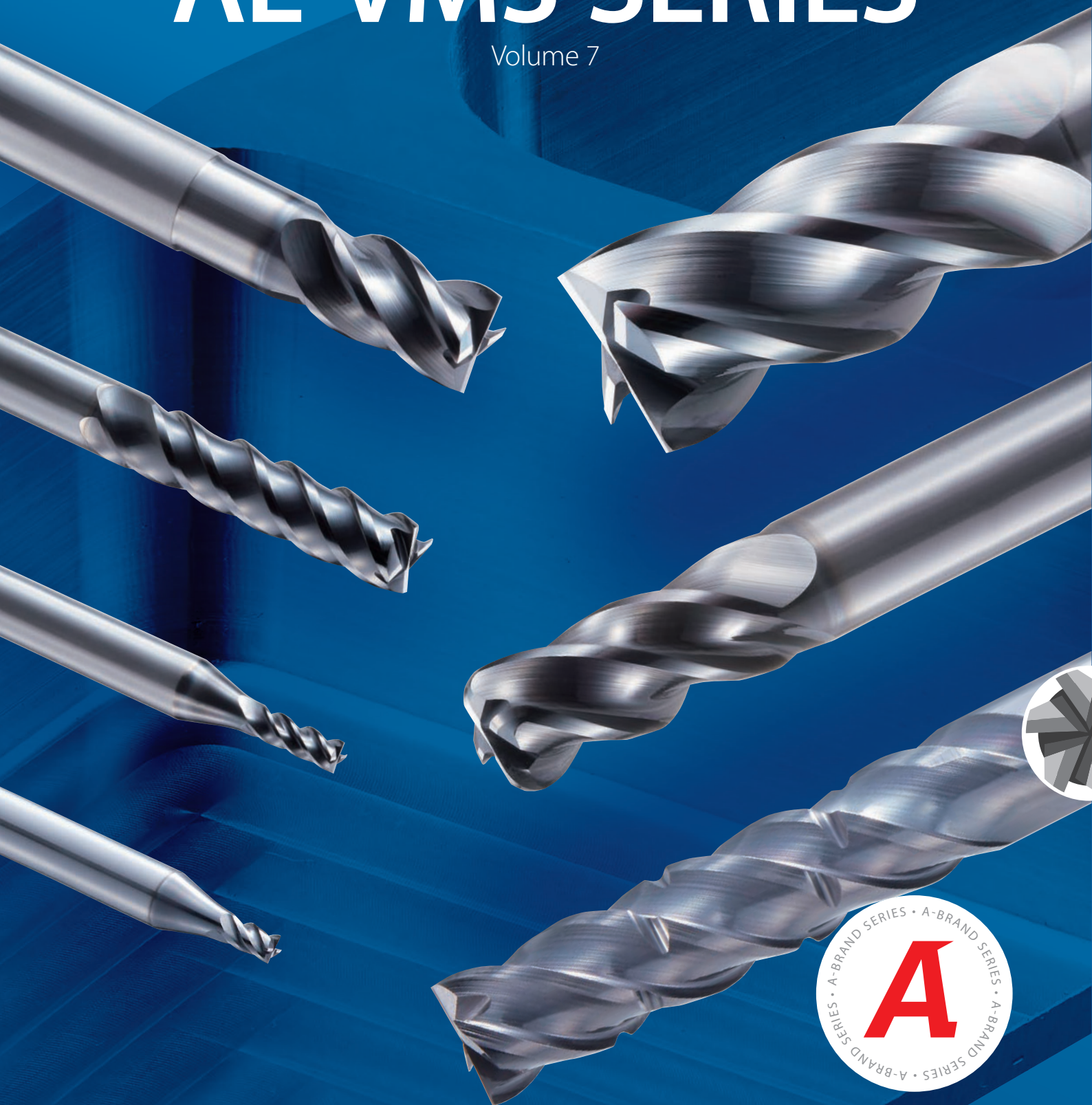




Anti Vibration Carbide End mill

# AE-VMS SERIES

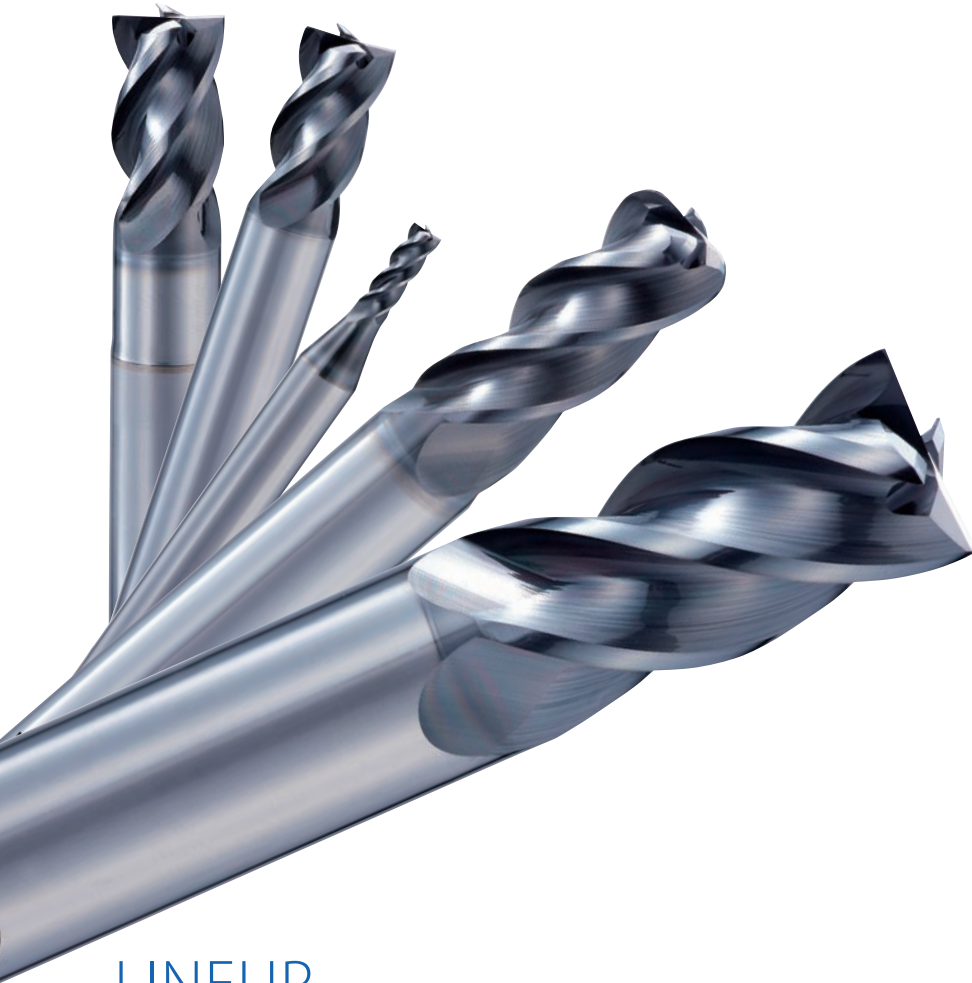
Volume 7





























# INDEX

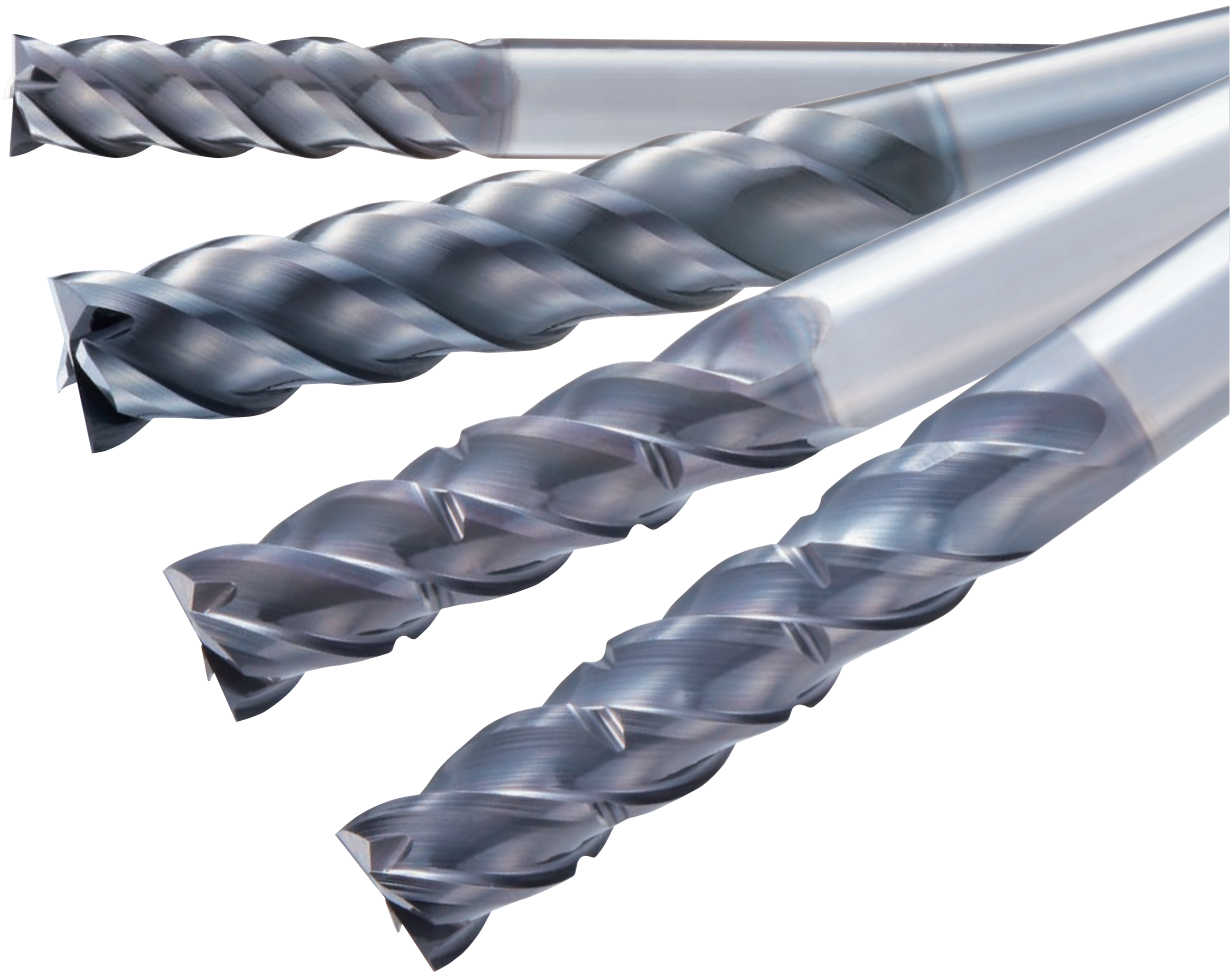
## AE-VMS / AE-VMSS

	AE-VMS Square, radius .....	PAGE 8
	AE-VMSS Short, square .....	PAGE 9
	AE-VMSS Long neck .....	PAGE 10




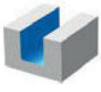

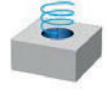






## LINEUP

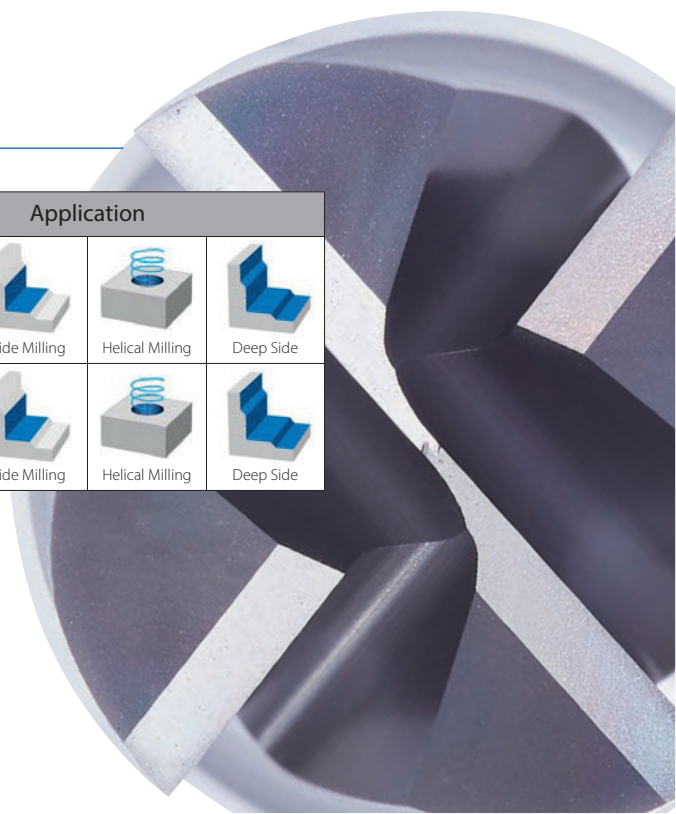
		Cutting edge shape		Application					
AE-VMS Short	Square								
	Radius								
AE-VMSS Stub	Square								
	Long Neck								



## AE-VML

-  A-VML Long, square ..... PAGE 11
-  A-VML Long, square with chipbreaker..... PAGE 11

		Cutting edge shape		Application			
AE-VML Long	Square						Trochoidal Side Milling Helical Milling Deep Side
	Square with Chipbreaker						Trochoidal Side Milling Helical Milling Deep Side



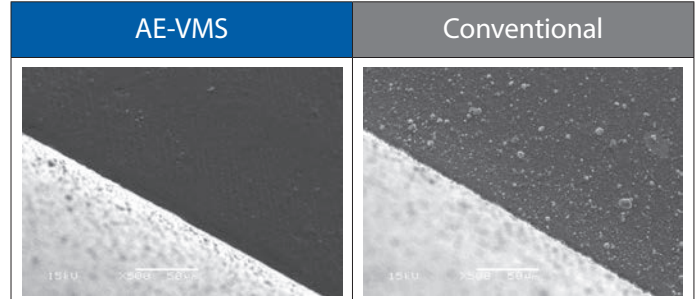
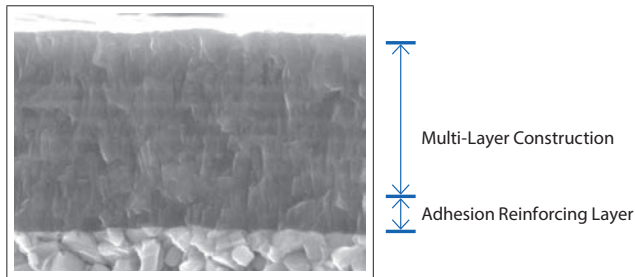
# KEY FEATURES: AE-VMS • AE-VMSS



# AE-VMS: THE A-BRAND END MILL

## Duarise coating

The new duarise coating provides excellent lubricity, superior friction-resistance and high oxidation temperature. Multi-layer construction minimizes the thermal cracks that often occurred while using water-soluble oil.



Smoothing surface coating treatment made an excellent quality of surface finishing.

## Positive rake angle

A stable performance is gathered by reducing cutting forces as a result of a sharp and positive rake angle.

## New flute form

The new flute form with its excellent chip evacuation properties enables stable milling and the suppression of burrs.

Figure 1. 10% lower cutting force versus the competitors

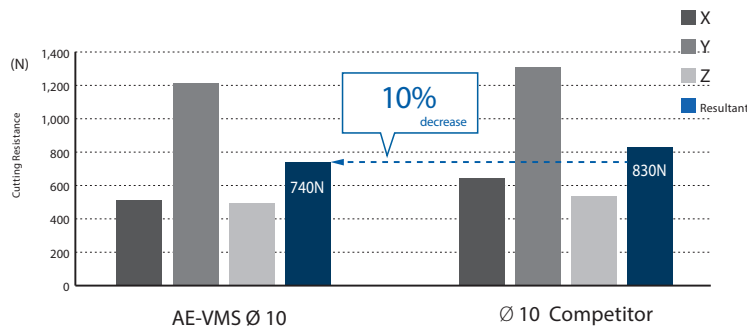
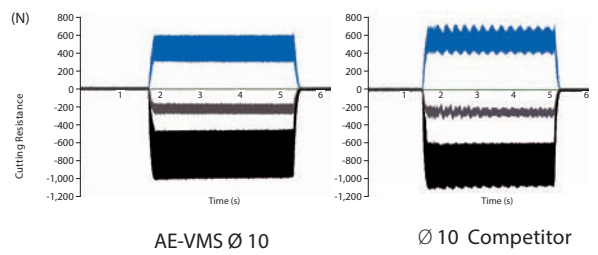
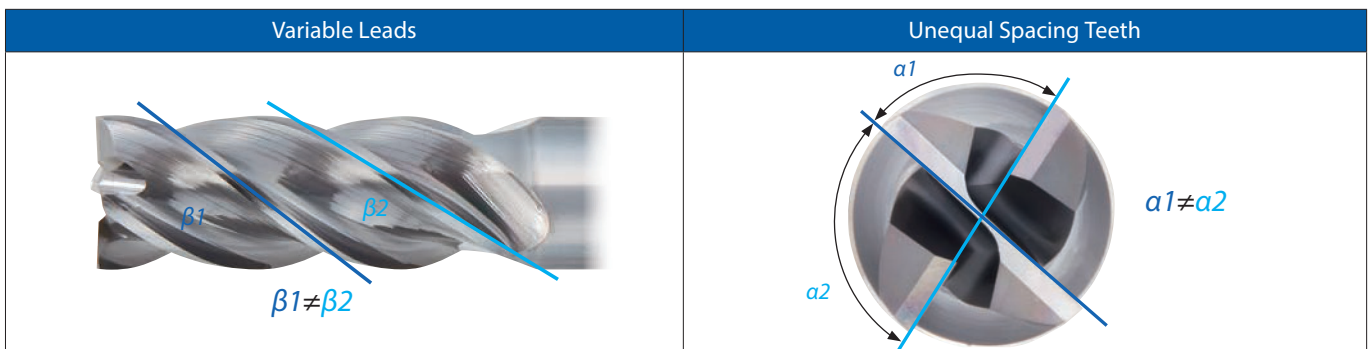


Figure 2. Stable performance even when the overhang length is L/D=4



## High rigidity

The unequal spacing of teeth and variable-lead geometry enables stable and high efficiency milling and the suppression of vibration.



# KEY FEATURES: AE-VML

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1 Dularise coating

2 Microrelief geometry

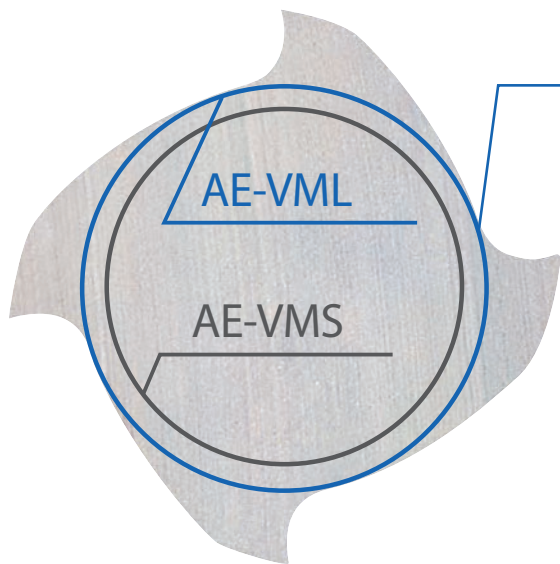
3 For high-speed side milling

4 Long flutes

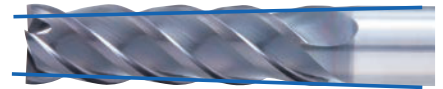
5 Solid carbide



# AE-VML: ULTIMATE SIDE MILLING EFFICIENCY



## High Rigidity



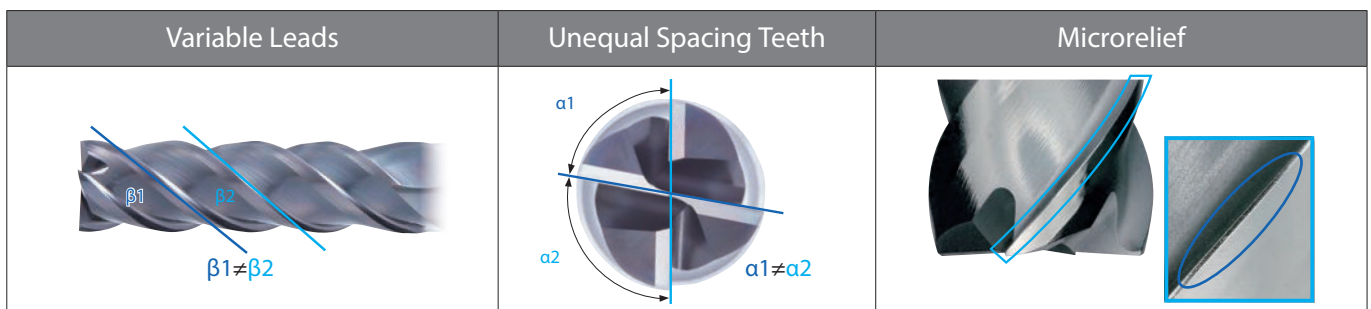
High-speed side milling is made possible by the large thick core design. The web taper geometry, where the thickness of core changes from the cutting edge to the shank, greatly improves tool rigidity, thereby prevents the machining surface from tilting.

## High Helix

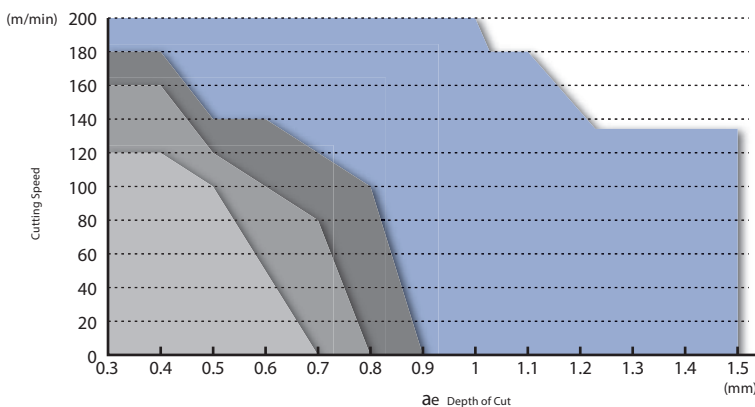
Reduces cutting force to enable stable milling

## Suppression of vibration

The combination of variable lead, unequal spacing teeth and microrelief geometry contributes to stable and high efficiency milling performance.



Chattering is greatly suppressed even during high-speed, high-depth milling, resulting in unrivaled high efficiency performance.



- AE-VML Ø10x40
- A Competitor
- B Competitor
- C Competitor

S50C  
Work Material  
( $a_p$ ) 40mm  
Depth of Cut

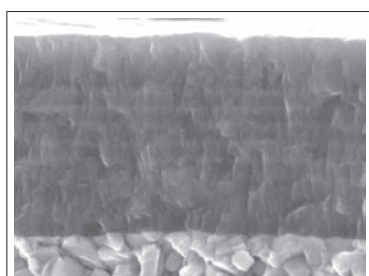


Milling | Solid carbide

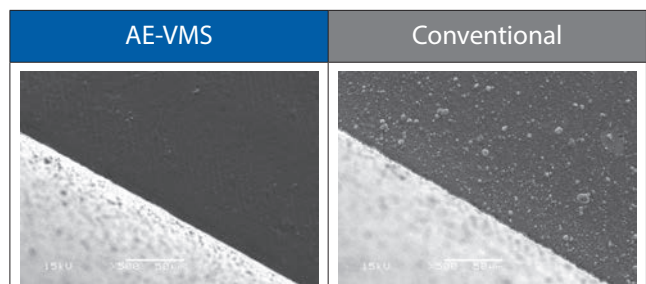


## DUARISE Coating

Provides excellent lubricity, superior friction-resistance and high oxidation temperature. Multi-layer construction minimizes the thermal cracks that often occurred while using watersoluble oil.



Multi-Layer Construction  
Adhesion Reinforcing Layer



Smoothing surface coating treatment made an excellent quality of surface finishing.

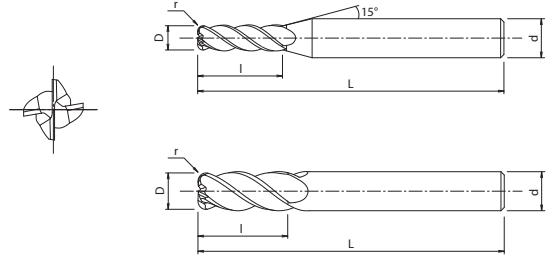
# AE-VMS

Milling | Solid carbide



Type 1

Type 2



- First choice in quality and performance
- Carbide end mill with Duarise coating
- Wide variety in applications and work materials
- 4 flutes, variable helix and unequal spacing



EDP	D	R	L	l	d	Type	Price
8555830	3	-	60	8	6	1	
8556050	3	0,2	60	8	6	1	
8556060	3	0,5	60	8	6	1	
8555840	4	-	60	11	6	1	
8556070	4	0,2	60	11	6	1	
8556080	4	0,5	60	11	6	1	
8556090	4	1	60	11	6	1	
8555850	5	-	60	13	6	1	
8556100	5	0,2	60	13	6	1	
8556110	5	0,5	60	13	6	1	
8556120	5	1	60	13	6	1	
8555860	6	-	60	13	6	2	
8556130	6	0,3	60	13	6	2	
8556140	6	0,5	60	13	6	2	
8556150	6	1	60	13	6	2	
8555880	8	-	70	19	8	2	
8556160	8	0,3	70	19	8	2	
8556170	8	0,5	70	19	8	2	
8556180	8	1	70	19	8	2	
8556190	8	1,5	70	19	8	2	
8556200	8	2	70	19	8	2	
8555900	10	-	80	22	10	2	
8556210	10	0,3	80	22	10	2	
8556220	10	0,5	80	22	10	2	
8556230	10	1	80	22	10	2	
8556240	10	1,5	80	22	10	2	
8556250	10	2	80	22	10	2	
8556260	10	3	80	22	10	2	
8555920	12	-	90	26	12	2	
8556270	12	0,5	90	26	12	2	
8556280	12	1	90	26	12	2	
8556290	12	1,5	90	26	12	2	
8556300	12	2	90	26	12	2	
8556310	12	3	90	26	12	2	
8555960	16	-	100	32	16	2	
8556000	20	-	110	40	20	2	
8556010	25	-	120	50	25	2	

Milling | Solid carbide











# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AE-VMS / AE-VMSS

Square Type

### Side milling

Cutting Speed	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel ≤200HB	
	130 (100-150) (m/min)		120 (100-150) (m/min)		100 (80-120) (m/min)		80 (60-100) (m/min)	
Ø	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
1	38.200	840	28.700	690	25.500	510	22.300	450
1,5	25.500	920	21.200	760	17.000	540	14.900	460
2	19.900	1.430	17.500	840	14.300	630	11.100	470
2,5	15.900	1.590	14.000	900	11.500	690	8.900	480
3	13.800	1.660	12.700	1.070	10.600	760	8.000	480
4	10.400	1.830	9.600	1.150	8.000	800	6.000	530
5	8.300	1.990	7.600	1.220	6.400	900	4.800	560
6	6.900	2.070	6.400	1.540	5.300	1.060	4.200	640
8	5.200	1.770	4.800	1.540	4.000	1.040	3.200	610
10	4.100	1.640	3.800	1.370	3.200	900	2.500	580
12	3.500	1.400	3.200	1.280	2.700	760	2.100	530
16	2.600	1.250	2.400	1.060	2.000	640	1.400	450
20	2.100	1.010	1.900	840	1.600	510	1.100	370
25	1.700	820	1.500	660	1.300	420	900	310

Depth of cut	ap	ae
	1,5D	0,2D

### Slotting

Cutting Speed	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel ≤200HB	
	100 (80-120) (m/min)		90 (70-110) (m/min)		80 (60-100) (m/min)		70 (50-80) (m/min)	
Ø	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
1	28.700	570	25.500	460	22.300	360	19.100	340
1,5	19.100	610	17.000	480	14.900	420	12.700	360
2	14.300	630	12.700	510	11.100	440	9.600	380
2,5	11.500	780	10.200	570	8.900	460	7.600	430
3	10.600	930	9.600	690	8.500	510	7.400	470
4	8.000	960	7.200	720	6.400	510	5.600	490
5	6.400	1.020	5.700	800	5.100	610	4.500	560
6	5.300	1.060	4.800	900	4.200	670	3.700	370
8	4.000	910	3.600	720	3.200	640	2.800	370
10	3.200	840	2.900	700	2.500	550	2.200	350
12	2.700	810	2.400	670	2.100	550	1.900	330
16	2.000	600	1.800	500	1.600	420	1.200	310
20	1.600	480	1.400	390	1.300	340	900	250
25	1.300	390	1.100	310	1.000	260	600	170

Depth of cut	ap	
	1D	

Dc	ap	
	Dc≤6	0,5D
	Dc>6	1D

- The above milling condition is a guideline for the overhang length is 3xD.
- Use a rigid and precise machine and holder.
- The rotational speed is calculated by the median of the recommended cutting speed. Adjustment may be necessary depending on the rigidity of the workpiece fixture and machine.
- Please use a suitable fluid with high smoke retardant properties.
- During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.
- Please use water-soluble oil when machining stainless steel.
- Reduce speed and feed as well as depth of cut when high precision is required.
- Adjust the speed and feed accordingly when the overhang length is longer than specified.

Milling | Solid carbide

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AE-VMS / AE-VMSS

Radius Type

Side milling

Cutting Speed	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel ≤200HB					
	130 (100-150) (m/min)		120 (100-150) (m/min)		100 (80-120) (m/min)		80 (60-100) (m/min)					
∅	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)				
3	13.800	1.410	12.700	910	10.600	610	8.000	380				
4	10.400	1.560	9.600	980	8.000	640	6.000	480				
5	8.300	1.690	7.600	1.030	6.400	720	4.800	450				
6	6.900	1.970	6.400	1.460	5.300	950	4.200	570				
8	5.200	1.680	4.800	1.460	4.000	940	3.200	550				
10	4.100	1.560	3.800	1.300	3.200	810	2.500	520				
12	3.500	1.330	3.200	1.220	2.700	680	2.100	480				
Depth of cut			<table border="1"> <tr><td>ap</td><td>ae</td></tr> <tr><td>1,5D</td><td>0,2D</td></tr> </table>		ap	ae	1,5D	0,2D				
ap	ae											
1,5D	0,2D											

Slotting

Cutting Speed	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel ≤200HB									
	100 (80-120) (m/min)		90 (70-110) (m/min)		80 (60-100) (m/min)		70 (50-80) (m/min)									
∅	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)								
3	10.600	790	9.600	590	8.500	410	7.400	380								
4	8.000	820	7.200	610	6.400	410	5.600	390								
5	6.400	870	5.700	680	5.100	490	4.500	450								
6	5.300	1.010	4.800	860	4.200	600	3.700	330								
8	4.000	870	3.600	680	3.200	580	2.800	330								
10	3.200	800	2.900	660	2.500	500	2.200	320								
12	2.700	770	2.400	640	2.100	490	1.900	300								
Depth of cut			<table border="1"> <tr><td>ap</td></tr> <tr><td>1D</td></tr> </table>		ap	1D			<table border="1"> <tr><td>Dc</td><td>ap</td></tr> <tr><td>Dc≤6</td><td>0,5D</td></tr> <tr><td>Dc&gt;6</td><td>1D</td></tr> </table>		Dc	ap	Dc≤6	0,5D	Dc>6	1D
ap																
1D																
Dc	ap															
Dc≤6	0,5D															
Dc>6	1D															

- The above milling condition is a guideline for the overhang length is 3xD.
- Use a rigid and precise machine and holder.
- The rotational speed is calculated by the median of the recommended cutting speed. Adjustment may be necessary depending on the rigidity of the workpiece fixture and machine.
- Please use a suitable fluid with high smoke retardant properties.
- During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.
- Please use water-soluble oil when machining stainless steel.
- Reduce speed and feed as well as depth of cut when high precision is required.
- Adjust the speed and feed accordingly when the overhang length is longer than specified.

Fix rate cutting condition

∅	Work Material	Mild Steel - Carbon Steel Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel Hardened Steel PX5 • NAK80 • 30~45 HRC		Stainless Steel (≤ 200HB)	
		S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
Side Milling	4	90%		90%		80%		70%	
	5	80%		80%		70%		70%	
Slotting	4	80%		70%		70%		60%	
	5	70%		60%		60%		50%	

Milling | Solid carbide



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AE-VML

Long type (Applies also to chipbreaker type)

ae=0.05D • Standard side milling 3D

Vc	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	8.500	2.480	8.000	2.180	7.400	2.010	6.600	1.660
8	6.400	1.870	6.000	1.630	5.600	1.520	5.000	1.260
10	5.100	1.730	4.800	1.440	4.500	1.350	4.000	1.120
12	4.200	1.430	4.000	1.200	3.700	1.110	3.300	920
Depth of cut								

1. Use a rigid and precise machine and holder.
2. The rotational speed is calculated by the median of the recommended cutting speed. Adjustment may be necessary depending on the rigidity of the workpiece fixture and machine.
3. Please use a suitable fluid with high smoke retardant properties.
4. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.
5. Please use water-soluble coolant when machining stainless steel.

ae=0.1D • High efficiency side milling 3D

Vc	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	11.700	3.180	9.000	2.270	7.200	1.810	6.900	1.600
8	8.800	2.390	6.800	1.710	5.400	1.360	5.200	1.210
10	7.000	2.240	5.400	1.510	4.300	1.200	4.100	1.070
12	5.800	1.860	4.500	1.260	3.600	1.010	3.500	910
Depth of cut								

ae=0.15D • High efficiency side milling 3D

Vc	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	7.400	1.860	5.600	1.300	4.800	1.110	4.500	950
8	5.600	1.410	4.200	970	3.600	840	3.400	720
10	4.500	1.350	3.300	860	2.900	750	2.700	650
12	3.700	1.110	2.800	730	2.400	620	2.300	550
Depth of cut								

ae≤0.2D • High efficiency side milling 3D

Vc	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	5.300	1.230	4.200	890	3.700	780	3.500	670
8	4.000	930	3.200	680	2.800	590	2.600	500
10	3.200	900	2.500	600	2.200	530	2.100	460
12	2.700	760	2.100	500	1.900	460	1.700	370
Depth of cut								

Milling | Solid carbide



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AE-VML

Long type (Applies also to chipbreaker type)

**ae=0.05D • Standard side milling 4D**

Vc	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	7.400	2.010	6.900	1.740	6.400	1.610	6.100	1.420
8	5.600	1.520	5.200	1.310	4.800	1.210	4.600	1.070
10	4.500	1.440	4.100	1.230	3.800	1.140	3.700	960
12	3.700	1.180	3.500	1.050	3.200	960	3.100	810
Depth of cut								

1. Use a rigid and precise machine and holder.
2. The rotational speed is calculated by the median of the recommended cutting speed. Adjustment may be necessary depending on the rigidity of the workpiece fixture and machine.
3. Please use a suitable fluid with high smoke retardant properties.
4. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.
5. Please use water-soluble coolant when machining stainless steel.

**ae=0.1D • High efficiency side milling 4D**

Vc	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	10.600	2.670	8.500	1.970	6.900	1.600	6.600	1.400
8	8.000	2.020	6.400	1.480	5.200	1.210	5.000	1.060
10	6.400	1.920	5.100	1.330	4.100	1.070	4.000	690
12	5.300	1.590	4.200	1.090	3.500	910	3.300	790
Depth of cut								

**ae=0.15D • High efficiency side milling 4D**

Vc	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	7.200	1.670	6.100	1.290	4.500	950	4.000	770
8	5.400	1.250	4.600	980	3.400	720	3.000	580
10	4.300	1.200	3.700	890	2.700	650	2.400	530
12	3.600	1.010	3.100	740	2.300	550	2.000	440
Depth of cut								

Milling | Solid carbide

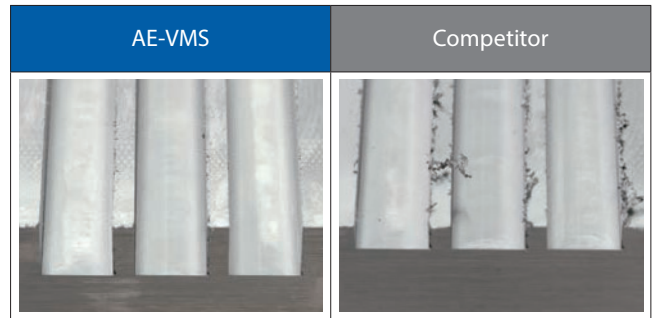


# CUTTING DATA

## Suppression of Burrs

Great surface finish without vibration and minimal burrs.

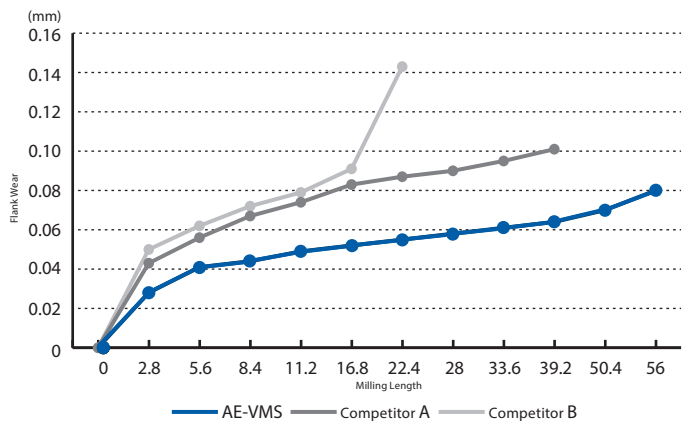
Tool	AE-VMS Ø 10	Competitor Ø 10
Work Material	SUS316	
Cutting Speed	69m/min (2.200 min <sup>-1</sup> )	
Feed Rate	350mm/min (0,04mm/t)	
Depth of Cut	ap = 10mm	ap=5mm
Coolant	Water Soluble	
Machine	Vertical Machining Center	
M.R.R.	35 cm <sup>3</sup> /min	17,5 cm <sup>3</sup> /min



## Stable Performance

Stable performance on stainless steel

Tool	AE-VMS Ø 10
Work Material	SUS304
Cutting Speed	70m/min (2.250 min <sup>-1</sup> )
Feed Rate	475mm/min (0,053mm/t)
Depth of Cut	ap = 10mm
Coolant	Water Soluble
Machine	Vertical Machining Center



Milling | Solid carbide

## Cutting edge wear comparison

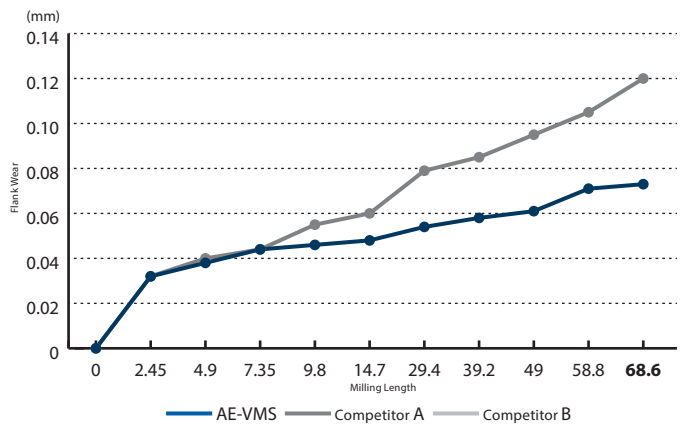




## Stable performance

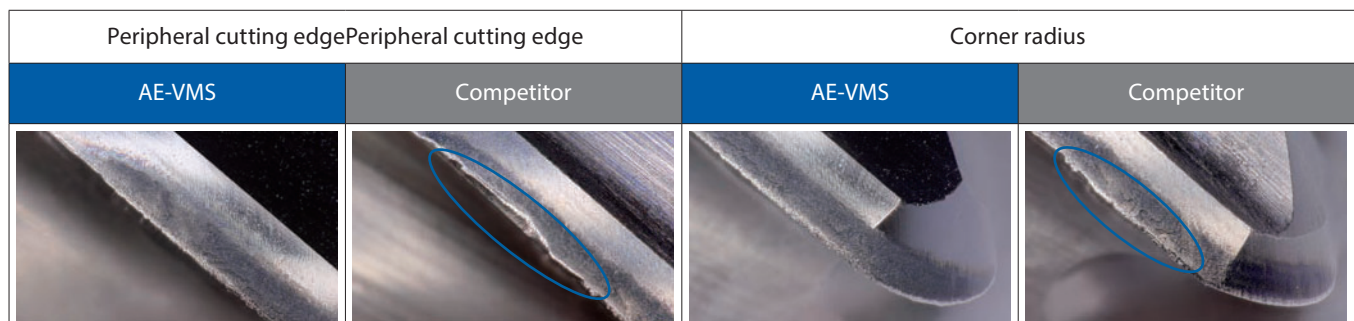
Stable performance even in slotting

Tool	AE-VMS Ø 6 X R1
Work Material	SUS304
Milling method	Slot milling
Cutting Speed	80m/min (4.200 min <sup>-1</sup> )
Feed Rate	830mm/min (0,049 mm/t)
Depth of Cut	ap = 3mm
Coolant	Water Soluble
Machine	Horizontal Machining Center



## Wear comparison

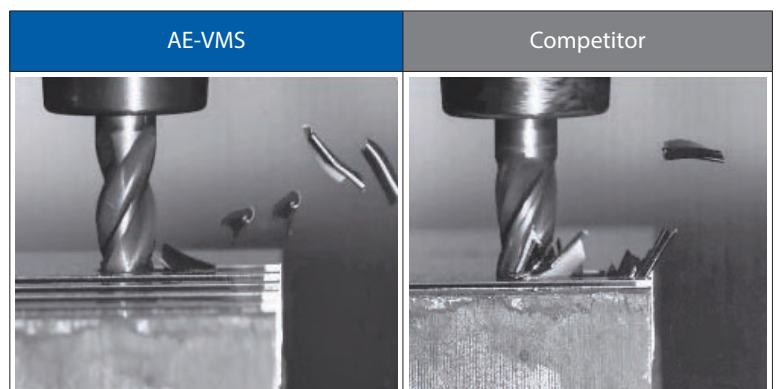
Wear comparison after milling 68,6



## High efficiency

Trouble-free chip evacuation even in high-speed slotting

Tool	AE-VMS Ø 10 X R1
Work Material	SCM440
Milling method	Slot milling
Cutting Speed	90m/min (2.900 min <sup>-1</sup> )
Feed Rate	660mm/min (0,057 mm/t)
Depth of Cut	ap = 10mm
Coolant	None
Machine	Vertical Machining Center

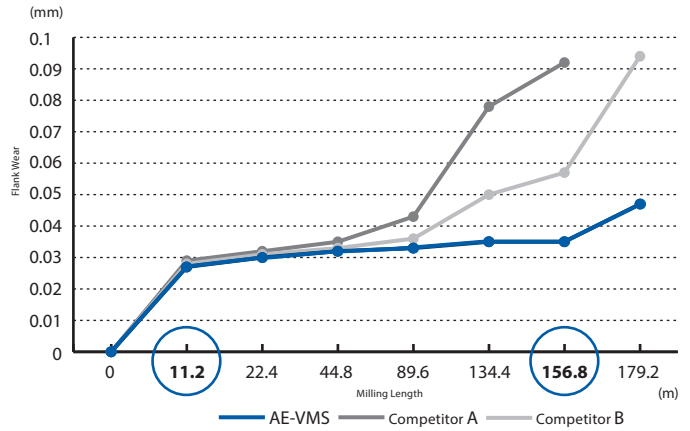


# CUTTING DATA

## Suppression of Burrs

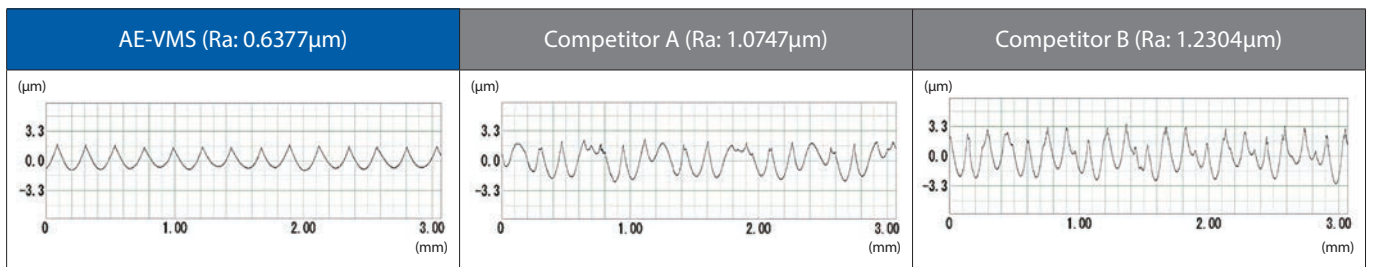
Suppression of cutting heat generation minimizes tool wear

Tool	AE-VMS Ø 6
Work Material	SCM440
Cutting Speed	140m/min (7.500 min <sup>-1</sup> )
Feed Rate	1.800mm/min (0,06mm/t)
Depth of Cut	ap = 9mm ae= 1,2mm
Coolant	Air Blow
Machine	Vertical Machining Center



## Surface roughness comparison

Surface roughness after milling 11,2m



## Tool condition comparison

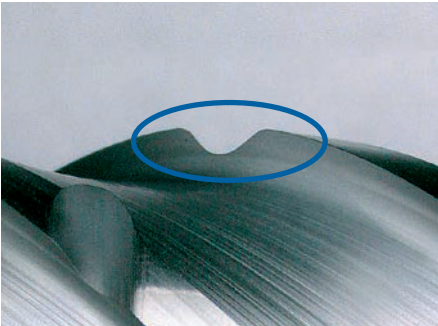
Tool condition after milling 156,8m

	Cutting Chips	Wear Comparison
AE-VMS	<p>Brown about 500°C</p>	<p>No Cutting Edge Recession</p>
Competitor A	<p>Purple about 600°C</p>	<p>Excessive Cutting Edge Recession</p>
Competitor B	<p>Blue about 700°C</p>	<p>Minimal Cutting Edge Recession</p>

Milling | Solid carbide

# AE-VML: WITH CHIPBREAKER

Minimizes chipping with unique R profiles at the edge of the chipbreaker.



## Troubled by long and stringy chip accumulation

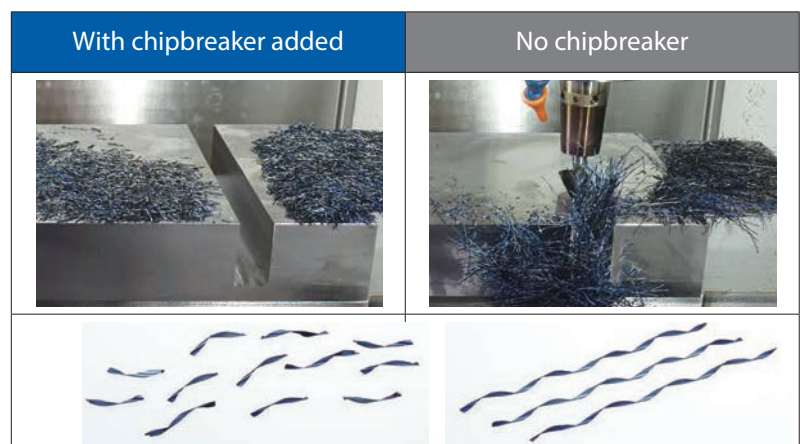


Large chip accumulation can be problematic for long-hour and high chip removal side milling, trochoidal milling, and pocket milling with long flute length end mills.

**Breaks chips into small pieces!**

## Enables continuous machine operation

The chipbreaker (-N) creates small chips that can be easily evacuated by air or cutting oil. For high-quality machined surfaces, we recommend the AE-VML square without chipbreaker.



<b>Tool</b>	AE-VML $\phi 10 \times 40$ -N With chipbreaker	<b>Feed Rate</b>	1,140mm/min 0.075mm/t
<b>Work Material</b>	NAK80(40HRC)	<b>Depth of Cut</b>	ap=40mm ae=0.5mm
<b>Milling Method</b>	Trochoidal	<b>Coolant</b>	Air blow
<b>Cutting Speed</b>	120m/min 3,800min <sup>-1</sup>	<b>Machine</b>	BT50 Vertical Machining Center

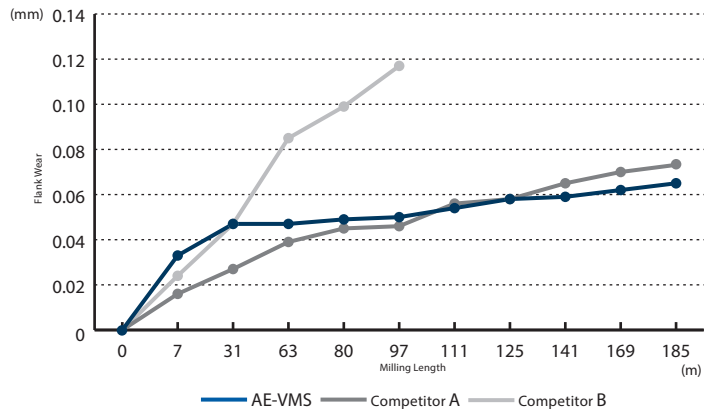


# CUTTING DATA

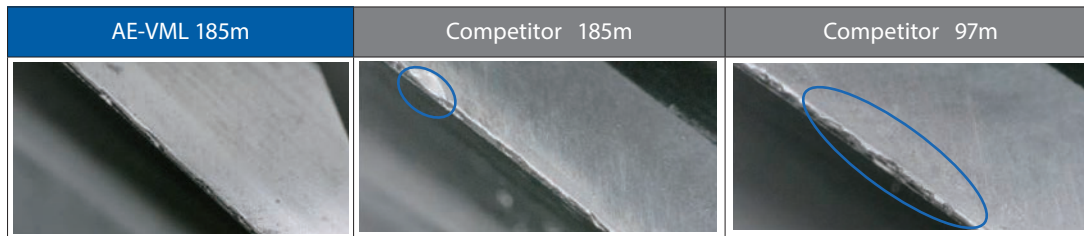
## Stable performance

Stable performance even at 4D depth of cut

Tool	AE-VML Ø 10 x 40
Work Material	S50C
Milling Method	Side milling
Cutting Speed	130m/min (4,200min <sup>-1</sup> )
Feed Rate	1.200mm/min (0,07mm/t)
Depth of Cut	ap=40mm ae=0.5mm
Coolant	Air Blow
Machine	Horizontal Machining Center



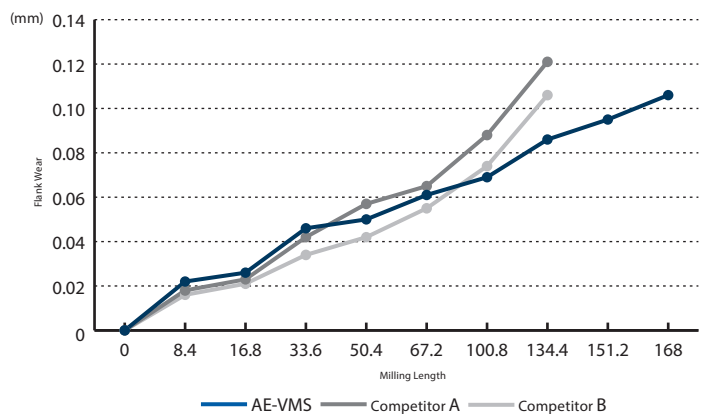
## Wear comparison of the peripheral cutting edge



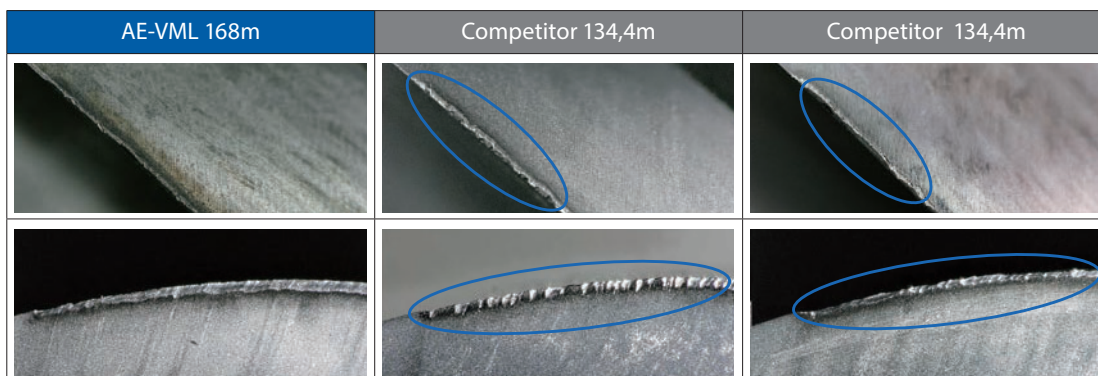
## Long tool life

DUARISE coating greatly reduces tool wear progression even with the use of water-soluble coolant.

Tool	AE-VML Ø 10 x 31
Work Material	SCM440(30HRC)
Milling Method	Side milling
Cutting Speed	180m/min (5.700min <sup>-1</sup> )
Feed Rate	1.400mm/min (0,06mm/t)
Depth of Cut	ap=25mm ae=1mm
Coolant	Water Soluble
Machine	Vertical Machining Center



Wear comparison of the peripheral cutting edge



Milling | Solid carbide





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shaping your dreams

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