

8-flute End Mill for Vertical Wall/Bottom Face Finishing

ER8WB-ATH (Radius type)

ES8WB-ATH (Square type)



MOLDINO Tool Engineering, Ltd.

New Product News | No.2101E-7 | 2025-3

The Zenith of Milling for Vertical Wall and Bottom Face Finishing

Vertical wall and bottom face finishing with a single tool!

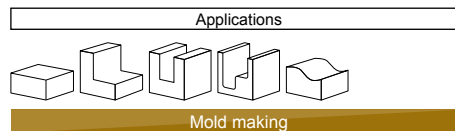
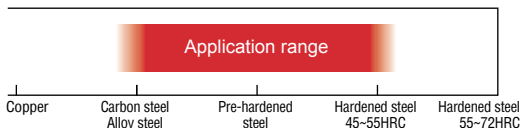
ER8WB-ATH/ES8WB-ATH features

01

Peripheral cutting edge design tailored for vertical wall milling
Allows milling as intended with minimal deflection,
reducing re-machining and re-working steps.

02

Incorporates MOLDINO's own corner radius edges to achieve
high-quality bottom face milling.

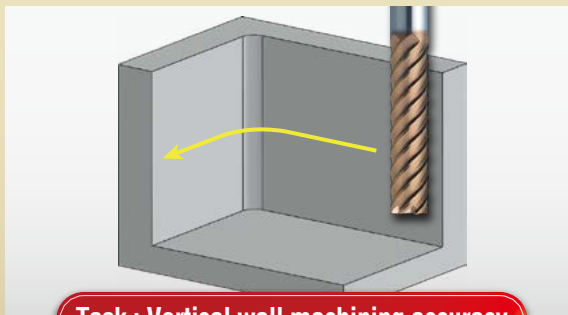


ER8WB-ATH : $\phi 6 \sim \phi 12$ [19 Items]
(Corner radius RE1)

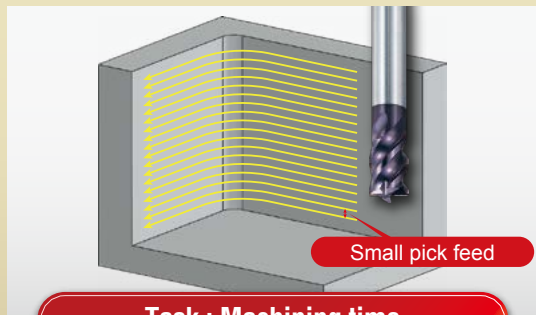
ES8WB-ATH : $\phi 6 \sim \phi 12$ [19 Items]
(Square)

Task

1 Using long-flute end mills for vertical walls of molds reduces accuracy and generates the need for time-consuming remachining and reworking.



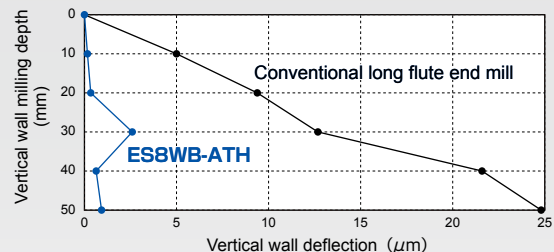
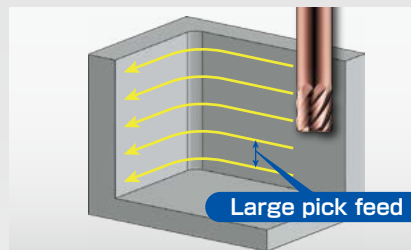
2 Reducing pick feed when contour milling achieves machining accuracy for vertical walls but increases machining time.



Proposal

Using the ER(S)8WB-ATH reduces re-working such as zero cutting and correction, making unattended machining more practical.

The ER(S)8WB-ATH allows contour milling with larger pick feed.



Work material : STAVAX (52HRC) Machine : Vertical MC Coolant : Air blow Projection : 60mm(L/D=5)

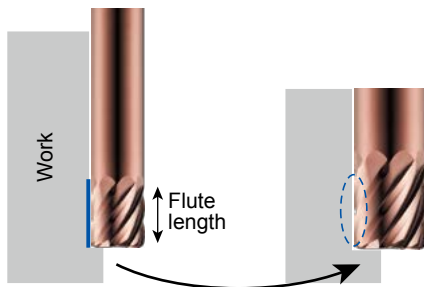
【Conventional long-flute end mill】

Tool specifications : $\phi 12 \cdot$ Flute length 55mm \cdot 6Flutes
 $n=530\text{min}^{-1}$ ($v_c=20\text{m/min}$) $v_f=93\text{mm/min}$ ($f_z=0.03\text{mm/t}$)
 $a_p=50\text{mm}$ $a_e=0.05\text{mm}$

【ES8WB-ATH】

Tool specifications : ES8WB1200LN-60-ATH ($\phi 12 \cdot$ Flute length 12mm \cdot 8Flutes)
 $n=1,326\text{min}^{-1}$ ($v_c=50\text{m/min}$) $v_f=636\text{mm/min}$ ($f_z=0.06\text{mm/t}$)
 $a_p=6\text{mm}$ $a_e=0.05\text{mm}$

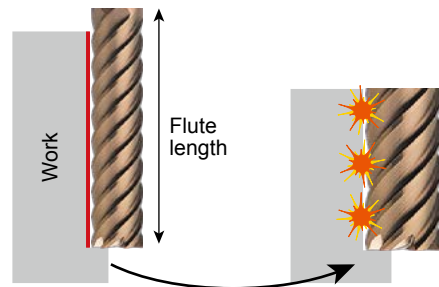
Vertical wall finishing using ER(S)8WB-ATH



Solution

- Short flute gives high rigidity
=> **Minimizes deflection**
- Tool design with few contact points
=> **Minimizes vibration**

Vertical wall finishing with conventional long-flute end mill



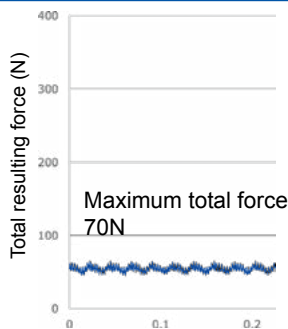
Task

- Extended projection length (flute length)
=> **Deflection**
- Multiple contact points
=> **Increased vibration**

Comparison of cutting force

Work material : SKD61(48HRC) Machine : Vertical MC(BT40) Coolant : Air blow Projection : 30mm(L/D=5)

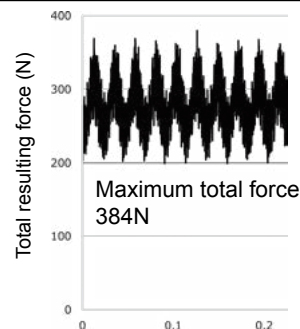
ER(S)8WB-ATH



Tool : ES8WB0600LN-30-AT
($\phi 6$, Flute length 6mm,
Under neck length 30mm)
Cutting conditions : $n=2650\text{min}^{-1}$
($v_c=50\text{m/min}$)
 $v_f=636\text{mm/min}$
($f_z 0.03\text{mm/t}$)
 $a_p 3\text{mm}$ $a_e 0.1\text{mm}$

Reduced cutting force and vibration

Conventional long flute end mill

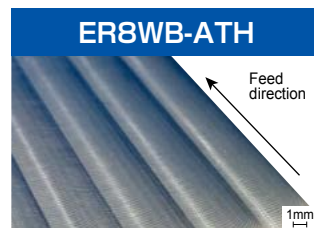
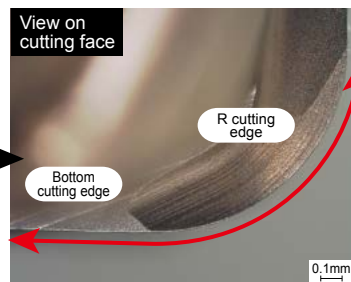
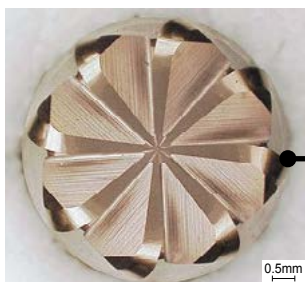


Tool : 6flutes long flute
($\phi 6$, Flute length 25mm)
Cutting conditions : $n=2650\text{min}^{-1}$
($v_c=50\text{m/min}$)
 $v_f=477\text{mm/min}$
($f_z 0.03\text{mm/t}$)
 $a_p 25\text{mm}$ $a_e 0.1\text{mm}$

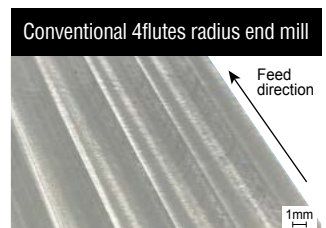
Large cutting force, resulting in vibration

This is the Point

The unique design reducing cutting force and vibration allows milling as intended with minimal deflection.



Shiny appearance
with uniform
cutter marks



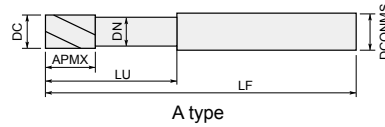
Milled surface
appears cloudy.
Uneven cutter marks

Smooth interface between bottom and radius
cutting edges ensures high-quality
bottom face milling.

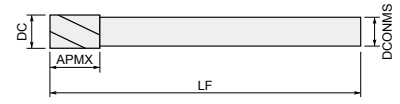
Work material : S50C Machine : Vertical MC(BT40)
Coolant : Air blow Projection : 60mm(L/D=5)
Tool : Conventional 4flutes radius end mill,
ER8WB1200LN-60-R1.0-ATH($\phi 12$)
Cutting conditions : $n=5310\text{min}^{-1}$ ($v_c 200\text{m/min}$) $f_z 0.06\text{mm/t}$ $a_p 0.05\text{mm}$ $a_e 6\text{mm}$

Line Up

Square



A type



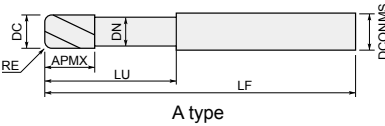
B type

ES8WB LN(LS)-ATH

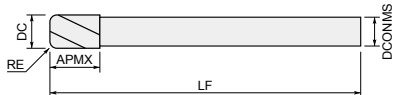


Item code	Stock	Size(mm)						Shape
		Tool dia.	Flute length	Under neck length	Neck dia.	Overall length	Shank dia.	
		DC	APMX	LU	DN	LF	DCONMS	
ES8WB0600LN-20-ATH	●	6	6	20	5.88	70	6	A
ES8WB0600LN-30-ATH	●		6	30	5.88	80	6	A
ES8WB0600LN-40-ATH	●		6	40	5.88	90	6	A
ES8WB0600LN-50-ATH	●		6	50	5.88	100	6	A
ES8WB0700LS-ATH	●	7	7	—	—	90	6	B
ES8WB0800LN-30-ATH	●	8	8	30	7.84	75	8	A
ES8WB0800LN-40-ATH	●		8	40	7.84	90	8	A
ES8WB0800LN-50-ATH	●		8	50	7.84	100	8	A
ES8WB0800LN-60-ATH	●		8	60	7.84	110	8	A
ES8WB0900LS-ATH	●	9	9	—	—	100	8	B
ES8WB1000LN-35-ATH	●	10	10	35	9.8	80	10	A
ES8WB1000LN-50-ATH	●		10	50	9.8	100	10	A
ES8WB1000LN-60-ATH	●		10	60	9.8	110	10	A
ES8WB1000LN-80-ATH	●		10	80	9.8	130	10	A
ES8WB1100LS-ATH	●	11	11	—	—	110	10	B
ES8WB1200LN-40-ATH	●	12	12	40	11.8	90	12	A
ES8WB1200LN-60-ATH	●		12	60	11.8	110	12	A
ES8WB1200LN-80-ATH	●		12	80	11.8	130	12	A
ES8WB1200LN-100-ATH	●		12	100	11.8	150	12	A

Radius

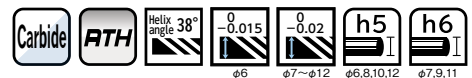


A type



B type

ER8WB LN(LS)-R-ATH



Item code	Stock	Size(mm)							Shape
		Tool dia.	Corner radius	Flute length	Under neck length	Neck dia.	Overall length	Shank dia.	
		DC	RE	APMX	LU	DN	LF	DCONMS	
ER8WB0600LN-20-R1.0-ATH	●	6	1	7	20	5.88	70	6	A
ER8WB0600LN-30-R1.0-ATH	●		1	7	30	5.88	80	6	A
ER8WB0600LN-40-R1.0-ATH	●		1	7	40	5.88	90	6	A
ER8WB0600LN-50-R1.0-ATH	●		1	7	50	5.88	100	6	A
ER8WB0700LS-R1.0-ATH	●	7	1	8	—	—	90	6	B
ER8WB0800LN-30-R1.0-ATH	●	8	1	9	30	7.84	75	8	A
ER8WB0800LN-40-R1.0-ATH	●		1	9	40	7.84	90	8	A
ER8WB0800LN-50-R1.0-ATH	●		1	9	50	7.84	100	8	A
ER8WB0800LN-60-R1.0-ATH	●		1	9	60	7.84	110	8	A
ER8WB0900LS-R1.0-ATH	●	9	1	10	—	—	100	8	B
ER8WB1000LN-35-R1.0-ATH	●	10	1	11	35	9.8	80	10	A
ER8WB1000LN-50-R1.0-ATH	●		1	11	50	9.8	100	10	A
ER8WB1000LN-60-R1.0-ATH	●		1	11	60	9.8	110	10	A
ER8WB1000LN-80-R1.0-ATH	●		1	11	80	9.8	130	10	A
ER8WB1100LS-R1.0-ATH	●	11	1	12	—	—	110	10	B
ER8WB1200LN-40-R1.0-ATH	●	12	1	13	40	11.8	90	12	A
ER8WB1200LN-60-R1.0-ATH	●		1	13	60	11.8	110	12	A
ER8WB1200LN-80-R1.0-ATH	●		1	13	80	11.8	130	12	A
ER8WB1200LN-100-R1.0-ATH	●		1	13	100	11.8	150	12	A

●: Stocked items.

Recommended Cutting Conditions

Vertical wall finishing

Work material			Carbon steels Alloy steels (180~250HB)		Tool steels (25~35HRC)		Pre-hardened steels (35~45HRC)		Hardened steels (45~55HRC)	
Item code	a_p (mm)	a_e (mm)	Revolution n (min ⁻¹)	Feed rate v_f (mm/min)	Revolution n (min ⁻¹)	Feed rate v_f (mm/min)	Revolution n (min ⁻¹)	Feed rate v_f (mm/min)	Revolution n (min ⁻¹)	Feed rate v_f (mm/min)
ER(S)8WB0600LN-20-(R1.0)-ATH	3	≤0.1	7960	1910	6370	1530	4770	1140	3180	760
ER(S)8WB0600LN-30-(R1.0)-ATH	3	≤0.1	6630	1590	5310	1270	3980	960	2650	640
ER(S)8WB0600LN-40-(R1.0)-ATH	3	≤0.1	4640	780	3710	620	2790	470	1860	310
ER(S)8WB0600LN-50-(R1.0)-ATH	3	≤0.1	3320	400	2650	320	1990	240	1330	160
ER(S)8WB0700LS-(R1.0)-ATH	3.5	≤0.1	5680	1590	4550	1270	3410	950	2270	640
ER(S)8WB0800LN-30-(R1.0)-ATH	4	≤0.1	5970	1910	4770	1530	3580	1150	2390	760
ER(S)8WB0800LN-40-(R1.0)-ATH	4	≤0.1	4970	1590	3980	1270	2980	950	1990	640
ER(S)8WB0800LN-50-(R1.0)-ATH	4	≤0.1	3480	890	2790	620	2090	540	1390	360
ER(S)8WB0800LN-60-(R1.0)-ATH	4	≤0.1	2490	400	1990	320	1490	240	990	160
ER(S)8WB0900LS-(R1.0)-ATH	4.5	≤0.1	4420	1590	3540	1270	2650	950	1770	640
ER(S)8WB1000LN-35-(R1.0)-ATH	5	≤0.1	4770	1910	3820	1530	2860	1140	1910	760
ER(S)8WB1000LN-50-(R1.0)-ATH	5	≤0.1	3980	1590	3180	1270	2390	960	1590	640
ER(S)8WB1000LN-60-(R1.0)-ATH	5	≤0.1	2790	890	2230	620	1670	530	1110	360
ER(S)8WB1000LN-80-(R1.0)-ATH	5	≤0.1	1990	400	1590	320	1190	240	800	160
ER(S)8WB1100LS-(R1.0)-ATH	5.5	≤0.1	3620	1510	2890	1210	2170	910	1450	610
ER(S)8WB1200LN-40-(R1.0)-ATH	6	≤0.1	3980	1720	3180	1370	2390	1030	1590	690
ER(S)8WB1200LN-60-(R1.0)-ATH	6	≤0.1	3320	1430	2650	1140	1990	860	1330	570
ER(S)8WB1200LN-80-(R1.0)-ATH	6	≤0.1	2320	700	1860	560	1390	420	930	280
ER(S)8WB1200LN-100-(R1.0)-ATH	6	≤0.1	1660	360	1330	290	990	210	660	140



* Cutting conditions for the long-shank type (ø 7/9/11) are for a tool projection of 5DC (tool diameter × 5). Modify the conditions using the following correction factors if the projection amount changes:

Cutting condition correction factors for long-shank type (%)

Work material			Carbon steels Alloy steels (180~250HB)		Tool steels (25~35HRC)		Pre-hardened steels (35~45HRC)		Hardened steels (45~55HRC)	
Projection	a_p (mm)	a_e (mm)	Revolution n (min ⁻¹)	Feed rate v_f (mm/min)	Revolution n (min ⁻¹)	Feed rate v_f (mm/min)	Revolution n (min ⁻¹)	Feed rate v_f (mm/min)	Revolution n (min ⁻¹)	Feed rate v_f (mm/min)
5DC	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
6DC	100%	100%	70%	60%	70%	60%	70%	60%	70%	60%
7DC	100%	100%	70%	50%	70%	50%	70%	50%	70%	50%

- [Note]**
- ① Use the appropriate coolant for the work material and machining shape.
 - ② Use a highly rigid and accurate machine as possible.
 - ③ These Recommended Cutting Conditions indicate only the rule of a thumb for the cutting conditions. In actual machining, the condition should be adjusted according to the machining shape, purpose and the machine type.
 - ④ If the rpm available is lower than that recommended please reduce the feed rate to the same ratio.

Regrinding compatibility range table

Item code	Product name	Line up tool dia. (mm)	Shape	Re-grinding compatibility range(mm)	
				Outer dia.	End
ES8WB-ATH	8-flute End Mill for Vertical Wall/Bottom Face Finishing (Square type)	6 ~ 12		6~12	6~12
ER8WB-ATH	8-flute End Mill for Vertical Wall/Bottom Face Finishing (Radius type)	6 ~ 12		6~12	6~12

Recommended Cutting Conditions

Bottom face finishing

※ A radius type (ER8WB-ATH) should be used for bottom face finishing.

Work material			Carbon steels Alloy steels (180~250HB)		Tool steels (25~35HRC)		Pre-hardened steels (35~45HRC)		Hardened steels (45~55HRC)	
Item code	a_p (mm)	a_e (mm)	Revolution n (min ⁻¹)	Feed rate v_f (mm/min)	Revolution n (min ⁻¹)	Feed rate v_f (mm/min)	Revolution n (min ⁻¹)	Feed rate v_f (mm/min)	Revolution n (min ⁻¹)	Feed rate v_f (mm/min)
ER8WB0600LN-20-R1.0-ATH	0.05~0.1	3~6	9550	2290	7960	1910	6370	1530	4770	1140
ER8WB0600LN-30-R1.0-ATH	0.05~0.1	3~6	7960	1910	6630	1590	5310	1270	3980	960
ER8WB0600LN-40-R1.0-ATH	0.05~0.1	3~6	5570	940	4640	780	3710	620	2790	470
ER8WB0600LN-50-R1.0-ATH	0.05~0.1	3~6	3980	480	3320	400	2650	320	1990	240
ER8WB0700LS-R1.0-ATH	0.05~0.1	3.5~7	6820	1910	5680	1590	4550	1270	3410	950
ER8WB0800LN-30-R1.0-ATH	0.05~0.1	4~8	7160	2290	5970	1910	4770	1530	3580	1150
ER8WB0800LN-40-R1.0-ATH	0.05~0.1	4~8	5970	1910	4970	1590	3980	1270	2980	950
ER8WB0800LN-50-R1.0-ATH	0.05~0.1	4~8	4180	1070	3480	890	2790	710	2090	540
ER8WB0800LN-60-R1.0-ATH	0.05~0.1	4~8	2980	480	2490	400	1990	320	1490	240
ER8WB0900LS-R1.0-ATH	0.05~0.1	4.5~9	5310	1910	4420	1590	3540	1270	2650	950
ER8WB1000LN-35-R1.0-ATH	0.05~0.1	5~10	5730	2290	4770	1910	3820	1530	2860	1140
ER8WB1000LN-50-R1.0-ATH	0.05~0.1	5~10	4770	1910	3980	1590	3180	1270	2390	960
ER8WB1000LN-60-R1.0-ATH	0.05~0.1	5~10	3340	1070	2790	890	2230	710	1670	530
ER8WB1000LN-80-R1.0-ATH	0.05~0.1	5~10	2390	480	1990	400	1590	320	1190	240
ER8WB1100LS-R1.0-ATH	0.05~0.1	5.5~11	4340	1810	3620	1510	2890	1210	2170	910
ER8WB1200LN-40-R1.0-ATH	0.05~0.1	6~12	4770	2060	3980	1720	3180	1370	2390	1030
ER8WB1200LN-60-R1.0-ATH	0.05~0.1	6~12	3980	1720	3320	1430	2650	1140	1990	860
ER8WB1200LN-80-R1.0-ATH	0.05~0.1	6~12	2790	840	2320	700	1860	560	1390	420
ER8WB1200LN-100-R1.0-ATH	0.05~0.1	6~12	1990	430	1660	360	1330	290	990	210

* Cutting conditions for the long-shank type ($\phi 7/9/11$) are for a tool projection of 5DC (tool diameter \times 5). Modify the conditions using the following correction factors if the projection amount changes:

Cutting condition correction factors for long-shank type (%)

Work material			Carbon steels Alloy steels (180~250HB)		Tool steels (25~35HRC)		Pre-hardened steels (35~45HRC)		Hardened steels (45~55HRC)	
Projection	a_p (mm)	a_e (mm)	Revolution n (min ⁻¹)	Feed rate v_f (mm/min)	Revolution n (min ⁻¹)	Feed rate v_f (mm/min)	Revolution n (min ⁻¹)	Feed rate v_f (mm/min)	Revolution n (min ⁻¹)	Feed rate v_f (mm/min)
5DC	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
6DC	100%	100%	70%	60%	70%	60%	70%	60%	70%	60%
7DC	100%	100%	70%	50%	70%	50%	70%	50%	70%	50%

- [Note]**
- ① Use the appropriate coolant for the work material and machining shape.
 - ② Use a highly rigid and accurate machine as possible.
 - ③ These Recommended Cutting Conditions indicate only the rule of a thumb for the cutting conditions. In actual machining, the condition should be adjusted according to the machining shape, purpose and the machine type.
 - ④ If the rpm available is lower than that recommended please reduce the feed rate to the same ratio.
 - ⑤ For slotting, adjust the feed rate to 50% as general criteria.
 - ⑥ For ramping, adjust the ramp angle to 0.5° or less and the feed rate to 50% as general criteria.

The ER8WB-ATH achieves high-quality bottom face milling.

This is the Point

Use with a small pick feed and high cutting speed milling allows for a high mirror finish



Work size : 80×70mm



Work material : STAVAX(52HRC)
Machine : Vertical MC(HSK-E32)
Coolant : Water base coolant
Projection : 20mm(L/D \div 3)
Tool : ER8WB0600LN-20-R1.0-ATH ($\phi 6$)
Cutting conditions : $n=40,000\text{min}^{-1}$ ($v_c=753\text{m/min}$)
 $v_f=3,200\text{mm/min}$ ($f_z=0.01\text{mm/t}$)
 $a_p=0.015\text{mm}$ $a_e=0.02\text{mm}$ Wet
Reciprocating machining of scanning line 2-hour machining time

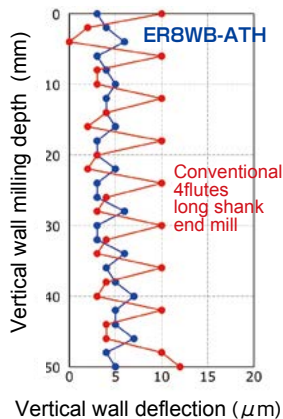
Surface roughness in pick direction Ra:0.015 μm Rz:0.069 μm

Diecast mold core vertical wall finishing

Work material : SKD61(45HRC) Machine : Vertical MC (HSK-A63) Coolant : Air blow Projection : 65mm(L/D≒5)
Tool : ER8WB1200LN-60-R1.0-ATH(φ12) Conventional 4flutes long shank end mill

Cutting conditions : ER8WB-ATH
 $n=1,326\text{min}^{-1}$ ($v_c=50\text{m/min}$) $v_f=636\text{mm/min}$ ($f_z=0.06\text{mm/t}$)
 $a_p=6\text{mm}$ $a_e=0.1\text{mm}$

Conventional 4flutes long shank end mill
 $n=1,326\text{min}^{-1}$ ($v_c=50\text{m/min}$) $v_f=318\text{mm/min}$ ($f_z=0.06\text{mm/t}$)
 $a_p=6\text{mm}$ $a_e=0.1\text{mm}$



ER8WB-ATH

Surface roughness in pick direction
 $Ra 0.130\mu\text{m}$
 $Rz 0.966\mu\text{m}$

Milled surface with minimal unevenness and shine



Conventional

Surface roughness in pick direction
 $Ra 0.480\mu\text{m}$
 $Rz 3.533\mu\text{m}$

Cloudy and uneven milled surface with conventional tools

ER8WB-ATH allows good machining accuracy and machining surface to be twofold efficiency for conventional tools.

Example for plastic molds and bushing hole finishing

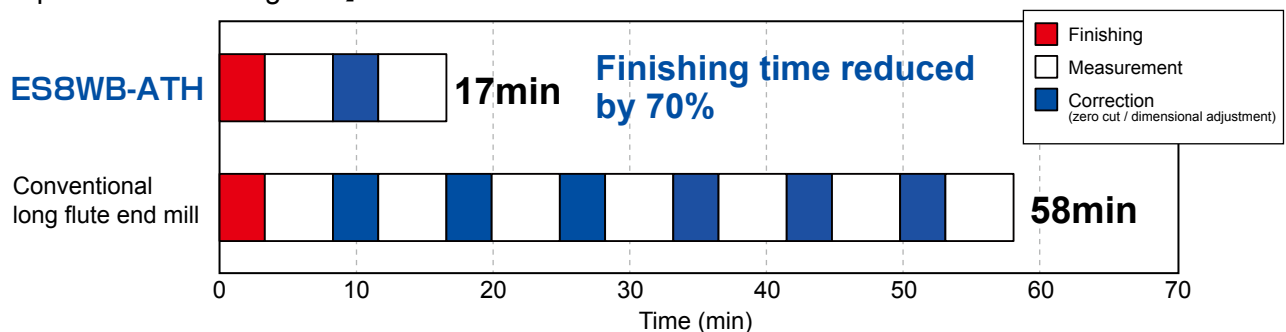
Work material : STAVAX(52HRC) Machine : Vertical MC (BT40) Coolant : Oil base coolant Projection : 50mm(L/D=5)
Tool : ES8WB1000LN-50-ATH(φ10) Conventional long flute end mill Hole dia. : 42mm Depth : 37mm

Cutting conditions : ES8WB-ATH
 $n=1,592\text{min}^{-1}$ ($v_c=50\text{m/min}$) $v_f=318\text{mm/min}$ ($f_z=0.025\text{mm/t}$)
 $a_p=5\text{mm}$ $a_e=0.05\text{mm}$

Conventional 6flutes long flute end mill
 $n=600\text{min}^{-1}$ ($v_c=19\text{m/min}$) $v_f=80\text{mm/min}$ ($f_z=0.022\text{mm/t}$)
 $a_p=20\text{mm}$ $a_e=0.05\text{mm}$

* Machined using finishing machining with nominal diameter for both tools

【Comparison of finishing time】



ES8WB-ATH



Surface roughness in pick direction $Ra : 0.216\mu\text{m}$ $Rz : 0.924\mu\text{m}$

- Long-flute end mill requires total of 6 zero cuts and corrections for deflection and dimensional adjustment.
- ES8WB-ATH achieves deflection of less than $3\mu\text{m}$, even **without zero cutting**. Completed with just one final dimensional adjustment.



The diagrams and table data are examples of test results, and are not guaranteed values.
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Attentions on Safety

1. Cautions regarding handling

- (1) When removing the tool from its case (packaging), be careful that the tool does not pop out or is dropped. Be particularly careful regarding contact with the tool flutes.
- (2) When handling tools with sharp cutting flutes, be careful not to touch the cutting flutes directly with your bare hands.

2. Cautions regarding mounting

- (1) Before use, check the outside appearance of the tool for scratches, cracks, etc. and that it is firmly mounted in the collet chuck, etc.
- (2) If abnormal chattering, etc. occurs during use, stop the machine immediately and remove the cause of the chattering.

3. Cautions during use

- (1) Before use, confirm the dimensions and direction of rotation of the tool and milling work material.
- (2) The numerical values in the standard cutting conditions table should be used as criteria when starting new work. The cutting conditions should be adjusted as appropriate when the cutting depth is large, the rigidity of the machine being used is low, or according to the conditions of the work material.
- (3) Cutting tools are made of a hard material. During use, they may break and fly off. In addition, cutting chips may also fly off. Since there is a danger of injury to workers, fire, or eye damage from such flying pieces, a safety cover should be attached when work is performed and safety equipment such as safety goggles should be worn to create a safe environment for work.
- (4) There is a risk of fire or inflammation due to sparks, heat due to breakage, and cutting chips. Do not use where there is a risk of fire or explosion. **Please caution of fire while using oil base coolant, fire prevention is necessary.**
- (5) Do not use the tool for any purpose other than that for which it is intended.

4. Cautions regarding regrinding

- (1) If regrinding is not performed at the proper time, there is a risk of the tool breaking. Replace the tool with one in good condition, or perform regrinding.
- (2) Grinding dust will be created when regrinding a tool. When regrinding, be sure to attach a safety cover over the work area and wear safety clothes such as safety goggles, etc.
- (3) This product contains the specified chemical substance cobalt and its inorganic compounds. When performing regrinding or similar processing, be sure to handle the processing in accordance with the local laws and regulations regarding prevention of hazards due to specified chemical substances.

MOLDINO Tool Engineering, Ltd.


Head Office
 Hulic Ryogoku Bldg. 8F, 4-31-11, Ryogoku, Sumida-ku, Tokyo, Japan 130-0026
 International Sales Dept. : TEL +81-3-6890-5103 FAX +81-3-6890-5128

Official Web Site

<https://www.moldino.com>

Database for selection Cutting Tool Products **[TOOL SEARCH]**

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Search Web 

Europe **MOLDINO Tool Engineering Europe GmbH**
 Itterpark 12, 40724 Hilden, Germany.
 Tel +49-(0)2103-24820 Fax +49-(0)2103-248230

America **MITSUBISHI MATERIALS U.S.A. CORPORATION**
DETROIT OFFICE Customer service
 41700 Gardenbrook Road, Suite 120, Novi, MI 48375-1320 U.S.A.
 Tel +1(248) 308-2620 Fax +1(248) 308-2627

Mexico **MMC METAL DE MEXICO, S.A. DE C.V.**
 Av. La Cañada No.16, Parque Industrial Bernardo Quintana, El Marques, Querétaro, CP 76246, México
 Tel +52-442-1926800

Brazil **MMC METAL DO BRASIL LTDA.**
 Rua Cincinato Braga, 340 13° andar, Bela Vista – CEP 01333-010 São Paulo – SP., Brasil
 Tel +55(11)3506-5600 Fax +55(11)3506-5677

Thailand **MMC Hardmetal (Thailand) Co., Ltd. MOLDINO Division**
 622 Emporium Tower, Floor 22/1-4, Sukhumvit Road, Klongton, Klongtoey,
 Bangkok 10110, Thailand
 TEL:+66-(0)2-661-8175 FAX:+66-(0)2-661-8176

India **MMC Hardmetal India Pvt Ltd.**
 H.O.: Prasad Enclave, #118/119, 1st Floor, 2nd Stage, 5th main, BBMP Ward #11, (New #38),
 Industrial Suburb, Yeshwanthpura, Bengaluru, 560 022, Karnataka, India.
 Tel +91-80-2204-3600

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