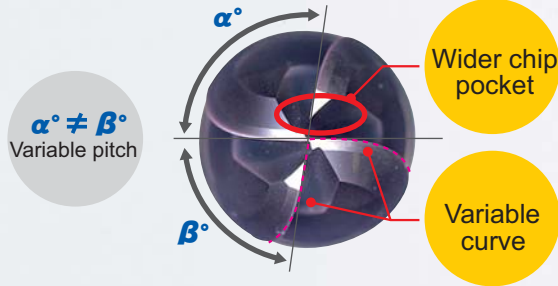


IMPACT MIRACLE vibration control end mill series

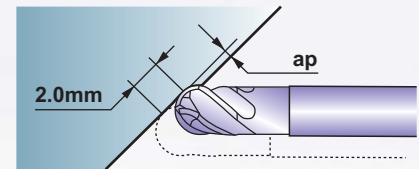
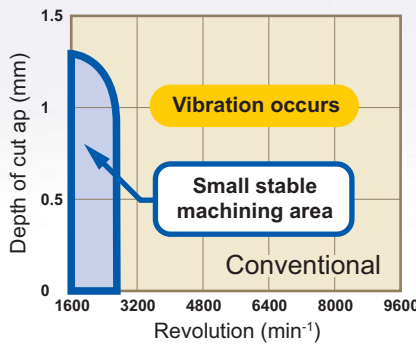
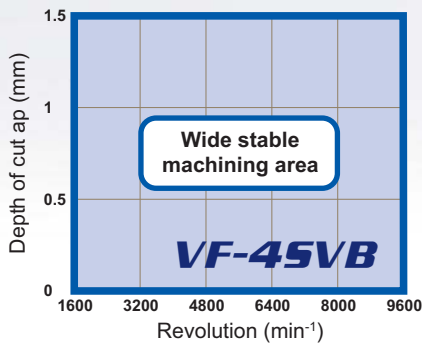
# VF-45VB

**“Variable curve” radius cutting edges for difficult-to-cut materials.**



- Newly designed radius cutting edges reduce vibration.
- Suitable for difficult-to-cut materials and thin plate machining.

### Vibration Resistance Comparison



End mill	VF45VBR0500 (R5)
Work material	DIN X5CrNi18-10
Revolution	1600-9600min <sup>-1</sup>
Feed rate	580-2300mm/min (0.06mm/tooth)
Cutting fluid	Emulsion

## VF-45VB

Ball nose, Short cut length, 4 flute, Variable curve

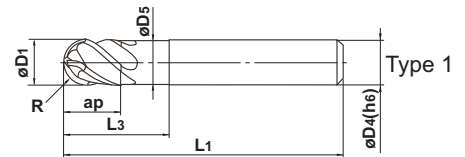


D4 = 6	0 - -0.008
8 ≤ D4 ≤ 10	0 - -0.009
12 ≤ D4 ≤ 16	0 - -0.011
D4 = 20	0 - -0.013

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
○	○			◎	◎		



Helix angle



- Impact Miracle end mill with variable curve ensures stable machining of difficult-to-cut materials.

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Overall Length L1	Shank Dia. D4	No. of Flutes N	Stock	Type
VF45VBR0300	3	6	9	15	5.85	50	6	4	●	1
R0400	4	8	12	20	7.85	60	8	4	●	1
R0500	5	10	15	25	9.7	70	10	4	●	1
R0600	6	12	18	30	11.7	75	12	4	●	1
R0800	8	16	24	40	15.5	90	16	4	●	1
R1000	10	20	30	50	19.5	100	20	4	●	1

● : Inventory maintained.

# IMPACT MIRACLE END MILLS

## VF-45VB

Ball nose, Short cut length, 4 flute, Variable curve

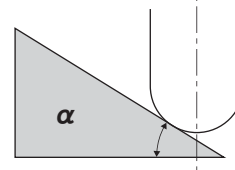
Work material	Carbon steel, Alloy steel (-45HRC) JIS S55C, SCM					Austenitic stainless steel JIS SUS304, SUS316 Titanium alloy JIS Ti-6Al-4V					Heat resistant alloy Inconel etc.				
	$\alpha \leq 15^\circ$		$\alpha > 15^\circ$		Depth of cut $a_p$ (mm)	$\alpha \leq 15^\circ$		$\alpha > 15^\circ$		Depth of cut $a_p$ (mm)	$\alpha \leq 15^\circ$		$\alpha > 15^\circ$		Depth of cut $a_p$ (mm)
	Revolution ( $\text{min}^{-1}$ )	Feed rate (mm/min)	Revolution ( $\text{min}^{-1}$ )	Feed rate (mm/min)		Revolution ( $\text{min}^{-1}$ )	Feed rate (mm/min)	Revolution ( $\text{min}^{-1}$ )	Feed rate (mm/min)		Revolution ( $\text{min}^{-1}$ )	Feed rate (mm/min)	Revolution ( $\text{min}^{-1}$ )	Feed rate (mm/min)	
<b>R 3</b>	16000	4800	10600	2100	0.5	12000	3200	8000	1400	0.5	3200	500	2100	210	0.25
<b>R 4</b>	12000	4300	8000	1900	0.8	9000	3200	6000	1400	0.8	2400	430	1600	190	0.4
<b>R 5</b>	9600	4100	6400	1800	1	7200	3000	4800	1300	1	2000	420	1300	180	0.5
<b>R 6</b>	8000	4000	5300	1800	1.2	6000	3000	4000	1300	1.2	1700	350	1100	150	0.6
<b>R 8</b>	6000	3200	4000	1400	1.6	4500	2500	3000	1100	1.6	1200	300	800	130	0.8
<b>R10</b>	4800	3000	3200	1300	2	3600	2300	2400	1000	2	1000	250	640	100	1

$\leq 0.5R$   
 $\leq a_p$

$\leq 0.2R$   
 $\leq a_p$

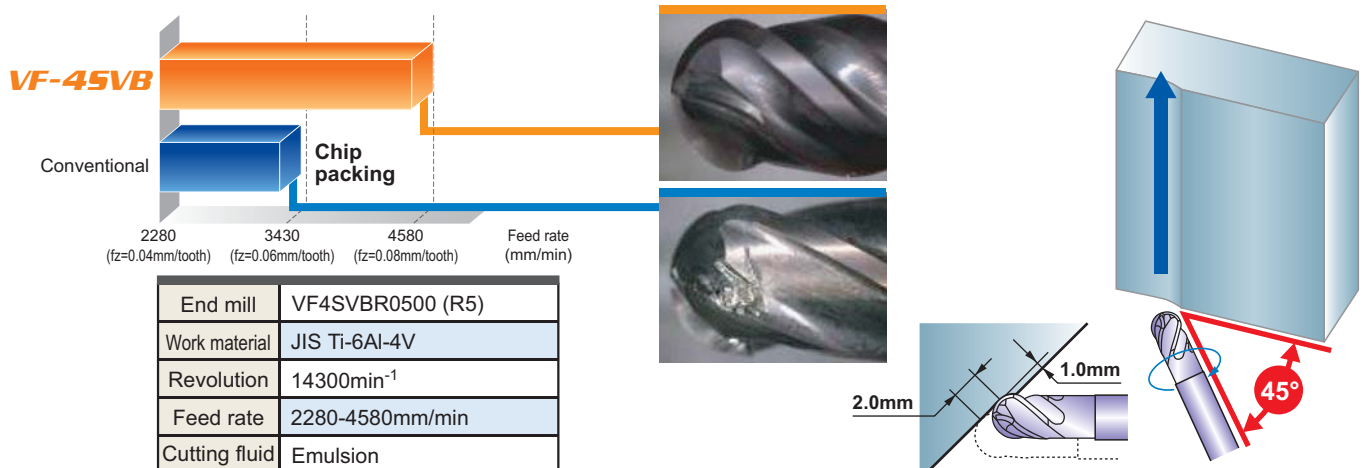
R:Radius

- 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective. When cutting heat-resistant alloys, the use of non water-soluble cutting fluid is recommended.
- 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
- 3) This end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate.
- 3)  $\alpha$  is the inclination angle of the machined surface.



## Cutting performance

### Excellent chip disposal!



#### For Your Safety

- Don't handle tools and chips without gloves.
- Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage.
- Please use safety covers and wear safety glasses.
- When using compounded cutting oils, please take fire precautions.
- When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

## MITSUBISHI MATERIALS CORPORATION

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#### Area Marketing & Operations Dept.

KFC bldg., 8F, 1-6-1, Yokoami, Sumida-ku, Tokyo 130-0015, Japan

TEL +81-3-5819-8772 FAX +81-3-5819-8774