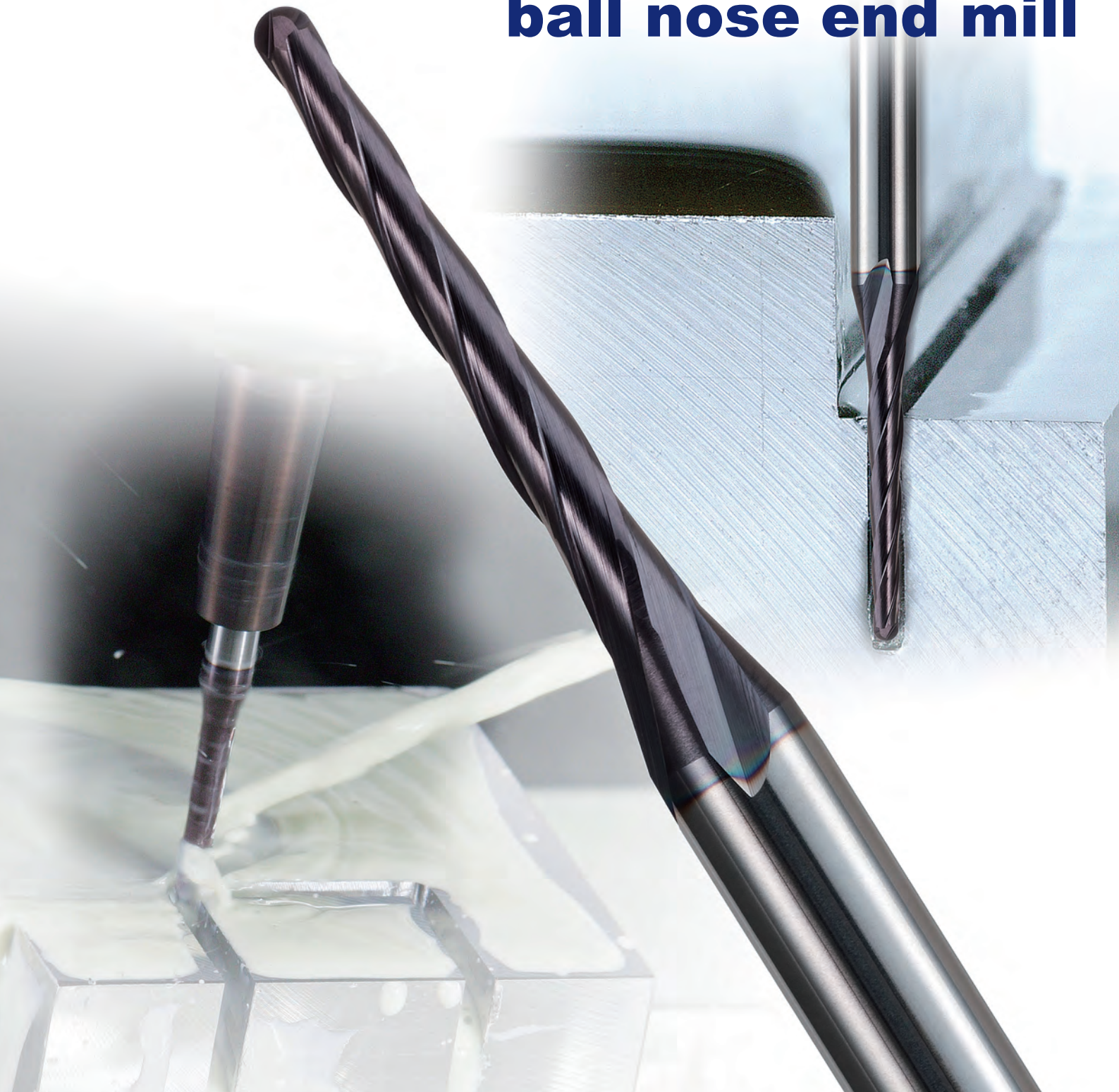


4 flute *MSTAR* taper ball nose end mill for rib milling

MS4LTB

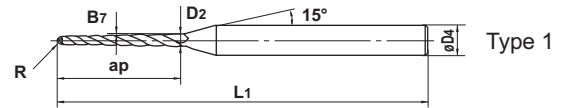
**New addition to *MSTAR*
end mill series for deep
slotting taper flute
ball nose end mill**



MSTAR END MILLS

MS4LTB NEW

Ball nose, 4 flute, Taper, For rib milling



● 4 flute taper ball nose end mill for rib milling.

Unit : mm

Order Number	Radius of ball nose R	Taper Angle One Side B7	Large Mill Dia. D2	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes N	Stock	Type
MS4LTBR0030T0030L04	0.3	30'	0.66	4	45	4	4	●	1
R0030T0030L06	0.3	30'	0.70	6	45	4	4	●	1
R0030T0100L04	0.3	1°	0.73	4	45	4	4	●	1
R0030T0100L06	0.3	1°	0.80	6	45	4	4	●	1
R0030T0130L04	0.3	1°30'	0.79	4	45	4	4	●	1
R0030T0130L06	0.3	1°30'	0.90	6	45	4	4	●	1
R0030T0200L04	0.3	2°	0.86	4	45	4	4	●	1
R0030T0200L06	0.3	2°	1.00	6	45	4	4	●	1
R0040T0030L06	0.4	30'	0.90	6	50	4	4	●	1
R0040T0030L08	0.4	30'	0.93	8	50	4	4	●	1
R0040T0030L10	0.4	30'	0.97	10	50	4	4	●	1
R0040T0100L06	0.4	1°	1.00	6	50	4	4	●	1
R0040T0100L08	0.4	1°	1.07	8	50	4	4	●	1
R0040T0100L10	0.4	1°	1.14	10	50	4	4	●	1
R0040T0130L06	0.4	1°30'	1.09	6	50	4	4	●	1
R0040T0130L08	0.4	1°30'	1.20	8	50	4	4	●	1
R0040T0130L10	0.4	1°30'	1.30	10	50	4	4	●	1
R0040T0200L06	0.4	2°	1.19	6	50	4	4	●	1
R0040T0200L08	0.4	2°	1.33	8	50	4	4	●	1
R0040T0200L10	0.4	2°	1.47	10	50	4	4	●	1
R0050T0030L08	0.5	30'	1.13	8	50	4	4	●	1
R0050T0030L10	0.5	30'	1.17	10	50	4	4	●	1
R0050T0030L12	0.5	30'	1.20	12	50	4	4	●	1
R0050T0030L16	0.5	30'	1.27	16	55	4	4	●	1
R0050T0100L08	0.5	1°	1.26	8	50	4	4	●	1
R0050T0100L10	0.5	1°	1.33	10	50	4	4	●	1
R0050T0100L12	0.5	1°	1.40	12	50	4	4	●	1
R0050T0100L16	0.5	1°	1.54	16	55	4	4	●	1
R0050T0130L08	0.5	1°30'	1.39	8	50	4	4	●	1
R0050T0130L10	0.5	1°30'	1.50	10	50	4	4	●	1
R0050T0130L12	0.5	1°30'	1.60	12	50	4	4	●	1
R0050T0130L16	0.5	1°30'	1.81	16	55	4	4	●	1
R0050T0200L08	0.5	2°	1.52	8	50	4	4	●	1
R0050T0200L10	0.5	2°	1.66	10	50	4	4	●	1
R0050T0200L12	0.5	2°	1.80	12	50	4	4	●	1
R0050T0200L16	0.5	2°	2.08	16	55	4	4	●	1
R0060T0030L08	0.6	30'	1.33	8	50	4	4	●	1
R0060T0030L10	0.6	30'	1.36	10	50	4	4	●	1

● : Inventory maintained.

Order Number	Radius of ball nose R	Taper Angle One Side B7	Large Mill Dia. D2	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes N	Stock	Type	
MS4LTBR0060T0030L12	0.6	30'	1.40	12	50	4	4	●	1	
R0060T0030L16	0.6	30'	1.47	16	55	4	4	●	1	
R0060T0100L08	0.6	1°	1.46	8	50	4	4	●	1	
R0060T0100L10	0.6	1°	1.53	10	50	4	4	●	1	
R0060T0100L12	0.6	1°	1.60	12	50	4	4	●	1	
R0060T0100L16	0.6	1°	1.74	16	55	4	4	●	1	
R0060T0130L08	0.6	1°30'	1.59	8	50	4	4	●	1	
R0060T0130L10	0.6	1°30'	1.69	10	50	4	4	●	1	
R0060T0130L12	0.6	1°30'	1.80	12	50	4	4	●	1	
R0060T0130L16	0.6	1°30'	2.01	16	55	4	4	●	1	
R0060T0200L08	0.6	2°	1.72	8	50	4	4	●	1	
R0060T0200L10	0.6	2°	1.86	10	50	4	4	●	1	
R0060T0200L12	0.6	2°	2.00	12	50	4	4	●	1	
R0060T0200L16	0.6	2°	2.28	16	55	4	4	●	1	
R0075T0030L08	0.75	30'	1.63	8	50	4	4	●	1	
R0075T0030L10	0.75	30'	1.66	10	50	4	4	●	1	
R0075T0030L12	0.75	30'	1.70	12	50	4	4	●	1	
R0075T0030L16	0.75	30'	1.77	16	55	4	4	●	1	
R0075T0030L20	0.75	30'	1.84	20	60	4	4	●	1	
R0075T0100L08	0.75	1°	1.75	8	50	4	4	●	1	
R0075T0100L10	0.75	1°	1.82	10	50	4	4	●	1	
R0075T0100L12	0.75	1°	1.89	12	50	4	4	●	1	
R0075T0100L16	0.75	1°	2.03	16	55	4	4	●	1	
R0075T0100L20	0.75	1°	2.17	20	60	4	4	●	1	
R0075T0130L08	0.75	1°30'	1.88	8	50	4	4	●	1	
R0075T0130L10	0.75	1°30'	1.98	10	50	4	4	●	1	
R0075T0130L12	0.75	1°30'	2.09	12	50	4	4	●	1	
R0075T0130L16	0.75	1°30'	2.30	16	55	4	4	●	1	
R0075T0130L20	0.75	1°30'	2.51	20	60	4	4	●	1	
R0075T0200L08	0.75	2°	2.01	8	50	4	4	●	1	
R0075T0200L10	0.75	2°	2.15	10	50	4	4	●	1	
R0075T0200L12	0.75	2°	2.29	12	50	4	4	●	1	
R0075T0200L16	0.75	2°	2.57	16	55	4	4	●	1	
R0075T0200L20	0.75	2°	2.84	20	60	4	4	●	1	
R0090T0030L08	0.9	30'	1.92	8	50	4	4	●	1	
R0090T0030L10	0.9	30'	1.96	10	50	4	4	●	1	
R0090T0030L12	0.9	30'	1.99	12	50	4	4	●	1	
R0090T0030L16	0.9	30'	2.06	16	55	4	4	●	1	
R0090T0030L20	0.9	30'	2.13	20	60	4	4	●	1	
R0090T0100L08	0.9	1°	2.05	8	50	4	4	●	1	
R0090T0100L10	0.9	1°	2.12	10	50	4	4	●	1	
R0090T0100L12	0.9	1°	2.19	12	50	4	4	●	1	
R0090T0100L16	0.9	1°	2.33	16	55	4	4	●	1	
R0090T0100L20	0.9	1°	2.47	20	60	4	4	●	1	
R0090T0130L08	0.9	1°30'	2.17	8	50	4	4	●	1	
R0090T0130L10	0.9	1°30'	2.28	10	50	4	4	●	1	
R0090T0130L12	0.9	1°30'	2.38	12	50	4	4	●	1	
R0090T0130L16	0.9	1°30'	2.59	16	55	4	4	●	1	

Order Number	Radius of ball nose R	Taper Angle One Side B7	Large Mill Dia. D2	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes N	Stock	Type	
MS4LTBR0090T0130L20	0.9	1°30'	2.80	20	60	4	4	●	1	
R0090T0200L08	0.9	2°	2.30	8	50	4	4	●	1	
R0090T0200L10	0.9	2°	2.44	10	50	4	4	●	1	
R0090T0200L12	0.9	2°	2.58	12	50	4	4	●	1	
R0090T0200L16	0.9	2°	2.86	16	55	4	4	●	1	
R0090T0200L20	0.9	2°	3.13	20	60	4	4	●	1	
R0100T0030L10	1	30'	2.16	10	50	4	4	●	1	
R0100T0030L12	1	30'	2.19	12	50	4	4	●	1	
R0100T0030L16	1	30'	2.26	16	55	4	4	●	1	
R0100T0030L20	1	30'	2.33	20	60	4	4	●	1	
R0100T0030L25	1	30'	2.42	25	65	4	4	●	1	
R0100T0030L30	1	30'	2.51	30	65	4	4	●	1	
R0100T0100L10	1	1°	2.31	10	50	4	4	●	1	
R0100T0100L12	1	1°	2.38	12	50	4	4	●	1	
R0100T0100L16	1	1°	2.52	16	55	4	4	●	1	
R0100T0100L20	1	1°	2.66	20	60	4	4	●	1	
R0100T0100L25	1	1°	2.84	25	65	4	4	●	1	
R0100T0100L30	1	1°	3.01	30	65	4	4	●	1	
R0100T0130L10	1	1°30'	2.47	10	50	4	4	●	1	
R0100T0130L12	1	1°30'	2.58	12	50	4	4	●	1	
R0100T0130L16	1	1°30'	2.79	16	55	4	4	●	1	
R0100T0130L20	1	1°30'	3.00	20	60	4	4	●	1	
R0100T0130L25	1	1°30'	3.26	25	65	4	4	●	1	
R0100T0130L30	1	1°30'	3.52	30	65	4	4	●	1	
R0100T0200L10	1	2°	2.63	10	50	4	4	●	1	
R0100T0200L12	1	2°	2.77	12	50	4	4	●	1	
R0100T0200L16	1	2°	3.05	16	55	4	4	●	1	
R0100T0200L20	1	2°	3.33	20	60	4	4	●	1	
R0100T0200L25	1	2°	3.68	25	65	4	4	●	1	
R0100T0200L30	1	2°	4.03	30	65	4	4	●	1	

MS4LTB

Ball nose, 4 flute, Taper, For rib milling

Work material		Carbon steel, Alloy steel, Tool steel, Pre-hardened steel AISI 1049, SCM, SK, AISI H13, STAVAX, AISI 420, NAK, HPM (-45HRC)			Hardened steel AISI H13 (45-52HRC)		
R (mm)	Length of cut (mm)	Revolution (min ⁻¹)	Feed rate (mm/min)	Depth of cut per pass ap (mm)	Revolution (min ⁻¹)	Feed rate (mm/min)	Depth of cut per pass ap (mm)
R0.3	4	18,000-32,000	250-600	0.01	13,000-24,000	200-400	0.005
	6			0.007			0.004
R0.4	6	14,000-24,000	250-600	0.025	10,000-18,000	200-400	0.013
	8			0.02			0.01
	10			0.015			0.008
R0.5	8	11,000-19,000	300-800	0.025	8,000-14,000	200-500	0.013
	10			0.02			0.01
	12			0.018			0.009
	16			0.015			0.008
R0.6	8	9,200-16,000	300-800	0.035	6,600-12,000	200-500	0.018
	10			0.03			0.015
	12			0.027			0.013
	16			0.02			0.01
R0.75	8	7,500-13,000	300-800	0.05	5,300-9,500	200-500	0.025
	10			0.04			0.02
	12			0.035			0.018
	16			0.03			0.015
	20			0.02			0.01
R0.9	8	6,200-11,000	300-800	0.08	4,400-8,000	200-500	0.04
	10			0.07			0.035
	12			0.06			0.035
	16			0.05			0.03
	20			0.04			0.02
R1	10	5,500-9,500	300-800	0.08	4,000-7,200	200-500	0.045
	12			0.07			0.04
	16			0.05			0.03
	20			0.04			0.02
	25			0.03			0.015
	30			0.02			0.01

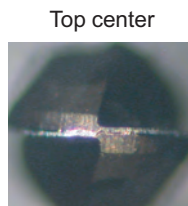
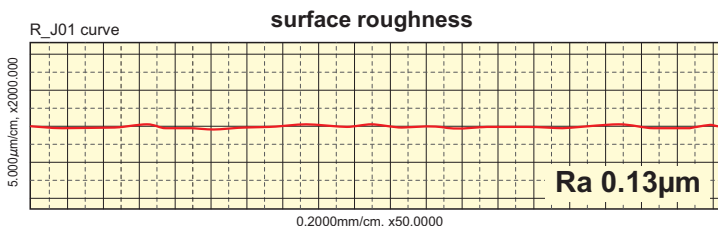
- 1) The above table shows the revolution and feed rate for each neck length. Please reduce the feed rate when using end mills with a longer neck length.
- 2) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately. Please reduce the feed rate when the surface finish is important.

Machining Example 1

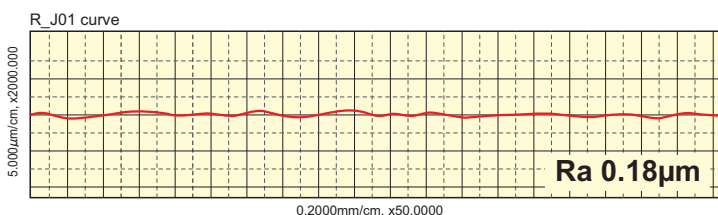
Compare surface finish and tool wear

Realize ideal surface finish!

MS4LTB
Cutting 6 groove

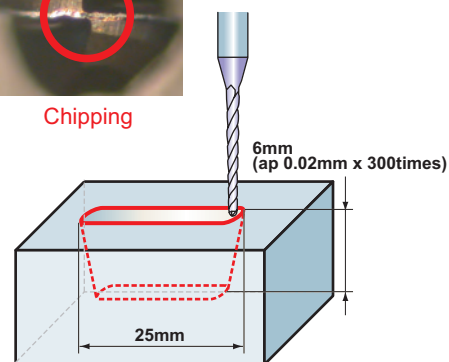


Competitor
Cutting 1 groove



Chipping

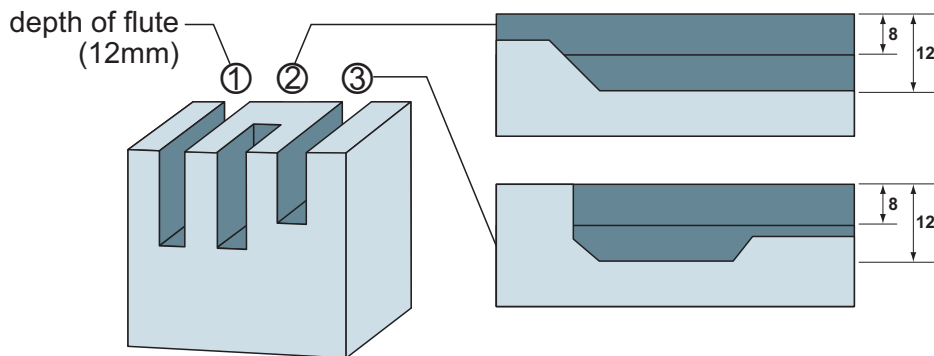
End mill	MS4LTB R0.4 x 30' x 8
Work material	SKD61 (50HRC)
Revolution	20,000min ⁻¹ (50m/min)
Feed rate	500mm/min (0.013mm/tooth)
Cutting method	Blind rib(flute length25mm), non water soluble cutting fluid



Machining Example 2

Performance Report

Achieved good cutting performance in blind flute machining and complex geometry.



End mill	MS4LTB R0.5 x 1° x 8
Work material	STAVAX-H (55HRC)
Revolution	20,000min ⁻¹ (63m/min)
Feed rate	1,000mm/min (0.025mm/tooth)



JQA-2522
JQA-EM0941

MITSUBISHI MATERIALS KOBE TOOLS

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