

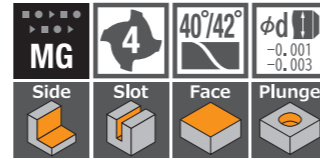
MUGEN COATING 4-Flute High Efficient "Z" End Mill for Carbon Steels Total 62 sizes

Recommended Milling Conditions

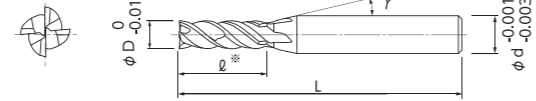
- P Carbon Steel
- P Alloy Steel
- P Prehardened Steel

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High efficient machining on carbon steels!
Continuous machining from plunging approach to slotting

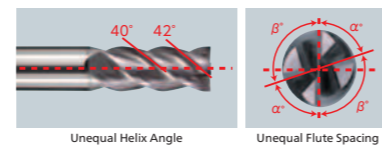


Plunge depth is referred to recommended milling conditions



※ The practical Length of Cut is 0.1mm longer than the specification table.

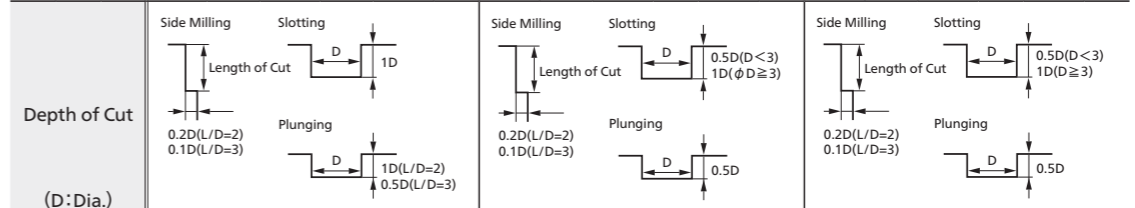
- Unequal flute spacing, unequal helix angle and high rigid end profile design to minimize chatter realize high efficient machining.
- New developed special edge profile realized multi-functional performance of side milling, slot milling and plunging approaches on carbon steels.
- Long time stable machining is realized by adopting MUGEN COATING.
- Total 62 sizes, some sizes line up with L/D=2 or 3.



Code No.	Dia. (D)	Length of Cut (ℓ)	Neck Taper Angle (γ)	Shank Dia. (d)	Overall Length (L)
08-00135-01020	1	2	12°	4	50
08-00135-01030		3	12°	4	50
08-00135-01120	1.1	2.2	12°	4	50
08-00135-01220	1.2	2.4	12°	4	50
08-00135-01320	1.3	2.6	12°	4	50
08-00135-01420	1.4	2.8	12°	4	50
08-00135-01520	1.5	3	12°	4	50
08-00135-01530		4.5	12°	4	50
08-00135-01620	1.6	3.2	12°	6	50
08-00135-01720	1.7	3.4	12°	6	50
08-00135-01820	1.8	3.6	12°	6	50
08-00135-01920	1.9	3.8	12°	6	50
08-00135-02020	2	4	12°	6	50
08-00135-02030		6	12°	6	60
08-00135-02120	2.1	4.2	12°	6	50
08-00135-02220	2.2	4.4	12°	6	50
08-00135-02320	2.3	4.6	12°	6	50
08-00135-02420	2.4	4.8	12°	6	50
08-00135-02520	2.5	5	12°	6	50
08-00135-02530		7.5	12°	6	60
08-00135-02620	2.6	5.2	12°	6	50
08-00135-02720	2.7	5.4	12°	6	50
08-00135-02820	2.8	5.6	12°	6	50
08-00135-02920	2.9	5.8	12°	6	50
08-00135-03020	3	6	12°	6	50
08-00135-03030		9	12°	6	60
08-00135-03120	3.1	6.2	12°	6	50
08-00135-03220	3.2	6.4	12°	6	50
08-00135-03320	3.3	6.6	12°	6	50
08-00135-03420	3.4	6.8	12°	6	50

Code No.	Dia. (D)	Length of Cut (ℓ)	Neck Taper Angle (γ)	Shank Dia. (d)	Overall Length (L)
08-00135-03520	3.5	7	12°	6	50
08-00135-03530		10.5	12°	6	60
08-00135-03620	3.6	7.2	12°	6	50
08-00135-03720	3.7	7.4	12°	6	50
08-00135-03820	3.8	7.6	12°	6	50
08-00135-03920	3.9	7.8	12°	6	50
08-00135-04020	4	8	12°	6	50
08-00135-04030		12	12°	6	60
08-00135-04120	4.1	8.2	12°	6	50
08-00135-04220	4.2	8.4	12°	6	50
08-00135-04320	4.3	8.6	12°	6	50
08-00135-04420	4.4	8.8	12°	6	50
08-00135-04520	4.5	9	12°	6	50
08-00135-04530		13.5	12°	6	60
08-00135-04620	4.6	9.2	12°	6	50
08-00135-04720	4.7	9.4	12°	6	50
08-00135-04820	4.8	9.6	12°	6	50
08-00135-04920	4.9	9.8	12°	6	50
08-00135-05020	5	10	12°	6	50
08-00135-05030		15	12°	6	60
08-00135-05120	5.1	10.2	12°	6	50
08-00135-05220	5.2	10.4	12°	6	50
08-00135-05320	5.3	10.6	12°	6	50
08-00135-05420	5.4	10.8	12°	6	50
08-00135-05520	5.5	11	12°	6	50
08-00135-05530		16.5	12°	6	60
08-00135-05620	5.6	11.2	12°	6	50
08-00135-05720	5.7	11.4	12°	6	50
08-00135-05820	5.8	11.6	12°	6	50
08-00135-05920	5.9	11.8	12°	6	50
08-00135-06020	6	12	-	6	60
08-00135-06030		18	-	6	60

Work Material	Carbon Steels S50C						Alloy Steels SCM·SKD						Prehardened Steels (~40HRC)							
	Side Milling		Slotting		Plunging		Side Milling		Slotting		Plunging		Side Milling		Slotting		Plunging			
	Spindle Speed	Feed	Spindle Speed	Feed	Spindle Speed	Feed	Spindle Speed	Feed	Spindle Speed	Feed	Spindle Speed	Feed	Spindle Speed	Feed	Spindle Speed	Feed	Spindle Speed	Feed		
1	2	2	20,000	800	18,000	450	18,000	150	19,000	700	16,000	360	16,000	100	16,200	500	12,800	290	12,800	100
	3	3	17,500	700	16,000	350	16,000	100	16,800	580	14,500	250	14,500	50	14,300	430	11,600	200	11,600	50
1.5	3	2	14,800	900	13,500	560	13,500	150	13,500	800	12,500	450	12,500	120	11,500	600	10,100	360	10,100	120
	4.5	3	12,800	770	11,500	420	11,500	100	12,000	650	10,300	300	10,300	75	10,200	500	8,300	240	8,300	75
2	4	2	12,500	1,100	11,000	650	11,000	150	11,000	1,000	9,500	520	9,500	150	9,400	750	7,700	420	7,700	150
	6	3	11,000	900	10,000	500	10,000	100	9,600	750	8,400	360	8,400	100	8,200	580	6,800	290	6,800	100
2.5	5	2	10,900	1,300	9,000	850	9,000	200	9,000	1,120	8,000	680	8,000	150	7,700	850	6,400	540	6,400	150
	7.5	3	9,600	1,050	8,200	600	8,200	150	7,800	920	7,200	430	7,200	120	6,600	700	5,800	340	5,800	120
3	6	2	10,000	1,600	8,600	1,000	8,600	250	8,000	1,300	7,500	720	7,500	200	6,800	900	6,000	580	6,000	200
	9	3	9,000	1,300	7,800	730	7,800	200	6,600	1,000	6,400	530	6,400	150	5,600	720	5,300	420	5,300	150
3.5	7	2	9,200	1,650	7,900	1,000	7,900	250	7,400	1,340	6,900	800	6,900	200	6,300	920	5,500	640	5,500	200
	10.5	3	8,100	1,400	6,900	820	6,900	200	6,000	1,050	5,800	590	5,800	150	5,300	730	4,700	440	4,700	150
4	8	2	8,500	1,700	7,000	1,100	7,000	300	7,200	1,400	6,300	850	6,300	200	6,100	950	5,000	700	5,000	200
	12	3	7,500	1,400	6,100	850	6,100	250	5,900	1,100	5,600	610	5,600	150	5,100	760	4,300	470	4,300	150
4.5	9	2	7,600	1,700	6,300	1,100	6,300	300	6,600	1,500	5,700	880	5,700	200	5,600	1,000	4,600	700	4,600	200
	13.5	3	7,100	1,550	5,500	900	5,500	250	5,800	1,150	5,000	650	5,000	150	4,900	780	3,900	500	3,900	150
5	10	2	7,000	1,900	5,700	1,100	5,700	300	6,300	1,600	5,200	880	5,200	200	5,400	1,100	4,200	700	4,200	200
	15	3	6,500	1,700	5,000	900	5,000	250	5,700	1,250	4,600	650	4,600	150	4,800	800	3,600	520	3,600	150
5.5	11	2	6,400	2,000	5,300	1,100	5,300	300	6,100	1,600	4,800	880	4,800	200	5,200	1,100	3,900	700	3,900	200
	16.5	3	6,000	1,800	4,600	900	4,600	250	5,600	1,250	4,300	650	4,300	150	4,700	800	3,300	520	3,300	150
6	12	2	6,000	2,000	4,900	1,100	4,900	300	5,700	1,600	4,500	880	4,500	200	4,800	1,100	3,600	700	3,600	200
	18	3	5,600	1,800	4,300	900	4,300	250	5,300	1,250	4,000	650	4,000	150	4,500	800	3,100	520	3,100	150



- Notes
- ※1 Please choose the short end tooth when measure the tool length.
 - ※2 Adjust milling condition conforming with machine rigidity and clamping condition. Final milling conditions are subject to machining profile, purpose and machine status.
 - ※3 Adjust both Spindle Speed and Feed at the same rate.
 - ※4 Please increasing the coolant flow rate and pressure as much as possible, and supply it sufficiently to the machining point and flute.
 - ※5 Please change the Depth of Cut or Feed when chips could not remove smoothly during plunging.
 - ※6 Please be noted there would be a possible tool chipping or breakage when the chip removal is insufficient.
 - ※7 Use a rigid and precise machine and chuck holder.
 - ※8 Overhang of end mill should be as short as possible from spindle nose.

How to Order When you order, indicate MSCZ440 (D)×(ℓ).
※(γ) is reference value.

Machining case S-027