MSCZ440-LN

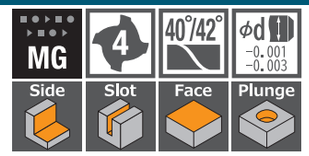
Size ϕ 1 ～ ϕ 6

≦40 HRC

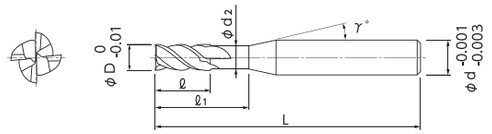
MUGEN COATING 4-Flute Long Neck High Efficient "Z" End Mill for Carbon Steels

Total 33 sizes

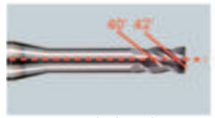
High efficient machining on carbon steels.
Continuous machining from plunging approach to slotting.
Long neck type to prevent interference



Plunge depth is refered to recommended milling conditions



- 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.
- Long neck type prevent interference with work material, the Under neck length lined up with L/D=3 to 5.


Unequal Helix Angle


Unequal Flute Spacing

Unit : mm

Code No.	Dia. (D)	Length of Cut (ℓ)	Under Neck Length (ℓ1)	Neck Dia. (d2)	Neck Taper Angle (γ)	Shank Dia. (d)	Overall Length (L)
08-00136-01013	1	1.5	3	0.95	12°	4	50
08-00136-01014			4	0.95	12°	4	50
08-00136-01015			5	0.95	12°	4	50
08-00136-01513	1.5	2.3	4.5	1.45	12°	4	50
08-00136-01514			6	1.45	12°	4	50
08-00136-01515			7.5	1.45	12°	4	50
08-00136-02013	2	3	6	1.94	12°	6	50
08-00136-02014			8	1.94	12°	6	50
08-00136-02015			10	1.94	12°	6	50
08-00136-02513	2.5	3.8	7.5	2.4	12°	6	50
08-00136-02514			10	2.4	12°	6	50
08-00136-02515			12.5	2.4	12°	6	60
08-00136-03013	3	4.5	9	2.85	12°	6	50
08-00136-03014			12	2.85	12°	6	50
08-00136-03015			15	2.85	12°	6	60
08-00136-03513	3.5	5.3	10.5	3.35	12°	6	50
08-00136-03514			14	3.35	12°	6	60
08-00136-03515			17.5	3.35	12°	6	60
08-00136-04013	4	6	12	3.8	12°	6	50
08-00136-04014			16	3.8	12°	6	60
08-00136-04015			20	3.8	12°	6	60
08-00136-04513	4.5	6.8	13.5	4.3	12°	6	50
08-00136-04514			18	4.3	12°	6	60
08-00136-04515			22.5	4.3	12°	6	60
08-00136-05013	5	7.5	15	4.8	12°	6	50
08-00136-05014			20	4.8	12°	6	60
08-00136-05015			25	4.8	12°	6	60
08-00136-05513	5.5	8.3	16.5	5.3	12°	6	50
08-00136-05514			22	5.3	12°	6	60
08-00136-05515			27.5	5.3	12°	6	60
08-00136-06013	6	9	18	5.8	–	6	60
08-00136-06014			24	5.8	–	6	60
08-00136-06015			30	5.8	–	6	70

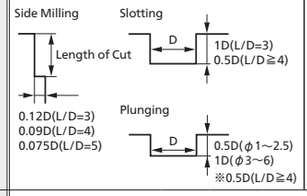
How to Order When you order, indicate MSCZ440-LN (D)×(ℓ)×(ℓ1).

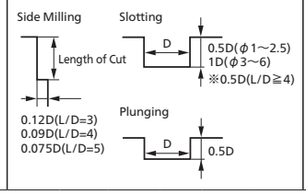
※(γ) is reference value.

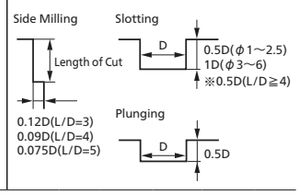
Recommended Milling Conditions

Work Material			Carbon Steels S50C						Alloy Steels SCM・SKD						Prehardened Steels (～40HRC)					
Dia.	Under Neck Length	L/D	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
			min-1	mm/min	min-1	mm/min	min-1	mm/min	min-1	mm/min	min-1	mm/min	min-1	mm/min	min-1	mm/min	min-1	mm/min	min-1	mm/min
1	3	3	18,900	760	17,000	400	17,000	100	18,100	650	15,300	300	15,300	50	15,400	470	12,300	240	12,300	50
	4	4	16,700	600	15,000	320	15,000	70	16,200	520	13,500	220	13,500	40	13,800	400	10,800	170	10,800	40
	5	5	13,300	400	12,000	200	12,000	50	12,900	350	10,900	130	10,900	30	11,000	180	8,800	100	8,800	30
1.5	4.5	3	14,200	860	12,500	480	12,500	120	13,000	750	11,300	360	11,300	100	11,100	560	9,100	290	9,100	100
	6	4	12,200	660	11,000	380	11,000	100	11,600	580	9,500	260	9,500	70	9,900	430	7,600	210	7,600	70
	7.5	5	10,000	450	9,000	240	9,000	70	9,600	400	7,600	160	7,600	50	8,200	200	6,100	130	6,100	50
2	6	3	11,800	1,000	10,600	580	10,600	150	10,400	870	8,900	440	8,900	100	8,900	680	7,200	350	7,200	100
	8	4	10,400	810	9,400	460	9,400	120	9,100	660	8,000	310	8,000	70	7,700	460	6,400	250	6,400	70
	10	5	8,400	560	7,600	290	7,600	100	8,000	480	6,500	190	6,500	50	6,800	230	5,200	150	5,200	50
2.5	7.5	3	10,100	1,200	8,600	770	8,600	200	8,400	1,000	7,600	580	7,600	150	7,200	780	6,100	460	6,100	150
	10	4	8,600	900	7,400	530	7,400	150	7,400	780	6,600	360	6,600	100	6,300	500	5,300	290	5,300	100
	12.5	5	7,100	650	6,200	370	6,200	120	6,800	560	5,400	240	5,400	70	5,800	270	4,300	190	4,300	70
3	9	3	9,600	1,500	8,300	840	8,300	250	7,100	1,150	7,200	620	7,200	150	6,200	800	5,800	500	5,800	150
	12	4	8,000	1,150	6,900	640	6,900	200	6,200	900	6,000	440	6,000	120	5,300	530	4,800	350	4,800	120
	15	5	6,800	740	5,900	420	5,900	150	5,800	620	5,100	270	5,100	100	4,900	300	4,100	220	4,100	100
3.5	10.5	3	8,700	1,540	7,500	920	7,500	250	6,800	1,200	6,600	690	6,600	150	5,800	840	5,200	530	5,200	150
	14	4	7,500	1,180	6,400	720	6,400	200	5,600	950	5,400	490	5,400	120	4,800	540	4,300	380	4,300	120
	17.5	5	6,300	820	5,400	460	5,400	150	5,200	650	4,700	300	4,700	100	4,400	300	3,600	230	3,600	100
4	12	3	8,100	1,600	6,800	1,000	6,800	250	6,600	1,250	5,900	750	5,900	150	5,600	860	4,700	600	4,700	150
	16	4	6,800	1,200	5,600	760	5,600	200	5,500	950	5,000	520	5,000	120	4,700	560	3,900	400	3,900	120
	20	5	5,700	850	4,800	500	4,800	150	4,800	700	4,200	320	4,200	100	4,100	320	3,300	250	3,300	100
4.5	13.5	3	7,400	1,640	6,100	1,000	6,100	250	6,400	1,300	5,300	750	5,300	150	5,400	900	4,300	600	4,300	150
	18	4	6,500	1,200	5,100	800	5,100	200	5,400	950	4,500	550	4,500	120	4,600	600	3,600	400	3,600	120
	22.5	5	5,200	850	4,300	520	4,300	150	4,600	700	3,800	340	3,800	100	3,900	320	3,000	270	3,000	100
5	15	3	6,800	1,840	5,500	1,000	5,500	250	6,100	1,400	4,800	750	4,800	150	5,200	950	3,900	600	3,900	150
	20	4	6,000	1,250	4,800	800	4,800	200	5,200	1,000	4,200	550	4,200	120	4,400	600	3,300	400	3,300	120
	25	5	4,900	850	3,900	520	3,900	150	4,400	700	3,500	340	3,500	100	3,700	340	2,800	270	2,800	100
5.5	16.5	3	6,200	1,900	5,100	1,000	5,100	250	5,900	1,400	4,400	750	4,400	150	5,000	950	3,600	600	3,600	150
	22	4	5,600	1,250	4,400	800	4,400	200	4,900	1,000	3,900	550	3,900	120	4,200	620	3,100	400	3,100	120
	27.5	5	4,600	850	3,700	550	3,700	150	4,200	700	3,200	340	3,200	100	3,600	350	2,600	270	2,600	100
6	18	3	5,800	1,900	4,700	1,000	4,700	250	5,500	1,400	4,100	750	4,100	150	4,700	950	3,400	600	3,400	150
	24	4	5,200	1,250	4,100	800	4,100	200	4,600	1,000	3,700	550	3,700	120	3,900	620	2,900	400	2,900	120
	30	5	4,300	850	3,400	550	3,400	150	4,000	700	3,000	340	3,000	100	3,400	350	2,400	270	2,400	100

Depth of Cut (D:Dia.)







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.