MITSUBISHI
MITSUBISHI MATERIALS

TOOLS NEWS

2011.7 Update B171G

IMPACT MIRACLE end mill with multiple internal through coolant holes

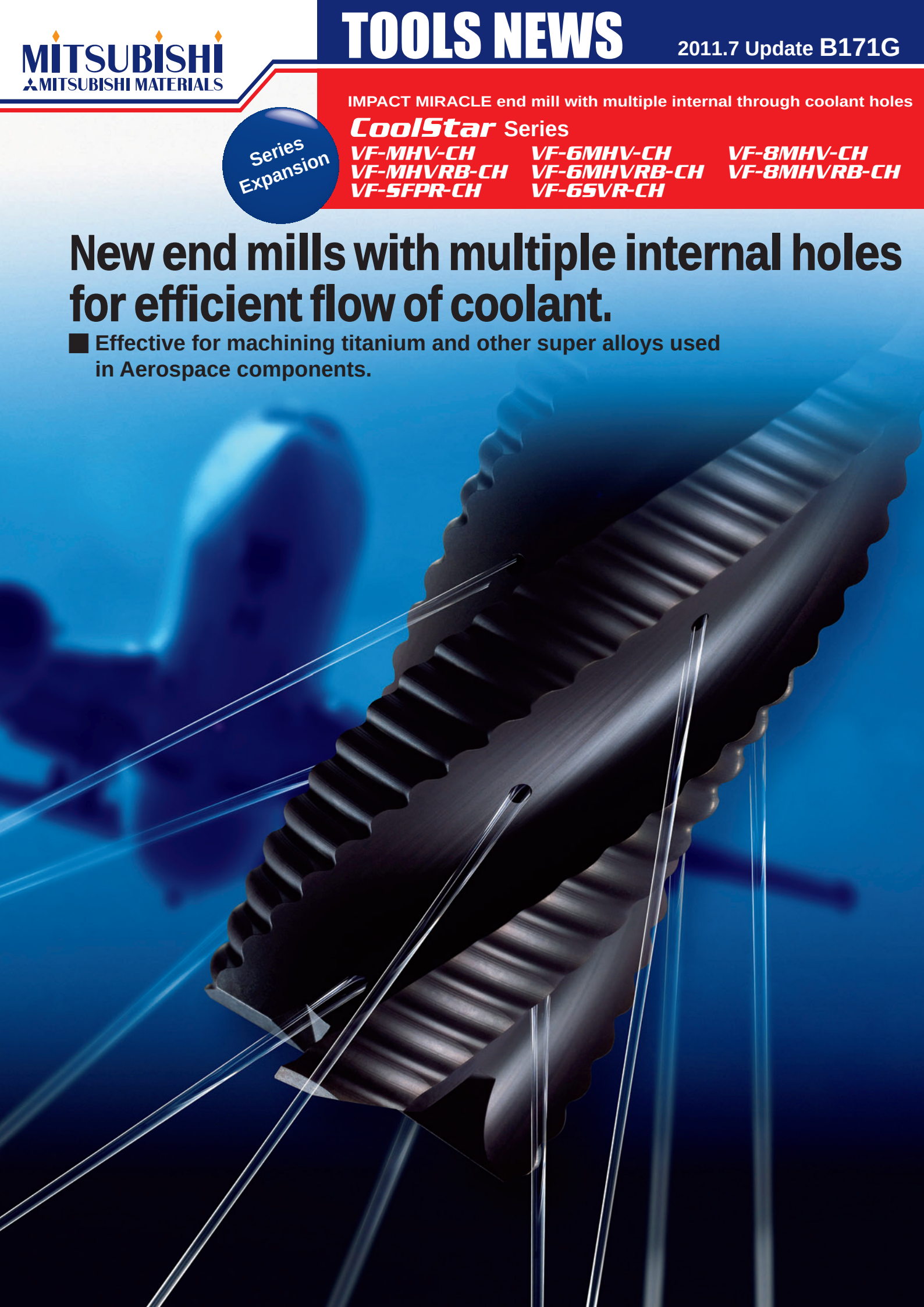
Series Expansion

CoolStar Series

VF-MHV-CH
VF-MHVRB-CH
VF-5FPR-CH
VF-6MHV-CH
VF-6MHVRB-CH
VF-6SVR-CH
VF-8MHV-CH
VF-8MHVRB-CH

New end mills with multiple internal holes for efficient flow of coolant.

■ Effective for machining titanium and other super alloys used in Aerospace components.



iMPACT MIRACLE END MILLS

IMPACT MIRACLE end mill with multiple internal through coolant holes

CoolStar Series

VF-MHV-CH
VF-MHVRB-CH
VF-5FPR-CH
VF-6MHV-CH
VF-6MHVRB-CH
VF-6SVR-CH
VF-8MHV-CH
VF-8MHVRB-CH

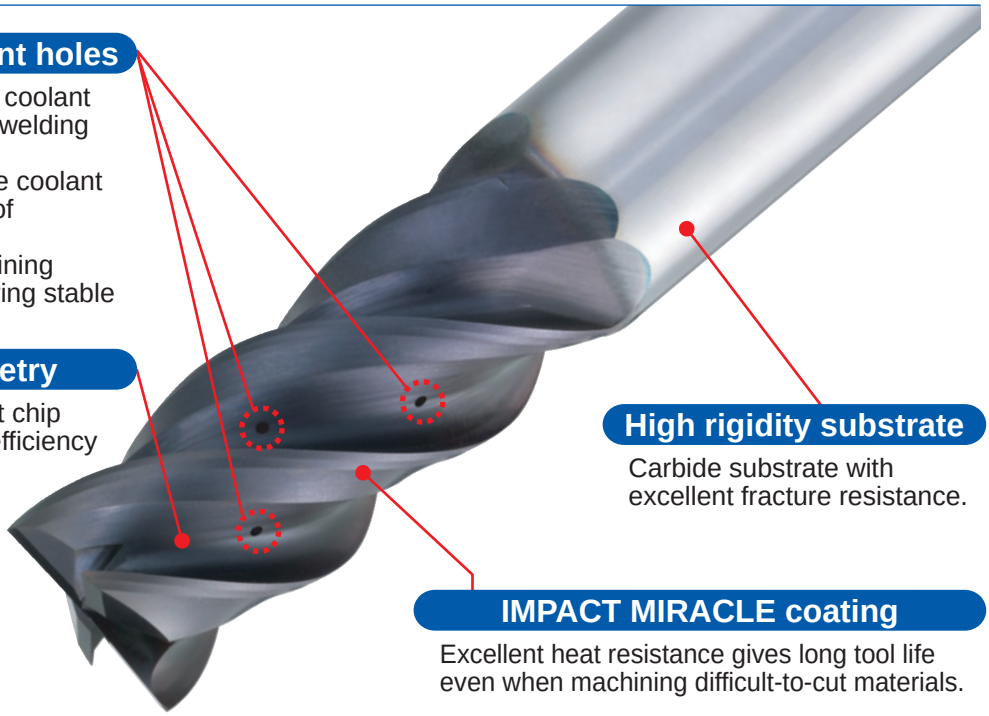
Features

Multiple internal coolant holes

The multiple internal through coolant system is used for improved welding resistance.
The spiral arrangement of the coolant holes enables a wide range of machining applications.
Especially suitable for machining difficult-to-cut materials, offering stable machining.

Unique flute geometry

Flute geometry with excellent chip disposal properties for high efficiency machining.



High rigidity substrate

Carbide substrate with excellent fracture resistance.

IMPACT MIRACLE coating

Excellent heat resistance gives long tool life even when machining difficult-to-cut materials.

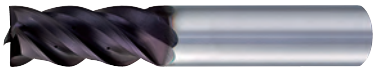
Wide selection

VF-MHV-CH

2 different sizes available.

End mill, Medium cut length,
4 flute, Irregular helix flutes,
with multiple internal through coolant

ø16, ø20

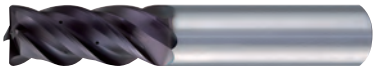


VF-MHVRB-CH

4 different sizes available.

Corner radius end mill,
Medium cut length, 4 flute,
Irregular helix flutes,
with multiple internal through coolant

ø16 (2 sizes), **ø20** (2 sizes)



VF-6MHV-CH

4 different sizes available.

End mill, Medium cut length,
6 flute, Irregular helix flutes,
with multiple internal through coolant

ø10, ø12, ø16, ø20

VF-6MHVRB-CH

8 different sizes available.

Corner radius end mill,
Medium cut length, 6 flute,
Irregular helix flutes,
with multiple internal through coolant

ø10 (2 sizes), **ø12** (2 sizes)
ø16 (2 sizes), **ø20** (2 sizes)

VF-8MHV-CH

2 different sizes available.

End mill, Medium cut length,
8 flute, Irregular helix flutes,
with multiple internal through coolant

ø16, ø20

VF-8MHVRB-CH

4 different sizes available.

Corner radius end mill,
Medium cut length, 8 flute,
Irregular helix flutes,
with multiple internal through coolant

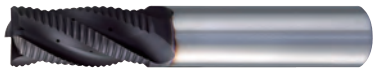
ø16 (2 sizes), **ø20** (2 sizes)

VF-5FPR-CH

2 different sizes available.

Roughing end mill,
Short cut length, 4 flute,
with multiple internal through coolant

ø16, ø20



VF-6SVR-CH

2 different sizes available.

Roughing end mill,
Short cut length, 6 flute,
Irregular helix flutes,
with multiple internal through coolant

ø16, ø20

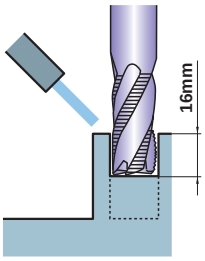
*Please consult Mitsubishi Materials for any geometry that is not in this literature (e.g. different diameters and lengths can be made to order).

Cutting Performance

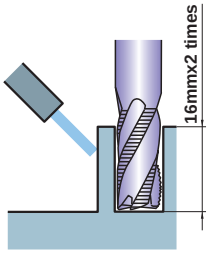
Stable coolant supply is possible for various applications!

VF-5FPR-CH

Excellent chip removal and cooling.



First step



Second step

Deep slotting

Conventional product (External coolant)

Welding occurred during the second stage of machining (machining stopped).

End mill	VFSFPRCHD1600 (ø16)
Work material	JIS Ti-6Al-4V
Revolution	2000min^{-1} (100m/min)
Feed rate	400mm/min (0.05mm/tooth)
Cutting fluid	Emulsion (0.7MPa)

Tool life comparison when machining stainless steel and titanium alloy.

VF-6MHV-CH

Excellent chip removal and cooling.

VF-6MHV-CH

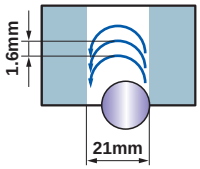
Excellent chip removal and cooling.

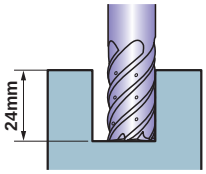
Feed rate:1800mm/min (0.1mm/tooth)

Conventional product (External coolant)

Chip packing

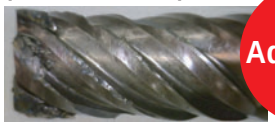
Stainless steel





End mill	VF6MHVCHD1600 (ø16)
Work material	JIS SUS304
Revolution	3000min^{-1} (150m/min)
Feed rate	1800mm/min (0.1mm/tooth)
Cutting fluid	Emulsion (0.7MPa)

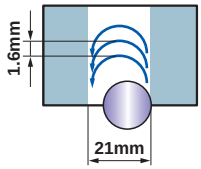
Conventional product (External coolant)

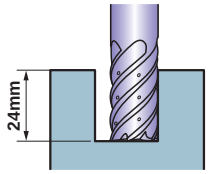


Adhesion

Feed rate:1350mm/min (0.075mm/tooth)

Titanium alloy

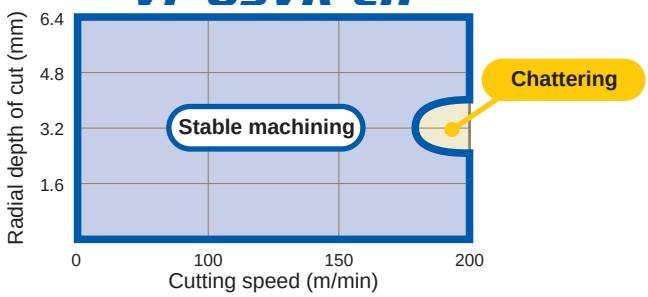




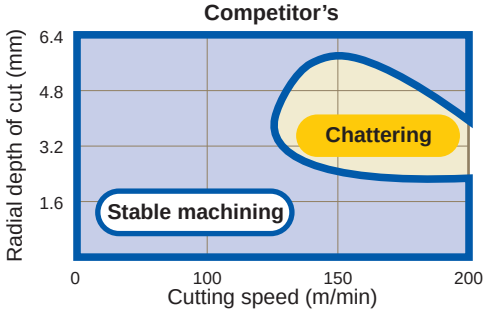
End mill	VF6MHVCHD1600 (ø16)
Work material	JIS Ti-6Al-4V
Revolution	3000min^{-1} (150m/min)
Feed rate	1800mm/min (0.1mm/tooth)
Cutting fluid	Emulsion (0.7MPa)

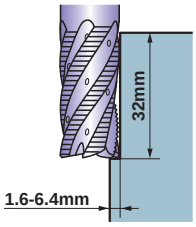
Stable cutting area comparision when machining stainless steel.

VF-6SVR-CH



Competitor's





End mill	VF6SVRCH1600 (ø16)
Work material	JIS SUS304
Revolution	2000–4000min^{-1} (100–200m/min)
Feed rate	600–1200mm/min (0.05mm/tooth)
Cutting fluid	Emulsion (0.7MPa)

VF-MHV-CH

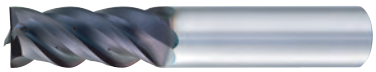
End mill, Medium cut length, 4 flute, Irregular helix flutes, with multiple internal through coolant

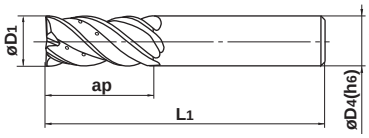
0 — -0.03

h6 D4 = 16 0 — -0.011
D4 = 20 0 — -0.013

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

CoolStar end mills





Type 1

UWC VF 42° 45° Helix angle Gash land

● Vibration control end mill with multiple internal through coolant holes ensures stable machining on difficult-to-cut materials and applications requiring long overhangs.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flute N	Stock	Type
VFMHVCHD1600	16	35	90	16	4	●	1
D2000	20	45	110	20	4	●	1

● : **Inventory maintained.**

Recommended Cutting Conditions

Shoulder milling

Work material	Austenitic Stainless Steel JIS SUS304, JIS SUS316 Titanium Alloy JIS Ti-6Al-4V		Heat resistant alloys Inconel, etc.	
Dia. (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
16	2000	560	800	110
20	1600	510	600	100
Depth of cut	≤0.1D 0.5D-1.5D		≤0.05D 0.5D-1.5D	

D:Dia.

Slotting

Work material	Austenitic Stainless Steel JIS SUS304, JIS SUS316 Titanium Alloy JIS Ti-6Al-4V	
Dia. (mm)	Revolution (min^{-1})	Feed rate (mm/min)
16	1400	170
20	1100	130
Depth of cut	D 0.5D-1.5D	

D:Dia.

1) If the depth of cut is shallow, the revolution and feed rate can be increased.
2) The irregular helix flute end mill has a large 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 proportionately, or set a lower depth of cut.
3) For shoulder milling, climb cutting is recommended.

VF-MHVRB-CH

Corner radius end mill, Medium cut length, 4 flute, Irregular helix flutes, with multiple internal through coolant

R ±0.015 | 0 −-0.03 | h6 | 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
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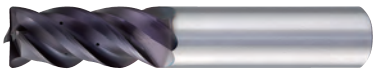
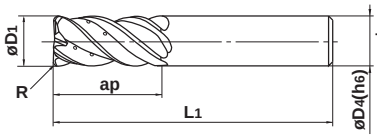
CoolStar end mills





Type 1

UWC VF 42° 45° Helix angle

● Vibration control corner radius end mill with multiple internal through coolant holes ensures stable machining on difficult-to-cut materials and applications requiring long overhangs.

Unit : mm

Order Number	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flute N	Stock	Type
VFMHVRBCHD1600R100	16	1	35	90	16	4	●	1
D1600R300	16	3	35	90	16	4	●	1
D2000R100	20	1	45	110	20	4	●	1
D2000R300	20	3	45	110	20	4	●	1

● : **Inventory maintained.**

Recommended Cutting Conditions

Shoulder milling

Work material	Austenitic Stainless Steel JIS SUS304, JIS SUS316 Titanium Alloy JIS Ti-6Al-4V		Heat resistant alloys Inconel, etc.	
Dia. (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
16	2000	560	800	110
20	1600	510	600	100
Depth of cut	≤0.1D 0.5D-1.5D		≤0.05D 0.5D-1.5D	

D:Dia.

Slotting

Work material	Austenitic Stainless Steel JIS SUS304, JIS SUS316 Titanium Alloy JIS Ti-6Al-4V	
Dia. (mm)	Revolution (min^{-1})	Feed rate (mm/min)
16	1400	170
20	1100	130
Depth of cut	D 0.5D-1.5D	

D:Dia.

1) If the depth of cut is shallow, the revolution and feed rate can be increased.
2) The irregular helix flute end mill has a large 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 proportionately, or set a lower depth of cut.
3) For shoulder milling, climb cutting is recommended.

VF-6MHV-CH

End mill, Medium cut length, 6 flute, Irregular helix flutes with multiple internal through coolant

D1≤12 0 −-0.020
D1>12 0 −-0.030

h6

D4 = 10 0 −-0.009
D4 = 12 0 −-0.011
D4 = 16 0 −-0.011
D4 = 20 0 −-0.013

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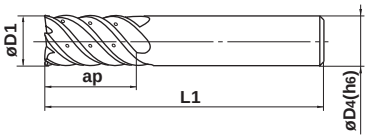
CoolStar end mills



Type 1

● Vibration control end mill with multiple internal through coolant holes ensures stable machining on difficult-to-cut materials and applications requiring long overhangs.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flute N	Stock	Type
NEW VF6MHVCHD1000	10	22	70	10	6	●	1
NEW D1200	12	26	75	12	6	●	1
D1600	16	32	90	16	6	●	1
D2000	20	38	100	20	6	●	1

● : Inventory maintained.

Recommended Cutting Conditions

Shoulder milling

Work material	Austenitic Stainless Steel JIS SUS304, JIS SUS316 Titanium Alloy JIS Ti-6Al-4V		Heat resistant alloys Inconel, etc.	
Dia. (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
10	4800	2000	1300	260
12	4000	2000	1100	230
16	3000	1600	800	180
20	2400	1400	640	150
Depth of cut	≤0.1D, 0.5D-1.5D		≤0.05D, 0.5D-1.5D	

D:Dia.

Trochoid milling

Work material	Austenitic Stainless Steel JIS SUS304, JIS SUS316 Titanium Alloy JIS Ti-6Al-4V	
Dia. (mm)	Revolution (min^{-1})	Feed rate (mm/min)
10	4800	1400
12	4000	1200
16	3000	1100
20	2400	900
Depth of cut	1.5D≤, ≤0.1D, 0.5D-1.5D	

D:Dia.

1) If the depth of cut is shallow, the revolution and feed rate can be increased.
2) The irregular helix flute end mill has a large 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 proportionately.
3) Climb cutting is recommended.

VF-6MHVRB-CH

Corner radius end mill, Medium cut length, 6 flute, Irregular helix flutes, with multiple internal through coolant

R ±0.015

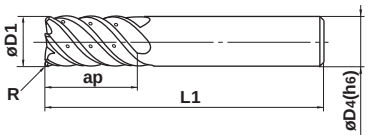
D1≤12 0 — -0.020
D1>12 0 — -0.030

h6

D4 = 10 0 — -0.009
D4 = 12 0 — -0.011
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
				◎	◎		

CoolStar end mills



Type 1

UWC VF 43.5° 45° Helix angle

● Vibration control corner radius end mill with multiple internal through coolant holes ensures stable machining on difficult-to-cut materials and applications requiring long overhangs.

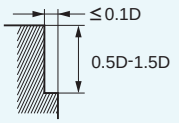
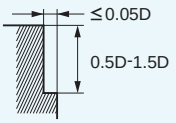
Unit : mm

Order Number	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flute N	Stock	Type
NEW VF6MHVRBCHD1000R050	10	0.5	22	70	10	6	●	1
NEW D1000R100	10	1	22	70	10	6	●	1
NEW D1200R050	12	0.5	26	75	12	6	●	1
NEW D1200R100	12	1	26	75	12	6	●	1
D1600R100	16	1	32	90	16	6	●	1
D1600R300	16	3	32	90	16	6	●	1
D2000R100	20	1	38	100	20	6	●	1
D2000R300	20	3	38	100	20	6	●	1

● : **Inventory maintained.**

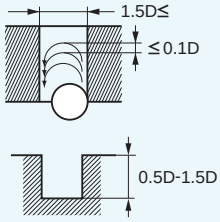
Recommended Cutting Conditions

Shoulder milling

Work material	Austenitic Stainless Steel JIS SUS304, JIS SUS316 Titanium Alloy JIS Ti-6Al-4V		Heat resistant alloys Inconel, etc.	
Dia. (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
10	4800	2000	1300	260
12	4000	2000	1100	230
16	3000	1600	800	180
20	2400	1400	640	150
Depth of cut				

D:Dia.

Trochoid milling

Work material	Austenitic Stainless Steel JIS SUS304, JIS SUS316 Titanium Alloy JIS Ti-6Al-4V	
Dia. (mm)	Revolution (min^{-1})	Feed rate (mm/min)
10	4800	1400
12	4000	1200
16	3000	1100
20	2400	900
Depth of cut		

D:Dia.

1) If the depth of cut is shallow, the revolution and feed rate can be increased.
2) The irregular helix flute end mill has a large 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 proportionately.
3) Climb cutting is recommended.

VF-8MHV-CH NEW

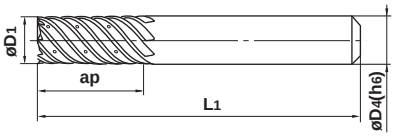
End mill, Medium cut length, 8 flute, Irregular helix flutes, with multiple internal through coolant

0 — -0.03

h6 D4 = 16 0 — -0.011
D4 = 20 0 — -0.013

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

CoolStar end mills



Type 1

● Vibration control 8 flute end mill with multiple internal through coolant hole ensures efficient side finishing of difficult-to-cut materials such as stainless steels, titanium and inconel alloys.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flute N	Stock	Type
VF8MHVCHD1600	16	32	90	16	8	●	1
D2000	20	38	100	20	8	●	1

● : **Inventory maintained.**

Recommended Cutting Conditions

Shoulder milling

Work material	Austenitic Stainless Steel JIS SUS304, JIS SUS316 Titanium Alloy JIS Ti-6Al-4V		Heat resistant alloys Inconel, etc.	
Dia. (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
16	3000	2100	800	240
20	2400	1900	640	200
Depth of cut	≤0.08D 0.5D-1.5D		≤0.05D 0.5D-1.5D	

D:Dia.

Trochoid milling

Work material	Austenitic Stainless Steel JIS SUS304, JIS SUS316 Titanium Alloy JIS Ti-6Al-4V	
Dia. (mm)	Revolution (min^{-1})	Feed rate (mm/min)
16	3000	1400
20	2400	1200
Depth of cut	1.5D≤ ≤0.08D 0.5D-1.5D	

D:Dia.

1) If the depth of cut is shallow, the revolution and feed rate can be increased.
2) The irregular helix flute end mill has a large 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 proportionately.
3) Climb cutting is recommended.

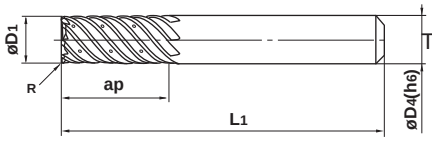
VF-8MHVRB-CH NEW

Corner radius end mill, Medium cut length, 8 flute, Irregular helix flutes, with multiple internal through coolant

R ±0.015 | 0 — -0.03 | h6 D4 = 16 0 — -0.011 D4 = 20 0 — -0.013

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

CoolStar end mills



Type 1

UWC VF 44° 45° Helix angle

● Vibration control 8 flute corner radius end mill with multiple internal through coolant hole ensures efficient side finishing of difficult-to-cut materials such as stainless steels, titanium and inconel alloys.

Unit : mm

Order Number	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flute N	Stock	Type
VF8MHVRBCHD1600R100	16	1	32	90	16	8	●	1
D1600R300	16	3	32	90	16	8	●	1
D2000R100	20	1	38	100	20	8	●	1
D2000R300	20	3	38	100	20	8	●	1

●: **Inventory maintained.**

Recommended Cutting Conditions

Shoulder milling

Work material	Austenitic Stainless Steel JIS SUS304, JIS SUS316 Titanium Alloy JIS Ti-6Al-4V		Heat resistant alloys Inconel, etc.	
Dia. (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
16	3000	2100	800	240
20	2400	1900	640	200
Depth of cut	≤0.08D, 0.5D-1.5D		≤0.05D, 0.5D-1.5D	

D:Dia.

Trochoid milling

Work material	Austenitic Stainless Steel JIS SUS304, JIS SUS316 Titanium Alloy JIS Ti-6Al-4V	
Dia. (mm)	Revolution (min^{-1})	Feed rate (mm/min)
16	3000	1400
20	2400	1200
Depth of cut	1.5D≤, ≤0.08D, 0.5D-1.5D	

D:Dia.

1) If the depth of cut is shallow, the revolution and feed rate can be increased.
2) The irregular helix flute end mill has a large 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 proportionately.
3) Climb cutting is recommended.

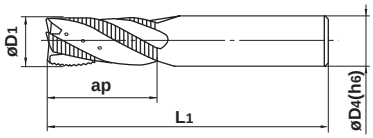
VF-SFPR-CH

Roughing end mill, Short cut length, 4 flute, with multiple internal through coolant

h6 D4 = 16 0 — -0.011
D4 = 20 0 — -0.013

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

CoolStar end mills



Type 1

Helix angle

● Roughing end mill with multiple internal through coolant holes suitable for difficult-to-cut materials.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flute N	Stock	Type
VFSFPRCHD1600	16	33	90	16	4	●	1
D2000	20	38	100	20	4	●	1

● : **Inventory maintained.**

Recommended Cutting Conditions

Shoulder milling

Work material	Austenitic Stainless Steel JIS SUS304, JIS SUS316 Titanium Alloy JIS Ti-6Al-4V		Heat resistant alloys Inconel, etc.	
Dia. (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
16	1200	300	800	110
20	1000	300	600	100
Depth of cut	≤0.5D, 0.5D-1.5D		≤0.3D, 0.5D-1.0D	

D:Dia.

Trochoid milling

Work material	Austenitic Stainless Steel JIS SUS304, JIS SUS316 Titanium Alloy JIS Ti-6Al-4V	
Dia. (mm)	Revolution (min^{-1})	Feed rate (mm/min)
16	800	100
20	600	80
Depth of cut	D, 0.5D-1.0D	

D:Dia.

1) If the depth of cut is shallow, the revolution and feed rate can be increased.
2) 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 proportionately, or set a lower depth of cut.
3) For shoulder milling, climb cutting is recommended.

VF-6SVR-CH

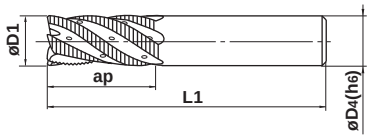
Roughing end mill, Short cut length, 6 flute, Irregular helix flutes, with multiple internal through coolant

h6

D4 = 16 0 — -0.011
D4 = 20 0 — -0.013

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

CoolStar
end mills



Type 1

UWC VF 28.5° 30°

Helix angle

● 6 flute roughing end mill with multiple internal through coolant hole ensures efficient side finishing of difficult-to-cut materials such as stainless steels, titanium and inconel alloys.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flute N	Stock	Type
VF6SVRCHD1600	16	33	90	16	6	●	1
D2000	20	38	100	20	6	●	1

● : Inventory maintained.

Recommended Cutting Conditions

Shoulder milling

Work material	Austenitic Stainless Steel JIS SUS304, JIS SUS316 Titanium Alloy JIS Ti-6Al-4V		Heat resistant alloys Inconel, etc.	
Dia. (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
16	2400	1200	800	160
20	2000	1000	640	140
Depth of cut	≤0.3D 0.5D-1.5D		≤0.2D 0.5D-1.5D	

D:Dia.

1) If the depth of cut is shallow, the revolution and feed rate can be increased.
2) The irregular helix flute end mill has a large 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 proportionately.
3) Climb cutting is recommended.

ÍMPACT MIRACLE END MILLS

IMPACT MIRACLE end mill with multiple internal through coolant holes

CoolStar Series

For Your Safety
●Don't handle inserts 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 attaching inserts or spare parts, please use only the correct wrench or spanner. ●When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

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(Tools specifications subject to change without notice.)

EXP-09-E097
2011.4.(-)