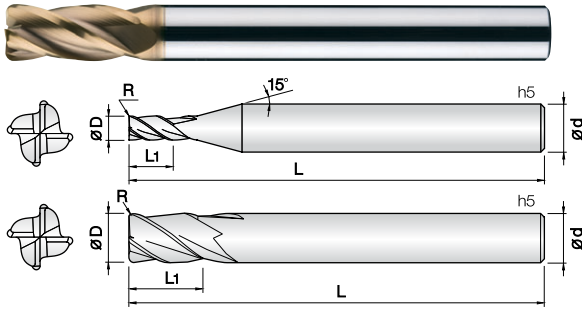




- Endmills for pre-hardened and hardened steel (HRC50~62)
- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- Designed for minimizing edge chipping by corner R shape.
- Various corner R and overall length for wide range application.
- Outstanding performance at high speed machining by ultra fine (0.2 μ m) WC grade.



R2 ~ 4

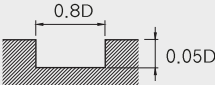
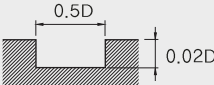
D Size	D Tolerance
Ø1 ~ 5	+0 ~ -0.01 mm
Ø6 ~ 12	-0.005 ~ -0.015 mm
Ø16 ~ 20	-0.01 ~ -0.02 mm

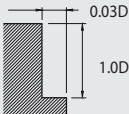
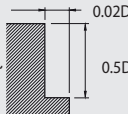
mm

2NCR / 4NCR

■ Use the same RPM and raise up the feed up to 30% for 4NCR.

• RPM: rev./min • Feed: mm/min

Slotting																
Material	Alloy Steel				Prehardened Steel / Hardened Steel				Hardened Steels				Hardened Steels			
Hardness	30 ~ 40HRC				40 ~ 45HRC				45 ~ 55HRC				55 ~ 62HRC			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
Ø0.4	50,000	662	0.020	0.32	45,000	315	0.020	0.32	40,000	126	0.008	0.20	33,000	70	0.008	0.20
Ø0.5	50,000	756	0.025	0.4	45,000	360	0.025	0.4	40,000	144	0.01	0.25	33,000	80	0.01	0.25
Ø0.6	50,000	851	0.03	0.48	45,000	405	0.03	0.48	40,000	162	0.012	0.3	30,000	90	0.012	0.3
Ø0.8	50,000	945	0.04	0.64	45,000	450	0.04	0.64	30,000	180	0.016	0.4	25,000	100	0.016	0.4
Ø 1	48,000	2,344	0.05	0.8	38,000	1,116	0.05	0.8	25,500	446	0.02	0.5	20,500	248	0.02	0.5
Ø 2	33,300	2,797	0.1	1.6	26,000	1,332	0.1	1.6	17,500	533	0.04	1	14,500	296	0.04	1
Ø 3	21,800	2,835	0.15	2.4	17,300	1,350	0.15	2.4	11,500	540	0.06	1.5	9,500	300	0.06	1.5
Ø 4	16,700	2,911	0.2	3.2	13,200	1,386	0.2	3.2	8,800	554	0.08	2	7,200	308	0.08	2
Ø 5	15,700	3,100	0.25	4	12,500	1,476	0.25	4	8,300	590	0.1	2.5	6,400	328	0.1	2.5
Ø 6	13,100	3,024	0.3	4.8	10,350	1,440	0.3	4.8	6,900	576	0.12	3	5,300	320	0.12	3
Ø 8	9,880	2,759	0.4	6.4	7,800	1,314	0.4	6.4	5,200	526	0.16	4	4,000	292	0.16	4
Ø 10	7,800	2,570	0.5	8	6,150	1,224	0.5	8	4,100	490	0.2	5	3,200	272	0.2	5
Ø 12	6,650	2,570	0.6	9.6	5,250	1,224	0.6	9.6	3,500	490	0.24	6	2,650	272	0.24	6
Ø 16	6,150	2,400	0.8	12.8	5,500	1,180	0.8	12.8	3,210	450	0.32	8	2,420	250	0.32	8
Depth of Cut	~ 45HRC  45HRC ~ 															

Side Cutting																
Material	Alloy Steel				Prehardened Steel / Hardened Steel				Hardened Steels				Hardened Steels			
Hardness	30 ~ 40HRC				40 ~ 45HRC				45 ~ 55HRC				55 ~ 62HRC			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø0.4	50,000	278	0.4	0.01	45,000	250	0.4	0.01	40,000	150	0.20	0.01	33,000	70	0.20	0.01
ø0.5	50,000	308	0.5	0.015	45,000	277	0.5	0.015	40,000	166	0.25	0.01	33,000	80	0.25	0.01
ø0.6	50,000	309	0.6	0.018	45,000	278	0.6	0.018	40,000	167	0.30	0.012	30,000	90	0.30	0.012
ø0.8	50,000	503	0.8	0.024	40,000	452	0.8	0.024	30,000	271	0.40	0.016	25,000	100	0.40	0.016
ø1	48,000	980	1	0.03	38,000	882	1	0.03	25,500	529	0.50	0.02	20,500	248	0.50	0.02
ø2	33,300	1,440	2	0.06	26,000	1,296	2	0.06	17,500	778	1.00	0.04	14,500	296	1.00	0.04
ø3	21,800	1,470	3	0.09	17,300	1,323	3	0.09	11,500	794	1.50	0.06	9,500	296	1.50	0.06
ø4	16,700	1,500	4	0.12	13,200	1,350	4	0.12	8,800	810	2.00	0.08	7,200	308	2.00	0.08
ø5	15,700	1,740	5	0.15	12,500	1,566	5	0.15	8,300	940	2.50	0.1	6,400	328	2.50	0.1
ø6	13,100	1,620	6	0.18	10,350	1,458	6	0.18	6,900	875	3.00	0.12	5,300	320	3.00	0.12
ø8	9,880	1,584	8	0.24	7,800	1,426	8	0.24	5,200	855	4.00	0.16	4,000	292	4.00	0.16
ø10	7,800	1,440	10	0.3	6,150	1,296	10	0.3	4,100	778	5.00	0.2	3,200	272	5.00	0.2
ø12	6,650	1,440	12	0.36	5,250	1,296	12	0.36	3,500	778	6.00	0.24	2,650	272	6.00	0.24
ø16	6,280	1,290	16	0.48	5,100	1,120	16	0.48	3,410	750	8.00	0.32	2,440	250	8.00	0.32
Depth of Cut	~ 45HRC  45HRC ~ 															

- When milling workpiece HRC over 62, reduce 20% of the RPM and feed with the same diameter.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.
- The parameters on the table is based on 2flutes. For using 4flutes, use the same RPM and raise up the feed up to 50% in stable milling condition.
- For groove milling, set up the Ae value by considering of corner radius value.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.