	310	410	510	620	720	820	920	1030	1230	1440	1540	1850	2050	2570	3080
32	200	300	400	500	600	700	800	900	1000	1190	1390	1490	1790	1990	2490	2990

圓頭銑刀實際加工直徑計算表　Ball End Milling Actual Diameter　ボールエンドミル実際の加工径の計算表

圓頭 R	刃徑 D	軸向切削深度 Axial Depth of Cut (Ap) 軸方向切削深さ mm														
Radius	Dia	0.01	0.02	0.03	0.04	0.05	0.08	0.1	0.15	0.2	0.3	0.5	0.8	1	2	3
0.1R	0.2	0.087	0.12	0.143	0.16	0.173	0.196	0.2								
0.2R	0.4	0.125	0.174	0.211	0.24	0.265	0.32	0.35	0.39	0.4						
0.3R	0.6	0.154	0.215	0.262	0.299	0.332	0.41	0.45	0.52	0.57	0.6					
0.4R	0.8	0.178	0.25	0.304	0.349	0.387	0.48	0.53	0.62	0.69	0.77					
0.5R	1	0.199	0.28	0.341	0.392	0.436	0.54	0.6	0.71	0.8	0.92	1				
1R	2	0.282	0.398	0.486	0.56	0.624	0.78	0.87	1.05	1.2	1.43	1.73	1.96	2		
1.5R	3	0.346	0.488	0.597	0.688	0.768	0.97	1.08	1.31	1.5	1.8	2.24	2.65	2.83		
2R	4	0.399	0.564	0.69	0.796	0.889	1.12	1.25	1.52	1.74	2.11	2.65	3.2	3.46	4	
2.5R	5	0.447	0.631	0.722	0.891	0.995	1.25	1.4	1.71	1.96	2.37	3	3.67	4	4.9	
3R	6	0.489	0.692	0.846	0.977	1.091	1.38	1.54	1.87	2.15	2.62	3.32	4.08	4.47	5.66	6
4R	8	0.565	0.799	0.978	1.129	1.261	1.59	1.78	2.17	2.5	3.04	3.87	4.8	5.29	6.93	7.75
5R	10	0.632	0.894	1.094	1.262	1.411	1.78	1.99	2.43	2.8	3.41	4.36	5.43	6	8	9.17
6R	12	0.693	0.979	1.198	1.383	1.546	1.95	2.18	2.67	3.07	3.75	4.8	5.99	6.63	8.94	10.39
7R	14	0.748	1.058	1.295	1.495	1.67	2.11	2.36	2.88	3.32	4.05	5.2	6.5	7.21	9.8	11.49
8R	16	0.8	1.131	1.384	1.598	1.786	2.26	2.52	3.08	3.56	4.34	5.57	6.97	7.75	10.58	12.49
9R	18	0.848	1.199	1.468	1.695	1.895	2.39	2.68	3.27	3.77	4.61	5.92	7.42	8.25	11.31	13.42
10R	20	0.894	1.264	1.548	1.787	1.997	2.52	2.82	3.45	3.98	4.86	6.24	7.84	8.72	12	14.28

圓頭立銑刀實際直徑計算公式　Calculation of Actual Diameter

$$d=2\sqrt{Ap(D-Ap)}$$



Data

簡介表　Guide Lines　選定基準

刀具原料　Tool Materia　工具母材

MG Carbide
超微粒
Micro Grain
超硬

UMG Carbide
極超微粒
Ultra Micro Grain
極超硬

塗層種類　Coating Type　コーテイングタイプ

TiAlN F-NaNo
高抗熱性、高抗氧化性、奈米結構潤滑性佳
適用任何材料及鋼鐵硬度＜48HRC
High heat resistance, high oxidation resistance, nanocomposite coating with lubrication property.
Suitable for any materail and steels < 48HRC.
高耐熱性、高耐酸化性、ナノ構造潤滑良いです
任意の材料と鋼＜ 48HRCに適して

TiAlN F-Top
高抗磨損、抗氧化性、隔熱性，刀口鈍化
適用任何鋼鐵的鑽孔加工
High wear resistance, high oxidation resistance, thermal insulation, edge passivation.
Suitable for drilling application in any kind of steels.
高耐磨耗、高耐酸化性、高熱絶縁、鈍化刃先
任意の鋼に掘削適用します

AlTiN X
非常高抗熱性，非常高抗氧化性
適用鋼鐵硬度＜52HRC
Very high heat resistance and oxidation resistance.
Suitable for steels < 52HRC.
非常の高耐熱性、非常の高抗は酸化します
鋼＜52HRCに適用します

AlTiCrN X
多層膜，更高的硬度，高抗氧化性、隔熱性
適用鋼鐵硬度＜56HRC
Multilayer, higher hardness, high oxidatino resistance, good thermal insulation.
Suitable for steels < 56HRC.
多層膜、もっと高い硬度、高耐酸化性、高熱絶縁
鋼＜56HRCに適用します

AlTiCrN HX
多層膜，更高的硬度，高抗氧化性、隔熱性
適用鋼鐵硬度＜56HRC
Multilayer, higher hardness, high oxidatino resistance, good thermal insulation.
Suitable for steels < 56HRC.
多層膜、もっと高い硬度、高耐酸化性、高熱絶縁
鋼＜56HRCに適用します

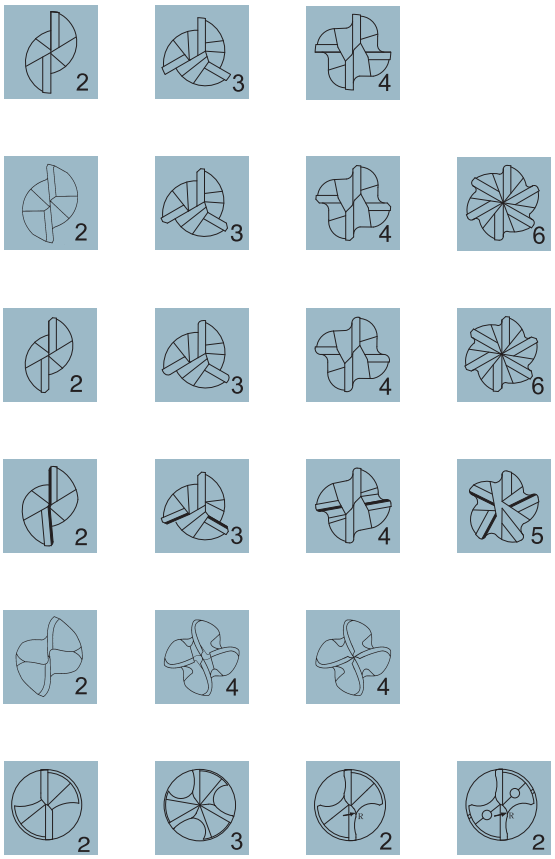
AlTiSiN GX
多層膜，更高的奈米硬度，非常高抗熱性、隔熱性，
適用高效率的加工條件及中高硬度合金鋼材＜68HRC
Multilayer, higher nanohardness, extremly high heat resistance, very good thermal insulation
Suitable for high performance machining condition and also for midhardness alloy steels < 68HRC.
多層膜、もっと高いナノ硬度、とても高い耐熱性、高熱絶縁
高い効率の加工の条件を適用できます
中高硬度の合金の鋼材＜68HRC適用します

one AlTiCrN SX
多層膜，更高的硬度，高抗氧化性、高抗磨損，
適用不鏽鋼材的加工
Multilayer, higher hardness, high oxidatino resistance、high wear resistance.
Suitable for machining stainless steels
多層膜、もっと高い硬度, 高耐酸化性、高耐磨耗
ステンレスの加工を適用できます

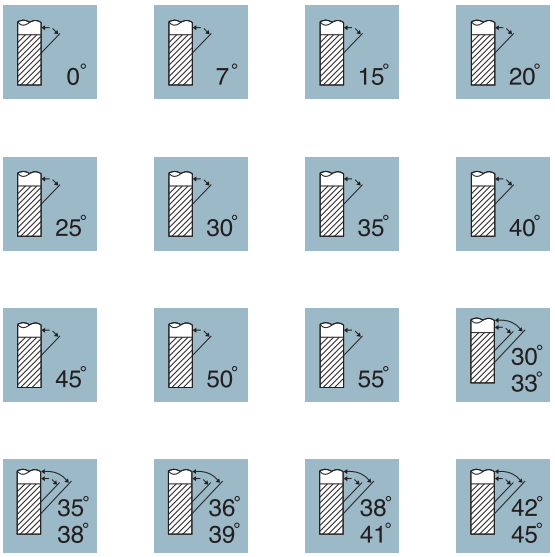
AlCrSiN TX
高塗層厚度的多層膜，非常高抗磨損，非常高抗熱性，
適用堅硬難切削的材料
Multilayer with high coating thickness , extremely high wear resistance、heat resistance.
Suitable for milling in heavily machinable materials
コーティング厚さの多層膜、とても高い耐磨耗、とても高い耐熱性
かたい切削材料を適用できます

Diamond Dc
極高硬度、化學穩定性
適用石墨加工
Extremely high hardness、good chemical stability.
Suitable for machining graphite.
非常に高硬度、良い化学的安定性
グラファイトの加工を適用できます

刀具刃數　Number of Flute　刃数



螺旋角　Helix Angle　ねじれ角



簡介表　Guide Lines　選定基準

傾斜角度　Relief　逃げ角

傾斜
Slant Relief
傾斜除去

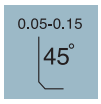
偏心傾斜
Eccentric Relief
偏心除去

大偏心傾斜
Big Eccentric Relief
大偏心除去

切削邊緣　Corner of Cutting Edges　刃先コーナー形状

直角
Sharp
刃先ピンカド

圓頭角
Ball Nose
ボール



45° 直角
Corner Edge 45°
コーナー45度

角度半徑
Corner Radius
コーナーR

長度系列　Series Length　全長・刃長 シリーズ

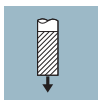
短系列
Stub Length
スタブシリーズ

標準長系列
Standard Length
レギュラーシリーズ

加長系列
Long Length
ロングシリーズ

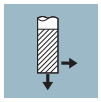
特長系列
Extra Long Length
エキストラロングシリーズ

銑削方向　Machining Direction　切削方向

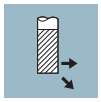


插削銑
Slotting
スロッター加工

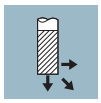
側銑
Side Milling
側面切削



側銑/插削銑
Side Milling / Slotting
側面切削/スロッター加工

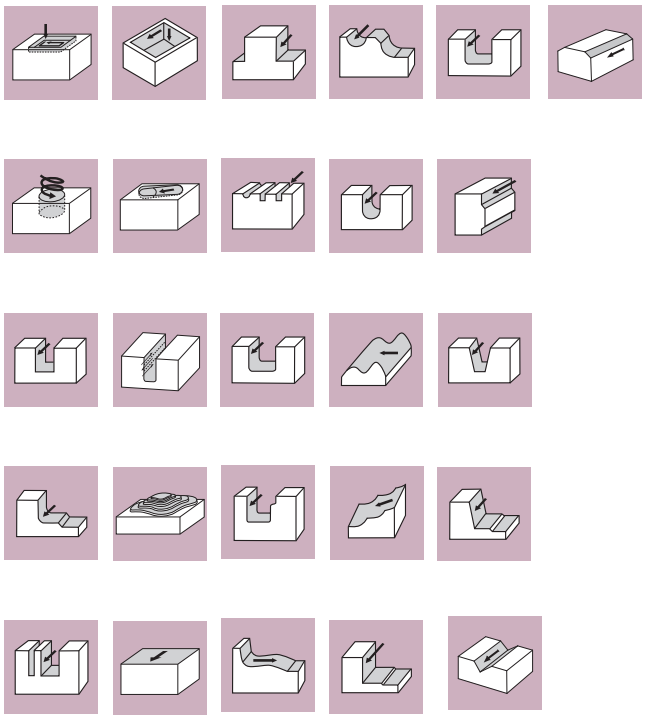


側銑/輪廓銑
Side Milling / Profile Milling
側面切削/輪郭加工



側銑/輪廓銑/插削銑
Side Milling / Profile Milling / Slotting
側面切削/輪郭加工/スロッター加工

機械加工方式　Type of Operation　機械加工方式



材料種類 Materials Groups 材料種類			塗層種類 Coating Type コーティングタイプ											
			TiAlN F-NaNo	TiAlN F-TOP	AlTiN X	AlTiCrN X	AlTiCrN HX	AlTiSiN GX	AlTiSiN NX	one AlTiCrN SX	AlCrSiN TX	CrN W	DLC AX	Diamond DC
P	GR.1	非合金鋼鐵 Non-alloyed steel	●	●	●	●	●	●	●					
P	GR.2	低合金鋼鐵<24HRC Low-alloyed Steel	●	●	●	●	●	●	●					
P	GR.3	高合金鋼鐵<30HRC Hi-alloyed Stee	●	●	●	●	●	●	●					
H	GR.4	硬化鋼 30~38HRC Hardened Steel	●	●	●	●	●	●	●					
H	GR.5	硬化鋼 38~48HRC Hardened Steel	●	●	●	●	●	●	●					
H	GR.6	硬化鋼 48~56HRC Hardened Steel		○	○	●	●	●	●					
H	GR.7	硬化鋼 56~68HRC Hardened Steel						●	●					
M	GR.8	不銹鋼 Stainless Steel	○	○	○	●	●	●	●	●	○			
K	GR.9	鑄鐵 Cast Iron	●	●	●	●	●	●	●					
N	GR.10	鋁 Aluminium	○	○	○	○	○	○	○				●	
N	GR.11	銅 Copper	○	○	○	○	○	○	○			●		
N	GR.12	塑膠 Plastics												
N	GR.13	複合材料 FRP CFRP Composite Material												
N	GR.14	石墨 Graphite												●
S	GR.15	鈦合金 Titanium				○	○	○	○	○	●			
S	GR.16	鎳 Nickel				○	○	○	○	○	●			
S	GR.17	耐熱鋼 Heat-resistant Steel				○	○	○	○	○	●			

立銑刀訂製品詢價單
Special End Mills Inquiry Form

客戶：
Customers

Date: 年/Y 月/M 日/D

電話：
Tel

傳真：
Fax

被削材：
material to be cut _____

硬度：
Hardened _____

聯絡人：
contatc

分機：
Ext

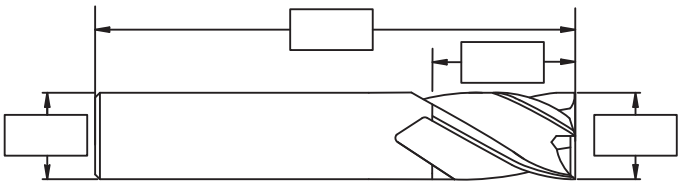
加工型式：
Works Type

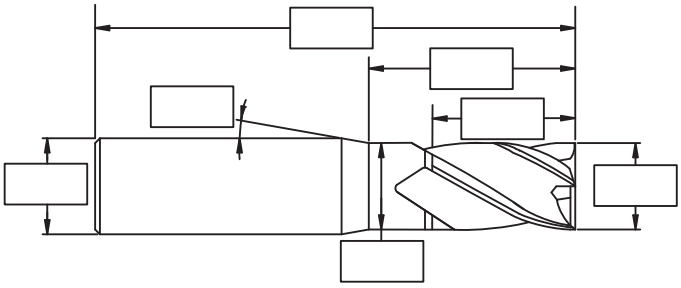
切深Ap: ☐ mm 切寬Ae: ☐ mm

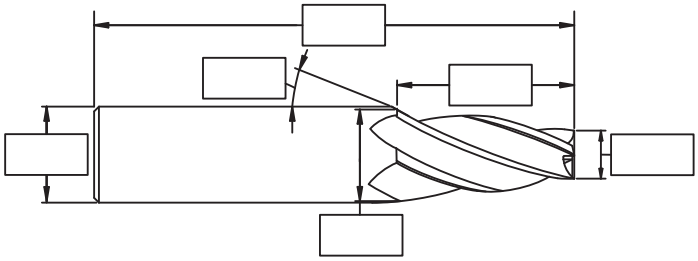
E-maill:

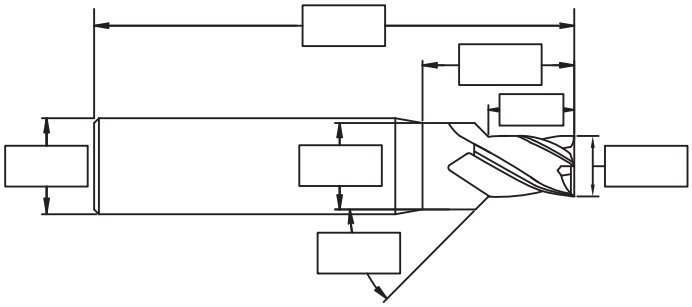
需求數：
Quantities,pcs _____

塗層：
conting ☐ 塗層 Coating ☐ 無塗層 Uncoating

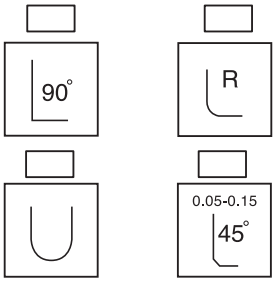




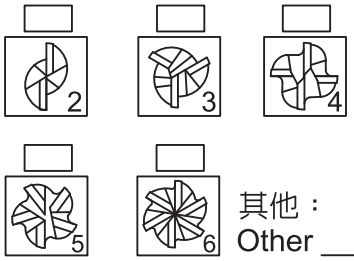




刀底型式：
corner of cutting angle

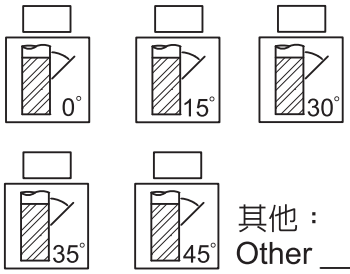


刃數：
teeth



其他：
Other _____

螺旋角：
Helix Angle



其他：
Other _____

備註：
Remarks

Data

鑽頭訂製品詢價單

Special Drills Inquiry Form

客戶：
Customers

電話：
Tel

傳真：
Fax

聯絡人：
contatc

分機：
Ext

E-maill:

Date: 年/Y 月/M 日/D

被削材：
material to be cut _____

硬度：
Hardened _____

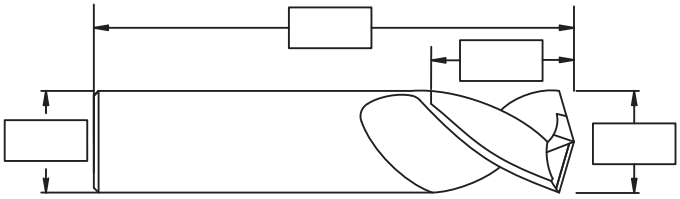
加工型式：
Works Type

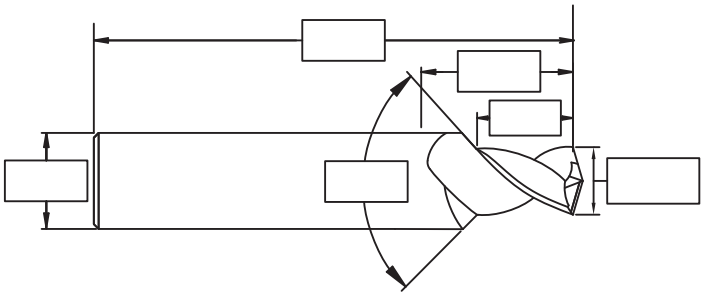
深度Dp: ☐ mm

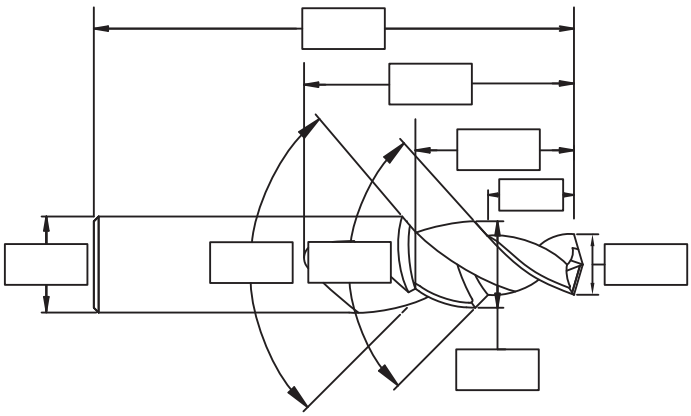
冷卻水孔
coolant holes: ☐ 有 yes ☐ 無 no

需求數：
Quantities,pcs _____

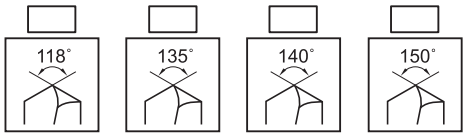
塗層：
conting ☐ 塗層 Coating ☐ 無塗層 Uncoating



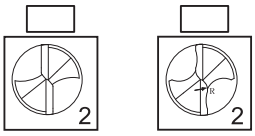




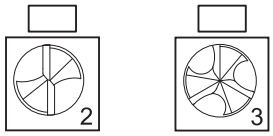
鑽尖：
Point Angle



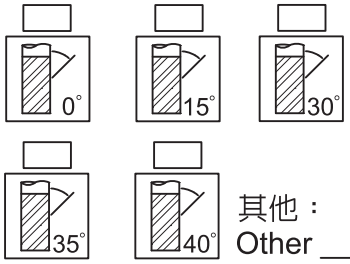
鑽尖型式：
Point Type



刃數：
teeth



螺旋角：
Helix Angle



其他：
Other _____

備註：
Remarks

鉸刀訂製品詢價單

Special Reamers Inquiry Form

客戶：
Customers

Date: 年/Y 月/M 日/D

電話：
Tel

傳真：
Fax

被削材：
material to be cut _____

硬度：
Hardened _____

聯絡人：
contatc

分機：
Ext

加工型式：
Works Type

深度Dp: ☐ mm

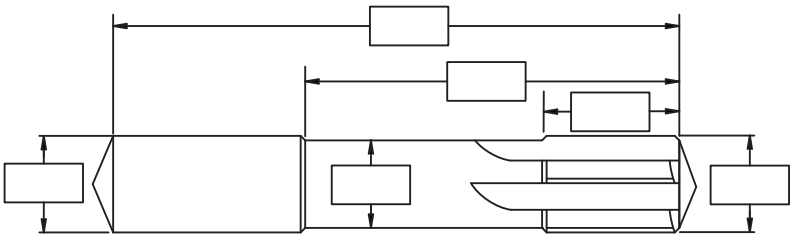
E-maill:

需求數：
Quantities,pcs _____

塗層：
conting

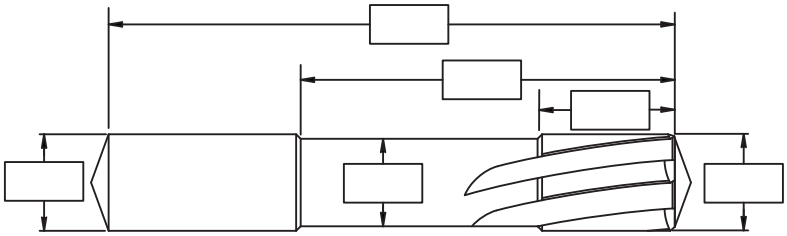
☐ 塗層
Coating

☐ 無塗層
Uncoating

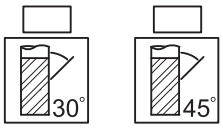


刃數：
teeth

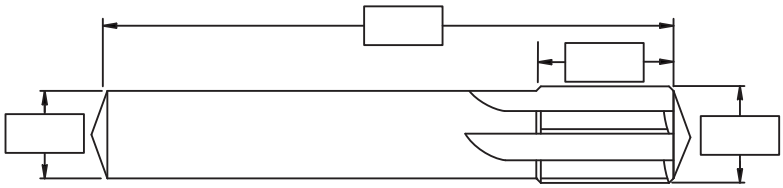
其他：
Other _____



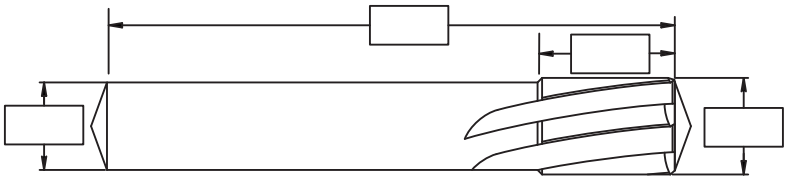
螺旋角：
Helix Angle



其他：
Other _____



備註：
Remarks



Data

7leaders™

The Art of Cutting

HPC / HSC 刀柄系列
HPC / HSC Holder System

HPC / HSC ホルダシリーズ

高速筒夾刀柄 **High Speed Collet Chuck** 高速回転コレットチャック	BT40		P183
強力筒夾刀柄 **Powergrip Collet Chuck** 強力コレットチャック	BT40		P184
高速筒夾刀柄 **High Speed Collet Chuck** 高速回転コレットチャック	HSK63A		P185
強力筒夾刀柄 **Powergrip Collet Chuck** 強力コレットチャック	HSK63A		P186
高速筒夾刀柄 **High Speed Collet Chuck** 高速回転コレットチャック	SK40		P187
強力筒夾刀柄 **Powergrip Collet Chuck** 強力コレットチャック	SK40		P188
強力熱縮刀柄 **Powergrip Shrink Chuck** 強力焼きばめチャック	BT40		P189
強力熱縮刀柄 **Powergrip Shrink Chuok** 強力焼きばめチャック	HSK63A SK40		P190

Holders

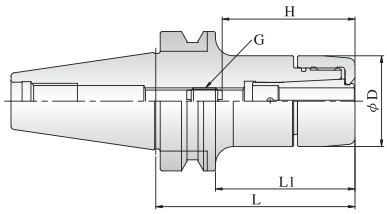
高速筒夾刀柄
High Speed Collet Chuck

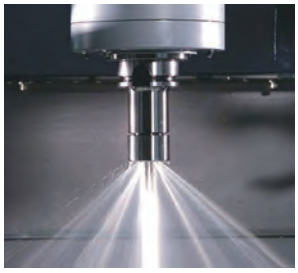
JIS B 6339 / BT40

高速回転コレットチャック

○HPC ●HSC

訂購編號 Code No.	L mm	L1 mm	D mm	G mm	H mm	筒夾 Collet	螺帽 Nut	板手 Spanner
BT30-HSC8-50AM	50	28	30	L-M10	32-46	HSC8	CN-HSC8AM	SP-SR30
BT30-HSC8-75AM	75	53	30	L-M10	32-64	HSC8	CN-HSC8AM	SP-SR30
BT40-HSC8-60AM	60	33	30	L-M10	32-70	HSC8	CN-HSC8AM	SP-SR30
BT40-HSC8-90AM	90	63	30	L-M10	32-70	HSC8	CN-HSC8AM	SP-SR30
BT40-HSC12-60AM	60	33	42	L-M12	40-70	HSC12	CN-HSC12AM	SP-SR42
BT40-HSC12-90AM	90	63	42	L-M12	40-80	HSC12	CN-HSC12AM	SP-SR42





- ☑跳動精度＜5μm (4×D)
- ☑刀柄精細動平衡。
- ☑最高轉速可達30,000RPM；G2.5
- ☑專門為銑刀設計的小角度筒夾，提高對銑刀的夾持力及吸震效果。
- ☑冷卻切削液可經由筒夾的溝槽噴出。

- ☑Runout accuracy < 5μm. (4 X D)
- ☑Chuck body fine balanced.
- ☑Highest Spindle speed: 30,000RPM ; G2.5
- ☑Collets specially designed for end mills. Collets with small angle enhance the stiffness rigidity and clamping force on end mills.
- ☑The coolant can spurt out from the collet slot.

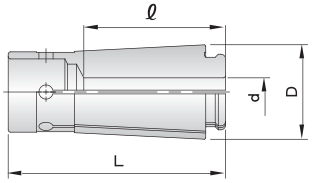
- ☑振れ精度＜5μm (4×D)
- ☑チャック精密動バランス
- ☑最高回転30,000RPMまで；G2.5可能
- ☑EM専用に設計された小径コレットにより、保持力と防振効果アップ
- ☑冷却液はコレットの隙間から噴射

筒夾
Collet

コレット

銑刀柄插入筒夾內長度需達"ℓ"長度以上，以發揮最佳效果。
When put end mill into collet must reach length "ℓ" to get best performance
最高効果の発揮ができるため、シャンク部はコレットに“ℓ”以上を挿し込まないといけません。

訂購編號 Code No.	d mm	ℓ mm	D mm	L mm
HSC8-03	3	15	15.6	35
04	4	20		
05	5	25		
06	6	25		
08	8	25		
HSC12-03	3	15	20	46
04	4	20		
05	5	25		
06	6	30		
08	8	34		
10	10	34		
12	12	34		



HSC 螺帽
HSC Nut

訂購編號 Code No.	外徑 Outside Dia
CN-HSC8AM	30
CN-HSC12AM	42

HSC 板手
HSC Spanner

訂購編號 Code No.	內徑 Interior Dia
SP-SR30	30
SP-SR42	42

強力筒夾刀柄
Powergrip Collet Chuck

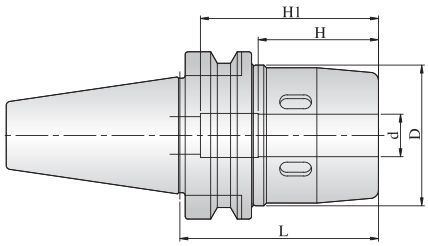
JIS B 6339 / BT40

強力コレットチャック

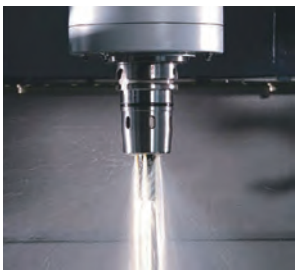
● HPC ○ HSC

訂購編號 Code No.	L mm	D mm	d mm	H mm	H1 mm	筒夾 Collet
BT40-HPC20-90	90	57	20	47	90	HPC20

注意：H = ø20最短銑刀柄長度
Remark：H = ø20min tool length



- ☑ 跳動精度＜5μm (4×D)
- ☑ 刀柄精細動平衡。
- ☑ 最高轉速可達30,000RPM ; G2.5
- ☑ 採用針狀軸承設計夾持力極佳。
- ☑ 冷卻切削液可經由筒夾的溝槽噴出。

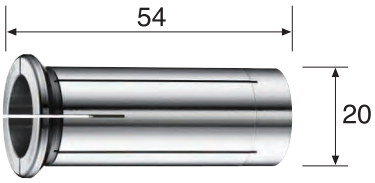


- ☑ Runout accuracy < 5μm. (4 X D)
- ☑ Chuck body fine balanced.
- ☑ Highest Spindle speed : 30,000RPM ; G2.5
- ☑ Design by needle roller bearing, it can bring powerful clamping force.
- ☑ The coolant can spurt out from the collet slot.

- ☑ 振れ精度＜5μm (4×D)
- ☑ チャック精密動バランス
- ☑ 最高回転30,000RPMまで；G2.5可能
- ☑ ピンベアリング採用により、保持力に優れています
- ☑ 冷却液はコレットの隙間から噴射

筒夾
Collet

コレット



訂購編號 Code No.	內徑 Ø d
HPC20-06	6
HPC20-08	8
HPC20-10	10
HPC20-12	12
HPC20-16	16

板手
Spanner

スパナ

訂購編號 Code No.	No. 30194-704

Holders

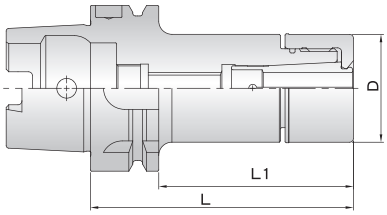
高速筒夾刀柄
High Speed Collet Chuck

DIN 69839-1 / HSK63A

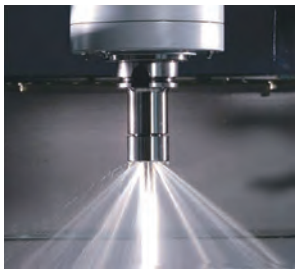
高速回転コレットチャック

○HPC ●HSC

訂購編號 Code No.	L mm	L1 mm	D mm	筒夾 Collet	螺帽 Nut	板手 Spanner
HSK63A-HSC8-75AM	75	49	30	HSC8	CN-HSC8AM	SP-SR30
HSK63A-HSC12-75AM	75	49	42	HSC12	CN-HSC12AM	SP-SR42
HSK63A-HSC12-100AM	100	74	42	HSC12	CN-HSC12AM	SP-SR42



- ☑ 跳動精度＜5μm (4×D)
- ☑ 刀柄精細動平衡。
- ☑ 最高轉速可達30,000RPM；G2.5
- ☑ 專門為銑刀設計的小角度筒夾，提高對銑刀的夾持力及吸震效果。
- ☑ 冷卻切削液可經由筒夾的溝槽噴出。



- ☑ Runout accuracy < 5μm. (4 X D)
- ☑ Chuck body fine balanced.
- ☑ Highest Spindle speed: 30,000RPM ; G2.5
- ☑ Collets specially designed for end mills. Collets with small angle enhance the stiffness rigidity and clamping force on end mills.
- ☑ The coolant can spurt out from the collet slot.

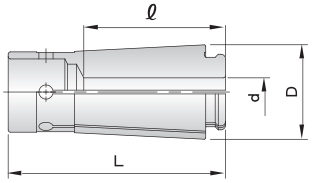
- ☑ 振れ精度＜5μm (4×D)
- ☑ チャック精密動バランス
- ☑ 最高回転30,000RPMまで；G2.5可能
- ☑ EM専用に設計された小径コレットにより、保持力と防振効果アップ
- ☑ 冷却液はコレットの隙間から噴射

筒夾
Collet

コレット

銑刀柄插入筒夾內長度需達"ℓ"長度以上，以發揮最佳效果。
When put end mill into collet must reach length "ℓ" to get best performance
最高効果の発揮ができるため、シャンク部はコレットに“ℓ”以上を挿し込まないといけません。

訂購編號 Code No.	d mm	ℓ mm	D mm	L mm
HSC8-03	3	15	15.6	35
04	4	20		
05	5	25		
06	6	25		
08	8	25		
HSC12-03	3	15	20	46
04	4	20		
05	5	25		
06	6	30		
08	8	34		
10	10	34		
12	12	34		



HSC 螺帽
HSC Nut

訂購編號 Code No.	外徑 Outside Dia
CN-HSC8AM	30
CN-HSC12AM	42

HSC 板手
HSC Spanner

訂購編號 Code No.	內徑 Interior Dia
SP-SR30	30
SP-SR42	42

強力筒夾刀柄
Powergrip Collet Chuck

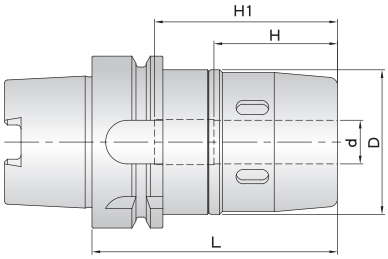
DIN 69839-1 / HSK63A

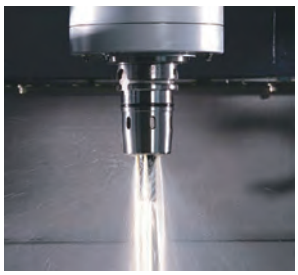
強力コレットチャック

● HPC ○ HSC

訂購編號 Code No.	L mm	D mm	d mm	H mm	H1 mm	筒夾 Collet
HSK63A-HPC20-105	105	57	20	47	75	HPC20

注意：H = ø20最短銑刀柄長度
Remark：H = ø20min tool length





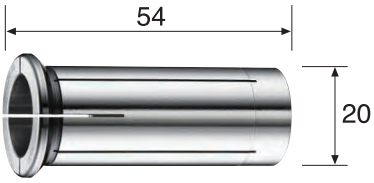
- ☑ 跳動精度＜5μm (4×D)
- ☑ 刀柄精細動平衡。
- ☑ 最高轉速可達30,000RPM ; G2.5
- ☑ 採用針狀軸承設計夾持力極佳。
- ☑ 冷卻切削液可經由筒夾的溝槽噴出。

- ☑ Runout accuracy < 5μm. (4 X D)
- ☑ Chuck body fine balanced.
- ☑ Highest Spindle speed : 30,000RPM ; G2.5
- ☑ Design by needle roller bearing, it can bring powerful clamping force.
- ☑ The coolant can spurt out from the collet slot.

- ☑ 振れ精度＜5μm (4×D)
- ☑ チャック精密動バランス
- ☑ 最高回転30,000RPMまで；G2.5可能
- ☑ ピンベアリング採用により、保持力に優れています
- ☑ 冷却液はコレットの隙間から噴射

筒夾
Collet

コレット



訂購編號 Code No.	內徑 Ø d
HPC20-06	6
HPC20-08	8
HPC20-10	10
HPC20-12	12
HPC20-16	16

板手
Spanner

スパナ

訂購編號 Code No.	No. 30194-704

Holders

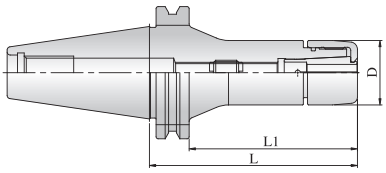
高速筒夾刀柄
High Speed Collet Chuck

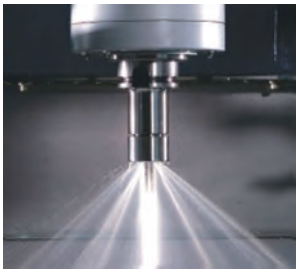
DIN 69871 / SK40

高速回転コレットチャック

○HPC ●HSC

訂購編號 Code No.	L mm	L1 mm	D mm	G mm	H mm	筒夾 Collet	螺帽 Nut	板手 Spanner
SK40-HSC8-63AM	63	44	30	L-M10	32-70	HSC8	CN-HSC8AM	SP-SR30
SK40-HSC12-100AM	100	81	42	L-M12	40-80	HSC12	CN-HSC12AM	SP-SR42





- ☑ 跳動精度＜5μm (4×D)
- ☑ 刀柄精細動平衡。
- ☑ 最高轉速可達20,000RPM；G2.5
- ☑ 專門為銑刀設計的小角度筒夾，提高對銑刀的夾持力及吸震效果。
- ☑ 冷卻切削液可經由筒夾的溝槽噴出。

- ☑ Runout accuracy < 5μm. (4 X D)
- ☑ Chuck body fine balanced.
- ☑ Highest Spindle speed: 20,000RPM ; G2.5
- ☑ Collets specially designed for end mills. Collets with small angle enhance the stiffness rigidity and clamping force on end mills.
- ☑ The coolant can spurt out from the collet slot.

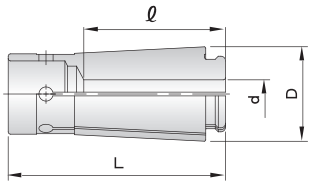
- ☑ 振れ精度＜5μm (4×D)
- ☑ チャック精密動バランス
- ☑ 最高回転20,000RPMまで；G2.5可能
- ☑ EM専用に設計された小径コレットにより、保持力と防振効果アップ
- ☑ 冷却液はコレットの隙間から噴射

筒夾
Collet

コレット

When put end mill into collet must reach length "ℓ" to get best performance
銑刀柄插入筒夾內長度需達"ℓ"長度以上，以發揮最佳效果。
最高効果の発揮ができるため、シャンク部はコレットに“ℓ”以上を挿し込まないといけません。

訂購編號 Code No.	d mm	ℓ mm	D mm	L mm
HSC8-03	3	15	15.6	35
04	4	20		
05	5	25		
06	6	25		
08	8	25		
HSC12-03	3	15	20	46
04	4	20		
05	5	25		
06	6	30		
08	8	34		
10	10	34		
12	12	34		



HSC 螺帽
HSC Nut

訂購編號 Code No.	外徑 Outside Dia
CN-HSC8AM	30
CN-HSC12AM	42

HSC 板手
HSC Spanner

訂購編號 Code No.	內徑 Interior Dia
SP-SR30	30
SP-SR42	42

強力筒夾刀柄
Powergrip Collet Chuck

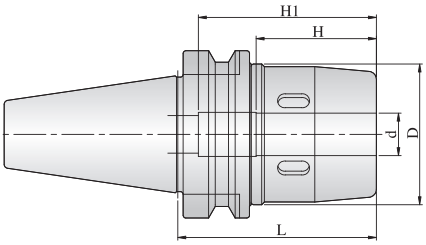
DIN 698371 / SK40

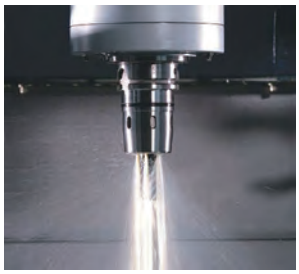
強力コレットチャック

● HPC ○ HSC

訂購編號 Code No.	L mm	D mm	d mm	H mm	H1 mm	筒夾 Coolet
SK40-HPC20-95	95	57	20	47	90	HPC20

注意：H = ø20最短銑刀柄長度
Remark：H = ø20min tool length





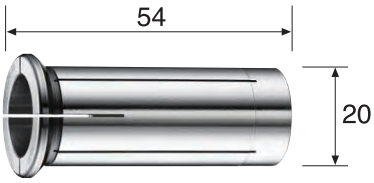
- ☑ 跳動精度＜5μm (4×D)
- ☑ 刀柄精細動平衡。
- ☑ 最高轉速可達20,000RPM ; G2.5
- ☑ 採用針狀軸承設計夾持力極佳。
- ☑ 冷卻切削液可經由筒夾的溝槽噴出。

- ☑ Runout accuracy < 5μm. (4 X D)
- ☑ Chuck body fine balanced.
- ☑ Highest Spindle speed : 20,000RPM ; G2.5
- ☑ Design by needle roller bearing, it can bring powerful clamping force.
- ☑ The coolant can spurt out from the collet slot.

- ☑ 振れ精度＜5μm (4×D)
- ☑ チャック精密動バランス
- ☑ 最高回転20,000RPMまで；G2.5可能
- ☑ ピンベアリング採用により、保持力に優れています
- ☑ 冷却液はコレットの隙間から噴射

筒夾
Collet

コレット



訂購編號 Code No.	內徑 Ø d
HPC20-06	6
HPC20-08	8
HPC20-10	10
HPC20-12	12
HPC20-16	16

板手
Spanner

スパナ

訂購編號 Code No.	No. 30194-704

Holders

強力熱縮刀柄

Powergrip Shrink Chuck

JIS B 6339 / BT40

強力焼きばめチャック

●HPC ●HSC

- ☑ 跳動精度＜3μm
- ☑ 刀柄精細動平衡。
- ☑ 最高轉速可達25,000RPM；G2.5
- ☑ 所有功能面全部加工。
- ☑ 高鋼性，高夾持力。
- ☑ 冷卻噴孔可被密封。

- ☑ Runout accuracy < 3μm.
- ☑ Chuck body fine balanced.
- ☑ Highest Spindle speed : 25,000RPM ; G2.5
- ☑ All functional surfaces machined.
- ☑ High rigidity, high clamping force.
- ☑ Cool Jet bores that can be sealed included.

- ☑ 振れ精度＜3μm
- ☑ チャック精密動バランス
- ☑ 最高回転25,000RPMまで；G2.5可能
- ☑ 全機能面加工可能
- ☑ 高鋼性、高保持力
- ☑ 冷却噴射穴は密封可能

- ☑ 跳動精度＜3μm
- ☑ 刀柄精細動平衡。
- ☑ 最高轉速可達25,000RPM；G2.5
- ☑ 所有功能面全部加工。
- ☑ 高鋼性，高夾持力。
- ☑ 兩種類型：標準長（壁厚3 mm）超長（壁厚1.5 mm）

- ☑ Runout accuracy < 3μm.
- ☑ Chuck body fine balanced.
- ☑ Highest Spindle speed : 25,000RPM ; G2.5
- ☑ All functional surfaces machined.
- ☑ High rigidity, high clamping force.
- ☑ 2 type: Standard (3 mm wall thickness) and extra slim (1.5 mm wall thickness)

- ☑ 振れ精度＜3μm
- ☑ チャック精密動バランス
- ☑ 最高回転25,000RPMまで；G2.5可能
- ☑ 全機能面加工可能
- ☑ 高鋼性、高保持力
- ☑ 二種類：標準長タイプ（壁肉厚3 mm）超ロングタイプ（壁肉厚1.5 mm）

■本熱縮刀柄由HAIMER提供，詳細尺寸依原廠目錄。 www.haimer.com

■The powergrip shrink chucks are supplied by HAIMER, for size specification please refer to www.haimer.com

強力熱縮刀柄
Powergrip Shrink Chuck

DIN 69893-1 / HSK63A

強力焼きばめチャック

●HPC ●HSC

- ☑ 跳動精度＜3μm
- ☑ 刀柄精細動平衡。
- ☑ 最高轉速可達25,000RPM；G2.5
- ☑ 所有功能面全部加工。
- ☑ 高鋼性，高夾持力。
- ☑ 冷卻噴孔可被密封。

- ☑ Runout accuracy < 3μm.
- ☑ Chuck body fine balanced.
- ☑ Highest Spindle speed : 25,000RPM ; G2.5
- ☑ All functional surfaces machined.
- ☑ High rigidity, high clamping force.
- ☑ Cool Jet bores that can be sealed included.

- ☑ 振れ精度＜3μm
- ☑ チャック精密動バランス
- ☑ 最高回転25,000RPMまで；G2.5可能
- ☑ 全機能面加工可能
- ☑ 高鋼性、高保持力
- ☑ 冷却噴射穴は密封可能

強力熱縮刀柄
Powergrip Shrink Chuck

DIN 69871 / SK40

強力焼きばめチャック

●HPC ●HSC

- ☑ 跳動精度＜3μm
- ☑ 刀柄精細動平衡。
- ☑ 最高轉速可達25,000RPM；G2.5
- ☑ 所有功能面全部加工。
- ☑ 高鋼性，高夾持力。
- ☑ 冷卻噴孔可被密封。

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- ☑ 振れ精度＜3μm
- ☑ チャック精密動バランス
- ☑ 最高回転25,000RPMまで；G2.5可能
- ☑ 全機能面加工可能
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7leaders™

The Art of Cutting

内容

Contents

内容

瑞士工廠風景

Factory overview

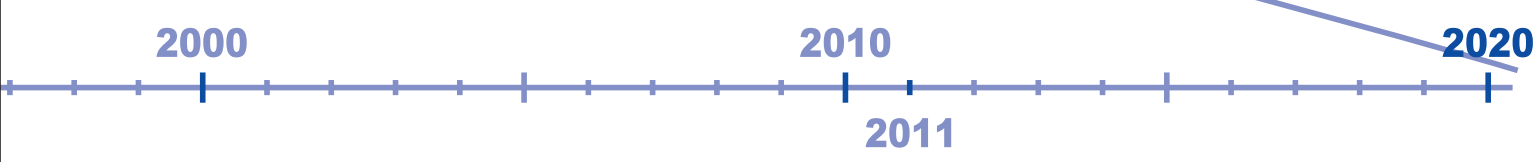
工場の概観

Extramet成立於1980年瑞士的Plaffeiem。七駿科技股份有限公司創立於1990年並開始與Extramet配合銷售碳化鎢鋼圓棒，並用 ETM 品牌行銷碳化鎢鋼圓棒。
我們提供各式高品質超微粒、極超微粒的鎢鋼圓棒、圓管及板條。七駿公司為台灣最主要碳化鎢鋼切削工具之供應商，在國內外市場占有一席之地。

Our History!

7-Leaders Corp., founded in 1990, and EXTREMET, founded in 1980 in Plaffeien, Switzerland, have been cooperating with each other since 1990. We offer Tungsten Carbide solid rods, Tungsten Carbide tubes, Tungsten Carbide rods with two parallel or twisted coolant holes, Tungsten Carbide squares and rectangular bars. 7-Leaders Corp. has successfully reached a leading position in Tungsten Carbide Rods Industry with its well-known stable quality in Taiwan.

1980年、スイスPlaffeiemに設立されたEXTRAMENT社と、1990年に設立された７-Leaders社は、1990年以来、互いに協力関係にあります。
高品質の超硬／極超硬丸棒、超硬円管（パイプ）や
超硬扁板を提供しております。
7Leaders社は、台湾で主要な超硬切削工具メーカーであるとともに、国内外の市場で確固たる地位を築いております。



服務系統

Service System

サービスシステム

服務系統！品質與信賴是我們與客戶往來時不可或缺的兩個要件，我們透過有經驗的服務人員提供協助以滿足客戶的需求。
持續性審慎評估我們的製程，結合我們的經驗與集中注意力在產品研發上，我們確保能提供最高品質的碳化鎢鋼產品。

Our Customer Services!

"Quality and Reliability" are two integral parts of our Company's basic policy. We take it as our serious responsibility that we thoroughly understand our customers' market and satisfy their needs. Our professionally well-trained employees are devoted to assisting all our customers, finding solutions for their specific requirements and problems that they encounter.

Continual assessment of our production process, coupled with our experience focusing on R&D, ensures that we are able to offer the highest standard of quality for our full range of Tungsten Carbide products.

顧客サービス！品質と信頼はわが社のスローガンである。我々はスペシャリストを通じてお客様のニーズを満たす努力をしている。
継続的且つ慎重に製作過程を評価し、尚且つ業界経験を活かし商品開発に専念することで、我々は最高品質の超硬製品をお客様に提供できると確信している。

R&D

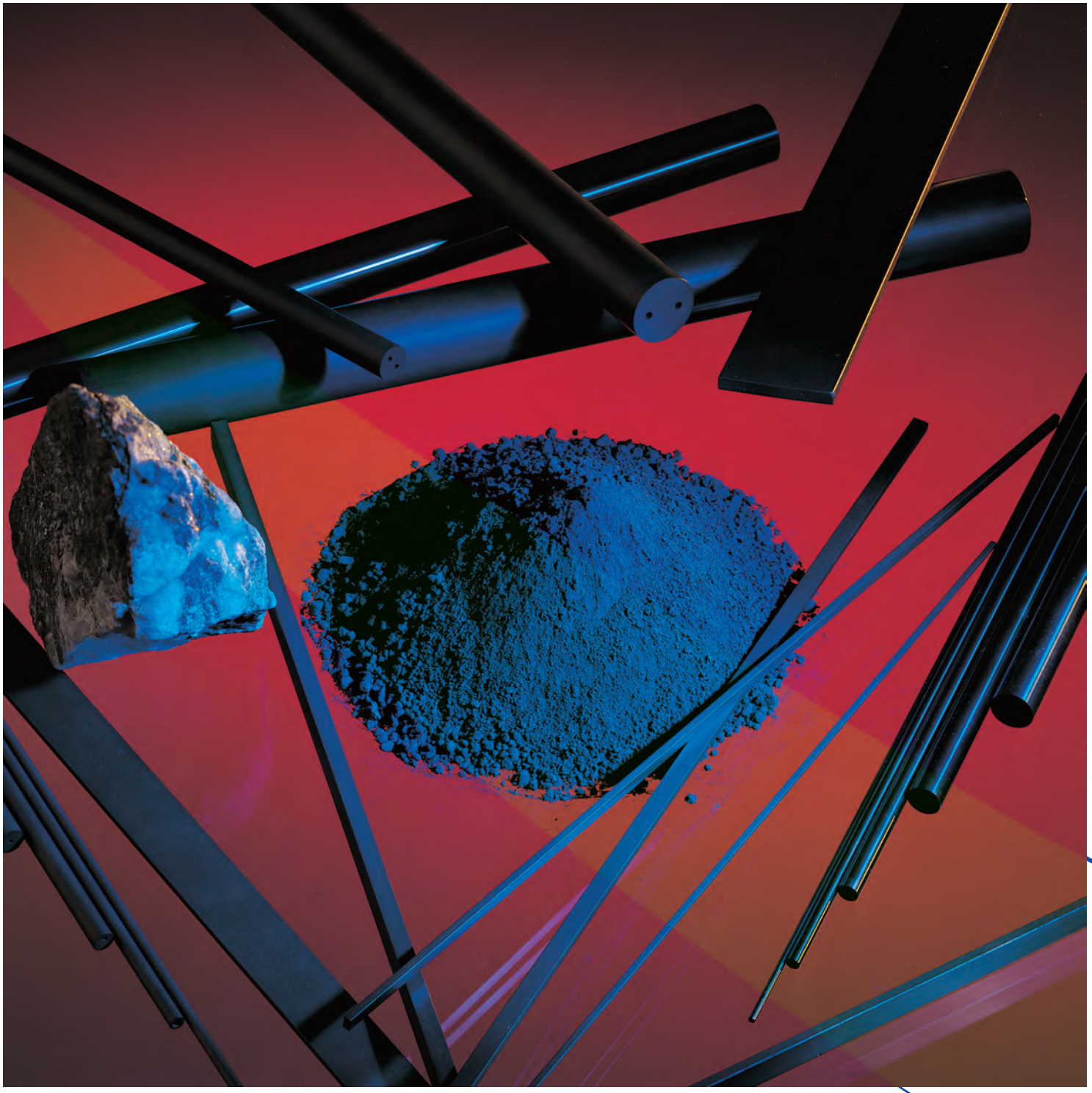
Extramet in Swiss

7-Leaders Corp. in Taiwan

我們的產品

Our products

弊社の商品



產品！這些年我們的產品線從鎢鋼圓棒擴及到完整的碳化鎢鋼產品。我們標準的產品系列包含：

- 碳化鎢鋼圓棒
- 碳化鎢鋼圓管
- 碳化鎢鋼雙排孔圓棒
- 碳化鎢鋼方形、長型板條
- 特殊規格訂製的碳化鎢鋼產品

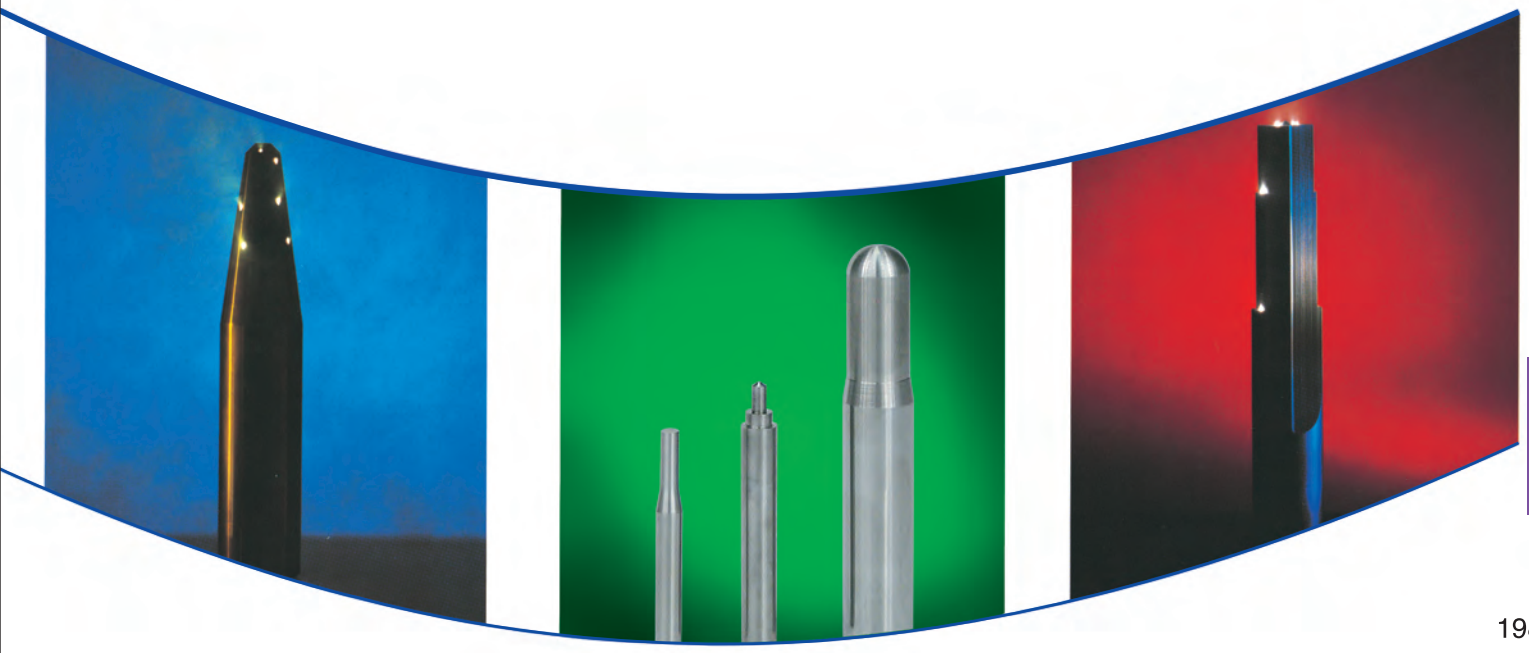
Our Products!

Through the years, our products line has evolved from solid carbide rods to a complete line of extruded tungsten carbide products. Our standard program now includes:

- Tungsten Carbide solid rods.
- Tungsten Carbide tubes.
- Tungsten Carbide rods with two parallel or twisted coolant holes.
- Tungsten Carbide squares and rectangular bars.
- Special Tungsten Carbide parts, manufactured to customer specification.

数年の年月を経て、超硬丸棒のラインナップから、様々な超硬材製品のラインナップを拡充しました。
現在の標準ラインナップ：

- 超硬丸棒
- 超硬円管（パイプ）
- 超硬丸棒（２オイルホール）
- 超硬扁板（正方形・長方形）
- 特殊規格超硬材商品



材質說明
Technical Instructions
材質の説明

材質 Grade	碳化鎢 Wc %	鈷 Co %	粒度 μm	密度 g/cm³	硬度 HV30 N/mm²	抗折力 TRS N/mm²	應用範圍 Application
M100	94	6	< 0.8	14.80	1790	> 3000	M100通用等級是最優質的高度抗磨損材料，供非鐵金屬、鋁、銅、瓷、塑膠、鑄鐵、低硬度鋼和強化纖維的材料。特別優良的適合性於鑽石塗層。
M210	90	10	< 0.8	14.45	1570	> 4000	M210次微米等級伴隨著優良的撞擊力和T.R.S.供非鐵金屬、中高硬度的合金鋼、鑄鐵、鋁合金和不銹鋼、鎳合金。主要的次微米等級廣泛的使用在旋轉的全碳化鎢刀具。
M212	88	12	< 0.6	14.10	1680	> 3600	M212是用超級細微的等級結合鈷含量12%，表現出高硬度和卓越的堅強度。特別適用於銑削，還有因為它的高度切削角穩定，非常適合鑽孔和銑削在高溫合金、不銹鋼和鈦合金，中高硬度的合金鋼。
M409	91	9	~1.2	14.49	1550	> 3500	M409搭配它的切割角度力量和抗磨損-結合它的抗溫性-這個等級主要是強調在研磨粗糙或是針對在很難加工材料的鑽孔用(例如：不銹鋼和非腐蝕性的鎳合金)
M412	88	12	~1.2	14.26	1440	> 4000	M412那卓越的橫切力搭配著高度破壞韌性，預先指定這個優良等級適用在很難加工的材料。高度的使用在重切削的粗銑使用。
M509	91	9	~1.2	14.50	1560	> 3500	M509這個碳化鎢等級，特別研發的合金內容物、完美的高度破壞韌性和切割角度力量。這是理想的適用於使用在沖模、衝壓在單調的、粉末壓縮的工具和車床心軸。
M512	88	12	~1.2	14.25	1440	> 4000	M512這個特殊的橫向的力量搭配著高度破壞韌性，預先指定這個優良等級適用在沖模、衝壓在鋼成型的工具。 特別的適用範圍包含由碳化鎢生產工具。
M609	91	9	< 0.4	14.40	1950	> 4000	M609卓越的超級細微等級供高效能的使用，是用頂級的鎢搭配細粒尺寸小於0.4μm以下，顯著的超越了任何碳化鎢等級的硬度。它的特色為高切割角度穩定性，維持高度抗磨損和相當的硬度。這個等級是使用在高度耐磨損的材質上，例如硬化鋼、高強度的鋁合金、石墨和新合成的材料上。
M610	90	10	< 0.5	14.40	1780	> 4000	M610是我們頂級碳化鎢供銑削硬材。因為含有10%的鈷含量和結合細粒0.5μm尺寸造就了高硬度和高抗磨的特性，特別開發為了立銑刀使用在表面硬度48-68HRC洛式硬度，因此被建議使用在切削高硬度的且經過鍛鍊的鋼材上、鑄件、鍛練過的合金鋼和工具鋼材上。
M612	88	12	< 0.5	14.10	1720	> 4200	M612是優質的銑刀等級的材料，含有12%的鈷含量代表了高度的堅韌性，一個好的碰撞強度和TRS是這個超級微粒等級的必要優勢。 可加工於高硬度的材質達到洛式硬度64HRC，模具製造和可切割堅固的鋼、鈦合金、高溫合金、不銹鋼和玻璃纖維強化的塑膠。

Grade	Wc %	Co %	Grain size µm	Density g/cm³	Hardness HV30 N/mm²	TRS N/mm²	Application
M100	94	6	< 0.8	14.80	1790	> 3000	M100 Universal grade for the machining of non-ferrous metals, aluminium, copper, porcelain, plastic, cast iron, steel of low hardness and fibre reinforced materials. High wear resistance, excellent suitability for diamond coating.
M210	90	10	< 0.8	14.45	1570	> 4000	M210 Submicron grade with a good impact strength and T.R.S. for the machining of non-ferrous metals, aluminium alloys, nickel alloys and stainless steel. Main submicron grade with broad applications for rotating, solid carbide tools.
M212	88	12	< 0.6	14.10	1680	> 3600	M212 is made of ultrafine tungsten carbide grade. In combination with a Cobalt content of 12%, high hardness and superior toughness are obtained. It is particularly suitable for milling and, due to its high cutting edge stability, well suited for drilling and milling applications in high temperature alloys, stainless steels, cast iron, titanium alloys.
M409	91	9	~1.2	14.49	1550	> 3500	M409 With its cutting edge strength and wear resistance – coupled with its temperature resistance – this grade is primarily aimed at mill roughing, or drilling of heavily machinable materials (example: stainless steel and non corrosive nickel-base alloys).
M412	88	12	~1.2	14.26	1440	> 4000	M412 The exceptional transverse strength paired with a high fracture toughness, predestines this fine grade for the application of heavily machinable materials. High usability in interrupted cutting applications.
M509	91	9	~1.2	14.50	1560	> 3500	M509 This carbide grade, with its specifically developed alloy content, optimises fracture toughness and cutting edge strength. It is ideally suited for applications like dies, punches for fine blanking, powder pressing tools and mandrels.
M512	88	12	~1.2	14.25	1440	> 4000	M512 The exceptional transverse strength paired with a high fracture toughness, predestines this fine grade for dies and punches for steel forming tools. Future applications could include the production of tools from carbide.
M609	91	9	< 0.4	14.40	1950	> 4000	M609 This outstanding ultrafine grade is for high-performance applications. This is made of superfine tungsten carbide with grain sizes smaller than 0.4µm, significantly surpassing the hardness of any other grades. This carbide grade features high cutting- edge stability while maintaining high wear resistance and considerable toughness. This grade is applied in highly wear-resistant materials, such as hardened steels, highstrength aluminium alloys, graphite, as well as new composite materials.
M610	90	10	< 0.5	14.40	1780	> 4000	M610 is our top carbide grade for milling hard materials. High hardness and wear resistance with sufficient toughness are achieved by combination of 10% Cobalt content and a grain size of 0.5µm. This grade was especially developed for end milling applications in materials covering hardness range 48-68 HRC and is recommended for milling in fully hardened and tempered steels, hard cast materials, tempered alloys and tool steels.
M612	88	12	< 0.5	14.10	1720	> 4200	M612 A Cobalt content of 12% is responsible for a high toughness. And a good impact strength and T.R.S. is the essential advantage of this ultrafine grade. For machining of materials hardened up to 64 HRC, mould constructions and machining of hardened steels, titanium alloys, high temperature alloys, stainless steels as well as glass-fiber reinforced plastics.

超硬／極超硬黑皮丸棒

幣別：新台幣NT.

Code No. RR-ØD×L Grade

ØDmm 直徑Tol	Lmm Tol ±5.0	材質/Grade M100	M210	M212	M609	M610	M612	M409	M412	M509	M512
1.2 -0.05/+0.15	330	●	●								
1.4 -0.05/+0.15	330	●	●								
1.6 -0.05/+0.15	330	●	●								
1.8 -0.05/+0.15	330	●	●								
2.0 -0.05/+0.15	330	●	●								
2.3 -0.05/+0.15	330	●	●								
2.5 -0.05/+0.15	330	●	●								
2.8 -0.05/+0.15	330	●	●								
3.3 -0.05/+0.15	330	●	●	●	●		●		●		●
3.5 -0.05/+0.15	330	●	●								
3.8 -0.05/+0.15	330	●	●								
4.3 -0.05/+0.15	330	●	●	●	●	●	●		●		●
4.8 -0.05/+0.15	330	●	●								
5.0 -0.05/+0.15	330	●	●								
5.3 -0.05/+0.15	330	●	●	●	●		●				
5.5 -0.05/+0.15	330	●	●								
5.8 -0.05/+0.15	330	●	●								
6.3 -0.05/+0.20	330	●	●	●	●	●	●	●	●	●	●
6.7 -0.05/+0.20	330	●	●								
7.3 -0.05/+0.20	330	●	●								
7.8 -0.05/+0.20	330	●	●								
8.3 -0.05/+0.20	330	●	●	●	●	●	●	●	●	●	●
8.8 -0.05/+0.20	330	●	●								
9.3 -0.05/+0.20	330	●	●								
9.8 -0.05/+0.20	330	●	●								
10.3 -0.05/+0.20	330	●	●	●	●	●	●	●	●	●	●
10.8 -0.05/+0.25	330	●	●								
11.3 -0.05/+0.25	330	●	●								
11.8 -0.05/+0.25	330	●	●								
12.3 -0.05/+0.25	330	●	●	●	●	●	●	●	●	●	●
12.8 -0.05/+0.25	330	●	●								
13.3 -0.05/+0.25	330	●	●								
13.8 -0.05/+0.25	330	●	●								
14.3 -0.05/+0.25	330	●	●	●	●		●	●		●	
14.8 -0.05/+0.25	330	●	●								
15.3 -0.05/+0.30	330	●	●								
15.8 -0.05/+0.30	330	●	●								
16.3 -0.05/+0.30	330	●	●	●	●	●	●	●	●	●	●
16.8 -0.05/+0.30	330	●	●								
17.3 -0.05/+0.30	330	●	●								
17.8 -0.05/+0.30	330	●	●								
18.3 -0.05/+0.30	330	●	●	●	●		●	●		●	
18.8 -0.05/+0.30	330	●	●								
19.3 -0.05/+0.30	330	●	●								
19.8 -0.05/+0.30	330	●	●								
20.3 -0.05/+0.30	330	●	●	●	●	●	●	●		●	
20.8 -0.05/+0.40	330	●	●								
21.3 -0.05/+0.40	330	●	●								
21.8 -0.05/+0.40	330	●	●								
22.3 -0.05/+0.40	330	●	●								
22.8 -0.05/+0.40	330	●	●								
23.3 -0.05/+0.40	330	●	●								
24.3 -0.05/+0.40	330	●	●								
25.3 -0.05/+0.40	330	●	●		●		●				
25.8 -0.05/+0.40	330	●	●								
26.3 -0.05/+0.40	330	●	●								
28.3 -0.05/+0.60	330	●	●								
30.3 -0.05/+0.60	330	●	●								
32.6 -0.05/+0.60	330	●	●								

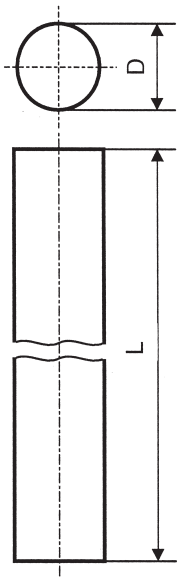
超微粒/極超微粒鎢鋼磨光圓棒

Tungsten Carbide Rods Ground

超硬／極超硬センタレス仕上げ丸棒

全長：100mm　　Code No. RRG-ØD×L Grade

ØDmm 直径Tol h6	Lmm Tol ±1.0	材質/Grade M100	M210	M612
1.0	100	●	●	
1.5	100	●	●	
2.0	100	●	●	
2.5	100	●	●	
3.0	100	●	●	●
4.0	100	●	●	●
5.0	100	●	●	●
6.0	100	●	●	●
8.0	100	●	●	●
10.0	100	●	●	●
12.0	100	●	●	●
16.0	100	●	●	●
20.0	100	●	●	●



全長：330mm　　Code No. RRG-ØD×L Grade

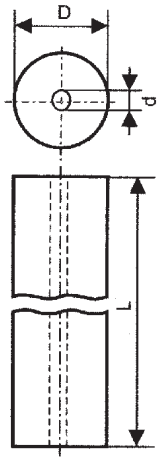
ØDmm 直径Tol h6	Lmm Tol ±5.0	材質/Grade M100	M210	M609	M612
1.0	330	●	●		
1.5	330	●	●		
2.0	330	●	●		
2.5	330	●	●		
3.0	330	●	●	●	●
4.0	330	●	●	●	●
5.0	330	●	●	●	●
6.0	330	●	●	●	●
7.0	330	●	●		
8.0	330	●	●	●	●
9.0	330	●	●		
10.0	330	●	●	●	●
12.0	330	●	●	●	●
14.0	330	●	●	●	●
16.0	330	●	●	●	●
18.0	330	●	●	●	●
20.0	330	●	●	●	●

超微粒鎢鋼黑皮圓管

Tungsten Carbide Tubes

超硬黒皮円管（パイプ）

Code No. RO-ØD×d×L Grade



ØDmm 直徑Tol	dmm Tol 0/-0.1	Lmm Tol ±5.0	材質/Grade M100	材質/Grade M210
2.3 -0.05/+0.15	0.2	330	●	●
2.3 -0.05/+0.15	0.8	330	●	●
3.3 -0.05/+0.15	0.2	330	●	●
3.3 -0.05/+0.15	0.3	330	●	●
3.3 -0.05/+0.15	0.4	330	●	●
3.3 -0.05/+0.15	0.6	330	●	●
3.3 -0.05/+0.15	0.8	330	●	●
3.3 -0.05/+0.15	1.0	330	●	●
4.3 -0.05/+0.15	0.2	330	●	●
4.3 -0.05/+0.15	0.3	330	●	●
4.3 -0.05/+0.15	0.4	330	●	●
4.3 -0.05/+0.15	0.6	330	●	●
4.3 -0.05/+0.15	0.8	330	●	●
4.3 -0.05/+0.15	1.0	330	●	●
5.3 -0.05/+0.15	1.0	330	●	●
6.3 -0.05/+0.20	0.3	330	●	●
6.3 -0.05/+0.20	0.4	330	●	●
6.3 -0.05/+0.20	0.6	330	●	●
6.3 -0.05/+0.20	0.8	330	●	●
6.3 -0.05/+0.20	1.0	330	●	●
6.3 -0.05/+0.20	1.5	330	●	●
6.3 -0.05/+0.20	2.0	330	●	●
7.3 -0.05/+0.20	1.5	330	●	●
8.3 -0.05/+0.20	1.0	330	●	●
8.3 -0.05/+0.20	1.5	330	●	●
8.3 -0.05/+0.20	2.0	330	●	●
10.3 -0.05/+0.20	1.0	330	●	●
10.3 -0.05/+0.20	1.5	330	●	●
10.3 -0.05/+0.20	2.0	330	●	●
12.3 -0.05/+0.25	1.5	330	●	●
12.3 -0.05/+0.25	2.0	330	●	●
12.3 -0.05/+0.25	2.5	330	●	●
12.3 -0.05/+0.25	3.0	330	●	●
13.3 -0.05/+0.25	2.0	330	●	●
13.3 -0.05/+0.25	2.5	330	●	●
14.3 -0.05/+0.25	2.0	330	●	●
14.3 -0.05/+0.25	2.5	330	●	●
15.3 -0.05/+0.30	2.8	330	●	●
16.3 -0.05/+0.30	2.0	330	●	●
16.3 -0.05/+0.30	3.0	330	●	●
20.3 -0.05/+0.30	2.0	330	●	●
20.3 -0.05/+0.30	3.5	330	●	●
25.3 -0.05/+0.40	5.0	330	●	●
32.6 -0.05/+0.60	5.0	330	●	●

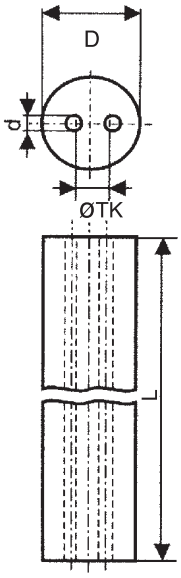
超微粒鎢鋼黑皮雙排孔圓棒

Tungsten Carbide Rods With Two Straight Coolant Holes

超硬黒皮丸棒（２オイルホール／ストレート）

Code No. RS-ØD×TK×d×L Grade

ØDmm 直徑Tol	TK mm	d mm	Lmm Tol ±5.0	材質/Grade M100
4.3 -0.05/+0.15	1.5	0.9	330	●
5.3 -0.05/+0.15	2.0	0.9	330	●
6.3 -0.05/+0.20	2.0	0.9	330	●
6.3 -0.05/+0.20	3.0	0.9	330	●
7.3 -0.05/+0.20	2.0	0.9	330	●
7.3 -0.05/+0.20	3.5	0.9	330	●
8.3 -0.05/+0.20	2.0	0.9	330	●
8.3 -0.05/+0.20	4.0	0.9	330	●
9.3 -0.05/+0.20	2.6	1.2	330	●
9.3 -0.05/+0.20	4.0	1.2	330	●
10.3 -0.05/+0.20	2.6	1.2	330	●
10.3 -0.05/+0.20	5.0	1.2	330	●
11.3 -0.05/+0.25	3.5	1.5	330	●
11.3 -0.05/+0.25	5.0	2.0	330	●
12.3 -0.05/+0.25	3.5	1.5	330	●
12.3 -0.05/+0.25	6.2	2.0	330	●
13.3 -0.05/+0.25	3.5	1.5	330	●
13.3 -0.05/+0.25	6.2	2.0	330	●
14.3 -0.05/+0.25	3.5	1.5	330	●
14.3 -0.05/+0.25	7.0	2.0	330	●
15.3 -0.05/+0.30	5.0	2.0	330	●
15.3 -0.05/+0.30	7.0	2.0	330	●
16.3 -0.05/+0.30	5.0	2.0	330	●
16.3 -0.05/+0.30	8.0	2.0	330	●
17.3 -0.05/+0.30	6.2	2.0	330	●
17.3 -0.05/+0.30	8.0	2.0	330	●
18.3 -0.05/+0.30	6.2	2.0	330	●
18.3 -0.05/+0.30	9.0	2.0	330	●
19.3 -0.05/+0.30	6.2	2.0	330	●
19.3 -0.05/+0.30	9.0	2.0	330	●
20.3 -0.05/+0.30	6.2	2.0	330	●
20.3 -0.05/+0.30	10.0	2.5	330	●
25.3 -0.05/+0.40	8.0	2.5	330	●
25.3 -0.05/+0.40	12.0	3.0	330	●



超微粒鎢鋼雙螺旋孔黑皮圓棒-30°螺旋

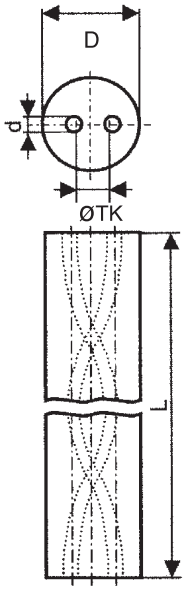
Tungsten Carbide Rods With Two Coolant Ducts Twisted - 30°

超硬黒皮丸棒（２オイルホール／30° ねじれ）

適用：直柄直身

Code No. RX-ØD×TK×d×L×Helix angle Grade

ØDmm 直徑Tol +0.5	ØTKmm Tol	Ødmm Tol	Pitch Tol ±0.5°	Helix angle of rods	Lmm Tol ±5.0	Cutter Dia of 30° Helix	材質/Grade M210
3.3	1.5	0.4	P16.32	30°	330	3	●
4.3	2.1	0.5	P21.77	30°	330	4	●
5.3	2.6	0.7	P27.21	30°	330	5	●
6.3	2.6	0.7	P32.65	30°	330	6	●
8.3	4.0	1.0	P43.53	30°	330	8	●
10.3	4.8	1.4	P54.41	30°	330	10	●
12.3	5.4	1.5	P65.30	30°	330	12	●
14.3	7.1	1.7	P76.18	30°	330	14	●
16.3	8.3	1.7	P87.06	30°	330	16	●
18.3	9.5	2.0	P97.95	30°	330	18	●
20.3	10.4	2.8	P108.83	30°	330	20	●



超微粒鎢鋼雙螺旋孔黑皮圓棒-30°/40°螺旋

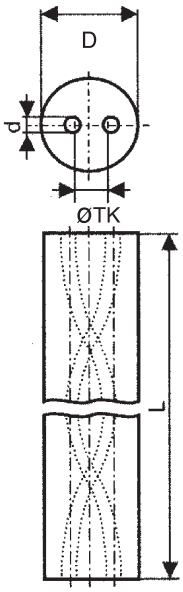
Tungsten Carbide Rods With Two Coolant Ducts Twisted - 30°/40°

超硬黒皮丸棒（２オイルホール／30° & 40° ねじれ）

適用：銑刀柄

Code No. RX-ØD×TK×d×L×Helix angle Grade

ØDmm 直徑Tol +0.5	ØTKmm Tol	Ødmm Tol	Pitch Tol ±0.5°	Helix angle of rods	Lmm Tol ±5.0	Shank h6	Cutter Dia of 30° Helix	材質/Grade M210
6.3	1.6	0.5	P18.00	40°	330	6	3-4	●
6.3	2.0	0.5	P22.46	40°	330	6	4-5	●
6.3	2.6	0.7	P32.65	30°	330	6	5-6	●
8.3	3.5	0.9	P35.00	40°	330	8	6-7	●
8.3	4.0	1.0	P43.53	30°	330	8	7-8	●
10.3	4.5	1.1	P46.00	40°	330	10	8-9	●
10.3	4.8	1.4	P54.41	30°	330	10	9-10	●
12.3	5.4	1.5	P65.30	30°	330	12	10-12	●
14.3	7.1	1.7	P76.18	30°	330	14	12-14	●
16.3	8.3	1.7	P87.06	30°	330	16	14-16	●
18.3	9.5	2.0	P97.95	30°	330	18	16-18	●
20.3	10.4	2.8	P108.83	30°	330	20	18-20	●



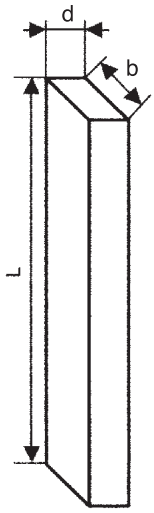
超微粒鎢鋼黑皮板條

Tungsten Carbide Strips

超硬黑皮扁板

Code No. RTS-d×b×L Grade

d mm Tol +0.2/+0.5	b mm Tol +0.2/+0.5	Lmm Tol ±5.0	材質/Grade	
			M100	M210
1.0	3.0	330	●	●
1.0	4.0	330	●	●
1.5	3.0	330	●	●
1.5	4.0	330	●	●
1.5	5.0	330	●	●
1.5	6.0	330	●	●
1.5	8.0	330	●	●
1.5	10.0	330	●	●
2.0	2.0	330	●	●
2.0	3.0	330	●	●
2.0	4.0	330	●	●
2.0	5.0	330	●	●
2.0	6.0	330	●	●
2.0	8.0	330	●	●
2.0	10.0	330	●	●
2.0	12.0	330	●	●
2.0	15.0	330	●	●
2.0	18.0	330	●	●
2.0	20.0	330	●	●
3.0	3.0	330	●	●
3.0	4.0	330	●	●
3.0	5.0	330	●	●
3.0	6.0	330	●	●
3.0	8.0	330	●	●
3.0	10.0	330	●	●
3.0	12.0	330	●	●
3.0	13.0	330	●	●
3.0	15.0	330	●	●
3.0	18.0	330	●	●
3.0	20.0	330	●	●
3.0	22.0	330	●	●
3.0	25.0	330	●	●
3.0	30.0	330	●	●
4.0	4.0	330	●	●
4.0	6.0	330	●	●
4.0	8.0	330	●	●
4.0	10.0	330	●	●
4.0	12.0	330	●	●
4.0	13.0	330	●	●
4.0	15.0	330	●	●
4.0	18.0	330	●	●
4.0	20.0	330	●	●
4.0	22.0	330	●	●
4.0	25.0	330	●	●
4.0	30.0	330	●	●
4.0	35.0	330	●	●



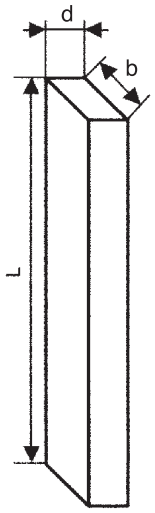
超微粒鎢鋼黑皮板條

Tungsten Carbide Strips

超硬黑皮扁板

Code No. RTS-d×b×L Grade

d mm Tol +0.2/+0.5	b mm Tol +0.2/+0.5	Lmm Tol ±5.0	材質/Grade	
			M100	M210
5.0	5.0	330	●	●
5.0	8.0	330	●	●
5.0	10.0	330	●	●
5.0	13.0	330	●	●
5.0	16.0	330	●	●
5.0	18.0	330	●	●
5.0	20.0	330	●	●
5.0	22.0	330	●	●
5.0	25.0	330	●	●
5.0	30.0	330	●	●
5.0	35.0	330	●	●
6.0	6.0	330	●	●
6.0	16.0	330	●	●
6.0	20.0	330	●	●
6.0	25.0	330	●	●
6.0	30.0	330	●	●
6.0	35.0	330	●	●
8.0	8.0	330	●	●
10.0	10.0	330	●	●
12.0	12.0	330	●	●

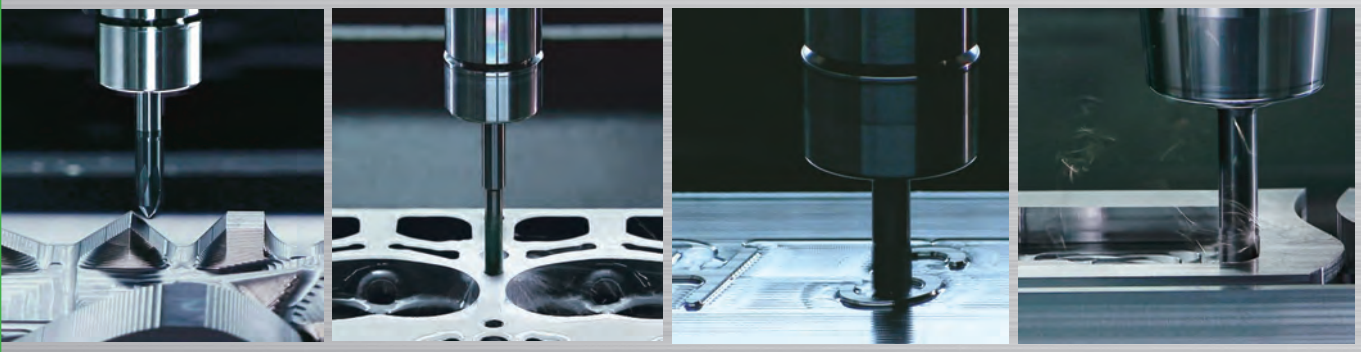


ISO公差測量表

ISO Tolerance measure table (μm)

ISOはめあい公差表

φmm	< 3	3—6	6—10	10—18	18—30	30—50	50—65	65—80
e 7	- 14 - 24	- 20 - 32	- 25 - 40	- 32 - 50	- 40 - 61	- 50 - 75	- 60 - 90	- 60 - 90
e 8	- 14 - 28	- 20 - 38	- 25 - 47	- 32 - 59	- 40 - 73	- 50 - 89	- 60 - 106	- 60 - 106
e 9	- 14 - 39	- 20 - 50	- 25 - 61	- 32 - 75	- 40 - 92	- 50 - 112	- 60 - 134	- 60 - 134
h 5	0 - 4	0 - 5	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 13
h 6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16	0 - 19	0 - 19
h 7	0 - 10	0 - 12	0 - 15	0 - 18	0 - 21	0 - 25	0 - 30	0 - 30
h 8	0 - 14	0 - 18	0 - 22	0 - 27	0 - 33	0 - 39	0 - 46	0 - 46
h 9	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
m 6	+ 8 + 2	+ 12 + 4	+ 15 + 6	+ 18 + 7	+ 21 + 8	+ 25 + 9	+ 30 + 11	+ 30 + 11
m 7	+ 12 + 2	+ 16 + 4	+ 21 + 6	+ 25 + 7	+ 29 + 8	+ 34 + 9	+ 41 + 11	+ 41 + 11
z 9	+ 51 + 26	+ 65 + 35	+ 78 + 42	+ 103 + 60	+ 140 + 88	+ 198 + 136	+ 246 + 172	+ 284 + 210
H 5	+ 4 0	+ 5 0	+ 6 0	+ 8 0	+ 9 0	+ 11 0	+ 13 0	+ 13 0
H 6	+ 6 0	+ 8 0	+ 9 0	+ 11 0	+ 13 0	+ 16 0	+ 19 0	+ 19 0
H 7	+ 10 0	+ 12 0	+ 15 0	+ 18 0	+ 21 0	+ 25 0	+ 30 0	+ 30 0
H 8	+ 14 0	+ 18 0	+ 22 0	+ 27 0	+ 33 0	+ 39 0	+ 46 0	+ 46 0
H 9	+ 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
P 6	- 6 - 12	- 9 - 17	- 12 - 21	- 15 - 26	- 18 - 31	- 21 - 37	- 26 - 45	- 26 - 45
P 7	- 6 - 16	- 8 - 20	- 9 - 24	- 11 - 29	- 14 - 35	- 17 - 42	- 21 - 51	- 21 - 51
P 9	- 6 - 31	- 12 - 42	- 15 - 51	- 18 - 61	- 22 - 74	- 26 - 88	- 32 - 106	- 32 - 106



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