



MEX AND MH

STEEL AND HARDENED STEEL

30÷55 HRC (MEX) AND 30÷70 HRC (MH)

🇬🇧 MEX: Ultra-fine micrograin and Endless Orange coating for high performance machining on 30÷55 HRC materials.

MH: Wide range of tools available for general milling, copying and super finishing (30÷70 HRC).

🇮🇹 MEX: Micrograna ultrafine e rivestimento Endless Orange per lavorazione ad alto rendimento di materiali con durezza compresa tra 30÷55 HRC.
MH: Ampia gamma per soddisfare applicazioni di copiatura e super finitura (30÷70 HRC).

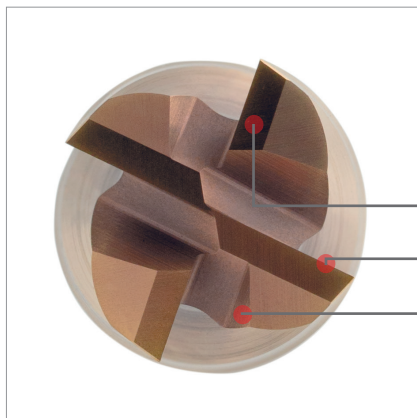
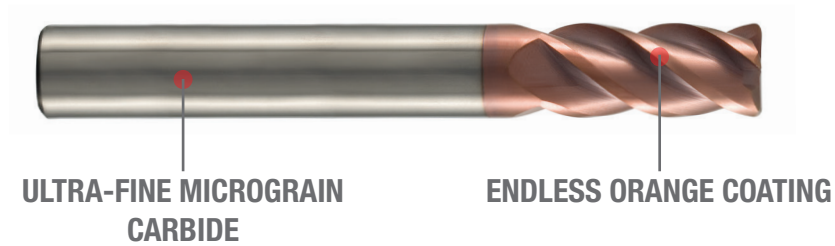
🇩🇪 MEX: Besonders feine Mikrokörnung und Beschichtung Endless Orange für Hochleistungsbearbeitungen von Materialien mit einer Härte zwischen 30 und 55 HRC.
MH: Große Produktpalette für Anwendungen zum Fräsen im Allgemeinen, Kopierfräsen und Schlichtbearbeitung (30÷70 HRC).

🇫🇷 MEX: Ultra Micrograin et revêtement Endless Orange pour un usinage à rendement élevé de matériaux ayant une dureté comprise entre 30÷55 HRC.

MH: Une large gamme pour satisfaire les applications de fraisage général, copiage et super finition (30÷70 HRC).

MEX&MH

Features of MEX end mills

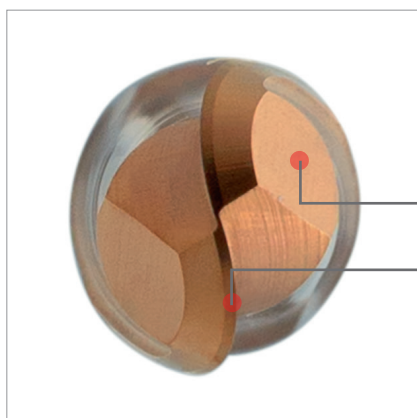


SPECIAL EDGE TREATMENT

STRONG EDGE DESIGN

LARGE CORE DIAMETER

Features of MH end mills



MH COATING

SPECIAL EDGE DESIGN

MEX&MH

Features and Benefits of MEX series

- Special edge design allows high reliability and better surface finishing for ISO P, ISO H <55HRC
- High rigidity due to large core diameter
- High temperature stability during the machining process thanks to the Endless Orange coating
- Ultra-fine micrograin carbide improves wear resistance and increase the tool life

- Lo speciale design del tagliente consente un'elevata affidabilità e una migliore finitura superficiale per ISO P, ISO H <55HRC
- Elevata rigidità grazie al diametro del nocciolo interno rinforzato
- Stabilità alle alte temperature durante il processo di lavorazione grazie al rivestimento Endless Orange
- Il metallo duro micrograna ultra-fine migliora la resistenza all'usura e aumenta la durata dell'utensile

- Die spezielle Schneidkantenkonstruktion ermöglicht hohe Zuverlässigkeit und verbesserte Oberflächenqualität für ISO P, ISO H <55HRC
- Hohe Robustheit durch verstärkten inneren Kerndurchmesser
- Hohe Temperaturstabilität bei der Bearbeitung dank der Endless Orange-Beschichtung
- Ultrafeines mikrokörniges Hartmetall verbessert die Verschleißfestigkeit und erhöht die Standzeit des Werkzeugs

- La conception spéciale du tranchant assure une haute fiabilité et une meilleure finition superficielle pour ISO P, ISO H <55HRC
- Haute rigidité grâce au diamètre du noyau interne renforcé
- Stabilité aux hautes températures pendant le processus d'usinage grâce au revêtement Endless Orange
- Le carbure à micro-grain ultrafin améliore la résistance à l'usure et augmente la durée de vie de l'outil

Features and Benefits of MH series

- Special edge design enables high versatility of general milling, copying and super finishing on materials from 30 to 70 HRC
- High temperature stability during the machining process thanks to the MH coating
- Nano-micrograin carbide guarantees excellent wear resistance and long life

- Lo speciale design del tagliente consente un'elevata versatilità in fresatura generale, copiatura e superfinitura di materiali da 30 a 70 HRC
- Stabilità alle alte temperature durante il processo di lavorazione grazie al rivestimento MH
- Il metallo duro nano-micrograna garantisce ottima resistenza all'usura e lunga durata

- Die spezielle Schneidkantenkonstruktion ermöglicht hohe Vielseitigkeit beim allgemeinen Fräsen, Nacharbeiten und Feinstbearbeiten von Materialien von 30 bis 70 HRC
- Hohe Temperaturstabilität bei der Bearbeitung dank der MH-Beschichtung
- Das Nanokorn-Hartmetall sorgt für hervorragende Verschleißfestigkeit und lange Standzeit

- La conception spéciale du tranchant permet une grande polyvalence général de fraisage, la copie et la superfinition de matériaux de 30 à 70 HRC.
- Stabilité aux hautes températures pendant le processus d'usinage grâce au revêtement MH
- Le carbure nano-micrograin garantit une excellente résistance à l'usure et une longue durée de vie

Use case

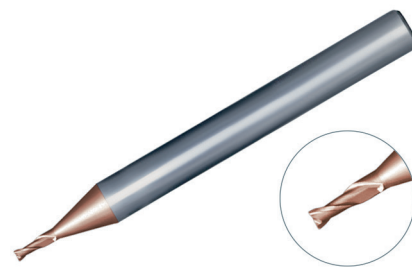
Tool Type	MHLNB2
Workpiece	W.-Nr 1.2379 X155CrVMo12 1(K110) 50HRC
Parameters	Vc 120 m/min, fz 0,025 mm/t, ap 0,07 mm, ae 0,6 mm
Coolant	air
Diameter	3 mm
Machining time:	

 **OSAWA**  +85%

Competitor A 

MEXM2

- Cylindrical shank
- 2 flutes
- Miniature



P	M	K	N	S	H
★		★			★



DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
0.3	0/-0.010	4	h6	0.6	40	2	MEXM20030	●
0.4	0/-0.010	4	h6	0.8	40	2	MEXM20040	●
0.5	0/-0.010	4	h6	1	40	2	MEXM20050	●
0.6	0/-0.010	4	h6	1.2	40	2	MEXM20060	●
0.7	0/-0.010	4	h6	1.4	40	2	MEXM20070	●
0.8	0/-0.010	4	h6	1.6	40	2	MEXM20080	●
0.9	0/-0.010	4	h6	1.8	40	2	MEXM20090	⊙
1	0/-0.015	3	h6	2	40	2	MEXM20100	●
1.1	0/-0.015	3	h6	2.2	40	2	MEXM20110	●
1.2	0/-0.015	3	h6	2.4	40	2	MEXM20120	●
1.3	0/-0.015	3	h6	2.6	40	2	MEXM20130	●
1.4	0/-0.015	3	h6	2.8	40	2	MEXM20140	●
1.5	0/-0.015	3	h6	3	40	2	MEXM20150	●
1.6	0/-0.015	3	h6	3.2	40	2	MEXM20160	⊙
1.7	0/-0.015	3	h6	3.4	40	2	MEXM20170	●
1.8	0/-0.015	3	h6	3.6	40	2	MEXM20180	●
1.9	0/-0.015	3	h6	3.8	40	2	MEXM20190	●
2	0/-0.015	3	h6	4	40	2	MEXM20200	●

★ 1st choice, ☆ suitable, ● stock standard, ⊙ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

MEXM2

	Material Group ISO 513		P2 P3 P4 K1 K2	P4 P5 K3	P6 K4	H1 H4 H5
	Hardness/Rm		≤1000 N/mm ²	≤35 HRC	35÷45 HRC	45÷55 HRC
	ap x ae		ap x D	ap x D	ap x D	ap x D
	Vc (m/min)		70÷90	50÷70	30÷50	20÷40
	DC (mm)	ap (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	0.3	0.02	0.004	0.004	0.003	0.003
	0.4	0.02	0.006	0.005	0.005	0.004
	0.5	0.03	0.007	0.006	0.006	0.005
	0.6	0.03	0.008	0.007	0.006	0.006
	0.8	0.04	0.010	0.009	0.008	0.007
	1	0.05	0.012	0.011	0.010	0.008
	1.2	0.06	0.022	0.020	0.018	0.015
	1.4	0.07	0.024	0.022	0.019	0.017
	1.5	0.08	0.025	0.023	0.020	0.018
	1.6	0.08	0.026	0.023	0.021	0.018
	1.8	0.09	0.028	0.025	0.022	0.020
	2	0.10	0.030	0.027	0.024	0.021

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

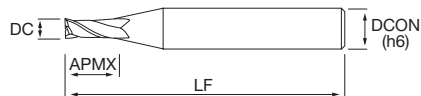
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

MEXM2SC

- Cylindrical shank
- 2 flutes
- Short cutting length
- Miniature



P	M	K	N	S	H
★		★			★



DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
0.2	0/-0.010	4	h6	0.3	50	2	MEXM2SC0020	◎
0.3	0/-0.010	4	h6	0.4	50	2	MEXM2SC0030	●
0.4	0/-0.010	4	h6	0.6	50	2	MEXM2SC0040	●
0.5	0/-0.010	4	h6	0.7	50	2	MEXM2SC0050	●
0.6	0/-0.010	4	h6	0.9	50	2	MEXM2SC0060	●
0.7	0/-0.010	4	h6	1	50	2	MEXM2SC0070	●
0.8	0/-0.010	4	h6	1.2	50	2	MEXM2SC0080	●
0.9	0/-0.010	4	h6	1.4	50	2	MEXM2SC0090	◎

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

MEXM2SC

	Material Group ISO 513		P2 P3 P4 K1 K2	P4 P5 K3	P6 K4	H1 H4 H5
	Hardness/Rm		≤1000 N/mm ²	≤35 HRC	35÷45 HRC	45÷55 HRC
	ap x ae		ap x D	ap x D	ap x D	ap x D
	Vc (m/min)		70÷110	50÷90	40÷60	20÷40
	DC (mm)	ap (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	0.2	0.01	0.003	0.003	0.002	0.002
	0.3	0.02	0.004	0.004	0.003	0.003
	0.4	0.02	0.006	0.005	0.005	0.004
	0.5	0.03	0.007	0.006	0.006	0.005
	0.6	0.03	0.008	0.007	0.006	0.006
	0.8	0.04	0.010	0.009	0.008	0.007
	0.9	0.05	0.012	0.011	0.010	0.008

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

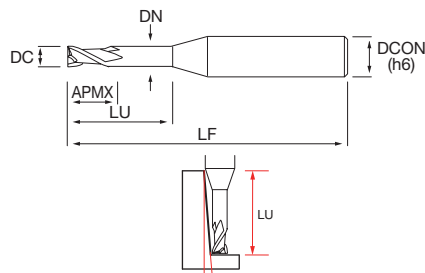
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

MEXLN2

- Cylindrical shank
- 2 flutes
- Extended and reduced neck

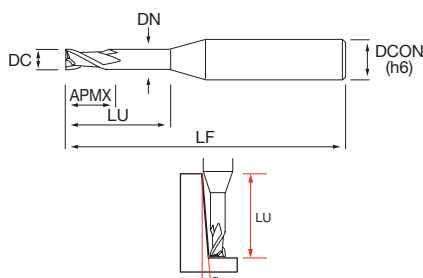


DC	DC tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
0.2	0/-0.010	4	0.3	0.5	0.16	50	2	0.57	0.59	0.61	0.63	0.68	MEXLN2002005	⊙
0.2	0/-0.010	4	0.3	1	0.16	50	2	1.09	1.12	1.16	1.21	1.3	MEXLN200201	⊙
0.2	0/-0.010	4	0.3	1.5	0.16	50	2	1.6	1.66	1.72	1.78	1.91	MEXLN2002015	⊙
0.3	0/-0.010	4	0.4	1	0.26	50	2	1.09	1.12	1.16	1.21	1.3	MEXLN200301	●
0.3	0/-0.010	4	0.4	2	0.26	50	2	2.12	2.19	2.27	2.35	2.53	MEXLN200302	⊙
0.3	0/-0.010	4	0.4	3	0.26	50	2	3.15	3.26	3.38	3.5	3.76	MEXLN200303	●
0.4	0/-0.010	4	0.6	2	0.37	50	2	2.12	2.19	2.27	2.35	2.53	MEXLN200402	●
0.4	0/-0.010	4	0.6	3	0.37	50	2	3.15	3.26	3.38	3.5	3.76	MEXLN200403	●
0.4	0/-0.010	4	0.6	4	0.37	50	2	4.19	4.33	4.49	4.65	5	MEXLN200404	●
0.4	0/-0.010	4	0.6	5	0.37	50	2	5.22	5.4	5.59	5.79	6.23	MEXLN200405	●
0.5	0/-0.010	4	0.7	2	0.45	50	2	2.16	2.23	2.31	2.4	2.57	MEXLN200502	●
0.5	0/-0.010	4	0.7	4	0.45	50	2	4.23	4.37	4.53	4.69	5.04	MEXLN200504	●
0.5	0/-0.010	4	0.7	6	0.45	50	2	6.29	6.51	6.74	6.98	7.51	MEXLN200506	●
0.5	0/-0.010	4	0.7	8	0.45	50	2	8.36	8.65	8.96	9.28	9.98	MEXLN200508	●
0.6	0/-0.010	4	0.9	2	0.55	50	2	2.16	2.23	2.31	2.4	2.57	MEXLN200602	●
0.6	0/-0.010	4	0.9	4	0.55	50	2	4.23	4.37	4.53	4.69	5.04	MEXLN200604	●
0.6	0/-0.010	4	0.9	6	0.55	50	2	6.29	6.51	6.74	6.98	7.51	MEXLN200606	⊙
0.6	0/-0.010	4	0.9	8	0.55	50	2	8.36	8.65	8.96	9.28	9.98	MEXLN200608	●
0.6	0/-0.010	4	0.9	10	0.55	50	2	10.43	10.79	11.17	11.57	12.44	MEXLN200610	●
0.7	0/-0.010	4	1	2	0.65	50	2	2.16	2.23	2.31	2.4	2.57	MEXLN200702	●
0.7	0/-0.010	4	1	4	0.65	50	2	4.23	4.37	4.53	4.69	5.04	MEXLN200704	●
0.7	0/-0.010	4	1	6	0.65	50	2	6.29	6.51	6.74	6.98	7.51	MEXLN200706	●
0.7	0/-0.010	4	1	8	0.65	50	2	8.36	8.65	8.96	9.28	9.98	MEXLN200708	●
0.7	0/-0.010	4	1	10	0.65	50	2	10.43	10.79	11.17	11.57	12.44	MEXLN200710	⊙
0.8	0/-0.010	4	1.2	4	0.75	50	2	4.23	4.37	4.53	4.69	5.04	MEXLN200804	●
0.8	0/-0.010	4	1.2	6	0.75	50	2	6.29	6.51	6.74	6.98	7.51	MEXLN200806	●
0.8	0/-0.010	4	1.2	8	0.75	50	2	8.36	8.65	8.96	9.28	9.98	MEXLN200808	●
0.8	0/-0.010	4	1.2	10	0.75	50	2	10.43	10.79	11.17	11.57	12.44	MEXLN200810	●
0.8	0/-0.010	4	1.2	12	0.75	50	2	12.49	12.93	13.38	13.87	14.91	MEXLN200812	⊙
0.9	0/-0.010	4	1.4	6	0.85	50	2	6.29	6.51	6.74	6.98	7.51	MEXLN200906	⊙
0.9	0/-0.010	4	1.4	8	0.85	50	2	8.36	8.65	8.96	9.28	9.98	MEXLN200908	●
0.9	0/-0.010	4	1.4	10	0.85	50	2	10.43	10.79	11.17	11.57	12.44	MEXLN200910	⊙
0.9	0/-0.010	4	1.4	15	0.85	50	2	15.6	16.14	16.71	17.31	18.61	MEXLN200915	⊙
1	0/-0.015	4	1.5	6	0.95	50	2	6.39	6.61	6.84	7.09	7.62	MEXLN201006	●
1	0/-0.015	4	1.5	8	0.95	50	2	8.46	8.75	9.06	9.38	10.09	MEXLN201008	●
1	0/-0.015	4	1.5	10	0.95	50	2	10.52	10.89	11.27	11.68	12.56	MEXLN201010	●
1	0/-0.015	4	1.5	12	0.95	50	2	12.59	13.03	13.49	13.97	15.02	MEXLN201012	●
1	0/-0.015	4	1.5	14	0.95	50	2	14.66	15.17	15.7	16.27	17.49	MEXLN201014	●
1	0/-0.015	4	1.5	16	0.95	50	2	16.73	17.3	17.92	18.56	19.96	MEXLN201016	●
1.2	0/-0.015	4	1.8	6	1.15	50	2	6.39	6.61	6.84	7.09	7.62	MEXLN201206	●
1.2	0/-0.015	4	1.8	8	1.15	50	2	8.46	8.75	9.06	9.38	10.09	MEXLN201208	●
1.2	0/-0.015	4	1.8	10	1.15	50	2	10.52	10.89	11.27	11.68	12.56	MEXLN201210	●
1.2	0/-0.015	4	1.8	12	1.15	50	2	12.59	13.03	13.49	13.97	15.02	MEXLN201212	●
1.4	0/-0.015	4	2.1	6	1.35	50	2	6.39	6.61	6.84	7.09	7.62	MEXLN201406	●
1.4	0/-0.015	4	2.1	8	1.35	50	2	8.46	8.75	9.06	9.38	10.09	MEXLN201408	⊙

★ 1st choice, ☆ suitable, ● stock standard, ⊙ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

MEXLN2

- Cylindrical shank
- 2 flutes
- Extended and reduced neck

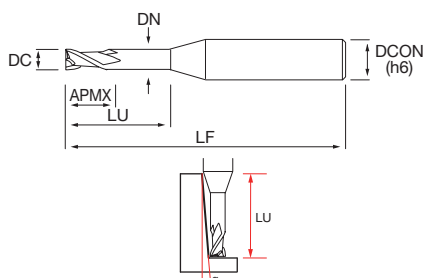


DC	DC tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
1.4	0/-0.015	4	2.1	10	1.35	50	2	10.52	10.89	11.27	11.68	12.56	MEXLN201410	●
1.4	0/-0.015	4	2.1	12	1.35	50	2	12.59	13.03	13.49	13.97	15.02	MEXLN201412	●
1.4	0/-0.015	4	2.1	16	1.35	50	2	16.73	17.3	17.92	18.56	19.96	MEXLN201416	●
1.5	0/-0.015	4	2.3	6	1.45	50	2	6.39	6.61	6.84	7.09	7.62	MEXLN201506	●
1.5	0/-0.015	4	2.3	8	1.45	50	2	8.46	8.75	9.06	9.38	10.09	MEXLN201508	●
1.5	0/-0.015	4	2.3	10	1.45	50	2	10.52	10.89	11.27	11.68	12.56	MEXLN201510	●
1.5	0/-0.015	4	2.3	12	1.45	50	2	12.59	13.03	13.49	13.97	15.02	MEXLN201512	●
1.5	0/-0.015	4	2.3	14	1.45	50	2	14.66	15.17	15.7	16.27	17.49	MEXLN201514	●
1.5	0/-0.015	4	2.3	16	1.45	50	2	16.73	17.3	17.92	18.56	19.96	MEXLN201516	●
1.5	0/-0.015	4	2.3	18	1.45	60	2	18.79	19.44	20.13	20.86	22.43	MEXLN201518	●
1.5	0/-0.015	4	2.3	20	1.45	60	2	20.86	21.58	22.35	23.15	-	MEXLN201520	●
1.6	0/-0.015	4	2.4	6	1.55	50	2	6.39	6.61	6.84	7.09	7.62	MEXLN201606	●
1.6	0/-0.015	4	2.4	8	1.55	50	2	8.46	8.75	9.06	9.38	10.09	MEXLN201608	●
1.6	0/-0.015	4	2.4	10	1.55	50	2	10.52	10.89	11.27	11.68	12.56	MEXLN201610	●
1.6	0/-0.015	4	2.4	12	1.55	50	2	12.59	13.03	13.49	13.97	15.02	MEXLN201612	●
1.6	0/-0.015	4	2.4	14	1.55	50	2	14.66	15.17	15.7	16.27	17.49	MEXLN201614	●
1.6	0/-0.015	4	2.4	16	1.55	50	2	16.73	17.3	17.92	18.56	19.96	MEXLN201616	●
1.6	0/-0.015	4	2.4	18	1.55	60	2	18.79	19.44	20.13	20.86	22.43	MEXLN201618	●
1.6	0/-0.015	4	2.4	20	1.55	60	2	20.86	21.58	22.35	23.15	-	MEXLN201620	●
1.8	0/-0.015	4	2.7	6	1.75	50	2	6.39	6.61	6.84	7.09	7.62	MEXLN201806	●
1.8	0/-0.015	4	2.7	8	1.75	50	2	8.46	8.75	9.06	9.38	10.09	MEXLN201808	●
1.8	0/-0.015	4	2.7	10	1.75	50	2	10.52	10.89	11.27	11.68	12.56	MEXLN201810	●
1.8	0/-0.015	4	2.7	12	1.75	50	2	12.59	13.03	13.49	13.97	15.02	MEXLN201812	●
1.8	0/-0.015	4	2.7	16	1.75	50	2	16.73	17.3	17.92	18.56	19.96	MEXLN201816	●
1.8	0/-0.015	4	2.7	20	1.75	60	2	20.86	21.58	22.35	23.15	-	MEXLN201820	●
2	0/-0.015	4	3	6	1.95	50	2	6.39	6.61	6.84	7.09	7.62	MEXLN202006	●
2	0/-0.015	4	3	8	1.95	50	2	8.46	8.75	9.06	9.38	10.09	MEXLN202008	●
2	0/-0.015	4	3	10	1.95	50	2	10.52	10.89	11.27	11.68	12.56	MEXLN202010	●
2	0/-0.015	4	3	12	1.95	50	2	12.59	13.03	13.49	13.97	15.02	MEXLN202012	●
2	0/-0.015	4	3	14	1.95	50	2	14.66	15.17	15.7	16.27	17.49	MEXLN202014	●
2	0/-0.015	4	3	16	1.95	50	2	16.73	17.3	17.92	18.56	-	MEXLN202016	●
2	0/-0.015	4	3	18	1.95	60	2	18.79	19.44	20.13	20.86	-	MEXLN202018	●
2	0/-0.015	4	3	20	1.95	60	2	20.86	21.58	22.35	23.15	-	MEXLN202020	●
2	0/-0.015	4	3	25	1.95	75	2	26.03	26.93	27.88	-	-	MEXLN202025	●
2	0/-0.015	4	3	30	1.95	75	2	31.2	32.28	33.42	-	-	MEXLN202030	●
2.5	0/-0.020	4	3.7	8	2.4	50	2	8.46	8.75	9.06	9.38	10.09	MEXLN202508	●
2.5	0/-0.020	4	3.7	10	2.4	50	2	10.52	10.89	11.27	11.68	12.56	MEXLN202510	●
2.5	0/-0.020	4	3.7	12	2.4	50	2	12.59	13.03	13.49	13.97	-	MEXLN202512	●
2.5	0/-0.020	4	3.7	16	2.4	50	2	16.73	17.3	17.92	18.56	-	MEXLN202516	●
2.5	0/-0.020	4	3.7	20	2.4	60	2	20.86	21.58	22.35	-	-	MEXLN202520	●
2.5	0/-0.020	4	3.7	25	2.4	60	2	26.03	26.93	27.88	-	-	MEXLN202525	●
2.5	0/-0.020	4	3.7	30	2.4	75	2	31.2	32.28	-	-	-	MEXLN202530	●
3	0/-0.025	6	4.5	8	2.85	50	2	8.65	8.95	9.26	9.6	10.31	MEXLN203008	●
3	0/-0.025	6	4.5	10	2.85	50	2	10.72	11.09	11.48	11.89	12.78	MEXLN203010	●
3	0/-0.025	6	4.5	12	2.85	50	2	12.78	13.23	13.69	14.18	15.25	MEXLN203012	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

MEXLN2

- Cylindrical shank
- 2 flutes
- Extended and reduced neck



P	M	K	N	S	H
★		★			★

OSAWA
NORM

MEX

NMG
ENDLESS
ORANGE

<55
HRC

FHA 40°

SQUARE

ZEFP 2

SQUARE RIB

DC	DC tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
3	0/-0.025	6	4.5	14	2.85	50	2	14.85	15.36	15.91	16.48	17.72	MEXLN203014	●
3	0/-0.025	6	4.5	16	2.85	60	2	16.92	17.5	18.12	18.77	20.18	MEXLN203016	●
3	0/-0.025	6	4.5	18	2.85	60	2	18.99	19.64	20.34	21.07	22.65	MEXLN203018	●
3	0/-0.025	6	4.5	20	2.85	60	2	21.05	21.78	22.55	23.36	25.12	MEXLN203020	●
3	0/-0.025	6	4.5	25	2.85	75	2	26.22	27.13	28.09	29.1	-	MEXLN203025	●
4	0/-0.025	6	4.5	10	3.85	60	2	10.91	11.29	11.68	12.1	13	MEXLN204010	●
4	0/-0.025	6	4.5	15	3.85	60	2	16.08	16.63	17.22	17.84	19.17	MEXLN204015	◎
4	0/-0.025	6	4.5	20	3.85	60	2	21.25	21.98	22.76	23.57	-	MEXLN204020	●
4	0/-0.025	6	4.5	25	3.85	75	2	26.41	27.33	28.29	-	-	MEXLN204025	●
4	0/-0.025	6	4.5	30	3.85	75	2	31.58	32.67	33.83	-	-	MEXLN204030	●
4	0/-0.025	6	4.5	40	3.85	75	2	41.92	43.37	-	-	-	MEXLN204040	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

MEXLN2

Material Group ISO 513			P2 P3 P4 K1 K2	P4 P5 K3	P6 K4	H1 H4 H5
Hardness/Rm			≤1000 N/mm ²	≤35 HRC	35÷45 HRC	45÷55 HRC
ap x ae			ap x D	ap x D	ap x D	ap x D
Vc (m/min)			70÷110	50÷90	40÷60	20÷40
DC (mm)	LU (mm)	ap (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
0.2	≤ 6D	0.01	0.003	0.003	0.002	0.002
	≤ 8D	0.01	0.003	0.002	0.002	0.002
	≤ 10D	0.01	0.002	0.002	0.002	0.001
	≤ 12D	0.01	0.002	0.001	0.001	0.001
0.3	≤ 6D	0.02	0.004	0.004	0.003	0.003
	≤ 8D	0.01	0.004	0.003	0.003	0.003
	≤ 10D	0.01	0.003	0.003	0.003	0.002
	≤ 12D	0.01	0.003	0.003	0.002	0.002
0.4	≤ 6D	0.02	0.006	0.005	0.005	0.004
	≤ 8D	0.02	0.005	0.005	0.004	0.004
	≤ 10D	0.01	0.005	0.004	0.004	0.003
	≤ 12D	0.01	0.004	0.004	0.003	0.003
0.5	≤ 6D	0.03	0.007	0.006	0.006	0.005
	≤ 8D	0.02	0.006	0.006	0.005	0.004
	≤ 10D	0.02	0.006	0.005	0.004	0.004
	≤ 12D	0.01	0.005	0.004	0.004	0.003
0.6	≤ 6D	0.03	0.008	0.007	0.006	0.006
	≤ 8D	0.03	0.007	0.006	0.006	0.005
	≤ 10D	0.02	0.006	0.006	0.005	0.004
	≤ 12D	0.02	0.006	0.005	0.004	0.004
0.8	≤ 6D	0.04	0.010	0.009	0.008	0.007
	≤ 8D	0.03	0.009	0.008	0.007	0.006
	≤ 10D	0.03	0.008	0.007	0.006	0.006
	≤ 12D	0.02	0.007	0.006	0.006	0.005
1	≤ 6D	0.05	0.012	0.011	0.010	0.008
	≤ 8D	0.04	0.011	0.010	0.009	0.008
	≤ 10D	0.04	0.010	0.009	0.008	0.007
	≤ 12D	0.03	0.008	0.008	0.007	0.006
1.2	≤ 6D	0.06	0.022	0.020	0.018	0.015
	≤ 8D	0.05	0.020	0.018	0.016	0.014
	≤ 10D	0.04	0.018	0.016	0.014	0.012
	≤ 12D	0.03	0.015	0.014	0.012	0.011
1.4	≤ 6D	0.07	0.024	0.022	0.019	0.017
	≤ 8D	0.06	0.022	0.019	0.017	0.015
	≤ 10D	0.05	0.019	0.017	0.015	0.013
	≤ 12D	0.04	0.017	0.015	0.013	0.012
	≤ 15D	0.03	0.014	0.013	0.012	0.010
1.5	≥ 15D	0.02	0.012	0.011	0.010	0.008
	≤ 6D	0.08	0.025	0.023	0.020	0.018
	≤ 8D	0.06	0.023	0.020	0.018	0.016
	≤ 10D	0.05	0.020	0.018	0.016	0.014
	≤ 12D	0.04	0.018	0.016	0.014	0.012
1.6	≤ 15D	0.03	0.015	0.014	0.012	0.011
	≥ 15D	0.02	0.013	0.011	0.010	0.009
	≤ 6D	0.08	0.026	0.023	0.021	0.018
	≤ 8D	0.07	0.023	0.021	0.019	0.016
	≤ 10D	0.06	0.021	0.019	0.017	0.015
1.6	≤ 12D	0.04	0.018	0.016	0.015	0.013
	≤ 15D	0.04	0.016	0.014	0.012	0.011
	≥ 15D	0.02	0.013	0.012	0.010	0.009



SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

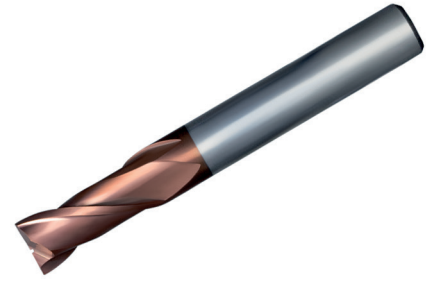
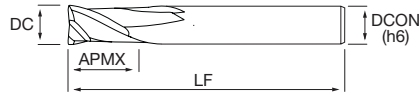
MEXLN2

Material Group ISO 513			P2	P3	P4	K1	K2	P4	P5	K3	P6	K4	H1	H4	H5
Hardness/Rm			≤1000 N/mm ²					≤35 HRC			35÷45 HRC		45÷55 HRC		
ap x ae			ap x D					ap x D			ap x D		ap x D		
Vc (m/min)			70÷110					50÷90			40÷60		20÷40		
DC (mm)	LU (mm)	ap (mm)	fz (mm/z)					fz (mm/z)			fz (mm/z)		fz (mm/z)		
1.8	≤ 6D	0.09	0.028					0.025			0.022		0.020		
	≤ 8D	0.08	0.025					0.023			0.020		0.018		
	≤ 10D	0.06	0.022					0.020			0.018		0.016		
	≤ 12D	0.05	0.020					0.018			0.016		0.014		
	≤ 15D	0.04	0.017					0.015			0.013		0.012		
	≥ 15D	0.03	0.014					0.013			0.011		0.010		
2	≤ 6D	0.10	0.030					0.027			0.024		0.021		
	≤ 8D	0.09	0.027					0.024			0.022		0.019		
	≤ 10D	0.07	0.024					0.022			0.019		0.017		
	≤ 12D	0.06	0.021					0.019			0.017		0.015		
	≤ 15D	0.05	0.018					0.016			0.014		0.013		
	≥ 15D	0.03	0.018					0.016			0.014		0.013		
2.5	≤ 6D	0.13	0.035					0.032			0.028		0.025		
	≤ 8D	0.11	0.032					0.028			0.025		0.022		
	≤ 10D	0.09	0.028					0.025			0.022		0.020		
	≤ 12D	0.07	0.025					0.022			0.020		0.017		
	≤ 15D	0.06	0.021					0.019			0.017		0.015		
	≥ 15D	0.04	0.021					0.019			0.017		0.015		
3	≤ 6D	0.15	0.040					0.036			0.032		0.028		
	≤ 8D	0.13	0.036					0.032			0.029		0.025		
	≤ 10D	0.11	0.032					0.029			0.026		0.022		
	≤ 12D	0.08	0.028					0.025			0.022		0.020		
	≤ 15D	0.07	0.024					0.022			0.019		0.017		
	≥ 15D	0.05	0.024					0.022			0.019		0.017		
4	≤ 6D	0.20	0.050					0.045			0.040		0.035		
	≤ 8D	0.17	0.045					0.041			0.036		0.032		
	≤ 10D	0.14	0.040					0.036			0.032		0.028		
	≤ 12D	0.11	0.035					0.032			0.028		0.025		
	≤ 15D	0.09	0.030					0.027			0.024		0.021		
	≥ 15D	0.06	0.030					0.027			0.024		0.021		



MEXCS2

- Cylindrical shank
- 2 flutes



P	M	K	N	S	H
★		★			★



DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
1	0/-0.012	4	h6	2.5	40	2	MEXCS2010	●
1.5	0/-0.012	4	h6	4	40	2	MEXCS2015	●
2	0/-0.012	4	h6	6	40	2	MEXCS2020	●
2.5	0/-0.012	4	h6	8	40	2	MEXCS2025	●
3	0/-0.012	6	h6	8	55	2	MEXCS2030	●
3.5	0/-0.012	6	h6	10	55	2	MEXCS2035	●
4	0/-0.012	6	h6	10	55	2	MEXCS2040	●
4.5	0/-0.012	6	h6	12	55	2	MEXCS2045	●
5	0/-0.012	6	h6	13	55	2	MEXCS2050	●
5.5	0/-0.012	6	h6	14	55	2	MEXCS2055	●
6	0/-0.015	6	h6	15	60	2	MEXCS2060	●
6.5	0/-0.015	8	h6	17	65	2	MEXCS2065	●
7	0/-0.015	8	h6	18	65	2	MEXCS2070	●
8	0/-0.015	8	h6	20	70	2	MEXCS2080	●
8.5	0/-0.015	10	h6	21	70	2	MEXCS2085	●
9	0/-0.015	10	h6	23	70	2	MEXCS2090	●
10	0/-0.015	10	h6	22	75	2	MEXCS2100	●
11	0/-0.015	12	h6	28	75	2	MEXCS2110	●
12	0/-0.015	12	h6	26	80	2	MEXCS2120	●
14	0/-0.020	14	h6	32	90	2	MEXCS2140	●
16	0/-0.020	16	h6	32	90	2	MEXCS2160	●
18	0/-0.020	18	h6	38	100	2	MEXCS2180	●
20	0/-0.020	20	h6	38	100	2	MEXCS2200	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

MEXCS2

	Material Group ISO 513	P2 P3 P4 K1 K2	P4 P5 K3	P6 K4	H1 H4 H5
	Hardness/Rm	≤1000 N/mm ²	≤35 HRC	35÷45 HRC	45÷55 HRC
	ap x ae	0.5D x D	0.3D x D	0.2D x D	0.1D x D
	Vc (m/min)	70÷110	50÷90	40÷60	20÷40
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.006	0.005	0.005	0.004
	2	0.010	0.009	0.008	0.007
	3	0.014	0.013	0.012	0.010
	4	0.020	0.018	0.016	0.014
	5	0.026	0.023	0.020	0.018
	6	0.032	0.029	0.026	0.023
	8	0.038	0.034	0.031	0.027
	10	0.046	0.041	0.037	0.032
	12	0.055	0.050	0.044	0.039
	14	0.064	0.057	0.051	0.045
	16	0.072	0.065	0.058	0.051
	18	0.082	0.074	0.066	0.058
	20	0.094	0.084	0.075	0.065

< D3 mm: ap = 0.1D ÷ 0.2D

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

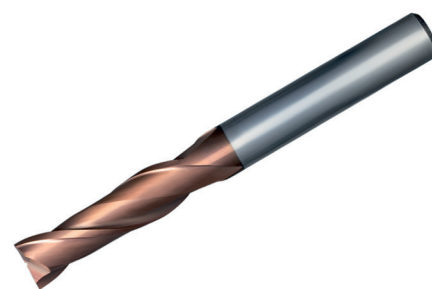
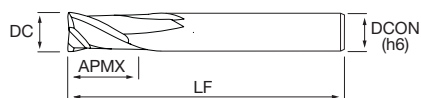
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

MEXCL2

- Cylindrical shank
- 2 flutes
- Long



P	M	K	N	S	H
★		★			★



DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
1	0/-0.030	6	h6	8	60	2	MEXCL2010	●
1.5	0/-0.030	6	h6	12	60	2	MEXCL2015	●
2	0/-0.030	6	h6	12	60	2	MEXCL2020	●
3	0/-0.030	6	h6	15	60	2	MEXCL2030	●
4	0/-0.030	6	h6	20	60	2	MEXCL2040	●
5	0/-0.030	6	h6	25	70	2	MEXCL2050	●
6	0/-0.030	6	h6	25	70	2	MEXCL2060	●
8	0/-0.030	8	h6	30	80	2	MEXCL2080	●
10	0/-0.030	10	h6	35	90	2	MEXCL2100	●
12	0/-0.030	12	h6	40	90	2	MEXCL2120	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

MEXCL2

	Material Group ISO 513	P2 P3 P4 K1 K2	P4 P5 K3	P6 K4	H1 H4 H5
	Hardness/Rm	≤1000 N/mm ²	≤35 HRC	35÷45 HRC	45÷55 HRC
	ap x ae	0.5D x D	0.3D x D	0.2D x D	0.1D x D
	Vc (m/min)	70÷110	50÷90	40÷60	20÷40
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.005	0.005	0.004	0.004
	1.5	0.006	0.005	0.005	0.004
	2	0.009	0.008	0.007	0.006
	3	0.012	0.011	0.010	0.008
	4	0.018	0.016	0.014	0.013
	5	0.024	0.022	0.019	0.017
	6	0.029	0.026	0.023	0.020
	8	0.035	0.032	0.028	0.025
	10	0.041	0.037	0.033	0.029
	12	0.050	0.045	0.040	0.035

≤ D3 mm: ap = 0.4 mm

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

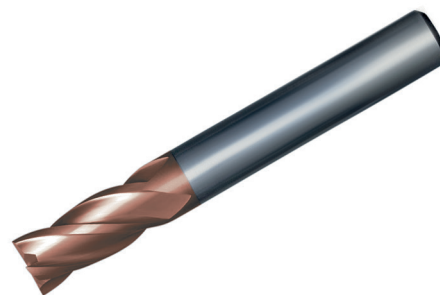
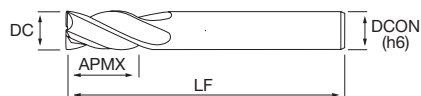
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

MEX400

- Cylindrical shank
- 4 flutes unequal pitch



P	M	K	N	S	H
★		★			★



DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
1	0/-0.010	4	h6	3	50	4	MEX400010	●
1.5	0/-0.010	4	h6	4.5	50	4	MEX400015	●
2	0/-0.015	4	h6	6	40	4	MEX400020	●
2.5	0/-0.015	4	h6	8	40	4	MEX400025	●
3	0/-0.015	6	h6	8	55	4	MEX400030	●
3.5	0/-0.020	6	h6	10	55	4	MEX400035	●
4	0/-0.020	6	h6	11	55	4	MEX400040	●
4.5	0/-0.020	6	h6	11	45	4	MEX400045	●
5	0/-0.020	6	h6	13	55	4	MEX400050	●
5.5	0/-0.020	6	h6	13	55	4	MEX400055	●
6	0/-0.020	6	h6	15	60	4	MEX400060	●
6.5	0/-0.020	8	h6	17	65	4	MEX400065	●
7	0/-0.020	8	h6	18	65	4	MEX400070	●
8	0/-0.020	8	h6	20	70	4	MEX400080	●
9	0/-0.020	10	h6	23	70	4	MEX400090	●
10	0/-0.020	10	h6	22	75	4	MEX400100	●
11	0/-0.020	12	h6	28	75	4	MEX400110	●
12	-0.005/-0.025	12	h6	26	80	4	MEX400120	●
14	-0.010/-0.025	14	h6	35	90	4	MEX400140	●
16	-0.010/-0.025	16	h6	32	100	4	MEX400160	●
20	-0.010/-0.025	20	h6	40	100	4	MEX400200	●
25	-0.010/-0.025	25	h6	40	100	4	MEX400250	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

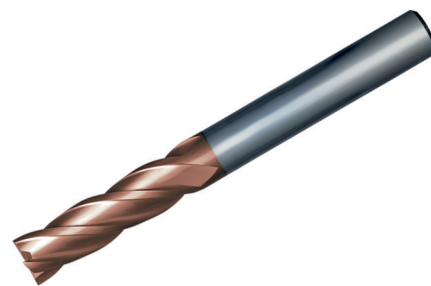
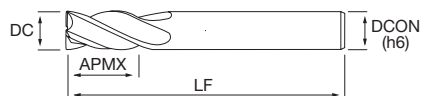
Cutting Parameters

MEX400

	Material Group ISO 513	P2 P3 P4 K1 K2	P4 P5 K3	P6 K4	H1 H4 H5
	Hardness/Rm	≤1000 N/mm ²	≤35 HRC	35÷45 HRC	45÷55 HRC
	ap x ae	D x 0.05D	D x 0.05D	D x 0.05D	D x 0.05D
	Vc (m/min)	120÷160	100÷140	90÷120	80÷100
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.007	0.006		0.006
	2	0.010	0.010	0.010	0.010
	3	0.016	0.016	0.016	0.016
	4	0.027	0.027	0.027	0.027
	5	0.036	0.036	0.036	0.036
	6	0.043	0.043	0.043	0.043
	8	0.060	0.060	0.060	0.060
	10	0.085	0.085	0.085	0.085
	12	0.100	0.100	0.100	0.100
	14	0.120	0.120	0.120	0.120
	16	0.150	0.150	0.150	0.150
	18	0.175	0.175	0.175	0.175
	20	0.200	0.200	0.200	0.200
	22	0.215	0.215	0.215	0.215
	25	0.225	0.225	0.225	0.225

MEXCL4

- Cylindrical shank
- 4 flutes
- Long



P	M	K	N	S	H
★		★			★



DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
2	0/-0.020	6	h6	8	60	4	MEXCL4020	●
3	0/-0.020	6	h6	15	60	4	MEXCL4030	●
3	0/-0.030	6	h6	25	100	4	MEXCL4030100	●
4	0/-0.020	6	h6	20	60	4	MEXCL4040	●
4	0/-0.030	6	h6	31	100	4	MEXCL4040100	●
5	0/-0.020	6	h6	25	70	4	MEXCL4050	●
5	0/-0.030	6	h6	31	100	4	MEXCL4050100	●
6	0/-0.020	6	h6	25	70	4	MEXCL4060	●
6	0/-0.030	6	h6	38	100	4	MEXCL4060100	●
8	0/-0.020	8	h6	30	80	4	MEXCL4080	●
8	0/-0.030	8	h6	41	100	4	MEXCL4080100	●
10	0/-0.020	10	h6	35	90	4	MEXCL4100	●
10	0/-0.035	10	h6	57	125	4	MEXCL4100125	●
12	0/-0.020	12	h6	40	90	4	MEXCL4120	●
12	0/-0.035	12	h6	75	150	4	MEXCL4120150	●
14	0/-0.020	16	h6	50	110	4	MEXCL4140	●
14	0/-0.035	14	h6	75	150	4	MEXCL4140150	●
16	0/-0.020	16	h6	50	110	4	MEXCL4160	●
16	0/-0.035	16	h6	75	150	4	MEXCL4160150	●
20	0/-0.020	20	h6	50	110	4	MEXCL4200	●
20	0/-0.035	20	h6	75	150	4	MEXCL4200150	●
25	0/-0.050	25	h6	70	130	4	MEXCL4250	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

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K - HSS END MILLS

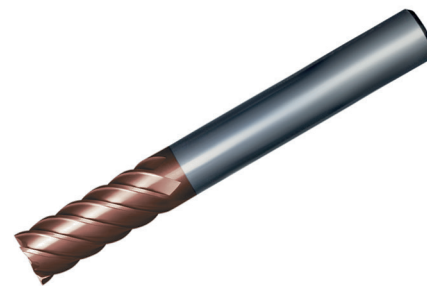
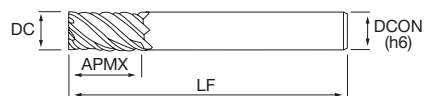
L - CARBIDE BURRS

MEXCL4

	Material Group ISO 513	P2 P3 P4 K1 K2	P4 P5 K3	P6 K4	H1 H4 H5
	Hardness/Rm	≤1000 N/mm ²	≤35 HRC	35÷45 HRC	45÷55 HRC
	ap x ae	1.5D x 0.1D	1.5D x 0.05D	1.5D x 0.05D	1.5D x 0.05D
	Vc (m/min)	60÷100	50÷70	30÷50	20÷40
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	2	0.014	0.013	0.012	0.010
	3	0.022	0.020	0.017	0.015
	4	0.029	0.026	0.023	0.020
	5	0.033	0.029	0.026	0.023
	6	0.036	0.033	0.029	0.025
	8	0.047	0.042	0.038	0.033
	10	0.060	0.054	0.048	0.042
	12	0.072	0.065	0.058	0.051
	14	0.083	0.075	0.066	0.058
	16	0.094	0.084	0.075	0.065
	20	0.119	0.107	0.095	0.083
	25	0.150	0.135	0.120	0.105

MEXCSHM

- Cylindrical shank
- Multi flute



P	M	K	N	S	H
★		★			★



DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
3	0/-0.020	6	h6	8	50	6	MEXCSHM030	●
4	0/-0.020	6	h6	11	50	6	MEXCSHM040	●
5	0/-0.020	6	h6	13	50	6	MEXCSHM050	●
6	0/-0.020	6	h6	15	60	6	MEXCSHM060	●
8	0/-0.020	8	h6	20	70	6	MEXCSHM080	●
10	0/-0.020	10	h6	25	80	6	MEXCSHM100	●
12	0/-0.020	12	h6	30	80	6	MEXCSHM120	●
14	0/-0.020	14	h6	30	90	6	MEXCSHM140	●
16	0/-0.020	16	h6	40	100	6	MEXCSHM160	●
18	0/-0.020	18	h6	35	100	8	MEXCSHM180	●
20	0/-0.020	20	h6	50	100	8	MEXCSHM200	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

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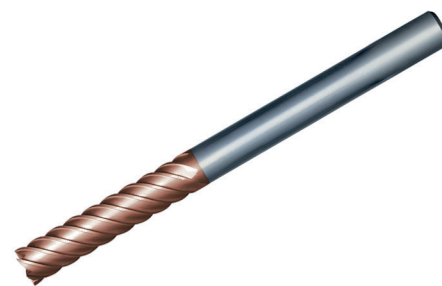
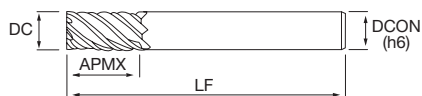
L - CARBIDE BURRS

MEXCSHM

	Material Group ISO 513	P2 P3 P4 K1 K2	P4 P5 K3	P6 K4	H1 H4 H5
	Hardness/Rm	≤1000 N/mm ²	≤35 HRC	35÷45 HRC	45÷55 HRC
	ap x ae	1.5D x 0.1D	1.5D x 0.1D	1.5D x 0.05D	1.5D x 0.05D
	Vc (m/min)	120÷160	90÷130	60÷100	50÷70
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	0.008	0.008	0.007	0.006
	4	0.012	0.011	0.010	0.008
	5	0.014	0.013	0.012	0.010
	6	0.018	0.016	0.014	0.013
	8	0.028	0.025	0.022	0.019
	10	0.034	0.030	0.027	0.024
	12	0.041	0.037	0.033	0.029
	14	0.048	0.043	0.038	0.034
	16	0.056	0.051	0.045	0.039
	18	0.065	0.059	0.052	0.046
	20	0.073	0.066	0.058	0.051

MEXCLHM

- Cylindrical shank
- Multi flute
- Long



P	M	K	N	S	H
★		★			★



DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
3	0/-0.030	6	h6	19	75	6	MEXCLHM030	●
4	0/-0.030	6	h6	19	75	6	MEXCLHM040	◎
5	0/-0.030	6	h6	19	75	6	MEXCLHM050	●
6	0/-0.030	6	h6	25	80	6	MEXCLHM060	●
8	0/-0.030	8	h6	40	100	6	MEXCLHM080	●
10	0/-0.030	10	h6	45	120	6	MEXCLHM100	●
12	0/-0.030	12	h6	60	120	6	MEXCLHM120	●
16	0/-0.030	16	h6	80	150	6	MEXCLHM160	●
20	0/-0.030	20	h6	80	150	8	MEXCLHM200	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

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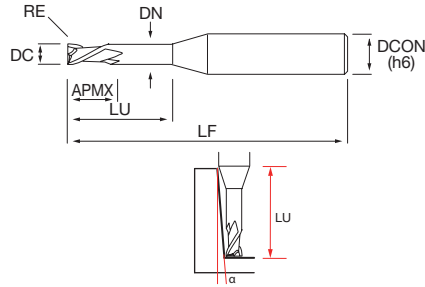
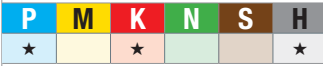
Cutting Parameters

MEXCLHM

	Material Group ISO 513	P2 P3 P4 K1 K2	P4 P5 K3	P6 K4	H1 H4 H5
	Hardness/Rm	≤1000 N/mm ²	≤35 HRC	35÷45 HRC	45÷55 HRC
	ap x ae	1.5D x 0.05D	1.5D x 0.05D	1.5D x 0.05D	1.5D x 0.05D
	Vc (m/min)	80÷120	50÷90	40÷60	20÷40
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	0.007	0.006	0.006	0.005
	4	0.010	0.009	0.008	0.007
	5	0.012	0.011	0.010	0.009
	6	0.015	0.014	0.012	0.011
	8	0.023	0.021	0.019	0.016
	10	0.029	0.026	0.023	0.020
	12	0.035	0.031	0.028	0.024
	14	0.041	0.037	0.033	0.029
	16	0.048	0.043	0.038	0.034
	18	0.055	0.050	0.044	0.039
	20	0.063	0.057	0.050	0.044

MEXLN2R

- Cylindrical shank
- 2 flutes
- Extended and reduced neck
- Corner radius



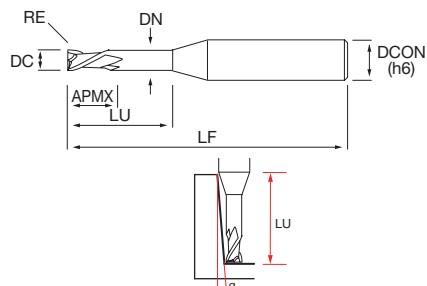
DC	DC tol.	RE	RE tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
0.3	0/-0.010	0.05	0/-0.010	4	0.4	1	0.26	50	2	1.08	1.12	1.15	1.19	1.25	MEXLN20030001	●
0.3	0/-0.010	0.05	0/-0.010	4	0.4	1.5	0.26	50	2	1.6	1.65	1.7	1.75	1.85	MEXLN20030065	●
0.3	0/-0.010	0.05	0/-0.010	4	0.4	2	0.26	50	2	2.12	2.19	2.25	2.32	2.46	MEXLN20030002	●
0.3	0/-0.010	0.05	0/-0.010	4	0.4	3	0.26	50	2	3.15	3.25	3.35	3.46	3.66	MEXLN20030003	●
0.3	0/-0.010	0.1	0/-0.010	4	0.4	1	0.26	50	2	1.08	1.12	1.15	1.18	1.24	MEXLN20030101	●
0.3	0/-0.010	0.1	0/-0.010	4	0.4	1.5	0.26	50	2	1.6	1.65	1.7	1.75	1.84	MEXLN20030165	●
0.3	0/-0.010	0.1	0/-0.010	4	0.4	2	0.26	50	2	2.12	2.18	2.25	2.31	2.45	MEXLN20030102	●
0.3	0/-0.010	0.1	0/-0.010	4	0.4	3	0.26	50	2	3.15	3.25	3.35	3.45	3.65	MEXLN20030103	●
0.4	0/-0.010	0.05	0/-0.010	4	0.6	1	0.37	50	2	1.08	1.12	1.15	1.19	1.25	MEXLN20040001	●
0.4	0/-0.010	0.05	0/-0.010	4	0.6	3	0.37	50	2	3.15	3.25	3.35	3.46	3.66	MEXLN20040003	●
0.4	0/-0.010	0.05	0/-0.010	4	0.6	4	0.37	50	2	4.19	4.32	4.46	4.59	4.86	MEXLN20040004	●
0.4	0/-0.010	0.1	0/-0.010	4	0.6	1	0.37	50	2	1.08	1.12	1.15	1.18	1.24	MEXLN20040101	●
0.4	0/-0.010	0.1	0/-0.010	4	0.6	2	0.37	50	2	2.12	2.18	2.25	2.31	2.45	MEXLN20040102	●
0.4	0/-0.010	0.1	0/-0.010	4	0.6	3	0.37	50	2	3.15	3.25	3.35	3.45	3.65	MEXLN20040103	●
0.4	0/-0.010	0.1	0/-0.010	4	0.6	4	0.37	50	2	4.18	4.32	4.45	4.58	4.85	MEXLN20040104	●
0.5	0/-0.010	0.05	0/-0.010	4	0.7	2	0.45	50	2	2.16	2.23	2.29	2.36	2.5	MEXLN20050002	●
0.5	0/-0.010	0.05	0/-0.010	4	0.7	4	0.45	50	2	4.22	4.36	4.5	4.63	4.9	MEXLN20050004	●
0.5	0/-0.010	0.05	0/-0.010	4	0.7	6	0.45	50	2	6.29	6.49	6.7	6.9	7.31	MEXLN20050006	●
0.5	0/-0.010	0.1	0/-0.010	4	0.7	2	0.45	50	2	2.16	2.22	2.29	2.36	2.49	MEXLN20050102	●
0.5	0/-0.010	0.1	0/-0.010	4	0.7	4	0.45	50	2	4.22	4.36	4.49	4.63	4.89	MEXLN20050104	●
0.5	0/-0.010	0.1	0/-0.010	4	0.7	6	0.45	50	2	6.29	6.49	6.69	6.89	7.3	MEXLN20050106	●
0.6	0/-0.010	0.1	0/-0.010	4	0.9	2	0.55	50	2	2.16	2.22	2.29	2.36	2.49	MEXLN20060102	●
0.6	0/-0.010	0.1	0/-0.010	4	0.9	4	0.55	50	2	4.22	4.36	4.49	4.63	4.89	MEXLN20060104	●
0.6	0/-0.010	0.1	0/-0.010	4	0.9	6	0.55	50	2	6.29	6.49	6.69	6.89	7.3	MEXLN20060106	●
0.7	0/-0.010	0.1	0/-0.010	4	1	4	0.65	50	2	4.22	4.36	4.49	4.63	4.89	MEXLN20070104	●
0.7	0/-0.010	0.1	0/-0.010	4	1	6	0.65	50	2	6.29	6.49	6.69	6.89	7.3	MEXLN20070106	●
0.8	0/-0.010	0.05	0/-0.010	4	1.2	4	0.75	50	2	4.22	4.36	4.5	4.63	4.9	MEXLN20080004	●
0.8	0/-0.010	0.05	0/-0.010	4	1.2	6	0.75	50	2	6.29	6.49	6.7	6.9	7.31	MEXLN20080006	●
0.8	0/-0.010	0.05	0/-0.010	4	1.2	8	0.75	50	2	8.36	8.63	8.9	9.17	9.71	MEXLN20080008	●
0.8	0/-0.010	0.1	0/-0.010	4	1.2	4	0.75	50	2	4.22	4.36	4.49	4.63	4.89	MEXLN20080104	●
0.8	0/-0.010	0.1	0/-0.010	4	1.2	6	0.75	50	2	6.29	6.49	6.69	6.89	7.3	MEXLN20080106	●
0.8	0/-0.010	0.1	0/-0.010	4	1.2	8	0.75	50	2	8.36	8.63	8.89	9.16	9.7	MEXLN20080108	●
0.9	0/-0.010	0.1	0/-0.010	4	1.4	8	0.85	50	2	8.36	8.63	8.89	9.16	9.7	MEXLN20090108	●
0.9	0/-0.010	0.1	0/-0.010	4	1.4	15	0.85	50	2	15.59	16.1	16.6	17.11	18.12	MEXLN20090115	●
1	0/-0.015	0.1	0/-0.010	4	1.5	4	0.95	50	2	4.32	4.46	4.59	4.73	5.01	MEXLN20100104	●
1	0/-0.015	0.1	0/-0.010	4	1.5	6	0.95	50	2	6.39	6.59	6.8	7	7.41	MEXLN20100106	●
1	0/-0.015	0.1	0/-0.010	4	1.5	8	0.95	50	2	8.45	8.73	9	9.27	9.81	MEXLN20100108	●
1	0/-0.015	0.1	0/-0.010	4	1.5	10	0.95	50	2	10.52	10.86	11.2	11.54	12.22	MEXLN20100110	●
1	0/-0.015	0.1	0/-0.010	4	1.5	12	0.95	50	2	12.59	12.99	13.4	13.81	14.62	MEXLN20100112	●
1	0/-0.015	0.1	0/-0.010	4	1.5	16	0.95	50	2	16.72	17.26	17.8	18.35	19.43	MEXLN20100116	●
1	0/-0.015	0.1	0/-0.010	4	1.5	20	0.95	50	2	20.86	21.53	22.21	22.88	24.24	MEXLN20100120	●
1	0/-0.015	0.2	0/-0.010	4	1.5	4	0.95	50	2	4.32	4.45	4.58	4.72	4.99	MEXLN20100204	●
1	0/-0.015	0.2	0/-0.010	4	1.5	6	0.95	50	2	6.38	6.58	6.79	6.99	7.39	MEXLN20100206	●
1	0/-0.015	0.2	0/-0.010	4	1.5	8	0.95	50	2	8.45	8.72	8.99	9.26	9.79	MEXLN20100208	●
1	0/-0.015	0.2	0/-0.010	4	1.5	10	0.95	50	2	10.52	10.85	11.19	11.52	12.2	MEXLN20100210	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

MEXLN2R

- Cylindrical shank
- 2 flutes
- Extended and reduced neck
- Corner radius

P	M	K	N	S	H
★		★			★

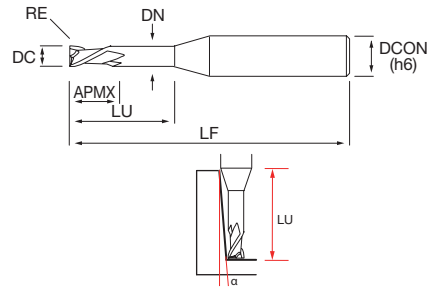
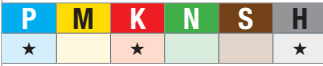


DC	DC tol.	RE	RE tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
1	0/-0.015	0.2	0/-0.010	4	1.5	12	0.95	50	2	12.58	12.99	13.39	13.79	14.6	MEXLN20100212	◎
1	0/-0.015	0.2	0/-0.010	4	1.5	16	0.95	50	2	16.72	17.26	17.79	18.33	19.41	MEXLN20100216	●
1	0/-0.015	0.2	0/-0.010	4	1.5	20	0.95	50	2	20.85	21.53	22.2	22.87	24.22	MEXLN20100220	●
1	0/-0.015	0.3	0/-0.010	4	1.5	6	0.95	50	2	6.38	6.58	6.78	6.97	7.37	MEXLN20100306	◎
1	0/-0.015	0.3	0/-0.010	4	1.5	10	0.95	50	2	10.51	10.85	11.18	11.51	12.18	MEXLN20100310	●
1	0/-0.015	0.3	0/-0.010	4	1.5	16	0.95	50	2	16.72	17.25	17.78	18.32	19.39	MEXLN20100316	●
1	0/-0.015	0.3	0/-0.010	4	1.5	20	0.95	50	2	20.85	21.52	22.19	22.86	24.2	MEXLN20100320	●
1.2	0/-0.015	0.1	0/-0.010	4	1.8	6	1.15	50	2	6.39	6.59	6.8	7	7.41	MEXLN20120106	●
1.2	0/-0.015	0.1	0/-0.010	4	1.8	8	1.15	50	2	8.45	8.73	9	9.27	9.81	MEXLN20120108	◎
1.2	0/-0.015	0.1	0/-0.010	4	1.8	10	1.15	50	2	10.52	10.86	11.2	11.54	12.22	MEXLN20120110	◎
1.2	0/-0.015	0.1	0/-0.010	4	1.8	12	1.15	50	2	12.59	12.99	13.4	13.81	14.62	MEXLN20120112	●
1.4	0/-0.015	0.1	0/-0.010	4	2.1	6	1.35	50	2	6.39	6.59	6.8	7	7.41	MEXLN20140106	◎
1.4	0/-0.015	0.1	0/-0.010	4	2.1	8	1.35	50	2	8.45	8.73	9	9.27	9.81	MEXLN20140108	◎
1.4	0/-0.015	0.1	0/-0.010	4	2.1	10	1.35	50	2	10.52	10.86	11.2	11.54	12.22	MEXLN20140110	●
1.4	0/-0.015	0.1	0/-0.010	4	2.1	12	1.35	50	2	12.59	12.99	13.4	13.81	14.62	MEXLN20140112	◎
1.4	0/-0.015	0.1	0/-0.010	4	2.1	16	1.35	50	2	16.72	17.26	17.8	18.35	19.43	MEXLN20140116	●
1.5	0/-0.015	0.1	0/-0.010	4	2.3	4	1.45	50	2	4.32	4.46	4.59	4.73	5.01	MEXLN20150104	●
1.5	0/-0.015	0.1	0/-0.010	4	2.3	8	1.45	50	2	8.45	8.73	9	9.27	9.81	MEXLN20150108	◎
1.5	0/-0.015	0.1	0/-0.010	4	2.3	12	1.45	50	2	12.59	12.99	13.4	13.81	14.62	MEXLN20150112	●
1.5	0/-0.015	0.1	0/-0.010	4	2.3	16	1.45	50	2	16.72	17.26	17.8	18.35	19.43	MEXLN20150116	●
1.5	0/-0.015	0.1	0/-0.010	4	2.3	20	1.45	60	2	20.86	21.53	22.21	22.88	24.24	MEXLN20150120	◎
1.5	0/-0.015	0.2	0/-0.010	4	2.3	8	1.45	50	2	8.45	8.72	8.99	9.26	9.79	MEXLN20150208	●
1.5	0/-0.015	0.2	0/-0.010	4	2.3	10	1.45	50	2	10.52	10.85	11.19	11.52	12.2	MEXLN20150210	●
1.5	0/-0.015	0.2	0/-0.010	4	2.3	12	1.45	50	2	12.58	12.99	13.39	13.79	14.6	MEXLN20150212	●
1.5	0/-0.015	0.2	0/-0.010	4	2.3	16	1.45	50	2	16.72	17.26	17.79	18.33	19.41	MEXLN20150216	●
1.5	0/-0.015	0.2	0/-0.010	4	2.3	20	1.45	60	2	20.85	21.53	22.2	22.87	24.22	MEXLN20150220	●
1.5	0/-0.015	0.3	0/-0.010	4	2.3	8	1.45	50	2	8.45	8.71	8.98	9.24	9.77	MEXLN20150308	●
1.5	0/-0.015	0.3	0/-0.010	4	2.3	16	1.45	50	2	16.72	17.25	17.78	18.32	19.39	MEXLN20150316	●
1.5	0/-0.015	0.3	0/-0.010	4	2.3	20	1.45	60	2	20.85	21.52	22.19	22.86	24.2	MEXLN20150320	●
1.6	0/-0.015	0.1	0/-0.010	4	2.4	8	1.55	50	2	8.45	8.73	9	9.27	9.81	MEXLN20160108	●
1.6	0/-0.015	0.1	0/-0.010	4	2.4	12	1.55	50	2	12.59	12.99	13.4	13.81	14.62	MEXLN20160112	●
1.6	0/-0.015	0.1	0/-0.010	4	2.4	16	1.55	50	2	16.72	17.26	17.8	18.35	19.43	MEXLN20160116	◎
1.8	0/-0.015	0.2	0/-0.010	4	2.7	8	1.75	50	2	8.45	8.72	8.99	9.26	9.79	MEXLN20180208	●
1.8	0/-0.015	0.2	0/-0.010	4	2.7	12	1.75	50	2	12.58	12.99	13.39	13.79	14.6	MEXLN20180212	◎
1.8	0/-0.015	0.2	0/-0.010	4	2.7	16	1.75	50	2	16.72	17.26	17.79	18.33	19.41	MEXLN20180216	●
2	0/-0.015	0.2	0/-0.010	4	3	6	1.95	50	2	6.38	6.58	6.79	6.99	7.39	MEXLN20200206	●
2	0/-0.015	0.2	0/-0.010	4	3	8	1.95	50	2	8.45	8.72	8.99	9.26	9.79	MEXLN20200208	●
2	0/-0.015	0.2	0/-0.010	4	3	10	1.95	50	2	10.52	10.85	11.19	11.52	12.2	MEXLN20200210	●
2	0/-0.015	0.2	0/-0.010	4	3	12	1.95	50	2	12.58	12.99	13.39	13.79	14.6	MEXLN20200212	●
2	0/-0.015	0.2	0/-0.010	4	3	14	1.95	50	2	14.65	15.12	15.59	16.06	17.01	MEXLN20200214	◎
2	0/-0.015	0.2	0/-0.010	4	3	16	1.95	50	2	16.72	17.26	17.79	18.33	19.41	MEXLN20200216	●
2	0/-0.015	0.2	0/-0.010	4	3	20	1.95	60	2	20.85	21.53	22.2	22.87	-	MEXLN20200220	●
2	0/-0.015	0.2	0/-0.010	4	3	25	1.95	75	2	26.02	26.86	27.7	28.54	-	MEXLN20200225	●
2	0/-0.015	0.2	0/-0.010	4	3	30	1.95	75	2	31.19	32.2	33.21	-	-	MEXLN20200230	●
2	0/-0.015	0.5	0/-0.010	4	3	6	1.95	50	2	6.37	6.56	6.75	6.95	7.33	MEXLN20200506	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

MEXLN2R

- Cylindrical shank
- 2 flutes
- Extended and reduced neck
- Corner radius



DC	DC tol.	RE	RE tol.	DCON	APMX	LU	DN	LF	ZEPF	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
2	0/-0.015	0.5	0/-0.010	4	3	8	1.95	50	2	8.44	8.7	8.96	9.22	9.73	MEXLN20200508	●
2	0/-0.015	0.5	0/-0.010	4	3	12	1.95	50	2	12.57	12.97	13.36	13.75	14.54	MEXLN20200512	●
2	0/-0.015	0.5	0/-0.010	4	3	16	1.95	50	2	16.71	17.24	17.76	18.29	19.35	MEXLN20200516	●
2	0/-0.015	0.5	0/-0.010	4	3	20	1.95	60	2	20.84	21.51	22.17	22.83	-	MEXLN20200520	●
2	0/-0.015	0.5	0/-0.010	4	3	25	1.95	75	2	26.01	26.84	27.67	28.5	-	MEXLN20200525	●
2	0/-0.015	0.5	0/-0.010	4	3	30	1.95	75	2	31.18	32.18	33.18	-	-	MEXLN20200530	●
2.5	0/-0.020	0.3	0/-0.015	4	3.7	8	2.4	50	2	8.45	8.71	8.98	9.24	9.77	MEXLN20250308	◎
2.5	0/-0.020	0.3	0/-0.015	4	3.7	12	2.4	50	2	12.58	12.98	13.38	13.78	14.58	MEXLN20250312	◎
2.5	0/-0.020	0.3	0/-0.015	4	3.7	16	2.4	50	2	16.72	17.25	17.78	18.32	-	MEXLN20250316	●
2.5	0/-0.020	0.3	0/-0.015	4	3.7	20	2.4	60	2	20.85	21.52	22.19	-	-	MEXLN20250320	◎
2.5	0/-0.020	0.3	0/-0.015	4	3.7	25	2.4	60	2	26.02	26.86	27.69	-	-	MEXLN20250325	◎
2.5	0/-0.020	0.3	0/-0.015	4	3.7	30	2.4	75	2	31.19	32.19	-	-	-	MEXLN20250330	◎
2.5	0/-0.020	0.5	0/-0.015	4	3.7	8	2.4	50	2	8.44	8.7	8.96	9.22	9.73	MEXLN20250508	●
2.5	0/-0.020	0.5	0/-0.015	4	3.7	12	2.4	50	2	12.57	12.97	13.36	13.75	14.54	MEXLN20250512	●
2.5	0/-0.020	0.5	0/-0.015	4	3.7	16	2.4	50	2	16.71	17.24	17.76	18.29	-	MEXLN20250516	●
2.5	0/-0.020	0.5	0/-0.015	4	3.7	20	2.4	60	2	20.84	21.51	22.17	-	-	MEXLN20250520	●
2.5	0/-0.020	0.5	0/-0.015	4	3.7	25	2.4	60	2	26.01	26.84	27.67	-	-	MEXLN20250525	◎
2.5	0/-0.020	0.5	0/-0.015	4	3.7	30	2.4	75	2	31.18	32.18	-	-	-	MEXLN20250530	◎
3	0/-0.025	0.2	0/-0.015	6	4.5	10	2.85	50	2	10.71	11.05	11.39	11.74	12.42	MEXLN20300210	◎
3	0/-0.025	0.2	0/-0.015	6	4.5	12	2.85	50	2	12.78	13.19	13.6	14	14.82	MEXLN20300212	◎
3	0/-0.025	0.2	0/-0.015	6	4.5	16	2.85	60	2	16.91	17.46	18	18.54	19.63	MEXLN20300216	●
3	0/-0.025	0.2	0/-0.015	6	4.5	20	2.85	60	2	21.05	21.72	22.4	23.08	24.44	MEXLN20300220	◎
3	0/-0.025	0.2	0/-0.015	6	4.5	25	2.85	75	2	26.21	27.06	27.91	28.75	30.45	MEXLN20300225	●
3	0/-0.025	0.3	0/-0.015	6	4.5	10	2.85	50	2	10.71	11.04	11.38	11.72	12.4	MEXLN20300310	●
3	0/-0.025	0.3	0/-0.015	6	4.5	12	2.85	50	2	12.77	13.18	13.59	13.99	14.8	MEXLN20300312	●
3	0/-0.025	0.3	0/-0.015	6	4.5	16	2.85	60	2	16.91	17.45	17.99	18.53	19.61	MEXLN20300316	●
3	0/-0.025	0.3	0/-0.015	6	4.5	20	2.85	60	2	21.04	21.72	22.39	23.07	24.42	MEXLN20300320	●
3	0/-0.025	0.3	0/-0.015	6	4.5	25	2.85	75	2	26.21	27.05	27.9	28.74	30.43	MEXLN20300325	●
3	0/-0.025	0.5	0/-0.015	6	4.5	10	2.85	50	2	10.7	11.03	11.36	11.7	12.36	MEXLN20300510	●
3	0/-0.025	0.5	0/-0.015	6	4.5	12	2.85	50	2	12.77	13.17	13.57	13.96	14.76	MEXLN20300512	●
3	0/-0.025	0.5	0/-0.015	6	4.5	16	2.85	60	2	16.9	17.44	17.97	18.5	19.57	MEXLN20300516	●
3	0/-0.025	0.5	0/-0.015	6	4.5	20	2.85	60	2	21.04	21.7	22.37	23.04	24.38	MEXLN20300520	●
3	0/-0.025	0.5	0/-0.015	6	4.5	25	2.85	75	2	26.2	27.04	27.88	28.71	30.39	MEXLN20300525	●
4	0/-0.025	0.3	0/-0.015	6	4.5	10	3.85	60	2	10.9	11.24	11.59	11.93	12.62	MEXLN20400310	◎
4	0/-0.025	0.3	0/-0.015	6	4.5	15	3.85	60	2	16.07	16.58	17.09	17.61	18.63	MEXLN20400315	◎
4	0/-0.025	0.3	0/-0.015	6	4.5	20	3.85	60	2	21.24	21.92	22.6	23.28	-	MEXLN20400320	●
4	0/-0.025	0.3	0/-0.015	6	4.5	25	3.85	75	2	26.4	27.25	28.1	28.95	-	MEXLN20400325	●
4	0/-0.025	0.3	0/-0.015	6	4.5	30	3.85	75	2	31.57	32.59	33.61	-	-	MEXLN20400330	●
4	0/-0.025	0.3	0/-0.015	6	4.5	40	3.85	75	2	41.91	43.26	-	-	-	MEXLN20400340	●
4	0/-0.025	0.5	0/-0.015	6	4.5	10	3.85	60	2	10.89	11.23	11.57	11.91	12.58	MEXLN20400510	◎
4	0/-0.025	0.5	0/-0.015	6	4.5	15	3.85	60	2	16.06	16.57	17.07	17.58	18.59	MEXLN20400515	●
4	0/-0.025	0.5	0/-0.015	6	4.5	20	3.85	60	2	21.23	21.9	22.58	23.25	-	MEXLN20400520	●
4	0/-0.025	0.5	0/-0.015	6	4.5	25	3.85	75	2	26.4	27.24	28.08	28.92	-	MEXLN20400525	●
4	0/-0.025	0.5	0/-0.015	6	4.5	30	3.85	75	2	31.57	32.58	33.59	-	-	MEXLN20400530	●
4	0/-0.025	0.5	0/-0.015	6	4.5	40	3.85	75	2	41.9	43.25	-	-	-	MEXLN20400540	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

MEXLN2R

Material Group ISO 513			P2	P3	P4	K1	K2	P4	P5	K3	P6	K4	H1	H4	H5
Hardness/Rm			≤1000 N/mm ²					≤35 HRC			35÷45 HRC		45÷55 HRC		
ap x ae			ap x D					ap x D			ap x D		ap x D		
Vc (m/min)			70÷110					50÷90			40÷60		20÷40		
DC (mm)	LU (mm)	ap (mm)	fz (mm/z)					fz (mm/z)			fz (mm/z)		fz (mm/z)		
0.3	≤ 6D	0.02	0.004					0.004			0.003		0.003		
	≤ 8D	0.01	0.004					0.003			0.003		0.003		
	≤ 10D	0.01	0.003					0.003			0.003		0.002		
	≤ 12D	0.01	0.003					0.003			0.002		0.002		
0.4	≤ 6D	0.02	0.006					0.005			0.005		0.004		
	≤ 8D	0.02	0.005					0.005			0.004		0.004		
	≤ 10D	0.01	0.005					0.004			0.004		0.003		
	≤ 12D	0.01	0.004					0.004			0.003		0.003		
0.5	≤ 6D	0.03	0.007					0.006			0.006		0.005		
	≤ 8D	0.02	0.006					0.006			0.005		0.004		
	≤ 10D	0.02	0.006					0.005			0.004		0.004		
	≤ 12D	0.01	0.005					0.004			0.004		0.003		
0.6	≤ 6D	0.03	0.008					0.007			0.006		0.006		
	≤ 8D	0.03	0.007					0.006			0.006		0.005		
	≤ 10D	0.02	0.006					0.006			0.005		0.004		
	≤ 12D	0.02	0.006					0.005			0.004		0.004		
0.8	≤ 6D	0.04	0.010					0.009			0.008		0.007		
	≤ 8D	0.03	0.009					0.008			0.007		0.006		
	≤ 10D	0.03	0.008					0.007			0.006		0.006		
	≤ 12D	0.02	0.007					0.006			0.006		0.005		
1	≤ 6D	0.05	0.012					0.011			0.010		0.008		
	≤ 8D	0.04	0.011					0.010			0.009		0.008		
	≤ 10D	0.04	0.010					0.009			0.008		0.007		
	≤ 12D	0.03	0.008					0.008			0.007		0.006		
1.2	≤ 6D	0.06	0.022					0.020			0.018		0.015		
	≤ 8D	0.05	0.020					0.018			0.016		0.014		
	≤ 10D	0.04	0.018					0.016			0.014		0.012		
	≤ 12D	0.03	0.015					0.014			0.012		0.011		
1.4	≤ 6D	0.07	0.024					0.022			0.019		0.017		
	≤ 8D	0.06	0.022					0.019			0.017		0.015		
	≤ 10D	0.05	0.019					0.017			0.015		0.013		
	≤ 12D	0.04	0.017					0.015			0.013		0.012		
1.5	≤ 15D	0.03	0.014					0.013			0.012		0.010		
	≥ 15D	0.02	0.012					0.011			0.010		0.008		
	≤ 6D	0.08	0.025					0.023			0.020		0.018		
	≤ 8D	0.06	0.023					0.020			0.018		0.016		
1.6	≤ 10D	0.05	0.020					0.018			0.016		0.014		
	≤ 12D	0.04	0.018					0.016			0.014		0.012		
	≤ 15D	0.03	0.015					0.014			0.012		0.011		
	≥ 15D	0.02	0.013					0.011			0.010		0.009		
1.6	≤ 6D	0.08	0.026					0.023			0.021		0.018		
	≤ 8D	0.07	0.023					0.021			0.019		0.016		
	≤ 10D	0.06	0.021					0.019			0.017		0.015		
	≤ 12D	0.04	0.018					0.016			0.015		0.013		
1.6	≤ 15D	0.04	0.016					0.014			0.012		0.011		
	≥ 15D	0.02	0.013					0.012			0.010		0.009		



Cutting Parameters

MEXLN2R

	Material Group ISO 513		P2 P3 P4 K1 K2	P4 P5 K3	P6 K4	H1 H4 H5
	Hardness/Rm		≤1000 N/mm ²	≤35 HRC	35÷45 HRC	45÷55 HRC
	ap x ae		ap x D	ap x D	ap x D	ap x D
	Vc (m/min)		70÷110	50÷90	40÷60	20÷40
	DC (mm)	LU (mm)	ap (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)
1.8	≤ 6D	0.09	0.028	0.025	0.022	0.020
	≤ 8D	0.08	0.025	0.023	0.020	0.018
	≤ 10D	0.06	0.022	0.020	0.018	0.016
	≤ 12D	0.05	0.020	0.018	0.016	0.014
	≤ 15D	0.04	0.017	0.015	0.013	0.012
	≥ 15D	0.03	0.014	0.013	0.011	0.010
2	≤ 6D	0.10	0.030	0.027	0.024	0.021
	≤ 8D	0.09	0.027	0.024	0.022	0.019
	≤ 10D	0.07	0.024	0.022	0.019	0.017
	≤ 12D	0.06	0.021	0.019	0.017	0.015
	≤ 15D	0.05	0.018	0.016	0.014	0.013
	≥ 15D	0.03	0.018	0.016	0.014	0.013
2.5	≤ 6D	0.13	0.035	0.032	0.028	0.025
	≤ 8D	0.11	0.032	0.028	0.025	0.022
	≤ 10D	0.09	0.028	0.025	0.022	0.020
	≤ 12D	0.07	0.025	0.022	0.020	0.017
	≤ 15D	0.06	0.021	0.019	0.017	0.015
	≥ 15D	0.04	0.021	0.019	0.017	0.015
3	≤ 6D	0.15	0.040	0.036	0.032	0.028
	≤ 8D	0.13	0.036	0.032	0.029	0.025
	≤ 10D	0.11	0.032	0.029	0.026	0.022
	≤ 12D	0.08	0.028	0.025	0.022	0.020
	≤ 15D	0.07	0.024	0.022	0.019	0.017
	≥ 15D	0.05	0.024	0.022	0.019	0.017
4	≤ 6D	0.20	0.050	0.045	0.040	0.035
	≤ 8D	0.17	0.045	0.041	0.036	0.032
	≤ 10D	0.14	0.040	0.036	0.032	0.028
	≤ 12D	0.11	0.035	0.032	0.028	0.025
	≤ 15D	0.09	0.030	0.027	0.024	0.021
	≥ 15D	0.06	0.030	0.027	0.024	0.021

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

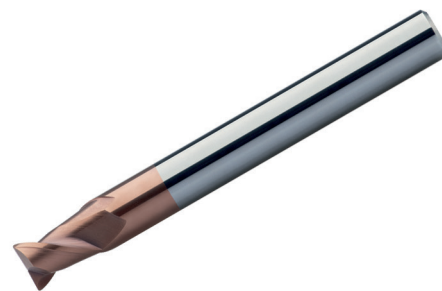
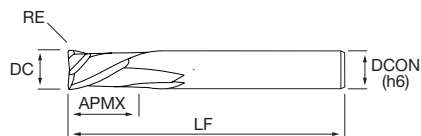
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

MEXLS2R

- Cylindrical shank
- 2 flutes
- Long
- Corner radius



P	M	K	N	S	H
★		★			★



DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
2	0/-0.015	0.3	0/-0.010	6	h6	4	75	2	MEXLS2R03020	●
3	0/-0.020	0.3	0/-0.015	6	h6	5	75	2	MEXLS2R03030	●
3	0/-0.020	0.5	0/-0.015	6	h6	5	75	2	MEXLS2R05030	●
4	0/-0.020	0.3	0/-0.015	6	h6	8	75	2	MEXLS2R03040	●
4	0/-0.020	0.5	0/-0.015	6	h6	8	75	2	MEXLS2R05040	●
5	0/-0.020	0.3	0/-0.015	6	h6	9	75	2	MEXLS2R03050	●
5	0/-0.020	0.5	0/-0.015	6	h6	9	75	2	MEXLS2R05050	●
6	0/-0.020	0.3	0/-0.015	6	h6	10	75	2	MEXLS2R03060	●
6	0/-0.020	0.5	0/-0.015	6	h6	10	75	2	MEXLS2R05060	●
6	0/-0.020	1	0/-0.015	6	h6	10	75	2	MEXLS2R10060	●
8	0/-0.020	0.3	0/-0.015	8	h6	12	75	2	MEXLS2R03080	●
8	0/-0.020	0.5	0/-0.015	8	h6	12	75	2	MEXLS2R05080	●
8	0/-0.020	1	0/-0.015	8	h6	12	75	2	MEXLS2R10080	●
10	0/-0.020	0.5	0/-0.020	10	h6	14	100	2	MEXLS2R05100	●
10	0/-0.020	1	0/-0.020	10	h6	14	100	2	MEXLS2R10100	●
12	0/-0.020	0.5	0/-0.020	12	h6	16	100	2	MEXLS2R05120	●
12	0/-0.020	1	0/-0.020	12	h6	16	100	2	MEXLS2R10120	●
16	0/-0.020	0.5	0/-0.020	16	h6	22	125	2	MEXLS2R05160	●
16	0/-0.020	1	0/-0.020	16	h6	22	125	2	MEXLS2R10160	●

★ 1st choice, ☆ suitable, ● stock standard, ● non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters
MEXLS2R

	Material Group ISO 513	P2 P3 P4 K1 K2	P4 P5 K3	P6 K4	H1 H4 H5
	Hardness/Rm	≤1000 N/mm ²	≤35 HRC	35÷45 HRC	45÷55 HRC
	ap x ae	0.3D x D	0.3D x D	0.2D x D	0.05D x D
	Vc (m/min)	70÷110	50÷90	40÷60	20÷40
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	2	0.005	0.005	0.004	0.004
	3	0.006	0.005	0.005	0.004
	4	0.009	0.008	0.007	0.006
	5	0.012	0.011	0.010	0.008
	6	0.018	0.016	0.014	0.013
	8	0.024	0.022	0.019	0.017
	10	0.029	0.026	0.023	0.020
	12	0.035	0.032	0.028	0.025

≤ D3 mm: ap = 0.4 mm

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

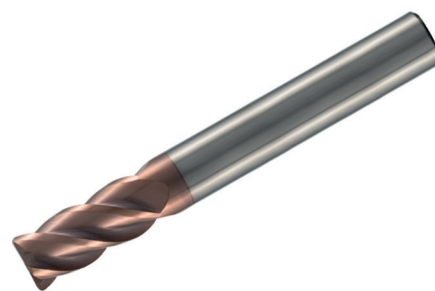
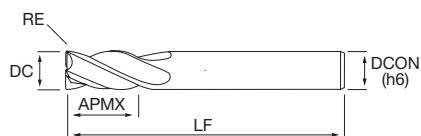
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

MEXCS4R

- Cylindrical shank
- 4 flutes
- Corner radius



P	M	K	N	S	H
★		★			★

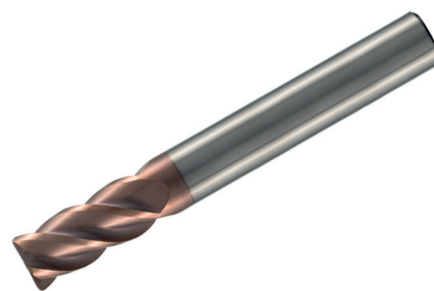
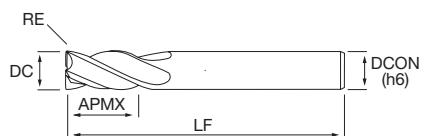


DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
1	0/-0.015	0.2	0/-0.010	4	h6	3	50	4	MEXCS4R01002	●
1.5	0/-0.015	0.2	0/-0.010	4	h6	4.5	50	4	MEXCS4R01502	●
2	0/-0.015	0.2	0/-0.010	4	h6	6.5	50	4	MEXCS4R02002	●
2	0/-0.015	0.3	0/-0.010	4	h6	6.5	50	4	MEXCS4R02003	●
2.5	0/-0.020	0.2	0/-0.015	4	h6	6.5	50	4	MEXCS4R02502	●
2.5	0/-0.020	0.5	0/-0.015	4	h6	6.5	50	4	MEXCS4R02505	●
3	0/-0.020	0.2	0/-0.015	4	h6	9	50	4	MEXCS4R03002	●
3	0/-0.020	0.3	0/-0.015	4	h6	9	50	4	MEXCS4R03003	●
3	0/-0.020	0.5	0/-0.015	4	h6	9	50	4	MEXCS4R03005	●
4	0/-0.020	0.3	0/-0.015	4	h6	12	50	4	MEXCS4R04003	●
4	0/-0.020	0.5	0/-0.015	4	h6	12	50	4	MEXCS4R04005	●
4	0/-0.020	1	0/-0.015	4	h6	12	50	4	MEXCS4R04010	●
5	0/-0.020	0.3	0/-0.015	5	h6	15	50	4	MEXCS4R05003	●
5	0/-0.020	0.5	0/-0.015	5	h6	15	50	4	MEXCS4R05005	●
5	0/-0.020	1	0/-0.015	5	h6	15	50	4	MEXCS4R05010	●
6	0/-0.020	0.3	0/-0.015	6	h6	16	50	4	MEXCS4R06003	●
6	0/-0.020	0.5	0/-0.015	6	h6	16	50	4	MEXCS4R06005	●
6	0/-0.020	1	0/-0.015	6	h6	16	50	4	MEXCS4R06010	●
8	0/-0.020	0.3	0/-0.015	8	h6	20	64	4	MEXCS4R08003	●
8	0/-0.020	0.5	0/-0.015	8	h6	20	64	4	MEXCS4R08005	●
8	0/-0.020	1	0/-0.015	8	h6	20	64	4	MEXCS4R08010	●
8	0/-0.020	1.5	0/-0.015	8	h6	20	64	4	MEXCS4R08015	⊙
8	0/-0.020	2	0/-0.015	8	h6	20	64	4	MEXCS4R08020	●
10	0/-0.020	0.3	0/-0.020	10	h6	22	75	4	MEXCS4R10003	●
10	0/-0.020	0.5	0/-0.020	10	h6	22	75	4	MEXCS4R10005	●
10	0/-0.020	1	0/-0.020	10	h6	22	75	4	MEXCS4R10010	●
10	0/-0.020	1.5	0/-0.020	10	h6	22	75	4	MEXCS4R10015	●
10	0/-0.020	2	0/-0.020	10	h6	22	75	4	MEXCS4R10020	●
12	0/-0.020	0.3	0/-0.020	12	h6	25	75	4	MEXCS4R12003	●
12	0/-0.020	0.5	0/-0.020	12	h6	25	75	4	MEXCS4R12005	●
12	0/-0.020	1	0/-0.020	12	h6	25	75	4	MEXCS4R12010	●
12	0/-0.020	1.5	0/-0.020	12	h6	25	75	4	MEXCS4R12015	●
12	0/-0.020	2	0/-0.020	12	h6	25	75	4	MEXCS4R12020	●
12	0/-0.020	3	0/-0.020	12	h6	25	75	4	MEXCS4R12030	●
14	0/-0.020	0.5	0/-0.020	14	h6	32	90	4	MEXCS4R14005	⊙
14	0/-0.020	1	0/-0.020	14	h6	32	90	4	MEXCS4R14010	●
14	0/-0.020	2	0/-0.020	14	h6	32	90	4	MEXCS4R14020	⊙
16	0/-0.020	0.5	0/-0.020	16	h6	32	90	4	MEXCS4R16005	●
16	0/-0.020	1	0/-0.020	16	h6	32	90	4	MEXCS4R16010	●
16	0/-0.020	2	0/-0.020	16	h6	32	90	4	MEXCS4R16020	●
16	0/-0.020	3	0/-0.020	16	h6	32	90	4	MEXCS4R16030	⊙
18	0/-0.020	0.5	0/-0.020	18	h6	38	100	4	MEXCS4R18005	●
18	0/-0.020	1	0/-0.020	18	h6	38	100	4	MEXCS4R18010	●
20	0/-0.020	0.5	0/-0.020	20	h6	38	100	4	MEXCS4R20005	●
20	0/-0.020	1	0/-0.020	20	h6	38	100	4	MEXCS4R20010	●

★ 1st choice, ☆ suitable, ● stock standard, ⊙ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

MEXCS4R

- Cylindrical shank
- 4 flutes
- Corner radius



P	M	K	N	S	H
★		★			★



DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
20	0/-0.020	2	0/-0.020	20	h6	38	100	4	MEXCS4R20020	●
20	0/-0.020	3	0/-0.020	20	h6	38	100	4	MEXCS4R20030	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

Cutting Parameters

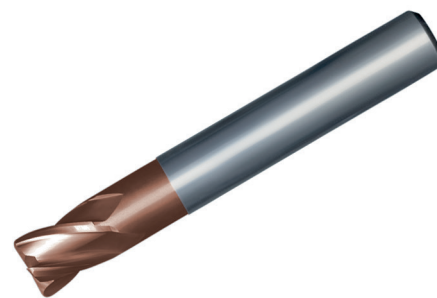
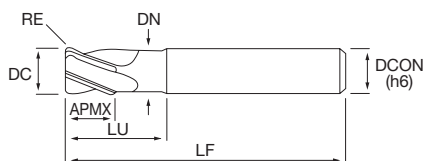
MEXCS4R

	Material Group ISO 513	P2 P3 P4 K1 K2	P4 P5 K3	P6 K4	H1 H4 H5
	Hardness/Rm	≤1000 N/mm ²	≤35 HRC	35÷45 HRC	45÷55 HRC
	ap x ae	D x 0.1D	D x 0.1D	D x 0.05D	D x 0.05D
	Vc (m/min)	80÷120	50÷90	40÷60	20÷40
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.009	0.008	0.007	0.006
	2	0.017	0.015	0.014	0.012
	3	0.026	0.023	0.020	0.018
	4	0.034	0.031	0.027	0.024
	5	0.038	0.034	0.031	0.027
	6	0.043	0.038	0.034	0.030
	8	0.055	0.050	0.044	0.039
	10	0.071	0.064	0.057	0.050
	12	0.085	0.077	0.068	0.060
	14	0.098	0.088	0.078	0.068
	16	0.110	0.099	0.088	0.077
	18	0.125	0.113	0.100	0.088
	20	0.140	0.126	0.112	0.098

MEX410R

- Cylindrical shank
- 4 flutes
- Short
- Corner radius

P	M	K	N	S	H
★		★			★



DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LU	DN	LF	ZEFP	EDP no.	Stock
2	0/-0.012	0.2	±0.020	6	h6	2.5	5	1.9	50	4	MEX410R02020	●
2.5	0/-0.012	0.25	±0.020	6	h6	3	6	2.4	50	4	MEX410R025025	●
3	0/-0.012	0.3	±0.020	6	h6	4	7	2.85	50	4	MEX410R03030	●
4	0/-0.012	0.5	±0.020	6	h6	5	9	3.85	50	4	MEX410R05040	●
5	0/-0.015	0.5	±0.020	6	h6	6	12	4.85	50	4	MEX410R05050	●
6	0/-0.015	0.5	±0.020	6	h6	7	14	5.8	60	4	MEX410R05060	●
8	0/-0.015	1	±0.020	8	h6	10	18	7.8	70	4	MEX410R10080	●
10	0/-0.015	1	±0.020	10	h6	12	25	9.8	75	4	MEX410R10100	●
12	0/-0.015	1	±0.020	12	h6	15	30	11.8	80	4	MEX410R10120	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

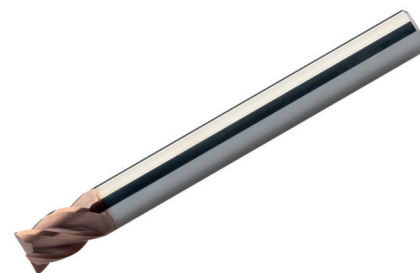
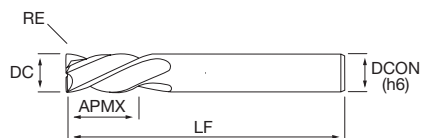
Cutting Parameters

MEX410R

	Material Group ISO 513	P2 P3 P4 K1 K2	P4 P5 K3	P6 K4	H1 H4 H5
	Hardness/Rm	≤1000 N/mm ²	≤35 HRC	35÷45 HRC	45÷55 HRC
	ap x ae	D x 0.1D	D x 0.1D	D x 0.05D	D x 0.05D
	Vc (m/min)	80÷120	50÷90	40÷60	20÷40
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	2	0.015	0.014	0.012	0.011
	3	0.023	0.021	0.018	0.016
	4	0.031	0.028	0.024	0.021
	5	0.034	0.031	0.028	0.024
	6	0.038	0.034	0.031	0.027
	8	0.050	0.045	0.040	0.035
	10	0.065	0.059	0.052	0.046
	12	0.077	0.069	0.061	0.054

MEXLS4R

- Cylindrical shank
- 4 flutes
- Long
- Corner radius



P	M	K	N	S	H
★		★			★



DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
2	0/-0.015	0.3	0/-0.010	6	h6	4	75	4	MEXLS4R03020	⊙
3	0/-0.020	0.3	0/-0.015	6	h6	5	75	4	MEXLS4R03030	●
3	0/-0.020	0.5	0/-0.015	6	h6	5	75	4	MEXLS4R05030	●
4	0/-0.020	0.3	0/-0.015	6	h6	8	75	4	MEXLS4R03040	●
4	0/-0.020	0.5	0/-0.015	6	h6	8	75	4	MEXLS4R05040	●
5	0/-0.020	0.3	0/-0.015	6	h6	9	75	4	MEXLS4R03050	●
5	0/-0.020	0.5	0/-0.015	6	h6	9	75	4	MEXLS4R05050	●
6	0/-0.020	0.3	0/-0.015	6	h6	10	75	4	MEXLS4R03060	●
6	0/-0.020	0.5	0/-0.015	6	h6	10	75	4	MEXLS4R05060	●
6	0/-0.020	1	0/-0.015	6	h6	10	75	4	MEXLS4R10060	●
8	0/-0.020	0.3	0/-0.015	8	h6	12	75	4	MEXLS4R03080	●
8	0/-0.020	0.5	0/-0.015	8	h6	12	75	4	MEXLS4R05080	●
8	0/-0.020	1	0/-0.015	8	h6	12	75	4	MEXLS4R10080	●
10	0/-0.020	0.5	0/-0.020	10	h6	14	100	4	MEXLS4R05100	⊙
10	0/-0.020	1	0/-0.020	10	h6	14	100	4	MEXLS4R10100	●
12	0/-0.020	0.5	0/-0.020	12	h6	16	100	4	MEXLS4R05120	●
12	0/-0.020	1	0/-0.020	12	h6	16	100	4	MEXLS4R10120	●
16	0/-0.020	0.5	0/-0.020	16	h6	22	125	4	MEXLS4R05160	●
16	0/-0.020	1	0/-0.020	16	h6	22	125	4	MEXLS4R10160	●

★ 1st choice, ☆ suitable, ● stock standard, ⊙ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

MEXLS4R

	Material Group ISO 513	P2 P3 P4 K1 K2	P4 P5 K3	P6 K4	H1 H4 H5
	Hardness/Rm	≤1000 N/mm ²	≤35 HRC	35÷45 HRC	45÷55 HRC
	ap x ae	D x 0.1D	D x 0.05D	D x 0.05D	D x 0.05D
	Vc (m/min)	70÷110	50÷90	40÷60	20÷40
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	2	0.014	0.013	0.012	0.010
	3	0.022	0.020	0.017	0.015
	4	0.029	0.026	0.023	0.020
	5	0.033	0.029	0.026	0.023
	6	0.036	0.033	0.029	0.025
	8	0.047	0.042	0.038	0.033
	10	0.060	0.054	0.048	0.042
	12	0.072	0.065	0.058	0.051
	16	0.094	0.084	0.075	0.065

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

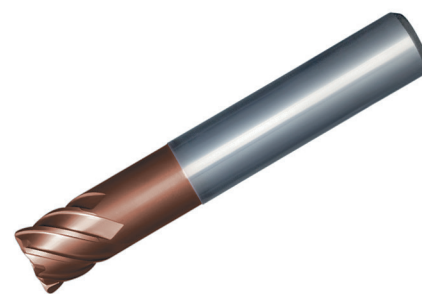
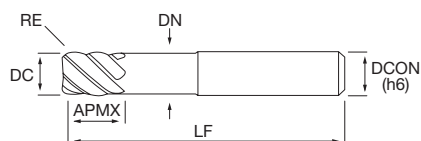
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

MEX610R

- Cylindrical shank
- Multi flute
- Short
- Corner radius



P	M	K	N	S	H
★		★			★



DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LU	DN	LF	ZEFP	EDP no.	Stock
6	0/-0.030	0.5	±0.020	6	h6	6	14	5.8	50	6	MEX610R05060	●
8	0/-0.030	0.5	±0.020	8	h6	8	24	7.8	60	6	MEX610R05080	●
10	0/-0.030	1	±0.020	10	h6	10	30	9.8	70	6	MEX610R10100	●
12	0/-0.030	1	±0.020	12	h6	12	30	11.8	75	6	MEX610R10120	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

Cutting Parameters

MEX610R

	Material Group ISO 513	P2 P3 P4 K1 K2	P4 P5 K3	P6 K4	H1 H4 H5
	Hardness/Rm	≤1000 N/mm ²	≤35 HRC	35÷45 HRC	45÷55 HRC
	ap x ae	D x 0.1D	D x 0.1D	D x 0.05D	D x 0.05D
	Vc (m/min)	120÷160	90÷130	60÷100	50÷70
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	6	0.018	0.016	0.014	0.013
	8	0.028	0.025	0.022	0.019
	10	0.034	0.030	0.027	0.024
	12	0.041	0.037	0.033	0.029

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

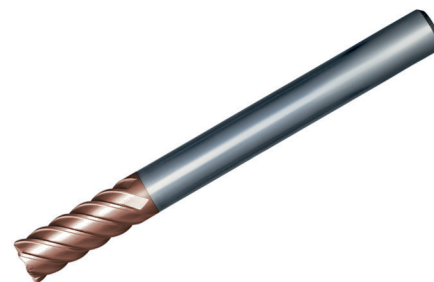
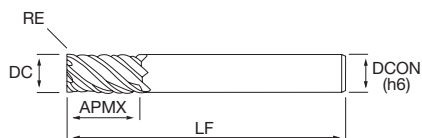
K - HSS END MILLS

L - CARBIDE BURRS

MEX611R

- Cylindrical shank
- Multi flute
- Long
- Corner radius

P	M	K	N	S	H
★		★			★



DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
6	0/-0.030	0.5	±0.020	6	h6	15	90	6	MEX611R05060	●
8	0/-0.030	0.5	±0.020	8	h6	20	100	6	MEX611R05080	●
10	0/-0.030	0.5	±0.020	10	h6	25	100	6	MEX611R05100	○
10	0/-0.030	1	±0.020	10	h6	25	100	6	MEX611R10100	●
12	0/-0.030	0.5	±0.020	12	h6	30	100	6	MEX611R05120	●
12	0/-0.030	1	±0.020	12	h6	30	100	6	MEX611R10120	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

Cutting Parameters

MEX611R

	Material Group ISO 513	P2 P3 P4 K1 K2	P4 P5 K3	P6 K4	H1 H4 H5
	Hardness/Rm	≤1000 N/mm ²	≤35 HRC	35÷45 HRC	45÷55 HRC
	ap x ae	1.5D x 0.05D	1.5D x 0.05D	1.5D x 0.05D	1.5D x 0.05D
	Vc (m/min)	100÷140	80÷120	50÷70	30÷50
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	6	0.015	0.014	0.012	0.011
	8	0.023	0.021	0.019	0.016
	10	0.029	0.026	0.023	0.020
	12	0.035	0.031	0.028	0.024

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

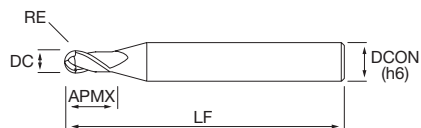
K - HSS END MILLS

L - CARBIDE BURRS

MHMB204

- Cylindrical shank
- 2 flutes ball nose
- Miniature

P	M	K	N	S	H
★		★			★



DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
0.2	0/-0.010	0.1	0/-0.010	4	h6	0.2	50	2	MHMB200204	●
0.3	0/-0.010	0.15	0/-0.010	4	h6	0.3	50	2	MHMB200304	●
0.4	0/-0.010	0.2	0/-0.010	4	h6	0.4	50	2	MHMB200404	●
0.5	0/-0.010	0.25	0/-0.010	4	h6	0.4	50	2	MHMB200504	●
0.6	0/-0.010	0.3	0/-0.010	4	h6	0.5	50	2	MHMB200604	●
0.7	0/-0.010	0.35	0/-0.010	4	h6	0.6	50	2	MHMB200704	●
0.8	0/-0.010	0.4	0/-0.010	4	h6	0.6	50	2	MHMB200804	●
0.9	0/-0.010	0.45	0/-0.010	4	h6	0.8	50	2	MHMB200904	●
1	0/-0.015	0.5	0/-0.015	4	h6	0.8	50	2	MHMB201004	●
1.5	0/-0.015	0.75	0/-0.015	4	h6	1.35	50	2	MHMB201504	●
2	0/-0.015	1	0/-0.015	4	h6	1.7	50	2	MHMB202004	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

MHMB204

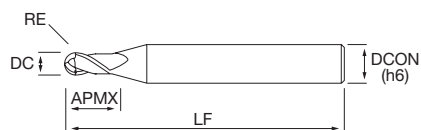
	Material Group ISO 513		P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3
	Hardness/Rm		≤45 HRC	45÷55 HRC	55÷60 HRC	60÷65 HRC
	ap x ae		0.05D x 0.1D	0.05D x 0.1D	0.05D x 0.1D	0.05D x 0.1D
	Vc (m/min)		80÷120	60÷100	40÷80	20÷60
	DC (mm)	ap (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	0.1	0.04	0.004	0.004	0.003	0.003
	0.2	0.09	0.006	0.005	0.005	0.004
	0.3	0.13	0.008	0.007	0.006	0.006
	0.4	0.17	0.010	0.009	0.008	0.007
	0.5	0.22	0.012	0.011	0.010	0.008
	0.6	0.26	0.015	0.014	0.012	0.011
	0.7	0.31	0.018	0.016	0.014	0.013
	0.8	0.35	0.020	0.018	0.016	0.014
	0.9	0.39	0.023	0.021	0.018	0.016
	1	0.44	0.026	0.023	0.020	0.017
	1.5	0.79	0.040	0.036	0.030	0.026
	2	1.20	0.055	0.050	0.041	0.036

	α	n (rpm)	Vf (mm/min)
	15°	x 1.1	x 1.1

MHMB206

- Cylindrical shank
- 2 flutes ball nose
- Miniature
- 6 mm. shank

P	M	K	N	S	H
★		★			★


OSAWA
NORM

MH
NMG
MH COAT

30÷70
HRC

FHA 30°
BALL NOSE
ZEFP 2 BALL
COPYING

DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
0.4	0/-0.010	0.2	0/-0.010	6	h6	0.4	50	2	MHMB200406	●
0.5	0/-0.010	0.25	0/-0.010	6	h6	0.5	50	2	MHMB200506	●
0.6	0/-0.010	0.3	0/-0.010	6	h6	0.6	50	2	MHMB200606	●
0.8	0/-0.010	0.4	0/-0.010	6	h6	0.8	50	2	MHMB200806	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

MHMB206

	Material Group ISO 513		P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3
	Hardness/Rm		≤45 HRC	45÷55 HRC	55÷60 HRC	60÷65 HRC
	ap x ae		0.05D x 0.2D	0.05D x 0.2D	0.05D x 0.2D	0.05D x 0.2D
	Vc (m/min)		80÷120	60÷100	40÷80	20÷60
	DC (mm)	ap (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	0.4	0.17	0.010	0.009	0.008	0.007
	0.5	0.22	0.012	0.011	0.010	0.008
	0.6	0.26	0.015	0.014	0.012	0.011
	0.8	0.35	0.020	0.018	0.016	0.014

	α	n (rpm)	Vf (mm/min)
	15°	x 1.1	x 1.1

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

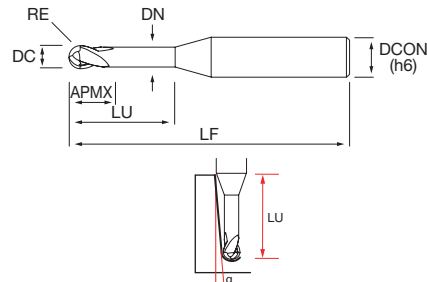
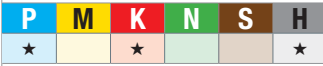
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

MHLNB2

- Cylindrical shank
- 2 flutes ball nose
- Extended and reduced neck

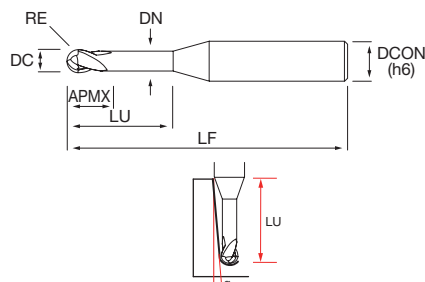


DC	DC tol.	RE	RE tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
0.2	0/-0.010	0.1	0/-0.010	4	0.2	0.5	0.17	50	2	0.57	0.58	0.6	0.62	0.66	MHLNB2002005	●
0.2	0/-0.010	0.1	0/-0.010	4	0.2	1	0.17	50	2	1.08	1.12	1.15	1.19	1.27	MHLNB200201	●
0.2	0/-0.010	0.1	0/-0.010	4	0.2	1.5	0.17	50	2	1.6	1.65	1.71	1.76	1.89	MHLNB2002015	◎
0.3	0/-0.010	0.15	0/-0.010	4	0.3	1	0.27	50	2	1.08	1.11	1.15	1.18	1.26	MHLNB200301	●
0.3	0/-0.010	0.15	0/-0.010	4	0.3	2	0.27	50	2	2.12	2.18	2.25	2.33	2.49	MHLNB200302	●
0.3	0/-0.010	0.15	0/-0.010	4	0.3	3	0.27	50	2	3.15	3.25	3.36	3.48	3.73	MHLNB200303	◎
0.4	0/-0.010	0.2	0/-0.010	4	0.4	1	0.37	50	2	1.08	1.11	1.14	1.18	1.25	MHLNB200401	●
0.4	0/-0.010	0.2	0/-0.010	4	0.4	2	0.37	50	2	2.11	2.18	2.25	2.32	2.48	MHLNB200402	●
0.4	0/-0.010	0.2	0/-0.010	4	0.4	3	0.37	50	2	3.15	3.25	3.36	3.47	3.72	MHLNB200403	●
0.4	0/-0.010	0.2	0/-0.010	4	0.4	4	0.37	50	2	4.18	4.32	4.46	4.62	4.95	MHLNB200404	◎
0.4	0/-0.010	0.2	0/-0.010	4	0.4	5	0.37	50	2	5.21	5.39	5.57	5.77	6.18	MHLNB200405	◎
0.5	0/-0.010	0.25	0/-0.010	4	0.4	2	0.45	50	2	2.15	2.22	2.29	2.36	2.52	MHLNB200502	●
0.5	0/-0.010	0.25	0/-0.010	4	0.4	3	0.45	50	2	3.18	3.29	3.39	3.51	3.75	MHLNB200503	●
0.5	0/-0.010	0.25	0/-0.010	4	0.4	4	0.45	50	2	4.22	4.35	4.5	4.65	4.98	MHLNB200504	●
0.5	0/-0.010	0.25	0/-0.010	4	0.4	5	0.45	50	2	5.25	5.42	5.61	5.8	6.22	MHLNB200505	◎
0.5	0/-0.010	0.25	0/-0.010	4	0.4	6	0.45	50	2	6.28	6.49	6.71	6.95	7.45	MHLNB200506	●
0.5	0/-0.010	0.25	0/-0.010	4	0.4	8	0.45	50	2	8.35	8.63	8.93	9.24	9.92	MHLNB200508	◎
0.6	0/-0.010	0.3	0/-0.010	4	0.5	2	0.55	50	2	2.15	2.21	2.28	2.35	2.5	MHLNB200602	●
0.6	0/-0.010	0.3	0/-0.010	4	0.5	3	0.55	50	2	3.18	3.28	3.39	3.5	3.74	MHLNB200603	◎
0.6	0/-0.010	0.3	0/-0.010	4	0.5	4	0.55	50	2	4.22	4.35	4.49	4.65	4.97	MHLNB200604	●
0.6	0/-0.010	0.3	0/-0.010	4	0.5	5	0.55	50	2	5.25	5.42	5.6	5.79	6.21	MHLNB200605	◎
0.6	0/-0.010	0.3	0/-0.010	4	0.5	6	0.55	50	2	6.28	6.49	6.71	6.94	7.44	MHLNB200606	●
0.6	0/-0.010	0.3	0/-0.010	4	0.5	8	0.55	50	2	8.35	8.63	8.92	9.23	9.91	MHLNB200608	●
0.8	0/-0.010	0.4	0/-0.010	4	0.6	2	0.75	50	2	2.15	2.21	2.27	2.34	2.48	MHLNB200802	●
0.8	0/-0.010	0.4	0/-0.010	4	0.6	4	0.75	50	2	4.21	4.34	4.48	4.63	4.95	MHLNB200804	●
0.8	0/-0.010	0.4	0/-0.010	4	0.6	5	0.75	50	2	5.25	5.41	5.59	5.78	6.18	MHLNB200805	●
0.8	0/-0.010	0.4	0/-0.010	4	0.6	6	0.75	50	2	6.28	6.48	6.7	6.93	7.42	MHLNB200806	●
0.8	0/-0.010	0.4	0/-0.010	4	0.6	7	0.75	50	2	7.31	7.55	7.81	8.07	8.65	MHLNB200807	●
0.8	0/-0.010	0.4	0/-0.010	4	0.6	8	0.75	50	2	8.35	8.62	8.91	9.22	9.88	MHLNB200808	●
0.8	0/-0.010	0.4	0/-0.010	4	0.6	10	0.75	50	2	10.41	10.76	11.13	11.51	12.35	MHLNB200810	●
1	0/-0.015	0.5	0/-0.015	4	0.8	3	0.9	50	2	3.27	3.37	3.47	3.57	3.8	MHLNB201003	●
1	0/-0.015	0.5	0/-0.015	4	0.8	4	0.9	50	2	4.31	4.44	4.58	4.72	5.04	MHLNB201004	●
1	0/-0.015	0.5	0/-0.015	4	0.8	5	0.9	50	2	5.34	5.51	5.68	5.87	6.27	MHLNB201005	●
1	0/-0.015	0.5	0/-0.015	4	0.8	6	0.9	50	2	6.37	6.58	6.79	7.02	7.5	MHLNB201006	●
1	0/-0.015	0.5	0/-0.015	4	0.8	7	0.9	50	2	7.41	7.64	7.9	8.16	8.74	MHLNB201007	◎
1	0/-0.015	0.5	0/-0.015	4	0.8	8	0.9	50	2	8.44	8.71	9	9.31	9.97	MHLNB201008	●
1	0/-0.015	0.5	0/-0.015	4	0.8	9	0.9	50	2	9.47	9.78	10.11	10.46	11.21	MHLNB201009	◎
1	0/-0.015	0.5	0/-0.015	4	0.8	10	0.9	50	2	10.51	10.85	11.22	11.61	12.44	MHLNB201010	●
1	0/-0.015	0.5	0/-0.015	4	0.8	12	0.9	50	2	12.57	12.99	13.43	13.9	14.91	MHLNB201012	●
1	0/-0.015	0.5	0/-0.015	4	0.8	14	0.9	50	2	14.64	15.13	15.65	16.19	17.37	MHLNB201014	◎
1	0/-0.015	0.5	0/-0.015	4	0.8	16	0.9	50	2	16.71	17.27	17.86	18.49	19.84	MHLNB201016	●
1	0/-0.015	0.5	0/-0.015	4	0.8	20	0.9	60	2	20.84	21.55	22.29	23.08	24.78	MHLNB201020	●
1.2	0/-0.015	0.6	0/-0.015	4	1	6	1.1	50	2	6.37	6.57	6.78	7	7.48	MHLNB201206	●
1.2	0/-0.015	0.6	0/-0.015	4	1	8	1.1	50	2	8.44	8.71	8.99	9.3	9.95	MHLNB201208	◎
1.2	0/-0.015	0.6	0/-0.015	4	1	10	1.1	50	2	10.5	10.85	11.21	11.59	12.42	MHLNB201210	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

MHLNB2

- Cylindrical shank
- 2 flutes ball nose
- Extended and reduced neck



P	M	K	N	S	H
★		★			★



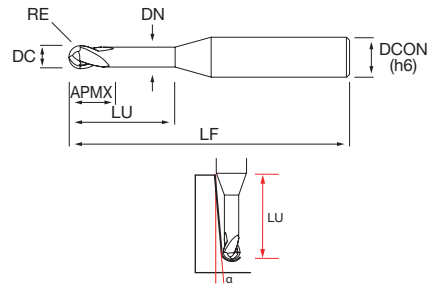
DC	DC tol.	RE	RE tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
1.2	0/-0.015	0.6	0/-0.015	4	1	12	1.1	50	2	12.57	12.98	13.42	13.89	14.88	MHLNB201212	◎
1.4	0/-0.015	0.7	0/-0.015	4	1.1	8	1.3	50	2	8.43	8.7	8.98	9.28	9.93	MHLNB201408	●
1.4	0/-0.015	0.7	0/-0.015	4	1.1	12	1.3	50	2	12.57	12.98	13.41	13.87	14.86	MHLNB201412	◎
1.4	0/-0.015	0.7	0/-0.015	4	1.1	16	1.3	50	2	16.7	17.26	17.84	18.46	19.8	MHLNB201416	◎
1.5	0/-0.015	0.75	0/-0.015	4	1.2	8	1.4	50	2	8.43	8.7	8.98	9.27	9.91	MHLNB201508	●
1.5	0/-0.015	0.75	0/-0.015	4	1.2	12	1.4	50	2	12.57	12.97	13.41	13.86	14.85	MHLNB201512	●
1.5	0/-0.015	0.75	0/-0.015	4	1.2	16	1.4	50	2	16.7	17.25	17.84	18.45	19.78	MHLNB201516	●
1.5	0/-0.015	0.75	0/-0.015	4	1.2	18	1.4	60	2	18.77	19.39	20.05	20.75	22.25	MHLNB201518	●
1.5	0/-0.015	0.75	0/-0.015	6	2.4	20	1.4	50	2	20.84	21.53	22.26	23.04	24.72	MHLNB201520	●
1.6	0/-0.015	0.8	0/-0.015	4	1.3	8	1.5	50	2	8.43	8.69	8.97	9.27	9.9	MHLNB201608	◎
1.6	0/-0.015	0.8	0/-0.015	4	1.3	12	1.5	50	2	12.56	12.97	13.4	13.86	14.84	MHLNB201612	●
1.6	0/-0.015	0.8	0/-0.015	4	1.3	16	1.5	50	2	16.7	17.25	17.83	18.45	19.77	MHLNB201616	●
1.6	0/-0.015	0.8	0/-0.015	4	1.3	20	1.5	60	2	20.83	21.53	22.26	23.03	-	MHLNB201620	●
1.8	0/-0.015	0.9	0/-0.015	4	1.4	8	1.7	50	2	8.43	8.69	8.96	9.25	9.88	MHLNB201808	●
1.8	0/-0.015	0.9	0/-0.015	4	1.4	12	1.7	50	2	12.56	12.96	13.39	13.84	14.81	MHLNB201812	◎
1.8	0/-0.015	0.9	0/-0.015	4	1.4	16	1.7	50	2	16.7	17.24	17.82	18.43	19.75	MHLNB201816	●
1.8	0/-0.015	0.9	0/-0.015	4	1.4	20	1.7	60	2	20.83	21.52	22.25	23.02	-	MHLNB201820	●
2	0/-0.015	1	0/-0.015	4	1.6	4	1.9	50	2	4.29	4.4	4.52	4.65	4.92	MHLNB202004	●
2	0/-0.015	1	0/-0.015	4	1.6	6	1.9	50	2	6.36	6.54	6.74	6.94	7.39	MHLNB202006	●
2	0/-0.015	1	0/-0.015	4	1.6	8	1.9	50	2	8.42	8.68	8.95	9.24	9.86	MHLNB202008	●
2	0/-0.015	1	0/-0.015	4	1.6	10	1.9	50	2	10.49	10.82	11.17	11.53	12.32	MHLNB202010	●
2	0/-0.015	1	0/-0.015	4	1.6	12	1.9	50	2	12.56	12.96	13.38	13.83	14.79	MHLNB202012	●
2	0/-0.015	1	0/-0.015	4	1.6	14	1.9	50	2	14.62	15.1	15.59	16.12	17.26	MHLNB202014	●
2	0/-0.015	1	0/-0.015	4	1.6	16	1.9	50	2	16.69	17.23	17.81	18.42	19.73	MHLNB202016	●
2	0/-0.015	1	0/-0.015	4	1.6	18	1.9	60	2	18.76	19.37	20.02	20.71	-	MHLNB202018	●
2	0/-0.015	1	0/-0.015	4	1.6	20	1.9	60	2	20.83	21.51	22.24	23	-	MHLNB202020	●
2	0/-0.015	1	0/-0.015	4	1.6	22	1.9	60	2	22.89	23.65	24.45	25.3	-	MHLNB202022	●
2	0/-0.015	1	0/-0.015	4	1.6	25	1.9	75	2	25.99	26.86	27.77	28.74	-	MHLNB202025	●
2	0/-0.015	1	0/-0.015	4	1.6	30	1.9	75	2	31.16	32.21	33.31	-	-	MHLNB202030	●
3	0/-0.020	1.5	0/-0.015	6	2.4	8	2.8	50	2	8.6	8.84	9.1	9.37	9.96	MHLNB203008	●
3	0/-0.020	1.5	0/-0.015	6	2.4	10	2.8	50	2	10.67	10.98	11.32	11.67	12.43	MHLNB203010	●
3	0/-0.020	1.5	0/-0.015	6	2.4	12	2.8	50	2	12.73	13.12	13.53	13.96	14.9	MHLNB203012	●
3	0/-0.020	1.5	0/-0.015	6	2.4	16	2.8	60	2	16.87	17.4	17.96	18.55	19.83	MHLNB203016	●
3	0/-0.020	1.5	0/-0.015	6	2.4	20	2.8	60	2	21	21.68	22.39	23.14	24.77	MHLNB203020	●
3	0/-0.020	1.5	0/-0.015	6	2.4	25	2.8	75	2	26.17	27.02	27.93	28.88	-	MHLNB203025	●
3	0/-0.020	1.5	0/-0.015	6	2.4	30	2.8	75	2	31.34	32.37	33.46	34.62	-	MHLNB203030	●
3	0/-0.020	1.5	0/-0.015	6	2.4	35	2.8	75	2	36.51	37.72	39	40.35	-	MHLNB203035	◎
4	0/-0.020	2	0/-0.015	6	3.2	10	3.7	50	2	10.84	11.15	11.47	11.81	12.54	MHLNB204010	●
4	0/-0.020	2	0/-0.015	6	3.2	16	3.7	60	2	17.04	17.56	18.11	18.69	19.94	MHLNB204016	●
4	0/-0.020	2	0/-0.015	6	3.2	20	3.7	60	2	21.18	21.84	22.54	23.28	-	MHLNB204020	●
4	0/-0.020	2	0/-0.015	6	3.2	25	3.7	75	2	26.35	27.19	28.08	29.02	-	MHLNB204025	●
4	0/-0.020	2	0/-0.015	6	3.2	30	3.7	75	2	31.51	32.53	33.61	-	-	MHLNB204030	●
4	0/-0.020	2	0/-0.015	6	3.2	35	3.7	75	2	36.68	37.88	39.15	-	-	MHLNB204035	●
4	0/-0.020	2	0/-0.015	6	3.2	40	3.7	100	2	41.85	43.23	-	-	-	MHLNB204040	●
4	0/-0.020	2	0/-0.015	6	3.2	45	3.7	100	2	47.02	48.57	-	-	-	MHLNB204045	◎

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

MHLNB2

- Cylindrical shank
- 2 flutes ball nose
- Extended and reduced neck

P	M	K	N	S	H
★		★			★



OSAWA NORM	MH	NMG MH COAT	30÷70 HRC	FHA 30°	BALL NOSE	ZEFP 2 BALL	ROUND RIB
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DC	DC tol.	RE	RE tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
4	0/-0.020	2	0/-0.015	6	3.2	50	3.7	100	2	52.19	53.92	-	-	-	MHLNB204050	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

Cutting Parameters

MHLNB2

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Cutting Parameters

MHLNB2

	Material Group ISO 513				P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3				
	Hardness/Rm				≤45 HRC		45÷55 HRC		55÷60 HRC		60÷65 HRC	
	ap x ae				ap x 0.2D		ap x 0.2D		ap x 0.2D		ap x 0.2D	
	Vc (m/min)				140÷160		110÷130		80÷100		50÷70	
	DC (mm)	LU (mm)	ap (mm)	DC(eff.) (mm)	fz (mm/z)		fz (mm/z)		fz (mm/z)		fz (mm/z)	
	4	≤ 6D	0.20	1.74	0.095		0.086		0.076		0.067	
		≤ 8D	0.17	1.61	0.086		0.069		0.062		0.054	
≤ 10D		0.14	1.47	0.076		0.055		0.049		0.043		
≤ 12D		0.11	1.31	0.067		0.042		0.037		0.033		
>12D		0.09	1.19	0.057		0.031		0.027		0.024		

	α	n (rpm)	Vf (mm/min)
	45°	x 1.65	x 1.65
	30°	x 1.30	x 1.30
	15°	x 1.15	x 1.15

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

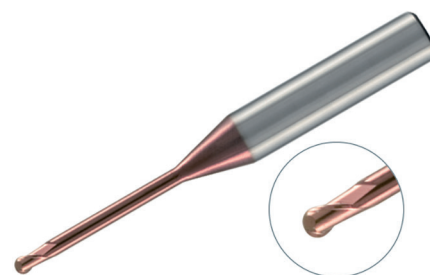
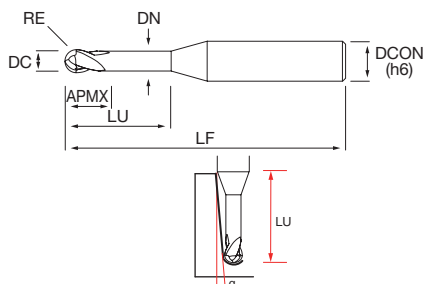
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

MHCRB2

- Cylindrical shank
- 2 flutes ball nose
- Extended and reduced neck
- 6 mm. shank



P	M	K	N	S	H
★		★			★



DC	DC tol.	RE	RE tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
0.5	0/-0.012	0.25	±0.005	6	0.5	2	0.45	50	2	2.15	2.22	2.29	2.36	2.52	MHCRB20050206	○
0.5	0/-0.012	0.25	±0.005	6	0.5	4	0.45	50	2	4.22	4.35	4.5	4.65	4.98	MHCRB20050406	●
0.6	0/-0.012	0.3	±0.005	6	0.5	2	0.55	50	2	2.15	2.21	2.28	2.35	2.5	MHCRB20060206	●
0.6	0/-0.012	0.3	±0.005	6	0.5	4	0.55	50	2	4.22	4.35	4.49	4.65	4.97	MHCRB20060406	●
0.6	0/-0.012	0.3	±0.005	6	0.5	6	0.55	50	2	6.28	6.49	6.71	6.94	7.44	MHCRB20060606	●
0.8	0/-0.012	0.4	±0.005	6	0.8	2	0.75	50	2	2.15	2.21	2.27	2.34	2.48	MHCRB20080206	●
0.8	0/-0.012	0.4	±0.005	6	0.8	4	0.75	50	2	4.21	4.34	4.48	4.63	4.95	MHCRB20080406	●
0.8	0/-0.012	0.4	±0.005	6	0.8	6	0.75	50	2	6.28	6.48	6.7	6.93	7.42	MHCRB20080606	●
1	0/-0.012	0.5	±0.005	6	1	3	0.9	50	2	3.27	3.37	3.47	3.57	3.8	MHCRB20100306	●
1	0/-0.012	0.5	±0.005	6	1	6	0.9	50	2	6.37	6.58	6.79	7.02	7.5	MHCRB20100606	●
1	0/-0.012	0.5	±0.005	6	1	8	0.9	50	2	8.44	8.71	9	9.31	9.97	MHCRB20100806	●
1	0/-0.012	0.5	±0.005	6	1	10	0.9	50	2	10.51	10.85	11.22	11.61	12.44	MHCRB20101006	●
1.2	0/-0.012	0.6	±0.005	6	1.2	6	1.1	50	2	6.37	6.57	6.78	7	7.48	MHCRB20120606	●
1.2	0/-0.012	0.6	±0.005	6	1.2	8	1.1	50	2	8.44	8.71	8.99	9.3	9.95	MHCRB20120806	●
1.2	0/-0.012	0.6	±0.005	6	1.2	10	1.1	50	2	10.5	10.85	11.21	11.59	12.42	MHCRB20121006	●
1.5	0/-0.012	0.75	±0.005	6	1.5	4	1.4	50	2	4.3	4.42	4.55	4.68	4.98	MHCRB20150406	●
1.5	0/-0.012	0.75	±0.005	6	1.5	8	1.4	50	2	8.43	8.7	8.98	9.27	9.91	MHCRB20150806	●
1.5	0/-0.012	0.75	±0.005	6	1.5	10	1.4	50	2	10.5	10.84	11.19	11.57	12.38	MHCRB20151006	●
1.5	0/-0.012	0.75	±0.005	6	1.5	12	1.4	50	2	12.57	12.97	13.41	13.86	14.85	MHCRB20151206	●
1.5	0/-0.012	0.75	±0.005	6	1.5	16	1.4	50	2	16.7	17.25	17.84	18.45	19.78	MHCRB20151606	●
2	0/-0.012	1	±0.005	6	3	6	1.9	50	2	6.36	6.54	6.74	6.94	7.39	MHCRB20200606	●
2	0/-0.012	1	±0.005	6	3	8	1.9	50	2	8.42	8.68	8.95	9.24	9.86	MHCRB20200806	●
2	0/-0.012	1	±0.005	6	3	10	1.9	50	2	10.49	10.82	11.17	11.53	12.32	MHCRB20201006	●
2	0/-0.012	1	±0.005	6	3	12	1.9	50	2	12.56	12.96	13.38	13.83	14.79	MHCRB20201206	●
2	0/-0.012	1	±0.005	6	3	16	1.9	50	2	16.69	17.23	17.81	18.42	19.73	MHCRB20201606	●
2	0/-0.012	1	±0.005	6	3	20	1.9	50	2	20.83	21.51	22.24	23	24.66	MHCRB20202006	●

★ 1st choice, ☆ suitable, ● stock standard, ○ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

MHCRB2

Material Group ISO 513				P3	P4	P5	K2	K3	P6	K4	H1	H4	H5	H2	H3		
Hardness/Rm				≤45 HRC					45÷55 HRC					55÷60 HRC		60÷65 HRC	
ap x ae				ap x 0.2D					ap x 0.2D					ap x 0.2D		ap x 0.2D	
Vc (m/min)				140÷160					110÷130					80÷100		50÷70	
DC (mm)	l1 (mm)	ap (mm)	DC(eff.) (mm)	fz (mm/z)					fz (mm/z)					fz (mm/z)		fz (mm/z)	
0.5	≤ 6D	0.03	0.22	0.020					0.018					0.016		0.014	
	≤ 8D	0.02	0.20	0.018					0.015					0.013		0.011	
	≤ 10D	0.02	0.18	0.016					0.012					0.010		0.009	
0.6	≤ 6D	0.03	0.26	0.022					0.020					0.018		0.015	
	≤ 8D	0.03	0.24	0.020					0.016					0.014		0.012	
	≤ 10D	0.02	0.22	0.018					0.013					0.011		0.010	
0.8	≤ 6D	0.04	0.35	0.025					0.023					0.020		0.018	
	≤ 8D	0.03	0.32	0.023					0.018					0.016		0.014	
	≤ 10D	0.03	0.29	0.020					0.014					0.013		0.011	
1	≤ 6D	0.05	0.44	0.030					0.027					0.024		0.021	
	≤ 8D	0.04	0.40	0.027					0.022					0.019		0.017	
	≤ 10D	0.04	0.37	0.024					0.017					0.015		0.013	
	≤ 12D	0.03	0.33	0.021					0.013					0.012		0.010	
	>12D	0.02	0.30	0.018					0.010					0.009		0.008	
1.2	≤ 6D	0.06	0.52	0.035					0.032					0.028		0.025	
	≤ 8D	0.05	0.48	0.032					0.026					0.023		0.020	
	≤ 10D	0.04	0.44	0.028					0.020					0.018		0.016	
	≤ 12D	0.03	0.39	0.025					0.015					0.014		0.012	
	>12D	0.03	0.36	0.021					0.011					0.010		0.009	
1.5	≤ 6D	0.08	0.65	0.045					0.041					0.036		0.032	
	≤ 8D	0.06	0.61	0.041					0.033					0.029		0.026	
	≤ 10D	0.05	0.55	0.036					0.026					0.023		0.020	
	≤ 12D	0.04	0.49	0.032					0.020					0.018		0.015	
	>12D	0.03	0.44	0.027					0.015					0.013		0.011	
2	≤ 6D	0.10	0.87	0.060					0.054					0.048		0.042	
	≤ 8D	0.09	0.81	0.054					0.044					0.039		0.034	
	≤ 10D	0.07	0.74	0.048					0.035					0.031		0.027	
	≤ 12D	0.06	0.65	0.042					0.026					0.024		0.021	
	>12D	0.05	0.59	0.036					0.019					0.017		0.015	
	≥ 15D	0.06	0.06	0.030					0.027					0.024		0.021	

	α	n (rpm)	Vf (mm/min)
	45°	x 1.65	x 1.65
	30°	x 1.30	x 1.30
	15°	x 1.15	x 1.15

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

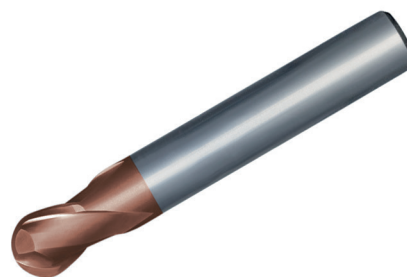
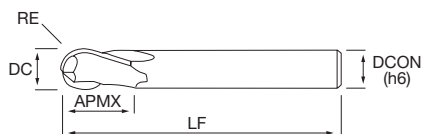
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

MEXCSB2

- Cylindrical shank
- 2 flutes ball nose



P	M	K	N	S	H
★		★			★



DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
1	0/-0.020	0.5	0/-0.010	3	h6	3	38	2	MEXCSB2010	●
1.5	0/-0.020	0.75	0/-0.010	3	h6	3	38	2	MEXCSB2015	●
2	0/-0.020	1	0/-0.010	6	h6	3	50	2	MEXCSB2020	●
2.5	0/-0.020	1.25	0/-0.015	4	h6	4	50	2	MEXCSB202550	●
3	0/-0.020	1.5	0/-0.010	6	h6	4	50	2	MEXCSB2030	●
4	0/-0.020	2	0/-0.010	6	h6	5	54	2	MEXCSB2040	●
5	0/-0.020	2.5	0/-0.010	6	h6	6	54	2	MEXCSB2050	●
6	0/-0.020	3	0/-0.010	6	h6	12	60	2	MEXCSB2060	●
8	0/-0.020	4	0/-0.010	8	h6	14	60	2	MEXCSB2080	●
10	0/-0.020	5	0/-0.010	10	h6	18	70	2	MEXCSB2100	●
12	0/-0.020	6	0/-0.010	12	h6	22	80	2	MEXCSB2120	●
14	0/-0.020	7	0/-0.020	14	h6	32	90	2	MEXCSB2140	●
16	0/-0.020	8	0/-0.020	16	h6	32	90	2	MEXCSB2160	●
18	0/-0.020	9	0/-0.020	18	h6	38	100	2	MEXCSB2180	⊙
20	0/-0.020	10	0/-0.020	20	h6	38	100	2	MEXCSB2200	●

★ 1st choice, ☆ suitable, ● stock standard, ⊙ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

MEXCSB2

	Material Group ISO 513		P2 P3 P4 K1 K2	P4 P5 K3	P6 K4	H1 H4 H5
	Hardness/Rm		≤1000 N/mm ²	≤35 HRC	35÷45 HRC	45÷55 HRC
	ap x ae		0.05D x 0.2D	0.05D x 0.2D	0.05D x 0.2D	0.05D x 0.2D
	Vc (m/min)		120÷160	80÷120	60÷100	50÷70
	DC (mm)	ap (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.44	0.009	0.008	0.007	0.006
	1.5	0.79	0.012	0.011	0.010	0.008
	2	1.20	0.012	0.011	0.010	0.008
	2.5	1.65	0.015	0.014	0.012	0.011
	3	2.14	0.018	0.016	0.014	0.013
	4	3.20	0.025	0.023	0.020	0.018
	5	4.33	0.032	0.029	0.026	0.022
	6	5.50	0.038	0.034	0.030	0.027
	8	7.84	0.048	0.043	0.038	0.034
	10	10.00	0.057	0.051	0.046	0.040
	12	11.76	0.067	0.060	0.054	0.047
	14	12.83	0.080	0.072	0.064	0.056
	16	12.80	0.095	0.086	0.076	0.067
	18	10.80	0.108	0.097	0.086	0.076
	20	12.00	0.108	0.097	0.086	0.076

	α	n (rpm)	Vf (mm/min)
	15°	x 1.1	x 1.1

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

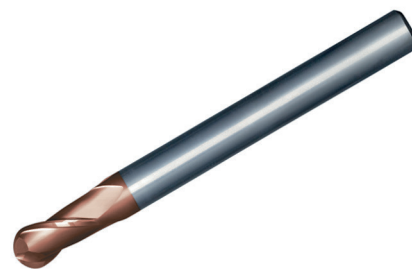
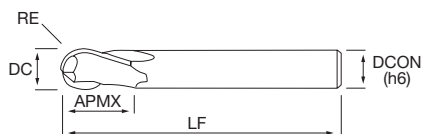
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

MEXCLSB2

- Cylindrical shank
- 2 flutes ball nose
- Long reach



P	M	K	N	S	H
★		★			★



DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
1	0/-0.012	0.5	0/-0.010	4	h6	2.5	50	2	MEXCLSB2010	●
1.2	0/-0.012	0.6	0/-0.010	4	h6	3	50	2	MEXCLSB2012	●
1.5	0/-0.012	0.75	0/-0.010	4	h6	4	50	2	MEXCLSB2015	●
2	0/-0.012	1	0/-0.010	6	h6	5	50	2	MEXCLSB2020	●
2.5	0/-0.012	1.25	0/-0.010	6	h6	6	60	2	MEXCLSB2025	●
3	0/-0.012	1.5	0/-0.010	6	h6	8	60	2	MEXCLSB2030	●
4	0/-0.012	2	0/-0.010	6	h6	8	70	2	MEXCLSB2040	●
5	0/-0.012	2.5	0/-0.010	6	h6	10	80	2	MEXCLSB2050	●
6	0/-0.015	3	0/-0.010	6	h6	12	90	2	MEXCLSB2060	●
8	0/-0.015	4	0/-0.010	8	h6	14	100	2	MEXCLSB2080	●
10	0/-0.015	5	0/-0.010	10	h6	18	100	2	MEXCLSB2100	●
12	0/-0.015	6	0/-0.010	12	h6	22	110	2	MEXCLSB2120	●
14	0/-0.035	7	0/-0.020	14	h6	32	125	2	MEXCLSB2140	●
16	0/-0.035	8	0/-0.020	16	h6	32	150	2	MEXCLSB2160	●
20	0/-0.035	10	0/-0.020	20	h6	38	150	2	MEXCLSB2200	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

MEXCLSB2

	Material Group ISO 513		P2 P3 P4 K1 K2	P4 P5 K3	P6 K4	H1 H4 H5
	Hardness/Rm		≤1000 N/mm ²	≤35 HRC	35÷45 HRC	45÷55 HRC
	ap x ae		0.05D x 0.2D	0.05D x 0.2D	0.05D x 0.2D	0.05D x 0.2D
	Vc (m/min)		100÷140	80÷120	60÷80	40÷60
	DC (mm)	ap (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.44	0.015	0.014	0.012	0.011
	2	0.87	0.021	0.019	0.017	0.015
	3	1.31	0.027	0.024	0.022	0.019
	4	1.74	0.037	0.033	0.029	0.026
	5	2.18	0.045	0.041	0.036	0.032
	6	2.62	0.051	0.046	0.041	0.036
	8	3.49	0.060	0.054	0.048	0.042
	10	4.36	0.068	0.061	0.054	0.048
	12	5.23	0.077	0.069	0.061	0.054
	14	6.10	0.089	0.080	0.071	0.062
	16	6.97	0.102	0.092	0.082	0.071
	18	7.85	0.115	0.103	0.092	0.080
	20	8.72	0.132	0.119	0.106	0.092

α	n (rpm)	Vf (mm/min)
30°	x 0.8	x 0.8
15°	x 0.7	x 0.7
0°	x 0.6	x 0.6

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

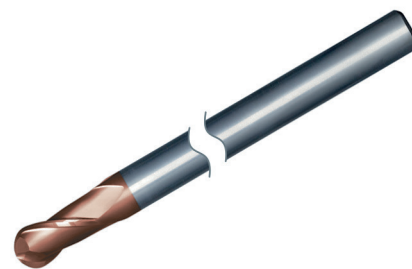
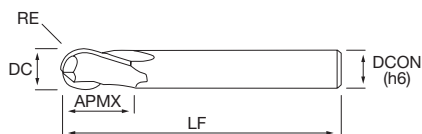
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

MEX253

- Cylindrical shank
- 2 flutes ball nose
- Extra long reach



P	M	K	N	S	H
★		★			★



DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
1	0/-0.020	0.5	0/-0.010	4	h6	3	75	2	MEX25301075	●
1	0/-0.020	0.5	0/-0.010	4	h6	3	100	2	MEX253010100	●
1.5	0/-0.020	0.75	0/-0.010	4	h6	3	75	2	MEX25301575	●
1.5	0/-0.020	0.75	0/-0.010	4	h6	3	100	2	MEX253015100	●
2	0/-0.020	1	0/-0.010	4	h6	4	75	2	MEX25302075	●
2	0/-0.020	1	0/-0.010	4	h6	4	100	2	MEX253020100	▽
3	0/-0.030	1.5	0/-0.015	6	h6	5	75	2	MEX25303075	●
3	0/-0.030	1.5	0/-0.015	6	h6	5	100	2	MEX253030	●
4	0/-0.030	2	0/-0.015	6	h6	8	100	2	MEX253040	●
5	0/-0.030	2.5	0/-0.015	6	h6	9	100	2	MEX253050100	●
6	0/-0.030	3	0/-0.015	6	h6	10	150	2	MEX253060150	●
8	0/-0.030	4	0/-0.015	8	h6	12	150	2	MEX253080	●
10	0/-0.035	5	0/-0.020	10	h6	14	150	2	MEX25310150	●
12	0/-0.035	6	0/-0.020	12	h6	16	150	2	MEX25312150	●
16	0/-0.035	8	0/-0.020	16	h6	32	200	2	MEX253160	●
20	0/-0.035	10	0/-0.020	20	h6	38	200	2	MEX253200	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

MEX253

	Material Group ISO 513		P2 P3 P4 K1 K2	P4 P5 K3	P6 K4	H1 H4 H5
	Hardness/Rm		≤1000 N/mm ²	≤35 HRC	35÷45 HRC	45÷55 HRC
	ap x ae		0.05D x 0.2D	0.05D x 0.2D	0.05D x 0.2D	0.05D x 0.2D
	Vc (m/min)		90÷130	60÷100	50÷70	30÷50
	DC (mm)	ap (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.44	0.015	0.014	0.012	0.011
	2	0.87	0.021	0.019	0.017	0.015
	3	1.31	0.027	0.024	0.022	0.019
	4	1.74	0.037	0.033	0.029	0.026
	5	2.18	0.045	0.041	0.036	0.032
	6	2.62	0.051	0.046	0.041	0.036
	8	3.49	0.060	0.054	0.048	0.042
	10	4.36	0.068	0.061	0.054	0.048
	12	5.23	0.077	0.069	0.061	0.054
	14	6.10	0.089	0.080	0.071	0.062
	16	6.97	0.102	0.092	0.082	0.071
	18	7.85	0.115	0.103	0.092	0.080
	20	8.72	0.132	0.119	0.106	0.092

α	n (rpm)	Vf (mm/min)
30°	x 0.8	x 0.8
15°	x 0.7	x 0.7
0°	x 0.6	x 0.6

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS



UH AND MH

STEEL AND HARDENED STEEL

< 70 HRC (UH) AND 30÷ 70 HRC (MH)

🇬🇧 Nano micrograin and UH RED and MH, TiSi base coating for high performance milling on hardened steel up to 70 HRC. High reliability and long life in dry milling operation adopting high speed or high feed strategy. The cutting geometry has been specifically designed to obtain high precision and high quality surface finishing.

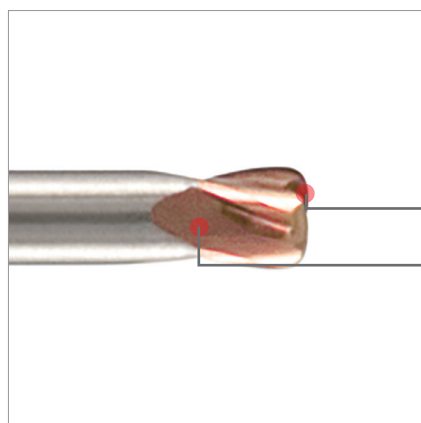
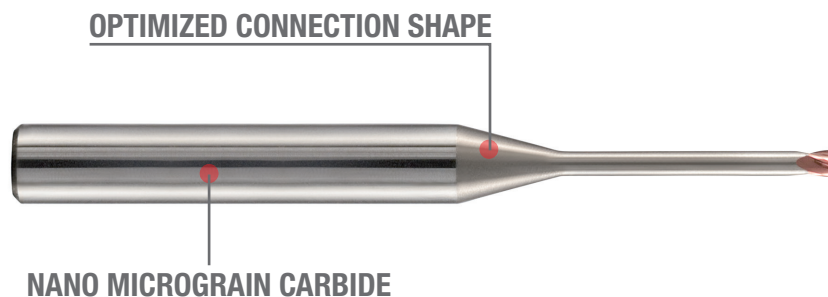
🇮🇹 Nano micrograna e rivestimento UH RED e MH, a base TiSi per la fresatura di materiali temprati sino a 70 HRC. Grande affidabilità e durata nell'utilizzo di strategie di lavorazione ad alta velocità o alto avanzamento e con la possibilità di evitare l'utilizzo del refrigerante. Le geometrie di taglio specifiche garantiscono elevata precisione ed eccellente finitura della superficie lavorata.

🇩🇪 Nano-Mikrokörnung und Beschichtung UH RED und MH auf TiSi-Basis für das Fräsen von gehärteten Materialien bis zu 70 HRC. Hohe Zuverlässigkeit und lange Standzeit auch bei Bearbeitungsverfahren mit hoher Geschwindigkeit und großem Vorschub und mit der Möglichkeit, ohne Kühlmittel zu arbeiten. Die spezifischen Schnittgeometrien gewährleisten eine hohe Präzision und eine hervorragende Endbearbeitung der bearbeiteten Fläche.

🇫🇷 Nano micrograin et revêtement UH RED et MH à base TiSi pour le fraisage de matériaux trempés jusqu'à 70 HRC. Grande fiabilité et durée dans l'utilisation stratégique d'usinage à haute vitesse ou avancement élevé et avec la possibilité d'éviter l'utilisation de lubrifiant. Les géométries de coupe spécifiques garantissent une précision élevée et une excellente finition de la surface usinée.

UH&MH

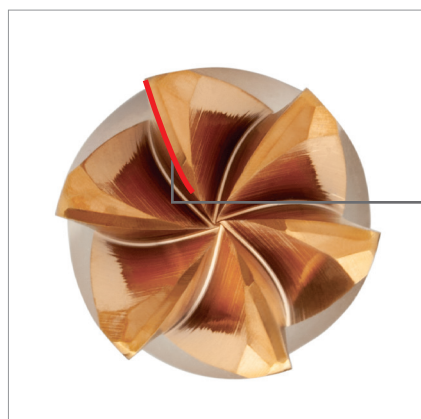
Features of UH end mills



INNOVATIVE GRINDING TECHNOLOGY

TISI BASED NANO MULTILAYER UH RED COATING

High feed strategy UHF RT

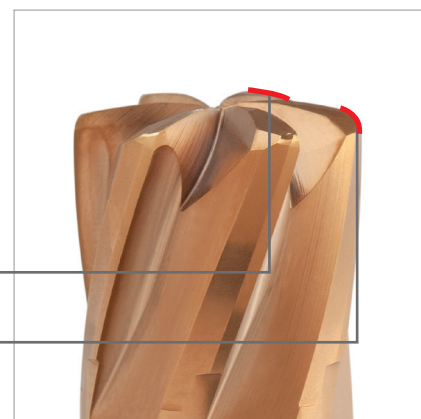


UNIQUE 3 RADII DESIGN

CURVED EDGE

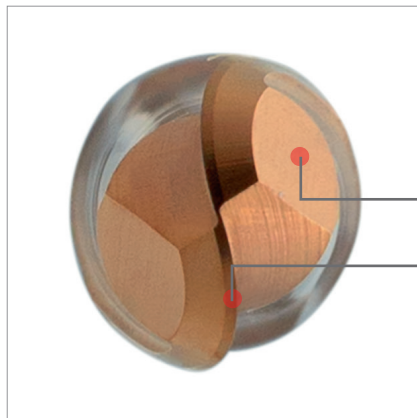
HEAD RADIUS

CORNER RADIUS



UH&MH

Features of MH end mills



Features and Benefits of UH series

- High edge quality for less chipping and reliable tool life due to the innovative grinding technology
- Great wear resistance even at high cutting speed thanks to the nano micrograin carbide
- Optimized connection shape allows greater stability during machining
- High temperature stability improved by the TiSi based nano multilayer coating
- Multi-edged endmill UHF RT with unique 3 radii geometry, specific for high feed milling on hardened steels up to 70HRC.

- Elevata qualità del tagliente garantisce minori scheggiature e miglior durata dell'utensile grazie all'innovativa tecnologia di rettifica
- Grande resistenza all'usura anche a velocità di taglio elevate grazie al metallo duro nanomicrograna
- La forma ottimizzata di connessione consente una maggiore stabilità durante la lavorazione
- Stabilità alle alte temperature migliorata dal rivestimento nano multistrato con base TiSi
- Fresa multitagliente UHF RT con geometria unica a 3 raggi, specifica per fresatura ad avanzamenti elevati su acciai temprati fino a 70HRC.

- Die hohe Schneidkantenqualität gewährleistet weniger Ausbrüche und eine längere Standzeit des Werkzeugs dank der innovativen Schleiftechnologie
- Hohe Verschleißfestigkeit auch bei hohen Schneidgeschwindigkeiten dank Nanomikrokorn-Hartmetall
- Die optimierte Form der Verbindung ermöglicht eine höhere Stabilität bei der Bearbeitung
- Verbesserte Stabilität bei hohen Temperaturen durch mehrschichtige Nanobeschichtung mit TiSi-Basis
- Mehrzahnfräser UHF RT mit einzigartiger 3-Radius-Geometrie, speziell für das Fräsen von gehärteten Stählen bis zu 70HRC mit hohem Vorschub.

- La haute qualité du tranchant garantit de moindres ébréchures et une plus longue durée de vie de l'outil grâce à la technologie innovante de rectification
- Grande résistance à l'usure y compris à haute vitesse de coupe grâce au carbure nano-micrograin
- La forme de connexion optimisée permet une stabilité accrue pendant l'usinage.
- Stabilité aux hautes températures améliorée par le revêtement nano multicouche avec base TiSi
- Fraise multi-tranchant UHF RT avec géométrie unique à 3 rayons, spéciale fraisage à grande avance sur les aciers trempés jusqu'à 70HRC.

UH&MH

Features and Benefits of MH series

- Special edge design enables high versatility for general milling, copying and super finishing on materials from 30 to 70 HRC
- High temperature stability during the machining process thanks to the MH coating
- Nano-micrograin carbide guarantees excellent wear resistance and long life
- Die spezielle Schneidkantenkonstruktion ermöglicht hohe Vielseitigkeit beim allgemeinen Fräsen, Nacharbeiten und Feinstbearbeiten von Materialien von 30 bis 70 HRC
- Hohe Temperaturstabilität bei der Bearbeitung dank der MH-Beschichtung
- Das Nanokorn-Hartmetall sorgt für hervorragende Verschleißfestigkeit und lange Standzeit
- Lo speciale design del tagliente consente un'elevata versatilità in fresatura generale, copiatura e superfinitura di materiali da 30 a 70 HRC
- Stabilità alle alte temperature durante il processo di lavorazione grazie al rivestimento MH
- Il metallo duro nano-micrograna garantisce ottima resistenza all'usura e lunga durata
- La conception spéciale du tranchant permet une grande polyvalence général de fraisage, la copie et la superfinition de matériaux de 30 à 70 HRC.
- Stabilité aux hautes températures pendant le processus d'usinage grâce au revêtement MH
- Le carbure nano-micrograin garantit une excellente résistance à l'usure et une longue durée de vie

Use case

Tool Type	UHF4LN
Workpiece	W.-Nr 1.2379 X155CrVMo12 1(K110) 60HRC
Parameters	Vc 60 m/min, fz 0,01 mm/t, ap 0,04 mm, ae 1,5 mm
Coolant	air
Diameter	1,5 mm
Machining time	



UHM204

- Cylindrical shank
- 2F
- Miniature



P	M	K	N	S	H
☆		☆			★

OSAWA
NORM

UH

NMG
UH RED

<70
HRC

FHA 40°

SQUARE

ZEFP 2

SLOTING

DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
0.1	0/-0.010	4	h6	0.2	40	2	UHM200104	⊙
0.2	0/-0.010	4	h6	0.3	50	2	UHM200204	⊙
0.3	0/-0.010	4	h6	0.4	50	2	UHM200304	●
0.4	0/-0.010	4	h6	0.6	50	2	UHM200404	⊙
0.5	0/-0.010	4	h6	0.7	50	2	UHM200504	●
0.6	0/-0.010	4	h6	0.9	50	2	UHM200604	⊙
0.7	0/-0.010	4	h6	1	50	2	UHM200704	●
0.8	0/-0.010	4	h6	1.2	50	2	UHM200804	⊙
0.9	0/-0.010	4	h6	1.4	50	2	UHM200904	⊙

★ 1st choice, ☆ suitable, ● stock standard, ⊙ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

UHM204

	Material Group ISO 513		P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3
	Hardness/Rm		≤45 HRC	45÷55 HRC	55÷60 HRC	60÷65 HRC
	ap x ae		ap x D	ap x D	ap x D	ap x D
	Vc (m/min)		80÷120	60÷100	50÷70	30÷50
	DC (mm)	ap (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	0.1	0.01	0.002	0.002	0.002	0.001
	0.2	0.01	0.003	0.003	0.002	0.002
	0.3	0.02	0.004	0.004	0.003	0.003
	0.4	0.02	0.006	0.005	0.005	0.004
	0.5	0.03	0.007	0.006	0.006	0.005
	0.6	0.03	0.008	0.007	0.006	0.006
	0.8	0.04	0.010	0.009	0.008	0.007
	0.9	0.05	0.012	0.011	0.010	0.008

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

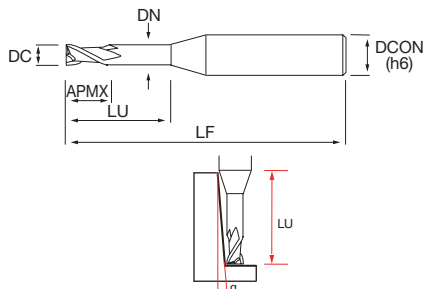
K - HSS END MILLS

L - CARBIDE BURRS

UHLN2

- Cylindrical shank
- 2F
- Extended and reduced neck

P M K N S H



DC	DC tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
0.2	0/-0.010	4	0.3	0.5	0.16	50	2	0.57	0.59	0.61	0.63	0.68	UHLN2002005	●
0.2	0/-0.010	4	0.3	1	0.16	50	2	1.09	1.12	1.16	1.21	1.3	UHLN200201	●
0.2	0/-0.010	4	0.3	1.5	0.16	50	2	1.6	1.66	1.72	1.78	1.91	UHLN2002015	◎
0.3	0/-0.010	4	0.4	1	0.26	50	2	1.09	1.12	1.16	1.21	1.3	UHLN200301	●
0.3	0/-0.010	4	0.4	2	0.26	50	2	2.12	2.19	2.27	2.35	2.53	UHLN200302	●
0.3	0/-0.010	4	0.4	3	0.26	50	2	3.15	3.26	3.38	3.5	3.76	UHLN200303	●
0.4	0/-0.010	4	0.6	2	0.37	50	2	2.12	2.19	2.27	2.35	2.53	UHLN200402	◎
0.4	0/-0.010	4	0.6	3	0.37	50	2	3.15	3.26	3.38	3.5	3.76	UHLN200403	●
0.4	0/-0.010	4	0.6	4	0.37	50	2	4.19	4.33	4.49	4.65	5	UHLN200404	●
0.4	0/-0.010	4	0.6	5	0.37	50	2	5.22	5.4	5.59	5.79	6.23	UHLN200405	●
0.5	0/-0.010	4	0.7	2	0.45	50	2	2.16	2.23	2.31	2.4	2.57	UHLN200502	●
0.5	0/-0.010	4	0.7	4	0.45	50	2	4.23	4.37	4.53	4.69	5.04	UHLN200504	●
0.5	0/-0.010	4	0.7	6	0.45	50	2	6.29	6.51	6.74	6.98	7.51	UHLN200506	●
0.5	0/-0.010	4	0.7	8	0.45	50	2	8.36	8.65	8.96	9.28	9.98	UHLN200508	●
0.6	0/-0.010	4	0.9	2	0.55	50	2	2.16	2.23	2.31	2.4	2.57	UHLN200602	●
0.6	0/-0.010	4	0.9	4	0.55	50	2	4.23	4.37	4.53	4.69	5.04	UHLN200604	●
0.6	0/-0.010	4	0.9	6	0.55	50	2	6.29	6.51	6.74	6.98	7.51	UHLN200606	●
0.6	0/-0.010	4	0.9	8	0.55	50	2	8.36	8.65	8.96	9.28	9.98	UHLN200608	●
0.6	0/-0.010	4	0.9	10	0.55	50	2	10.43	10.79	11.17	11.57	12.44	UHLN200610	●
0.7	0/-0.010	4	1	2	0.65	50	2	2.16	2.23	2.31	2.4	2.57	UHLN200702	●
0.7	0/-0.010	4	1	4	0.65	50	2	4.23	4.37	4.53	4.69	5.04	UHLN200704	●
0.7	0/-0.010	4	1	6	0.65	50	2	6.29	6.51	6.74	6.98	7.51	UHLN200706	◎
0.7	0/-0.010	4	1	8	0.65	50	2	8.36	8.65	8.96	9.28	9.98	UHLN200708	●
0.7	0/-0.010	4	1	10	0.65	50	2	10.43	10.79	11.17	11.57	12.44	UHLN200710	◎
0.8	0/-0.010	4	1.2	4	0.75	50	2	4.23	4.37	4.53	4.69	5.04	UHLN200804	●
0.8	0/-0.010	4	1.2	6	0.75	50	2	6.29	6.51	6.74	6.98	7.51	UHLN200806	◎
0.8	0/-0.010	4	1.2	8	0.75	50	2	8.36	8.65	8.96	9.28	9.98	UHLN200808	●
0.8	0/-0.010	4	1.2	10	0.75	50	2	10.43	10.79	11.17	11.57	12.44	UHLN200810	●
0.8	0/-0.010	4	1.2	12	0.75	50	2	12.49	12.93	13.38	13.87	14.91	UHLN200812	◎
0.9	0/-0.010	4	1.4	6	0.85	50	2	6.29	6.51	6.74	6.98	7.51	UHLN200906	●
0.9	0/-0.010	4	1.4	8	0.85	50	2	8.36	8.65	8.96	9.28	9.98	UHLN200908	●
0.9	0/-0.010	4	1.4	10	0.85	50	2	10.43	10.79	11.17	11.57	12.44	UHLN200910	●
0.9	0/-0.010	4	1.4	15	0.85	50	2	15.6	16.14	16.71	17.31	18.61	UHLN200915	●
1	0/-0.015	4	1.5	6	0.95	50	2	6.39	6.61	6.84	7.09	7.62	UHLN201006	●
1	0/-0.015	4	1.5	8	0.95	50	2	8.46	8.75	9.06	9.38	10.09	UHLN201008	●
1	0/-0.015	4	1.5	10	0.95	50	2	10.52	10.89	11.27	11.68	12.56	UHLN201010	●
1	0/-0.015	4	1.5	12	0.95	50	2	12.59	13.03	13.49	13.97	15.02	UHLN201012	●
1	0/-0.015	4	1.5	14	0.95	50	2	14.66	15.17	15.7	16.27	17.49	UHLN201014	●
1	0/-0.015	4	1.5	16	0.95	50	2	16.73	17.3	17.92	18.56	19.96	UHLN201016	●
1.2	0/-0.015	4	1.8	6	1.15	50	2	6.39	6.61	6.84	7.09	7.62	UHLN201206	◎
1.2	0/-0.015	4	1.8	8	1.15	50	2	8.46	8.75	9.06	9.38	10.09	UHLN201208	●
1.2	0/-0.015	4	1.8	10	1.15	50	2	10.52	10.89	11.27	11.68	12.56	UHLN201210	●
1.2	0/-0.015	4	1.8	12	1.15	50	2	12.59	13.03	13.49	13.97	15.02	UHLN201212	●
1.4	0/-0.015	4	2.1	6	1.35	50	2	6.39	6.61	6.84	7.09	7.62	UHLN201406	◎
1.4	0/-0.015	4	2.1	8	1.35	50	2	8.46	8.75	9.06	9.38	10.09	UHLN201408	◎

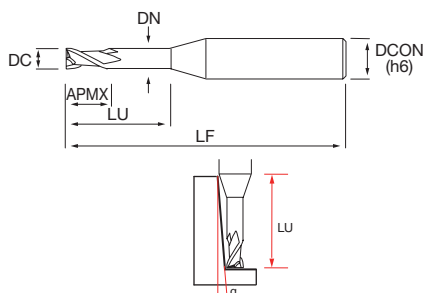
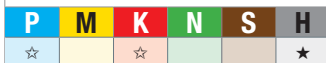
★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

UH (<70HRC) and MH (30÷70HRC) Square



UHLN2

- Cylindrical shank
- 2F
- Extended and reduced neck



DC	DC tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
1.4	0/-0.015	4	2.1	10	1.35	50	2	10.52	10.89	11.27	11.68	12.56	UHLN201410	●
1.4	0/-0.015	4	2.1	12	1.35	50	2	12.59	13.03	13.49	13.97	15.02	UHLN201412	●
1.4	0/-0.015	4	2.1	14	1.35	50	2	14.66	15.17	15.7	16.27	17.49	UHLN201414	●
1.4	0/-0.015	4	2.1	16	1.35	50	2	16.73	17.3	17.92	18.56	19.96	UHLN201416	●
1.5	0/-0.015	4	2.3	6	1.45	50	2	6.39	6.61	6.84	7.09	7.62	UHLN201506	●
1.5	0/-0.015	4	2.3	8	1.45	50	2	8.46	8.75	9.06	9.38	10.09	UHLN201508	●
1.5	0/-0.015	4	2.3	10	1.45	50	2	10.52	10.89	11.27	11.68	12.56	UHLN201510	◎
1.5	0/-0.015	4	2.3	12	1.45	50	2	12.59	13.03	13.49	13.97	15.02	UHLN201512	●
1.5	0/-0.015	4	2.3	14	1.45	50	2	14.66	15.17	15.7	16.27	17.49	UHLN201514	◎
1.5	0/-0.015	4	2.3	16	1.45	50	2	16.73	17.3	17.92	18.56	19.96	UHLN201516	●
1.5	0/-0.015	4	2.3	18	1.45	60	2	18.79	19.44	20.13	20.86	22.43	UHLN201518	●
1.5	0/-0.015	4	2.3	20	1.45	60	2	20.86	21.58	22.35	23.15	-	UHLN201520	●
1.6	0/-0.015	4	2.4	6	1.55	50	2	6.39	6.61	6.84	7.09	7.62	UHLN201606	●
1.6	0/-0.015	4	2.4	8	1.55	50	2	8.46	8.75	9.06	9.38	10.09	UHLN201608	●
1.6	0/-0.015	4	2.4	10	1.55	50	2	10.52	10.89	11.27	11.68	12.56	UHLN201610	●
1.6	0/-0.015	4	2.4	12	1.55	50	2	12.59	13.03	13.49	13.97	15.02	UHLN201612	●
1.6	0/-0.015	4	2.4	14	1.55	50	2	14.66	15.17	15.7	16.27	17.49	UHLN201614	●
1.6	0/-0.015	4	2.4	16	1.55	50	2	16.73	17.3	17.92	18.56	19.96	UHLN201616	●
1.6	0/-0.015	4	2.4	18	1.55	60	2	18.79	19.44	20.13	20.86	22.43	UHLN201618	●
1.6	0/-0.015	4	2.4	20	1.55	60	2	20.86	21.58	22.35	23.15	-	UHLN201620	●
1.8	0/-0.015	4	2.7	6	1.75	50	2	6.39	6.61	6.84	7.09	7.62	UHLN201806	◎
1.8	0/-0.015	4	2.7	8	1.75	50	2	8.46	8.75	9.06	9.38	10.09	UHLN201808	●
1.8	0/-0.015	4	2.7	10	1.75	50	2	10.52	10.89	11.27	11.68	12.56	UHLN201810	◎
1.8	0/-0.015	4	2.7	12	1.75	50	2	12.59	13.03	13.49	13.97	15.02	UHLN201812	●
1.8	0/-0.015	4	2.7	14	1.75	50	2	14.66	15.17	15.7	16.27	17.49	UHLN201814	●
1.8	0/-0.015	4	2.7	16	1.75	50	2	16.73	17.3	17.92	18.56	19.96	UHLN201816	●
1.8	0/-0.015	4	2.7	18	1.75	60	2	18.79	19.44	20.13	20.86	-	UHLN201818	●
1.8	0/-0.015	4	2.7	20	1.75	60	2	20.86	21.58	22.35	23.15	-	UHLN201820	●
2	0/-0.015	4	3	6	1.95	50	2	6.39	6.61	6.84	7.09	7.62	UHLN202006	●
2	0/-0.015	4	3	8	1.95	50	2	8.46	8.75	9.06	9.38	10.09	UHLN202008	●
2	0/-0.015	4	3	10	1.95	50	2	10.52	10.89	11.27	11.68	12.56	UHLN202010	●
2	0/-0.015	4	3	12	1.95	50	2	12.59	13.03	13.49	13.97	15.02	UHLN202012	●
2	0/-0.015	4	3	14	1.95	50	2	14.66	15.17	15.7	16.27	17.49	UHLN202014	◎
2	0/-0.015	4	3	16	1.95	50	2	16.73	17.3	17.92	18.56	-	UHLN202016	●
2	0/-0.015	4	3	18	1.95	60	2	18.79	19.44	20.13	20.86	-	UHLN202018	●
2	0/-0.015	4	3	20	1.95	60	2	20.86	21.58	22.35	23.15	-	UHLN202020	●
2	0/-0.015	4	3	25	1.95	75	2	26.03	26.93	27.88	-	-	UHLN202025	●
2	0/-0.015	4	3	30	1.95	75	2	31.2	32.28	33.42	-	-	UHLN202030	●
2.5	0/-0.020	4	3.7	8	2.4	50	2	8.46	8.75	9.06	9.38	10.09	UHLN202508	●
2.5	0/-0.020	4	3.7	10	2.4	50	2	10.52	10.89	11.27	11.68	12.56	UHLN202510	●
2.5	0/-0.020	4	3.7	12	2.4	50	2	12.59	13.03	13.49	13.97	-	UHLN202512	●
2.5	0/-0.020	4	3.7	14	2.4	50	2	14.66	15.17	15.7	16.27	-	UHLN202514	●
2.5	0/-0.020	4	3.7	16	2.4	50	2	16.73	17.3	17.92	18.56	-	UHLN202516	●
2.5	0/-0.020	4	3.7	18	2.4	60	2	18.79	19.44	20.13	20.86	-	UHLN202518	●
2.5	0/-0.020	4	3.7	20	2.4	60	2	20.86	21.58	22.35	-	-	UHLN202520	◎

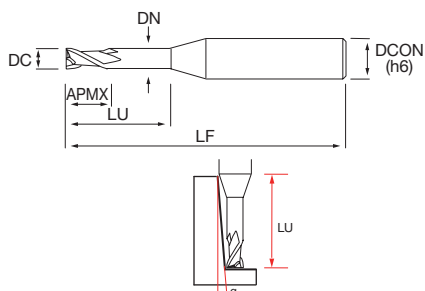
★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

UH (<70HRC) and MH (30÷70HRC) Square

UHLN2

- Cylindrical shank
- 2F
- Extended and reduced neck

P	M	K	N	S	H
☆		☆			★



OSAWA
NORM

UH

NMG
UH RED

<70
HRC

FHA 40°

SQUARE

ZEFP 2

SQUARE RIB

DC	DC tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
2.5	0/-0.020	4	3.7	25	2.4	75	2	24.1	24.94	25.83	-	-	UHLN202525	●
2.5	0/-0.020	4	3.7	30	2.4	75	2	31.2	32.28	-	-	-	UHLN202530	◎
3	0/-0.020	6	4.5	8	2.85	50	2	8.65	8.95	9.26	9.6	10.31	UHLN203008	●
3	0/-0.020	6	4.5	10	2.85	50	2	10.72	11.09	11.48	11.89	12.78	UHLN203010	●
3	0/-0.020	6	4.5	12	2.85	50	2	12.78	13.23	13.69	14.18	15.25	UHLN203012	●
3	0/-0.020	6	4.5	14	2.85	50	2	14.85	15.36	15.91	16.48	17.72	UHLN203014	●
3	0/-0.020	6	4.5	16	2.85	60	2	16.92	17.5	18.12	18.77	20.18	UHLN203016	●
3	0/-0.020	6	4.5	18	2.85	60	2	18.99	19.64	20.34	21.07	22.65	UHLN203018	◎
3	0/-0.020	6	4.5	20	2.85	60	2	21.05	21.78	22.55	23.36	25.12	UHLN203020	●
3	0/-0.020	6	4.5	25	2.85	75	2	26.22	27.13	28.09	29.1	-	UHLN203025	●
4	0/-0.020	6	4.5	10	3.85	60	2	10.91	11.29	11.68	12.1	13	UHLN204010	●
4	0/-0.020	6	4.5	15	3.85	60	2	16.08	16.63	17.22	17.84	19.17	UHLN204015	◎
4	0/-0.020	6	4.5	20	3.85	60	2	21.25	21.98	22.76	23.57	-	UHLN204020	●
4	0/-0.020	6	4.5	25	3.85	75	2	26.41	27.33	28.29	-	-	UHLN204025	◎
4	0/-0.020	6	4.5	30	3.85	75	2	31.58	32.67	33.83	-	-	UHLN204030	●
4	0/-0.020	6	4.5	40	3.85	75	2	41.92	43.37	-	-	-	UHLN204040	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

UHLN2

Material Group ISO 513			P3	P4	P5	K2	K3	P6	K4	H1	H4	H5	H2	H3
Hardness/Rm			≤45 HRC					45÷55 HRC					55÷60 HRC	60÷65 HRC
ap x ae			ap x D					ap x D					ap x D	ap x D
Vc (m/min)			80÷120					60÷100					50÷70	30÷50
DC (mm)	LU (mm)	ap (mm)	fz (mm/z)					fz (mm/z)					fz (mm/z)	fz (mm/z)
0.2	≤ 6D	0.01	0.003					0.003					0.002	0.002
	≤ 8D	0.01	0.003					0.002					0.002	0.002
	≤ 10D	0.01	0.002					0.002					0.002	0.001
	≤ 12D	0.01	0.002					0.001					0.001	0.001
0.3	≤ 6D	0.02	0.004					0.004					0.003	0.003
	≤ 8D	0.01	0.003					0.003					0.003	0.002
	≤ 10D	0.01	0.003					0.003					0.002	0.002
	≤ 12D	0.01	0.002					0.002					0.002	0.002
0.4	≤ 6D	0.02	0.006					0.005					0.005	0.004
	≤ 8D	0.02	0.005					0.005					0.004	0.004
	≤ 10D	0.01	0.004					0.004					0.003	0.003
	≤ 12D	0.01	0.003					0.003					0.003	0.002
0.5	≤ 6D	0.03	0.007					0.006					0.006	0.005
	≤ 8D	0.02	0.006					0.005					0.005	0.004
	≤ 10D	0.02	0.005					0.004					0.004	0.003
	≤ 12D	0.01	0.004					0.003					0.003	0.003
0.6	≤ 6D	0.03	0.008					0.007					0.006	0.006
	≤ 8D	0.03	0.007					0.006					0.005	0.005
	≤ 10D	0.02	0.006					0.005					0.004	0.004
	≤ 12D	0.02	0.004					0.004					0.004	0.003
0.8	≤ 6D	0.04	0.010					0.009					0.008	0.007
	≤ 8D	0.03	0.009					0.008					0.007	0.006
	≤ 10D	0.03	0.007					0.006					0.006	0.005
	≤ 12D	0.02	0.006					0.005					0.004	0.004
1	≤ 6D	0.05	0.012					0.011					0.010	0.008
	≤ 8D	0.04	0.010					0.009					0.008	0.007
	≤ 10D	0.04	0.008					0.008					0.007	0.006
	≤ 12D	0.03	0.007					0.006					0.005	0.005
1.2	≤ 6D	0.06	0.022					0.020					0.018	0.015
	≤ 8D	0.05	0.019					0.017					0.015	0.013
	≤ 10D	0.04	0.015					0.014					0.012	0.011
	≤ 12D	0.03	0.012					0.011					0.010	0.008
1.4	≤ 6D	0.07	0.024					0.022					0.019	0.017
	≤ 8D	0.06	0.020					0.018					0.016	0.014
	≤ 10D	0.05	0.017					0.015					0.013	0.012
	≤ 12D	0.04	0.013					0.012					0.011	0.009
	≤ 15D	0.03	0.011					0.010					0.009	0.008
	> 15D	0.02	0.007					0.006					0.006	0.005
1.5	≤ 6D	0.08	0.025					0.023					0.020	0.018
	≤ 8D	0.06	0.021					0.019					0.017	0.015
	≤ 10D	0.05	0.018					0.016					0.014	0.012
	≤ 12D	0.04	0.014					0.012					0.011	0.010
	≤ 15D	0.03	0.011					0.010					0.009	0.008
	> 15D	0.02	0.008					0.007					0.006	0.005
1.6	≤ 6D	0.08	0.026					0.023					0.021	0.018
	≤ 8D	0.07	0.022					0.020					0.018	0.015
	≤ 10D	0.06	0.018					0.016					0.015	0.013
	≤ 12D	0.04	0.014					0.013					0.011	0.010
	≤ 15D	0.04	0.012					0.011					0.009	0.008
	> 15D	0.02	0.008					0.007					0.006	0.005



Cutting Parameters

UHLN2

Material Group ISO 513			P3	P4	P5	K2	K3	P6	K4	H1	H4	H5	H2	H3		
Hardness/Rm			≤45 HRC					45÷55 HRC					55÷60 HRC		60÷65 HRC	
ap x ae			ap x D					ap x D					ap x D		ap x D	
Vc (m/min)			80÷120					60÷100					50÷70		30÷50	
DC (mm)	LU (mm)	ap (mm)	fz (mm/z)					fz (mm/z)					fz (mm/z)		fz (mm/z)	
1.8	≤ 6D	0.09	0.028					0.025					0.022		0.020	
	≤ 8D	0.08	0.024					0.021					0.019		0.017	
	≤ 10D	0.06	0.020					0.018					0.016		0.014	
	≤ 12D	0.05	0.015					0.014					0.012		0.011	
	≤ 15D	0.04	0.013					0.011					0.010		0.009	
	> 15D	0.03	0.008					0.008					0.007		0.006	
2	≤ 6D	0.10	0.030					0.027					0.024		0.021	
	≤ 8D	0.09	0.026					0.023					0.020		0.018	
	≤ 10D	0.07	0.021					0.019					0.017		0.015	
	≤ 12D	0.06	0.017					0.015					0.013		0.012	
	≤ 15D	0.05	0.014					0.012					0.011		0.009	
	> 15D	0.03	0.009					0.008					0.007		0.006	
2.5	≤ 6D	0.13	0.035					0.032					0.028		0.025	
	≤ 8D	0.11	0.030					0.027					0.024		0.021	
	≤ 10D	0.09	0.025					0.022					0.020		0.017	
	≤ 12D	0.07	0.019					0.017					0.015		0.013	
	≤ 15D	0.06	0.016					0.014					0.013		0.011	
	> 15D	0.04	0.011					0.009					0.008		0.007	
3	≤ 6D	0.15	0.040					0.036					0.032		0.028	
	≤ 8D	0.13	0.034					0.031					0.027		0.024	
	≤ 10D	0.11	0.028					0.025					0.022		0.020	
	≤ 12D	0.08	0.022					0.020					0.018		0.015	
	≤ 15D	0.07	0.018					0.016					0.014		0.013	
	> 15D	0.05	0.012					0.011					0.010		0.008	
4	≤ 6D	0.20	0.050					0.045					0.040		0.035	
	≤ 8D	0.17	0.043					0.038					0.034		0.030	
	≤ 10D	0.14	0.035					0.032					0.028		0.025	
	≤ 12D	0.11	0.028					0.025					0.022		0.019	
	≤ 15D	0.09	0.023					0.020					0.018		0.016	
	> 15D	0.06	0.015					0.014					0.012		0.011	



SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

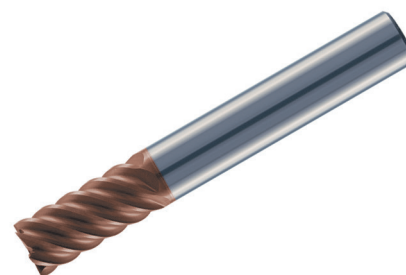
K - HSS END MILLS

L - CARBIDE BURRS

UH (<70HRC) and MH (30÷70HRC) Square

UH600

- Cylindrical shank
- Multi flute



P	M	K	N	S	H
☆		☆			★

OSAWA
NORM

UH

NMG
UH RED

<70
HRC

FHA 50°

SQUARE

ZEFP 6-8

SIDE MILLING

DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
3	0/-0.020	6	h6	8	50	6	UH600030	●
4	0/-0.020	6	h6	11	50	6	UH600040	●
5	0/-0.020	6	h6	13	50	6	UH600050	●
6	0/-0.020	6	h6	20	60	6	UH600060	●
8	0/-0.020	8	h6	20	64	6	UH600080	●
10	0/-0.020	10	h6	22	70	6	UH600100	●
12	0/-0.020	12	h6	25	75	6	UH600120	●
14	0/-0.020	14	h6	30	90	6	UH600140	●
16	0/-0.020	16	h6	30	90	8	UH600160	●
20	0/-0.020	20	h6	38	100	8	UH600200	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

UH600

	Material Group ISO 513	P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3
	Hardness/Rm	≤45 HRC	45÷55 HRC	55÷60 HRC	60÷65 HRC
	ap x ae	1.5D x 0.1D	1.5D x 0.05D	1.5D x 0.05D	1.5D x 0.05D
	Vc (m/min)	140÷180	100÷140	80÷100	60÷80
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	0.008	0.008	0.007	0.006
	4	0.012	0.011	0.010	0.008
	5	0.014	0.013	0.012	0.010
	6	0.018	0.016	0.014	0.013
	8	0.028	0.025	0.022	0.019
	10	0.034	0.030	0.027	0.024
	12	0.041	0.037	0.033	0.029
	14	0.048	0.043	0.038	0.034
	16	0.056	0.051	0.045	0.039
	18	0.066	0.059	0.053	0.046
	20	0.078	0.070	0.062	0.055

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

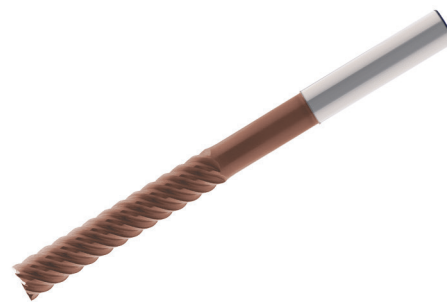
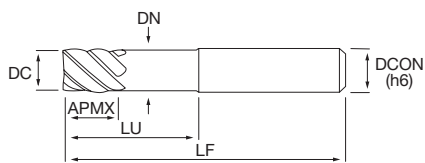
K - HSS END MILLS

L - CARBIDE BURRS

UH (<70HRC) and MH (30÷70HRC) Square

UH612

- Cylindrical shank
- Multi flute
- Long



P	M	K	N	S	H
☆		☆			★

OSAWA
NORM

UH

NMG
UH RED

<70
HRC

FHA 50°

SQUARE

ZEFP 6-8

SIDE MILLING

DC	DC tol.	DCON	TCDCON	APMX	LU	DN	LF	ZEFP	EDP no.	Stock
3	0/-0.025	6	h6	19	30	2.8	75	6	UH612030	●
4	0/-0.025	6	h6	19	32	3.7	75	6	UH612040	●
5	0/-0.025	6	h6	19	32	4.6	75	6	UH612050	●
6	0/-0.025	6	h6	38	60	5.5	100	6	UH612060	●
8	0/-0.025	8	h6	41	60	7.4	100	6	UH612080	●
10	0/-0.025	10	h6	57	85	9.2	125	6	UH612100	●
12	0/-0.025	12	h6	75	110	11	150	6	UH612120	●
16	0/-0.025	16	h6	75	110	15	150	8	UH612160	●
20	0/-0.025	20	h6	75	110	19	150	8	UH612200	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

UH612

	Material Group ISO 513	P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3
	Hardness/Rm	≤45 HRC	45÷55 HRC	55÷60 HRC	60÷65 HRC
	ap x ae	1.5D x 0.05D	1.5D x 0.05D	1.5D x 0.05D	1.5D x 0.05D
	Vc (m/min)	90÷130	70÷110	50÷70	30÷50
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	0.007	0.006	0.006	0.005
	4	0.010	0.009	0.008	0.007
	5	0.012	0.011	0.010	0.009
	6	0.015	0.014	0.012	0.011
	8	0.023	0.021	0.019	0.016
	10	0.029	0.026	0.023	0.020
	12	0.035	0.031	0.028	0.024
	14	0.041	0.037	0.033	0.029
	16	0.048	0.043	0.038	0.034
	20	0.066	0.060	0.053	0.046

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

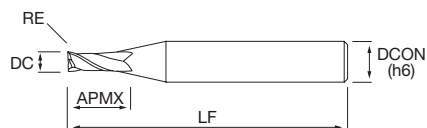
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

UHM206

- Cylindrical shank
- 2F
- Miniature
- Corner radius
- 6 mm. shank



P	M	K	N	S	H
☆		☆			★



DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
0.3	0/-0.012	-	-	6	h6	0.45	50	2	UHM200306	●
0.4	0/-0.012	-	-	6	h6	0.6	50	2	UHM200406	●
0.5	0/-0.012	0.05	±0.010	6	h6	0.7	50	2	UHM200506	●
0.6	0/-0.012	0.05	±0.010	6	h6	0.9	50	2	UHM200606	●
0.8	0/-0.012	0.05	±0.010	6	h6	1.2	50	2	UHM200806	●
1	0/-0.012	0.1	±0.010	6	h6	1.5	50	2	UHM201006	●
1.5	0/-0.012	0.15	±0.010	6	h6	2.2	50	2	UHM201506	●
2	0/-0.012	0.15	±0.010	6	h6	2.2	50	2	UHM202006	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

UHM206

	Material Group ISO 513		P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3
	Hardness/Rm		≤45 HRC	45÷55 HRC	55÷60 HRC	60÷65 HRC
	ap x ae		ap x D	ap x D	ap x D	ap x D
	Vc (m/min)		80÷120	60÷100	50÷70	30÷50
	DC (mm)	ap (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	0.3	0.02	0.004	0.004	0.003	0.003
	0.4	0.02	0.006	0.005	0.005	0.004
	0.5	0.03	0.007	0.006	0.006	0.005
	0.6	0.03	0.008	0.007	0.006	0.006
	0.8	0.04	0.010	0.009	0.008	0.007
	1	0.05	0.012	0.011	0.010	0.008
	1.5	0.08	0.025	0.023	0.020	0.018
	2	0.10	0.030	0.027	0.024	0.021

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

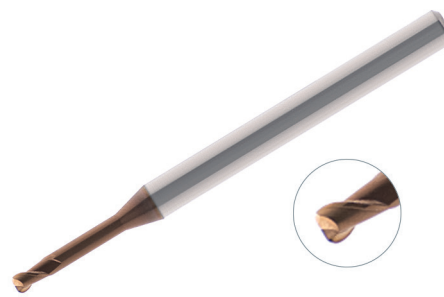
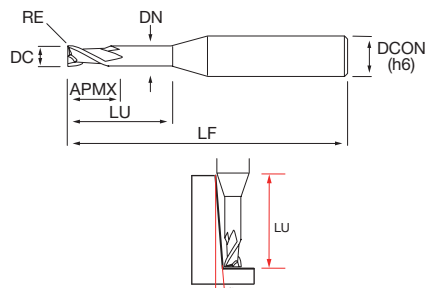
L - CARBIDE BURRS

UH (<70HRC) and MH (30÷70HRC) Corner radius

UH211

- Cylindrical shank
- 2F
- Extended and reduced neck
- Corner radius

P M K N S H



DC	DC tol.	RE	RE tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
1	0/-0.012	0.1	0/-0.010	4	2	4	0.95	50	2	4.36	4.6	4.86	5.16	5.89	UH2110100104	●
1	0/-0.012	0.1	0/-0.010	4	2	6	0.95	50	2	6.46	6.82	7.21	7.66	8.74	UH2110100106	●
1	0/-0.012	0.1	0/-0.010	4	2	8	0.9	50	2	8.45	8.73	9	9.27	9.81	UH2110100108	●
1	0/-0.012	0.2	0/-0.010	4	2	4	0.95	50	2	4.36	4.6	4.86	5.16	5.89	UH2110100204	●
1	0/-0.012	0.2	0/-0.010	4	2	8	0.95	50	2	8.57	9.04	9.56	10.15	11.18	UH2110100208	●
1	0/-0.012	0.3	0/-0.010	4	2	4	0.9	50	2	4.31	4.44	4.57	4.7	4.97	UH2110100304	●
1	0/-0.012	0.3	0/-0.010	4	2	8	0.95	50	2	8.57	9.04	9.56	10.15	11.18	UH2110100308	●
1.5	0/-0.012	0.1	0/-0.010	4	2.5	6	1.45	50	2	6.3	6.52	6.75	7.01	7.57	UH2110150106	●
1.5	0/-0.012	0.1	0/-0.010	4	2.5	10	1.45	50	2	10.43	10.8	11.19	11.61	12.55	UH2110150110	●
1.5	0/-0.012	0.2	0/-0.010	4	2.5	8	1.45	50	2	8.37	8.66	8.97	9.31	10.06	UH2110150208	●
1.5	0/-0.012	0.2	0/-0.010	4	2.5	12	1.45	50	2	12.5	12.94	13.4	13.91	15.03	UH2110150212	●
2	0/-0.012	0.1	0/-0.010	4	3	6	1.95	50	2	6.3	6.52	6.75	7.01	7.57	UH2110200106	●
2	0/-0.012	0.1	0/-0.010	4	3	12	1.95	50	2	12.5	12.94	13.4	13.91	15.03	UH2110200112	●
2	0/-0.012	0.2	0/-0.010	4	3	6	1.95	50	2	6.3	6.52	6.75	7.01	7.57	UH2110200206	●
2	0/-0.012	0.2	0/-0.010	4	3	12	1.95	50	2	12.5	12.94	13.4	13.91	15.03	UH2110200212	●
2	0/-0.012	0.3	0/-0.010	4	3	8	1.95	50	2	8.37	8.66	8.97	9.31	10.06	UH2110200308	●
2	0/-0.012	0.3	0/-0.010	4	3	12	1.95	50	2	12.5	12.94	13.4	13.91	15.03	UH2110200312	●
2	0/-0.012	0.3	0/-0.010	4	3	16	1.95	50	2	16.64	17.21	17.84	18.5	-	UH2110200316	●
2	0/-0.012	0.5	0/-0.010	4	3	6	1.95	50	2	6.3	6.52	6.75	7.01	7.57	UH2110200506	●
2	0/-0.012	0.5	0/-0.010	4	3	12	1.95	50	2	12.5	12.94	13.4	13.91	15.03	UH2110200512	●
3	0/-0.012	0.3	0/-0.010	6	4.5	10	2.8	55	2	10.71	11.04	11.38	11.72	12.4	UH2110300310	●
3	0/-0.012	0.3	0/-0.010	6	4.5	16	2.85	55	2	16.83	17.41	18.04	18.72	20.24	UH2110300316	●
3	0/-0.012	0.5	0/-0.010	6	4.5	10	2.85	55	2	10.63	11	11.39	11.82	12.78	UH2110300510	●
3	0/-0.012	0.5	0/-0.010	6	4.5	16	2.85	55	2	16.83	17.41	18.04	18.72	20.24	UH2110300516	●
4	0/-0.012	0.2	0/-0.010	6	6	20	3.85	60	2	20.96	21.69	22.48	23.32	-	UH2110400220	●
4	0/-0.012	0.3	0/-0.010	6	6	12	3.85	55	2	12.69	13.14	13.61	14.12	15.27	UH2110400312	●
4	0/-0.012	0.3	0/-0.010	6	6	20	3.85	60	2	20.96	21.69	22.48	23.32	-	UH2110400320	●
4	0/-0.012	0.5	0/-0.010	6	6	12	3.85	55	2	12.69	13.14	13.61	14.12	15.27	UH2110400512	●
4	0/-0.012	0.5	0/-0.010	6	6	20	3.85	60	2	20.96	21.69	22.48	23.32	-	UH2110400520	●
4	0/-0.012	1	0/-0.010	6	6	16	3.85	55	2	16.83	17.41	18.04	18.72	-	UH2110401016	●
6	0/-0.015	0.5	0/-0.010	6	9	15	5.85	60	2	-	-	-	-	-	UH2110600520	●
6	0/-0.015	1	0/-0.010	6	9	15	5.85	60	2	-	-	-	-	-	UH2110601020	●
6	0/-0.015	2	0/-0.010	6	9	15	5.85	60	2	-	-	-	-	-	UH2110602020	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

UH211

Material Group ISO 513			P3	P4	P5	K2	K3	P6	K4	H1	H4	H5	H2	H3
Hardness/Rm			≤45 HRC					45÷55 HRC					55÷60 HRC	60÷65 HRC
ap x ae			ap x D					ap x D					ap x D	ap x D
Vc (m/min)			80÷120					60÷100					50÷70	30÷50
DC (mm)	LU (mm)	ap (mm)	fz (mm/z)					fz (mm/z)					fz (mm/z)	fz (mm/z)
1	≤ 6D	0.05	0.012					0.011					0.010	0.008
	≤ 8D	0.04	0.010					0.009					0.008	0.007
	≤ 10D	0.04	0.008					0.008					0.007	0.006
	≤ 12D	0.03	0.007					0.006					0.005	0.005
1.5	≤ 6D	0.08	0.025					0.023					0.020	0.018
	≤ 8D	0.06	0.021					0.019					0.017	0.015
	≤ 10D	0.05	0.018					0.016					0.014	0.012
	≤ 12D	0.04	0.014					0.012					0.011	0.010
	≤ 15D	0.03	0.011					0.010					0.009	0.008
2	> 15D	0.02	0.008					0.007					0.006	0.005
	≤ 6D	0.10	0.030					0.027					0.024	0.021
	≤ 8D	0.09	0.026					0.023					0.020	0.018
	≤ 10D	0.07	0.021					0.019					0.017	0.015
	≤ 12D	0.06	0.017					0.015					0.013	0.012
2.5	≤ 15D	0.05	0.014					0.012					0.011	0.009
	> 15D	0.03	0.009					0.008					0.007	0.006
	≤ 6D	0.13	0.035					0.032					0.028	0.025
	≤ 8D	0.11	0.030					0.027					0.024	0.021
	≤ 10D	0.09	0.025					0.022					0.020	0.017
3	≤ 12D	0.07	0.019					0.017					0.015	0.013
	≤ 15D	0.06	0.016					0.014					0.013	0.011
	> 15D	0.04	0.011					0.009					0.008	0.007
	≤ 6D	0.15	0.040					0.036					0.032	0.028
	≤ 8D	0.13	0.034					0.031					0.027	0.024
4	≤ 10D	0.11	0.028					0.025					0.022	0.020
	≤ 12D	0.08	0.022					0.020					0.018	0.015
	≤ 15D	0.07	0.018					0.016					0.014	0.013
	> 15D	0.05	0.012					0.011					0.010	0.008
	≤ 6D	0.20	0.050					0.045					0.040	0.035
6	≤ 8D	0.17	0.043					0.038					0.034	0.030
	≤ 10D	0.14	0.035					0.032					0.028	0.025
	≤ 12D	0.11	0.028					0.025					0.022	0.019
	≤ 15D	0.09	0.023					0.020					0.018	0.016
	> 15D	0.06	0.015					0.014					0.012	0.011
6	≤ 6D	0.30	0.070					0.063					0.056	0.049
	≤ 8D	0.26	0.060					0.054					0.048	0.042
	≤ 10D	0.21	0.049					0.044					0.039	0.034
	≤ 12D	0.17	0.039					0.035					0.031	0.027
	> 15D	0.14	0.032					0.028					0.025	0.022



SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

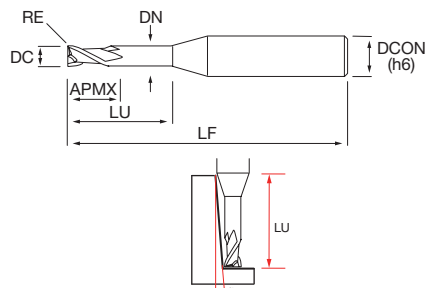
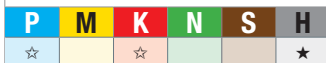
L - CARBIDE BURRS

UH (<70HRC) and MH (30÷70HRC) Corner radius



UH212

- Cylindrical shank
- 2 flutes
- Extended and reduced neck
- Corner radius

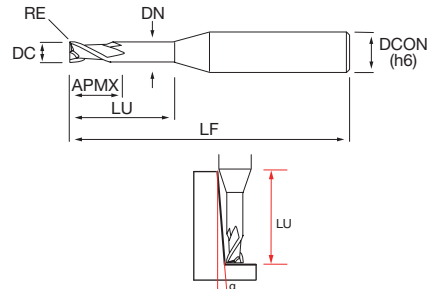
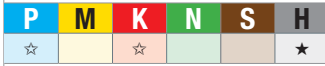


DC	DC tol.	RE	RE tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
0.2	0/-0.010	0.02	0/-0.010	4	0.3	0.5	0.16	50	2	0.57	0.59	0.6	0.62	0.66	UH21200202005	⊙
0.2	0/-0.010	0.02	0/-0.010	4	0.3	1	0.16	50	2	1.09	1.12	1.16	1.19	1.26	UH2120020201	⊙
0.2	0/-0.010	0.02	0/-0.010	4	0.3	1.5	0.16	50	2	1.6	1.65	1.71	1.76	1.86	UH21200202015	●
0.3	0/-0.010	0.05	0/-0.010	4	0.4	1	0.26	50	2	1.09	1.12	1.15	1.19	1.26	UH21200300501	●
0.3	0/-0.010	0.05	0/-0.010	4	0.4	2	0.26	50	2	2.12	2.19	2.26	2.32	2.46	UH21200300502	●
0.3	0/-0.010	0.03	0/-0.010	4	0.4	3	0.26	50	2	3.15	3.25	3.36	3.46	3.66	UH21200300303	●
0.3	0/-0.010	0.05	0/-0.010	4	0.4	3	0.26	50	2	3.15	3.25	3.36	3.46	3.66	UH21200300503	●
0.4	0/-0.010	0.05	0/-0.010	4	0.6	2	0.37	50	2	2.12	2.19	2.26	2.32	2.46	UH21200400502	⊙
0.4	0/-0.010	0.03	0/-0.010	4	0.6	3	0.37	50	2	3.15	3.25	3.36	3.46	3.66	UH21200400303	●
0.4	0/-0.010	0.05	0/-0.010	4	0.6	3	0.37	50	2	3.15	3.25	3.36	3.46	3.66	UH21200400503	●
0.4	0/-0.010	0.03	0/-0.010	4	0.6	4	0.37	50	2	4.19	4.32	4.46	4.59	4.86	UH21200400304	●
0.4	0/-0.010	0.05	0/-0.010	4	0.6	4	0.37	50	2	4.19	4.32	4.46	4.59	4.86	UH21200400504	●
0.4	0/-0.010	0.03	0/-0.010	4	0.6	5	0.37	50	2	5.22	5.39	5.56	5.73	6.07	UH21200400305	●
0.4	0/-0.010	0.05	0/-0.010	4	0.6	5	0.37	50	2	5.22	5.39	5.56	5.73	6.07	UH21200400505	●
0.5	0/-0.010	0.05	0/-0.010	4	0.7	2	0.45	50	2	2.16	2.23	2.29	2.36	2.5	UH21200500502	●
0.5	0/-0.010	0.05	0/-0.010	4	0.7	4	0.45	50	2	4.22	4.36	4.5	4.63	4.9	UH21200500504	●
0.5	0/-0.010	0.05	0/-0.010	4	0.7	6	0.45	50	2	6.29	6.49	6.7	6.9	7.31	UH21200500506	●
0.5	0/-0.010	0.05	0/-0.010	4	0.7	8	0.45	50	2	8.36	8.63	8.9	9.17	9.71	UH21200500508	●
0.6	0/-0.010	0.05	0/-0.010	4	0.9	2	0.55	50	2	2.16	2.23	2.29	2.36	2.5	UH21200600502	⊙
0.6	0/-0.010	0.05	0/-0.010	4	0.9	4	0.55	50	2	4.22	4.36	4.5	4.63	4.9	UH21200600504	⊙
0.6	0/-0.010	0.05	0/-0.010	4	0.9	6	0.55	50	2	6.29	6.49	6.7	6.9	7.31	UH21200600506	●
0.6	0/-0.010	0.05	0/-0.010	4	0.9	8	0.55	50	2	8.36	8.63	8.9	9.17	9.71	UH21200600508	●
0.6	0/-0.010	0.05	0/-0.010	4	0.9	10	0.55	50	2	10.43	10.76	11.1	11.44	12.12	UH21200600510	⊙
0.7	0/-0.010	0.1	0/-0.010	4	1	2	0.65	50	2	2.16	2.22	2.29	2.36	2.49	UH21200701002	⊙
0.7	0/-0.010	0.08	0/-0.010	4	1	4	0.65	50	2	4.22	4.36	4.49	4.63	4.9	UH21200700804	●
0.7	0/-0.010	0.1	0/-0.010	4	1	4	0.65	50	2	4.22	4.36	4.49	4.63	4.9	UH21200701004	●
0.7	0/-0.010	0.1	0/-0.010	4	1	6	0.65	50	2	6.29	6.49	6.69	6.9	7.3	UH21200701006	⊙
0.7	0/-0.010	0.1	0/-0.010	4	1	8	0.65	50	2	8.36	8.63	8.9	9.17	9.71	UH21200701008	⊙
0.7	0/-0.010	0.1	0/-0.010	4	1	10	0.65	50	2	10.42	10.76	11.1	11.44	12.11	UH21200701010	⊙
0.8	0/-0.010	0.1	0/-0.010	4	1.2	4	0.75	50	2	4.22	4.36	4.49	4.63	4.9	UH21200801004	⊙
0.8	0/-0.010	0.08	0/-0.010	4	1.2	6	0.75	50	2	6.29	6.49	6.69	6.9	7.3	UH21200800806	●
0.8	0/-0.010	0.1	0/-0.010	4	1.2	6	0.75	50	2	6.29	6.49	6.69	6.9	7.3	UH21200801006	●
0.8	0/-0.010	0.08	0/-0.010	4	1.2	8	0.75	50	2	8.36	8.63	8.9	9.17	9.71	UH21200800808	●
0.8	0/-0.010	0.1	0/-0.010	4	1.2	8	0.75	50	2	8.36	8.63	8.9	9.17	9.71	UH21200801008	●
0.8	0/-0.010	0.08	0/-0.010	4	1.2	10	0.75	50	2	10.42	10.76	11.1	11.44	12.11	UH21200800810	●
0.8	0/-0.010	0.1	0/-0.010	4	1.2	10	0.75	50	2	10.42	10.76	11.1	11.44	12.11	UH21200801010	●
0.8	0/-0.010	0.1	0/-0.010	4	1.2	12	0.75	50	2	12.49	12.9	13.3	13.7	14.51	UH21200801012	⊙
0.9	0/-0.010	0.08	0/-0.010	4	1.4	6	0.85	50	2	6.29	6.49	6.69	6.9	7.3	UH21200900806	●
0.9	0/-0.010	0.1	0/-0.010	4	1.4	6	0.85	50	2	6.29	6.49	6.69	6.9	7.3	UH21200901006	●
0.9	0/-0.010	0.08	0/-0.010	4	1.4	8	0.85	50	2	8.36	8.63	8.9	9.17	9.71	UH21200900808	●
0.9	0/-0.010	0.1	0/-0.010	4	1.4	8	0.85	50	2	8.36	8.63	8.9	9.17	9.71	UH21200901008	●
0.9	0/-0.010	0.08	0/-0.010	4	1.4	10	0.85	50	2	10.42	10.76	11.1	11.44	12.11	UH21200900810	●
0.9	0/-0.010	0.1	0/-0.010	4	1.4	10	0.85	50	2	10.42	10.76	11.1	11.44	12.11	UH21200901010	●
0.9	0/-0.010	0.08	0/-0.010	4	1.4	15	0.85	50	2	15.59	16.1	16.6	17.11	18.12	UH21200900815	●
0.9	0/-0.010	0.1	0/-0.010	4	1.4	15	0.85	50	2	15.59	16.1	16.6	17.11	18.12	UH21200901015	●

★ 1st choice, ☆ suitable, ● stock standard, ⊙ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

UH212

- Cylindrical shank
- 2 flutes
- Extended and reduced neck
- Corner radius



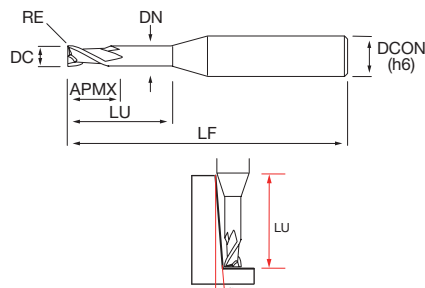
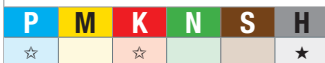
DC	DC tol.	RE	RE tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
1	0/-0.015	0.1	0/-0.010	4	1.5	6	0.95	50	2	6.39	6.59	6.8	7	7.41	UH2120100106	●
1	0/-0.015	0.1	0/-0.010	4	1.5	8	0.95	50	2	8.45	8.73	9	9.27	9.81	UH2120100108	●
1	0/-0.015	0.1	0/-0.010	4	1.5	10	0.95	50	2	10.52	10.86	11.2	11.54	12.22	UH2120100110	●
1	0/-0.015	0.1	0/-0.010	4	1.5	12	0.95	50	2	12.59	12.99	13.4	13.81	14.62	UH2120100112	●
1	0/-0.015	0.1	0/-0.010	4	1.5	14	0.95	50	2	14.66	15.13	15.6	16.08	17.03	UH2120100114	●
1	0/-0.015	0.1	0/-0.010	4	1.5	16	0.95	50	2	16.72	17.26	17.8	18.35	19.43	UH2120100116	◎
1.2	0/-0.015	0.1	0/-0.010	4	1.8	6	1.15	50	2	6.39	6.59	6.8	7	7.41	UH2120120106	●
1.2	0/-0.015	0.1	0/-0.010	4	1.8	8	1.15	50	2	8.45	8.73	9	9.27	9.81	UH2120120108	◎
1.2	0/-0.015	0.1	0/-0.010	4	1.8	10	1.15	50	2	10.52	10.86	11.2	11.54	12.22	UH2120120110	◎
1.2	0/-0.015	0.1	0/-0.010	4	1.8	12	1.15	50	2	12.59	12.99	13.4	13.81	14.62	UH2120120112	●
1.4	0/-0.015	0.1	0/-0.010	4	2.1	6	1.35	50	2	6.38	6.59	6.79	6.99	7.4	UH21201401006	●
1.4	0/-0.015	0.15	0/-0.010	4	2.1	8	1.35	50	2	8.45	8.72	8.99	9.26	9.8	UH21201401508	●
1.4	0/-0.015	0.1	0/-0.010	4	2.1	8	1.35	50	2	8.45	8.72	8.99	9.26	9.8	UH21201401008	●
1.4	0/-0.015	0.1	0/-0.010	4	2.1	10	1.35	50	2	10.52	10.86	11.19	11.53	12.21	UH21201401010	◎
1.4	0/-0.015	0.15	0/-0.010	4	2.1	12	1.35	50	2	12.59	12.99	13.4	13.8	14.61	UH21201401512	●
1.4	0/-0.015	0.1	0/-0.010	4	2.1	12	1.35	50	2	12.59	12.99	13.4	13.8	14.61	UH21201401012	●
1.4	0/-0.015	0.15	0/-0.010	4	2.1	14	1.35	50	2	14.65	15.13	15.6	16.07	17.02	UH21201401514	●
1.4	0/-0.015	0.1	0/-0.010	4	2.1	14	1.35	50	2	14.65	15.13	15.6	16.07	17.02	UH21201401014	●
1.4	0/-0.015	0.15	0/-0.010	4	2.1	16	1.35	50	2	16.72	17.26	17.8	18.34	19.42	UH21201401516	●
1.4	0/-0.015	0.1	0/-0.010	4	2.1	16	1.35	50	2	16.72	17.26	17.8	18.34	19.42	UH21201401016	●
1.5	0/-0.015	0.15	0/-0.010	4	2.3	6	1.45	50	2	6.38	6.59	6.79	6.99	7.4	UH21201501506	◎
1.5	0/-0.015	0.15	0/-0.010	4	2.3	8	1.45	50	2	8.45	8.72	8.99	9.26	9.8	UH21201501508	●
1.5	0/-0.015	0.15	0/-0.010	4	2.3	10	1.45	50	2	10.52	10.86	11.19	11.53	12.21	UH21201501510	◎
1.5	0/-0.015	0.15	0/-0.010	4	2.3	12	1.45	50	2	12.59	12.99	13.4	13.8	14.61	UH21201501512	●
1.5	0/-0.015	0.15	0/-0.010	4	2.3	14	1.45	50	2	14.65	15.13	15.6	16.07	17.02	UH21201501514	●
1.5	0/-0.015	0.15	0/-0.010	4	2.3	16	1.45	50	2	16.72	17.26	17.8	18.34	19.42	UH21201501516	◎
1.5	0/-0.015	0.15	0/-0.010	4	2.3	18	1.45	60	2	18.79	19.39	20	20.61	21.82	UH21201501518	●
1.5	0/-0.015	0.15	0/-0.010	4	2.3	20	1.45	50	2	20.86	21.53	22.2	22.88	24.23	UH21201501520	●
1.6	0/-0.015	0.2	0/-0.010	4	2.4	6	1.55	50	2	6.38	6.59	6.79	6.99	7.4	UH21201602006	●
1.6	0/-0.015	0.15	0/-0.010	4	2.4	8	1.55	50	2	8.45	8.72	8.99	9.26	9.8	UH21201601508	●
1.6	0/-0.015	0.2	0/-0.010	4	2.4	8	1.55	50	2	8.45	8.72	8.99	9.26	9.8	UH21201602008	●
1.6	0/-0.015	0.15	0/-0.010	4	2.4	10	1.55	50	2	10.52	10.86	11.19	11.53	12.21	UH21201601510	●
1.6	0/-0.015	0.2	0/-0.010	4	2.4	10	1.55	50	2	10.52	10.86	11.19	11.53	12.21	UH21201602010	●
1.6	0/-0.015	0.15	0/-0.010	4	2.4	12	1.55	50	2	12.59	12.99	13.4	13.8	14.61	UH21201601512	●
1.6	0/-0.015	0.2	0/-0.010	4	2.4	12	1.55	50	2	12.59	12.99	13.4	13.8	14.61	UH21201602012	●
1.6	0/-0.015	0.15	0/-0.010	4	2.4	14	1.55	50	2	14.65	15.13	15.6	16.07	17.02	UH21201601514	●
1.6	0/-0.015	0.2	0/-0.010	4	2.4	14	1.55	50	2	14.65	15.13	15.6	16.07	17.02	UH21201602014	●
1.6	0/-0.015	0.15	0/-0.010	4	2.4	16	1.55	50	2	16.72	17.26	17.8	18.34	19.42	UH21201601516	●
1.6	0/-0.015	0.2	0/-0.010	4	2.4	16	1.55	50	2	16.72	17.26	17.8	18.34	19.42	UH21201602016	●
1.6	0/-0.015	0.15	0/-0.010	4	2.4	18	1.55	60	2	18.79	19.39	20	20.61	21.82	UH21201601518	●
1.6	0/-0.015	0.2	0/-0.010	4	2.4	18	1.55	50	2	18.79	19.39	20	20.61	21.82	UH21201602018	●
1.6	0/-0.015	0.15	0/-0.010	4	2.4	20	1.55	60	2	20.86	21.53	22.2	22.88	24.23	UH21201601520	●
1.6	0/-0.015	0.2	0/-0.010	4	2.4	20	1.55	50	2	20.86	21.53	22.2	22.88	24.23	UH21201602020	●
1.8	0/-0.015	0.2	0/-0.010	4	2.7	6	1.75	50	2	6.38	6.58	6.79	6.99	7.39	UH2120180206	●
1.8	0/-0.015	0.2	0/-0.010	4	2.7	8	1.75	50	2	8.45	8.72	8.99	9.26	9.79	UH2120180208	◎

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

UH (<70HRC) and MH (30÷70HRC) Corner radius

UH212

- Cylindrical shank
- 2 flutes
- Extended and reduced neck
- Corner radius



DC	DC tol.	RE	RE tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
1.8	0/-0.015	0.2	0/-0.010	4	2.7	10	1.75	50	2	10.52	10.85	11.19	11.52	12.2	UH2120180210	●
1.8	0/-0.015	0.2	0/-0.010	4	2.7	12	1.75	50	2	12.58	12.99	13.39	13.79	14.6	UH2120180212	◎
1.8	0/-0.015	0.2	0/-0.010	4	2.7	14	1.75	50	2	14.65	15.12	15.59	16.06	17.01	UH2120180214	●
1.8	0/-0.015	0.2	0/-0.010	4	2.7	16	1.75	50	2	16.72	17.26	17.79	18.33	19.41	UH2120180216	●
1.8	0/-0.015	0.2	0/-0.010	4	2.7	18	1.75	60	2	18.79	19.39	20	20.6	21.81	UH2120180218	●
1.8	0/-0.015	0.2	0/-0.010	4	2.7	20	1.75	60	2	20.85	21.53	22.2	22.87	24.22	UH2120180220	●
2	0/-0.015	0.2	0/-0.010	4	3	6	1.95	50	2	6.38	6.58	6.79	6.99	7.39	UH2120200206	●
2	0/-0.015	0.2	0/-0.010	4	3	8	1.95	50	2	8.45	8.72	8.99	9.26	9.79	UH2120200208	●
2	0/-0.015	0.2	0/-0.010	4	3	10	1.95	50	2	10.52	10.85	11.19	11.52	12.2	UH2120200210	●
2	0/-0.015	0.2	0/-0.010	4	3	12	1.95	50	2	12.58	12.99	13.39	13.79	14.6	UH2120200212	●
2	0/-0.015	0.2	0/-0.010	4	3	14	1.95	50	2	14.65	15.12	15.59	16.06	17.01	UH2120200214	●
2	0/-0.015	0.2	0/-0.010	4	3	16	1.95	50	2	16.72	17.26	17.79	18.33	19.41	UH2120200216	●
2	0/-0.015	0.2	0/-0.010	4	3	18	1.95	60	2	18.79	19.39	20	20.6	21.81	UH2120200218	●
2	0/-0.015	0.2	0/-0.010	4	3	20	1.95	60	2	20.85	21.53	22.2	22.87	-	UH2120200220	●
2	0/-0.015	0.2	0/-0.010	4	3	25	1.95	75	2	26.02	26.86	27.7	28.54	-	UH2120200225	●
2	0/-0.015	0.2	0/-0.010	4	3	30	1.95	75	2	31.19	32.2	33.21	-	-	UH2120200230	●
2.5	0/-0.020	0.3	0/-0.015	4	3.7	8	2.4	50	2	8.45	8.71	8.98	9.24	9.77	UH2120250308	●
2.5	0/-0.020	0.3	0/-0.015	4	3.7	10	2.4	50	2	10.51	10.85	11.18	11.51	12.18	UH2120250310	●
2.5	0/-0.020	0.3	0/-0.015	4	3.7	12	2.4	50	2	12.58	12.98	13.38	13.78	14.58	UH2120250312	●
2.5	0/-0.020	0.3	0/-0.015	4	3.7	14	2.4	50	2	14.65	15.12	15.58	16.05	-	UH2120250314	●
2.5	0/-0.020	0.3	0/-0.015	4	3.7	16	2.4	50	2	16.72	17.25	17.78	18.32	-	UH2120250316	●
2.5	0/-0.020	0.3	0/-0.015	4	3.7	18	2.4	60	2	18.78	19.38	19.99	20.59	-	UH2120250318	●
2.5	0/-0.020	0.3	0/-0.015	4	3.7	20	2.4	60	2	20.85	21.52	22.19	22.86	-	UH2120250320	●
2.5	0/-0.020	0.3	0/-0.015	4	3.7	25	2.4	60	2	26.02	26.86	27.69	-	-	UH2120250325	●
2.5	0/-0.020	0.3	0/-0.015	4	3.7	30	2.4	75	2	31.19	32.19	-	-	-	UH2120250330	●
3	0/-0.025	0.3	0/-0.015	6	4.5	8	2.85	50	2	8.64	8.91	9.18	9.45	10	UH2120300308	●
3	0/-0.025	0.3	0/-0.015	6	4.5	10	2.85	50	2	10.71	11.04	11.38	11.72	12.4	UH2120300310	●
3	0/-0.025	0.3	0/-0.015	6	4.5	12	2.85	50	2	12.77	13.18	13.59	13.99	14.8	UH2120300312	◎
3	0/-0.025	0.3	0/-0.015	6	4.5	14	2.85	50	2	14.84	15.31	15.79	16.26	17.21	UH2120300314	●
3	0/-0.025	0.3	0/-0.015	6	4.5	16	2.85	60	2	16.91	17.45	17.99	18.53	19.61	UH2120300316	◎
3	0/-0.025	0.3	0/-0.015	6	4.5	18	2.85	60	2	18.98	19.58	20.19	20.8	22.02	UH2120300318	●
3	0/-0.025	0.3	0/-0.015	6	4.5	20	2.85	60	2	21.04	21.72	22.39	23.07	24.42	UH2120300320	●
3	0/-0.025	0.3	0/-0.015	6	4.5	25	2.85	75	2	26.21	27.05	27.9	28.74	30.43	UH2120300325	●
4	0/-0.025	0.4	0/-0.015	6	4.5	10	3.85	60	2	10.9	11.24	11.58	11.92	12.6	UH2120400410	●
4	0/-0.025	0.4	0/-0.015	6	4.5	15	3.85	60	2	16.06	16.57	17.08	17.59	18.61	UH2120400415	●
4	0/-0.025	0.4	0/-0.015	6	4.5	20	3.85	60	2	21.23	21.91	22.59	23.27	-	UH2120400420	●
4	0/-0.025	0.4	0/-0.015	6	4.5	25	3.85	75	2	26.4	27.25	28.09	28.94	-	UH2120400425	●
4	0/-0.025	0.4	0/-0.015	6	4.5	30	3.85	75	2	31.57	32.58	33.6	-	-	UH2120400430	●
4	0/-0.025	0.4	0/-0.015	6	4.5	40	3.85	75	2	41.9	43.25	-	-	-	UH2120400440	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

UH212

Material Group ISO 513			P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3
Hardness/Rm			≤45 HRC	45÷55 HRC	55÷60 HRC	60÷65 HRC
ap x ae			ap x D	ap x D	ap x D	ap x D
Vc (m/min)			80÷120	60÷100	50÷70	30÷50
DC (mm)	LU (mm)	ap (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
0.2	≤ 6D	0.01	0.003	0.003	0.002	0.002
	≤ 8D	0.01	0.003	0.002	0.002	0.002
	≤ 10D	0.01	0.002	0.002	0.002	0.001
	≤ 12D	0.01	0.002	0.001	0.001	0.001
0.3	≤ 6D	0.02	0.004	0.004	0.003	0.003
	≤ 8D	0.01	0.003	0.003	0.003	0.002
	≤ 10D	0.01	0.003	0.003	0.002	0.002
	≤ 12D	0.01	0.002	0.002	0.002	0.002
0.4	≤ 6D	0.02	0.006	0.005	0.005	0.004
	≤ 8D	0.02	0.005	0.005	0.004	0.004
	≤ 10D	0.01	0.004	0.004	0.003	0.003
	≤ 12D	0.01	0.003	0.003	0.003	0.002
0.5	≤ 6D	0.03	0.007	0.006	0.006	0.005
	≤ 8D	0.02	0.006	0.005	0.005	0.004
	≤ 10D	0.02	0.005	0.004	0.004	0.003
	≤ 12D	0.01	0.004	0.003	0.003	0.003
0.6	≤ 6D	0.03	0.008	0.007	0.006	0.006
	≤ 8D	0.03	0.007	0.006	0.005	0.005
	≤ 10D	0.02	0.006	0.005	0.004	0.004
	≤ 12D	0.02	0.004	0.004	0.004	0.003
0.8	≤ 6D	0.04	0.010	0.009	0.008	0.007
	≤ 8D	0.03	0.009	0.008	0.007	0.006
	≤ 10D	0.03	0.007	0.006	0.006	0.005
	≤ 12D	0.02	0.006	0.005	0.004	0.004
1	≤ 6D	0.05	0.012	0.011	0.010	0.008
	≤ 8D	0.04	0.010	0.009	0.008	0.007
	≤ 10D	0.04	0.008	0.008	0.007	0.006
	≤ 12D	0.03	0.007	0.006	0.005	0.005
1.2	≤ 6D	0.06	0.022	0.020	0.018	0.015
	≤ 8D	0.05	0.019	0.017	0.015	0.013
	≤ 10D	0.04	0.015	0.014	0.012	0.011
	≤ 12D	0.03	0.012	0.011	0.010	0.008
1.4	≤ 6D	0.07	0.024	0.022	0.019	0.017
	≤ 8D	0.06	0.020	0.018	0.016	0.014
	≤ 10D	0.05	0.017	0.015	0.013	0.012
	≤ 12D	0.04	0.013	0.012	0.011	0.009
	≤ 15D	0.03	0.011	0.010	0.009	0.008
	> 15D	0.02	0.007	0.006	0.006	0.005
1.5	≤ 6D	0.08	0.025	0.023	0.020	0.018
	≤ 8D	0.06	0.021	0.019	0.017	0.015
	≤ 10D	0.05	0.018	0.016	0.014	0.012
	≤ 12D	0.04	0.014	0.012	0.011	0.010
	≤ 15D	0.03	0.011	0.010	0.009	0.008
	≥ 15D	0.02	0.008	0.007	0.006	0.005
1.6	≤ 6D	0.08	0.026	0.023	0.021	0.018
	≤ 8D	0.07	0.022	0.020	0.018	0.015
	≤ 10D	0.06	0.018	0.016	0.015	0.013
	≤ 12D	0.04	0.014	0.013	0.011	0.010
	≤ 15D	0.04	0.012	0.011	0.009	0.008
	> 15D	0.02	0.008	0.007	0.006	0.005



SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

Cutting Parameters

UH212

Material Group ISO 513			P3	P4	P5	K2	K3	P6	K4	H1	H4	H5	H2	H3
Hardness/Rm			≤45 HRC					45÷55 HRC					55÷60 HRC	60÷65 HRC
ap x ae			ap x D					ap x D					ap x D	ap x D
Vc (m/min)			80÷120					60÷100					50÷70	30÷50
DC (mm)	LU (mm)	ap (mm)	fz (mm/z)					fz (mm/z)					fz (mm/z)	fz (mm/z)
0.2	≤ 6D	0.01	0.003					0.003					0.002	0.002
	≤ 8D	0.01	0.003					0.002					0.002	0.002
	≤ 10D	0.01	0.002					0.002					0.002	0.001
	≤ 12D	0.01	0.002					0.001					0.001	0.001
0.3	≤ 6D	0.02	0.004					0.004					0.003	0.003
	≤ 8D	0.01	0.003					0.003					0.003	0.002
	≤ 10D	0.01	0.003					0.003					0.002	0.002
	≤ 12D	0.01	0.002					0.002					0.002	0.002
0.4	≤ 6D	0.02	0.006					0.005					0.005	0.004
	≤ 8D	0.02	0.005					0.005					0.004	0.004
	≤ 10D	0.01	0.004					0.004					0.003	0.003
	≤ 12D	0.01	0.003					0.003					0.003	0.002
0.5	≤ 6D	0.03	0.007					0.006					0.006	0.005
	≤ 8D	0.02	0.006					0.005					0.005	0.004
	≤ 10D	0.02	0.005					0.004					0.004	0.003
	≤ 12D	0.01	0.004					0.003					0.003	0.003
0.6	≤ 6D	0.03	0.008					0.007					0.006	0.006
	≤ 8D	0.03	0.007					0.006					0.005	0.005
	≤ 10D	0.02	0.006					0.005					0.004	0.004
	≤ 12D	0.02	0.004					0.004					0.004	0.003
0.8	≤ 6D	0.04	0.010					0.009					0.008	0.007
	≤ 8D	0.03	0.009					0.008					0.007	0.006
	≤ 10D	0.03	0.007					0.006					0.006	0.005
	≤ 12D	0.02	0.006					0.005					0.004	0.004
1	≤ 6D	0.05	0.012					0.011					0.010	0.008
	≤ 8D	0.04	0.010					0.009					0.008	0.007
	≤ 10D	0.04	0.008					0.008					0.007	0.006
	≤ 12D	0.03	0.007					0.006					0.005	0.005
1.2	≤ 6D	0.06	0.022					0.020					0.018	0.015
	≤ 8D	0.05	0.019					0.017					0.015	0.013
	≤ 10D	0.04	0.015					0.014					0.012	0.011
	≤ 12D	0.03	0.012					0.011					0.010	0.008
1.4	≤ 6D	0.07	0.024					0.022					0.019	0.017
	≤ 8D	0.06	0.020					0.018					0.016	0.014
	≤ 10D	0.05	0.017					0.015					0.013	0.012
	≤ 12D	0.04	0.013					0.012					0.011	0.009
	≤ 15D	0.03	0.011					0.010					0.009	0.008
	> 15D	0.02	0.007					0.006					0.006	0.005
1.5	≤ 6D	0.08	0.025					0.023					0.020	0.018
	≤ 8D	0.06	0.021					0.019					0.017	0.015
	≤ 10D	0.05	0.018					0.016					0.014	0.012
	≤ 12D	0.04	0.014					0.012					0.011	0.010
	≤ 15D	0.03	0.011					0.010					0.009	0.008
	≥ 15D	0.02	0.008					0.007					0.006	0.005
1.6	≤ 6D	0.08	0.026					0.023					0.021	0.018
	≤ 8D	0.07	0.022					0.020					0.018	0.015
	≤ 10D	0.06	0.018					0.016					0.015	0.013
	≤ 12D	0.04	0.014					0.013					0.011	0.010
	≤ 15D	0.04	0.012					0.011					0.009	0.008
	> 15D	0.02	0.008					0.007					0.006	0.005



Cutting Parameters

UH212

Material Group ISO 513			P3	P4	P5	K2	K3	P6	K4	H1	H4	H5	H2	H3		
Hardness/Rm			≤45 HRC					45÷55 HRC					55÷60 HRC		60÷65 HRC	
ap x ae			ap x D					ap x D					ap x D		ap x D	
Vc (m/min)			80÷120					60÷100					50÷70		30÷50	
DC (mm)	LU (mm)	ap (mm)	fz (mm/z)					fz (mm/z)					fz (mm/z)		fz (mm/z)	
1.8	≤ 6D	0.09	0.028					0.025					0.022		0.020	
	≤ 8D	0.08	0.024					0.021					0.019		0.017	
	≤ 10D	0.06	0.020					0.018					0.016		0.014	
	≤ 12D	0.05	0.015					0.014					0.012		0.011	
	≤ 15D	0.04	0.013					0.011					0.010		0.009	
	> 15D	0.03	0.008					0.008					0.007		0.006	
2	≤ 6D	0.10	0.030					0.027					0.024		0.021	
	≤ 8D	0.09	0.026					0.023					0.020		0.018	
	≤ 10D	0.07	0.021					0.019					0.017		0.015	
	≤ 12D	0.06	0.017					0.015					0.013		0.012	
	≤ 15D	0.05	0.014					0.012					0.011		0.009	
	> 15D	0.03	0.009					0.008					0.007		0.006	
2.5	≤ 6D	0.13	0.035					0.032					0.028		0.025	
	≤ 8D	0.11	0.030					0.027					0.024		0.021	
	≤ 10D	0.09	0.025					0.022					0.020		0.017	
	≤ 12D	0.07	0.019					0.017					0.015		0.013	
	≤ 15D	0.06	0.016					0.014					0.013		0.011	
	> 15D	0.04	0.011					0.009					0.008		0.007	
3	≤ 6D	0.15	0.040					0.036					0.032		0.028	
	≤ 8D	0.13	0.034					0.031					0.027		0.024	
	≤ 10D	0.11	0.028					0.025					0.022		0.020	
	≤ 12D	0.08	0.022					0.020					0.018		0.015	
	≤ 15D	0.07	0.018					0.016					0.014		0.013	
	> 15D	0.05	0.012					0.011					0.010		0.008	
4	≤ 6D	0.20	0.050					0.045					0.040		0.035	
	≤ 8D	0.17	0.043					0.038					0.034		0.030	
	≤ 10D	0.14	0.035					0.032					0.028		0.025	
	≤ 12D	0.11	0.028					0.025					0.022		0.019	
	≤ 15D	0.09	0.023					0.020					0.018		0.016	
	> 15D	0.06	0.015					0.014					0.012		0.011	



SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

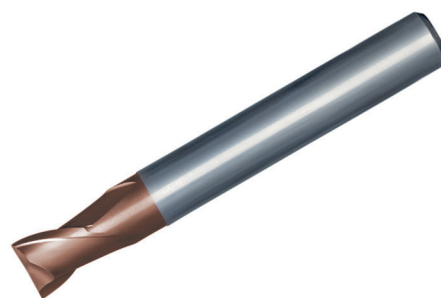
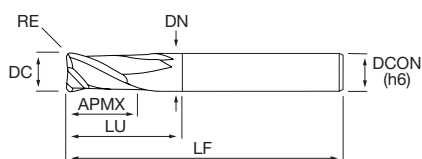
K - HSS END MILLS

L - CARBIDE BURRS

UH (<70HRC) and MH (30÷70HRC) Corner radius

UHCS2

- Cylindrical shank
- 2F
- Corner radius



P	M	K	N	S	H
☆		☆			★

OSAWA
NORM

UH

NMG
UH RED

<70
HRC

FHA 40°

RADIUS

ZEFP 2

SLOTING

DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LU	DN	LF	ZEFP	EDP no.	Stock
1	0/-0.012	0.1	±0.010	4	h6	2	3	0.95	50	2	UHCS2010	●
1.5	0/-0.012	0.1	±0.010	4	h6	2.5	4	1.45	50	2	UHCS2015	●
2	0/-0.012	0.1	±0.010	4	h6	3	6	1.95	50	2	UHCS2020	●
3	0/-0.012	0.1	±0.010	6	h6	4.5	8	2.85	55	2	UHCS2030	●
4	0/-0.012	0.1	±0.010	6	h6	6	10	3.85	55	2	UHCS2040	●
5	0/-0.012	0.2	±0.010	6	h6	6	11	4.85	50	2	UHCS2050	●
6	0/-0.015	0.2	±0.010	6	h6	9	15	5.85	60	2	UHCS2060	●
8	0/-0.015	0.2	±0.015	8	h6	12	20	7.7	70	2	UHCS2080	●
10	0/-0.015	0.2	±0.015	10	h6	15	25	9.7	70	2	UHCS2100	●
12	0/-0.015	0.3	±0.015	12	h6	18	30	11.7	80	2	UHCS2120	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

UHCS2

 SLOTING	Material Group ISO 513	P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3
	Hardness/Rm	≤45 HRC	45÷55 HRC	55÷60 HRC	60÷65 HRC
	ap x ae	0.3D x D	0.2D x D	0.2D x D	0.1D x D
	Vc (m/min)	80÷120	60÷100	50÷70	30÷50
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.007	0.006	0.006	0.005
	2	0.012	0.011	0.010	0.008
	3	0.017	0.015	0.014	0.012
	4	0.023	0.021	0.018	0.016
	5	0.030	0.027	0.024	0.021
	6	0.038	0.034	0.030	0.027
	8	0.050	0.045	0.040	0.035
	10	0.065	0.059	0.052	0.046
	12	0.080	0.072	0.064	0.056

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

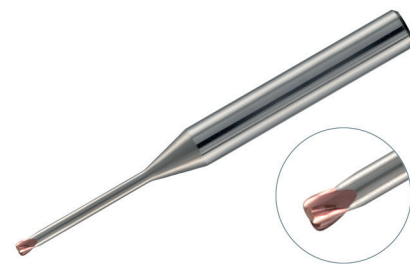
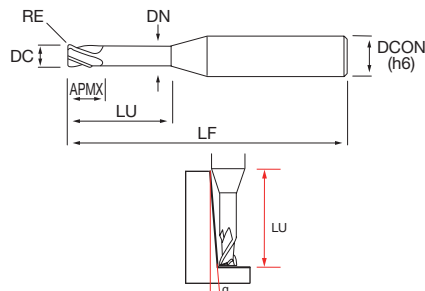
L - CARBIDE BURRS

UH (<70HRC) and MH (30÷70HRC) Corner radius



UHF4LN

- Cylindrical shank
- 4F Unequal Pitch
- Extended and reduced neck
- Corner radius



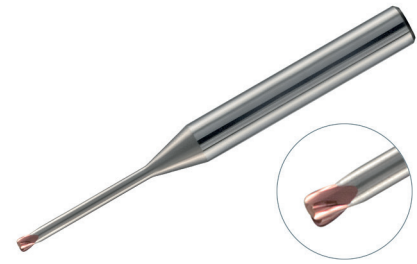
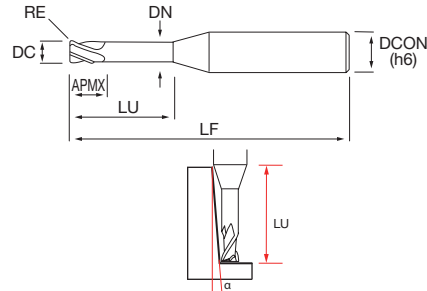
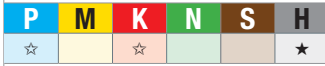
DC	DC tol.	RE	RE tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
1	0/-0.010	0.1	±0.005	4	1	4	0.9	50	4	4.32	4.46	4.62	4.78	5.13	UHF4LN0100104	●
1	0/-0.010	0.1	±0.005	4	1	6	0.9	50	4	6.39	6.6	6.83	7.08	7.6	UHF4LN0100106	●
1	0/-0.010	0.1	±0.005	4	1	8	0.9	50	4	8.45	8.74	9.05	9.37	10.07	UHF4LN0100108	●
1	0/-0.010	0.1	±0.005	4	1	10	0.9	50	4	10.52	10.88	11.26	11.66	12.53	UHF4LN0100110	◎
1	0/-0.010	0.1	±0.005	4	1	12	0.9	50	4	12.59	13.02	13.48	13.96	15	UHF4LN0100112	●
1	0/-0.010	0.1	±0.005	4	1	14	0.9	50	4	14.66	15.16	15.69	16.25	17.47	UHF4LN0100114	●
1	0/-0.010	0.1	±0.005	4	1	16	0.9	50	4	16.72	17.3	17.91	18.55	19.94	UHF4LN0100116	◎
1	0/-0.010	0.1	±0.005	4	1	20	0.9	75	4	20.86	21.57	22.33	23.14	24.87	UHF4LN0100120	●
1	0/-0.010	0.2	±0.005	4	1	4	0.9	50	4	4.32	4.46	4.61	4.77	5.11	UHF4LN0100204	●
1	0/-0.010	0.2	±0.005	4	1	6	0.9	50	4	6.38	6.6	6.82	7.06	7.57	UHF4LN0100206	●
1	0/-0.010	0.2	±0.005	4	1	8	0.9	50	4	8.45	8.73	9.04	9.35	10.04	UHF4LN0100208	●
1	0/-0.010	0.2	±0.005	4	1	10	0.9	50	4	10.52	10.87	11.25	11.65	12.51	UHF4LN0100210	●
1	0/-0.010	0.2	±0.005	4	1	12	0.9	50	4	12.58	13.01	13.47	13.94	14.98	UHF4LN0100212	◎
1	0/-0.010	0.2	±0.005	4	1	14	0.9	50	4	14.65	15.15	15.68	16.24	17.45	UHF4LN0100214	●
1	0/-0.010	0.2	±0.005	4	1	16	0.9	50	4	16.72	17.29	17.89	18.53	19.91	UHF4LN0100216	●
1	0/-0.010	0.2	±0.005	4	1	20	0.9	60	4	20.85	21.57	22.32	23.12	24.85	UHF4LN0100220	◎
1	0/-0.010	0.3	±0.005	4	1	6	0.9	50	4	6.38	6.59	6.81	7.05	7.55	UHF4LN0100306	●
1	0/-0.010	0.3	±0.005	4	1	10	0.9	50	4	10.51	10.87	11.24	11.63	12.49	UHF4LN0100310	●
1	0/-0.010	0.3	±0.005	4	1	16	0.9	50	4	16.72	17.28	17.88	18.52	19.89	UHF4LN0100316	●
1	0/-0.010	0.3	±0.005	4	1	20	0.9	60	4	20.85	21.56	22.31	23.11	24.82	UHF4LN0100320	◎
1.5	0/-0.010	0.1	±0.005	4	1.5	6	1.4	50	4	6.39	6.6	6.83	7.08	7.6	UHF4LN0150106	●
1.5	0/-0.010	0.1	±0.005	4	1.5	8	1.4	50	4	8.45	8.74	9.05	9.37	10.07	UHF4LN0150108	●
1.5	0/-0.010	0.1	±0.005	4	1.5	12	1.4	50	4	12.59	13.02	13.48	13.96	15	UHF4LN0150112	●
1.5	0/-0.010	0.1	±0.005	4	1.5	16	1.4	50	4	16.72	17.3	17.91	18.55	19.94	UHF4LN0150116	◎
1.5	0/-0.010	0.1	±0.005	4	1.5	20	1.4	60	4	20.86	21.57	22.33	23.14	-	UHF4LN0150120	●
1.5	0/-0.010	0.2	±0.005	4	1.5	6	1.4	50	4	6.38	6.6	6.82	7.06	7.57	UHF4LN0150206	●
1.5	0/-0.010	0.2	±0.005	4	1.5	8	1.4	50	4	8.45	8.73	9.04	9.35	10.04	UHF4LN0150208	●
1.5	0/-0.010	0.2	±0.005	4	1.5	10	1.4	50	4	10.52	10.87	11.25	11.65	12.51	UHF4LN0150210	●
1.5	0/-0.010	0.2	±0.005	4	1.5	12	1.4	50	4	12.58	13.01	13.47	13.94	14.98	UHF4LN0150212	●
1.5	0/-0.010	0.2	±0.005	4	1.5	14	1.4	50	4	14.65	15.15	15.68	16.24	17.45	UHF4LN0150214	●
1.5	0/-0.010	0.2	±0.005	4	1.5	16	1.4	50	4	16.72	17.29	17.89	18.53	19.91	UHF4LN0150216	●
1.5	0/-0.010	0.2	±0.005	4	1.5	18	1.4	60	4	18.79	19.43	20.11	20.83	22.38	UHF4LN0150218	●
1.5	0/-0.010	0.2	±0.005	4	1.5	20	1.4	60	4	20.85	21.57	22.32	23.12	-	UHF4LN0150220	●
1.5	0/-0.010	0.3	±0.005	4	1.5	8	1.4	50	4	8.45	8.73	9.03	9.34	10.02	UHF4LN0150308	◎
1.5	0/-0.010	0.3	±0.005	4	1.5	16	1.4	50	4	16.72	17.28	17.88	18.52	19.89	UHF4LN0150316	●
1.5	0/-0.010	0.3	±0.005	4	1.5	20	1.4	60	4	20.85	21.56	22.31	23.11	-	UHF4LN0150320	●
2	0/-0.010	0.2	±0.005	4	2	6	1.9	50	4	6.38	6.6	6.82	7.06	7.57	UHF4LN0200206	●
2	0/-0.010	0.2	±0.005	4	2	8	1.9	50	4	8.45	8.73	9.04	9.35	10.04	UHF4LN0200208	●
2	0/-0.010	0.2	±0.005	4	2	10	1.9	50	4	10.52	10.87	11.25	11.65	12.51	UHF4LN0200210	●
2	0/-0.010	0.2	±0.005	4	2	12	1.9	50	4	12.58	13.01	13.47	13.94	14.98	UHF4LN0200212	●
2	0/-0.010	0.2	±0.005	4	2	14	1.9	50	4	14.65	15.15	15.68	16.24	17.45	UHF4LN0200214	●
2	0/-0.010	0.2	±0.005	4	2	16	1.9	50	4	16.72	17.29	17.89	18.53	-	UHF4LN0200216	●
2	0/-0.010	0.2	±0.005	4	2	18	1.9	60	4	18.79	19.43	20.11	20.83	-	UHF4LN0200218	●
2	0/-0.010	0.2	±0.005	4	2	20	1.9	60	4	20.85	21.57	22.32	23.12	-	UHF4LN0200220	●
2	0/-0.010	0.2	±0.005	4	2	25	1.9	75	4	26.02	26.91	27.86	-	-	UHF4LN0200225	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

UH (<70HRC) and MH (30÷70HRC) Corner radius

UHF4LN

- Cylindrical shank
- 4F Unequal Pitch
- Extended and reduced neck
- Corner radius



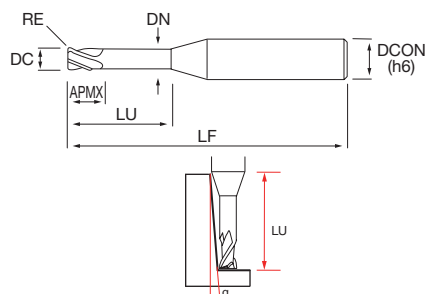
DC	DC tol.	RE	RE tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
2	0/-0.010	0.2	±0.005	4	2	30	1.9	75	4	31.19	32.26	33.4	-	-	UHF4LN0200230	●
2	0/-0.010	0.3	±0.005	4	2	8	1.9	50	4	8.45	8.73	9.03	9.34	10.02	UHF4LN0200308	●
2	0/-0.010	0.3	±0.005	4	2	16	1.9	50	4	16.72	17.28	17.88	18.52	-	UHF4LN0200316	●
2	0/-0.010	0.3	±0.005	4	2	20	1.9	60	4	20.85	21.56	22.31	23.11	-	UHF4LN0200320	◎
2	0/-0.010	0.5	±0.005	4	2	6	1.9	50	4	6.37	6.58	6.79	7.02	7.5	UHF4LN0200506	●
2	0/-0.010	0.5	±0.005	4	2	8	1.9	50	4	8.44	8.71	9	9.31	9.97	UHF4LN0200508	●
2	0/-0.010	0.5	±0.005	4	2	12	1.9	50	4	12.57	12.99	13.43	13.9	14.91	UHF4LN0200512	●
2	0/-0.010	0.5	±0.005	4	2	16	1.9	50	4	16.71	17.27	17.86	18.49	-	UHF4LN0200516	●
2	0/-0.010	0.5	±0.005	4	2	20	1.9	60	4	20.84	21.55	22.29	23.08	-	UHF4LN0200520	●
2	0/-0.010	0.5	±0.005	4	2	25	1.9	75	4	26.01	26.89	27.83	28.82	-	UHF4LN0200525	◎
2	0/-0.010	0.5	±0.005	4	2	30	1.9	75	4	31.18	32.24	33.36	-	-	UHF4LN0200530	●
2.5	0/-0.015	0.3	±0.005	4	2.5	8	2.4	50	4	8.45	8.73	9.03	9.34	10.02	UHF4LN0250308	●
2.5	0/-0.015	0.3	±0.005	4	2.5	10	2.4	50	4	10.51	10.87	11.24	11.63	12.49	UHF4LN0250310	●
2.5	0/-0.015	0.3	±0.005	4	2.5	12	2.4	50	4	12.58	13.01	13.45	13.93	-	UHF4LN0250312	●
2.5	0/-0.015	0.3	±0.005	4	2.5	14	2.4	50	4	14.65	15.14	15.67	16.22	-	UHF4LN0250314	●
2.5	0/-0.015	0.3	±0.005	4	2.5	16	2.4	50	4	16.72	17.28	17.88	18.52	-	UHF4LN0250316	●
2.5	0/-0.015	0.3	±0.005	4	2.5	18	2.4	60	4	18.78	19.42	20.1	20.81	-	UHF4LN0250318	◎
2.5	0/-0.015	0.3	±0.005	4	2.5	20	2.4	60	4	20.85	21.56	22.31	-	-	UHF4LN0250320	◎
2.5	0/-0.015	0.3	±0.005	4	2.5	25	2.4	60	4	26.02	26.91	27.85	-	-	UHF4LN0250325	●
2.5	0/-0.015	0.3	±0.005	4	2.5	30	2.4	75	4	31.19	32.25	-	-	-	UHF4LN0250330	●
2.5	0/-0.015	0.5	±0.005	4	2.5	8	2.4	50	4	8.44	8.71	9	9.31	9.97	UHF4LN0250508	●
2.5	0/-0.015	0.5	±0.005	4	2.5	12	2.4	50	4	12.57	12.99	13.43	13.9	-	UHF4LN0250512	●
2.5	0/-0.015	0.5	±0.005	4	2.5	16	2.4	50	4	16.71	17.27	17.86	18.49	-	UHF4LN0250516	◎
2.5	0/-0.015	0.5	±0.005	4	2.5	20	2.4	60	4	20.84	21.55	22.29	-	-	UHF4LN0250520	●
2.5	0/-0.015	0.5	±0.005	4	2.5	25	2.4	60	4	26.01	26.89	27.83	-	-	UHF4LN0250525	◎
2.5	0/-0.015	0.5	±0.005	4	2.5	30	2.4	75	4	31.18	32.24	-	-	-	UHF4LN0250530	◎
3	0/-0.015	0.2	±0.010	6	3	8	2.8	50	4	8.64	8.93	9.24	9.57	10.27	UHF4LN0300208	●
3	0/-0.015	0.2	±0.010	6	3	10	2.8	50	4	10.71	11.07	11.46	11.86	12.73	UHF4LN0300210	●
3	0/-0.015	0.2	±0.010	6	3	12	2.8	50	4	12.78	13.21	13.67	14.16	15.2	UHF4LN0300212	●
3	0/-0.015	0.2	±0.010	6	3	14	2.8	50	4	14.84	15.35	15.89	16.45	17.67	UHF4LN0300214	●
3	0/-0.015	0.2	±0.010	6	3	16	2.8	60	4	16.91	17.49	18.1	18.74	20.14	UHF4LN0300216	●
3	0/-0.015	0.2	±0.010	6	3	18	2.8	60	4	18.98	19.63	20.31	21.04	22.6	UHF4LN0300218	●
3	0/-0.015	0.2	±0.010	6	3	20	2.8	60	4	21.05	21.77	22.53	23.33	25.07	UHF4LN0300220	●
3	0/-0.015	0.2	±0.010	6	3	25	2.8	75	4	26.21	27.11	28.07	29.07	-	UHF4LN0300225	●
3	0/-0.015	0.3	±0.010	6	3	8	2.8	50	4	8.64	8.93	9.23	9.55	10.24	UHF4LN0300308	●
3	0/-0.015	0.3	±0.010	6	3	10	2.8	50	4	10.71	11.07	11.45	11.85	12.71	UHF4LN0300310	◎
3	0/-0.015	0.3	±0.010	6	3	12	2.8	50	4	12.77	13.2	13.66	14.14	15.18	UHF4LN0300312	◎
3	0/-0.015	0.3	±0.010	6	3	14	2.8	50	4	14.84	15.34	15.87	16.44	17.64	UHF4LN0300314	●
3	0/-0.015	0.3	±0.010	6	3	16	2.8	60	4	16.91	17.48	18.09	18.73	20.11	UHF4LN0300316	●
3	0/-0.015	0.3	±0.010	6	3	18	2.8	60	4	18.98	19.62	20.3	21.02	22.58	UHF4LN0300318	●
3	0/-0.015	0.3	±0.010	6	3	20	2.8	60	4	21.04	21.76	22.52	23.32	25.05	UHF4LN0300320	●
3	0/-0.015	0.3	±0.010	6	3	30	2.8	75	4	31.38	32.45	33.59	34.79	-	UHF4LN0300330	●
3	0/-0.015	0.5	±0.010	6	3	8	2.8	50	4	8.63	8.91	9.21	9.52	10.2	UHF4LN0300508	●
3	0/-0.015	0.5	±0.010	6	3	10	2.8	50	4	10.7	11.05	11.42	11.82	12.66	UHF4LN0300510	●
3	0/-0.015	0.5	±0.010	6	3	12	2.8	50	4	12.77	13.19	13.64	14.11	15.13	UHF4LN0300512	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

UH (<70HRC) and MH (30÷70HRC) Corner radius

UHF4LN

- Cylindrical shank
- 4F Unequal Pitch
- Extended and reduced neck
- Corner radius



P	M	K	N	S	H
☆		☆			★



DC	DC tol.	RE	RE tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
3	0/-0.015	0.5	±0.010	6	3	14	2.8	50	4	14.83	15.33	15.85	16.41	17.6	UHF4LN0300514	●
3	0/-0.015	0.5	±0.010	6	3	16	2.8	60	4	16.9	17.47	18.07	18.7	20.07	UHF4LN0300516	●
3	0/-0.015	0.5	±0.010	6	3	18	2.8	60	4	18.97	19.61	20.28	20.99	22.53	UHF4LN0300518	●
3	0/-0.015	0.5	±0.010	6	3	20	2.8	60	4	21.04	21.75	22.5	23.29	25	UHF4LN0300520	●
3	0/-0.015	0.5	±0.010	6	3	30	2.8	75	4	31.37	32.44	33.57	34.76	-	UHF4LN0300530	●
4	0/-0.015	0.3	±0.010	6	4	10	3.7	60	4	10.9	11.26	11.65	12.06	12.93	UHF4LN0400310	●
4	0/-0.015	0.3	±0.010	6	4	15	3.7	60	4	16.07	16.61	17.19	17.79	19.1	UHF4LN0400315	●
4	0/-0.015	0.3	±0.010	6	4	20	3.7	60	4	21.24	21.96	22.72	23.53	-	UHF4LN0400320	●
4	0/-0.015	0.3	±0.010	6	4	25	3.7	75	4	26.4	27.31	28.26	-	-	UHF4LN0400325	●
4	0/-0.015	0.3	±0.010	6	4	32	3.7	75	4	33.64	34.79	36.01	-	-	UHF4LN0400332	⊙
4	0/-0.015	0.3	±0.010	6	4	40	3.7	75	4	41.91	43.35	-	-	-	UHF4LN0400340	⊙
4	0/-0.015	0.5	±0.010	6	4	10	3.7	60	4	10.89	11.25	11.63	12.03	12.89	UHF4LN0400510	●
4	0/-0.015	0.5	±0.010	6	4	15	3.7	60	4	16.06	16.6	17.17	17.76	19.06	UHF4LN0400515	●
4	0/-0.015	0.5	±0.010	6	4	20	3.7	60	4	21.23	21.94	22.7	23.5	-	UHF4LN0400520	●
4	0/-0.015	0.5	±0.010	6	4	25	3.7	75	4	26.4	27.29	28.24	-	-	UHF4LN0400525	●
4	0/-0.015	0.5	±0.010	6	4	32	3.7	75	4	33.63	34.78	35.99	-	-	UHF4LN0400532	●
4	0/-0.015	0.5	±0.010	6	4	40	3.7	75	4	41.9	43.33	-	-	-	UHF4LN0400540	●

★ 1st choice, ☆ suitable, ● stock standard, ⊙ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

UHF4LN

Material Group ISO 513			P3	P4	P5	K2	K3	P6	K4	H1	H4	H5	H2	H3		
Hardness/Rm			≤45 HRC					45÷55 HRC					55÷60 HRC		60÷65 HRC	
ap x ae			ap x D					ap x D					ap x D		ap x D	
Vc (m/min)			80÷120					60÷100					50÷70		30÷50	
DC (mm)	LU (mm)	ap (mm)	fz (mm/z)					fz (mm/z)					fz (mm/z)		fz (mm/z)	
1	≤ 6D	0.05	0.010					0.009					0.008		0.007	
	≤ 8D	0.04	0.009					0.008					0.007		0.006	
	≤ 10D	0.04	0.007					0.006					0.006		0.005	
	≤ 12D	0.03	0.006					0.005					0.004		0.004	
1.5	≤ 6D	0.08	0.021					0.019					0.017		0.015	
	≤ 8D	0.06	0.018					0.016					0.014		0.013	
	≤ 10D	0.05	0.015					0.013					0.012		0.010	
	≤ 12D	0.04	0.012					0.011					0.009		0.008	
	≤ 15D	0.03	0.010					0.009					0.008		0.007	
	> 15D	0.02	0.006					0.006					0.005		0.004	
2	≤ 6D	0.10	0.026					0.023					0.020		0.018	
	≤ 8D	0.09	0.022					0.020					0.017		0.015	
	≤ 10D	0.07	0.018					0.016					0.014		0.012	
	≤ 12D	0.06	0.014					0.013					0.011		0.010	
	≤ 15D	0.05	0.011					0.010					0.009		0.008	
	> 15D	0.03	0.008					0.007					0.006		0.005	
2.5	≤ 6D	0.13	0.030					0.027					0.024		0.021	
	≤ 8D	0.11	0.025					0.023					0.020		0.018	
	≤ 10D	0.09	0.021					0.019					0.017		0.015	
	≤ 12D	0.07	0.016					0.015					0.013		0.011	
	≤ 15D	0.06	0.013					0.012					0.011		0.009	
	> 15D	0.04	0.009					0.008					0.007		0.006	
3	≤ 6D	0.15	0.034					0.031					0.027		0.024	
	≤ 8D	0.13	0.029					0.026					0.023		0.020	
	≤ 10D	0.11	0.024					0.021					0.019		0.017	
	≤ 12D	0.08	0.019					0.017					0.015		0.013	
	≤ 15D	0.07	0.015					0.014					0.012		0.011	
	> 15D	0.05	0.010					0.009					0.008		0.007	
4	≤ 6D	0.20	0.043					0.038					0.034		0.030	
	≤ 8D	0.17	0.036					0.033					0.029		0.025	
	≤ 10D	0.14	0.030					0.027					0.024		0.021	
	≤ 12D	0.11	0.023					0.021					0.019		0.016	
	≤ 15D	0.09	0.019					0.017					0.015		0.013	
	> 15D	0.06	0.013					0.011					0.010		0.009	



SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

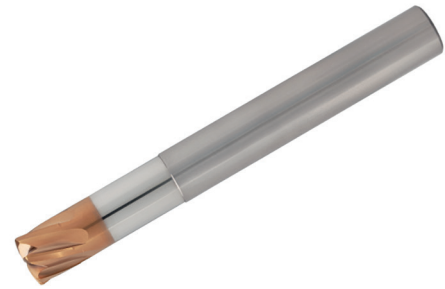
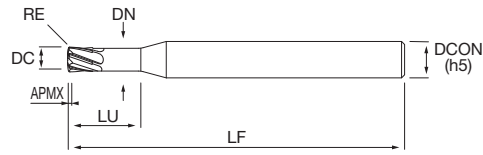
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

UHF-RT

- Cylindrical shank
- Multi flute
- Unique corner radius design for high feed machining

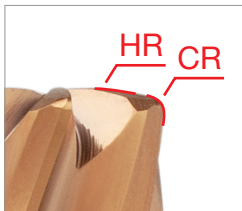


P	M	K	N	S	H
☆					★



DC	DC tol.	RP	DCON	TCDCON	APMX	LU	DN	LF	ZEFP	EDP no.	Stock
2	-0.014/-0.038	0.13	6	h5	0.07	6	1.9	50	4	UHF470RT020N	●
3	-0.014/-0.038	0.19	6	h5	0.1	9	2.9	60	4	UHF470RT030N	●
4	-0.014/-0.038	0.25	6	h5	0.13	12	3.9	60	6	UHF670RT040N	●
5	-0.014/-0.038	0.31	6	h5	0.17	15	4.7	60	6	UHF670RT050N	●
6	-0.014/-0.038	0.38	6	h5	0.2	18	5.5	60	6	UHF670RT060N	●
8	-0.014/-0.038	0.5	8	h5	0.27	24	7.5	75	6	UHF670RT080N	●
10	-0.014/-0.038	0.63	10	h5	0.33	30	9.5	90	6	UHF670RT100N	●
12	-0.014/-0.038	0.75	12	h5	0.4	36	11.5	100	6	UHF670RT120N	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion



The geometry with combined radius (corner radius + head radius) create thinner chips in comparison with conventional full radius, allowing a great reduction of cutting forces.



Special "no-contact" area in the end mill center, together with low helix geometry, reduce drastically the vibration, even when machining at corners.

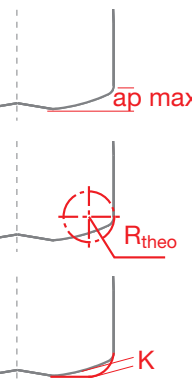
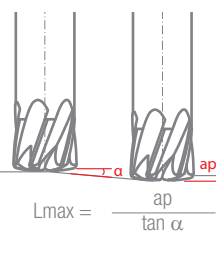


Curved cutting edges reduce chattering and improve the chips flow.

Cutting Parameters

UHF-RT

	Material Group ISO 513	P6 H1 H4 H5	H2	H3	
	Hardness/Rm	45÷55 HRC	55÷60 HRC	60÷65 HRC	
	ap x ae	0.03D x 0.55D	0.03D x 0.55D	0.03D x 0.55D	
	Vc (m/min)	100÷120	80÷100	50÷70	
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	
	2	0.070	0.050	0.040	
	3	0.100	0.080	0.060	
	4	0.150	0.100	0.080	
	5	0.200	0.120	0.100	
	6	0.250	0.200	0.150	
	8	0.350	0.250	0.200	
	10	0.400	0.300	0.250	
	12	0.450	0.350	0.300	

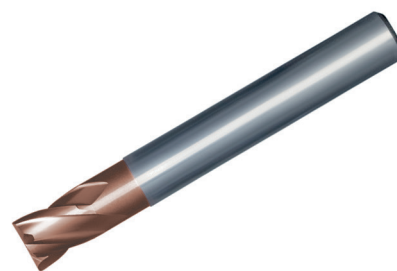
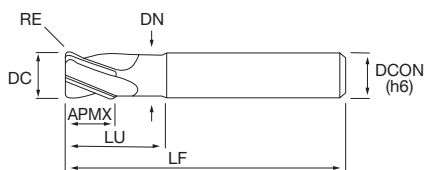
DC	ap max	CAM input			Circular interpolation			Cutting length for linear ramping Lmax (αmax=5°)		
		RP	max unmachined part K		Ø min	Ø max		EXAMPLE		
2	0.07	0.189	0.051		2.9	3.8		α=0.5°	α=5°	
3	0.10	0.283	0.076		4.3	5.8		8.02	0.80	
4	0.13	0.378	0.102		5.7	7.8		11.46	1.14	
5	0.17	0.472	0.127		7.1	9.8		14.90	1.49	
6	0.20	0.567	0.152		8.6	11.8		19.48	1.94	
8	0.27	0.756	0.203		11.4	15.8		22.92	2.29	
10	0.33	0.945	0.254		14.2	19.8		30.94	3.09	
12	0.40	1.134	0.305		17.1	23.8		37.81	3.77	
								45.84	4.57	

(mm)

UH (<70HRC) and MH (30÷70HRC) Corner radius

UHCS4

- Cylindrical shank
- 4F
- Corner radius



P	M	K	N	S	H
☆		☆			★

OSAWA
NORM

UH

NMG
UH RED

<70
HRC

FHA 40°

RADIUS

ZEFP 4

L
SIDE MILLING

DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LU	DN	LF	ZEFP	EDP no.	Stock
1	0/-0.012	0.1	±0.010	4	h6	2	3	0.95	50	4	UHCS4010	●
1.5	0/-0.012	0.1	±0.010	4	h6	2.5	4	1.45	50	4	UHCS4015	●
2	0/-0.012	0.1	±0.010	4	h6	3	6	1.95	50	4	UHCS4020	●
3	0/-0.012	0.1	±0.010	6	h6	4	8	2.85	55	4	UHCS4030	●
4	0/-0.012	0.1	±0.010	6	h6	6	10	3.85	55	4	UHCS4040	●
5	0/-0.012	0.2	±0.010	6	h6	6	11	4.85	50	4	UHCS4050	●
6	0/-0.015	0.2	±0.010	6	h6	9	15	5.85	60	4	UHCS4060	●
8	0/-0.015	0.2	±0.015	8	h6	12	20	7.7	70	4	UHCS4080	●
10	0/-0.015	0.2	±0.015	10	h6	15	25	9.7	70	4	UHCS4100	●
12	0/-0.015	0.3	±0.015	12	h6	18	30	11.7	80	4	UHCS4120	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

UHCS4

	Material Group ISO 513	P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3
	Hardness/Rm	≤45 HRC	45÷55 HRC	55÷60 HRC	60÷65 HRC
	ap x ae	D x 0.1D	D x 0.05D	D x 0.05D	D x 0.05D
	Vc (m/min)	90÷130	60÷100	50÷70	30÷50
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.010	0.009	0.008	0.007
	2	0.020	0.018	0.016	0.014
	3	0.030	0.027	0.024	0.021
	4	0.040	0.036	0.032	0.028
	5	0.045	0.041	0.036	0.032
	6	0.050	0.045	0.040	0.035
	8	0.065	0.059	0.052	0.046
	10	0.085	0.077	0.068	0.060
	12	0.100	0.090	0.080	0.070

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

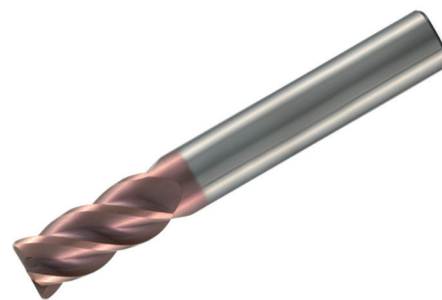
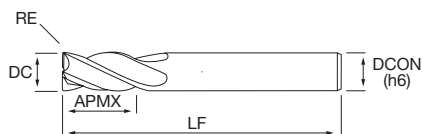
K - HSS END MILLS

L - CARBIDE BURRS

UH (<70HRC) and MH (30÷70HRC) Corner radius

UH410

- Cylindrical shank
- 4F
- Corner radius



P	M	K	N	S	H
☆		☆			★



DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
1	0/-0.015	0.2	0/-0.010	6	h6	3	50	4	UH41001002	●
1.5	0/-0.015	0.2	0/-0.010	6	h6	4.5	50	4	UH41001502	●
2	0/-0.015	0.3	0/-0.010	6	h6	6.5	50	4	UH41002003	●
2.5	0/-0.020	0.3	0/-0.015	6	h6	6.5	50	4	UH41002503	●
2.5	0/-0.020	0.5	0/-0.015	6	h6	6.5	50	4	UH41002505	●
3	0/-0.020	0.2	0/-0.015	6	h6	9	50	4	UH41003002	●
3	0/-0.020	0.3	0/-0.015	6	h6	9	50	4	UH41003003	●
3	0/-0.020	0.5	0/-0.015	6	h6	9	50	4	UH41003005	●
4	0/-0.020	0.3	0/-0.015	6	h6	12	50	4	UH41004003	●
4	0/-0.020	0.5	0/-0.015	6	h6	12	50	4	UH41004005	●
4	0/-0.020	1	0/-0.015	6	h6	12	50	4	UH41004010	◎
5	0/-0.020	0.3	0/-0.015	6	h6	15	50	4	UH41005003	●
5	0/-0.020	0.5	0/-0.015	6	h6	15	50	4	UH41005005	●
5	0/-0.020	1	0/-0.015	6	h6	15	50	4	UH41005010	◎
6	0/-0.020	0.3	0/-0.015	6	h6	16	50	4	UH41006003	●
6	0/-0.020	0.5	0/-0.015	6	h6	16	50	4	UH41006005	●
6	0/-0.020	1	0/-0.015	6	h6	16	50	4	UH41006010	●
8	0/-0.020	0.3	0/-0.015	8	h6	20	64	4	UH41008003	●
8	0/-0.020	0.5	0/-0.015	8	h6	20	64	4	UH41008005	●
8	0/-0.020	1	0/-0.015	8	h6	20	64	4	UH41008010	●
8	0/-0.020	1.5	0/-0.015	8	h6	20	64	4	UH41008015	●
8	0/-0.020	2	0/-0.015	8	h6	20	64	4	UH41008020	◎
10	0/-0.020	0.3	0/-0.020	10	h6	22	70	4	UH41010003	●
10	0/-0.020	0.5	0/-0.020	10	h6	22	70	4	UH41010005	●
10	0/-0.020	1	0/-0.020	10	h6	22	70	4	UH41010010	●
10	0/-0.020	1.5	0/-0.020	10	h6	22	70	4	UH41010015	●
10	0/-0.020	2	0/-0.020	10	h6	22	70	4	UH41010020	◎
12	0/-0.020	0.3	0/-0.020	12	h6	25	75	4	UH41012003	●
12	0/-0.020	0.5	0/-0.020	12	h6	25	75	4	UH41012005	●
12	0/-0.020	1	0/-0.020	12	h6	25	75	4	UH41012010	●
12	0/-0.020	1.5	0/-0.020	12	h6	25	75	4	UH41012015	●
12	0/-0.020	2	0/-0.020	12	h6	25	75	4	UH41012020	●
12	0/-0.020	3	0/-0.020	12	h6	25	75	4	UH41012030	●
14	0/-0.020	0.5	0/-0.020	14	h6	32	90	4	UH41014005	●
14	0/-0.020	1	0/-0.020	14	h6	32	90	4	UH41014010	●
16	0/-0.020	0.5	0/-0.020	16	h6	32	90	4	UH41016005	●
16	0/-0.020	1	0/-0.020	16	h6	32	90	4	UH41016010	●
16	0/-0.020	2	0/-0.020	16	h6	32	90	4	UH41016020	●
18	0/-0.020	1	0/-0.020	18	h6	38	100	4	UH41018010	◎
20	0/-0.020	0.5	0/-0.020	20	h6	38	100	4	UH41020005	●
20	0/-0.020	1	0/-0.020	20	h6	38	100	4	UH41020010	◎
20	0/-0.020	2	0/-0.020	20	h6	38	100	4	UH41020020	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

UH410

	Material Group ISO 513	P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3
	Hardness/Rm	≤45 HRC	45÷55 HRC	55÷60 HRC	60÷65 HRC
	ap x ae	D x 0.1D	D x 0.05D	D x 0.05D	D x 0.05D
	Vc (m/min)	90÷130	60÷100	50÷70	30÷50
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.010	0.009	0.008	0.007
	2	0.018	0.016	0.014	0.013
	3	0.027	0.024	0.022	0.019
	4	0.036	0.032	0.029	0.025
	5	0.041	0.036	0.032	0.028
	6	0.045	0.041	0.036	0.032
	8	0.059	0.053	0.047	0.041
	10	0.077	0.069	0.061	0.054
	12	0.090	0.081	0.072	0.063
	14	0.102	0.092	0.082	0.071
	16	0.114	0.103	0.091	0.080
	18	0.126	0.113	0.101	0.088
	20	0.138	0.124	0.110	0.097

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

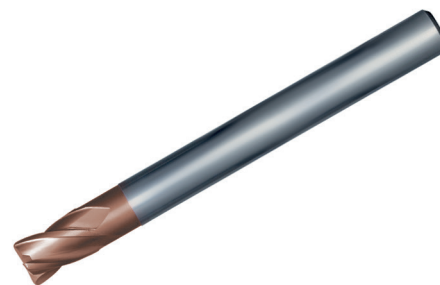
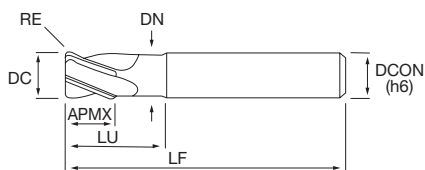
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

UH411

- Cylindrical shank
- 4F
- Corner radius
- Long



P	M	K	N	S	H
☆		☆			★

OSAWA
 NORM

UH
NMG
 UH RED

<70
 HRC


 FHA 40°


 RADIUS


 ZEFP 4


 SIDE MILLING

DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LU	DN	LF	ZEFP	EDP no.	Stock
3	0/-0.012	0.3	0/-0.010	6	h6	4	12	2.85	55	4	UH4110300312	●
3	0/-0.012	0.3	0/-0.010	6	h6	4	20	2.85	60	4	UH4110300320	●
3	0/-0.012	0.5	0/-0.010	6	h6	4	10	2.85	55	4	UH4110300510	●
3	0/-0.012	0.5	0/-0.010	6	h6	4	20	2.85	60	4	UH4110300520	●
4	0/-0.012	0.3	0/-0.010	6	h6	6	12	3.85	55	4	UH4110400312	●
4	0/-0.012	0.3	0/-0.010	6	h6	6	20	3.85	60	4	UH4110400320	●
4	0/-0.012	0.5	0/-0.010	6	h6	6	12	3.85	55	4	UH4110400512	●
4	0/-0.012	0.5	0/-0.010	6	h6	6	20	3.85	60	4	UH4110400520	●
4	0/-0.012	1	0/-0.010	6	h6	6	12	3.85	55	4	UH4110401012	●
6	0/-0.015	0.5	0/-0.010	6	h6	9	15	5.85	60	4	UH4110600520	●
6	0/-0.015	1	0/-0.010	6	h6	9	15	5.85	60	4	UH4110601020	●
8	0/-0.015	0.5	0/-0.015	8	h6	12	20	7.7	70	4	UH4110800525	●
8	0/-0.015	1	0/-0.015	8	h6	12	20	7.7	70	4	UH4110801025	●
8	0/-0.015	2	0/-0.015	8	h6	12	20	7.7	70	4	UH4110802025	●
10	0/-0.015	0.5	0/-0.015	10	h6	15	25	9.7	70	4	UH4111000532	●
10	0/-0.015	1	0/-0.015	10	h6	15	25	9.7	70	4	UH4111001032	●
10	0/-0.015	2	0/-0.015	10	h6	15	25	9.7	70	4	UH4111002032	●
12	0/-0.015	0.5	0/-0.015	12	h6	18	30	11.7	80	4	UH4111200538	●
12	0/-0.015	1	0/-0.015	12	h6	18	30	11.7	80	4	UH4111201038	●
12	0/-0.015	2	0/-0.015	12	h6	18	30	11.7	80	4	UH4111202038	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

UH411

	Material Group ISO 513	P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3
	Hardness/Rm	≤45 HRC	45÷55 HRC	55÷60 HRC	60÷65 HRC
	ap x ae	D x 0.05D	D x 0.05D	D x 0.05D	D x 0.05D
	Vc (m/min)	90÷130	60÷100	50÷70	30÷50
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	0.027	0.024	0.022	0.019
	4	0.036	0.032	0.029	0.025
	5	0.041	0.036	0.032	0.028
	6	0.045	0.041	0.036	0.032
	8	0.059	0.053	0.047	0.041
	10	0.077	0.069	0.061	0.054
	12	0.090	0.081	0.072	0.063

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

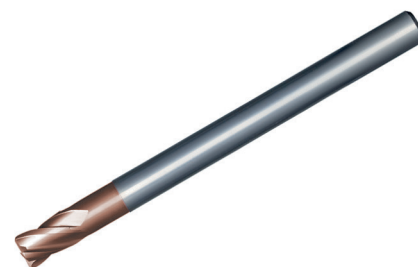
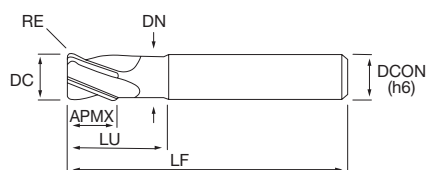
K - HSS END MILLS

L - CARBIDE BURRS

UH (<70HRC) and MH (30÷70HRC) Corner radius

UH412

- Cylindrical shank
- 4F
- Corner radius
- Long



P	M	K	N	S	H
☆		☆			★

OSAWA
NORM

UH

NMG
UH RED

<70
HRC

FHA 40°

RADIUS

ZEFP 4

L
SIDE MILLING

DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LU	DN	LF	ZEFP	EDP no.	Stock
2	0/-0.020	0.3	0/-0.010	6	h6	4	30	1.9	75	4	UH4120200330	◎
2	0/-0.020	0.3	0/-0.010	6	h6	4	60	1.9	100	4	UH4120200360	●
3	0/-0.020	0.3	0/-0.010	6	h6	5	30	2.8	75	4	UH4120300330	●
3	0/-0.020	0.3	0/-0.010	6	h6	5	60	2.8	100	4	UH4120300360	◎
3	0/-0.020	0.5	0/-0.010	6	h6	5	30	2.8	75	4	UH4120300530	●
3	0/-0.020	0.5	0/-0.010	6	h6	5	60	2.8	100	4	UH4120300560	◎
4	0/-0.020	0.3	0/-0.010	6	h6	8	32	3.7	75	4	UH4120400332	●
4	0/-0.020	0.3	0/-0.010	6	h6	8	60	3.7	100	4	UH4120400360	●
4	0/-0.020	0.5	0/-0.010	6	h6	8	32	3.7	75	4	UH4120400532	●
4	0/-0.020	0.5	0/-0.010	6	h6	8	60	3.7	100	4	UH4120400560	●
6	0/-0.020	0.5	0/-0.010	6	h6	9	40	5.85	90	4	UH4120600520	●
6	0/-0.020	1	0/-0.010	6	h6	9	40	5.85	90	4	UH4120601020	●
8	0/-0.020	0.5	0/-0.015	8	h6	12	45	7.7	100	4	UH4120800525	●
8	0/-0.020	1	0/-0.015	8	h6	12	45	7.7	100	4	UH4120801025	●
10	0/-0.020	0.5	0/-0.015	10	h6	15	50	9.7	100	4	UH4121000532	●
10	0/-0.020	1	0/-0.015	10	h6	15	50	9.7	100	4	UH4121001032	●
10	0/-0.020	2	0/-0.015	10	h6	15	50	9.7	100	4	UH4121002032	●
12	0/-0.020	0.5	0/-0.015	12	h6	18	60	11.7	110	4	UH4121200538	●
12	0/-0.020	1	0/-0.015	12	h6	18	60	11.7	110	4	UH4121201038	●
12	0/-0.020	2	0/-0.015	12	h6	18	60	11.7	110	4	UH4121202038	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

UH412

	Material Group ISO 513	P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3
	Hardness/Rm	≤45 HRC	45÷55 HRC	55÷60 HRC	60÷65 HRC
	ap x ae	D x 0.05D	D x 0.05D	D x 0.05D	D x 0.05D
	Vc (m/min)	80÷120	60÷100	50÷70	30÷50
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	2	0.016	0.015	0.013	0.011
	3	0.024	0.022	0.019	0.017
	4	0.032	0.029	0.026	0.023
	5	0.036	0.033	0.029	0.026
	6	0.041	0.036	0.032	0.028
	8	0.053	0.047	0.042	0.037
	10	0.069	0.062	0.055	0.048
	12	0.081	0.073	0.065	0.057

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

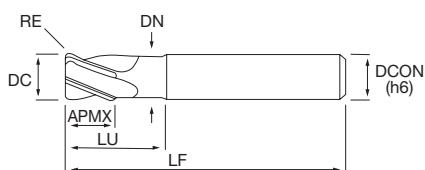
K - HSS END MILLS

L - CARBIDE BURRS

UH (<70HRC) and MH (30÷70HRC) Corner radius

UH413

- Cylindrical shank
- 4F
- Corner radius
- Long



P	M	K	N	S	H
☆		☆			★



DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LU	DN	LF	ZEFP	EDP no.	Stock
6	0/-0.020	0.3	0/-0.015	6	h6	10	60	5.5	125	4	UH4130600360	●
6	0/-0.020	0.5	0/-0.015	6	h6	10	60	5.5	125	4	UH4130600560	●
6	0/-0.020	1	0/-0.015	6	h6	10	60	5.5	125	4	UH4130601060	◎
8	0/-0.020	0.3	0/-0.015	8	h6	12	60	7.4	125	4	UH4130800360	●
8	0/-0.020	0.5	0/-0.015	8	h6	12	60	7.4	125	4	UH4130800560	●
8	0/-0.020	1	0/-0.015	8	h6	12	60	7.4	125	4	UH4130801060	●
8	0/-0.020	2	0/-0.015	8	h6	12	60	7.4	125	4	UH4130802060	●
10	0/-0.020	0.3	0/-0.020	10	h6	14	85	9.2	125	4	UH4131000385	●
10	0/-0.020	0.5	0/-0.020	10	h6	14	85	9.2	125	4	UH4131000585	●
10	0/-0.020	1	0/-0.020	10	h6	14	85	9.2	125	4	UH4131001085	●
10	0/-0.020	2	0/-0.020	10	h6	14	85	9.2	125	4	UH4131002085	●
12	0/-0.020	0.5	0/-0.020	12	h6	16	110	11	150	4	UH41312005110	●
12	0/-0.020	1	0/-0.020	12	h6	16	110	11	150	4	UH41312010110	●
12	0/-0.020	2	0/-0.020	12	h6	16	110	11	150	4	UH41312020110	●
16	0/-0.020	0.5	0/-0.020	16	h6	22	110	15	150	4	UH41316005110	●
16	0/-0.020	1	0/-0.020	16	h6	22	110	15	150	4	UH41316010110	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

UH413

	Material Group ISO 513	P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3
	Hardness/Rm	≤45 HRC	45÷55 HRC	55÷60 HRC	60÷65 HRC
	ap x ae	D x 0.05D	D x 0.05D	D x 0.05D	D x 0.05D
	Vc (m/min)	70÷110	60÷80	40÷60	30÷50
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	6	0.041	0.036	0.032	0.028
	8	0.053	0.047	0.042	0.037
	10	0.069	0.062	0.055	0.048
	12	0.081	0.073	0.065	0.057
	16	0.095	0.086	0.076	0.067

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

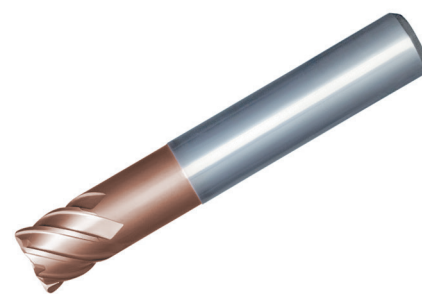
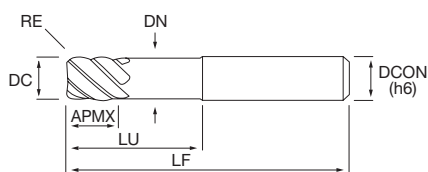
K - HSS END MILLS

L - CARBIDE BURRS

UH (<70HRC) and MH (30÷70HRC) Corner radius

UH610R

- Cylindrical shank
- Multi flute
- Corner radius



P	M	K	N	S	H
☆		☆			★



DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LU	DN	LF	ZEFP	EDP no.	Stock
6	0/-0.030	0.5	±0.015	6	h6	6	15	5.8	50	6	UH610R05060	●
8	0/-0.030	0.5	±0.015	8	h6	8	25	7.8	60	6	UH610R05080	●
10	0/-0.030	1	±0.015	10	h6	10	30	9.8	70	6	UH610R10100	●
12	0/-0.030	1	±0.015	12	h6	12	30	11.8	75	6	UH610R10120	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

UH610R

	Material Group ISO 513	P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3
	Hardness/Rm	≤45 HRC	45÷55 HRC	55÷60 HRC	60÷65 HRC
	ap x ae	D x 0.1D	D x 0.05D	D x 0.05D	D x 0.05D
	Vc (m/min)	140÷180	100÷140	70÷110	60÷80
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	6	0.018	0.016	0.014	0.013
	8	0.028	0.025	0.022	0.019
	10	0.034	0.030	0.027	0.024
	12	0.041	0.037	0.033	0.029

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

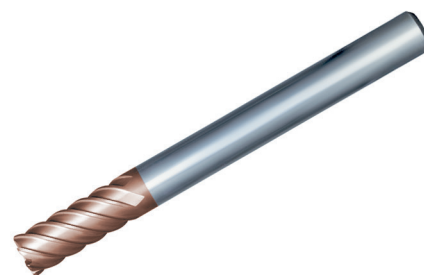
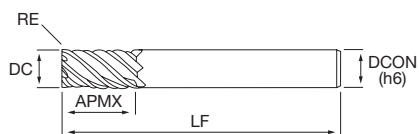
K - HSS END MILLS

L - CARBIDE BURRS

UH (<70HRC) and MH (30÷70HRC) Corner radius

UH611R

- Cylindrical shank
- Multi flute
- Long
- Corner radius



P	M	K	N	S	H
☆		☆			★

OSAWA
NORM

UH

NMG
UH RED

<70
HRC

FHA 50°

RADIUS

ZEFP 6

SIDE MILLING

DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
6	0/-0.030	0.5	±0.015	6	h6	15	90	6	UH611R05060	●
8	0/-0.030	0.5	±0.015	8	h6	20	100	6	UH611R05080	●
10	0/-0.030	0.5	±0.015	10	h6	25	100	6	UH611R05100	●
10	0/-0.030	1	±0.015	10	h6	25	100	6	UH611R10100	●
12	0/-0.030	0.5	±0.015	12	h6	30	110	6	UH611R05120	●
12	0/-0.030	1	±0.015	12	h6	30	110	6	UH611R10120	●
16	0/-0.030	1	±0.015	16	h6	32	130	6	UH611R10160	●
20	0/-0.030	1	±0.015	20	h6	38	140	6	UH611R10200	●
20	0/-0.030	2	±0.015	20	h6	38	140	6	UH611R20200	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

UH611R

	Material Group ISO 513	P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3
	Hardness/Rm	≤45 HRC	45÷55 HRC	55÷60 HRC	60÷65 HRC
	ap x ae	1.5D x 0.05D	1.5D x 0.05D	1.5D x 0.05D	1.5D x 0.05D
	Vc (m/min)	110÷150	90÷130	60÷80	40÷60
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	6	0.015	0.014	0.012	0.011
	8	0.023	0.021	0.019	0.016
	10	0.029	0.026	0.023	0.020
	12	0.035	0.031	0.028	0.024
	16	0.048	0.043	0.038	0.034
	20	0.066	0.060	0.053	0.046

SOLID

L - CARBIDE DRILLS

M - HSS DRILLS

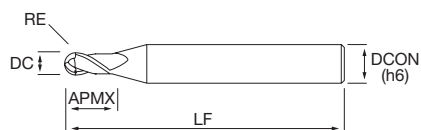
N - CARBIDE END MILLS

O - HSS END MILLS

P - CARBIDE BURRS

MHMB204

- Cylindrical shank
- 2 flutes ball nose
- Miniature



P	M	K	N	S	H
★		★			★



DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
0.2	0/-0.010	0.1	0/-0.010	4	h6	0.2	50	2	MHMB200204	●
0.3	0/-0.010	0.15	0/-0.010	4	h6	0.3	50	2	MHMB200304	●
0.4	0/-0.010	0.2	0/-0.010	4	h6	0.4	50	2	MHMB200404	●
0.5	0/-0.010	0.25	0/-0.010	4	h6	0.4	50	2	MHMB200504	●
0.6	0/-0.010	0.3	0/-0.010	4	h6	0.5	50	2	MHMB200604	●
0.7	0/-0.010	0.35	0/-0.010	4	h6	0.6	50	2	MHMB200704	●
0.8	0/-0.010	0.4	0/-0.010	4	h6	0.6	50	2	MHMB200804	●
0.9	0/-0.010	0.45	0/-0.010	4	h6	0.8	50	2	MHMB200904	●
1	0/-0.015	0.5	0/-0.015	4	h6	0.8	50	2	MHMB201004	●
1.5	0/-0.015	0.75	0/-0.015	4	h6	1.35	50	2	MHMB201504	●
2	0/-0.015	1	0/-0.015	4	h6	1.7	50	2	MHMB202004	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

MHMB204

	Material Group ISO 513		P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3				
	Hardness/Rm		≤45 HRC		45÷55 HRC		55÷60 HRC		60÷65 HRC	
	ap x ae		0.05D x 0.1D		0.05D x 0.1D		0.05D x 0.1D		0.05D x 0.1D	
	Vc (m/min)		80÷120		60÷100		40÷80		20÷60	
	DC (mm)	ap (mm)	fz (mm/z)		fz (mm/z)		fz (mm/z)		fz (mm/z)	
	0.1	0.04	0.004		0.004		0.003		0.003	
	0.2	0.09	0.006		0.005		0.005		0.004	
	0.3	0.13	0.008		0.007		0.006		0.006	
	0.4	0.17	0.010		0.009		0.008		0.007	
	0.5	0.22	0.012		0.011		0.010		0.008	
	0.6	0.26	0.015		0.014		0.012		0.011	
	0.7	0.31	0.018		0.016		0.014		0.013	
	0.8	0.35	0.020		0.018		0.016		0.014	
	0.9	0.39	0.023		0.021		0.018		0.016	
	1	0.44	0.026		0.023		0.020		0.017	
	1.5	0.79	0.040		0.036		0.030		0.026	
	2	1.20	0.055		0.050		0.041		0.036	

	α	n (rpm)	Vf (mm/min)
	15°	x 1.1	x 1.1

SOLID

L - CARBIDE DRILLS

M - HSS DRILLS

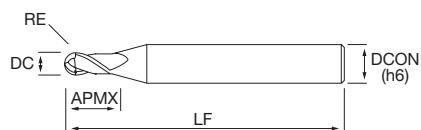
N - CARBIDE END MILLS

O - HSS END MILLS

P - CARBIDE BURRS

MHMB206

- Cylindrical shank
- 2 flutes ball nose
- Miniature
- 6 mm. shank



P	M	K	N	S	H
★		★			★

OSAWA NORM	MH	NMG MH COAT	30÷70 HRC	FHA 30°	BALL NOSE	ZEFP 2 BALL	COPYING
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DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
0.4	0/-0.010	0.2	0/-0.010	6	h6	0.4	50	2	MHMB200406	●
0.5	0/-0.010	0.25	0/-0.010	6	h6	0.5	50	2	MHMB200506	●
0.6	0/-0.010	0.3	0/-0.010	6	h6	0.6	50	2	MHMB200606	●
0.8	0/-0.010	0.4	0/-0.010	6	h6	0.8	50	2	MHMB200806	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

MHMB206

	Material Group ISO 513		P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3
	Hardness/Rm		≤45 HRC	45÷55 HRC	55÷60 HRC	60÷65 HRC
	ap x ae		0.05D x 0.2D	0.05D x 0.2D	0.05D x 0.2D	0.05D x 0.2D
	Vc (m/min)		80÷120	60÷100	40÷80	20÷60
	DC (mm)	ap (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	0.4	0.17	0.010	0.009	0.008	0.007
	0.5	0.22	0.012	0.011	0.010	0.008
	0.6	0.26	0.015	0.014	0.012	0.011
	0.8	0.35	0.020	0.018	0.016	0.014

	α	n (rpm)	Vf (mm/min)
	15°	x 1.1	x 1.1

SOLID

L - CARBIDE DRILLS

M - HSS DRILLS

N - CARBIDE END MILLS

O - HSS END MILLS

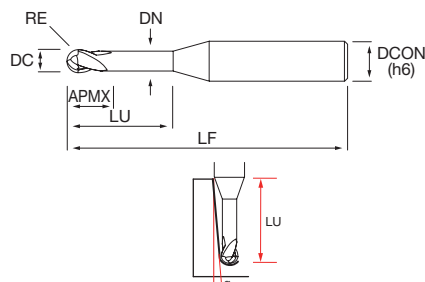
P - CARBIDE BURRS

UH (<70HRC) and MH (30÷70HRC) Ball nose



MHLNB2

- Cylindrical shank
- 2 flutes ball nose
- Extended and reduced neck



P	M	K	N	S	H
★		★			★

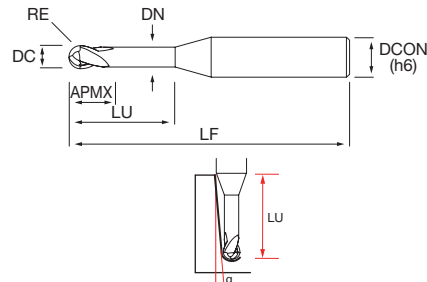
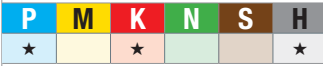


DC	DC tol.	RE	RE tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
0.2	0/-0.010	0.1	0/-0.010	4	0.2	0.5	0.17	50	2	0.57	0.58	0.6	0.62	0.66	MHLNB2002005	●
0.2	0/-0.010	0.1	0/-0.010	4	0.2	1	0.17	50	2	1.08	1.12	1.15	1.19	1.27	MHLNB200201	●
0.2	0/-0.010	0.1	0/-0.010	4	0.2	1.5	0.17	50	2	1.6	1.65	1.71	1.76	1.89	MHLNB2002015	◎
0.3	0/-0.010	0.15	0/-0.010	4	0.3	1	0.27	50	2	1.08	1.11	1.15	1.18	1.26	MHLNB200301	●
0.3	0/-0.010	0.15	0/-0.010	4	0.3	2	0.27	50	2	2.12	2.18	2.25	2.33	2.49	MHLNB200302	●
0.3	0/-0.010	0.15	0/-0.010	4	0.3	3	0.27	50	2	3.15	3.25	3.36	3.48	3.73	MHLNB200303	◎
0.4	0/-0.010	0.2	0/-0.010	4	0.4	1	0.37	50	2	1.08	1.11	1.14	1.18	1.25	MHLNB200401	●
0.4	0/-0.010	0.2	0/-0.010	4	0.4	2	0.37	50	2	2.11	2.18	2.25	2.32	2.48	MHLNB200402	●
0.4	0/-0.010	0.2	0/-0.010	4	0.4	3	0.37	50	2	3.15	3.25	3.36	3.47	3.72	MHLNB200403	●
0.4	0/-0.010	0.2	0/-0.010	4	0.4	4	0.37	50	2	4.18	4.32	4.46	4.62	4.95	MHLNB200404	◎
0.4	0/-0.010	0.2	0/-0.010	4	0.4	5	0.37	50	2	5.21	5.39	5.57	5.77	6.18	MHLNB200405	◎
0.5	0/-0.010	0.25	0/-0.010	4	0.4	2	0.45	50	2	2.15	2.22	2.29	2.36	2.52	MHLNB200502	●
0.5	0/-0.010	0.25	0/-0.010	4	0.4	3	0.45	50	2	3.18	3.29	3.39	3.51	3.75	MHLNB200503	●
0.5	0/-0.010	0.25	0/-0.010	4	0.4	4	0.45	50	2	4.22	4.35	4.5	4.65	4.98	MHLNB200504	●
0.5	0/-0.010	0.25	0/-0.010	4	0.4	5	0.45	50	2	5.25	5.42	5.61	5.8	6.22	MHLNB200505	◎
0.5	0/-0.010	0.25	0/-0.010	4	0.4	6	0.45	50	2	6.28	6.49	6.71	6.95	7.45	MHLNB200506	●
0.5	0/-0.010	0.25	0/-0.010	4	0.4	8	0.45	50	2	8.35	8.63	8.93	9.24	9.92	MHLNB200508	◎
0.6	0/-0.010	0.3	0/-0.010	4	0.5	2	0.55	50	2	2.15	2.21	2.28	2.35	2.5	MHLNB200602	●
0.6	0/-0.010	0.3	0/-0.010	4	0.5	3	0.55	50	2	3.18	3.28	3.39	3.5	3.74	MHLNB200603	◎
0.6	0/-0.010	0.3	0/-0.010	4	0.5	4	0.55	50	2	4.22	4.35	4.49	4.65	4.97	MHLNB200604	●
0.6	0/-0.010	0.3	0/-0.010	4	0.5	5	0.55	50	2	5.25	5.42	5.6	5.79	6.21	MHLNB200605	◎
0.6	0/-0.010	0.3	0/-0.010	4	0.5	6	0.55	50	2	6.28	6.49	6.71	6.94	7.44	MHLNB200606	●
0.6	0/-0.010	0.3	0/-0.010	4	0.5	8	0.55	50	2	8.35	8.63	8.92	9.23	9.91	MHLNB200608	●
0.8	0/-0.010	0.4	0/-0.010	4	0.6	2	0.75	50	2	2.15	2.21	2.27	2.34	2.48	MHLNB200802	●
0.8	0/-0.010	0.4	0/-0.010	4	0.6	4	0.75	50	2	4.21	4.34	4.48	4.63	4.95	MHLNB200804	●
0.8	0/-0.010	0.4	0/-0.010	4	0.6	5	0.75	50	2	5.25	5.41	5.59	5.78	6.18	MHLNB200805	●
0.8	0/-0.010	0.4	0/-0.010	4	0.6	6	0.75	50	2	6.28	6.48	6.7	6.93	7.42	MHLNB200806	●
0.8	0/-0.010	0.4	0/-0.010	4	0.6	7	0.75	50	2	7.31	7.55	7.81	8.07	8.65	MHLNB200807	●
0.8	0/-0.010	0.4	0/-0.010	4	0.6	8	0.75	50	2	8.35	8.62	8.91	9.22	9.88	MHLNB200808	●
0.8	0/-0.010	0.4	0/-0.010	4	0.6	10	0.75	50	2	10.41	10.76	11.13	11.51	12.35	MHLNB200810	●
1	0/-0.015	0.5	0/-0.015	4	0.8	3	0.9	50	2	3.27	3.37	3.47	3.57	3.8	MHLNB201003	●
1	0/-0.015	0.5	0/-0.015	4	0.8	4	0.9	50	2	4.31	4.44	4.58	4.72	5.04	MHLNB201004	●
1	0/-0.015	0.5	0/-0.015	4	0.8	5	0.9	50	2	5.34	5.51	5.68	5.87	6.27	MHLNB201005	●
1	0/-0.015	0.5	0/-0.015	4	0.8	6	0.9	50	2	6.37	6.58	6.79	7.02	7.5	MHLNB201006	●
1	0/-0.015	0.5	0/-0.015	4	0.8	7	0.9	50	2	7.41	7.64	7.9	8.16	8.74	MHLNB201007	◎
1	0/-0.015	0.5	0/-0.015	4	0.8	8	0.9	50	2	8.44	8.71	9	9.31	9.97	MHLNB201008	●
1	0/-0.015	0.5	0/-0.015	4	0.8	9	0.9	50	2	9.47	9.78	10.11	10.46	11.21	MHLNB201009	◎
1	0/-0.015	0.5	0/-0.015	4	0.8	10	0.9	50	2	10.51	10.85	11.22	11.61	12.44	MHLNB201010	●
1	0/-0.015	0.5	0/-0.015	4	0.8	12	0.9	50	2	12.57	12.99	13.43	13.9	14.91	MHLNB201012	●
1	0/-0.015	0.5	0/-0.015	4	0.8	14	0.9	50	2	14.64	15.13	15.65	16.19	17.37	MHLNB201014	◎
1	0/-0.015	0.5	0/-0.015	4	0.8	16	0.9	50	2	16.71	17.27	17.86	18.49	19.84	MHLNB201016	●
1	0/-0.015	0.5	0/-0.015	4	0.8	20	0.9	60	2	20.84	21.55	22.29	23.08	24.78	MHLNB201020	●
1.2	0/-0.015	0.6	0/-0.015	4	1	6	1.1	50	2	6.37	6.57	6.78	7	7.48	MHLNB201206	●
1.2	0/-0.015	0.6	0/-0.015	4	1	8	1.1	50	2	8.44	8.71	8.99	9.3	9.95	MHLNB201208	◎
1.2	0/-0.015	0.6	0/-0.015	4	1	10	1.1	50	2	10.5	10.85	11.21	11.59	12.42	MHLNB201210	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

MHLNB2

- Cylindrical shank
- 2 flutes ball nose
- Extended and reduced neck



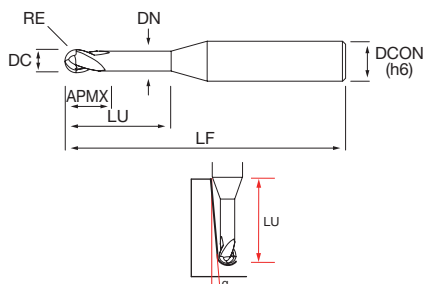
DC	DC tol.	RE	RE tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
1.2	0/-0.015	0.6	0/-0.015	4	1	12	1.1	50	2	12.57	12.98	13.42	13.89	14.88	MHLNB201212	⊙
1.4	0/-0.015	0.7	0/-0.015	4	1.1	8	1.3	50	2	8.43	8.7	8.98	9.28	9.93	MHLNB201408	●
1.4	0/-0.015	0.7	0/-0.015	4	1.1	12	1.3	50	2	12.57	12.98	13.41	13.87	14.86	MHLNB201412	⊙
1.4	0/-0.015	0.7	0/-0.015	4	1.1	16	1.3	50	2	16.7	17.26	17.84	18.46	19.8	MHLNB201416	⊙
1.5	0/-0.015	0.75	0/-0.015	4	1.2	8	1.4	50	2	8.43	8.7	8.98	9.27	9.91	MHLNB201508	●
1.5	0/-0.015	0.75	0/-0.015	4	1.2	12	1.4	50	2	12.57	12.97	13.41	13.86	14.85	MHLNB201512	●
1.5	0/-0.015	0.75	0/-0.015	4	1.2	16	1.4	50	2	16.7	17.25	17.84	18.45	19.78	MHLNB201516	●
1.5	0/-0.015	0.75	0/-0.015	4	1.2	18	1.4	60	2	18.77	19.39	20.05	20.75	22.25	MHLNB201518	●
1.5	0/-0.015	0.75	0/-0.015	6	2.4	20	1.4	50	2	20.84	21.53	22.26	23.04	24.72	MHLNB201520	●
1.6	0/-0.015	0.8	0/-0.015	4	1.3	8	1.5	50	2	8.43	8.69	8.97	9.27	9.9	MHLNB201608	⊙
1.6	0/-0.015	0.8	0/-0.015	4	1.3	12	1.5	50	2	12.56	12.97	13.4	13.86	14.84	MHLNB201612	●
1.6	0/-0.015	0.8	0/-0.015	4	1.3	16	1.5	50	2	16.7	17.25	17.83	18.45	19.77	MHLNB201616	●
1.6	0/-0.015	0.8	0/-0.015	4	1.3	20	1.5	60	2	20.83	21.53	22.26	23.03	-	MHLNB201620	●
1.8	0/-0.015	0.9	0/-0.015	4	1.4	8	1.7	50	2	8.43	8.69	8.96	9.25	9.88	MHLNB201808	●
1.8	0/-0.015	0.9	0/-0.015	4	1.4	12	1.7	50	2	12.56	12.96	13.39	13.84	14.81	MHLNB201812	⊙
1.8	0/-0.015	0.9	0/-0.015	4	1.4	16	1.7	50	2	16.7	17.24	17.82	18.43	19.75	MHLNB201816	●
1.8	0/-0.015	0.9	0/-0.015	4	1.4	20	1.7	60	2	20.83	21.52	22.25	23.02	-	MHLNB201820	●
2	0/-0.015	1	0/-0.015	4	1.6	4	1.9	50	2	4.29	4.4	4.52	4.65	4.92	MHLNB202004	●
2	0/-0.015	1	0/-0.015	4	1.6	6	1.9	50	2	6.36	6.54	6.74	6.94	7.39	MHLNB202006	●
2	0/-0.015	1	0/-0.015	4	1.6	8	1.9	50	2	8.42	8.68	8.95	9.24	9.86	MHLNB202008	●
2	0/-0.015	1	0/-0.015	4	1.6	10	1.9	50	2	10.49	10.82	11.17	11.53	12.32	MHLNB202010	●
2	0/-0.015	1	0/-0.015	4	1.6	12	1.9	50	2	12.56	12.96	13.38	13.83	14.79	MHLNB202012	●
2	0/-0.015	1	0/-0.015	4	1.6	14	1.9	50	2	14.62	15.1	15.59	16.12	17.26	MHLNB202014	●
2	0/-0.015	1	0/-0.015	4	1.6	16	1.9	50	2	16.69	17.23	17.81	18.42	19.73	MHLNB202016	●
2	0/-0.015	1	0/-0.015	4	1.6	18	1.9	60	2	18.76	19.37	20.02	20.71	-	MHLNB202018	●
2	0/-0.015	1	0/-0.015	4	1.6	20	1.9	60	2	20.83	21.51	22.24	23	-	MHLNB202020	●
2	0/-0.015	1	0/-0.015	4	1.6	22	1.9	60	2	22.89	23.65	24.45	25.3	-	MHLNB202022	●
2	0/-0.015	1	0/-0.015	4	1.6	25	1.9	75	2	25.99	26.86	27.77	28.74	-	MHLNB202025	●
2	0/-0.015	1	0/-0.015	4	1.6	30	1.9	75	2	31.16	32.21	33.31	-	-	MHLNB202030	●
3	0/-0.020	1.5	0/-0.015	6	2.4	8	2.8	50	2	8.6	8.84	9.1	9.37	9.96	MHLNB203008	●
3	0/-0.020	1.5	0/-0.015	6	2.4	10	2.8	50	2	10.67	10.98	11.32	11.67	12.43	MHLNB203010	●
3	0/-0.020	1.5	0/-0.015	6	2.4	12	2.8	50	2	12.73	13.12	13.53	13.96	14.9	MHLNB203012	●
3	0/-0.020	1.5	0/-0.015	6	2.4	16	2.8	60	2	16.87	17.4	17.96	18.55	19.83	MHLNB203016	●
3	0/-0.020	1.5	0/-0.015	6	2.4	20	2.8	60	2	21	21.68	22.39	23.14	24.77	MHLNB203020	●
3	0/-0.020	1.5	0/-0.015	6	2.4	25	2.8	75	2	26.17	27.02	27.93	28.88	-	MHLNB203025	●
3	0/-0.020	1.5	0/-0.015	6	2.4	30	2.8	75	2	31.34	32.37	33.46	34.62	-	MHLNB203030	●
3	0/-0.020	1.5	0/-0.015	6	2.4	35	2.8	75	2	36.51	37.72	39	40.35	-	MHLNB203035	⊙
4	0/-0.020	2	0/-0.015	6	3.2	10	3.7	50	2	10.84	11.15	11.47	11.81	12.54	MHLNB204010	●
4	0/-0.020	2	0/-0.015	6	3.2	16	3.7	60	2	17.04	17.56	18.11	18.69	19.94	MHLNB204016	●
4	0/-0.020	2	0/-0.015	6	3.2	20	3.7	60	2	21.18	21.84	22.54	23.28	-	MHLNB204020	●
4	0/-0.020	2	0/-0.015	6	3.2	25	3.7	75	2	26.35	27.19	28.08	29.02	-	MHLNB204025	●
4	0/-0.020	2	0/-0.015	6	3.2	30	3.7	75	2	31.51	32.53	33.61	-	-	MHLNB204030	●
4	0/-0.020	2	0/-0.015	6	3.2	35	3.7	75	2	36.68	37.88	39.15	-	-	MHLNB204035	●
4	0/-0.020	2	0/-0.015	6	3.2	40	3.7	100	2	41.85	43.23	-	-	-	MHLNB204040	●
4	0/-0.020	2	0/-0.015	6	3.2	45	3.7	100	2	47.02	48.57	-	-	-	MHLNB204045	⊙

★ 1st choice, ☆ suitable, ● stock standard, ⊙ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

UH (<70HRC) and MH (30÷70HRC) Ball nose

MHLNB2

- Cylindrical shank
- 2 flutes ball nose
- Extended and reduced neck



P	M	K	N	S	H
★		★			★

OSAWA
NORM

MH

NMG
MH COAT

30÷70
HRC

FHA 30°

BALL NOSE

ZEFP 2 BALL

ROUND RIB

DC	DC tol.	RE	RE tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
4	0/-0.020	2	0/-0.015	6	3.2	50	3.7	100	2	52.19	53.92	-	-	-	MHLNB204050	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

MHLNB2

Material Group ISO 513				P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3
Hardness/Rm				≤45 HRC	45÷55 HRC	55÷60 HRC	60÷65 HRC
ap x ae				ap x D	ap x D	ap x D	ap x D
Vc (m/min)				80÷120	60÷100	50÷70	30÷50
DC (mm)	LU (mm)	ap (mm)	DC(eff.) (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
0.2	≤ 6D	0.01	0.09	0.008	0.007	0.006	0.006
	≤ 8D	0.01	0.08	0.007	0.006	0.005	0.005
	≤ 10D	0.01	0.07	0.006	0.005	0.004	0.004
0.3	≤ 6D	0.02	0.13	0.010	0.009	0.008	0.007
	≤ 8D	0.01	0.12	0.009	0.007	0.006	0.006
	≤ 10D	0.01	0.11	0.008	0.006	0.005	0.004
0.4	≤ 6D	0.02	0.17	0.013	0.012	0.010	0.009
	≤ 8D	0.02	0.16	0.012	0.009	0.008	0.007
	≤ 10D	0.01	0.15	0.010	0.007	0.007	0.006
0.5	≤ 6D	0.03	0.22	0.017	0.015	0.014	0.012
	≤ 8D	0.02	0.20	0.015	0.012	0.011	0.010
	≤ 10D	0.02	0.18	0.014	0.010	0.009	0.008
0.6	≤ 6D	0.03	0.26	0.021	0.019	0.017	0.015
	≤ 8D	0.03	0.24	0.019	0.015	0.014	0.012
	≤ 10D	0.02	0.22	0.017	0.012	0.011	0.009
0.8	≤ 6D	0.04	0.35	0.025	0.023	0.020	0.018
	≤ 8D	0.03	0.32	0.023	0.018	0.016	0.014
	≤ 10D	0.03	0.29	0.020	0.014	0.013	0.011
1	≤ 6D	0.05	0.44	0.030	0.027	0.024	0.021
	≤ 8D	0.04	0.40	0.027	0.022	0.019	0.017
	≤ 10D	0.04	0.37	0.024	0.017	0.015	0.013
	≤ 12D	0.03	0.33	0.021	0.013	0.012	0.010
1.2	>12D	0.02	0.30	0.018	0.010	0.009	0.008
	≤ 6D	0.06	0.52	0.035	0.032	0.028	0.025
	≤ 8D	0.05	0.48	0.032	0.026	0.023	0.020
	≤ 10D	0.04	0.44	0.028	0.020	0.018	0.016
1.5	≤ 12D	0.03	0.39	0.025	0.015	0.014	0.012
	>12D	0.03	0.36	0.021	0.011	0.010	0.009
	≤ 6D	0.08	0.65	0.045	0.041	0.036	0.032
	≤ 8D	0.06	0.61	0.041	0.033	0.029	0.026
2	≤ 10D	0.05	0.55	0.036	0.026	0.023	0.020
	≤ 12D	0.04	0.49	0.032	0.020	0.018	0.015
	>12D	0.03	0.44	0.027	0.015	0.013	0.011
	≤ 6D	0.10	0.87	0.060	0.054	0.048	0.042
2.5	≤ 8D	0.09	0.81	0.054	0.044	0.039	0.034
	≤ 10D	0.07	0.74	0.048	0.035	0.031	0.027
	≤ 12D	0.06	0.65	0.042	0.026	0.024	0.021
	>12D	0.05	0.59	0.036	0.019	0.017	0.015
3	≤ 6D	0.13	1.09	0.060	0.054	0.048	0.042
	≤ 8D	0.11	1.01	0.054	0.044	0.039	0.034
	≤ 10D	0.09	0.92	0.048	0.035	0.031	0.027
	≤ 12D	0.07	0.82	0.042	0.026	0.024	0.021
	>12D	0.06	0.74	0.036	0.019	0.017	0.015
	≤ 6D	0.15	1.31	0.075	0.068	0.060	0.053
	≤ 8D	0.13	1.21	0.068	0.055	0.049	0.043
	≤ 10D	0.11	1.10	0.060	0.043	0.038	0.034
	≤ 12D	0.08	0.98	0.053	0.033	0.029	0.026
	>12D	0.07	0.89	0.045	0.024	0.022	0.019



α	n (rpm)	Vf (mm/min)
45°	x 1.65	x 1.65
30°	x 1.30	x 1.30
15°	x 1.15	x 1.15

Cutting Parameters

MHLNB2

	Material Group ISO 513				P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3
	Hardness/Rm				≤45 HRC	45÷55 HRC	55÷60 HRC	60÷65 HRC
	ap x ae				ap x D	ap x D	ap x D	ap x D
	Vc (m/min)				80÷120	60÷100	50÷70	30÷50
	DC (mm)	LU (mm)	ap (mm)	DC(eff.) (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	4	≤ 6D	0.20	1.74	0.095	0.086	0.076	0.067
		≤ 8D	0.17	1.61	0.086	0.069	0.062	0.054
		≤ 10D	0.14	1.47	0.076	0.055	0.049	0.043
		≤ 12D	0.11	1.31	0.067	0.042	0.037	0.033
		>12D	0.09	1.19	0.057	0.031	0.027	0.024

	α	n (rpm)	Vf (mm/min)
	45°	x 1.65	x 1.65
	30°	x 1.30	x 1.30
	15°	x 1.15	x 1.15

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

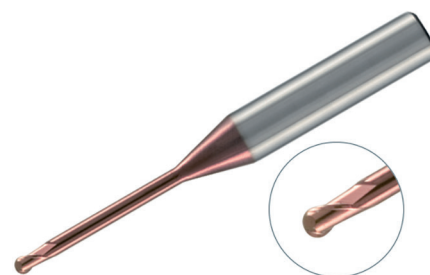
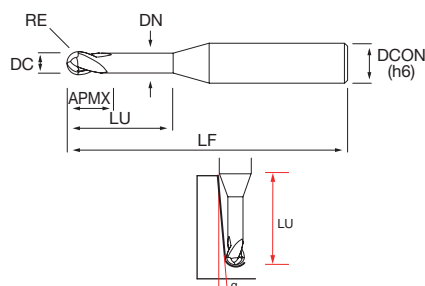
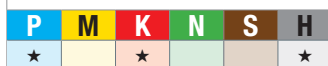
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

MHCRB2

- Cylindrical shank
- 2 flutes ball nose
- Extended and reduced neck
- 6 mm. shank



DC	DC tol.	RE	RE tol.	DCON	APMX	LU	DN	LF	ZEFP	LU α=30°	LU α=1°	LU α=1°30'	LU α=2°	LU α=3°	EDP no.	Stock
0.5	0/-0.012	0.25	±0.005	6	0.5	2	0.45	50	2	2.15	2.22	2.29	2.36	2.52	MHCRB20050206	○
0.5	0/-0.012	0.25	±0.005	6	0.5	4	0.45	50	2	4.22	4.35	4.5	4.65	4.98	MHCRB20050406	●
0.6	0/-0.012	0.3	±0.005	6	0.5	2	0.55	50	2	2.15	2.21	2.28	2.35	2.5	MHCRB20060206	●
0.6	0/-0.012	0.3	±0.005	6	0.5	4	0.55	50	2	4.22	4.35	4.49	4.65	4.97	MHCRB20060406	●
0.6	0/-0.012	0.3	±0.005	6	0.5	6	0.55	50	2	6.28	6.49	6.71	6.94	7.44	MHCRB20060606	●
0.8	0/-0.012	0.4	±0.005	6	0.8	2	0.75	50	2	2.15	2.21	2.27	2.34	2.48	MHCRB20080206	●
0.8	0/-0.012	0.4	±0.005	6	0.8	4	0.75	50	2	4.21	4.34	4.48	4.63	4.95	MHCRB20080406	●
0.8	0/-0.012	0.4	±0.005	6	0.8	6	0.75	50	2	6.28	6.48	6.7	6.93	7.42	MHCRB20080606	●
1	0/-0.012	0.5	±0.005	6	1	3	0.9	50	2	3.27	3.37	3.47	3.57	3.8	MHCRB20100306	●
1	0/-0.012	0.5	±0.005	6	1	6	0.9	50	2	6.37	6.58	6.79	7.02	7.5	MHCRB20100606	●
1	0/-0.012	0.5	±0.005	6	1	8	0.9	50	2	8.44	8.71	9	9.31	9.97	MHCRB20100806	●
1	0/-0.012	0.5	±0.005	6	1	10	0.9	50	2	10.51	10.85	11.22	11.61	12.44	MHCRB20101006	●
1.2	0/-0.012	0.6	±0.005	6	1.2	6	1.1	50	2	6.37	6.57	6.78	7	7.48	MHCRB20120606	●
1.2	0/-0.012	0.6	±0.005	6	1.2	8	1.1	50	2	8.44	8.71	8.99	9.3	9.95	MHCRB20120806	●
1.2	0/-0.012	0.6	±0.005	6	1.2	10	1.1	50	2	10.5	10.85	11.21	11.59	12.42	MHCRB20121006	●
1.5	0/-0.012	0.75	±0.005	6	1.5	4	1.4	50	2	4.3	4.42	4.55	4.68	4.98	MHCRB20150406	●
1.5	0/-0.012	0.75	±0.005	6	1.5	8	1.4	50	2	8.43	8.7	8.98	9.27	9.91	MHCRB20150806	●
1.5	0/-0.012	0.75	±0.005	6	1.5	10	1.4	50	2	10.5	10.84	11.19	11.57	12.38	MHCRB20151006	●
1.5	0/-0.012	0.75	±0.005	6	1.5	12	1.4	50	2	12.57	12.97	13.41	13.86	14.85	MHCRB20151206	●
1.5	0/-0.012	0.75	±0.005	6	1.5	16	1.4	50	2	16.7	17.25	17.84	18.45	19.78	MHCRB20151606	●
2	0/-0.012	1	±0.005	6	3	6	1.9	50	2	6.36	6.54	6.74	6.94	7.39	MHCRB20200606	●
2	0/-0.012	1	±0.005	6	3	8	1.9	50	2	8.42	8.68	8.95	9.24	9.86	MHCRB20200806	●
2	0/-0.012	1	±0.005	6	3	10	1.9	50	2	10.49	10.82	11.17	11.53	12.32	MHCRB20201006	●
2	0/-0.012	1	±0.005	6	3	12	1.9	50	2	12.56	12.96	13.38	13.83	14.79	MHCRB20201206	●
2	0/-0.012	1	±0.005	6	3	16	1.9	50	2	16.69	17.23	17.81	18.42	19.73	MHCRB20201606	●
2	0/-0.012	1	±0.005	6	3	20	1.9	50	2	20.83	21.51	22.24	23	24.66	MHCRB20202006	●

★ 1st choice, ☆ suitable, ● stock standard, ○ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

MHCRB2

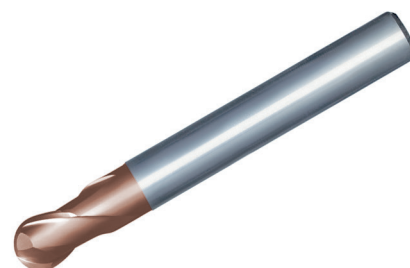
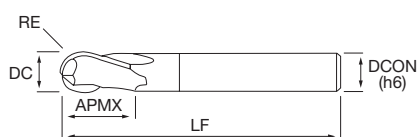
Material Group ISO 513				P3	P4	P5	K2	K3	P6	K4	H1	H4	H5	H2	H3		
Hardness/Rm				≤45 HRC					45÷55 HRC					55÷60 HRC		60÷65 HRC	
ap x ae				ap x 0.2D					ap x 0.2D					ap x 0.2D		ap x 0.2D	
Vc (m/min)				140÷160					110÷130					80÷100		50÷70	
DC (mm)	LU (mm)	ap (mm)	DC(eff.) (mm)	fz (mm/z)					fz (mm/z)					fz (mm/z)		fz (mm/z)	
0.5	≤ 6D	0.03	0.22	0.020					0.018					0.016		0.014	
	≤ 8D	0.02	0.20	0.018					0.015					0.013		0.011	
	≤ 10D	0.02	0.18	0.016					0.012					0.010		0.009	
0.6	≤ 6D	0.03	0.26	0.022					0.020					0.018		0.015	
	≤ 8D	0.03	0.24	0.020					0.016					0.014		0.012	
	≤ 10D	0.02	0.22	0.018					0.013					0.011		0.010	
0.8	≤ 6D	0.04	0.35	0.025					0.023					0.020		0.018	
	≤ 8D	0.03	0.32	0.023					0.018					0.016		0.014	
	≤ 10D	0.03	0.29	0.020					0.014					0.013		0.011	
1	≤ 6D	0.05	0.44	0.030					0.027					0.024		0.021	
	≤ 8D	0.04	0.40	0.027					0.022					0.019		0.017	
	≤ 10D	0.04	0.37	0.024					0.017					0.015		0.013	
	≤ 12D	0.03	0.33	0.021					0.013					0.012		0.010	
	>12D	0.02	0.30	0.018					0.010					0.009		0.008	
	≤ 6D	0.06	0.52	0.035					0.032					0.028		0.025	
1.2	≤ 8D	0.05	0.48	0.032					0.026					0.023		0.020	
	≤ 10D	0.04	0.44	0.028					0.020					0.018		0.016	
	≤ 12D	0.03	0.39	0.025					0.015					0.014		0.012	
	>12D	0.03	0.36	0.021					0.011					0.010		0.009	
	≤ 6D	0.08	0.65	0.045					0.041					0.036		0.032	
	≤ 8D	0.06	0.61	0.041					0.033					0.029		0.026	
1.5	≤ 10D	0.05	0.55	0.036					0.026					0.023		0.020	
	≤ 12D	0.04	0.49	0.032					0.020					0.018		0.015	
	>12D	0.03	0.44	0.027					0.015					0.013		0.011	
2	≤ 6D	0.10	0.87	0.060					0.054					0.048		0.042	
	≤ 8D	0.09	0.81	0.054					0.044					0.039		0.034	
	≤ 10D	0.07	0.74	0.048					0.035					0.031		0.027	
	≤ 12D	0.06	0.65	0.042					0.026					0.024		0.021	
	>12D	0.05	0.59	0.036					0.019					0.017		0.015	



α	n (rpm)	Vf (mm/min)
45°	x 1.65	x 1.65
30°	x 1.30	x 1.30
15°	x 1.15	x 1.15

UHCSB2

- Cylindrical shank
- 2 flutes ball nose



P	M	K	N	S	H
☆		☆			★

OSAWA
NORM

UH

NMG
UH RED

<70
HRC

FHA 30°

BALL NOSE

ZEFP 2 BALL

COPYING

DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
1	0/-0.012	0.5	0/-0.010	6	h6	1.5	40	2	UHCSB2010	●
1.5	0/-0.012	0.75	0/-0.010	6	h6	2.5	40	2	UHCSB2015	●
2	0/-0.012	1	0/-0.010	6	h6	3	40	2	UHCSB2020	●
2.5	0/-0.012	1.25	0/-0.010	6	h6	3	50	2	UHCSB2025	●
3	0/-0.012	1.5	0/-0.010	6	h6	4.5	50	2	UHCSB2030	●
4	0/-0.012	2	0/-0.010	6	h6	6	50	2	UHCSB2040	●
5	0/-0.012	2.5	0/-0.010	6	h6	7.5	50	2	UHCSB2050	●
6	0/-0.015	3	0/-0.010	6	h6	9	50	2	UHCSB2060	●
8	0/-0.015	4	0/-0.010	8	h6	12	50	2	UHCSB2080	●
10	0/-0.015	5	0/-0.010	10	h6	15	60	2	UHCSB2100	●
12	0/-0.015	6	0/-0.010	12	h6	18	60	2	UHCSB2120	●
14	0/-0.020	7	0/-0.020	14	h6	32	90	2	UHCSB2140	●
16	0/-0.020	8	0/-0.020	16	h6	32	90	2	UHCSB2160	●
18	0/-0.020	9	0/-0.020	18	h6	38	100	2	UHCSB2180	●
20	0/-0.020	10	0/-0.020	20	h6	38	100	2	UHCSB2200	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

Cutting Parameters

UHCSB2

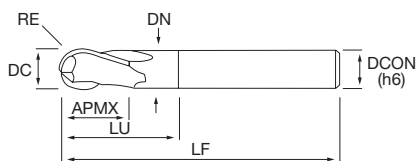
 COPPING	Material Group ISO 513		P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3
	Hardness/Rm		≤45 HRC	45÷55 HRC	55÷60 HRC	60÷65 HRC
	ap x ae		0.05D x 0.2D	0.05D x 0.2D	0.05D x 0.2D	0.05D x 0.2D
	Vc (m/min)		140÷180	100÷140	80÷100	60÷80
	DC (mm)	ap (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
1		0.44	0.009	0.008	0.007	0.006
1.5		0.79	0.012	0.011	0.010	0.008
2		1.20	0.012	0.011	0.010	0.008
2.5		1.65	0.015	0.014	0.012	0.011
3		2.14	0.018	0.016	0.014	0.013
4		3.20	0.025	0.023	0.020	0.018
5		4.33	0.032	0.029	0.026	0.022
6		5.50	0.038	0.034	0.030	0.027
8		7.84	0.048	0.043	0.038	0.034
10		10.00	0.057	0.051	0.046	0.040
12		11.76	0.067	0.060	0.054	0.047
14		12.83	0.080	0.072	0.064	0.056
16		12.80	0.095	0.086	0.076	0.067
18		10.80	0.108	0.097	0.086	0.076
20		12.00	0.108	0.097	0.086	0.076

 α	α	n (rpm)	Vf (mm/min)
	15°	x 1.1	x 1.1

UH (<70HRC) and MH (30÷70HRC) Ball nose

UH250

- Cylindrical shank
- 2 flutes ball nose
- Long reach



P	M	K	N	S	H
☆		☆			★

OSAWA
NORM

UH

NMG
UH RED

<70
HRC

FHA 30°

BALL NOSE

ZEFP 2 BALL

COPYING

DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LU	DN	LF	ZEFP	EDP no.	Stock
1	0/-0.012	0.5	0/-0.010	4	h6	1	2.2	0.95	50	2	UH250010	●
1.5	0/-0.012	0.75	0/-0.010	4	h6	1.5	3	1.45	50	2	UH250015	●
2	0/-0.012	1	0/-0.010	6	h6	2	4	1.95	50	2	UH250020	●
2.5	0/-0.020	1.25	0/-0.015	6	h6	4	10	2.4	50	2	UH250025	●
3	0/-0.012	1.5	0/-0.010	6	h6	3	6	2.85	60	2	UH250030	●
4	0/-0.012	2	0/-0.010	6	h6	4	8	3.85	70	2	UH250040	●
5	0/-0.012	2.5	0/-0.010	6	h6	5	10	4.85	80	2	UH250050	●
6	0/-0.015	3	0/-0.010	6	h6	6	12	5.85	90	2	UH250060	●
8	0/-0.015	4	0/-0.010	8	h6	8	16	7.7	100	2	UH250080	●
10	0/-0.015	5	0/-0.010	10	h6	10	20	9.7	100	2	UH250100	●
12	0/-0.015	6	0/-0.010	12	h6	12	24	11.7	110	2	UH250120	●
14	0/-0.020	7	0/-0.020	14	h6	32	80	13	125	2	UH250140	◎
16	0/-0.020	8	0/-0.020	16	h6	32	80	15	125	2	UH250160	●
18	0/-0.020	9	0/-0.020	18	h6	38	80	17	125	2	UH250180	●
20	0/-0.020	10	0/-0.020	20	h6	38	80	19	125	2	UH250200	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

Cutting Parameters

UH250

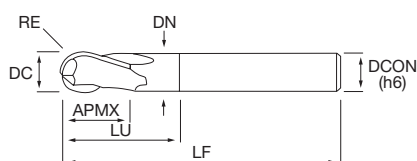
	Material Group ISO 513		P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3
	Hardness/Rm		≤45 HRC	45÷55 HRC	55÷60 HRC	60÷65 HRC
	ap x ae		0.05D x 0.2D	0.05D x 0.2D	0.05D x 0.2D	0.05D x 0.2D
	Vc (m/min)		120÷160	100÷130	70÷90	50÷70
	DC (mm)	ap (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.44	0.015	0.014	0.012	0.011
	2	0.87	0.021	0.019	0.017	0.015
	3	1.31	0.027	0.024	0.022	0.019
	4	1.74	0.037	0.033	0.029	0.026
	5	2.18	0.045	0.041	0.036	0.032
	6	2.62	0.051	0.046	0.041	0.036
	8	3.49	0.060	0.054	0.048	0.042
	10	4.36	0.068	0.061	0.054	0.048
	12	5.23	0.077	0.069	0.061	0.054
	14	6.10	0.089	0.080	0.071	0.062
	16	6.97	0.102	0.092	0.082	0.071
	18	7.85	0.115	0.103	0.092	0.080
	20	8.72	0.132	0.119	0.106	0.092

	α	n (rpm)	Vf (mm/min)
	30°	x 0.8	x 0.8
	15°	x 0.7	x 0.7
	0°	x 0.6	x 0.6

UH (<70HRC) and MH (30÷70HRC) Ball nose

UH253

- Cylindrical shank
- 2 flutes ball nose
- Extra-long reach



P	M	K	N	S	H
☆		☆			★



DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LU	DN	LF	ZEFP	EDP no.	Stock
1	0/-0.020	0.5	0/-0.010	6	h6	3	7	0.9	75	2	UH25301075	●
1	0/-0.020	0.5	0/-0.010	6	h6	3	10	0.9	100	2	UH253010100	●
1.5	0/-0.020	0.75	0/-0.010	6	h6	3	10	1.4	75	2	UH25301575	●
1.5	0/-0.020	0.75	0/-0.010	6	h6	3	15	1.4	100	2	UH253015100	●
2	0/-0.020	1	0/-0.010	6	h6	4	14	1.9	75	2	UH25302075	●
2	0/-0.020	1	0/-0.010	6	h6	4	20	1.9	100	2	UH253020100	●
2.5	0/-0.020	1.25	0/-0.015	6	h6	4	18	2.4	75	2	UH25302575	●
3	0/-0.025	1.5	0/-0.015	6	h6	5	21	2.8	75	2	UH25303075	●
3	0/-0.025	1.5	0/-0.015	6	h6	5	30	2.8	100	2	UH253030100	●
4	0/-0.025	2	0/-0.015	6	h6	8	28	3.7	75	2	UH25304075	●
4	0/-0.025	2	0/-0.015	6	h6	8	40	3.7	100	2	UH253040100	◎
5	0/-0.025	2.5	0/-0.015	6	h6	9	50	4.6	100	2	UH253050100	●
6	0/-0.025	3	0/-0.015	6	h6	10	60	5.5	100	2	UH253060100	●
6	0/-0.025	3	0/-0.015	6	h6	10	60	5.5	150	2	UH253060150	●
8	0/-0.030	4	0/-0.015	8	h6	12	60	7.4	100	2	UH253080100	●
8	0/-0.030	4	0/-0.015	8	h6	12	80	7.4	150	2	UH253080150	●
10	0/-0.035	5	0/-0.020	10	h6	14	85	9.2	125	2	UH253100125	●
10	0/-0.035	5	0/-0.020	10	h6	14	100	9.2	150	2	UH253100150	●
12	0/-0.035	6	0/-0.020	12	h6	16	85	11	125	2	UH253120125	●
12	0/-0.035	6	0/-0.020	12	h6	16	110	11	150	2	UH253120150	●
14	0/-0.035	7	0/-0.020	14	h6	32	110	13	150	2	UH253140150	▽
14	0/-0.035	7	0/-0.020	14	h6	32	150	13	200	2	UH253140200	▽
16	0/-0.035	8	0/-0.020	16	h6	32	110	15	150	2	UH253160150	▽
16	0/-0.035	8	0/-0.020	16	h6	32	150	15	200	2	UH253160200	▽
20	0/-0.035	10	0/-0.020	20	h6	38	110	19	150	2	UH253200150	▽
20	0/-0.035	10	0/-0.020	20	h6	38	150	19	200	2	UH253200200	▽

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

Cutting Parameters

UH253

	Material Group ISO 513		P3 P4 P5 K2 K3	P6 K4 H1 H4 H5	H2	H3
	Hardness/Rm		≤45 HRC	45÷55 HRC	55÷60 HRC	60÷65 HRC
	ap x ae		0.05D x 0.2D	0.05D x 0.2D	0.05D x 0.2D	0.05D x 0.2D
	Vc (m/min)		110÷150	80÷120	50÷90	40÷60
	DC (mm)	ap (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.44	0.015	0.014	0.012	0.011
	2	0.87	0.021	0.019	0.017	0.015
	3	1.31	0.027	0.024	0.022	0.019
	4	1.74	0.037	0.033	0.029	0.026
	5	2.18	0.045	0.041	0.036	0.032
	6	2.62	0.051	0.046	0.041	0.036
	8	3.49	0.060	0.054	0.048	0.042
	10	4.36	0.068	0.061	0.054	0.048
	12	5.23	0.077	0.069	0.061	0.054
	14	6.10	0.089	0.080	0.071	0.062
	16	6.97	0.102	0.092	0.082	0.071
	18	7.85	0.115	0.103	0.092	0.080
	20	8.72	0.132	0.119	0.106	0.092

α	n (rpm)	Vf (mm/min)
30°	x 0.8	x 0.8
15°	x 0.7	x 0.7
0°	x 0.6	x 0.6

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

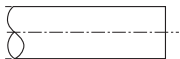


HSS END MILLS

Caption	.K2
Selection Guide	.K6
2 Flutes	.K12
2 Flutes Alu	.K19
3 Flutes	.K21
3 Flutes 50° Helix	.K27
4-6 Flutes	.K29
Roughing NR - HR	.K38
2 Flutes Ball Nose	.K43
Shell Mills	.K48
Corner Rounding	.K52
Dovetail Cutters	.K54
T-Slot	.K58
Woodruff	.K60

STOCK *		
●	 stock standard  stock standard	 Standard Lager  stock standard
⊙	 non-stock standard (no MOQ)  non-standard stock (no MOQ)	 Nicht-Lager-Standard (keine MOQ / Mindestbestellmenge)  non-standard stock (aucun MOQ/commande minimale)
○	 non-stock standard (MOQ)  non-standard stock (MOQ)	 Nicht-Lager-Standard (keine MOQ / Mindestbestellmenge)  non-standard stock (aucun MOQ/commande minimale)
▲	 upcoming product  prossima introduzione	 kommende Produkt  prochaine introduction
▽	 stock exhaustion  esaurimento stock	 Vorraterschöpfung  épuisement du stock

 APPLICATION GUIDELINES  INDICAZIONI PER L'APPLICAZIONE  LEITFADEN ZUR ANWENDUNG  INDICATIONS POUR L'APPLICATION		
★	 1st choice  1a scelta	 1. Wahl  1er choix
☆	 suitable  adatto	 geeignet  adapté

 SHANK  ATTACCO  SCHAF  QUEUET		
	 cylindrical shank  attacco cilindrico	 zylindrischer Schaft  queue cylindrique
	Weldon	

 MILLING STRATEGY  STRATEGIA DI FRESATURA  FRÄSSTRATEGIE  STRATÉGIES DE FRAISAGE		
	 slotting  fresatura di cave	 Nutfräsen  rainurage
	 side milling  contornatura	 Konturfräsen  contournage
	 copying  copiatura	 Kopieren  copiage
	 drilling  foratura	 Bohren  perçage
	 rounding  raggiatura concava	 Konkavradius  rayon concave
	dovetail A	

*  The stock category of items in this catalogue may change without prior notice
 La categoria di stock dei prodotti a catalogo può variare senza preavviso

 La catégorie de stock des articles dans ce catalogue peut être modifiée sans préavis.
 Die Einstufung der Produkte kann sich jederzeit ändern

✚ MILLING STRATEGY 🇮🇹 STRATEGIA DI FRESATURA 🇩🇪 FRÄSSTRATEGIE 🇫🇷 STRATÉGIES DE FRAISAGE			
	dovetail B		
	✚ T slot 🇮🇹 cave a T	🇩🇪 T Nut 🇫🇷 rainure en T	
	Woodruff		
✚ GEOMETRY 🇮🇹 GEOMETRIA 🇩🇪 GEOMETRIE 🇫🇷 GÉOMÉTRIE			
	✚ general purpose 🇮🇹 uso generico	🇩🇪 allgemeine Anwendung 🇫🇷 applications génériques	
	✚ for aluminium 🇮🇹 per alluminio	🇩🇪 für Aluminium 🇫🇷 pour aluminium	
✚ TYPE 🇮🇹 TIPO 🇩🇪 TYP 🇫🇷 TYPE			
	✚ sharp corner 🇮🇹 spigolo vivo	🇩🇪 scharfe Kante 🇫🇷 arête vive	
	✚ ball nose 🇮🇹 raggiata	🇩🇪 runder Stirn 🇫🇷 bout hémisphérique	
✚ NR. OF FLUTES 🇮🇹 N. DI TAGLIENTI 🇩🇪 ANZAHL DER SCHNEIDEN 🇫🇷 NOMBRE DE DENTS			
	✚ 2 flutes 🇮🇹 2 taglienti	🇩🇪 2 Schneiden 🇫🇷 2 arêtes de coupe	
	✚ 3 flutes 🇮🇹 3 taglienti	🇩🇪 3 Schneiden 🇫🇷 3 arêtes de coupe	
	✚ 4 flutes 🇮🇹 4 taglienti	🇩🇪 4 Schneiden 🇫🇷 4 arêtes de coupe	
	✚ 6 flutes 🇮🇹 6 taglienti	🇩🇪 6 Schneiden 🇫🇷 6 arêtes de coupe	
	✚ >6 flutes 🇮🇹 >6 taglienti	🇩🇪 >6 Schneiden 🇫🇷 >6 arêtes de coupe	
✚ CHIPBREAKER STYLE 🇮🇹 TIPO DI ROMPITRUCIOLO 🇫🇷 TYPE DE BRISE-COPEAUX 🇩🇪 SPÄNEBRECHER TYP			
	✚ roughing coarse pitch 🇮🇹 sgrossare passo grosso	🇩🇪 Schrappfräser Regelgewinde 🇫🇷 ébauche pas gros	

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

✚ CHIPBREAKER STYLE ✚ TIPO DI ROMPITRUCIOLO ✚ TYPE DE BRISE-COPEAUX ✚ SPÄNEBRECHER TYP


 ✚ roughing fine pitch
 ✚ sgrossare passo fine

 ✚ Schruppfräser Feingewinde
 ✚ ébauche pas fin

✚ MATERIAL ✚ MATERIALE ✚ WERKSTOFF ✚ MATIÈRE


 ✚ high speed steel 5%÷8% Co
 ✚ acciaio super rapido 5%÷8% Co

 ✚ Hochleistungsschnellschnittstahl 5%÷8% Co
 ✚ acier rapide 5%÷8% Co

✚ SURFACE TREATMENT ✚ TRATTAMENTO SUPERFICIALE ✚ OBERFLÄCHENBEHANDLUNG ✚ TRAITMENT DE SURFACE


 ✚ uncoated
 ✚ non rivestito

 ✚ unbeschichtet
 ✚ non revêtu

✚ COATINGS ✚ RIVESTIMENTI ✚ BESCHICHTUNGEN ✚ REVÊTEMENTS

						
✚ hardness (HV) ✚ durezza (HV)	✚ Härte (HV) ✚ durezza (HV)					3300
✚ friction coefficient ✚ coefficiente d'attrito	✚ Reibungskoeffizient ✚ coefficient de frottement					0.3
✚ thickness (μ) ✚ spessore (μ)	✚ dicke (μ) ✚ épaisseur (μ)					3
✚ max working temperature (°C) ✚ temperatura max (°C)	✚ höchste Temperatur (°C) ✚ température maximale (°C)					950

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

	ITEM NO.	PAGE	
HSS/Co - general purpose, square	WS2	K12	
	TAWS2	K13	
	WL2	K16	
	TAWL2	K17	
	WSA2	K19	
	WS3	K21	
	TAWS3	K22	
	WL3	K24	
	TAWL3	K25	
	TAWSH3	K27	
	WS4(6)	K29	
	TAWS4(6)	K30	
	WL4(6)	K32	
	TAWL4(6)	K33	
HSS/Co - general purpose, roughing	TAWSR	K35	
	WSFR	K37	
	TAWSFR	K38	
	WLFR	K40	
	TAWLFR	K41	
HSS/Co general purpose, ball nose	WSB2	K43	
	TAWSB2	K44	
	WLB2	K46	
HSS/Co general purpose, shell	FM	K48	
	FFR	K50	

RANGE	NORM	TYPE	MATERIAL / COATING	HELIX ANGLE	GEOMETRY	Z	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H
1-30	DIN 327	N	HSS/Co BR	30°	SQUARE	2	★	☆	★	☆		
1-25	DIN 327	N	HSS/Co PV200	30°	SQUARE	2	★	☆	★	☆		
3-30	DIN 844	N	HSS/Co BR	30°	SQUARE	2	★	☆	★	☆		
3-20	DIN 844	N	HSS/Co PV200	30°	SQUARE	2	★	☆	★	☆		
2-20	DIN 844	ALU	HSS/Co BR	42°	SQUARE	2				★		
1-32	DIN 844	N	HSS/Co BR	30°	SQUARE	3	★	☆	★	☆		
2-25	DIN 844	N	HSS/Co PV200	30°	SQUARE	3	★	☆	★	☆		
3-25	DIN 844	N	HSS/Co BR	30°	SQUARE	3	★	☆	★	☆		
3-20	DIN 844	N	HSS/Co PV200	30°	SQUARE	3	★	☆	★	☆		
6-20	DIN 844	N	HSS/Co PV200	45°	SQUARE	3	★	☆	★	☆		
2-30	DIN 844	N	HSS/Co BR	30°	SQUARE	4-6	★	☆	★	☆		
2-40	DIN 844	N	HSS/Co PV200	30°	SQUARE	4-6	★	☆	★	☆		
3-25	DIN 844	N	HSS/Co BR	30°	SQUARE	4-6	★	☆	★	☆		
3-40	DIN 844	N	HSS/Co PV200	30°	SQUARE	4-6	★	☆	★	☆		
6-20	DIN 844	N - NR	HSS/Co PV200	30°	SQUARE	3-4	★	☆	★	☆		
6-20	DIN 844	N - HR	HSS/Co BR	30°	SQUARE	3-4	★	☆	★	☆		
6-40	DIN 844	N - HR	HSS/Co PV200	30°	SQUARE	3-6	★	☆	★	☆		
6-20	DIN 844	N - HR	HSS/Co BR	30°	SQUARE	3-4	★	☆	★	☆		
6-40	DIN 844	N - HR	HSS/Co PV200	30°	SQUARE	3-6	★	☆	★	☆		
2-25	DIN 327	N	HSS/Co BR	30°	BALL NOSE	2	★	☆	★	☆		
3-20	DIN 327	N	HSS/Co PV200	30°	BALL NOSE	2	★	☆	★	☆		
3-20	DIN 1889	N	HSS/Co BR	30°	BALL NOSE	2	★	☆	★	☆		
40-63	DIN 1880	N	HSS/Co BR	30°	SQUARE	8-10	★	☆	★	☆		
40-63	DIN 1880	N - HR	HSS/Co BR	30°	SQUARE	6-10	★	☆	★	☆		

★ 1st choice ☆ suitable

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

	ITEM NO.	PAGE	
HSS/Co general purpose, corner rounding	WCR	K54	
HSS/Co general purpose, dovetail	WDC	K56	
	WDD	K58	
HSS/Co general purpose, T-slot	WTM	K60	
HSS/Co general purpose, woodruff	WWK	K62	

SELECTION GUIDE

RANGE	NORM	TYPE	MATERIAL / COATING	HELIX ANGLE	GEOMETRY	Z	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H
R1-R11	DIN 6518	N	HSS/Co BR	0°	RADIUS	4	★	☆	★	☆		
16-38	DIN 1833	N	HSS/Co BR	45°-60°	SQUARE	6-12	★	☆	★	☆		
16-38	DIN 1833	N	HSS/Co BR	45°-60°	SQUARE	6-12	★	☆	★	☆		
12.5-36	DIN 851	N	HSS/Co BR	15°	SQUARE	6-8	★	☆	★	☆		
10.5-32.5	DIN850	N	HSS/Co BR	10°	SQUARE	8-12	★	☆	★	☆		

★ 1st choice ☆ suitable

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS



HSS/Co

GENERAL PURPOSE

🇬🇧 The Osawa catalogue includes a wide range of HSS/Co end mills both coated and uncoated.

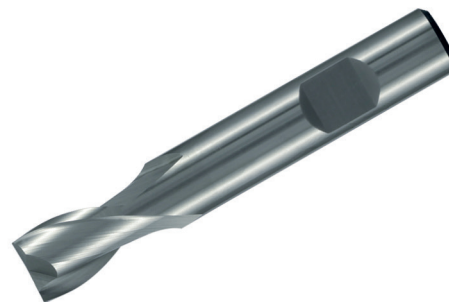
🇮🇹 Il catalogo Osawa include un'ampia scelta di frese in HSS/Co nudo e rivestito.

🇩🇪 Der Osawa Katalog umfasst eine große Auswahl an beschichteten und unbeschichteten Fräsern aus HSS/Co.

🇫🇷 Le catalogue Osawa inclut une large gamme de fraises en HSS/Co soit revêtues soit non revêtues.

WS2

- Weldon shank
- 2 flutes

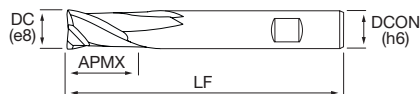


DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
1	-0.014/-0.028	6	h6	2.5	47	2	WS2010	●
1.5	-0.014/-0.028	6	h6	3	47	2	WS2015	●
2	-0.014/-0.028	6	h6	4	48	2	WS2020	●
2.5	-0.014/-0.028	6	h6	5	49	2	WS2025	●
3	-0.014/-0.028	6	h6	5	49	2	WS2030	●
3.5	-0.020/-0.038	6	h6	6	50	2	WS2035	●
4	-0.020/-0.038	6	h6	7	51	2	WS2040	●
4.5	-0.020/-0.038	6	h6	7	51	2	WS2045	●
5	-0.020/-0.038	6	h6	8	52	2	WS2050	●
5.5	-0.020/-0.038	6	h6	8	52	2	WS2055	●
6	-0.020/-0.038	6	h6	8	52	2	WS2060	●
6.5	-0.025/-0.047	10	h6	10	60	2	WS2065	●
7	-0.025/-0.047	10	h6	10	60	2	WS2070	●
7.5	-0.025/-0.047	10	h6	10	60	2	WS2075	●
8	-0.025/-0.047	10	h6	11	61	2	WS2080	●
8.5	-0.025/-0.047	10	h6	11	61	2	WS2085	●
9	-0.025/-0.047	10	h6	11	61	2	WS2090	●
9.5	-0.025/-0.047	10	h6	11	61	2	WS2095	●
10	-0.025/-0.047	10	h6	13	63	2	WS2100	●
10.5	-0.032/-0.059	12	h6	13	70	2	WS2105	●
11	-0.032/-0.059	12	h6	13	70	2	WS2110	●
11.5	-0.032/-0.059	12	h6	13	70	2	WS2115	●
12	-0.032/-0.059	12	h6	16	73	2	WS2120	●
12.5	-0.032/-0.059	12	h6	16	73	2	WS2125	●
13	-0.032/-0.059	12	h6	16	73	2	WS2130	●
13.5	-0.032/-0.059	12	h6	16	73	2	WS2135	●
14	-0.032/-0.059	12	h6	16	73	2	WS2140	●
15	-0.032/-0.059	12	h6	16	73	2	WS2150	●
16	-0.032/-0.059	16	h6	19	79	2	WS2160	●
17	-0.032/-0.059	16	h6	19	79	2	WS2170	●
18	-0.032/-0.059	16	h6	19	79	2	WS2180	●
19	-0.040/-0.073	16	h6	19	79	2	WS2190	●
20	-0.040/-0.073	20	h6	22	88	2	WS2200	●
22	-0.040/-0.073	20	h6	22	88	2	WS2220	●
24	-0.040/-0.073	25	h6	26	102	2	WS2240	●
25	-0.040/-0.073	25	h6	26	102	2	WS2250	●
26	-0.040/-0.073	25	h6	26	102	2	WS2260	●
28	-0.040/-0.073	25	h6	26	102	2	WS2280	●
30	-0.040/-0.073	25	h6	26	102	2	WS2300	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

TAWS2

- Weldon shank
- 2 flutes



DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
1	-0.014/-0.028	6	h6	2.5	47	2	TAWS2010	●
1.5	-0.014/-0.028	6	h6	3	47	2	TAWS2015	●
2	-0.014/-0.028	6	h6	4	48	2	TAWS2020	●
2.5	-0.014/-0.028	6	h6	5	49	2	TAWS2025	●
3	-0.014/-0.028	6	h6	5	49	2	TAWS2030	●
3.5	-0.020/-0.038	6	h6	6	50	2	TAWS2035	●
4	-0.020/-0.038	6	h6	7	51	2	TAWS2040	●
4.5	-0.020/-0.038	6	h6	7	51	2	TAWS2045	●
5	-0.020/-0.038	6	h6	8	52	2	TAWS2050	●
5.5	-0.020/-0.038	6	h6	8	52	2	TAWS2055	●
6	-0.020/-0.038	6	h6	8	52	2	TAWS2060	●
6.5	-0.025/-0.047	10	h6	10	60	2	TAWS2065	●
7	-0.025/-0.047	10	h6	10	60	2	TAWS2070	●
7.5	-0.025/-0.047	10	h6	10	60	2	TAWS2075	●
8	-0.025/-0.047	10	h6	11	61	2	TAWS2080	●
8.5	-0.025/-0.047	10	h6	11	61	2	TAWS2085	●
9	-0.025/-0.047	10	h6	11	61	2	TAWS2090	●
9.5	-0.025/-0.047	10	h6	11	61	2	TAWS2095	●
10	-0.025/-0.047	10	h6	13	63	2	TAWS2100	●
10.5	-0.032/-0.059	12	h6	13	70	2	TAWS2105	●
11	-0.032/-0.059	12	h6	13	70	2	TAWS2110	●
11.5	-0.032/-0.059	12	h6	13	70	2	TAWS2115	●
12	-0.032/-0.059	12	h6	16	73	2	TAWS2120	●
12.5	-0.032/-0.059	12	h6	16	73	2	TAWS2125	●
13	-0.032/-0.059	12	h6	16	73	2	TAWS2130	●
13.5	-0.032/-0.059	12	h6	16	73	2	TAWS2135	●
14	-0.032/-0.059	12	h6	16	73	2	TAWS2140	●
15	-0.032/-0.059	12	h6	16	73	2	TAWS2150	●
16	-0.032/-0.059	16	h6	19	79	2	TAWS2160	●
17	-0.032/-0.059	16	h6	19	79	2	TAWS2170	●
18	-0.032/-0.059	16	h6	19	79	2	TAWS2180	●
19	-0.040/-0.073	16	h6	19	79	2	TAWS2190	●
20	-0.040/-0.073	20	h6	22	88	2	TAWS2200	●
22	-0.040/-0.073	20	h6	22	88	2	TAWS2220	●
25	-0.040/-0.073	25	h6	26	102	2	TAWS2250	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

Cutting Parameters

TAWS2 WS2 (VC = -20% ÷ -30%)

	Material Group ISO 513	P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
	Hardness/Rm	≤45 HRC	45÷55 HRC	55÷60 HRC	60÷65 HRC
	ap x ae	0.03D x 0.3D	0.03D x 0.3D	0.02D x 0.3D	0.02D x 0.3D
	Vc (m/min)	110÷150	90÷130	60÷100	50÷70
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	2	0.033	0.029	0.026	0.023
	3	0.050	0.045	0.040	0.035
	4	0.068	0.061	0.054	0.047
	5	0.086	0.077	0.068	0.060
	6	0.104	0.093	0.083	0.072
	8	0.122	0.109	0.097	0.085
	3	0.050	0.045	0.040	0.035
	4	0.068	0.061	0.054	0.047
	5	0.086	0.077	0.068	0.060
	6	0.104	0.093	0.083	0.072
	8	0.122	0.109	0.097	0.085
	3	0.050	0.045	0.040	0.035
	4	0.068	0.061	0.054	0.047
	5	0.086	0.077	0.068	0.060
	6	0.104	0.093	0.083	0.072
	8	0.122	0.109	0.097	0.085
	5	0.086	0.077	0.068	0.060
	10	0.140	0.126	0.112	0.098
	12	0.158	0.142	0.126	0.110
ap x ae	≤ D3	0.25D x D			

	Material Group ISO 513	P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
	Hardness/Rm	≤700 N/mm ²	600÷800 N/mm ²	800÷1000 N/mm ²	900÷1200 N/mm ²
	ap x ae	1.5D x 0.5D	1.5D x 0.5D	1.5D x 0.3D	1.5D x 0.3D
	Vc (m/min)	50÷70	40÷60	30÷40	20÷30
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.003	0.003	0.003	0.003
	2	0.007	0.006	0.006	0.004
	3	0.007	0.006	0.006	0.005
	4	0.011	0.010	0.009	0.008
	5	0.016	0.014	0.012	0.011
	6	0.020	0.018	0.016	0.014
	8	0.026	0.024	0.021	0.018
	10	0.038	0.035	0.031	0.027
	12	0.048	0.043	0.038	0.034
	14	0.058	0.052	0.046	0.040
	16	0.068	0.062	0.055	0.048
	18	0.080	0.072	0.064	0.056
	20	0.092	0.083	0.074	0.065
	22	0.106	0.095	0.084	0.074
	24	0.118	0.106	0.094	0.082
	25	0.126	0.113	0.101	0.088
	26	0.132	0.119	0.106	0.092
	28	0.139	0.125	0.111	0.097
	30	0.146	0.132	0.117	0.102
ap x ae	≤ D3	1.5D x 0.25D	1.5D x 0.25D	1.2D x 0.1D	1.2D x 0.1D

Cutting Parameters

TAWS2 WS2 (VC = -20% ÷ -30%)

	Material Group ISO 513	P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
	Hardness/Rm	0.5D x D	0.5D x D	0.5D x D	0.5D x D
	ap x ae	30÷50	25÷35	20÷30	12÷18
	Vc (m/min)	110÷150	90÷130	60÷100	50÷70
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	0.005	0.003	0.002	0.002
	4	0.007	0.004	0.003	0.003
	5	0.009	0.006	0.005	0.005
	6	0.011	0.008	0.006	0.006
	8	0.016	0.010	0.008	0.008
	10	0.020	0.014	0.012	0.011
	12	0.024	0.018	0.015	0.014
	14	0.029	0.022	0.018	0.017
	16	0.034	0.026	0.021	0.020
	18	0.039	0.030	0.025	0.023
	20	0.044	0.035	0.029	0.027
	22	0.049	0.040	0.033	0.031
	24	0.053	0.044	0.037	0.034
	25	0.055	0.047	0.039	0.037
	26	0.058	0.050	0.041	0.039
	28	0.061	0.052	0.044	0.041
	30	0.064	0.055	0.046	0.043

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

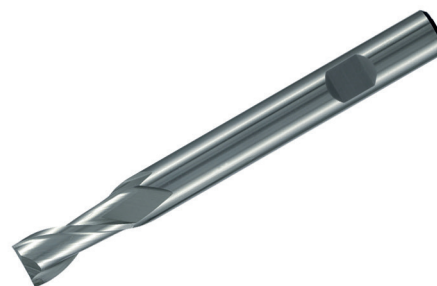
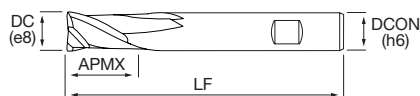
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

WL2

- Weldon shank
- 2 flutes
- Long



P	M	K	N	S	H
★	☆	★	☆		

DIN
844

N
HSS/Co
BR


FHA 30°

SQUARE

ZEFP 2

SLOTING

SIDE MILLING

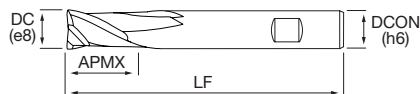
DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
3	-0.014/-0.028	6	h6	8	56	2	WL2030	●
4	-0.020/-0.038	6	h6	11	63	2	WL2040	●
5	-0.020/-0.038	6	h6	13	68	2	WL2050	●
6	-0.020/-0.038	6	h6	13	68	2	WL2060	●
7	-0.025/-0.047	10	h6	16	80	2	WL2070	●
8	-0.025/-0.047	10	h6	19	88	2	WL2080	●
9	-0.025/-0.047	10	h6	19	88	2	WL2090	●
10	-0.025/-0.047	10	h6	22	95	2	WL2100	●
11	-0.032/-0.059	12	h6	22	102	2	WL2110	●
12	-0.032/-0.059	12	h6	26	110	2	WL2120	●
13	-0.032/-0.059	12	h6	26	110	2	WL2130	●
14	-0.032/-0.059	12	h6	26	110	2	WL2140	●
15	-0.032/-0.059	12	h6	26	110	2	WL2150	●
16	-0.032/-0.059	16	h6	32	123	2	WL2160	●
18	-0.032/-0.059	16	h6	32	123	2	WL2180	●
20	-0.040/-0.073	20	h6	38	141	2	WL2200	●
22	-0.040/-0.073	20	h6	38	141	2	WL2220	●
24	-0.040/-0.073	25	h6	45	166	2	WL2240	○
25	-0.040/-0.073	25	h6	45	166	2	WL2250	●
28	-0.040/-0.073	25	h6	45	166	2	WL2280	●
30	-0.040/-0.073	25	h6	45	166	2	WL2300	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

TAWL2

- Weldon shank
- 2 flutes
- Long

P	M	K	N	S	H
★	☆	★	☆		



DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
3	-0.014/-0.028	6	h6	8	56	2	TAWL2030	●
4	-0.020/-0.038	6	h6	11	63	2	TAWL2040	●
5	-0.020/-0.038	6	h6	13	68	2	TAWL2050	●
6	-0.020/-0.038	6	h6	13	68	2	TAWL2060	●
8	-0.025/-0.047	10	h6	19	88	2	TAWL2080	●
10	-0.025/-0.047	10	h6	22	95	2	TAWL2100	●
12	-0.032/-0.059	12	h6	26	110	2	TAWL2120	●
14	-0.032/-0.059	12	h6	26	110	2	TAWL2140	●
16	-0.032/-0.059	16	h6	32	123	2	TAWL2160	●
18	-0.032/-0.059	16	h6	32	123	2	TAWL2180	●
20	-0.040/-0.073	20	h6	38	141	2	TAWL2200	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

Cutting Parameters

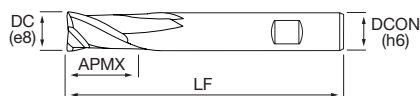
TAWL2 WL2 (VC = -20% ÷ -30%)

	Material Group ISO 513	P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
	Hardness/Rm	≤700 N/mm ²	600÷800 N/mm ²	800÷1000 N/mm ²	900÷1200 N/mm ²
	ap x ae	0.3D x D	0.3D x D	0.3D x D	0.3D x D
	Vc (m/min)	30÷50	25÷35	20÷30	12÷18
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	0.006	0.005	0.005	0.004
	4	0.008	0.007	0.007	0.006
	5	0.011	0.010	0.009	0.008
	6	0.014	0.012	0.011	0.010
	8	0.020	0.018	0.016	0.015
	10	0.025	0.023	0.020	0.019
	12	0.030	0.027	0.024	0.023
	14	0.036	0.032	0.029	0.027
	16	0.042	0.038	0.034	0.032
	18	0.048	0.043	0.038	0.036
	20	0.053	0.048	0.043	0.040
	22	0.060	0.054	0.048	0.045
	25	0.070	0.063	0.056	0.053
	28	0.077	0.069	0.062	0.058
	30	0.084	0.076	0.067	0.063
ap x ae		≤ D5	0.25D x D		

	Material Group ISO 513	P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
	Hardness/Rm	≤700 N/mm ²	600÷800 N/mm ²	800÷1000 N/mm ²	900÷1200 N/mm ²
	ap x ae	0.2D x 0.1D	0.2D x 0.1D	0.2D x 0.1D	0.2D x 0.1D
	Vc (m/min)	35÷55	30÷40	25÷35	12÷20
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	0.006	0.006	0.005	0.005
	4	0.009	0.008	0.007	0.007
	5	0.012	0.011	0.009	0.009
	6	0.015	0.014	0.012	0.011
	8	0.022	0.020	0.018	0.017
	10	0.028	0.025	0.022	0.021
	12	0.033	0.030	0.027	0.025
	14	0.040	0.036	0.032	0.030
	16	0.046	0.042	0.037	0.035
	18	0.052	0.047	0.042	0.039
	20	0.059	0.053	0.047	0.044
	22	0.065	0.059	0.052	0.049
	25	0.077	0.069	0.062	0.058
	28	0.085	0.076	0.068	0.064
	30	0.092	0.083	0.074	0.069
ap x ae		≤ D5	1.5D x 0.05D		

WSA2

- Weldon shank
- 2 flutes for aluminium



DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
2	-0.014/-0.028	6	h6	7	51	2	WSA2020	●
2.5	-0.014/-0.028	6	h6	8	52	2	WSA2025	●
3	-0.014/-0.028	6	h6	8	52	2	WSA2030	●
4	-0.020/-0.038	6	h6	11	55	2	WSA2040	●
5	-0.020/-0.038	6	h6	13	57	2	WSA2050	●
6	-0.020/-0.038	6	h6	13	57	2	WSA2060	●
8	-0.025/-0.047	10	h6	19	69	2	WSA2080	●
10	-0.025/-0.047	10	h6	22	72	2	WSA2100	●
12	-0.032/-0.059	12	h6	26	83	2	WSA2120	●
14	-0.032/-0.059	12	h6	26	83	2	WSA2140	●
16	-0.032/-0.059	16	h6	32	92	2	WSA2160	●
18	-0.032/-0.059	16	h6	32	92	2	WSA2180	●
20	-0.040/-0.073	20	h6	38	104	2	WSA2200	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

Cutting Parameters

WSA2

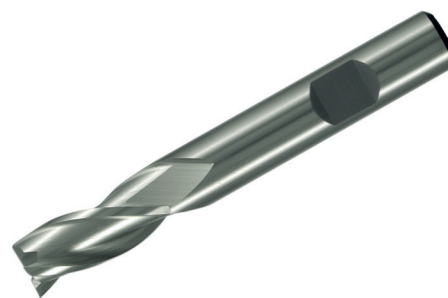
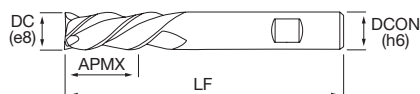
	Material Group ISO 513	N1	N2	N3 N4	N5
	Hardness/Rm				
	ap x ae	90÷110	70÷90	60÷80	100÷140
	Vc (m/min)	30÷50	25÷35	20÷30	12÷18
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	2	0.015	0.014	0.012	0.018
	3	0.020	0.018	0.016	0.024
	4	0.030	0.027	0.024	0.036
	5	0.035	0.032	0.028	0.042
	6	0.042	0.038	0.034	0.050
	8	0.056	0.050	0.045	0.067
	10	0.073	0.066	0.058	0.088
	12	0.090	0.081	0.072	0.108
	14	0.106	0.095	0.085	0.127
	16	0.120	0.108	0.096	0.144
	18	0.135	0.122	0.108	0.162
	20	0.150	0.135	0.120	0.180
ap x ae	≤ D3	0.2D x D			

	Material Group ISO 513	N1	N2	N3 N4	N5
	Hardness/Rm				
	ap x ae	1.5D x 0.5D	1.5D x 0.5D	1.5D x 0.5D	1.5D x 0.5D
	Vc (m/min)	100÷140	90÷110	70÷90	130÷150
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	2	0.018	0.016	0.014	0.020
	3	0.018	0.016	0.014	0.020
	4	0.024	0.022	0.019	0.027
	5	0.036	0.032	0.029	0.040
	6	0.042	0.038	0.034	0.047
	8	0.050	0.045	0.040	0.056
	10	0.067	0.060	0.054	0.075
	12	0.088	0.079	0.070	0.098
	14	0.108	0.097	0.086	0.121
	16	0.127	0.114	0.102	0.142
	18	0.144	0.130	0.115	0.161
	20	0.162	0.146	0.130	0.181
ap x ae	≤ D3	1.2D x 0.1D			

	Material Group ISO 513	N1	N2	N3 N4	N5
	Hardness/Rm				
	ap x ae	0.5D x 0.5D	0.5D x 0.5D	0.5D x 0.5D	0.5D x 0.5D
	Vc (m/min)	70÷90	55÷75	50÷60	90÷110
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	0.010	0.007	0.006	0.009
	4	0.015	0.009	0.008	0.012
	5	0.018	0.014	0.012	0.018
	6	0.021	0.016	0.014	0.021
	8	0.028	0.019	0.017	0.025
	10	0.037	0.025	0.022	0.034
	12	0.045	0.033	0.029	0.044
	14	0.053	0.041	0.036	0.054
	16	0.060	0.048	0.042	0.064
	18	0.068	0.054	0.048	0.072
	20	0.075	0.061	0.054	0.081

WS3

- Weldon shank
- 3 flutes



P	M	K	N	S	H
★	☆	★	☆		

DIN 844	N	HSS/Co BR	FHA 30°	SQUARE	ZEFP 3	SLOTING	SIDE MILLING
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DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
1	-0.014/-0.028	6	h6	3	47	3	WS3010	●
1.5	-0.014/-0.028	6	h6	7	51	3	WS3015	●
2	-0.014/-0.028	6	h6	7	51	3	WS3020	●
2.5	-0.014/-0.028	6	h6	8	52	3	WS3025	●
3	-0.014/-0.028	6	h6	8	52	3	WS3030	●
3.5	-0.020/-0.038	6	h6	10	54	3	WS3035	●
4	-0.020/-0.038	6	h6	11	55	3	WS3040	●
4.5	-0.020/-0.038	6	h6	11	55	3	WS3045	●
5	-0.020/-0.038	6	h6	13	57	3	WS3050	●
5.5	-0.020/-0.038	6	h6	13	57	3	WS3055	●
6	-0.020/-0.038	6	h6	13	57	3	WS3060	●
6.5	-0.025/-0.047	10	h6	16	66	3	WS3065	●
7	-0.025/-0.047	10	h6	16	66	3	WS3070	●
8	-0.025/-0.047	10	h6	19	69	3	WS3080	●
8.5	-0.025/-0.047	10	h6	19	69	3	WS3085	●
9	-0.025/-0.047	10	h6	19	69	3	WS3090	●
10	-0.025/-0.047	10	h6	22	72	3	WS3100	●
11	-0.032/-0.059	12	h6	22	79	3	WS3110	●
12	-0.032/-0.059	12	h6	26	83	3	WS3120	●
13	-0.032/-0.059	12	h6	26	83	3	WS3130	●
14	-0.032/-0.059	12	h6	26	83	3	WS3140	●
15	-0.032/-0.059	12	h6	26	83	3	WS3150	●
16	-0.032/-0.059	16	h6	32	92	3	WS3160	●
18	-0.032/-0.059	16	h6	32	92	3	WS3180	●
20	-0.040/-0.073	20	h6	38	104	3	WS3200	●
22	-0.040/-0.073	20	h6	38	104	3	WS3220	●
25	-0.040/-0.073	25	h6	45	121	3	WS3250	●
30	-0.040/-0.073	25	h6	45	121	3	WS3300	●
32	-0.050/-0.089	32	h6	53	133	3	WS3320	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

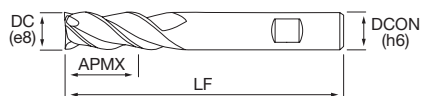
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

TAWS3

- Weldon shank
- 3 flutes



P	M	K	N	S	H
★	☆	★	☆		



DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
2	-0.014/-0.028	6	h6	7	51	3	TAWS3020	●
2.5	-0.014/-0.028	6	h6	8	52	3	TAWS3025	●
3	-0.014/-0.028	6	h6	8	52	3	TAWS3030	●
3.5	-0.020/-0.038	6	h6	10	54	3	TAWS3035	●
4	-0.020/-0.038	6	h6	11	55	3	TAWS3040	●
4.5	-0.020/-0.038	6	h6	11	55	3	TAWS3045	●
5	-0.020/-0.038	6	h6	13	57	3	TAWS3050	●
5.5	-0.020/-0.038	6	h6	13	57	3	TAWS3055	●
6	-0.020/-0.038	6	h6	13	57	3	TAWS3060	●
6.5	-0.025/-0.047	10	h6	16	66	3	TAWS3065	●
7	-0.025/-0.047	10	h6	16	66	3	TAWS3070	●
8	-0.025/-0.047	10	h6	19	69	3	TAWS3080	●
8.5	-0.025/-0.047	10	h6	19	69	3	TAWS3085	●
9	-0.025/-0.047	10	h6	19	69	3	TAWS3090	●
10	-0.025/-0.047	10	h6	22	72	3	TAWS3100	●
11	-0.032/-0.059	12	h6	22	79	3	TAWS3110	●
12	-0.032/-0.059	12	h6	26	83	3	TAWS3120	●
13	-0.032/-0.059	12	h6	26	83	3	TAWS3130	●
14	-0.032/-0.059	12	h6	26	83	3	TAWS3140	●
15	-0.032/-0.059	12	h6	26	83	3	TAWS3150	●
16	-0.032/-0.059	16	h6	32	92	3	TAWS3160	●
18	-0.032/-0.059	16	h6	32	92	3	TAWS3180	●
20	-0.040/-0.073	20	h6	38	104	3	TAWS3200	●
22	-0.040/-0.073	20	h6	38	104	3	TAWS3220	●
25	-0.040/-0.073	25	h6	45	121	3	TAWS3250	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

TAWS3 WS3 (VC = -20% ÷ -30%)

 SLOTTING	Material Group ISO 513	P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
	Hardness/Rm	≤700 N/mm ²	600÷800 N/mm ²	800÷1000 N/mm ²	900÷1200 N/mm ²
	ap x ae	0.3D x D	0.3D x D	0.3D x D	0.3D x D
	Vc (m/min)	40÷60	30÷50	25÷35	15÷25
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.003	0.002	0.002	0.002
	2	0.005	0.005	0.004	0.004
	3	0.008	0.007	0.006	0.006
	4	0.012	0.011	0.009	0.008
	5	0.015	0.014	0.011	0.011
	6	0.020	0.018	0.015	0.014
	8	0.029	0.026	0.022	0.020
	10	0.036	0.032	0.027	0.025
	12	0.043	0.039	0.032	0.030
	14	0.051	0.046	0.038	0.036
	16	0.060	0.054	0.045	0.042
	18	0.069	0.062	0.052	0.049
	20	0.079	0.071	0.059	0.055
	22	0.088	0.079	0.066	0.062
	25	0.099	0.089	0.074	0.069
	28	0.122	0.110	0.090	0.085
	30	0.128	0.115	0.093	0.090
	32	0.136	0.116	0.095	0.093
ap x ae	≤ D3	0.25D x D			

 SIDE MILLING	Material Group ISO 513	P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
	Hardness/Rm	≤700 N/mm ²	600÷800 N/mm ²	800÷1000 N/mm ²	900÷1200 N/mm ²
	ap x ae	1.5D x 0.5D	1.5D x 0.5D	1.5D x 0.3D	1.5D x 0.3D
	Vc (m/min)	50÷70	40÷60	30÷40	20÷30
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.003	0.003	0.002	0.002
	2	0.006	0.006	0.005	0.005
	3	0.006	0.006	0.005	0.005
	4	0.010	0.009	0.008	0.007
	5	0.014	0.013	0.011	0.010
	6	0.018	0.017	0.015	0.013
	8	0.024	0.021	0.019	0.017
	10	0.035	0.031	0.028	0.024
	12	0.043	0.039	0.035	0.030
	14	0.052	0.047	0.041	0.036
	16	0.062	0.055	0.049	0.043
	18	0.072	0.065	0.058	0.051
	20	0.083	0.075	0.067	0.058
	22	0.095	0.086	0.076	0.067
	25	0.113	0.102	0.091	0.079
	28	0.139	0.125	0.111	0.097
	30	0.143	0.130	0.115	0.100
	32	0.146	0.132	0.117	0.102
	30	0.146	0.132	0.117	0.102
ap x ae	≤ D3	1.5D x 0.25D	1.5D x 0.25D	1.2D x 0.1D	1.2D x 0.1D

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

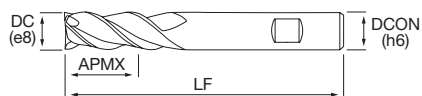
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

WL3

- Weldon shank
- 3 flutes
- Long



P	M	K	N	S	H
★	☆	★	☆		

DIN
844
N
HSS/Co
BR

FHA 30°

SQUARE

ZEFP 3

SLOTING

SIDE MILLING

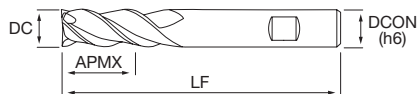
DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
3	-0.014/-0.028	6	h6	12	56	3	WL3030	●
4	-0.020/-0.038	6	h6	19	63	3	WL3040	●
5	-0.020/-0.038	6	h6	24	68	3	WL3050	●
6	-0.020/-0.038	6	h6	24	68	3	WL3060	●
8	-0.025/-0.047	10	h6	38	88	3	WL3080	●
10	-0.025/-0.047	10	h6	45	95	3	WL3100	●
12	-0.032/-0.059	12	h6	53	110	3	WL3120	●
14	-0.032/-0.059	12	h6	53	110	3	WL3140	●
16	-0.032/-0.059	16	h6	63	123	3	WL3160	●
18	-0.032/-0.059	16	h6	63	123	3	WL3180	●
20	-0.040/-0.073	20	h6	75	141	3	WL3200	●
22	-0.040/-0.073	20	h6	75	141	3	WL3220	●
25	-0.040/-0.073	25	h6	90	166	3	WL3250	○

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

TAWL3

- Weldon shank
- 3 flutes
- Long

P	M	K	N	S	H
★	☆	★	☆		



DIN 844	N	HSS/Co PV200	FHA 30°	SQUARE	ZEFP 3	SLOTING	SIDE MILLING
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DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
3	-0.014/-0.028	6	h6	12	56	3	TAWL3030	●
4	-0.020/-0.038	6	h6	19	63	3	TAWL3040	●
5	-0.020/-0.038	6	h6	24	68	3	TAWL3050	●
6	-0.020/-0.038	6	h6	24	68	3	TAWL3060	●
8	-0.025/-0.047	10	h6	38	88	3	TAWL3080	●
10	-0.025/-0.047	10	h6	45	95	3	TAWL3100	●
12	-0.032/-0.059	12	h6	53	110	3	TAWL3120	●
14	-0.032/-0.059	12	h6	53	110	3	TAWL3140	●
16	-0.032/-0.059	16	h6	63	123	3	TAWL3160	●
18	-0.032/-0.059	16	h6	63	123	3	TAWL3180	●
20	-0.040/-0.073	20	h6	75	141	3	TAWL3200	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

Cutting Parameters

TAWL3 WL3 (VC = -20% ÷ -30%)

	Material Group ISO 513	P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
	Hardness/Rm	≤700 N/mm ²	600÷800 N/mm ²	800÷1000 N/mm ²	900÷1200 N/mm ²
	ap x ae	0.3D x D	0.3D x D	0.3D x D	0.2D x D
	Vc (m/min)	30÷50	25÷35	20÷30	12÷18
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	0.006	0.005	0.005	0.004
	4	0.008	0.007	0.007	0.006
	5	0.011	0.010	0.009	0.008
	6	0.014	0.012	0.011	0.010
	8	0.020	0.018	0.016	0.015
	10	0.025	0.023	0.020	0.019
	12	0.030	0.027	0.024	0.023
	14	0.036	0.032	0.029	0.027
	16	0.042	0.038	0.034	0.032
	18	0.048	0.043	0.038	0.036
	20	0.053	0.048	0.043	0.040
	22	0.060	0.054	0.048	0.045
	25	0.070	0.063	0.056	0.053
ap x ae	≤ D5	0.25D x D			

	Material Group ISO 513	P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
	Hardness/Rm	≤700 N/mm ²	600÷800 N/mm ²	800÷1000 N/mm ²	900÷1200 N/mm ²
	ap x ae	2D x 0.1D	2D x 0.1D	2D x 0.1D	2D x 0.1D
	Vc (m/min)	40÷50	30÷40	25÷35	10÷20
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	0.006	0.006	0.005	0.005
	4	0.009	0.008	0.007	0.007
	5	0.012	0.011	0.009	0.009
	6	0.015	0.014	0.012	0.011
	8	0.022	0.020	0.018	0.017
	10	0.028	0.025	0.022	0.021
	12	0.033	0.030	0.027	0.025
	14	0.040	0.036	0.032	0.030
	16	0.046	0.042	0.037	0.035
	18	0.052	0.047	0.042	0.039
	20	0.059	0.053	0.047	0.044
	22	0.065	0.059	0.052	0.049
	25	0.077	0.069	0.062	0.058
ap x ae	≤ D5	1.5D x 0.05D	1.5D x 0.05D	1.5D x 0.05D	1.5D x 0.05D

TAWSH3

- Weldon shank
- 3 flutes



P	M	K	N	S	H
★	☆	★	☆		

DIN
844
N
HSS/Co
PV200


DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
6	+0.048/0	6	h6	13	57	3	TAWSH3060	●
8	+0.058/0	10	h6	19	69	3	TAWSH3080	●
10	+0.058/0	10	h6	22	72	3	TAWSH3100	●
12	+0.070/0	12	h6	26	83	3	TAWSH3120	○
14	+0.070/0	12	h6	26	83	3	TAWSH3140	●
16	+0.070/0	16	h6	32	92	3	TAWSH3160	●
18	+0.070/0	16	h6	32	92	3	TAWSH3180	●
20	+0.084/0	20	h6	38	104	3	TAWSH3200	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

Cutting Parameters

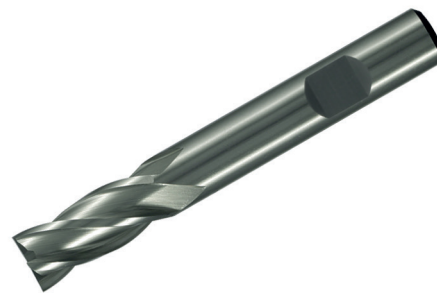
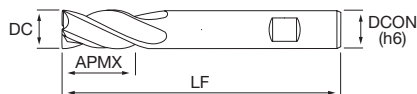
TAWSH3

	Material Group ISO 513	P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
	Hardness/Rm	≤700 N/mm ²	600÷800 N/mm ²	800÷1000 N/mm ²	900÷1200 N/mm ²
	ap x ae	0.3D x D	0.3D x D	0.3D x D	0.3D x D
	Vc (m/min)	40÷60	30÷50	25÷35	15÷25
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	6	0.020	0.018	0.015	0.014
	8	0.029	0.026	0.022	0.020
	10	0.036	0.032	0.027	0.025
	12	0.043	0.039	0.032	0.030
	14	0.051	0.046	0.038	0.036
	16	0.060	0.054	0.045	0.042
	18	0.069	0.062	0.052	0.049
	20	0.079	0.071	0.059	0.055

	Material Group ISO 513	P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
	Hardness/Rm	≤700 N/mm ²	600÷800 N/mm ²	800÷1000 N/mm ²	900÷1200 N/mm ²
	ap x ae	1.5D x 0.5D	1.5D x 0.5D	1.5D x 0.3D	1.5D x 0.3D
	Vc (m/min)	50÷70	40÷60	30÷40	20÷30
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	6	0.018	0.017	0.015	0.013
	8	0.024	0.021	0.019	0.017
	10	0.035	0.031	0.028	0.024
	12	0.043	0.039	0.035	0.030
	14	0.052	0.047	0.041	0.036
	16	0.062	0.055	0.049	0.043
	18	0.072	0.065	0.058	0.051
	20	0.083	0.075	0.067	0.058

WS4(6)

- Weldon shank
- 4 flutes



P	M	K	N	S	H
★	☆	★	☆		

DIN
844
N
HSS/Co
BR

FHA 30°

SQUARE

ZEFP 4

SIDE MILLING

DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
2	+0.040/0	6	h6	7	51	4	WS4020	●
3	+0.040/0	6	h6	8	52	4	WS4030	●
4	+0.040/0	6	h6	11	55	4	WS4040	●
5	+0.040/0	6	h6	13	57	4	WS4050	●
6	+0.040/0	6	h6	13	57	4	WS4060	●
7	+0.040/0	10	h6	16	66	4	WS4070	●
8	+0.040/0	10	h6	19	69	4	WS4080	●
9	+0.040/0	10	h6	19	69	4	WS4090	●
10	+0.040/0	10	h6	22	72	4	WS4100	●
11	+0.040/0	12	h6	22	79	4	WS4110	●
12	+0.040/0	12	h6	26	83	4	WS4120	●
13	+0.040/0	12	h6	26	83	4	WS4130	●
14	+0.040/0	12	h6	26	83	4	WS4140	●
15	+0.040/0	12	h6	26	83	4	WS4150	●
16	+0.040/0	16	h6	32	92	4	WS4160	●
18	+0.040/0	16	h6	32	92	4	WS4180	●
20	+0.040/0	20	h6	38	104	4	WS4200	●
22	+0.040/0	20	h6	38	104	4	WS4220	●
25	+0.040/0	25	h6	45	121	4	WS4250	●
24	+0.040/0	25	h6	45	121	6	WS6240	●
28	+0.040/0	25	h6	45	121	6	WS6280	●
30	+0.040/0	25	h6	45	121	6	WS6300	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

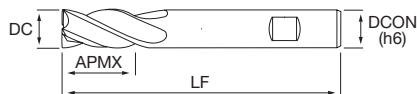
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

TAWS4(6)

- Weldon shank
- 4 flutes



P	M	K	N	S	H
★	☆	★	☆		

DIN 844	N	HSS/Co PV200				
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DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
2	+0.040/0	6	h6	7	51	4	TAWS4020	●
3	+0.040/0	6	h6	8	52	4	TAWS4030	●
4	+0.040/0	6	h6	11	55	4	TAWS4040	●
5	+0.040/0	6	h6	13	57	4	TAWS4050	●
6	+0.040/0	6	h6	13	57	4	TAWS4060	●
7	+0.040/0	10	h6	16	66	4	TAWS4070	●
8	+0.040/0	10	h6	19	69	4	TAWS4080	●
9	+0.040/0	10	h6	19	69	4	TAWS4090	●
10	+0.040/0	10	h6	22	72	4	TAWS4100	●
11	+0.040/0	12	h6	22	79	4	TAWS4110	●
12	+0.040/0	12	h6	26	83	4	TAWS4120	●
13	+0.040/0	12	h6	26	83	4	TAWS4130	●
14	+0.040/0	12	h6	26	83	4	TAWS4140	●
15	+0.040/0	12	h6	26	83	4	TAWS4150	●
16	+0.040/0	16	h6	32	92	4	TAWS4160	●
17	+0.040/0	16	h6	32	92	4	TAWS4170	●
18	+0.040/0	16	h6	32	92	4	TAWS4180	●
19	+0.040/0	16	h6	32	92	4	TAWS4190	●
20	+0.040/0	20	h6	38	104	4	TAWS4200	●
22	+0.040/0	20	h6	38	104	4	TAWS4220	●
25	+0.040/0	25	h6	45	121	4	TAWS4250	●
28	+0.040/0	25	h6	45	121	6	TAWS6280	●
30	+0.040/0	25	h6	45	121	6	TAWS6300	●
32	+0.040/0	32	h6	53	133	6	TAWS6320	●
36	+0.040/0	32	h6	53	133	6	TAWS6360	●
40	+0.040/0	40	h6	63	155	6	TAWS6400	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

TAWS4/6 WS4/6 (VC = -20% ÷ -30%)

Material Group ISO 513		P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
Hardness/Rm		≤700 N/mm ²	600÷800 N/mm ²	800÷1000 N/mm ²	900÷1200 N/mm ²
ap x ae		1.5D x 0.5D	1.5D x 0.5D	1.5D x 0.3D	1.5D x 0.3D
Vc (m/min)		50÷70	40÷60	30÷40	20÷30
DC (mm)	z	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
2	4	0.006	0.005	0.005	0.004
3	4	0.006	0.005	0.005	0.004
4	4	0.009	0.008	0.007	0.006
5	4	0.012	0.011	0.010	0.009
6	4	0.016	0.015	0.013	0.012
8	4	0.021	0.019	0.017	0.016
10	4	0.031	0.028	0.025	0.023
12	4	0.038	0.035	0.031	0.029
14	4	0.046	0.041	0.037	0.035
16	4	0.055	0.049	0.044	0.041
18	4	0.064	0.058	0.051	0.048
20	4	0.074	0.067	0.059	0.055
22	4	0.084	0.076	0.068	0.063
24	6	0.088	0.079	0.071	0.066
25	4	0.106	0.095	0.084	0.079
28	6	0.102	0.092	0.082	0.077
30	6	0.108	0.097	0.086	0.081
32	6	0.113	0.102	0.091	0.085
36	6	0.127	0.114	0.101	0.095
40	6	0.139	0.125	0.111	0.104
ap x ae		≤ D3	1.5D x 0.25D	1.2D x 0.1D	1.2D x 0.1D



SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

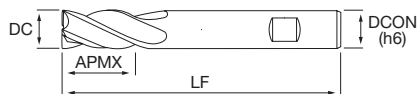
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

WL4(6)

- Weldon shank
- 4 flutes
- Long



P	M	K	N	S	H
★	☆	★	☆		

DIN 844	N	HSS/Co BR	FHA 30°	SQUARE	ZEFP 4	SIDE MILLING
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DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
3	+0.040/0	6	h6	12	56	4	WL4030	●
4	+0.040/0	6	h6	19	63	4	WL4040	●
5	+0.040/0	6	h6	24	68	4	WL4050	●
6	+0.040/0	6	h6	24	68	4	WL4060	●
7	+0.050/0	10	h6	30	80	4	WL4070	●
8	+0.050/0	10	h6	38	88	4	WL4080	●
9	+0.050/0	10	h6	38	88	4	WL4090	●
10	+0.050/0	10	h6	45	95	4	WL4100	●
11	+0.050/0	12	h6	45	102	4	WL4110	●
12	+0.050/0	12	h6	53	110	4	WL4120	●
13	+0.050/0	12	h6	53	110	4	WL4130	●
14	+0.050/0	12	h6	53	110	4	WL4140	●
15	+0.050/0	12	h6	53	110	4	WL4150	●
16	+0.050/0	16	h6	63	123	4	WL4160	●
17	+0.050/0	16	h6	63	123	4	WL4170	●
18	+0.050/0	16	h6	63	123	4	WL4180	●
19	+0.050/0	16	h6	63	123	4	WL4190	●
20	+0.050/0	20	h6	75	141	4	WL4200	●
22	+0.050/0	20	h6	75	141	6	WL6220	▽
25	+0.050/0	25	h6	90	166	6	WL6250	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

TAWL4(6)

- Weldon shank
- 4 flutes
- Long



P	M	K	N	S	H
★	☆	★	☆		



DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
3	+0.040/0	6	h6	12	56	4	TAWL4030	●
4	+0.040/0	6	h6	19	63	4	TAWL4040	●
5	+0.040/0	6	h6	24	68	4	TAWL4050	●
6	+0.040/0	6	h6	24	68	4	TAWL4060	●
7	+0.050/0	10	h6	30	80	4	TAWL4070	●
8	+0.050/0	10	h6	38	88	4	TAWL4080	●
9	+0.050/0	10	h6	38	88	4	TAWL4090	●
10	+0.050/0	10	h6	45	95	4	TAWL4100	●
11	+0.050/0	12	h6	45	102	4	TAWL4110	●
12	+0.050/0	12	h6	53	110	4	TAWL4120	●
13	+0.050/0	12	h6	53	110	4	TAWL4130	●
14	+0.050/0	12	h6	53	110	4	TAWL4140	●
15	+0.050/0	12	h6	53	110	4	TAWL4150	●
16	+0.050/0	16	h6	63	123	4	TAWL4160	●
17	+0.050/0	16	h6	63	123	4	TAWL4170	▽
18	+0.050/0	16	h6	63	123	4	TAWL4180	●
20	+0.050/0	20	h6	75	141	4	TAWL4200	●
22	+0.050/0	20	h6	75	141	6	TAWL6220	▽
25	+0.050/0	25	h6	90	166	6	TAWL6250	●
30	+0.050/0	25	h6	90	166	6	TAWL6300	●
32	+0.050/0	32	h6	106	186	6	TAWL6320	●
36	+0.050/0	32	h6	106	186	6	TAWL6360	●
40	+0.050/0	40	h6	125	217	6	TAWL6400	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

Cutting Parameters

TAWL4/6 WL4/6 (VC = -20% ÷ -30%)

	Material Group ISO 513		P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
	Hardness/Rm		≤700 N/mm ²	600÷800 N/mm ²	800÷1000 N/mm ²	900÷1200 N/mm ²
	ap x ae		2D x 0.1D	2D x 0.1D	2D x 0.1D	2D x 0.1D
	Vc (m/min)		40÷50	30÷40	25÷35	10÷20
	DC (mm)	z	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	4	0.004	0.004	0.003	0.003
	4	4	0.006	0.005	0.005	0.004
	5	4	0.009	0.008	0.007	0.006
	6	4	0.012	0.011	0.010	0.009
	8	4	0.015	0.013	0.012	0.011
	10	4	0.021	0.019	0.017	0.016
	12	4	0.027	0.024	0.021	0.020
	14	4	0.032	0.029	0.026	0.024
	16	4	0.038	0.034	0.030	0.028
	18	4	0.045	0.040	0.036	0.033
	20	4	0.050	0.045	0.040	0.038
	22	6	0.056	0.051	0.045	0.042
	25	6	0.068	0.061	0.054	0.051
	30	6	0.074	0.066	0.059	0.053
	32	6	0.077	0.069	0.062	0.054
	36	6	0.085	0.077	0.068	0.060
	40	6	0.095	0.086	0.076	0.067
ap x ae		≤ D5	1.5D x 0.05D	1.5D x 0.05D	1.2D x 0.05D	1.2D x 0.05D

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

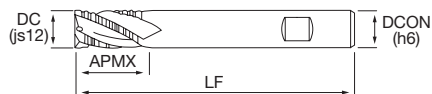
K - HSS END MILLS

L - CARBIDE BURRS

TAWSR

- Weldon shank
- Roughing NR

P	M	K	N	S	H
★	☆	★	☆		



DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
6	±0.060	6	h6	13	57	3	TAWSR060	●
7	±0.075	10	h6	16	66	3	TAWSR070	●
8	±0.075	10	h6	19	69	3	TAWSR080	●
9	±0.075	10	h6	19	69	3	TAWSR090	●
10	±0.075	10	h6	22	72	4	TAWSR100	●
11	±0.090	12	h6	22	79	4	TAWSR110	●
12	±0.090	12	h6	26	83	4	TAWSR120	●
13	±0.090	12	h6	26	83	4	TAWSR130	●
14	±0.090	12	h6	26	83	4	TAWSR140	●
15	±0.090	12	h6	26	83	4	TAWSR150	●
16	±0.090	16	h6	32	92	4	TAWSR160	●
17	±0.090	16	h6	32	92	4	TAWSR170	●
18	±0.090	16	h6	32	92	4	TAWSR180	●
20	±0.105	20	h6	38	104	4	TAWSR200	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

Cutting Parameters

TAWSR

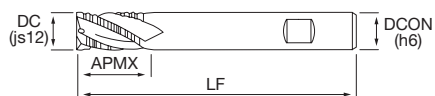
	Material Group ISO 513	P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
	Hardness/Rm	≤700 N/mm ²	600÷800 N/mm ²	800÷1000 N/mm ²	900÷1200 N/mm ²
	ap x ae	D x D	D x D	D x D	0.5D x D
	Vc (m/min)	40÷60	30÷50	25÷35	15÷25
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	6	0.022	0.020	0.018	0.017
	8	0.028	0.025	0.022	0.019
	10	0.035	0.032	0.028	0.025
	12	0.045	0.041	0.036	0.032
	14	0.055	0.050	0.044	0.039
	16	0.065	0.059	0.052	0.046
	18	0.075	0.068	0.060	0.053
	20	0.085	0.077	0.068	0.060

	Material Group ISO 513	P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
	Hardness/Rm	≤700 N/mm ²	600÷800 N/mm ²	800÷1000 N/mm ²	900÷1200 N/mm ²
	ap x ae	1.5D x 0.5D	1.5D x 0.5D	1.5D x 0.3D	1.5D x 0.3D
	Vc (m/min)	50÷70	40÷60	30÷40	20÷30
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	6	0.026	0.024	0.021	0.018
	8	0.033	0.030	0.026	0.023
	10	0.042	0.038	0.034	0.029
	12	0.054	0.049	0.043	0.038
	14	0.066	0.059	0.053	0.046
	16	0.078	0.070	0.062	0.055
	18	0.090	0.081	0.072	0.063
	20	0.102	0.092	0.082	0.071

WSFR

- Weldon shank
- Roughing NR

P	M	K	N	S	H
★	☆	★	☆		



DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
6	±0.060	6	h6	13	57	3	WSFR060	●
8	±0.075	10	h6	19	69	3	WSFR080	●
10	±0.075	10	h6	22	72	4	WSFR100	●
12	±0.090	12	h6	26	83	4	WSFR120	●
14	±0.090	12	h6	26	83	4	WSFR140	●
16	±0.090	16	h6	32	92	4	WSFR160	●
18	±0.090	16	h6	32	92	4	WSFR180	●
20	±0.105	20	h6	38	104	4	WSFR200	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

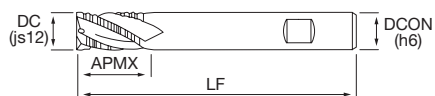
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

TAWSFR

- Weldon shank
- Roughing NR



P	M	K	N	S	H
★	☆	★	☆		



DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
6	±0.060	6	h6	13	57	3	TAWSFR060	●
7	±0.075	10	h6	16	66	3	TAWSFR070	●
8	±0.075	10	h6	19	69	3	TAWSFR080	●
9	±0.075	10	h6	19	69	3	TAWSFR090	●
10	±0.075	10	h6	22	72	4	TAWSFR100	●
11	±0.090	12	h6	22	79	4	TAWSFR110	●
12	±0.090	12	h6	26	83	4	TAWSFR120	●
13	±0.090	12	h6	26	83	4	TAWSFR130	●
14	±0.090	12	h6	26	83	4	TAWSFR140	●
15	±0.090	12	h6	26	83	4	TAWSFR150	●
16	±0.090	16	h6	32	92	4	TAWSFR160	●
17	±0.090	16	h6	32	92	4	TAWSFR170	●
18	±0.090	16	h6	32	92	4	TAWSFR180	●
20	±0.105	20	h6	38	104	4	TAWSFR200	●
22	±0.105	20	h6	38	104	5	TAWSFR220	●
25	±0.105	25	h6	45	121	5	TAWSFR250	●
28	±0.105	25	h6	45	121	6	TAWSFR280	●
30	±0.105	25	h6	45	121	6	TAWSFR300	●
32	±0.125	32	h6	53	133	6	TAWSFR320	●
36	±0.125	32	h6	53	133	6	TAWSFR360	●
40	±0.125	32	h6	63	155	6	TAWSFR400	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

TAWSFRR WSFR (VC = -20% ÷ -30%)

	Material Group ISO 513		P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
	Hardness/Rm		≤700 N/mm ²	600÷800 N/mm ²	800÷1000 N/mm ²	900÷1200 N/mm ²
	ap x ae		D x D	D x D	D x D	0.5D x D
	Vc (m/min)		40÷60	30÷50	25÷35	15÷25
	DC (mm)	z	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	6	3	0.022	0.020	0.018	0.017
	8	3	0.028	0.025	0.022	0.019
	10	4	0.035	0.032	0.028	0.025
	12	4	0.045	0.041	0.036	0.032
	14	4	0.055	0.050	0.044	0.039
	16	4	0.065	0.059	0.052	0.046
	18	4	0.075	0.068	0.060	0.053
	20	4	0.085	0.077	0.068	0.060
	22	5	0.086	0.077	0.068	0.060
	25	5	0.099	0.089	0.079	0.069
	28	6	0.100	0.090	0.080	0.070
	30	6	0.108	0.097	0.086	0.076
	32	6	0.116	0.104	0.093	0.081
	36	6	0.130	0.111	0.104	0.091
	40	6	0.145	0.123	0.116	0.102

	Material Group ISO 513		P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
	Hardness/Rm		≤700 N/mm ²	600÷800 N/mm ²	800÷1000 N/mm ²	900÷1200 N/mm ²
	ap x ae		1.5D x 0.5D	1.5D x 0.5D	1.5D x 0.3D	1.5D x 0.3D
	Vc (m/min)		50÷70	40÷60	30÷40	20÷30
	DC (mm)	z	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	6	3	0.026	0.024	0.021	0.018
	8	3	0.033	0.030	0.026	0.023
	10	4	0.042	0.038	0.034	0.029
	12	4	0.054	0.049	0.043	0.038
	14	4	0.066	0.059	0.053	0.046
	16	4	0.078	0.070	0.062	0.055
	18	4	0.090	0.081	0.072	0.063
	20	4	0.102	0.092	0.082	0.071
	22	5	0.103	0.092	0.082	0.072
	25	5	0.119	0.107	0.095	0.083
	28	6	0.120	0.108	0.096	0.084
	30	6	0.130	0.117	0.104	0.091
	32	6	0.139	0.125	0.111	0.097
	36	6	0.156	0.140	0.125	0.109
	40	6	0.174	0.157	0.139	0.122

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

WLFR

- Weldon shank
- Roughing NR
- Long



P	M	K	N	S	H
★	☆	★	☆		



DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
6	±0.060	6	h6	24	68	3	WLFR060	●
8	±0.075	10	h6	38	88	3	WLFR080	●
10	±0.075	10	h6	45	95	4	WLFR100	●
12	±0.090	12	h6	53	110	4	WLFR120	●
14	±0.090	12	h6	53	110	4	WLFR140	●
16	±0.090	16	h6	63	123	4	WLFR160	○
18	±0.090	16	h6	63	123	4	WLFR180	●
20	±0.105	20	h6	75	141	4	WLFR200	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

TAWLFR

- Weldon shank
- Roughing NR
- Long

P	M	K	N	S	H
★	☆	★	☆		



DC	DC tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
6	±0.060	6	h6	24	68	3	TAWLFR060	●
8	±0.075	10	h6	38	88	3	TAWLFR080	●
10	±0.075	10	h6	45	95	4	TAWLFR100	●
12	±0.090	12	h6	53	110	4	TAWLFR120	●
14	±0.090	12	h6	53	110	4	TAWLFR140	●
16	±0.090	16	h6	63	123	4	TAWLFR160	●
18	±0.090	16	h6	63	123	4	TAWLFR180	●
20	±0.105	20	h6	75	141	4	TAWLFR200	●
22	±0.105	20	h6	75	141	5	TAWLFR220	●
25	±0.105	25	h6	90	166	5	TAWLFR250	●
30	±0.105	25	h6	90	166	6	TAWLFR300	●
32	±0.105	32	h6	106	186	6	TAWLFR320	●
36	±0.125	32	h6	106	186	6	TAWLFR360	●
40	±0.125	32	h6	125	217	6	TAWLFR400	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

Cutting Parameters

TAWLFR WLFR (VC = -20% ÷ -30%)

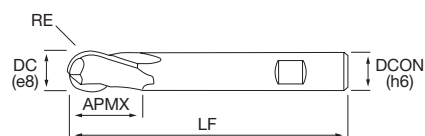
	Material Group ISO 513		P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
	Hardness/Rm		≤700 N/mm ²	600÷800 N/mm ²	800÷1000 N/mm ²	900÷1200 N/mm ²
	ap x ae		0.5D x D	0.5D x D	0.5D x D	0.3D x D
	Vc (m/min)		35÷45	25÷35	20÷30	10÷20
	DC (mm)	z	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	6	3	0.014	0.013	0.011	0.011
	8	3	0.020	0.018	0.016	0.014
	10	4	0.025	0.022	0.020	0.017
	12	4	0.032	0.028	0.025	0.022
	14	4	0.039	0.035	0.031	0.027
	16	4	0.046	0.041	0.036	0.032
	18	4	0.053	0.047	0.042	0.037
	20	4	0.060	0.054	0.048	0.042
	22	5	0.060	0.054	0.048	0.042
	25	5	0.069	0.062	0.055	0.049
	28	6	0.070	0.063	0.056	0.049
	30	6	0.076	0.068	0.060	0.053
	32	6	0.081	0.073	0.065	0.057
	36	6	0.091	0.077	0.073	0.064
	40	6	0.102	0.086	0.081	0.071

	Material Group ISO 513		P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
	Hardness/Rm		≤700 N/mm ²	600÷800 N/mm ²	800÷1000 N/mm ²	900÷1200 N/mm ²
	ap x ae		1.5D x 0.3D	1.5D x 0.3D	1.5D x 0.3D	1.5D x 0.2D
	Vc (m/min)		35÷45	25÷35	20÷30	10÷20
	DC (mm)	z	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	6	3	0.017	0.015	0.013	0.012
	8	3	0.024	0.022	0.019	0.017
	10	4	0.029	0.026	0.024	0.021
	12	4	0.038	0.034	0.030	0.026
	14	4	0.046	0.042	0.037	0.032
	16	4	0.055	0.049	0.044	0.038
	18	4	0.063	0.057	0.050	0.044
	20	4	0.071	0.064	0.057	0.050
	22	5	0.072	0.065	0.057	0.050
	25	5	0.083	0.075	0.067	0.058
	28	6	0.084	0.076	0.067	0.059
	30	6	0.091	0.082	0.073	0.064
	32	6	0.097	0.088	0.078	0.068
	36	6	0.109	0.098	0.087	0.076
	40	6	0.122	0.110	0.097	0.085

WSB2

- Weldon shank
- 2 flutes ball nose

P	M	K	N	S	H
★	☆	★	☆		


DIN
327

N
HSS/Co
BR


FHA 30°

BALL NOSE

ZEFP 2 BALL

COPYING

DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
2	-0.014/-0.028	1	±0.020	6	h6	4	48	2	WSB2020	●
3	-0.014/-0.028	1.5	±0.020	6	h6	5	49	2	WSB2030	●
4	-0.020/-0.038	2	±0.020	6	h6	7	51	2	WSB2040	●
5	-0.020/-0.038	2.5	±0.020	6	h6	8	52	2	WSB2050	●
6	-0.020/-0.038	3	±0.020	6	h6	8	52	2	WSB2060	●
8	-0.025/-0.047	4	±0.020	10	h6	11	61	2	WSB2080	●
10	-0.025/-0.047	5	±0.020	10	h6	13	63	2	WSB2100	●
12	-0.032/-0.059	6	±0.020	12	h6	16	73	2	WSB2120	●
14	-0.032/-0.059	7	±0.020	12	h6	16	73	2	WSB2140	●
16	-0.032/-0.059	8	±0.020	16	h6	19	79	2	WSB2160	●
18	-0.032/-0.059	9	±0.020	16	h6	19	79	2	WSB2180	●
20	-0.040/-0.073	10	±0.020	20	h6	22	88	2	WSB2200	●
25	-0.040/-0.073	12.5	±0.020	25	h6	26	102	2	WSB2250	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

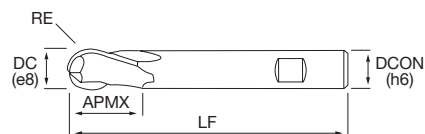
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

TAWSB2

- Weldon shank
- 2 flutes ball nose



P	M	K	N	S	H
★	☆	★	☆		



DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
3	-0.014/-0.028	1.5	±0.020	6	h6	5	49	2	TAWSB2030	⊙
4	-0.020/-0.038	2	±0.020	6	h6	7	51	2	TAWSB2040	●
5	-0.020/-0.038	2.5	±0.020	6	h6	8	52	2	TAWSB2050	●
6	-0.020/-0.038	3	±0.020	6	h6	8	52	2	TAWSB2060	●
8	-0.025/-0.047	4	±0.020	10	h6	11	61	2	TAWSB2080	●
10	-0.025/-0.047	5	±0.020	10	h6	13	63	2	TAWSB2100	●
12	-0.032/-0.059	6	±0.020	12	h6	16	73	2	TAWSB2120	●
14	-0.032/-0.059	7	±0.020	12	h6	16	73	2	TAWSB2140	⊙
16	-0.032/-0.059	8	±0.020	16	h6	19	79	2	TAWSB2160	●
20	-0.040/-0.073	10	±0.020	20	h6	22	88	2	TAWSB2200	●

★ 1st choice, ☆ suitable, ● stock standard, ⊙ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

TAWSB2 WSB2 (VC = -20% ÷ -30%)

	Material Group ISO 513		P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
	Hardness/Rm		≤700 N/mm ²	600÷800 N/mm ²	800÷1000 N/mm ²	900÷1200 N/mm ²
	ap x ae		0.1D x 0.2D	0.1D x 0.2D	0.1D x 0.2D	0.1D x 0.2D
	Vc (m/min)		40÷60	30÷50	25÷35	15÷25
	DC (mm)	z	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	2	1.20	0.020	0.018	0.016	0.015
	3	1.80	0.040	0.036	0.032	0.030
	4	2.40	0.060	0.054	0.048	0.045
	5	3.00	0.070	0.063	0.056	0.053
	6	3.60	0.082	0.074	0.066	0.062
	8	4.80	0.094	0.085	0.075	0.071
	10	6.00	0.110	0.099	0.088	0.083
	12	7.20	0.130	0.117	0.104	0.098
	14	8.40	0.150	0.135	0.120	0.113
	16	9.60	0.170	0.153	0.136	0.128
	18	10.80	0.190	0.171	0.152	0.143
	20	12.00	0.210	0.189	0.168	0.158
	22	13.20	0.232	0.209	0.186	0.174
	25	15.00	0.262	0.236	0.210	0.197

	α	n (rpm)	Vf (mm/min)
	15°	x 1.1	x 1.1

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

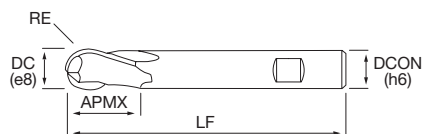
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

WLB2

- Weldon shank
- 2 flutes ball nose
- Long



P	M	K	N	S	H
★	☆	★	☆		



DC	DC tol.	RE	RE tol.	DCON	TCDCON	APMX	LF	ZEFP	EDP no.	Stock
3	-0.014/-0.028	1.5	±0.020	6	h6	8	56	2	WLB2030	●
4	-0.020/-0.038	2	±0.020	6	h6	11	63	2	WLB2040	●
5	-0.020/-0.038	2.5	±0.020	6	h6	13	68	2	WLB2050	●
6	-0.020/-0.038	3	±0.020	6	h6	13	68	2	WLB2060	●
8	-0.025/-0.047	4	±0.020	10	h6	19	88	2	WLB2080	●
10	-0.025/-0.047	5	±0.020	10	h6	22	95	2	WLB2100	●
12	-0.032/-0.059	6	±0.020	12	h6	26	110	2	WLB2120	●
14	-0.032/-0.059	7	±0.020	12	h6	26	110	2	WLB2140	●
16	-0.032/-0.059	8	±0.020	16	h6	32	123	2	WLB2160	●
18	-0.032/-0.059	9	±0.020	16	h6	32	123	2	WLB2180	●
20	-0.040/-0.073	10	±0.020	20	h6	38	141	2	WLB2200	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

WLB2

	Material Group ISO 513		P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
	Hardness/Rm		≤700 N/mm ²	600÷800 N/mm ²	800÷1000 N/mm ²	900÷1200 N/mm ²
	ap x ae		0.1D x 0.2D	0.1D x 0.2D	0.1D x 0.2D	0.1D x 0.2D
	Vc (m/min)		25÷35	20÷30	15÷25	10÷15
	DC (mm)	z	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	1.80	0.026	0.023	0.020	0.019
	4	2.40	0.038	0.034	0.031	0.029
	5	3.00	0.045	0.040	0.036	0.033
	6	3.60	0.052	0.047	0.042	0.039
	8	4.80	0.060	0.054	0.048	0.045
	10	6.00	0.070	0.063	0.056	0.053
	12	7.20	0.083	0.075	0.066	0.062
	14	8.40	0.096	0.086	0.077	0.072
	16	9.60	0.108	0.098	0.087	0.081
	18	10.80	0.121	0.109	0.097	0.091
	20	12.00	0.134	0.120	0.107	0.100

	α	n (rpm)	Vf (mm/min)
	15°	x 1.1	x 1.1

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

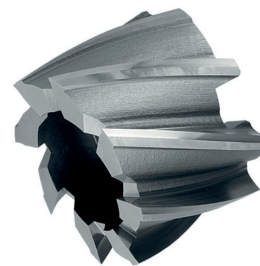
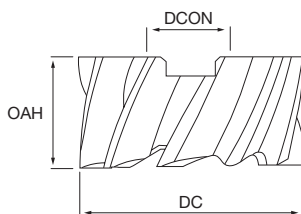
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

FM

- Shell mill
- Multi flute



P	M	K	N	S	H
★	☆	★	☆		

DIN
1880
N
HSS/Co
BR


DC	DC tol.	DCON	TCDCON	OAH	OAH tol.	ZEFP	EDP no.	Stock
40	+0.250/-0.150	16	+0.02/0	32	+0.50/-0	8	FM40	●
50	+0.250/-0.150	22	+0.02/0	36	+0.50/-0	8	FM50	●
63	+0.250/-0.150	27	+0.02/0	40	+0.50/-0	8	FM63	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

Cutting Parameters

FM

	Material Group ISO 513		P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
	Hardness/Rm		≤700 N/mm ²	600÷800 N/mm ²	800÷1000 N/mm ²	900÷1200 N/mm ²
	ap x ae		0.25D x 0.75D	0.25D x 0.75D	0.25D x 0.75D	0.25D x 0.75D
	Vc (m/min)		30÷45	20÷35	18÷26	11÷19
	DC (mm)	z	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	40	8	0.060	0.054	0.048	0.045
	50	8	0.070	0.063	0.056	0.053
	63	8	0.080	0.072	0.064	0.060
	80	10	0.100	0.090	0.080	0.075
	100	10	0.120	0.108	0.096	0.090

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

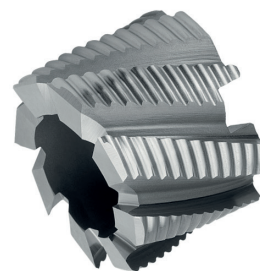
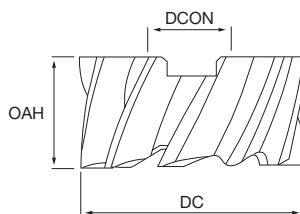
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

FFR

- Shell mill
- Multi flute
- Roughing HR



P	M	K	N	S	H
★	☆	★	☆		

DIN
1880
N
HSS/Co
BR


DC	DC tol.	DCON	TCDCON	OAH	OAH tol.	ZEFP	EDP no.	Stock
40	+0.250/-0.150	16	+0.02/0	32	+0.5/0	6	FFR40	●
50	+0.250/-0.150	22	+0.02/0	36	+0.5/0	8	FFR50	●
63	+0.250/-0.150	27	+0.02/0	40	+0.5/0	8	FFR63	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

Cutting Parameters

FFR

	Material Group ISO 513		P1 P2	P3 P7 K1	P4 M1 K2	P5 M2
	Hardness/Rm		≤700 N/mm ²	600÷800 N/mm ²	800÷1000 N/mm ²	900÷1200 N/mm ²
	ap x ae		0.25D x 0.75D	0.25D x 0.75D	0.25D x 0.75D	0.25D x 0.75D
	Vc (m/min)		30÷45	20÷35	18÷26	11÷19
	DC (mm)	z	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	40	8	0.080	0.072	0.064	0.060
	50	8	0.100	0.090	0.080	0.075
	63	8	0.120	0.108	0.096	0.090
	80	10	0.120	0.108	0.096	0.090
	100	10	0.140	0.126	0.112	0.105

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

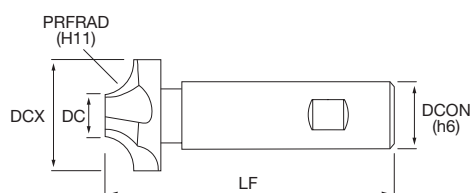
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

WCR

- Corner rounding



P	M	K	N	S	H
★	☆	★	☆		

DIN
6518
N
HSS/Co
BR

FHA 0°

ZEFP 4

ROUNDING

DC	DCX	PRFRAD	PRFRAD tol.	DCON	TCDCON	LF	ZEFP	EDP no.	Stock
6	8	1	+0.060/0	10	h6	60	4	WCR080	●
6	9	1.5	+0.060/0	10	h6	60	4	WCR090	●
6	10	2	+0.060/0	10	h6	60	4	WCR100	●
6	11	2.5	+0.060/0	10	h6	60	4	WCR110	●
6	12	3	+0.060/0	12	h6	60	4	WCR120	●
6	13	3.5	+0.075/0	12	h6	60	4	WCR130	●
6	14	4	+0.075/0	12	h6	60	4	WCR140	●
6	15	4.5	+0.075/0	12	h6	60	4	WCR150	●
6	16	5	+0.075/0	12	h6	60	4	WCR160	●
8	19	5.5	+0.075/0	16	h6	67	4	WCR190	●
8	20	6	+0.075/0	16	h6	67	4	WCR200	●
8	21	6.5	+0.090/0	16	h6	71	4	WCR210	●
8	22	7	+0.090/0	16	h6	71	4	WCR220	●
8	23	7.5	+0.090/0	16	h6	71	4	WCR230	●
8	24	8	+0.090/0	16	h6	71	4	WCR240	●
8	25	8.5	+0.090/0	25	h6	85	4	WCR250	●
8	26	9	+0.090/0	25	h6	85	4	WCR260	●
8	27	9.5	+0.090/0	25	h6	85	4	WCR270	●
8	28	10	+0.090/0	25	h6	85	4	WCR280	●
10	32	11	+0.110/0	25	h6	90	4	WCR320	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

WCR

 ROUNDING	Material Group ISO 513	P1 P2 P3 P4	P7 M1	K1 K2	N1 N2 N3 N4
	Hardness/Rm	≤800 N/mm ²	≤750 N/mm ²	≤350 HB	
	ap x ae	0.2D x 0.2D	0.2D x 0.2D	0.2D x 0.2D	0.2D x 0.2D
	Vc (m/min)	30÷50	15÷25	30÷40	60÷80
	DC (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	8	0.006	0.004	0.005	0.007
	9	0.008	0.006	0.007	0.009
	10	0.010	0.007	0.009	0.011
	11	0.012	0.008	0.010	0.013
	12	0.015	0.010	0.012	0.016
	13	0.017	0.012	0.014	0.019
	14	0.020	0.014	0.017	0.021
	15	0.023	0.016	0.019	0.025
	16	0.025	0.018	0.021	0.028
	17	0.026	0.018	0.022	0.029
	18	0.027	0.019	0.023	0.030
	19	0.029	0.020	0.024	0.031
	20	0.030	0.021	0.026	0.033
	21	0.033	0.023	0.028	0.036
	22	0.035	0.025	0.030	0.039
	23	0.038	0.026	0.032	0.041
	24	0.040	0.028	0.034	0.044
	25	0.042	0.029	0.035	0.046
	26	0.043	0.030	0.037	0.047
	27	0.045	0.031	0.038	0.049
	28	0.046	0.032	0.039	0.051
	32	0.050	0.035	0.043	0.055

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

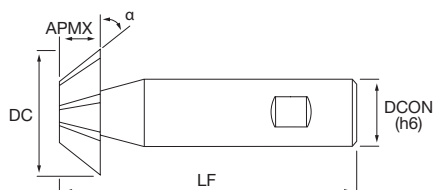
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

WDC

• Dovetail cutter



P	M	K	N	S	H
★	☆	★	☆		

DIN
1833

N

HSS/Co
BR

α
45°

α
60°

ZEFP 6-12

DOVETAIL B
45°-60°

DC	DC tol.	DCON	TCDCON	APMX	TCAPMX	LF	α	ZEFP	EDP no.	Stock
16	±0.055	12	h6	4	js14	60	45	6	WDC45160	●
20	±0.065	12	h6	5	js14	63	45	6	WDC45200	●
22	±0.065	12	h6	6	js14	67	45	6	WDC45220	●
25	±0.065	16	h6	6.3	js14	67	45	8	WDC45250	●
28	±0.065	16	h6	7.5	js14	67	45	8	WDC45280	●
32	±0.080	16	h6	8	js14	71	45	10	WDC45320	●
38	±0.080	16	h6	10	js14	80	45	12	WDC45380	○
16	±0.055	12	h6	6.3	js14	60	60	6	WDC60160	●
20	±0.065	12	h6	8	js14	63	60	6	WDC60200	●
22	±0.065	12	h6	9	js14	67	60	6	WDC60220	●
25	±0.065	16	h6	10	js14	67	60	8	WDC60250	●
28	±0.065	16	h6	11	js14	67	60	8	WDC60280	●
32	±0.080	16	h6	12.5	js14	71	60	10	WDC60320	●
38	±0.080	16	h6	16	js14	80	60	12	WDC60380	○

★ 1st choice, ☆ suitable, ● stock standard, ○ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

WDC 45° - 60°

	Material Group ISO 513		P1 P2 P3 P4	P7 M1	K1 K2	N1 N2 N3 N4
	Hardness/Rm		≤800 N/mm ²	≤750 N/mm ²	≤350 HB	
	ap x ae		0.2D x 0.15D	0.2D x 0.15D	0.2D x 0.15D	0.2D x 0.15D
	Vc (m/min)		30÷50	15÷25	30÷40	50÷70
	DC (mm)	z	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	16	6	0.015	0.011	0.013	0.017
	20	6	0.017	0.012	0.014	0.018
	22	6	0.018	0.013	0.015	0.020
	25	8	0.020	0.014	0.017	0.022
	28	8	0.023	0.016	0.019	0.025
	32	10	0.025	0.018	0.021	0.028
	38	12	0.028	0.020	0.024	0.031

SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

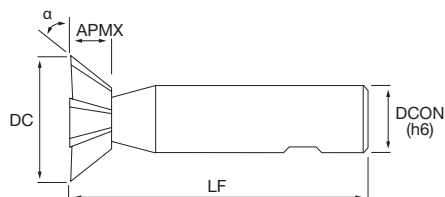
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

WDD

• Dovetail cutter



P	M	K	N	S	H
★	☆	★	☆		

DIN
1833

N

HSS/Co
BR

α

45°

α

60°

ZEFP 6-12

DOVETAIL A
45°-60°

DC	DC tol.	DCON	TCDCON	APMX	TCAPMX	LF	α	ZEFP	EDP no.	Stock
16	±0.055	12	h6	4	js14	60	45	6	WDD45160	●
20	±0.065	12	h6	5	js14	63	45	6	WDD45200	●
22	±0.065	12	h6	6	js14	67	45	6	WDD45220	●
25	±0.065	16	h6	6.3	js14	67	45	8	WDD45250	●
28	±0.065	16	h6	7.5	js14	67	45	8	WDD45280	●
32	±0.080	16	h6	8	js14	71	45	10	WDD45320	●
38	±0.080	16	h6	10	js14	80	45	12	WDD45380	○
16	±0.055	12	h6	6.3	js14	60	60	6	WDD60160	●
20	±0.065	12	h6	8	js14	63	60	6	WDD60200	●
22	±0.065	12	h6	9	js14	67	60	6	WDD60220	●
25	±0.065	16	h6	10	js14	67	60	8	WDD60250	●
28	±0.065	16	h6	11	js14	67	60	8	WDD60280	●
32	±0.080	16	h6	12.5	js14	71	60	10	WDD60320	●
38	±0.080	16	h6	16	js14	80	60	12	WDD60380	○

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

WDD 45° - 60°

	Material Group ISO 513		P1 P2 P3 P4	P7 M1	K1 K2	N1 N2 N3 N4
	Hardness/Rm		≤800 N/mm ²	≤750 N/mm ²	≤350 HB	
	ap x ae		0.2D x 0.15D	0.2D x 0.15D	0.2D x 0.15D	0.2D x 0.15D
	Vc (m/min)		30÷50	15÷25	30÷40	50÷70
	DC (mm)	z	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	16	6	0.015	0.011	0.013	0.017
	20	6	0.017	0.012	0.014	0.018
	22	6	0.018	0.013	0.015	0.020
	25	8	0.020	0.014	0.017	0.022
	28	8	0.023	0.016	0.019	0.025
	32	10	0.025	0.018	0.021	0.028
	38	12	0.028	0.020	0.024	0.031

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H - CARBIDE DRILLS

I - HSS DRILLS

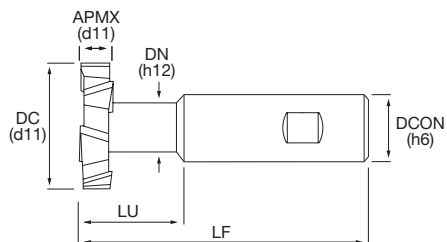
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

WTM

• T-slot



P	M	K	N	S	H
★	☆	★	☆		



DC	DC tol.	DCON	TCDCON	DN	DN tol.	LU	APMX	TCAPMX	LF	ZEFP	EDP no.	Stock
12.5	-0.050/-0.160	10	h6	5	0/-0.012	13	6	d11	57	6	WTM125	●
16	-0.050/-0.160	10	h6	6.5	0/-0.015	19	8	d11	62	6	WTM160	●
18	-0.050/-0.160	12	h6	8	0/-0.015	22	8	d11	70	6	WTM180	●
19	-0.065/-0.195	12	h6	8	0/-0.015	23	9	d11	71	6	WTM190	●
21	-0.065/-0.195	12	h6	10	0/-0.015	26	9	d11	74	6	WTM210	●
22	-0.065/-0.195	12	h6	10	0/-0.015	27	10	d11	75	6	WTM220	●
25	-0.065/-0.195	16	h6	12	0/-0.018	31	11	d11	82	6	WTM250	●
28	-0.065/-0.195	16	h6	13	0/-0.018	32	12	d11	83	6	WTM280	●
32	-0.080/-0.240	16	h6	15	0/-0.018	41	14	d11	90	8	WTM320	●
36	-0.080/-0.240	25	h6	17	0/-0.018	42	16	d11	103	8	WTM360	●

★ 1st choice, ☆ suitable, ● stock standard, ◎ non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

WTM

		P1	P2	P3	P4	P7	M1	K1	K2	N1	N2	N3	N4
Material Group ISO 513													
Hardness/Rm		≤800 N/mm ²				≤750 N/mm ²		≤350 HB					
ap x ae		DIN Norm 650				DIN Norm 650		DIN Norm 650		DIN Norm 650			
Vc (m/min)		25÷35				12÷18		20÷30		40÷60			
DC (mm)	z	fz (mm/z)				fz (mm/z)		fz (mm/z)		fz (mm/z)			
12.5	6	0.010				0.007		0.009		0.011			
16	6	0.025				0.018		0.021		0.028			
18	6	0.030				0.021		0.026		0.033			
19	6	0.035				0.025		0.030		0.039			
21	6	0.040				0.028		0.034		0.044			
22	6	0.043				0.030		0.036		0.047			
25	6	0.045				0.032		0.038		0.050			
28	6	0.050				0.035		0.043		0.055			
32	8	0.057				0.040		0.048		0.063			
36	8	0.065				0.046		0.055		0.072			



SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

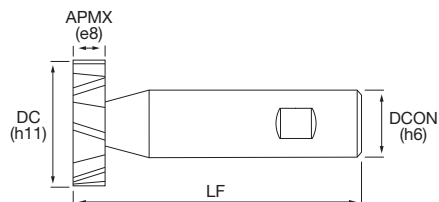
J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS

WWK

• Woodruff



DC	DC tol.	DCON	TCDCON	APMX	APMX tol.	LF	ZEFP	EDP no.	Stock
10.5	0/-0.110	6	h6	2	-0.032/-0.059	50	8	WWK105A	●
10.5	0/-0.110	6	h6	2.5	-0.032/-0.059	50	8	WWK105B	●
10.5	0/-0.110	6	h6	3	-0.032/-0.059	50	8	WWK105C	●
13.5	0/-0.110	10	h6	2	-0.032/-0.059	56	8	WWK135A	●
13.5	0/-0.110	10	h6	2.5	-0.032/-0.059	56	8	WWK135B	●
13.5	0/-0.110	10	h6	3	-0.032/-0.059	56	8	WWK135C	●
13.5	0/-0.110	10	h6	4	-0.032/-0.059	56	8	WWK135D	●
16.5	0/-0.110	10	h6	2.5	-0.032/-0.059	56	8	WWK165B	●
16.5	0/-0.110	10	h6	3	-0.032/-0.059	56	8	WWK165C	●
16.5	0/-0.110	10	h6	4	-0.032/-0.059	56	8	WWK165D	●
16.5	0/-0.110	10	h6	5	-0.032/-0.059	56	8	WWK165E	●
19.5	0/-0.130	10	h6	3	-0.040/-0.073	63	8	WWK195C	●
19.5	0/-0.130	10	h6	4	-0.040/-0.073	63	8	WWK195D	●
19.5	0/-0.130	10	h6	5	-0.040/-0.073	63	8	WWK195E	●
19.5	0/-0.130	10	h6	6	-0.040/-0.073	63	8	WWK195F	●
22.5	0/-0.130	10	h6	4	-0.040/-0.073	63	10	WWK225D	●
22.5	0/-0.130	10	h6	5	-0.040/-0.073	63	10	WWK225E	●
22.5	0/-0.130	10	h6	6	-0.040/-0.073	63	10	WWK225F	●
22.5	0/-0.130	10	h6	8	-0.040/-0.073	63	10	WWK225H	●
25.5	0/-0.130	10	h6	5	-0.040/-0.073	63	10	WWK255E	●
25.5	0/-0.130	10	h6	6	-0.040/-0.073	63	10	WWK255F	●
25.5	0/-0.130	10	h6	7	-0.040/-0.073	63	10	WWK255G	●
25.5	0/-0.130	10	h6	8	-0.040/-0.073	63	10	WWK255H	●
28.5	0/-0.130	10	h6	5	-0.040/-0.073	63	10	WWK285E	●
28.5	0/-0.130	10	h6	6	-0.040/-0.073	63	10	WWK285F	●
28.5	0/-0.130	10	h6	7	-0.040/-0.073	63	10	WWK285G	●
28.5	0/-0.130	10	h6	8	-0.040/-0.073	63	10	WWK285H	●
32.5	0/-0.160	12	h6	10	-0.050/-0.089	71	12	WWK325L	●
32.5	0/-0.160	12	h6	5	-0.050/-0.089	71	12	WWK325E	●
32.5	0/-0.160	12	h6	6	-0.050/-0.089	71	12	WWK325F	●
32.5	0/-0.160	12	h6	7	-0.050/-0.089	71	12	WWK325G	●
32.5	0/-0.160	12	h6	8	-0.050/-0.089	71	12	WWK325H	●

★ 1st choice, ☆ suitable, ● stock standard, ● non-stock standard (no MOQ), ○ non-stock standard (MOQ), ▲ upcoming product, ▽ stock exhaustion

Cutting Parameters

WWK

		P1 P2 P3 P4				P7 M1		K1 K2		N1 N2 N3 N4			
Material Group ISO 513													
Hardness/Rm		≤800 N/mm ²				≤750 N/mm ²		≤350 HB					
ap x ae		DIN Norm 6888				DIN Norm 6888		DIN Norm 6888		DIN Norm 6888			
Vc (m/min)		25÷35				12÷18		20÷30		40÷60			
DC (mm)	z	fz (mm/z)				fz (mm/z)		fz (mm/z)		fz (mm/z)			
10.5	8	0.010				0.007		0.009		0.011			
13.5	8	0.018				0.012		0.015		0.019			
16.5	8	0.025				0.018		0.021		0.028			
19.5	8	0.033				0.023		0.028		0.036			
22.5	10	0.040				0.028		0.034		0.044			
25.5	10	0.045				0.032		0.038		0.050			
28.5	10	0.050				0.035		0.043		0.055			
32.5	12	0.055				0.039		0.047		0.061			



SOLID

H - CARBIDE DRILLS

I - HSS DRILLS

J - CARBIDE END MILLS

K - HSS END MILLS

L - CARBIDE BURRS