

ดอกเอ็นมิล

ประเภท และ ตัวเลือก

Tool Types and selections



Type			Material & Coating						Page
			HSSE	TiCN	Carbide	Hard'X	Graph'X	TiAlN	
HIGH SPEED STEEL	Square End Mills		✓	✓	-	-	-	-	113 ~ 114
	Long Square End Mills		✓	✓	-	-	-	-	114
CARBIDE END MILLS	Ball Micro Precision		-	-	✓	✓	✓	-	115
	Micro Precision		-	-	✓	✓	✓	-	116
	Ball End Mills		-	-	✓	-	-	✓	117
	Long Ball End Mills		-	-	✓	-	-	✓	118
	Square End Mills		-	-	✓	-	-	✓	119
	Long Shank Square End Mills		-	-	✓	-	-	✓	120
	Long Flute Square End Mills		-	-	✓	-	-	✓	121

End Mills

ประเภท และ ตัวเลือก Tool Types and selections



Type			Material & Coating						Page
			HSSE	TiCN	Carbide	Hard'X	Graph'X	TiAlN	
CARBIDE END MILLS	Multi-V 40°		-	-	✓	✓	-	-	123
	Multi-V 60°		-	-	✓	✓	-	-	123
	Multi-V 90°		-	-	✓	✓	-	-	124
	Multi-V 100°		-	-	✓	✓	-	-	125
	Multi-V 120°		-	-	✓	✓	-	-	125
	Micro Round Corner		-	-	✓	✓	-	-	127
	Bi-Face Round Corner		-	-	✓	✓	-	-	128

วัสดุและการชุบ – Materials and Coating

วัสดุ Material						
	HSSE8 (HSSE Cobalt 8%)	Carbide	TiCN Coating	TiAlN Coating	Hard'X Coating	Graph'X Coating
ความแข็ง Hardness	67HRC	1800HV	+3000HV (for HSSE)	+3300HV (for carbide)	+3500HV (for carbide)	+8000HV (for carbide)



= วัสดุหลัก | Base Material



= วัสดุชุบ | Coating Material

ดอกเอ็นมิล

High Speed End Mills – ดอกเอ็นมิลไฮสปีด



2F



2F



4F



4F



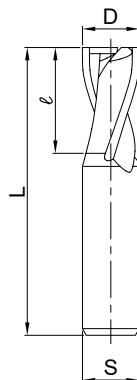
D	ℓ	L	S	Order Code			
				HSSE8	HSSE8% + TiCN	HSSE8	HSSE8% + TiCN
				Model 06HES2	Model 06HES-C2	Model 06HES4	Model 06HES-C4
3	10	55	6	06HES2030	06HES-C2030	06HES4030	06HES-C4030
4	12	60	8	06HES2040	06HES-C2040	06HES4040	06HES-C4040
5	15	65	8	06HES2050	06HES-C2050	06HES4050	06HES-C4050
6	15	65	8	06HES2060	06HES-C2060	06HES4060	06HES-C4060
8	21	75	10	06HES2080	06HES-C2080	06HES4080	06HES-C4080
10	26	80	10	06HES2100	06HES-C2100	06HES4100	06HES-C4100
12	31	90	12	06HES2120	06HES-C2120	06HES4120	06HES-C4120
14	35	95	16	06HES2140	06HES-C2140	06HES4140	06HES-C4140
16	40	105	16	06HES2160	06HES-C2160	06HES4160	06HES-C4160
18	40	105	16	06HES2180	06HES-C2180	06HES4180	06HES-C4180
20	45	115	20	06HES2200	06HES-C2200	06HES4200	06HES-C4200

Standards

2F & 4F

SRT

Standard



Long Type High Speed End Mills – ดอกเอ็นมิลไฮสปีด ร่นยาว



2F



2F



4F

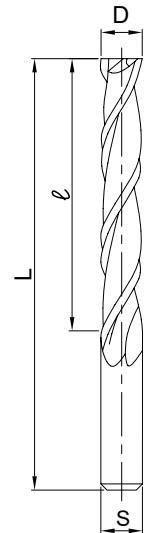


4F



D	ℓ	L	S	Order Code			
				HSSE8	HSSE8% + TiCN	HSSE8	HSSE8% + TiCN
				Model 06HESL2	Model 06HESL-C2	Model 06HESL4	Model 06HESL-C4
3	15	60	6	06HESL2030	06HESL-C2030	06HESL4030	06HESL-C4030
4	20	70	8	06HESL2040	06HESL-C2040	06HESL4040	06HESL-C4040
5	25	75	8	06HESL2050	06HESL-C2050	06HESL4050	06HESL-C4050
6	25	75	8	06HESL2060	06HESL-C2060	06HESL4060	06HESL-C4060
8	35	90	10	06HESL2080	06HESL-C2080	06HESL4080	06HESL-C4080
10	45	100	10	06HESL2100	06HESL-C2100	06HESL4100	06HESL-C4100
12	55	115	12	06HESL2120	06HESL-C2120	06HESL4120	06HESL-C4120
14	55	120	16	06HESL2140	06HESL-C2140	06HESL4140	06HESL-C4140
16	65	130	16	06HESL2160	06HESL-C2160	06HESL4160	06HESL-C4160
18	65	130	16	06HESL2180	06HESL-C2180	06HESL4180	06HESL-C4180
20	75	145	20	06HESL2200	06HESL-C2200	06HESL4200	06HESL-C4200

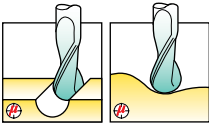
Standards	2F & 4F
	SRT Standard



End Mills

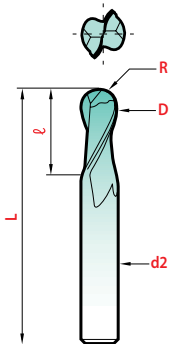
ดอกเอ็นมิล

Ball Micro Precision End Mills – ไมโครเอ็นมิลหัวบอล



D	L	ℓ	d2	R	Order Code		
					Carbide	Carbide+Hard'X	Carbide+Graph'X
					Model 068527	Model 068527H	Model 068527G
0.10	39	0.10	3	0.050	06852700100	068527H0010	
0.15	39	0.20	3	0.075	06852700150	068527H0015	
0.20	39	0.30	3	0.100	06852700200	068527H0020	
0.25	39	0.35	3	0.125	06852700250	068527H0025	
0.30	39	0.45	3	0.150	06852700300	068527H0030	
0.40	39	0.60	3	0.200	06852700400	068527H0040	068527G0040
0.50	39	0.75	3	0.250	06852700500	068527H0050	068527G0050
0.60	39	0.90	3	0.300	06852700600	068527H0060	068527G0060
0.70	39	1.05	3	0.350	06852700700	068527H0070	068527G0070
0.80	39	1.20	3	0.400	06852700800	068527H0080	068527G0080
0.90	39	1.35	3	0.450	06852700900	068527H0090	068527G0090
1.00	39	1.50	3	0.500	06852701000	068527H0100	068527G0100
1.10	39	1.65	3	0.550	06852701100	068527H0110	068527G0110
1.20	39	1.80	3	0.600	06852701200	068527H0120	068527G0120
1.40	39	2.10	3	0.700	06852701400	068527H0140	068527G0140
1.50	39	2.25	3	0.750	06852701500	068527H0150	068527G0150
1.60	39	2.40	3	0.800	06852701600	068527H0160	068527G0160
2.00	39	3.00	3	1.000	06852702000	068527H0200	068527G0200

Standards	2F
	Magafor Standard



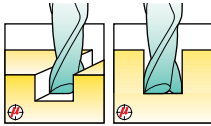
D	Tolerance		
	D	ℓ	d2
0.10-0.25	±0.01	+0.10	h5
0.30-0.40		+0.15	
0.50-0.60		+0.20	
0.70-2.00		+0.30	

D	L	ℓ	d2	R	Order Code	
					Carbide	Carbide+Hard'X
					Model 068521	Model 068521H
0.30	39	0.25	3	0.15	06852100300	068521H0030
0.40	39	0.30	3	0.20	06852100400	068521H0040
0.50	39	0.35	3	0.25	06852100500	068521H0050
0.60	39	0.45	3	0.30	06852100600	068521H0060
0.80	39	0.60	3	0.40	06852100800	068521H0080
1.00	39	0.75	3	0.50	06852101000	068521H0100

2F Extra Short

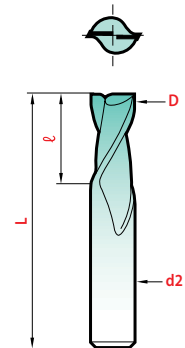
End Mills

Micro Precision End Mills – ไมโครเอ็นมิล



D	L	ℓ	d2	Order Code		
				Carbide	Carbide+Hard'X	Carbide+Graph'X
				Model 068507	Model 068507H	Model 068507G
0.10	39	0.10	3	06850700100	068507H0010	
0.15	39	0.20	3	06850700150	068507H0015	
0.20	39	0.30	3	06850700200	068507H0020	
0.25	39	0.35	3	06850700250	068507H0025	
0.30	39	0.45	3	06850700300	068507H0030	068507G0030
0.40	39	0.60	3	06850700400	068507H0040	068507G0040
0.50	39	0.75	3	06850700500	068507H0050	068507G0050
0.60	39	0.90	3	06850700600	068507H0060	068507G0060
0.70	39	1.05	3	06850700700	068507H0070	068507G0070
0.80	39	1.20	3	06850700800	068507H0080	068507G0080
0.90	39	1.35	3	06850700900	068507H0090	068507G0090
1.00	39	1.50	3	06850701000	068507H0100	068507G0100
1.10	39	1.65	3	06850701100	068507H0110	068507G0110
1.20	39	1.80	3	06850701200	068507H0120	068507G0120
1.30	39	1.95	3	06850701300	068507H0130	068507G0130
1.40	39	2.10	3	06850701400	068507H0140	068507G0140
1.50	39	2.25	3	06850701500	068507H0150	068507G0150
1.60	39	2.40	3	06850701600	068507H0160	068507G0160
1.70	39	2.55	3	06850701700	068507H0170	068507G0170
1.80	39	2.70	3	06850701800	068507H0180	068507G0180
1.90	39	2.85	3	06850701900	068507H0190	068507G0190
2.00	39	3.00	3	06850702000	068507H0200	068507G0200

Standards	2F
	Magafor Standard



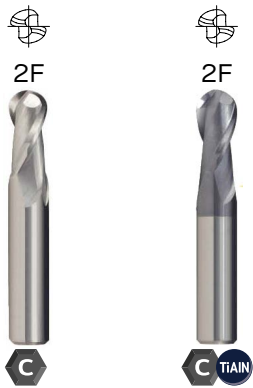
D	Tolerance		
	D	ℓ	d2
0.05-0.08	±0.005	+0.03	h5
0.10-0.12		+0.08	
0.15-0.25		+0.10	
0.30-0.45	h7	+0.15	h6
0.50-0.65		+0.20	
0.70-2.00		+0.30	

D	L	ℓ	d2	Order Code	
				Carbide	Carbide+Hard'X
				Model 068511	Model 068511H
0.40	39	0.30	3	06851100400	068511H0040
0.50	39	0.37	3	06851100500	068511H0050
0.60	39	0.45	3	06851100600	068511H0060
0.70	39	0.53	3	06851100700	068511H0070
0.80	39	0.60	3	06851100800	068511H0080
1.00	39	0.75	3	06851101000	068511H0100

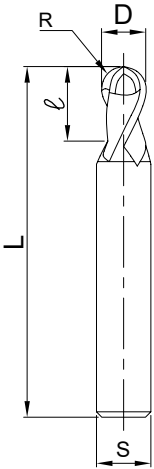
2F Extra Short

ดอกเอ็นมิล

Carbide Ball End Mills – ดอกเอ็นมิลคาร์ไบด์หัวบอล



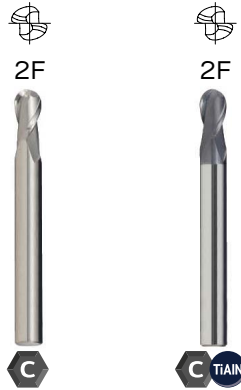
R	D	f	L	S	Order Code	
					Carbide	Carbide+TiAlN
					Model 06CEB2	Model 06CEB-T2
1	2	4	50	6	06CEB2020	06CEB-T2020
1.5	3	6	50	6	06CEB2030	06CEB-T2030
2	4	8	50	6	06CEB2040	06CEB-T2040
2.5	5	10	50	6	06CEB2050	06CEB-T2050
3	6	12	50	6	06CEB2060	06CEB-T2060
4	8	16	60	8	06CEB2080	06CEB-T2080
5	10	20	75	10	06CEB2100	06CEB-T2100
6	12	24	75	12	06CEB2120	06CEB-T2120
7	14	28	100	14	06CEB2140	06CEB-T2140
8	16	32	100	16	06CEB2160	06CEB-T2160
9	18	36	100	18	06CEB2180	06CEB-T2180
10	20	40	100	20	06CEB2200	06CEB-T2200



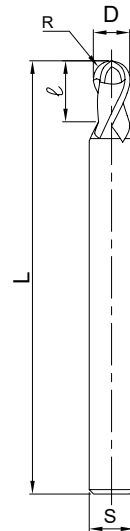
Standards	2F
	SRT
	Standard

End Mills

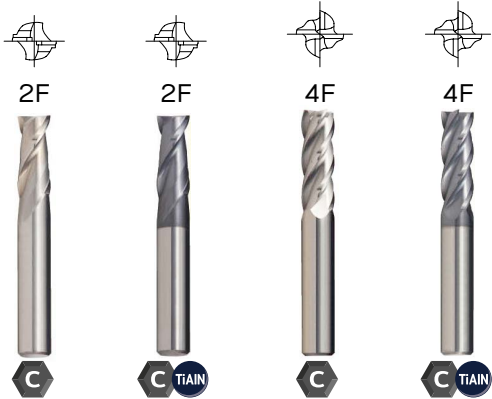
Carbide Ball End Mills Long Type – ดอกเอ็นมิลคาร์ไบด์หัวบอล รุ่นยาว



R	D	ℓ	L	S	Order Code	
					Carbide	Carbide+TiAlN
					Model 06CELB2	Model 06CELB-T2
1	2	4	75	6	06CELB2020075	06CELB-T2020075
1	2	4	100	6	06CELB2020100	06CELB-T2020100
1.5	3	6	75	6	06CELB2030075	06CELB-T2030075
1.5	3	6	100	6	06CELB2030100	06CELB-T2030100
2	4	8	75	6	06CELB2040075	06CELB-T2040075
2	4	8	100	6	06CELB2040100	06CELB-T2040100
2.5	5	10	75	6	06CELB2050075	06CELB-T2050075
2.5	5	10	100	6	06CELB2050100	06CELB-T2050100
3	6	12	75	6	06CELB2060075	06CELB-T2060075
3	6	12	100	6	06CELB2060100	06CELB-T2060100
3	6	12	150	6	06CELB2060150	06CELB-T2060150
4	8	16	75	8	06CELB2080075	06CELB-T2080075
4	8	16	100	8	06CELB2080100	06CELB-T2080100
4	8	16	150	8	06CELB2080150	06CELB-T2080150
5	10	20	100	10	06CELB2100100	06CELB-T2100100
5	10	20	150	10	06CELB2100150	06CELB-T2100150
5	10	20	200	10	06CELB2100200	06CELB-T2100200
6	12	24	100	12	06CELB2120100	06CELB-T2120100
6	12	24	150	12	06CELB2120150	06CELB-T2120150
6	12	24	200	12	06CELB2120200	06CELB-T2120200
8	16	32	150	16	06CELB2160150	06CELB-T2160150
8	16	32	200	16	06CELB2160200	06CELB-T2160200

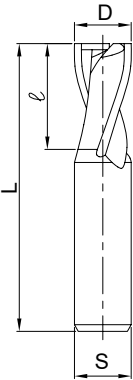


Standards	2F
	SRT
	Standard

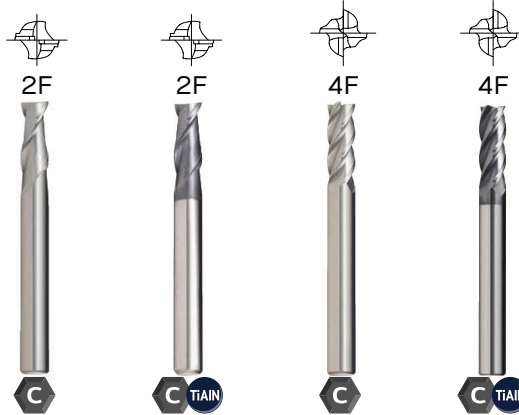


D	ℓ	L	S	Order Code			
				Carbide	Carbide+TiAlN	Carbide	Carbide+TiAlN
				Model 06CES2	Model 06CES-T2	Model 06CES4	Model 06CES-T4
2	6	50	6	06CES2020	06CES-T2020	06CES4020	06CES-T4020
3	8	50	6	06CES2030	06CES-T2030	06CES4030	06CES-T4030
4	11	50	6	06CES2040	06CES-T2040	06CES4040	06CES-T4040
5	13	50	6	06CES2050	06CES-T2050	06CES4050	06CES-T4050
6	16	50	6	06CES2060	06CES-T2060	06CES4060	06CES-T4060
8	20	60	8	06CES2080	06CES-T2080	06CES4080	06CES-T4080
10	30	75	10	06CES2100	06CES-T2100	06CES4100	06CES-T4100
12	32	75	12	06CES2120	06CES-T2120	06CES4120	06CES-T4120
14	40	100	16	06CES2140	06CES-T2140	06CES4140	06CES-T4140
16	40	100	16	06CES2160	06CES-T2160	06CES4160	06CES-T4160
18	45	100	20	06CES2180	06CES-T2180	06CES4180	06CES-T4180
20	45	100	20	06CES2200	06CES-T2200	06CES4200	06CES-T4200
25	45	100	25	06CES2250	06CES-T2250	06CES4250	06CES-T4250

Standards	2F & 4F
	SRT Standard

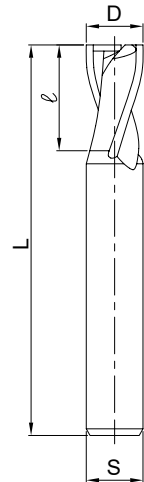


Carbide End Mills Long Shank Type – ดอกเอ็นมิลคาร์ไบด์ ร่นก้านยาว



D	ℓ	L	S	Order Code			
				Carbide	Carbide+TiAlN	Carbide	Carbide+TiAlN
				Model 06CELS2	Model 06CELS-T2	Model 06CELS4	Model 06CELS-T4
3	8	75	3	06CELS2030075	06CELS-T2030075	06CELS4030075	06CELS-T4030075
4	11	75	4	06CELS2040075	06CELS-T2040075	06CELS4040075	06CELS-T4040075
4	11	100	4	06CELS2040100	06CELS-T2040100	06CELS4040100	06CELS-T4040100
5	13	75	6	06CELS2050075	06CELS-T2050075	06CELS4050075	06CELS-T4050075
5	13	100	6	06CELS2050100	06CELS-T2050100	06CELS4050100	06CELS-T4050100
6	16	75	6	06CELS2060075	06CELS-T2060075	06CELS4060075	06CELS-T4060075
6	16	100	6	06CELS2060100	06CELS-T2060100	06CELS4060100	06CELS-T4060100
8	20	75	8	06CELS2080075	06CELS-T2080075	06CELS4080075	06CELS-T4080075
8	20	100	8	06CELS2080100	06CELS-T2080100	06CELS4080100	06CELS-T4080100
10	30	100	10	06CELS2100100	06CELS-T2100100	06CELS4100100	06CELS-T4100100
10	30	150	10	06CELS2100150	06CELS-T2100150	06CELS4100150	06CELS-T4100150
12	32	100	12	06CELS2120100	06CELS-T2120100	06CELS4120100	06CELS-T4120100
12	32	150	12	06CELS2120150	06CELS-T2120150	06CELS4120150	06CELS-T4120150
16	40	150	16	06CELS2160150	06CELS-T2160150	06CELS4160150	06CELS-T4160150
20	45	150	20	06CELS2200150	06CELS-T2200150	06CELS4200150	06CELS-T4200150

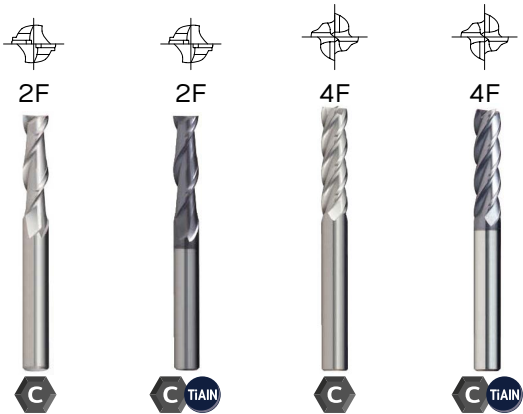
Standards	2F & 4F
	SRT
	Standard



End Mills

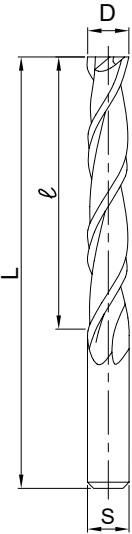
ดอกเอ็นมิล

Carbide End Mills Long Type – ดอกเอ็นมิลคาร์ไบด์ ร่นยาว



D	ℓ	L	S	Order Code			
				Carbide	Carbide+TiAlN	Carbide	Carbide+TiAlN
				Model 06CESL2	Model 06CESL-T2	Model 06CESL4	Model 06CESL-T4
2	12	50	4	06CESL2020	06CESL-T2020	06CESL4020	06CESL-T4020
3	15	60	6	06CESL2030	06CESL-T2030	06CESL4030	06CESL-T4030
4	20	75	6	06CESL2040	06CESL-T2040	06CESL4040	06CESL-T4040
5	25	75	6	06CESL2050	06CESL-T2050	06CESL4050	06CESL-T4050
6	30	75	6	06CESL2060	06CESL-T2060	06CESL4060	06CESL-T4060
8	40	100	8	06CESL2080	06CESL-T2080	06CESL4080	06CESL-T4080
10	40	100	10	06CESL2100	06CESL-T2100	06CESL4100	06CESL-T4100
12	50	100	12	06CESL2120	06CESL-T2120	06CESL4120	06CESL-T4120
14	50	150	16	06CESL2140	06CESL-T2140	06CESL4140	06CESL-T4140
16	65	150	16	06CESL2160	06CESL-T2160	06CESL4160	06CESL-T4160
20	75	200	20	06CESL2200	06CESL-T2200	06CESL4200	06CESL-T4200

Standards	2F & 4F
	SRT Standard



End Mills

คำแนะนำการใช้งาน ดอกไมโครเอ็นมิล คาร์ไบด์

Recommendations of use for Carbide End Mills

	Steels -HRC 30 -1000N/mm2		Steels HRC 30-HRC 45 1000-1500N/mm2		Harden Steels HRC 45-HRC 50 1500N/mm2		Cast Irons		Aluminum Alloys	
	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
Ø2	12350	640	9150	415	4000	125	10500	220	30800	395
Ø3	11400	575	8550	390	3800	125	7050	230	20500	395
Ø4	8950	630	7150	450	3600	150	5150	285	15400	395
Ø5	7800	700	6200	490	3100	150	4150	330	12100	470
Ø6	72050	870	5900	705	2700	160	3400	360	10300	470
Ø8	6100	1090	4900	785	2050	190	2500	460	7900	540
Ø10	5450	1330	4350	870	1750	190	2050	460	6150	540
Ø12	4990	1500	3950	950	1500	210	1750	460	5150	630
Ø14	4530	1495	3600	925	1300	210	1400	460	4300	630
Ø16	4085	1470	3200	905	1150	210	1300	460	3850	540
Ø18	3800	1425	3000	890	1050	210	1100	460	3400	540
Ø20	3550	1425	2800	885	950	210	1050	420	2950	540



2F



	Steels -HRC 30 -1000N/mm2		Steels HRC 30-HRC 45 1000-1500N/mm2		Stainless Steel		Cast Irons		Aluminum Alloys	
	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
Ø2	7850	160	5150	100	4300	80	9350	220	22000	460
Ø3	6100	180	3800	120	3150	100	6050	220	15400	460
Ø4	5150	255	3150	155	2650	130	4600	220	11000	460
Ø5	4300	270	2550	160	2150	135	3650	220	9150	460
Ø6	3800	300	2300	190	1950	155	2950	255	7600	485
Ø8	2850	325	1700	170	1450	155	2200	275	5700	485
Ø10	2200	280	1350	135	1150	135	1850	285	4600	485
Ø12	1850	240	1150	110	950	110	1450	295	3750	485
Ø14	1700	215	1050	100	850	100	1300	310	3300	485
Ø16	1500	185	950	95	700	95	1100	320	2850	485
Ø20	1150	145	700	70	550	70	900	340	2200	485



2F



	Steels -HRC 30 -1000N/mm2		Steels HRC 30-HRC 45 1000-1500N/mm2		Stainless Steel		Cast Irons		Aluminum Alloys	
	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
Ø2	9850	240	6450	145	5350	120	9350	640	22000	1320
Ø3	7600	270	4750	170	3950	145	6050	640	15400	1320
Ø4	6450	485	3950	300	3300	240	4600	640	11000	1320
Ø5	5350	510	3200	305	2700	255	3650	640	9150	1320
Ø6	4750	560	2850	350	2400	280	2950	770	7600	1430
Ø8	3550	605	2150	325	1800	300	2200	815	5700	1430
Ø10	2750	520	1700	255	1450	255	1850	860	4600	1430
Ø12	2350	440	1450	215	1150	205	1450	900	3750	1430
Ø14	2100	395	1300	195	1050	190	1300	945	3300	1430
Ø16	1850	350	1150	170	950	170	1100	970	2850	1430
Ø20	1450	270	900	135	700	130	900	1035	2200	1430



4F



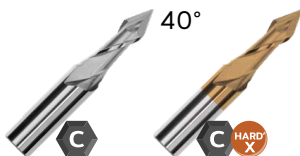
End Mills

ดอกเอ็นมิล

Multi V – เอ็นมิลปลายแหลม มัลติวี

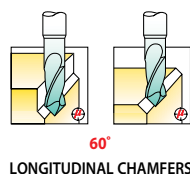
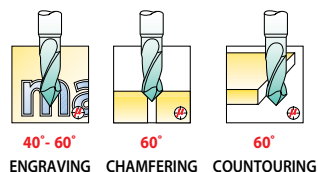
MULTI-V®

ทูลที่ถูกออกแบบมาให้ทำงานได้
หลากหลายในดอกเดียว
Special design to do
multiple jobs in one tool.

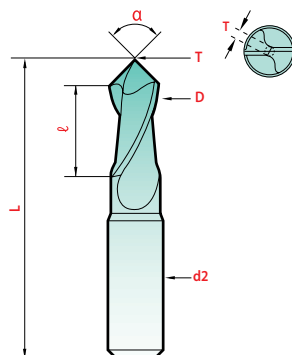


D	L	ℓ	d2	Web Thickness T	Order Code	
					Carbide	Carbide+Hard'X
					Model 068040	Model 068040H
0.5	39	1	3	0.05	06804000500	068040H0050
1.0	39	2	3	0.10	06804001000	068040H0100
1.5	39	3	3	0.15	06804001500	068040H0150
2.0	39	4	3	0.20	06804002000	068040H0200
3.0	50	6	4	0.30	06804003000	068040H0300
5.0	50	10	6	0.50	06804005000	068040H0500

Standards	Multi-V Magafor Standard
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D	L	ℓ	d2	Web Thickness T	Order Code	
					Carbide	Carbide+Hard'X
					Model 068088	Model 068088H
0.5	39	1	3	0.05	06808800500	068088H0050
0.8	39	1.6	3	0.08	06808800800	068088H0080
1.0	39	2	3	0.10	06808801000	068088H0100
1.2	39	2.4	3	0.12	06808801200	068088H0120
1.5	39	3	3	0.15	06808801500	068088H0150
1.8	39	3.6	3	0.18	06808801800	068088H0180
2.0	39	4	3	0.20	06808802000	068088H0200
2.5	39	5	3	0.25	06808802500	068088H0250
3.0	50	6	4	0.30	06808803000	068088H0300
4.0	50	8	5	0.40	06808804000	068088H0400
5.0	50	10	6	0.50	06808805000	068088H0500
6.0	60	12	8	0.60	06808806000	068088H0600
8.0	70	16	10	0.80	06808808000	068088H0800
10.0	70	18	12	1.00	06808810000	068088H1000
12.0	70	20	12	1.20	06808812000	068088H1200
16.0	80	26	16	1.60	06808816000	068088H1600
20.0	105	32	20	2.00	06808820000	068088H2000

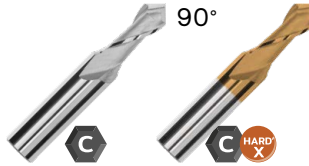


D	Tolerance		d2	Tolerance	
	D	α		d2	
0.1-10	h9	±1°	0.1-2.6	h5	
12-20	d9		3-20	h6	

Multi V – เ็นมิลปลายแหลม มัลติวี

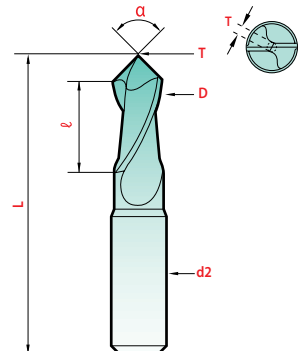
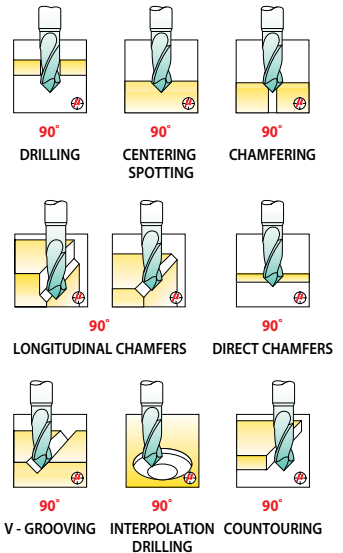
MULTI-V®

ทูลที่ถูกออกแบบมาให้ทำงานได้
หลากหลายในดอกเดียว
Special design to do
multiple jobs in one tool.



D	L	ℓ	d2	Web Thickness T	Order Code	
					Carbide	Carbide+Hard'X
					Model 068090	Model 068090H
0.1	39	0.2	3	0.01	06809000100	068090H0010
0.2	39	0.4	3	0.02	06809000200	068090H0020
0.3	39	0.6	3	0.03	06809000300	068090H0030
0.4	39	0.8	3	0.04	06809000400	068090H0040
0.5	39	1.0	3	0.05	06809000500	068090H0050
0.6	39	1.2	3	0.06	06809000600	068090H0060
0.7	39	1.4	3	0.07	06809000700	068090H0070
0.8	39	1.6	3	0.08	06809000800	068090H0080
0.9	39	1.8	3	0.09	06809000900	068090H0090
1.0	39	2.0	3	0.10	06809001000	068090H0100
1.1	39	2.2	3	0.11	06809001100	068090H0110
1.2	39	2.4	3	0.12	06809001200	068090H0120
1.3	39	2.6	3	0.13	06809001300	068090H0130
1.4	39	2.8	3	0.14	06809001400	068090H0140
1.5	39	3.0	3	0.15	06809001500	068090H0150
1.6	39	3.2	3	0.16	06809001600	068090H0160
1.7	39	3.4	3	0.17	06809001700	068090H0170
1.8	39	3.6	3	0.18	06809001800	068090H0180
1.9	39	3.8	3	0.19	06809001900	068090H0190
2.0	39	4.0	3	0.20	06809002000	068090H0200
2.1	39	4.2	3	0.21	06809002100	068090H0210
2.2	39	4.4	3	0.22	06809002200	068090H0220
2.3	39	4.6	3	0.23	06809002300	068090H0230
2.4	39	4.8	3	0.24	06809002400	068090H0240
2.5	39	5.0	3	0.25	06809002500	068090H0250
2.6	39	5.2	3	0.26	06809002600	068090H0260
3	50	6	4	0.30	06809003000	068090H0300
4	50	8	5	0.40	06809004000	068090H0400
4.76 (3/16")	50	9.5	6.35	0.50	06809004760	068090H0476
5	50	10	6	0.50	06809005000	068090H0500
6	60	12	8	0.60	06809006000	068090H0600
6.35 (1/4")	60	12	7.93	0.60	06809006350	068090H0635
7.93 (5/16")	70	16	9.52	0.80	06809007930	068090H0793
8	70	16	10	0.80	06809008000	068090H0800
9.52 (3/8")	70	18	12.7	1.00	06809009520	068090H0952
10	70	18	12	1.00	06809010000	068090H1000
12	70	20	12	1.20	06809012000	068090H1200
12.7 (1/2")	70	20	12.7	1.30	06809012700	068090H1270
15.87 (5/8")	80	25	15.87	1.60	06809015870	068090H1587
16	80	26	16	1.60	06809016000	068090H1600
20	100	32	20	2.00	06809020000	068090H2000

Standards	Multi-V
	Magafor Standard



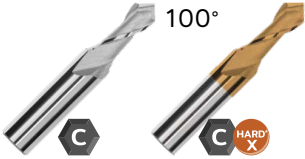
D	Tolerance		d2	Tolerance	
	D	α		d2	
0.1-10	h9	±1°	0.1-2.6	h5	
12-20	d9		3-20	h6	

ดอกเอ็นมิล

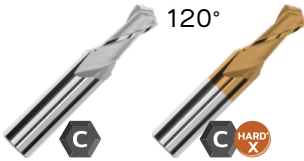
Multi V – เอ็นมิลปลายแหลม มัลติวี

MULTI-V®

ทูลที่ถูกออกแบบมาให้ทำงานได้
 หลากหลายในดอกเดียว
 Special design to do
 multiple jobs in one tool.

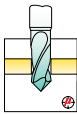


D	L	ℓ	d2	Web Thickness T	Order Code	
					Carbide	Carbide+Hard'X
					Model 068095	Model 068095H
6.0	60	12	8	0.60	06809506000	068095H0600
8.0	70	16	10	0.80	06809508000	068095H0800
10.0	70	18	12	1.00	06809510000	068095H1000
12.0	70	20	12	1.20	06809512000	068095H1200
16.0	80	26	16	1.60	06809516000	068095H1600

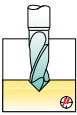


D	L	ℓ	d2	Web Thickness T	Order Code	
					Carbide	Carbide+Hard'X
					Model 068092	Model 068092H
1.0	39	2	3	0.10	06809201000	068092H0100
1.5	39	3	3	0.15	06809201500	068092H0150
2.0	39	4	3	0.20	06809202000	068092H0200
2.5	39	5	3	0.25	06809202500	068092H0250
3.0	50	6	4	0.30	06809203000	068092H0300
4.0	50	8	5	0.40	06809204000	068092H0400
5.0	50	10	6	0.50	06809205000	068092H0500
6.0	60	12	8	0.60	06809206000	068092H0600
8.0	70	16	10	0.80	06809208000	068092H0800
10.0	70	18	12	1.00	06809210000	068092H1000
12.0	70	20	12	1.20	06809212000	068092H1200
16.0	80	26	16	1.60	06809216000	068092H1600
20.0	100	32	20	2.00	06809220000	068092H2000

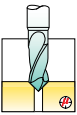
Standards	Multi-V
	Magafor Standard



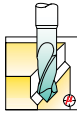
100°-120°
DRILLING



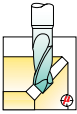
100°-120°
CENTERING SPOTTING



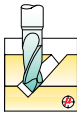
100°-120°
CHAMFERING



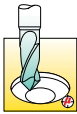
100°-120°
LONGITUDINAL CHAMFERS



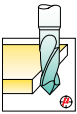
100°-120°
DIRECT CHAMFERS



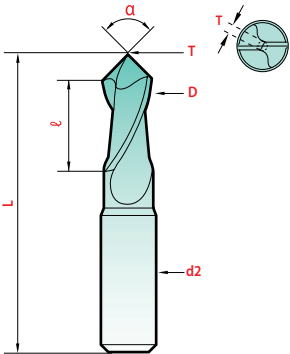
100°-120°
V-GROOVING



100°-120°
INTERPOLATION DRILLING



100°-120°
COUNTOURING

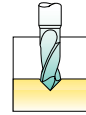


D	Tolerance		d2	Tolerance	
	D	α		d2	
0.1-10	h9	±1°	0.1-2.6	h5	
12-20	d9		3-20	h6	

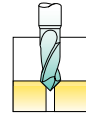
ข้อแนะนำการใช้งาน ดอกมัลติวี

Recommendations of use for Multi-V

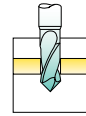
MATERIAL	SPEED	FEED (mm/t)									
	Vc m/min.	φ0.3	φ0.5	φ1	φ2	φ3	φ5	φ8	φ12	φ16	φ20
Steels up to 500 N/mm ²	60-75	0.003	0.005	0.01	0.025	0.05	0.100	0.150	0.200	0.250	0.300
Steels 500-800 N/mm ²	40-60	0.003	0.005	0.012	0.025	0.050	0.100	0.150	0.20	0.250	0.300
Steels 800-1000 N/mm ²	35-40	0.003	0.005	0.010	0.023	0.045	0.070	0.120	0.180	0.220	0.280
Steels 1000-1300 N/mm ²	30-35	0.002	0.004	0.009	0.023	0.045	0.070	0.120	0.170	0.220	0.260
Cast Iron > 180 HB	30-35	0.002	0.004	0.009	0.023	0.045	0.070	0.120	0.170	0.220	0.260
Stainless Steels	25-30	0.002	0.004	0.010	0.020	0.040	0.060	0.110	0.160	0.220	0.250
Titanium Alloys	25-30	0.002	0.004	0.010	0.020	0.040	0.060	0.110	0.160	0.220	0.250
Copper & Bronze	50-150	0.0026	0.005	0.025	0.050	0.100	0.150	0.250	0.300	0.350	0.450
Aluminium	80-150	0.004	0.007	0.015	0.030	0.050	0.090	0.150	0.200	0.270	0.350
Thermoplast	100-200	0.005	0.008	0.015	0.030	0.050	0.100	0.200	0.200	0.300	0.400



90°-100°-120°
CENTERING

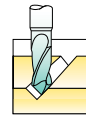


60°-90°-100°-120°
CHAMFERING

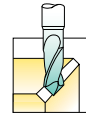


90°-100°-120°
DRILLING

MATERIAL	SPEED	CHIP THICKNESS (mm)									
	Vc m/min.	φ0.3	φ0.5	φ1	φ2	φ3	φ5	φ8	φ12	φ16	φ20
Steels up to 500 N/mm ²	60-75	0.0015	0.0025	0.0045	0.008	0.01	0.018	0.03	0.04	0.05	0.065
Steels 500-800 N/mm ²	40-60	0.0013	0.002	0.004	0.008	0.01	0.015	0.03	0.04	0.05	0.065
Steels 800-1000 N/mm ²	35-40	0.0013	0.002	0.004	0.008	0.01	0.015	0.03	0.04	0.05	0.065
Steels 1000-1300 N/mm ²	30-35	0.001	0.0017	0.0035	0.006	0.008	0.012	0.025	0.032	0.04	0.055
Cast Iron > 180 HB	30-35	0.001	0.0017	0.0035	0.006	0.008	0.012	0.025	0.032	0.04	0.055
Stainless Steels	25-30	0.001	0.0017	0.0035	0.006	0.008	0.012	0.025	0.032	0.04	0.055
Titanium Alloys	15-20	0.001	0.0012	0.0025	0.005	0.006	0.01	0.02	0.026	0.036	0.05
Copper & Bronze	50-150	0.0013	0.0025	0.006	0.012	0.016	0.02	0.034	0.04	0.06	0.08
Aluminium	80-150	0.0013	0.0035	0.006	0.012	0.016	0.021	0.034	0.04	0.06	0.08
Thermoplast	100-200	0.0015	0.004	0.0065	0.013	0.02	0.03	0.045	0.06	0.09	0.1



90°-100°-120°
V - GROOVING



60°-90°-100°-120°
LONGITUDINAL
CHAMFERS

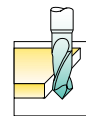
MATERIAL	SPEED	CHIP THICKNESS (mm)									
	Vc m/min.	φ0.3	φ0.5	φ1	φ2	φ3	φ5	φ8	φ12	φ16	φ20
Steels up to 500 N/mm ²	60-75	0.002	0.004	0.008	0.015	0.012	0.021	0.038	0.06	0.08	0.1
Steels 500-800 N/mm ²	40-60	0.0015	0.0035	0.007	0.015	0.012	0.02	0.038	0.06	0.08	0.1
Steels 800-1000 N/mm ²	35-40	0.0015	0.003	0.01	0.014	0.012	0.02	0.038	0.06	0.08	0.09
Steels 1000-1300 N/mm ²	30-35	0.001	0.003	0.007	0.014	0.012	0.02	0.038	0.055	0.075	0.08
Cast Iron > 180 HB	30-35	0.001	0.003	0.007	0.014	0.012	0.02	0.038	0.055	0.075	0.08
Stainless Steels	25-30	0.001	0.002	0.005	0.012	0.01	0.018	0.035	0.05	0.065	0.08
Titanium Alloys	15-20	0.001	0.002	0.005	0.012	0.01	0.018	0.035	0.05	0.065	0.08
Copper & Bronze	50-150	0.002	0.005	0.01	0.02	0.015	0.025	0.045	0.07	0.075	0.1
Aluminium	80-150	0.002	0.0045	0.008	0.017	0.012	0.02	0.04	0.06	0.07	0.09
Thermoplast	100-200	0.0025	0.005	0.01	0.02	0.015	0.025	0.045	0.07	0.07	0.1



60°-90°-100°-120°
INTERPOLATION
DRILLING



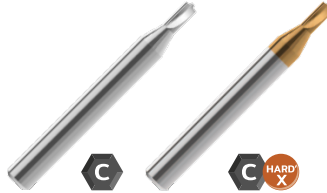
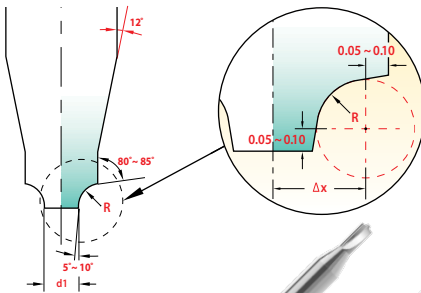
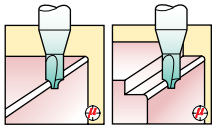
40°-60°
ENGRAVING



60°-90°-100°-120°
COUNTOURING

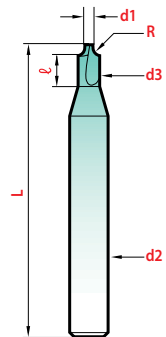
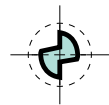
ดอกเอ็นมิล

Micro Round Corner – ไมโครเอ็นมิลกัศมุม R



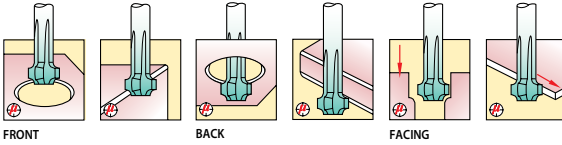
R ±0.02	d1	d2 h6	d3 0+0.02	Δx	ℓ	L	Order Code	
							Carbide	Carbide+Hard'X
							Model 068550	Model 068550H
0.10	0.5	3	0.8	0.35	2.5	50	06855000100	068550H0010
0.15	0.5	3	0.9	0.40	2.5	50	06855000150	068550H0015
0.20	0.5	3	1.0	0.45	2.5	50	06855000200	068550H0020
0.25	0.5	3	1.1	0.50	2.5	50	06855000250	068550H0025
0.30	0.5	3	1.2	0.55	2.5	50	06855000300	068550H0030
0.40	0.5	3	1.4	0.65	2.5	50	06855000400	068550H0040
0.50	0.5	3	1.6	0.75	2.5	50	06855000500	068550H0050
0.60	0.5	3	1.8	0.85	3	50	06855000600	068550H0060
0.70	0.5	3	2.0	0.95	3	50	06855000700	068550H0070
0.75	0.5	3	2.1	1.00	3	50	06855000750	068550H0075
0.80	0.8	3	2.5	1.20	4	50	06855000800	068550H0080
0.90	0.8	3	2.7	1.30	4	50	06855000900	068550H0090
1.00	0.8	3	2.9	1.40	4	50	06855001000	068550H0100
1.25	0.8	4	3.4	1.65	4	50	06855001250	068550H0125
1.50	1.5	5	4.6	2.25	6	50	06855001500	068550H0150
1.75	1.5	6	5.1	2.50	6	50	06855001750	068550H0175
2.00	1.5	6	5.6	2.75	8	50	06855002000	068550H0200
2.25	1.5	8	6.1	3.00	10	50	06855002250	068550H0225
2.50	1.5	8	6.6	3.25	10	50	06855002500	068550H0250
3.00	1.5	8	7.6	3.75	10	50	06855003000	068550H0300
4.00	1.9	10	10.0	4.95	-	55	06855004000	068550H0400
5.00	1.9	12	12.0	5.95	-	63	06855005000	068550H0500
6.00	1.9	14	14.0	6.95	-	74	06855006000	068550H0600

Standards	R Corner
	Magafor Standard

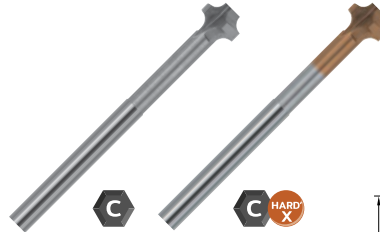
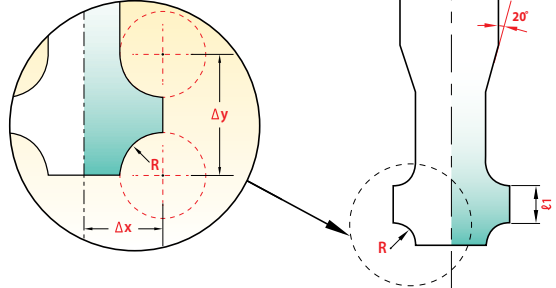


End Mills

Bi Face Round Corner – ไบเฟสกัดมุม R

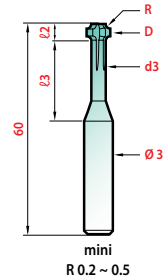


กัดมุม R ได้ทั้งขอบบนและล่างของงาน
โดยไม่ต้องพลิกชิ้นงาน
Cut round corner on front and
back of workpiece without
repositioning the workpiece.



Standards
Bi Face-R
Magafor
Standard

R ±0.02	D	d3	d2 h5	Δx	Δy	t1	t2	t3	Order Code	
									Carbide	Carbide+Hard'X
									Model 06848R	Model 06848RH
0.2	1.9	1.25	3	0.87	1.32	0.90	1.45	8	06848R00200	06848RH0020
0.3	2.3	1.45	3	1.07	1.82	1.20	1.95	9	06848R00300	06848RH0030
0.4	2.6	1.55	3	1.22	2.37	1.55	2.50	10	06848R00400	06848RH0040
0.5	2.9	1.65	3	1.37	2.87	1.85	3.00	12	06848R00500	06848RH0050



R ±0.02	D	d3	d2 h5	Δx	Δy	t1	t2	t3	Order Code	
									Carbide	Carbide+Hard'X
									Model 06849R	Model 06849RH
0.5	4.9	3.65	6	2.37	3.17	2.15	3.30	20	06849R00500	06849RH0050
0.6	5.2	3.75	6	2.52	3.37	2.14	3.50	25	06849R00600	06849RH0060
0.8	5.9	4.05	6	2.89	3.77	2.14	3.90	30	06849R00800	06849RH0080
1.0	6.6	4.35	8	3.22	4.27	2.23	4.30	35	06849R01000	06849RH0100
1.2	7.4	4.75	8	3.62	5.07	2.63	5.20	35	06849R01200	06849RH0120
1.5	8.4	5.10	10	4.12	5.77	2.73	5.80	35	06849R01500	06849RH0150
1.8	9.3	5.40	10	4.57	6.37	2.72	6.40	35	06849R01800	06849RH0180
2.0	9.9	5.60	10	4.87	6.87	2.82	6.80	35	06849R02000	06849RH0200
2.5	10.9	5.60	12	5.37	7.97	2.90	7.80	35	06849R02500	06849RH0250
3.0	11.9	5.60	12	5.87	9.07	3.00	8.80	35	06849R03000	06849RH0300

