

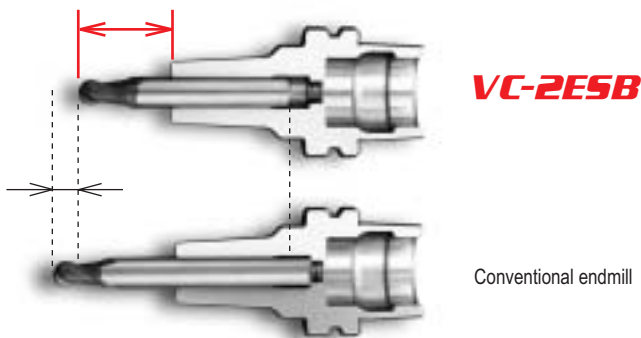
Ball Nose, Extra Short, 2 flute

**VC-2ESB**

**The supreme series for direct milling with HSK and shrink-fit-holder.**



**Optimum overhang is secured !**



- The optimal endmill series for direct milling in compact machining center.
- They display excellent performance in HSK and shrink-fit-holder by setting up high rigidity 1D flute and shortening shank length to the minimum.
- Long tool life is available due to applying "Miracle coating for high-speed and high-hardness processing".
- VC-2ESB shows excellent performance in dry-cutting.

# MIRACLE END MILLS

# VC-2ESB



Ball Nose, Extra Short, 2 flute

## Optimum overhang is ensured !

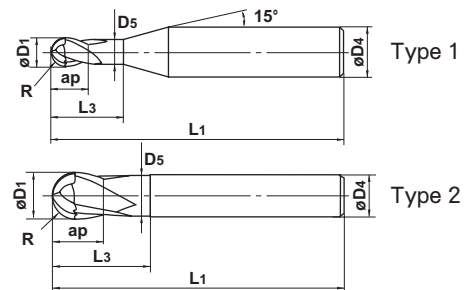
### Features

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- They display excellent performance in HSK and shrink-fit-holder by setting up high rigidity 1D flute and shortening shank length to the minimum.
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**VC-2ESB** **Size up** ±0.01  $D_1 < 6 \quad 0 - -0.028$   
 $6 \leq D_1 \quad 0 - -0.038$



- The optimal series for direct milling in compact machining center.



Unit : mm

Order Number	Radius of ball nose R	Dia. D <sub>1</sub>	Length of Cut ap	Neck Length L <sub>3</sub>	Neck Dia. D <sub>5</sub>	Overall Length L <sub>1</sub>	Shank Dia. D <sub>4</sub>	No. of Flute N	Stock	Type
<b>Size up</b> VC2ESBR0015N006	0.15	0.3	0.3	0.6	0.27	30	4	2	●	1
<b>Size up</b> VC2ESBR0020N008	0.2	0.4	0.4	0.8	0.36	30	4	2	●	1
<b>Size up</b> VC2ESBR0030N012	0.3	0.6	0.6	1.2	0.56	30	4	2	●	1
<b>Size up</b> VC2ESBR0040N016	0.4	0.8	0.8	1.6	0.76	30	4	2	●	1
VC2ESBR0050	0.5	1	1	—	—	30	4	2	●	1
<b>Size up</b> VC2ESBR0050N025	0.5	1	1	2.5	0.96	30	4	2	●	1
VC2ESBR0075	0.75	1.5	1.5	—	—	30	4	2	●	1
<b>Size up</b> VC2ESBR0075N040	0.75	1.5	1.5	4	1.46	30	4	2	●	1
VC2ESBR0100	1	2	2	—	—	40	6	2	●	1
<b>Size up</b> VC2ESBR0100N060	1	2	2	6	1.96	40	6	2	●	1
VC2ESBR0150	1.5	3	3	—	—	40	6	2	●	1
<b>Size up</b> VC2ESBR0150N080	1.5	3	3	8	2.96	40	6	2	●	1
VC2ESBR0200	2	4	4	—	—	40	6	2	●	1
<b>Size up</b> VC2ESBR0200N080	2	4	4	8	3.96	40	6	2	●	1
VC2ESBR0250	2.5	5	5	—	—	40	6	2	●	1
<b>Size up</b> VC2ESBR0250N120	2.5	5	5	12	4.96	40	6	2	●	1
VC2ESBR0300	3	6	6	—	—	40	6	2	●	2
<b>Size up</b> VC2ESBR0300N130	3	6	6	13	5.85	40	6	2	●	2
VC2ESBR0350	3.5	7	7	—	—	50	8	2	●	1
VC2ESBR0400	4	8	8	—	—	50	8	2	●	2
VC2ESBR0500	5	10	10	—	—	60	10	2	●	2
VC2ESBR0600	6	12	12	—	—	65	12	2	●	2

● : Inventory maintained.

# STANDARD CUTTING CONDITIONS OF MIRACLE END MILL

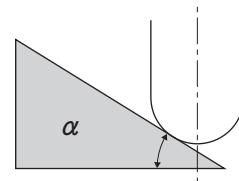
## VC-2ESB

Ball Nose, Extra Short, 2 flute

Work material	Alloy steel, Tool steel, Pre-hardened steel (-45HRC) SCM, AISI H13, AISI D2, NAK etc.				Hardened steel (45-55HRC) AISI H13, AISI D2, SUS420 etc.				Hardened steel (55-62HRC) AISI D2, SKH, SKS etc.			
	$\alpha \leq 15^\circ$		$\alpha > 15^\circ$		$\alpha \leq 15^\circ$		$\alpha > 15^\circ$		$\alpha \leq 15^\circ$		$\alpha > 15^\circ$	
	Revolution (min <sup>-1</sup> )	Feed rate (mm/min)	Revolution (min <sup>-1</sup> )	Feed rate (mm/min)	Revolution (min <sup>-1</sup> )	Feed rate (mm/min)	Revolution (min <sup>-1</sup> )	Feed rate (mm/min)	Revolution (min <sup>-1</sup> )	Feed rate (mm/min)	Revolution (min <sup>-1</sup> )	Feed rate (mm/min)
<b>R 0.15</b>	40,000	600	40,000	450	40,000	510	40,000	380	40,000	510	40,000	380
<b>R 0.2</b>	40,000	800	40,000	600	40,000	680	40,000	510	40,000	680	32,000	400
<b>R 0.3</b>	40,000	1,300	40,000	980	40,000	1,100	40,000	830	32,000	880	22,000	450
<b>R 0.4</b>	40,000	1,900	40,000	1,400	40,000	1,600	35,000	1,100	25,000	1,000	18,000	540
<b>R 0.5</b>	40,000	2,400	35,000	1,600	35,000	1,800	30,000	1,100	21,000	1,000	15,000	570
<b>R 0.75</b>	40,000	3,000	30,000	1,700	30,000	1,900	25,000	1,200	14,000	890	10,000	470
<b>R 1</b>	35,000	3,000	25,000	1,700	25,000	1,800	20,000	1,100	11,000	800	8,000	430
<b>R 1.25</b>	33,000	3,000	24,000	1,700	22,000	1,700	17,000	1,000	9,300	710	6,500	370
<b>R 1.5</b>	30,000	3,000	23,000	1,700	20,000	1,700	15,000	1,000	8,000	670	5,600	350
<b>R 2</b>	25,000	3,000	20,000	1,700	17,000	1,700	13,000	1,000	6,400	640	4,500	340
<b>R 2.5</b>	23,000	3,000	17,000	1,700	15,000	1,700	11,000	1,000	5,000	550	3,500	290
<b>R 3</b>	20,000	3,000	15,000	1,700	13,000	1,700	10,000	1,000	4,200	530	2,900	270
<b>R 4</b>	15,000	3,000	11,000	1,700	10,000	1,700	7,500	1,000	3,200	540	2,200	280
<b>R 5</b>	12,000	2,900	9,000	1,600	8,000	1,600	6,000	900	2,500	510	1,800	270
<b>R 6</b>	10,000	2,500	7,500	1,400	6,600	1,400	5,000	800	2,100	440	1,500	230
<b>R 8</b>	7,500	1,900	5,600	1,100	5,000	1,100	3,700	600	1,600	340	1,100	170
<b>R10</b>	6,000	1,600	4,500	900	4,000	900	3,000	500	1,300	290	900	150
Depth of cut												

R:Radius

- $\alpha$  is the inclination of machining surface.
- If the rigidity of the machine or the work material installation is very low, or chattering and noise are generated, please reduce the revolution and the feed rate proportionately.  
When high machining accuracy is especially needed, we recommend lowering feed rate.
- Cutting condition may be considerably different due to the overhang (milling depth and neck length), depth of cut, and machine tools.  
Please see the above table as a standard.
- If the depth of cut is shallow, the revolution and feed rate can be increased.



SOLID  
ENDMILL

STANDARD CUTTING CONDITIONS OF MIRACLE END MILL

# MITSUBISHI MATERIALS KOBE TOOLS



JQA-2522  
JQA-EM0941

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