

***MSSHV, MSMHV***

MSTAR vibration control end mill series

**The new generation end mill series. Ideal for efficient and economical machining of general milling applications.**



New vibration control end mill series

# ***MSMHV, MSSHV***

## **Features**

Irregular helix flutes assists in preventing vibration on difficult-to-cut materials and applications with a long overhang. The tough solid carbide substrate ensures high chipping resistance and long tool life.

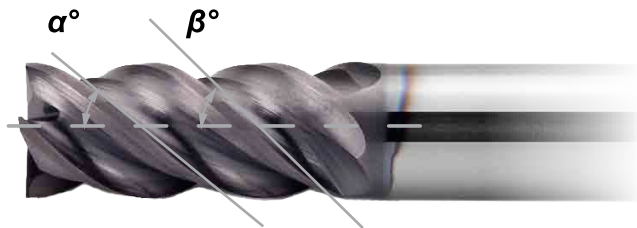


## **Multi-purpose use**

For a wide variety of workpiece materials such as mild steel, alloy steel, stainless steel and difficult to cut materials. All MSSHV/MSMHV end mills have a Weldon clamping face on the shank to ensure secure clamping.

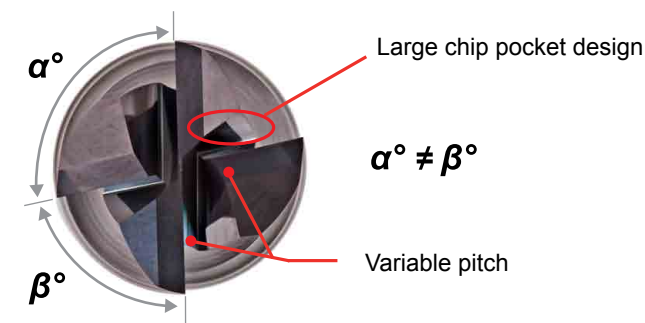


Reduced neck for deep machining (MSSHV type)



## **Variable flute angle**

In comparison with conventional solid carbide end mills, the use of irregular helix flutes assists in preventing vibration.

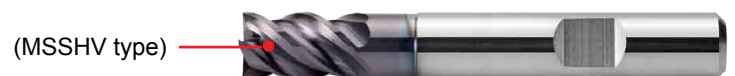


## **Improved Geometry**

New geometry with large chip pockets allows a smooth and quick chip disposal even during slot milling operations. The variable flute pitch reduced vibration during cutting.

## **Short and Medium types**

Two versions available as standard. The **MSSHV** type with 4 flutes, short flute length, reduced neck and a weldon shank and the **MSMHV** type with 4 flutes, medium flute length and a weldon shank.



# MSSHV

**NEW**

4 flute, variable helix, short flute length, reduced neck, weldon shank

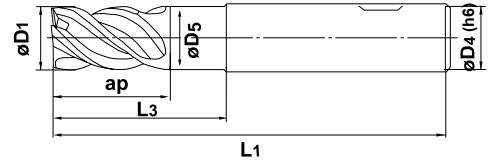


$D_1 \leq 12$  0 - -0.02  
 $D_1 > 12$  0 - -0.03



$D_4 = 6$  0 - -0.008  
 $8 \leq D_4 \leq 10$  0 - -0.009  
 $12 \leq D_4 \leq 16$  0 - -0.011

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



● MSTAR solid carbide end mill for efficient machining.

Unit : mm

Order number	D1	ap	L3	D5	L1	D4	N	Stock	Type
MSSHVD0600WE	6	9	14	5.85	50	6	4	●	1
MSSHVD0800WE	8	12	20	7.85	60	8	4	●	1
MSSHVD1000WE	10	15	25	9.7	70	10	4	●	1
MSSHVD1200WE	12	18	30	11.7	75	12	4	●	1
MSSHVD1600WE	16	24	40	15.5	90	16	4	●	1
MSSHVD2000WE	20	30	50	19.5	110	20	4	●	1

# MSMHV

**NEW**

4 flute, variable helix, medium flute length, weldon shank

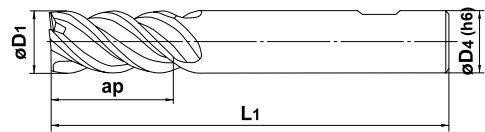


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○	○	○		◎	○		



● MSTAR solid carbide end mill for efficient machining.

Unit : mm

Order number	D1	ap	L1	D4	N	Stock	Type
MSMHVD0600WE	6	13	50	6	4	●	1
MSMHVD0800WE	8	19	60	8	4	●	1
MSMHVD1000WE	10	22	70	10	4	●	1
MSMHVD1200WE	12	26	75	12	4	●	1
MSMHVD1600WE	16	35	90	16	4	●	1
MSMHVD2000WE	20	45	110	20	4	●	1

● : Inventory maintained.

# MSSHV

**NEW**

4 flute, variable helix, short flute length, reduced neck, cylindrical shank

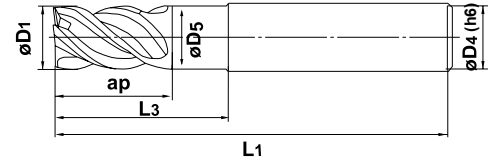


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○	○	○		○	○		



● MSTAR solid carbide end mill for efficient machining.

Unit : mm

Order number	D1	ap	L3	D5	L1	D4	N	Stock	Type
MSSHVD0600E	6	9	14	5.85	50	6	4	●	1
MSSHVD0800E	8	12	20	7.85	60	8	4	●	1
MSSHVD1000E	10	15	25	9.7	70	10	4	●	1
MSSHVD1200E	12	18	30	11.7	75	12	4	●	1
MSSHVD1600E	16	24	40	15.5	90	16	4	●	1
MSSHVD2000E	20	30	50	19.5	110	20	4	●	1

# MSMHV

**NEW**

4 flute, variable helix, medium flute length, cylindrical shank

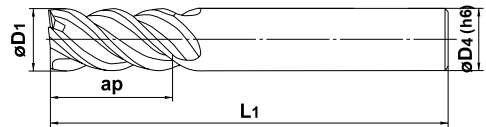


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● MSTAR solid carbide end mill for efficient machining.

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MSMHVD1600E	16	35	90	16	4	●	1
MSMHVD2000E	20	45	110	20	4	●	1

● : Inventory maintained.

# MSSHV/MSMHV

4 flute, variable helix, short flute length, weldon / cylindrical shank

## CUTTING CONDITIONS

Work Material	Carbon steel, Cast iron, Alloy steel (-30HRC)		Alloy steel, Tool steel, Pre-hardened steel (-45HRC)		Stainless steel (-1100N/mm <sup>2</sup> )		
	Diameter (mm)	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)
Side milling	6	9000	2240	8000	2240	5300	1060
	8	7000	1680	6000	1680	4000	960
	10	5000	1440	4800	1440	3200	770
	12	4000	1200	4000	1200	2700	760
	16	3000	1140	3000	1140	2000	560
	20	2400	860	2400	860	1600	510
Depth of cut							
Slot milling	6	6500	1280	4000	740	3700	440
	8	5000	1150	3000	670	2800	340
	10	4000	910	2500	530	2200	350
	12	3500	900	2000	530	1900	300
	16	2500	670	1500	390	1400	280
	20	2000	610	1200	350	1100	260
Depth of cut							

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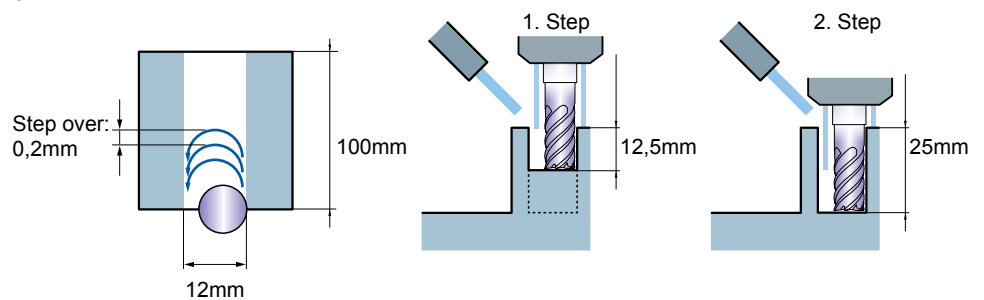
- 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
- 2) Air blow or oil mist is recommended for good chip evacuation.
- 3) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sound can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

## Application Example

Trochoidal milling of stainless steel.  
Length x width x depth of slot: 100x12x25mm

End mill	MSSHVD1000WE (ø10)
Material	1.4301 (X5CrNi18-10)
Revolution	10.000min <sup>-1</sup> (314m/min)
Feed	1.910mm/min (0.05mm/tooth)
Cooling	Emulsion
Holder	*HSK63A, Weldon

\*Chuck with through coolant  
balanced to G 2.5 / 25000min<sup>-1</sup>



## Results:

- Due to the trochoidal milling strategy a stable process is secured.
- High axial cutting depth and high cutting speeds possible.
- A smaller workpiece contact to the tool increases tool life and improve chip disposal.
- This machining strategy is recommended especially on low power machines.



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