

NEW



ASPV mini

Polish Mill V type ASPV mini

ASPV

Polish Mill V type ASPV

Expanded lineup with a focus on large-diameter bodies, precision bodies and insert grades.



MOLDINO Tool Engineering, Ltd.

New Product News | No.2601E | 2026-3

Addresses challenges posed by structural component finishing

Issue
01

We want to reduce cycle times, but increasing cutting conditions reduces accuracy.



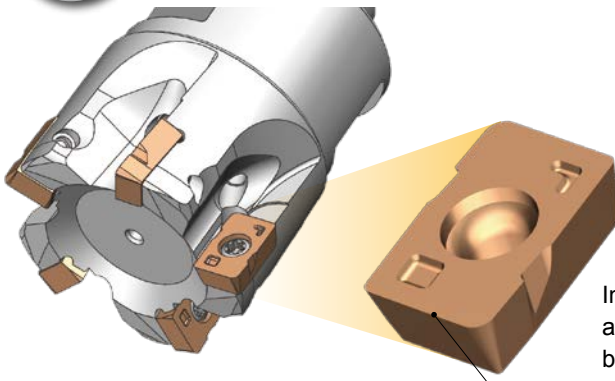
Proposed solutions

High precision × fine pitch concept

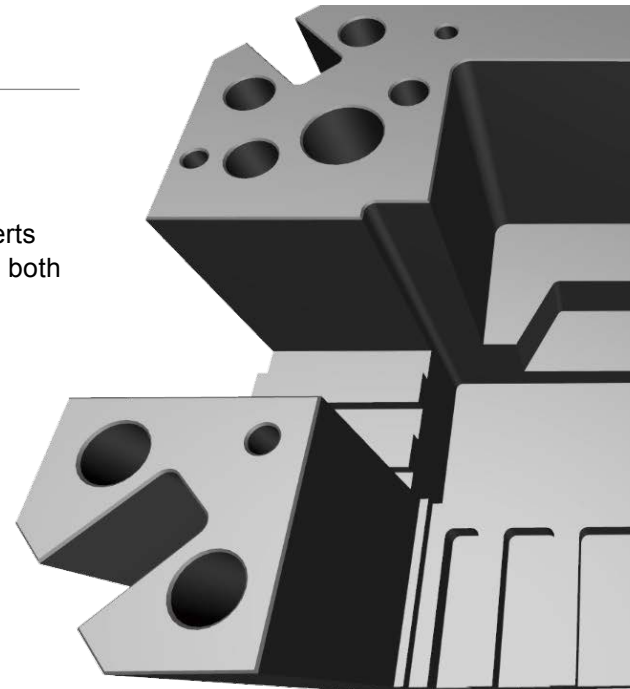


Point!

Combines high precision ground inserts with fine-pitch body design to ensure both accuracy and productivity.



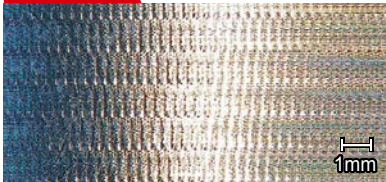
Inserts with wiper edges are also available for bottom face finishing.



Point!

Reduces rework operations and significantly reduces finishing time.

ASPV mini

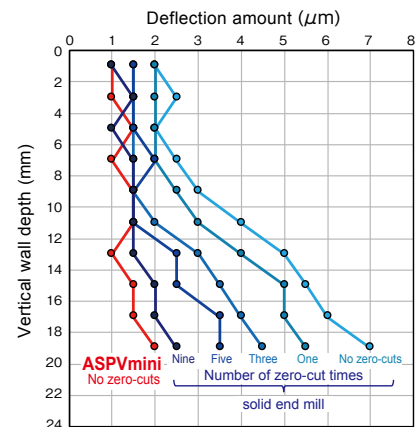


Shiny surface

Conventional (solid end mill)



Worn / Cloudy surface



ASPV mini



Equipped with small inserts featuring a free-cutting chipbreaker
Enables replacement of solid end mills.

Tool diameters $\phi 10 - \phi 33$ mm
For more information, see pages 4 - 11 in this catalog.

Issue

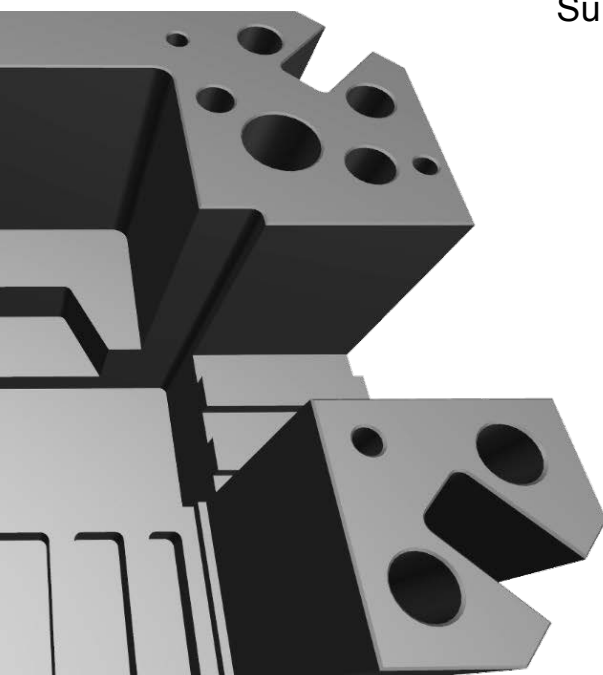
02

Different tools are required for various machining locations and depths. Typically, this calls for a large number of tools.

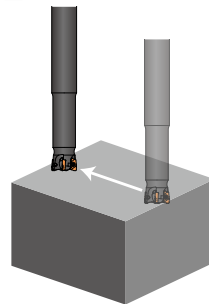


Proposed solutions

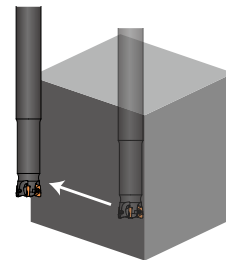
Supports a wide range of machining requirements.



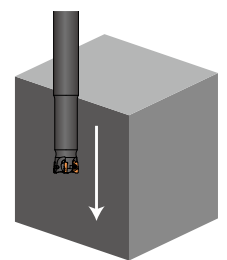
High flexibility in machining methods makes it possible to machine a wide range of locations.



Face milling



Contour machining

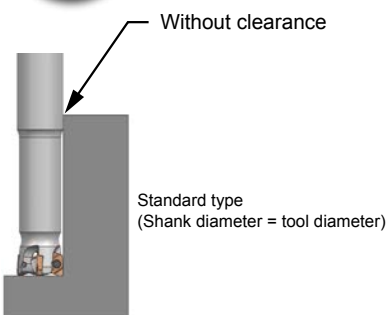


Vertical cutting

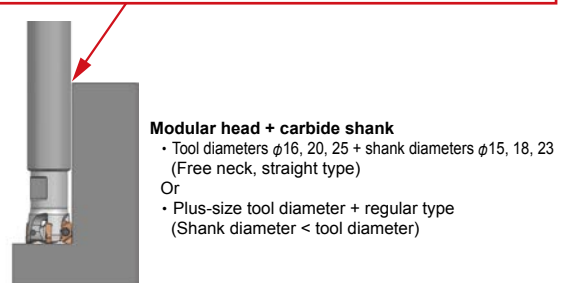
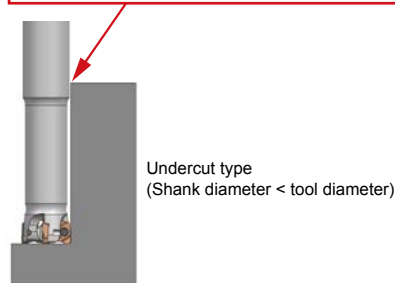
Interference avoidance variations



Extensive lineup reduces risk of interference with wall sections.



With clearance: reduced risk of interference



ASPV

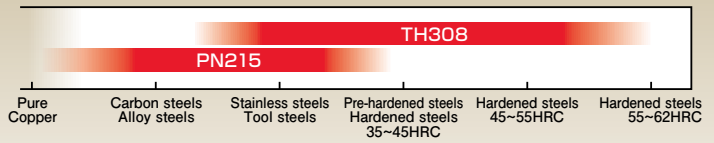
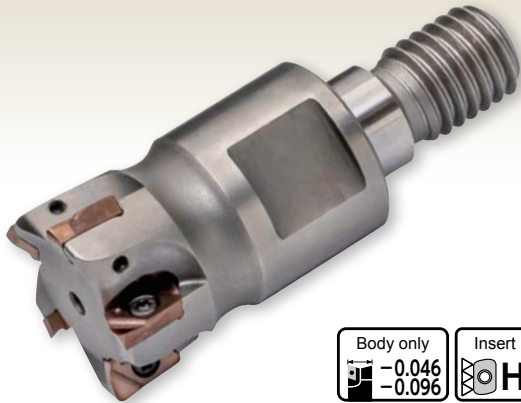


Large-diameter bodies and extensive insert lineup
Can be used with a wide range of materials from steel to aluminum and graphite.

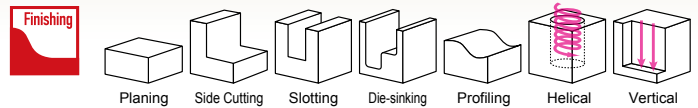
Tool diameters $\phi 12 - \phi 125$ mm
For more information, see pages 12 - 25 in this catalog.

ASPVmini Features and Machining Examples

ASPVmini



Applications



Features

Free-cutting chipbreaker

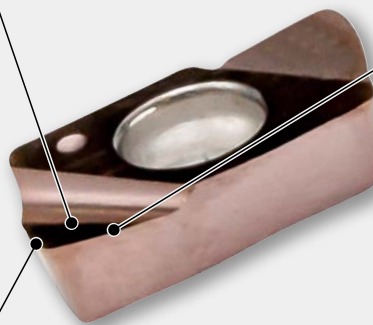
Achieves high-cutting surface grades, even for work materials whose cut surface tends to be cloudy, like carbon steel. Maintains high dimensional accuracy when cutting, even for tools with long overhangs.

Peripheral cutting edge

Functions as peripheral cutting edge when side cutting.

Front cutting edge

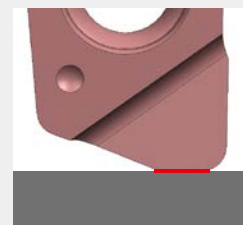
This edge is used for bottom surface finishing. Various shapes with wiper edges are lined up for each R size. Makes it possible to boost feed rates when finishing bottom surfaces.



Without wiper edge



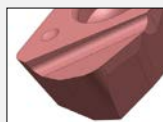
With wiper edge



Point!

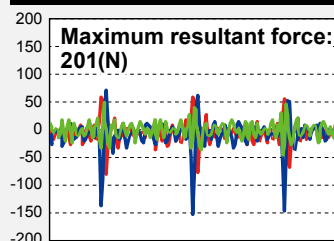
Ground chipbreaker

The ground chipbreaker suppresses cutting forces.



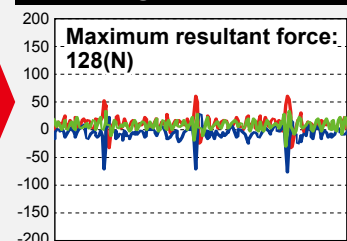
Work material : S50C(220HB)
 Cutter : Diameter $\phi 20$
 Insert : MPHT040205ZEL-0.5(TH308)
 Cutting speed : $v_c = 300\text{m/min}$
 Feed rate : $f_z = 0.1\text{mm/t}$
 Axial depth of cut : $a_p = 1.0\text{mm}$
 Radial depth of cut : $a_e = 0.2\text{mm}$

Conventional

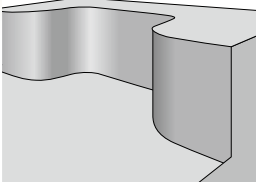
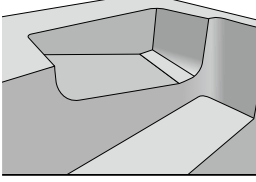
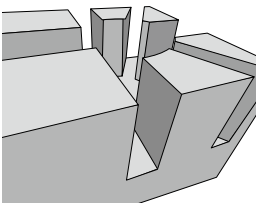
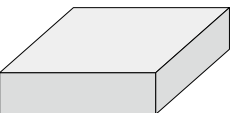


Reduced 36%

ASPVmini

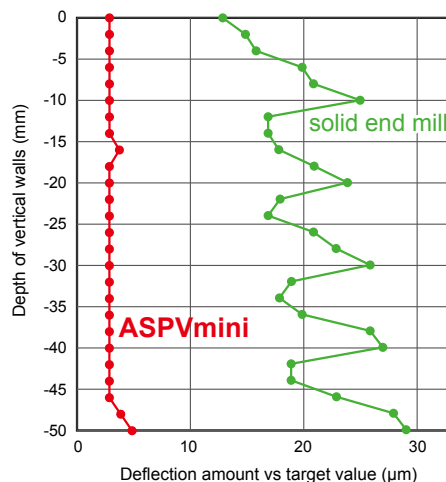


Field Data

Cutting examples	Cutting conditions		Result	
<p>Plastic mold Finishing mold base</p> 	<p>Tool : ASPVM1016R-4-M8、ASC16-8.5-160-95Z Work material : SCM440 (32HRC) Insert : MPHT040202ZEL (Equivalent to TH308) Overhang : 120mm (L/D=7.5) Machine : Vertical type (HSK63)</p>	<p>■ side wall Cutting speed : $V_c=300\text{m/min}$ Revolution : $n=6,000\text{min}^{-1}$ Feed speed : $V_f=2,150\text{mm/min}$ Feed rate : $f_z=0.1\text{mm/t}$ Cutting depth : $a_p=0.8\text{mm}$ Radial depth of cut : $a_e=0.05\text{mm}$ Coolant : Air-blow</p>	<p>■ Bottom surface Cutting speed : $V_c=200\text{m/min}$ Revolution : $n=4,000\text{min}^{-1}$ Feed speed : $V_f=1,600\text{mm/min}$ Feed rate : $f_z=0.1\text{mm/t}$ Cutting depth : $a_p=0.05\text{mm}$ Radial depth of cut : $a_e=8.0\text{mm}$ Coolant : Air-blow</p>	<p>Produces reference surfaces with a single cut and without zero cuts, reducing the time required for modification and additional cutting.</p>
<p>Die-casting mold Finishing design sections</p> 	<p>Tool : ASPVM1012R-3-M6、ASC12-6.5-74-24Z Work material : SKD61 (46HRC) Insert : MPHT040210ZEL-0.5 (Equivalent to TH308) Overhang : 50mm (L/D=4.2) Machine : Vertical type (HSK63)</p>	<p>■ side wall Cutting speed : $V_c=260\text{m/min}$ Revolution : $n=7,000\text{min}^{-1}$ Feed speed : $V_f=2,000\text{mm/min}$ Feed rate : $f_z=0.1\text{mm/t}$ Cutting depth : $a_p=0.1\text{mm}$ Radial depth of cut : $a_e=0.1\text{mm}$ Coolant : Air-blow</p>	<p>■ Bottom surface Cutting speed : $V_c=110\text{m/min}$ Revolution : $n=2,900\text{min}^{-1}$ Feed speed : $V_f=870\text{mm/min}$ Feed rate : $f_z=0.1\text{mm/t}$ Cutting depth : $a_p=0.1\text{mm}$ Radial depth of cut : $a_e=7.0\text{mm}$ Coolant : Air-blow</p>	<p>Maintains high surface grade and dimensional accuracy throughout the cutting process. Can be used as an integrated tool for both design and structural sections.</p>
<p>Mold components Finishing reference surfaces</p> 	<p>Tool : ASPVM1016R-4-M8、ASC16-8.5-160-95Z Work material : SCM440 (32HRC) Insert : MPHT040205ZEL (Equivalent to TH308) Overhang : 125mm (L/D=7.8) Machine : Vertical type (HSK63)</p>	<p>■ side wall Cutting speed : $V_c=300\text{m/min}$ Revolution : $n=6,000\text{min}^{-1}$ Feed speed : $V_f=2,400\text{mm/min}$ Feed rate : $f_z=0.1\text{mm/t}$ Cutting depth : $a_p=0.4\text{mm}$ Radial depth of cut : $a_e=0.05\text{mm}$ Coolant : Air-blow</p>		<p>Allows reference surface finishing at twice the feed rate of conventional tools. Achieves good dimensional accuracy without need for reworking, reducing cutting times to half or less compared to conventional tools.</p>
<p>Plate finishing</p> 	<p>Tool : ASPVM1012R-3-M6、ASC12-6.5-74-24Z Work material : S50C (220HB) Insert : MPHT040205ZEL (Equivalent to TH308) Overhang : 50mm (L/D=4.2) Machine : Vertical type (BT50)</p>	<p>■ Bottom surface Cutting speed : $V_c=300\text{m/min}$ Revolution : $n=7,958\text{min}^{-1}$ Feed speed : $V_f=1,194\text{mm/min}$ Feed rate : $f_z=0.05\text{mm/t}$ Cutting depth : $a_p=0.03\text{mm}$ Radial depth of cut : $a_e=9.6\text{mm}$ Coolant : Emulsion oil</p>		<p>Produces equivalent cutting surface grades at more than twice the feed rate of conventional cermet. Longer tool life for higher efficiency and lower tool costs.</p>

ASPVmini Cutting Data and Lineup

- Insert shapes with enhanced free-cutting capabilities enable to precisely finish deep vertical walls with extended overhangs.
- ASPVmini decreases wall deflection, reducing the time spent on reworking, additional work and modification issues during the finishing process.



⟨Cutting conditions⟩

Work material : S50C(220HB)
Machine : Vertical type (BT40)

solid end mill

Tool dia. : $\phi 20\text{mm}$

Revolution : $1,432\text{min}^{-1}$

Feed rate : 572mm/min

Depth of cut : $a_p=8.0\text{mm}$

Cutting width : $a_e=0.2\text{mm}$

Overhang : $\text{OH}=100\text{mm}$ (L/D=5)

ASPVmini

Tool dia. : $\phi 20\text{mm}$

Insert : MPHT040205ZEL-0.5 (TH308)

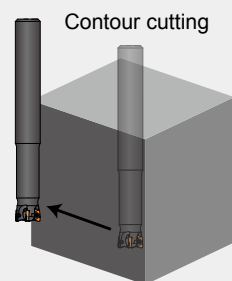
Revolution : $4,775\text{min}^{-1}$

Feed rate : $2,387\text{mm/min}$

Depth of cut : $a_p=1.0\text{mm}$

Cutting width : $a_e=0.2\text{mm}$

Overhang : $\text{OH}=100\text{mm}$ (L/D=5)



- Vertical cutting improves vertical wall accuracy, even when it's difficult to cut the wall at constant depth due to extremely long overhangs.

⟨Cutting conditions⟩

Work material : P21(40HRC)
Machine : Vertical type (HSK100)

Depth constant cutting

Tool dia. : $\phi 11\text{mm}$

Insert : MPHT040205ZEL-0.5 (TH308)

Revolution : $2,893\text{min}^{-1}$

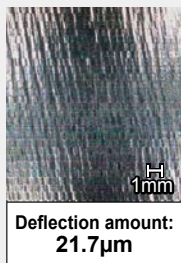
Feed rate : 463mm/min

Depth of cut : $a_p=0.5\text{mm}$

Cutting width : $a_e=0.1\text{mm}$

Overhang : $\text{OH}=90\text{mm}$ (L/D=8.2)

Air-blow



Vertical cutting

Tool dia. : $\phi 11\text{mm}$

Insert : MPHT040205ZEL-0.5 (TH308)

Revolution : $2,893\text{min}^{-1}$

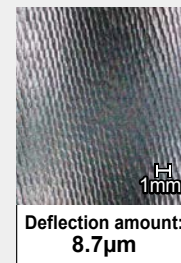
Feed rate : 463mm/min

Pick feed : $p_f=0.2\text{mm}$

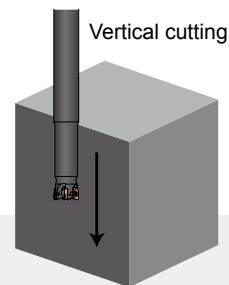
Cutting width : $a_e=0.1\text{mm}$

Overhang : $\text{OH}=90\text{mm}$ (L/D=8.2)

Air-blow



※Use only in pushing-down direction.



Steel shank Type

ASPV10 \circ \circ R- \circ

Numeric figure in a circle \circ



Fig-1
(Standard type)

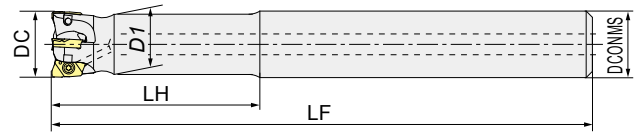
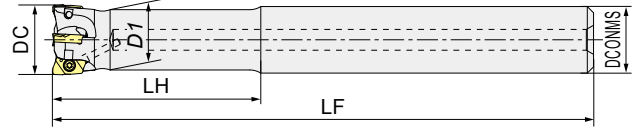


Fig-2
(Undercut type)

※ DC > DCONMS



Item code	Stock	No. of flutes	Size (mm)					Shape	Recommended insert
			DC	LF	LH	D1	DCONMS		
ASPV1010R-2	●	2	10	100	30	9.4	10	Fig-1 Standard type	MPHT0402 \circ \circ ZEL(- \circ \circ)
ASPV1011R-2	●	2	11	100	30	9.4	10	Fig-2 Undercut type	
ASPV1012R-3	●	3	12	100	40	11.2	12	Fig-1 Standard type	
ASPV1013R-3	●	3	13	100	40	11.2	12	Fig-2 Undercut type	
ASPV1016R-4	●	4	16	130	50	14.5	16	Fig-1 Standard type	
ASPV1017R-4	●	4	17	130	50	14.5	16	Fig-2 Undercut type	
ASPV1020R-5	●	5	20	160	60	18	20	Fig-1 Standard type	
ASPV1021R-5	●	5	21	160	60	18	20	Fig-2 Undercut type	
ASPV1025R-6	●	6	25	180	75	23	25	Fig-1 Standard type	
ASPV1026R-6	●	6	26	180	75	23	25	Fig-2 Undercut type	
ASPV1032R-8	●	8	32	200	100	30	32	Fig-1 Standard type	

ASPVmini

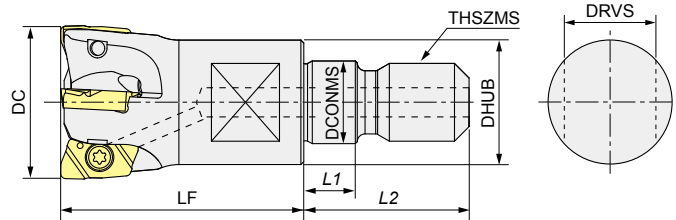
ASPV

Carbide shank

Modular Type

ASPVM10 \circ \circ R- \circ -M \circ \circ

Numeric figure in a circle \circ



Item code	Stock	No. of flutes	Size (mm)								Recommended insert
			DC	LF	DCONMS	THSZMS	DHUB	L1	L2	DRVS	
ASPVM1010R-2-M6	●	2	10	20	6.5	M6	9.4	5.5	14.5	7	MPHT0402 \circ \circ ZEL(- \circ \circ)
※ ASPVM1011R-2-M6	●	2	11	20	6.5	M6	9.8	5.5	14.5	7	
ASPVM1012R-3-M6	●	3	12	20	6.5	M6	9.8	5.5	14.5	7	
※ ASPVM1013R-3-M6	●	3	13	20	6.5	M6	9.8	5.5	14.5	7	
ASPVM1016R-4-M8	●	4	16	25	8.5	M8	12.8	5.5	17	10	
※ ASPVM1017R-4-M8	●	4	17	25	8.5	M8	12.8	5.5	17	10	
ASPVM1020R-5-M10	●	5	20	30	10.5	M10	17.8	5.5	19	15	
※ ASPVM1021R-5-M10	●	5	21	30	10.5	M10	17.8	5.5	19	15	
ASPVM1025R-6-M12	●	6	25	30	12.5	M12	20.8	5.5	22	17	
※ ASPVM1026R-6-M12	●	6	26	30	12.5	M12	20.8	5.5	22	17	
ASPVM1030R-6-M16	★	6	30	30	17	M16	28.8	6	23	22	
ASPVM1032R-8-M16	●	8	32	30	17	M16	28.8	6	23	22	
※ ASPVM1033R-8-M16	★	8	33	30	17	M16	28.8	6	23	22	

[Note] When ※ and carbide shank are used together as a set, there is no interference.

Do not apply lubricants to the threaded section or end surface sections in contact with the dedicated shank/arbor for modular mills.

★ : Stocked Items of New products. ● : Stocked items.

ASPVmini Lineup and Cutting Conditions

Inserts

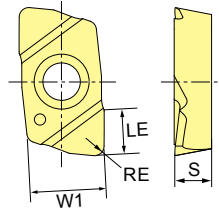


Fig.1

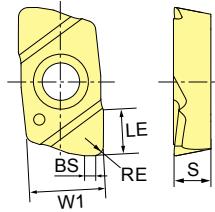


Fig.2

Item code	Tolerance class	Grade		Size (mm)					Shape
		TH308	PN215	W1	BS	S	LE	RE	
MPHT04020ZEL	H	●	★	4.3	0	2	2.3	0.2	Fig. 1
MPHT04020ZEL-0.5		●	★		0.5				Fig. 2
MPHT040205ZEL		●	★		0			0.5	Fig. 1
MPHT040205ZEL-0.5		●	★		0.5				Fig. 2
MPHT040205ZEL-1.0		★	★		1			1.0	Fig. 1
MPHT040210ZEL		●	★		0				Fig. 1
MPHT040210ZEL-0.5		●	★		0.5			Fig. 2	

: General cutting, First recommendation
 : General cutting, Second recommendation

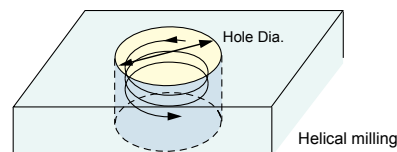
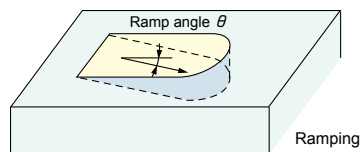
Parts

Parts	Clamp screw	Screw Driver	Screw anti-seizure agent
Shape			
Cutter body	Fastening torque (N·m)		
ASPV10 \odot \odot R- \odot ASPVM10 \odot \odot R- \odot -M \odot	T06-1804A	104-T6	P-37

The clamp screw is a consumable part. Since replacement life depends on the use environment, it is recommended that it be replaced at an early stage.

Ramp Angle / Hole Dia.

Regarding ramping and helical milling diameter.

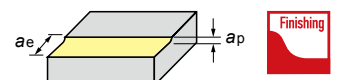


Tool Dia. (mm)	10	11	12	13	16	17	20	21	25	26	30	32	33
Maximum Ramping angle θ	0.5° or less												
Hole Dia. (mm)	13 ~ 19	15 ~ 21	17 ~ 23	19 ~ 25	25 ~ 31	27 ~ 33	33 ~ 39	35 ~ 41	43 ~ 59	45 ~ 51	53 ~ 59	57 ~ 63	59 ~ 65

Bottom finishing

Work material	Recommended grade	DC Tool dia. (mm)	φ 10			φ 12			φ 16			φ 20			φ 25			φ 32		
		Flutes	2 Flutes			3 Flutes			4 Flutes			5 Flutes			6 Flutes			8 Flutes		
		Overhang	<5DC	5DC-7DC	>7DC	<5DC	5DC-7DC	>7DC	<5DC	5DC-7DC	>7DC	<5DC	5DC-7DC	>7DC	<5DC	5DC-7DC	>7DC	<5DC	5DC-7DC	>7DC
Carbon steels Alloy steels (30HRC or less)	PN215 TH308	<i>n</i> (min ⁻¹)	6,366	5,411	4,456	5,305	4,509	3,714	3,979	3,382	2,785	3,183	2,706	2,228	2,546	2,165	1,783	1,989	1,691	1,393
		<i>Vc</i> (m/min)	200	170	140	200	170	140	200	170	140	200	170	140	200	170	140	200	170	140
		<i>Vf</i> (mm/min)	1,910	1,299	891	2,387	1,623	1,114	2,387	1,623	1,114	2,387	1,623	1,114	2,292	1,558	1,070	2,387	1,623	1,114
		<i>fz</i> (mm/t)	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1
		<i>ap</i> (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		<i>ae</i> (mm)	7	7	5	8	8	6	11	11	8	14	14	10	18	18	13	22	22	16
Alloy steels (Quenched and tempered steels) (35HRC or less)	PN215 TH308	<i>n</i> (min ⁻¹)	5,730	4,775	3,501	4,775	3,979	2,918	3,581	2,984	2,188	2,865	2,387	1,751	2,292	1,910	1,401	1,790	1,492	1,094
		<i>Vc</i> (m/min)	180	150	110	180	150	110	180	150	110	180	150	110	180	150	110	180	150	110
		<i>Vf</i> (mm/min)	1,375	955	700	1,719	1,194	875	1,719	1,194	875	1,719	1,194	875	1,650	1,146	840	1,719	1,194	875
		<i>fz</i> (mm/t)	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1
		<i>ap</i> (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		<i>ae</i> (mm)	7	7	5	8	8	6	11	11	8	14	14	10	18	18	13	22	22	16
Pre-hardened steels Alloy steels (Quenched and tempered steels) (45HRC or less)	TH308 PN215	<i>n</i> (min ⁻¹)	5,093	4,138	3,183	4,244	3,448	2,653	3,183	2,586	1,989	2,546	2,069	1,592	2,037	1,655	1,273	1,592	1,293	995
		<i>Vc</i> (m/min)	160	130	100	160	130	100	160	130	100	160	130	100	160	130	100	160	130	100
		<i>Vf</i> (mm/min)	1,019	828	637	1,273	1,035	796	1,273	1,035	796	1,273	1,035	796	1,222	993	764	1,273	1,035	796
		<i>fz</i> (mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		<i>ap</i> (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		<i>ae</i> (mm)	7	7	5	8	8	6	11	11	8	14	14	10	18	18	13	22	22	16
Hardened steels (55HRC or less)	TH308	<i>n</i> (min ⁻¹)	3,183	2,546	2,546	2,653	2,122	2,122	1,989	1,592	1,592	1,592	1,273	1,273	1,273	1,019	1,019	995	796	796
		<i>Vc</i> (m/min)	100	80	80	100	80	80	100	80	80	100	80	80	100	80	80	100	80	80
		<i>Vf</i> (mm/min)	637	509	509	796	637	637	796	637	637	796	637	637	796	611	611	796	637	637
		<i>fz</i> (mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		<i>ap</i> (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		<i>ae</i> (mm)	7	7	5	8	8	6	11	11	8	14	14	10	18	18	13	22	22	16
Hardened steels (62HRC or less)	TH308	<i>n</i> (min ⁻¹)	2,228	1,592	1,592	1,857	1,326	1,326	1,393	995	995	1,114	796	796	891	637	637	696	497	497
		<i>Vc</i> (m/min)	70	50	50	70	50	50	70	50	50	70	50	50	70	50	50	70	50	50
		<i>Vf</i> (mm/min)	446	318	255	557	398	318	557	398	318	557	398	318	535	382	306	557	398	318
		<i>fz</i> (mm/t)	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.1
		<i>ap</i> (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		<i>ae</i> (mm)	7	7	5	8	8	6	11	11	8	14	14	10	18	18	13	22	22	16
Stainless steels SUS	TH308 PN215	<i>n</i> (min ⁻¹)	5,730	4,775	3,501	4,775	3,979	2,918	3,581	2,984	2,188	2,865	2,387	1,751	2,292	1,910	1,401	1,790	1,492	1,094
		<i>Vc</i> (m/min)	180	150	110	180	150	110	180	150	110	180	150	110	180	150	110	180	150	110
		<i>Vf</i> (mm/min)	1,146	955	700	1,432	1,194	875	1,432	1,194	875	1,432	1,194	875	1,375	1,146	840	1,432	1,194	875
		<i>fz</i> (mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		<i>ap</i> (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		<i>ae</i> (mm)	7	7	5	8	8	6	11	11	8	14	14	10	18	18	13	22	22	16
Cast irons FC FCD	TH308 PN215	<i>n</i> (min ⁻¹)	6,366	5,411	4,456	5,305	4,509	3,714	3,979	3,382	2,785	3,183	2,706	2,228	2,546	2,165	1,783	1,989	1,691	1,393
		<i>Vc</i> (m/min)	200	170	140	200	170	140	200	170	140	200	170	140	200	170	140	200	170	140
		<i>Vf</i> (mm/min)	1,910	1,299	891	2,387	1,623	1,114	2,387	1,623	1,114	2,387	1,623	1,114	2,292	1,558	1,070	2,387	1,623	1,114
		<i>fz</i> (mm/t)	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1
		<i>ap</i> (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		<i>ae</i> (mm)	7	7	5	8	8	6	11	11	8	14	14	10	18	18	13	22	22	16
Heat resistant alloys Super heat resistant alloys	TH308 PN215	<i>n</i> (min ⁻¹)	1,592	1,273	955	1,326	1,061	796	995	796	597	796	637	477	637	509	382	497	398	298
		<i>Vc</i> (m/min)	50	40	30	50	40	30	50	40	30	50	40	30	50	40	30	50	40	30
		<i>Vf</i> (mm/min)	318	255	191	398	318	239	398	318	239	398	318	239	382	306	229	398	318	239
		<i>fz</i> (mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		<i>ap</i> (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		<i>ae</i> (mm)	7	7	5	8	8	6	11	11	8	14	14	10	18	18	13	22	22	16
Titanium alloys	TH308 PN215	<i>n</i> (min ⁻¹)	1,910	1,592	955	1,592	1,326	796	1,194	995	597	955	796	477	764	637	382	597	497	298
		<i>Vc</i> (m/min)	60	50	30	60	50	30	60	50	30	60	50	30	60	50	30	60	50	30
		<i>Vf</i> (mm/min)	19.1	15.9	9.55	15.9	13.3	7.96	11.9	9.95	5.97	9.55	7.96	4.77	7.64	6.37	3.82	5.97	4.97	2.98
		<i>fz</i> (mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		<i>ap</i> (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		<i>ae</i> (mm)	7	7	5	8	8	6	11	11	8	14	14	10	18	18	13	22	22	16

- [Note] ① Use the appropriate coolant for the work material and machining shape.
 ② These conditions are for general guidance; in actual machining conditions adjust the parameters according to your actual machine and work-piece conditions.
 ③ For slotting or ramping, feed rate should be set to 70% as general criteria.
 ④ Ensure to index the insert at the correct time to ensure safety of the tool-body.
 ⑤ The evacuation of swarf can cause burns, cuts or damage to the eyes please ensure the correct safety cover is fitted around the machine, and necessary personal protection equipment is worn by the machine operator.
 ⑥ Due to fire risks do not use neat cutting oil as a coolant.



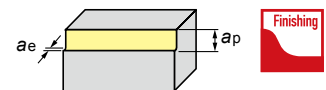
Recommended cutting conditions of ASPVmini

※ Red indicates primary recommended grade.

Side finishing

Work material	Recommended grade	DC Tool dia. (mm)	φ 10			φ 12			φ 16			φ 20			φ 25			φ 32		
		Flutes	2 Flutes			3 Flutes			4 Flutes			5 Flutes			6 Flutes			8 Flutes		
		Overhang	<5DC	5DC-7DC	>7DC	<5DC	5DC-7DC	>7DC	<5DC	5DC-7DC	>7DC	<5DC	5DC-7DC	>7DC	<5DC	5DC-7DC	>7DC	<5DC	5DC-7DC	>7DC
Carbon steels Alloy steels (30HRC or less)	PN215 TH308	<i>n</i> (min ⁻¹)	15,915	11,937	11,937	15,915	11,937	11,937	15,915	11,937	11,937	15,915	11,937	11,937	15,915	11,937	11,937	15,915	11,937	11,937
		<i>Vc</i> (m/min)	400	300	300	400	300	300	400	300	300	400	300	300	400	300	300	400	300	300
		<i>Vf</i> (mm/min)	2,387	1,432	1,194	2,387	1,432	1,194	2,387	1,432	1,194	2,387	1,432	1,194	2,387	1,432	1,194	2,387	1,432	1,194
		<i>fz</i> (mm/t)	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1
		<i>ap</i> (mm)	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
		<i>ae</i> (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Alloy steels (Quenched and tempered steels) (35HRC or less)	PN215 TH308	<i>n</i> (min ⁻¹)	11,937	9,947	9,947	11,937	9,947	9,947	11,937	9,947	9,947	11,937	9,947	9,947	11,937	9,947	9,947	11,937	9,947	9,947
		<i>Vc</i> (m/min)	300	250	250	300	250	250	300	250	250	300	250	250	300	250	250	300	250	250
		<i>Vf</i> (mm/min)	1,432	995	995	1,432	995	995	1,432	995	995	1,432	995	995	1,432	995	995	1,432	995	995
		<i>fz</i> (mm/t)	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1
		<i>ap</i> (mm)	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
		<i>ae</i> (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Pre-hardened steels Alloy steels (Quenched and tempered steels) (45HRC or less)	TH308 PN215	<i>n</i> (min ⁻¹)	9,947	7,958	7,958	9,947	7,958	7,958	9,947	7,958	7,958	9,947	7,958	7,958	9,947	7,958	7,958	9,947	7,958	7,958
		<i>Vc</i> (m/min)	250	200	200	250	200	200	250	200	200	250	200	200	250	200	200	250	200	200
		<i>Vf</i> (mm/min)	995	796	796	995	796	796	995	796	796	995	796	796	995	796	796	995	796	796
		<i>fz</i> (mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		<i>ap</i> (mm)	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
		<i>ae</i> (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Hardened steels (55HRC or less)	TH308	<i>n</i> (min ⁻¹)	7,958	5,968	5,968	7,958	5,968	5,968	7,958	5,968	5,968	7,958	5,968	5,968	7,958	5,968	5,968	7,958	5,968	5,968
		<i>Vc</i> (m/min)	200	150	150	200	150	150	200	150	150	200	150	150	200	150	150	200	150	150
		<i>Vf</i> (mm/min)	796	597	597	796	597	597	796	597	597	796	597	597	796	597	597	796	597	597
		<i>fz</i> (mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		<i>ap</i> (mm)	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
		<i>ae</i> (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Hardened steels (62HRC or less)	TH308	<i>n</i> (min ⁻¹)	5,968	3,979	3,979	5,968	3,979	3,979	5,968	3,979	3,979	5,968	3,979	3,979	5,968	3,979	3,979	5,968	3,979	3,979
		<i>Vc</i> (m/min)	150	100	100	150	100	100	150	100	100	150	100	100	150	100	100	150	100	100
		<i>Vf</i> (mm/min)	597	398	398	597	398	398	597	398	398	597	398	398	597	398	398	597	398	398
		<i>fz</i> (mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		<i>ap</i> (mm)	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
		<i>ae</i> (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Stainless steels SUS	TH308 PN215	<i>n</i> (min ⁻¹)	11,937	9,947	9,947	11,937	9,947	9,947	11,937	9,947	9,947	11,937	9,947	9,947	11,937	9,947	9,947	11,937	9,947	9,947
		<i>Vc</i> (m/min)	300	250	250	300	250	250	300	250	250	300	250	250	300	250	250	300	250	250
		<i>Vf</i> (mm/min)	1,194	995	995	1,194	995	995	1,194	995	995	1,194	995	995	1,194	995	995	1,194	995	995
		<i>fz</i> (mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		<i>ap</i> (mm)	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
		<i>ae</i> (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Cast irons FC FCD	TH308 PN215	<i>n</i> (min ⁻¹)	15,915	11,937	11,937	15,915	11,937	11,937	15,915	11,937	11,937	15,915	11,937	11,937	15,915	11,937	11,937	15,915	11,937	11,937
		<i>Vc</i> (m/min)	400	300	300	400	300	300	400	300	300	400	300	300	400	300	300	400	300	300
		<i>Vf</i> (mm/min)	2,387	1,432	1,194	2,387	1,432	1,194	2,387	1,432	1,194	2,387	1,432	1,194	2,387	1,432	1,194	2,387	1,432	1,194
		<i>fz</i> (mm/t)	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1
		<i>ap</i> (mm)	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
		<i>ae</i> (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Heat resistant alloys Super heat resistant alloys	TH308 PN215	<i>n</i> (min ⁻¹)	2,387	1,592	1,592	2,387	1,592	1,592	2,387	1,592	1,592	2,387	1,592	1,592	2,387	1,592	1,592	2,387	1,592	1,592
		<i>Vc</i> (m/min)	60	40	40	60	40	40	60	40	40	60	40	40	60	40	40	60	40	40
		<i>Vf</i> (mm/min)	239	159	159	239	159	159	239	159	159	239	159	159	239	159	159	239	159	159
		<i>fz</i> (mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		<i>ap</i> (mm)	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
		<i>ae</i> (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Titanium alloys	TH308 PN215	<i>n</i> (min ⁻¹)	3,979	3,183	3,183	3,979	3,183	3,183	3,979	3,183	3,183	3,979	3,183	3,183	3,979	3,183	3,183	3,979	3,183	3,183
		<i>Vc</i> (m/min)	100	80	80	100	80	80	100	80	80	100	80	80	100	80	80	100	80	80
		<i>Vf</i> (mm/min)	398	318	318	398	318	318	398	318	318	398	318	318	398	318	318	398	318	318
		<i>fz</i> (mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		<i>ap</i> (mm)	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
		<i>ae</i> (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

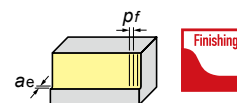
- [Note] ① Use the appropriate coolant for the work material and machining shape.
 ② These conditions are for general guidance; in actual machining conditions adjust the parameters according to your actual machine and work-piece conditions.
 ③ For slotting or ramping, feed rate should be set to 70% as general criteria.
 ④ Ensure to index the insert at the correct time to ensure safety of the tool-body.
 ⑤ The evacuation of swarf can cause burns, cuts or damage to the eyes please ensure the correct safety cover is fitted around the machine, and necessary personal protection equipment is worn by the machine operator.
 ⑥ Due to fire risks do not use neat cutting oil as a coolant.



Vertical side finishing (※ Use only in pushing-down direction.)

Work material	Recommended grade	DC Tool dia. (mm)	φ 10			φ 12			φ 16			φ 20			φ 25			φ 32		
		Flutes	2 Flutes			3 Flutes			4 Flutes			5 Flutes			6 Flutes			8 Flutes		
		Overhang	<5DC	5DC-7DC	>7DC	<5DC	5DC-7DC	>7DC	<5DC	5DC-7DC	>7DC	<5DC	5DC-7DC	>7DC	<5DC	5DC-7DC	>7DC	<5DC	5DC-7DC	>7DC
Carbon steels Alloy steels (30HRC or less)	PN215 TH308	n (min ⁻¹)	15,915	11,937	11,937	15,915	11,937	11,937	15,915	11,937	11,937	15,915	11,937	11,937	15,915	11,937	11,937	15,915	11,937	11,937
		Vc(m/min)	400	300	300	400	300	300	400	300	300	400	300	300	400	300	300	400	300	300
		Vf(mm/min)	2,387	1,432	1,194	2,387	1,432	1,194	2,387	1,432	1,194	2,387	1,432	1,194	2,387	1,432	1,194	2,387	1,432	1,194
		fz(mm/t)	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1
		pf(mm)	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8
		ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Alloy steels (Quenched and tempered steels) (35HRC or less)	PN215 TH308	n (min ⁻¹)	11,937	9,947	9,947	11,937	9,947	9,947	11,937	9,947	9,947	11,937	9,947	9,947	11,937	9,947	9,947	11,937	9,947	9,947
		Vc(m/min)	300	250	250	300	250	250	300	250	250	300	250	250	300	250	250	300	250	250
		Vf(mm/min)	1,432	995	995	1,432	995	995	1,432	995	995	1,432	995	995	1,432	995	995	1,432	995	995
		fz(mm/t)	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1
		pf(mm)	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8
		ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Pre-hardened steels Alloy steels (Quenched and tempered steels) (45HRC or less)	TH308 PN215	n (min ⁻¹)	9,947	7,958	7,958	9,947	7,958	7,958	9,947	7,958	7,958	9,947	7,958	7,958	9,947	7,958	7,958	9,947	7,958	7,958
		Vc(m/min)	250	200	200	250	200	200	250	200	200	250	200	200	250	200	200	250	200	200
		Vf(mm/min)	995	796	796	995	796	796	995	796	796	995	796	796	995	796	796	995	796	796
		fz(mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		pf(mm)	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8
		ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Hardened steels (55HRC or less)	TH308	n (min ⁻¹)	7,958	5,968	5,968	7,958	5,968	5,968	7,958	5,968	5,968	7,958	5,968	5,968	7,958	5,968	5,968	7,958	5,968	5,968
		Vc(m/min)	200	150	150	200	150	150	200	150	150	200	150	150	200	150	150	200	150	150
		Vf(mm/min)	796	597	597	796	597	597	796	597	597	796	597	597	796	597	597	796	597	597
		fz(mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		pf(mm)	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8
		ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Hardened steels (62HRC or less)	TH308	n (min ⁻¹)	5,968	3,979	3,979	5,968	3,979	3,979	5,968	3,979	3,979	5,968	3,979	3,979	5,968	3,979	3,979	5,968	3,979	3,979
		Vc(m/min)	150	100	100	150	100	100	150	100	100	150	100	100	150	100	100	150	100	100
		Vf(mm/min)	597	398	398	597	398	398	597	398	398	597	398	398	597	398	398	597	398	398
		fz(mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		pf(mm)	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8
		ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Stainless steels SUS	TH308 PN215	n (min ⁻¹)	11,937	9,947	9,947	11,937	9,947	9,947	11,937	9,947	9,947	11,937	9,947	9,947	11,937	9,947	9,947	11,937	9,947	9,947
		Vc(m/min)	300	250	250	300	250	250	300	250	250	300	250	250	300	250	250	300	250	250
		Vf(mm/min)	1,194	995	995	1,194	995	995	1,194	995	995	1,194	995	995	1,194	995	995	1,194	995	995
		fz(mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		pf(mm)	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8
		ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Cast irons FC FCD	TH308 PN215	n (min ⁻¹)	15,915	11,937	11,937	15,915	11,937	11,937	15,915	11,937	11,937	15,915	11,937	11,937	15,915	11,937	11,937	15,915	11,937	11,937
		Vc(m/min)	400	300	300	400	300	300	400	300	300	400	300	300	400	300	300	400	300	300
		Vf(mm/min)	2,387	1,432	1,194	2,387	1,432	1,194	2,387	1,432	1,194	2,387	1,432	1,194	2,387	1,432	1,194	2,387	1,432	1,194
		fz(mm/t)	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1
		pf(mm)	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8
		ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Heat resistant alloys Super heat resistant alloys	TH308 PN215	n (min ⁻¹)	2,387	1,592	1,592	2,387	1,592	1,592	2,387	1,592	1,592	2,387	1,592	1,592	2,387	1,592	1,592	2,387	1,592	1,592
		Vc(m/min)	60	40	40	60	40	40	60	40	40	60	40	40	60	40	40	60	40	40
		Vf(mm/min)	239	159	159	239	159	159	239	159	159	239	159	159	239	159	159	239	159	159
		fz(mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		pf(mm)	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8
		ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Titanium alloys	TH308 PN215	n (min ⁻¹)	3,979	3,183	3,183	3,979	3,183	3,183	3,979	3,183	3,183	3,979	3,183	3,183	3,979	3,183	3,183	3,979	3,183	3,183
		Vc(m/min)	100	80	80	100	80	80	100	80	80	100	80	80	100	80	80	100	80	80
		Vf(mm/min)	398	318	318	398	318	318	398	318	318	398	318	318	398	318	318	398	318	318
		fz(mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		pf(mm)	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8
		ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

- [Note] ① Use the appropriate coolant for the work material and machining shape.
 ② These conditions are for general guidance; in actual machining conditions adjust the parameters according to your actual machine and work-piece conditions.
 ③ Ensure to index the insert at the correct time to ensure safety of the tool-body.
 ④ The evacuation of swarf can cause burns, cuts or damage to the eyes please ensure the correct safety cover is fitted around the machine, and necessary personal protection equipment is worn by the machine operator.
 ⑤ Due to fire risks do not use neat cutting oil as a coolant.



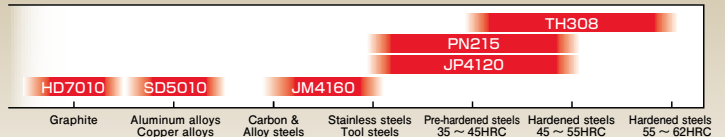
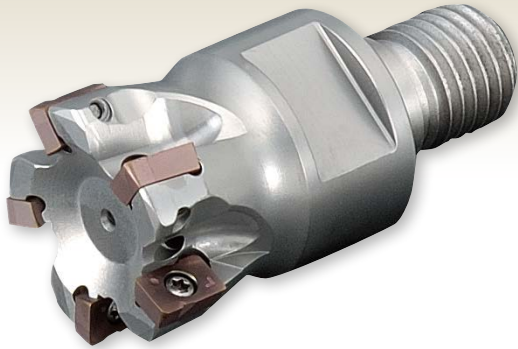
ASPvmini

ASPv

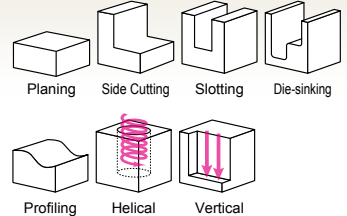
Carbide shank

ASPV Features and Machining Examples

ASPV



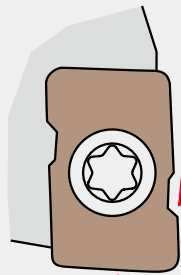
Cutting Applications



Body only ±0.03 ±0.1	Precision body only ±0.02	Insert N	Insert H
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Features

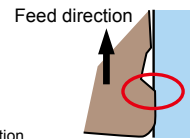
The inserts feature three cutting edges.



1 Cutting edge for reciprocating machining

This is used as the cutting edge in pulling-up direction during reciprocating machining.

The MPHWO603 \odot ZFL-N lacks a reciprocating machining cutting edge. Use only in pushing-down direction.



2 Peripheral cutting edge

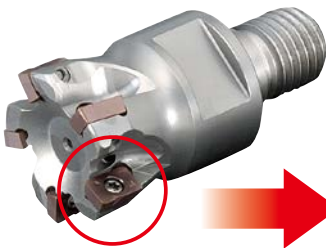
Peripheral cutting edge

This is used as the peripheral cutting edge during side machining.

3

Face cutting edge

This is used during bottom surface finishing.



Insert with wiper edge

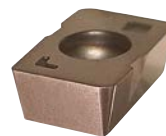
- MPHW0603 \odot ZEL-0.5
- MPHW0603 \odot ZEL-1.5
- MPHW0603 \odot ZEL-1.5F



The wiper edge allows use at higher feed rates.

Insert without wiper edge

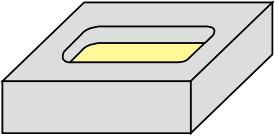
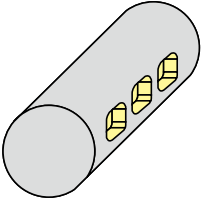
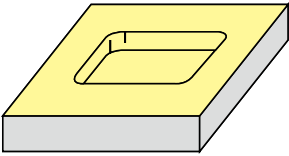
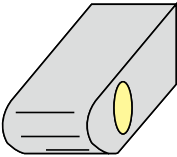
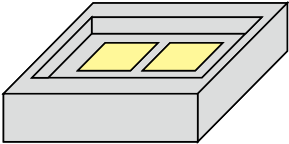
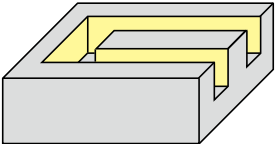
- MPHW0603 \odot ZEL
- MPNW0603 \odot ZEL
- MPHW0603 \odot ZFL
- MPHW0603 \odot ZFL-N



Ideal for bottom machining with long overhang (L/D = 5 or more) and conditions with low rigidity in the spindle direction

※ Inserts without a wiper edge are recommended for vertical machining.

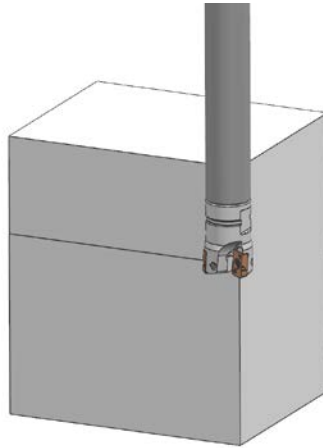
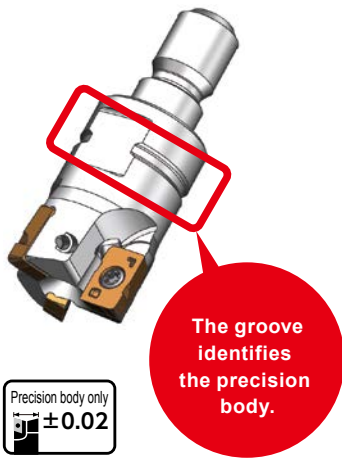
Field Data

Tools: ASPVS2020R-3	Cutting Conditions	Result
	<p>Work Material : S55C (220HB) Tools : ASPVS2020R-3 Arbor : Commercial milling chuck Insert : MPHWO60302ZEL-0.5 (MZ1000) Overhang : OH=50mm Machine used : Vertical type (BT50) Rotation speed : $n=3,180\text{min}^{-1}$ Cutting speed : $V_c=200\text{m/min}$ Feed rate : $V_f=670\text{mm/min}$ Feed rate per flute : 0.07mm/t Depth of cut : $a_p \times a_e=0.1 \times 10\text{mm}$</p>	<p>The feed rate is 1.5 times faster and the cutting accuracy is more consistent than previous indexable tools, more than doubling tool life.</p>
Tools: ASPVM2016R-2	Cutting Conditions	Result
	<p>Work Material : SCM (30HRC) Tools : ASPVM2016R-2 Arbor : ASC16-8.5-95-30 Insert : MPHWO60302ZEL (MZ1000) Overhang : OH=55mm Machine used : Multi-tasking machine (BT40) Rotation speed : $n=4,050\text{min}^{-1}$ Cutting speed : $V_c=203\text{m/min}$ Feed rate : $V_f=800\text{mm/min}$ Feed rate per flute : 0.1mm/t Depth of cut : $a_p \times a_e=0.5 \times 0.4\text{mm}$</p>	<p>HSS end mills were used previously, but using ASPVM together with a carbide shank improves inclination accuracy and enables consistent use of indexable tools.</p>
Tools: ASPVS2016R-2	Cutting Conditions	Result
	<p>Work Material : SUS420 Tools : ASPVS2016R-2 Arbor : Commercial milling chuck Insert : MPHWO60304ZEL-0.5 (Equivalent to JP4120) Overhang : OH=40mm Machine used : Vertical type (BT40) Rotation speed : $n=4,000\text{min}^{-1}$ Cutting speed : $V_c=200\text{m/min}$ Feed rate : $V_f=1,000\text{mm/min}$ Feed rate per flute : 0.125mm/t Depth of cut : $a_p \times a_e=0.1 \times 8\text{mm}$</p>	<p>Before, conventional shoulder type indexable tools tended to result in chattering marks as machining progressed, but ASPV achieves a consistent cutting surface with no chattering marks. Inserts showed satisfactory constant wear after approximately one hour of cutting.</p>
Tools: ASPVM2032R-5	Cutting Conditions	Result
	<p>Work Material : FCD550 Tools : ASPVM2032R-5 Arbor : ASC32-17-210-110 Insert : MPHWO60308ZEL (ATH08M) Overhang : OH=160mm Machine used : Vertical type (BT50) Rotation speed : $n=1,800\text{min}^{-1}$ Cutting speed : $V_c=180\text{m/min}$ Feed rate : $V_f=2,500\text{mm/min}$ Feed rate per flute : 0.28mm/t Depth of cut : $a_p \times a_e=1 \times 0.2\text{mm}$</p>	<p>Previously, the HSS end mills with long flute lengths were typically used, which led to inconsistent cutting accuracy. Using ASPVM and a carbide shank ensures consistent cutting accuracy.</p>
Tools: ASPVB2050R-7	Cutting Conditions	Result
	<p>Work Material : FC250 Tools : ASPVB2050R-7 Arbor : BT50-22.225-200-50 Insert : MPHWO60308ZEL-1.5 (ATH08M) Overhang : OH=250mm Machine used : Vertical type (BT50) Rotation speed : $n=1,270\text{min}^{-1}$ Cutting speed : $V_c=200\text{m/min}$ Feed rate : $V_f=1,510\text{mm/min}$ Feed rate per flute : 0.17mm/t Depth of cut : $a_p \times a_e=0.1 \times 30\text{mm}$</p>	<p>Compared to previous indexable tools, the feed marks on the cutting surface are consistent and satisfactory.</p>
Tools: ASPVM2032R-5	Cutting Conditions	Result
	<p>Work Material : SKD61 (HB\leq229) Tools : ASPVM2032R-5 Arbor : Commercial Modular arbor Insert : MPHWO60308ZEL (Equivalent to JP4120) Overhang : OH=220mm Machine used : Vertical type (BT50) Rotation speed : $n=5,000\text{min}^{-1}$ Cutting speed : $V_c=500\text{m/min}$ Feed rate : $V_f=4000\text{mm/min}$ Feed rate per flute : 0.16mm/t Depth of cut : $a_p \times a_e=1.0 \times 0.2\text{mm}$</p>	<p>Solid end mills led to inconsistent cutting accuracy. In contrast, ASPVM ensures consistent cutting accuracy and improved machining efficiency.</p>

ASPV Machining Examples

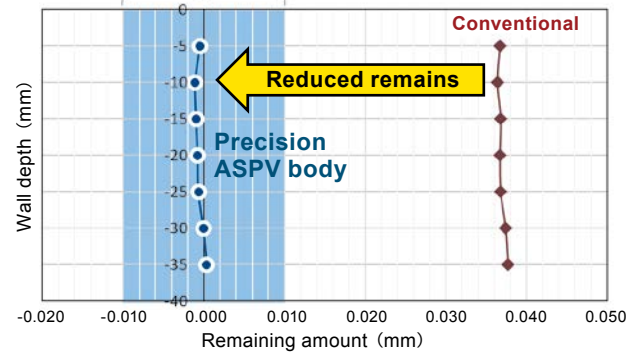
New precision body

Improved cutting diameter accuracy closer to the nominal diameter reduces remains.



Model No. : ASPVM-P-20 \odot \odot R- \odot -M \odot \odot
Tool dia. : ϕ 16 ~ 42

Example: ± 0.01 mm tolerance range

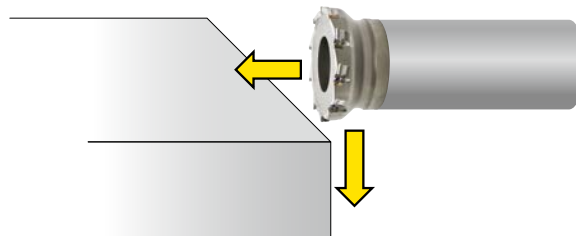


Machine : 5-axis machining center (HSK100 spindle)
Work material : S50C (220HB)
Tool : ϕ 20 modular head (single-insert) + carbide shank
MPHW060308ZEL
Cutting conditions : $V_c=300$ m/min, $f_z=0.1$ mm,
 $a_p=1.0$ mm, $a_e=0.1$ mm, Water-based cutting fluid

※ Depending on the insert combination, the cutting diameter may exceed the nominal diameter. Measure the actual diameter before use.

Expanded range of bore types sizes

Large diameter ϕ 80, 100, and 125mm products added to range



Customer feedback



Convenient: Makes it possible to machine the sides of large workpieces without changing tools

Work material : FCD500
Tool dia. : ϕ 125mm
Insert : MPHW060308ZEL (JP4120)
Cutting conditions :
 $V_c=200$ m/min
 $f_z=0.1$ mm/t
 $pf=2$ mm
 $a_e=0.1$ mm
OH=470mm
Air-blow

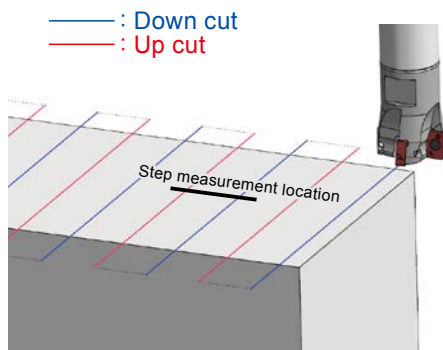


Replacing an adjustable cutter resulted in trouble-free use and excellent accuracy.

Work material : FC250
Tool dia. : ϕ 125mm
Insert : MPHW060308ZEL (JP4120)
Cutting conditions :
 $V_c=250$ m/min
 $f_z=0.1$ mm/t
 $a_p=0.2$ mm
 $a_e=50$ mm
OH=420mm
Air-blow

Optimized face cutting edge clearance angle reduces step height between machining passes.

Reduces step height between machining passes and improves surface quality.

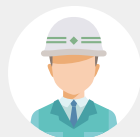


Model No. : MPHWO60308ZEL-1.5F
Grade : TH308, PN215, JP4120, MZ1000

Work material : DIEVAR (46.5HRC)
Tool dia. : $\phi 25\text{mm}$ (Single-insert)
Cutting conditions :
Vc=275m/min
fz=0.057mm/t
ap=0.04mm
ae=20mm
OH=175mm (L/D=7)
Water-based cutting fluid

	Conventional ①	Conventional ②	MPHW060308ZEL-1.5F (TH308)
Step height/profile	<p>Large step with protrusions</p>	<p>Large step with protrusions</p>	<p>Small step with smooth profile</p>

Customer feedback



Die casting manufacturer

Step between passes reduced to 2 μm

Work material : DIEVAR (45HRC)
Cutting method : Reciprocating bottom finishing
Tool dia. : $\phi 18\text{mm}$
Cutting conditions :
Vc=196m/min
fz=0.065mm/t
ap=0.03mm
ae=12mm
OH=40mm
Wet



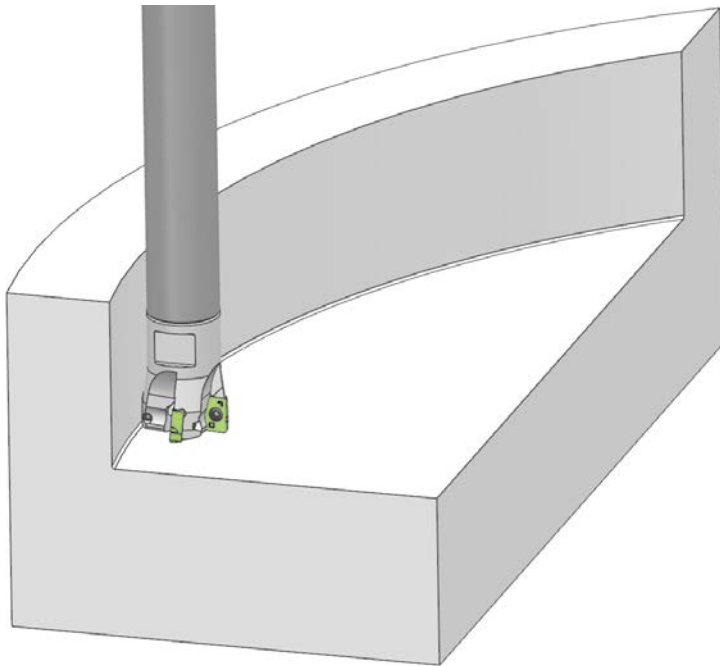
Plastic mold manufacturer

Reduces step between passes and improves surface appearance.

Work material : S50C (220HB)
Cutting method : Reciprocating bottom finishing
Tool dia. : $\phi 25\text{mm}$
Cutting conditions :
Vc=236m/min
fz=0.058mm/t
ap=0.1mm
ae=16mm
OH=100mm
Wet

ASPV Cutting Data and Lineup

01 Finishing machining example on aluminum part using SD5010



Cutting conditions

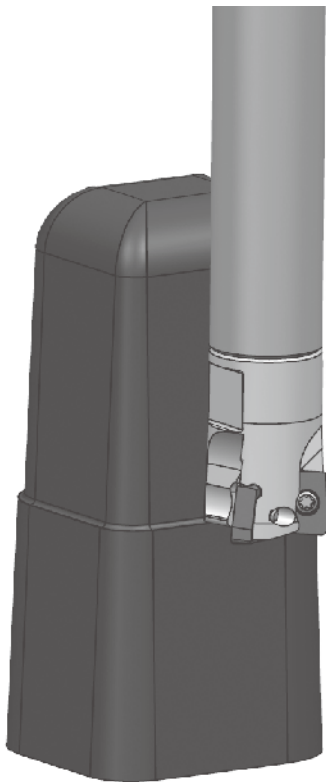
Work material : Aluminum (Equivalent to A1050)
 Tool : $\phi 25$ mm modular head (4 flutes) + carbide shank
 Insert : MPHWO60308ZFL (SD5010)

Cutting speed V_c (m/min)	668
Revolution n (rpm)	8500
Feed rate f_z (mm/t)	0.118
Feed speed $V_f =$ (mm/min)	4000
Axial depth of cut a_p (mm)	0.5
Radial depth of cut a_e (mm)	10
Overhang (mm)	110 (L/D=4.4)
Coolant	Water-based cutting fluid

Customer feedback

- Allows consistent machining with zero chattering and high quality finished machined face.

02 Example of roughing/finishing machining with graphite electrode using HD7010



Tool appearance after use



Cutting conditions

Work material : Graphite
 Tool : $\phi 20$ mm modular head (3 flutes) + carbide shank
 Insert : MPHWO60310ZFL-N (HD7010)

	Roughing	Finishing
Cutting speed V_c (m/min)	503	534
Revolution n (rpm)	8000	8500
Feed rate f_z (mm/t)	0.208	0.375
Feed speed $V_f =$ (mm/min)	5000	9000
Axial depth of cut a_p (mm)	0.75	0.15
Radial depth of cut a_e (mm)	1	1
Overhang (mm)	160 (L/D=8)	160 (L/D=8)
Coolant	Air-blow	Air-blow

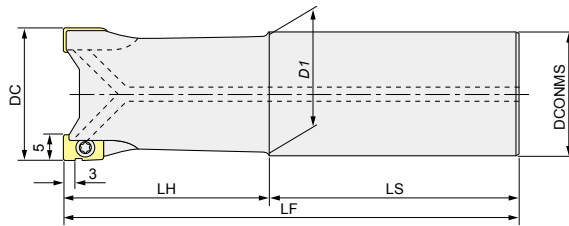
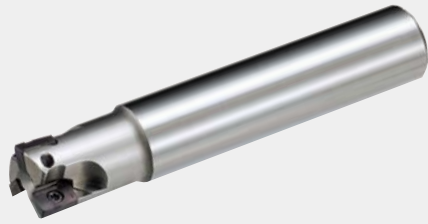
Customer feedback

- The tool was still usable even after 750 minutes of roughing and finishing.
- Wear is low and the machine face quality is excellent.

Straight Shank Type

ASPVS2○○○R-○

Numeric figure in a circle ○



Item code	Stock	No. of flutes	Size (mm)						Recommended insert
			DC	LF	LH	LS	D1	DCONMS	
ASPVS2016R-2	●	2	16	100	30	70	14.5	16	MPHW0603○○ZEL MPHW0603○○ZEL-○○ MPHW0603○○ZEL-1.5F MPHW0603○○ZFL MPHW0603○○ZFL-N MPNW0603○○ZEL
ASPVS2017R-2	★	2	17	100	30	70	14.5	16	
ASPVS2020R-3	●	3	20	110	30	80	18	20	
ASPVS2021R-3	★	3	21	110	30	80	18	20	
ASPVS2025R-4	●	4	25	120	40	80	23	25	
ASPVS2026R-4	★	4	26	120	40	80	23	25	
ASPVS2030R-4	●	5	30	150	50	100	28	32	
ASPVS2032R-5	●	5	32	150	50	100	30	32	
ASPVS2035R-5	●	5	35	150	50	100	31	32	
ASPVS2040R-6	●	6	40	170	50	120	31	32	

Modular Type

ASPVM20○○R-○

Numeric figure in a circle ○

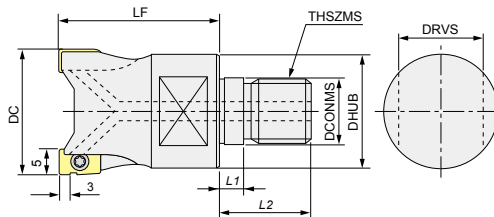


Fig.1

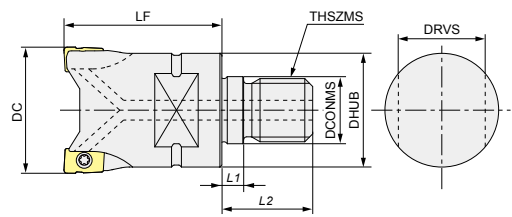


Fig.2

Item code	Stock	No. of flutes	Size (mm)								Shape	Recommended insert
			DC	LF	DCONMS	THSZMS	DHUB	L1	L2	DRVS		
ASPVM2012R-1	★	1	12	22	6.5	M6	9.8	5.5	14.5	7	MPHW0603○○ZEL MPHW0603○○ZEL-○○ MPHW0603○○ZEL-1.5F MPHW0603○○ZFL MPHW0603○○ZFL-N MPNW0603○○ZEL	
ASPVM2016R-2	●	2	16	25	8.5	M8	12.8	5.5	17	10		
※1 ASPVM2017R-2	★	2	17	25	8.5	M8	12.8	5.5	17	10		
※1 ASPVM2018R-2	●	2	18	25	8.5	M8	14.5	5.5	17	10		
ASPVM2020R-2	●	2	20	30	10.5	M10	17.8	5.5	19	15		
ASPVM2020R-3	●	3	20	30	10.5	M10	17.8	5.5	19	15		
※1 ASPVM2021R-3	★	3	21	30	10.5	M10	17.8	5.5	19	15		
※1 ASPVM2022R-3	●	3	22	30	10.5	M10	17.8	5.5	19	15		
ASPVM2025R-4	●	4	25	35	12.5	M12	20.8	5.5	22	17		
※1 ASPVM2026R-4	★	4	26	35	12.5	M12	20.8	5.5	22	17		
※1 ASPVM2028R-4	●	4	28	35	12.5	M12	23	5.5	22	17		
ASPVM2030R-4	●	4	30	40	17	M16	28.8	6	23	22		
ASPVM2032R-3	●	3	32	40	17	M16	28.8	6	23	22		
ASPVM2032R-5	●	5	32	40	17	M16	28.8	6	23	22		
※1 ASPVM2033R-5	★	5	33	40	17	M16	28.8	6	23	22		
※1 ASPVM2035R-5	●	5	35	40	17	M16	28.8	6	23	22		
※1 ASPVM2040R-6	●	6	40	40	17	M16	28.8	6	23	22		
High precision ※2 ASPVM-P-2016R-2-M8	★	2	16	25	8.5	M8	12.8	5.5	17	10		Fig-2
※2 ASPVM-P-2020R-3-M10	★	3	20	30	10.5	M10	17.8	5.5	19	15		
※2 ASPVM-P-2025R-4-M12	★	4	25	35	12.5	M12	20.8	5.5	22	17		
※2 ASPVM-P-2032R-5-M16	★	5	32	40	17	M16	28.8	6	23	22		
※1.2 ASPVM-P-2035R-5-M16	★	5	35	40	17	M16	28.8	6	23	22		
※1.2 ASPVM-P-2042R-6-M16	★	6	42	40	17	M16	28.8	6	23	22		

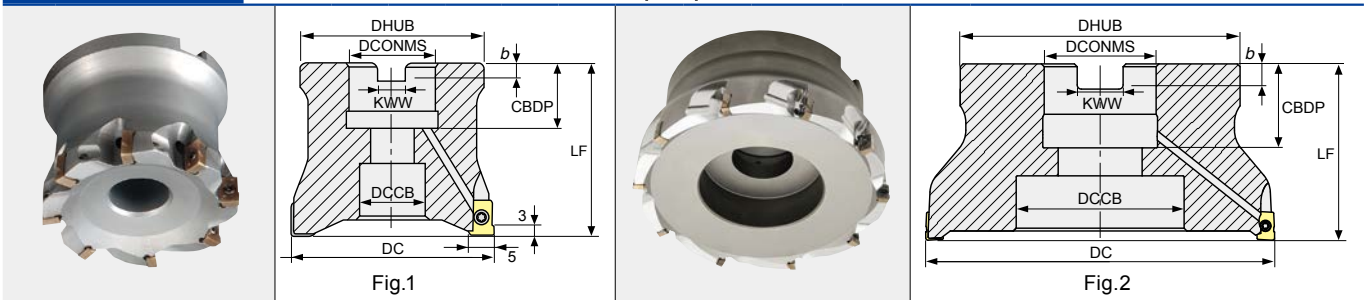
[Note] When ※1 and carbide shank are used together as a set, there is no interference.
 ※2 Depending on the insert combination, the cutting diameter may exceed the nominal diameter. Measure the actual diameter before use.
 Do not apply lubricants such as grease, etc. to the "contact faces" and "modular screws" of the "modular mill", "dedicated shanks" and "dedicated arbor".

ASPV Lineup

Bore Type

ASPVB2 $\odot\odot\odot\odot$ R(M)- \odot

Numeric figure in a circle \odot

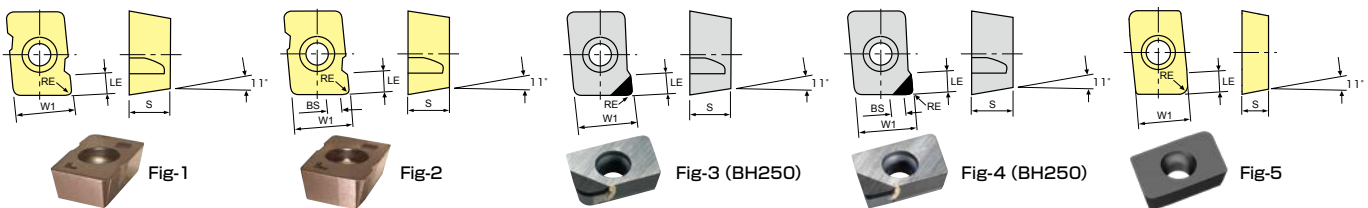


	Item code	Stock	No. of flutes	Size (mm)								Shape	Recommended insert
				DC	DHUB	LF	CBDP	KWW	b	DCONMS	DCCB		
Inch pilot	ASPVB2050R-7	●	7	50	47	50	19	8.4	5	22.225	17	Fig-1	MPHW0603 $\odot\odot$ ZEL MPHW0603 $\odot\odot$ ZEL- $\odot\odot$ MPHW0603 $\odot\odot$ ZEL-1.5F MPHW0603 $\odot\odot$ ZFL MPHW0603 $\odot\odot$ ZFL-N MPNW0603 $\odot\odot$ ZEL
	ASPVB2063R-8	●	8	63	60	50	19	8.4	5	22.225	17		
	ASPVB2080R-8	★	8	80	76	63	32	12.7	8	31.75	26		
	ASPVB2100R-10	★	10	100	96	63	32	12.7	8	31.75	26		
Metric pilot	ASPVB2125R-10	★	10	125	100	63	36	15.9	10	38.1	60	Fig-2	
	ASPVB2042RM-6	★	6	42	35	40	18	8.4	5.6	16	13.5	Fig-1	
	ASPVB2050RM-7	●	7	50	47	50	20	10.4	6.3	22	17		
	ASPVB2063RM-8	●	8	63	60	50	20	10.4	6.3	22	17		
	ASPVB2080RM-8	★	8	80	76	63	22	12.4	7	27	20		
	ASPVB2100RM-10	★	10	100	96	63	26	14.4	8	32	26		
	ASPVB2125RM-10	★	10	125	100	63	30	16.4	9	40	60	Fig-2	

[Note] Arbor screw is not included.

※ Before using a hollow-center configuration, deploy an arbor with a coolant supply port on the end face of the arbor-side connection.

Inserts



	P	M	K												
Carbon Steels	☑	☑					☑		☑	☑	☑				
SUS, etc.	☑	☑						☑							
Cast irons FC · FCD	☑								☑		☑				
Graphite														☑	
Aluminum alloys														☑	
Titanium alloys		☑	☑				☑	☑							
Hardened steels		☑	☑				☑								

☑ : General cutting, First recommendation
☐ : General cutting, Second recommendation

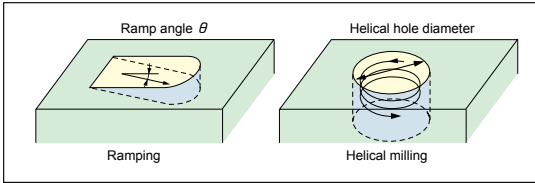
Item code	Tolerance class	Grade										Size (mm)					Shape	
		TH308	PN215	JP4105	ATH08M	JP4120	JM4160	JS4060	MZ1000	BH250	SD5010	HD7010	W1	BS	S	LE		RE
MPHW060302ZEL	H	★	★					●				6.35	-	3.18	3	0.2	Fig-1	
MPHW060302ZEL-0.5		★	★					●								0.5	0.2	Fig-2
MPHW060304ZEL		★	★	●	●			●								0.5	0.4	Fig-1
MPHW060304ZEL-0.5		★	★	●	●			●								0.5	0.4	Fig-2
MPHW060308ZEL		★	★	●	●	●		●								-	0.8	Fig-1
MPHW060308ZEL-1.5		★	★	●	●	●		●	●							1.5	0.8	Fig-2,4
MPHW060308ZEL-1.5F		★	★	●	●	★		★	●							1.5	0.8	Fig-2
MPHW060320ZEL		★	★	●	●			●	●							-	2.0	Fig-1,3
MPHW060304ZFL											●					-	0.4	Fig-1
MPHW060308ZFL											●					-	0.8	Fig-1
MPHW060305ZFL-N																-	0.5	Fig-5
MPHW060310ZFL-N																-	1.0	Fig-5
MPHW060320ZFL-N																-	2.0	Fig-5
MPNW060308ZEL		N					●	●	●								-	0.8
MPNW060320ZEL						●	●	●				-	2.0	Fig-1				

[Note] Please note that the JS Coating and HD Coating do not cause a reaction in conductive touch sensors.

★ : Stocked Items of New products. ● : Stocked items. No Mark : Manufactured request only.

Also allows direct milling without pilot hole

The absence of a cutting edge at the center constrains the ramping angle and hole diameter, but, as shown below, direct milling without a pilot hole is possible using ramping or helical milling.



[Note] ① Set the ramp angle θ within the range given above. Use with ramp angles not exceeding 0.5° is recommended.
② For hole diameters outside the range given above, drill a pilot hole before milling.

Tool Dia. (mm)	12	16	17	18	20	21	22	25	26	28
Maximum Ramping angle θ	2.5°	2.5°	2.5°	2.5°	2.5°	2.5°	2.5°	2.1°	2°	1.8°
Hole Dia. (mm)	14 ~ 22	22 ~ 30	24 ~ 32	26 ~ 34	30 ~ 38	32 ~ 40	34 ~ 42	40 ~ 48	42 ~ 50	46 ~ 54
Tool Dia. (mm)	30	32	35	40	42	50	63	80	100	125
Maximum Ramping angle θ	1.7°	1.6°	1.4°	1.2°	1°	1°	0.5°	0.4°	0.3°	0.2°
Hole Dia. (mm)	50 ~ 58	54 ~ 62	60 ~ 68	70 ~ 78	74 ~ 82	90 ~ 98	116 ~ 124	150 ~ 158	190 ~ 198	240 ~ 248

Parts

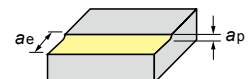
Numeric figure in a circle ○

Type	Parts	Clamp screw	Arbor screw (With Air hole)					Screw driver	Screw anti-seizure agent			
			Shape	Fastening torque (N·m)	Model No.	a	ϕb			c	d	f
Modular	ASPVM20○R-○	250-141	1.1	-	-	-	-	-	104-T8	P-37		
	ASPVM-P-20○R-○M○			-	-	-	-	-				
Shank	ASPVS20○R-○			-	-	-	-	-				
Bore	Inch size			ASPVB2050R-7	100-178	M10 × 1.5	16	35			25	8
	ASPVB2063R-8			100-179	M12 × 1.75	18	42	30			10	
	ASPVB2080R-8			100-180	M16 × 2.0	24	51	35			14	
	ASPVB2100R-10			-	-	-	-	-			-	
	*ASPVB2125R-10			-	-	-	-	-			-	
	mm size			ASPVB2042RM-6	100-183	M8 × 1.25	13	33			25	6
				ASPVB2050RM-7	100-178	M10 × 1.5	16	35			25	8
				ASPVB2063RM-8	100-179	M12 × 1.75	18	42			30	10
				ASPVB2080RM-8	100-180	M16 × 2.0	24	51			35	14
				ASPVB2100RM-10	-	-	-	-			-	-
*ASPVB2125RM-10				-	-	-	-	-			-	

[Note] Use the arbor screw above when supplying air and cutting fluid to each cutting edge. The clamp screw is a consumable part. Since replacement life depends on the use environment, it is recommended that it be replaced at an early stage.

* When using a hollow-center configuration, deploy an arbor with a coolant supply port on the end face of the arbor-side connection.

φ 40			φ 50			φ 63			φ 80			φ 100			φ 125		
6 Flutes			7 Flutes			8 Flutes			8 Flutes			10 Flutes			10 Flutes		
<5DC	5DC -7DC	>7DC	<5DC	5DC -7DC	>7DC	<5DC	5DC -7DC	>7DC	<5DC	5DC -7DC	>7DC	<5DC	5DC -7DC	>7DC	<5DC	5DC -7DC	>7DC
1,592	1,353	1,114	1,273	1,082	891	1,011	859	707	796	676	557	637	541	446	509	433	357
200	170	140	200	170	140	200	170	140	200	170	140	200	170	140	200	170	140
1,432	974	668	1,337	909	624	1,213	825	566	955	649	446	955	649	446	764	519	357
0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
28	28	20	35	35	25	44	44	32	56	56	40	70	70	50	88	88	63
3,979	3,183	3,183	3,183	2,546	2,546	2,526	2,021	2,021	1,989	1,592	1,592	1,592	1,273	1,273	1,273	1,019	1,019
500	400	400	500	400	400	500	400	400	500	400	400	500	400	400	500	400	400
2,387	1,910	1,528	2,228	1,783	1,426	2,021	1,617	1,293	1,592	1,273	1,019	1,592	1,273	1,019	1,273	1,019	815
0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
28	28	20	35	35	25	44	44	32	56	56	40	70	70	50	88	88	63
1,432	1,194	875	1,146	955	700	909	758	556	716	597	438	573	477	350	458	382	280
180	150	110	180	150	110	180	150	110	180	150	110	180	150	110	180	150	110
1,031	716	525	963	668	490	873	606	445	688	477	350	688	477	350	550	382	280
0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
28	28	20	35	35	25	44	44	32	56	56	40	70	70	50	88	88	63
1,273	1,035	796	1,019	828	637	808	657	505	637	517	398	509	414	318	407	331	255
160	130	100	160	130	100	160	130	100	160	130	100	160	130	100	160	130	100
764	621	477	713	579	446	647	525	404	509	414	318	509	414	318	407	331	255
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
28	28	20	35	35	25	44	44	32	56	56	40	70	70	50	88	88	63
796	637	637	637	509	509	505	404	404	398	318	318	318	255	255	255	204	204
100	80	80	100	80	80	100	80	80	100	80	80	100	80	80	100	80	80
477	382	382	446	357	357	404	323	323	318	255	255	318	255	255	255	204	204
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
28	28	20	35	35	25	44	44	32	56	56	40	70	70	50	88	88	63
557	398	398	446	318	318	354	253	253	279	199	199	223	159	159	178	127	127
70	50	50	70	50	50	70	50	50	70	50	50	70	50	50	70	50	50
334	239	191	312	223	178	283	202	162	223	159	127	223	159	127	178	127	102
0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
28	28	20	35	35	25	44	44	32	56	56	40	70	70	50	88	88	63
1,432	1,194	875	1,146	955	700	909	758	556	716	597	438	573	477	350	458	382	280
180	150	110	180	150	110	180	150	110	180	150	110	180	150	110	180	150	110
859	716	525	802	668	490	728	606	445	573	477	350	573	477	350	458	382	280
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
28	28	20	35	35	25	44	44	32	56	56	40	70	70	50	88	88	63
1,592	1,353	1,114	1,273	1,082	891	1,011	859	707	796	676	557	637	541	446	509	433	357
200	170	140	200	170	140	200	170	140	200	170	140	200	170	140	200	170	140
1,432	974	668	1,337	909	624	1,213	825	566	955	649	446	955	649	446	764	519	357
0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
28	28	20	35	35	25	44	44	32	56	56	40	70	70	50	88	88	63
6,366	4,775	4,775	5,093	3,820	3,820	4,042	3,032	3,032	3,183	2,387	2,387	2,546	1,910	1,910	2,037	1,528	1,528
800	600	600	800	600	600	800	600	600	800	600	600	800	600	600	800	600	600
63.7	47.7	38.2	50.9	38.2	30.6	40.4	30.3	24.3	31.8	23.9	19.1	25.5	19.1	15.3	20.4	15.3	12.2
0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
28	28	20	35	35	25	44	44	32	56	56	40	70	70	50	88	88	63
6,366	4,775	4,775	5,093	3,820	3,820	4,042	3,032	3,032	3,183	2,387	2,387	2,546	1,910	1,910	2,037	1,528	1,528
800	600	600	800	600	600	800	600	600	800	600	600	800	600	600	800	600	600
3,820	2,865	2,865	3,565	2,674	2,674	3,234	2,425	2,425	2,546	1,910	1,910	2,546	1,910	1,910	2,037	1,528	1,528
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
28	28	20	35	35	25	44	44	32	56	56	40	70	70	50	88	88	63
3,183	2,387	2,387	2,546	1,910	1,910	2,021	1,516	1,516	1,592	1,194	1,194	1,273	955	955	1,019	764	764
400	300	300	400	300	300	400	300	300	400	300	300	400	300	300	400	300	300
1,910	1,432	1,432	1,783	1,337	1,337	1,617	1,213	1,213	1,273	955	955	1,273	955	955	1,019	764	764
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
28	28	20	35	35	25	44	44	32	56	56	40	70	70	50	88	88	63
398	318	239	318	255	191	253	202	152	199	159	119	159	127	95.5	127	102	76.4
50	40	30	50	40	30	50	40	30	50	40	30	50	40	30	50	40	30
239	191	143	223	178	134	202	162	121	159	127	95.5	159	127	95.5	127	102	76.4
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
28	28	20	35	35	25	44	44	32	56	56	40	70	70	50	88	88	63
477	398	239	382	318	191	303	253	152	239	199	119	191	159	95.5	153	127	76.4
60	50	30	60	50	30	60	50	30	60	50	30	60	50	30	60	50	30
286	239	143	267	223	134	243	202	121	191	159	95.5	191	159	95.5	153	127	76.4
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
28	28	20	35	35	25	44	44	32	56	56	40	70	70	50	88	88	63



ASP/mini

ASPV

Carbide shank

Recommended cutting conditions of ASPV

※ Red indicates primary recommended grade.

Side finishing

Work material	Recommended grade	DC	φ 12			φ 16			φ 20			φ 25			φ 32		
		Tool dia. (mm)	1 Flutes			2 Flutes			3 Flutes			4 Flutes			5 Flutes		
		Flutes	<5DC	5DC -7DC	>7DC	<5DC	5DC -7DC	>7DC	<5DC	5DC -7DC	>7DC	<5DC	5DC -7DC	>7DC	<5DC	5DC -7DC	>7DC
Carbon steels Alloy steels (30HRC or less)	MZ1000 PN215 JP4120 JS4060	n (min ⁻¹)	10,610	7,958	7,958	7,958	5,968	5,968	6,366	4,775	4,775	5,093	3,820	3,820	3,979	2,984	2,984
		Vc(m/min)	400	300	300	400	300	300	400	300	300	400	300	300	400	300	300
		Vf(mm/min)	1,592	955	796	2,387	1,432	1,194	2,865	1,719	1,432	3,056	1,833	1,528	2,984	1,790	1,492
		fz(mm/t)	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1
		ap(mm)	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
	BH250	ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		n (min ⁻¹)	21,221	15,915	15,915	15,915	11,937	11,937	12,732	9,549	9,549	10,186	7,639	7,639	7,958	5,968	5,968
		Vc(m/min)	800	600	600	800	600	600	800	600	600	800	600	600	800	600	600
		Vf(mm/min)	2,122	1,592	1,273	3,183	2,387	1,910	3,820	2,865	2,292	4,074	3,056	2,445	3,979	2,984	2,387
		fz(mm/t)	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08
Alloy steels (Quenched and tempered steels) (35HRC or less)	MZ1000 PN215 JP4120 JS4060	n (min ⁻¹)	7,958	6,631	6,631	5,968	4,974	4,974	4,775	3,979	3,979	3,820	3,183	3,183	2,984	2,487	2,487
		Vc(m/min)	300	250	250	300	250	250	300	250	250	300	250	250	300	250	250
		Vf(mm/min)	955	663	663	1,432	995	995	1,719	1,194	1,194	1,833	1,273	1,273	1,790	1,243	1,243
		fz(mm/t)	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1
		ap(mm)	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
	TH308 PN215 JP4120	ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		n (min ⁻¹)	6,631	5,305	5,305	4,974	3,979	3,979	3,979	3,183	3,183	3,183	2,546	2,546	2,487	1,989	1,989
		Vc(m/min)	250	200	200	250	200	200	250	200	200	250	200	200	250	200	200
		Vf(mm/min)	663	531	531	995	796	796	1,194	955	955	1,273	1,019	1,019	1,243	995	995
		fz(mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Hardened steels (55HRC or less)	TH308 JP4120	n (min ⁻¹)	5,305	3,979	3,979	3,979	2,984	2,984	3,183	2,387	2,387	2,546	1,910	1,910	1,989	1,492	1,492
		Vc(m/min)	200	150	150	200	150	150	200	150	150	200	150	150	200	150	150
		Vf(mm/min)	531	398	398	796	597	597	955	716	716	1,019	764	764	995	746	746
		fz(mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		ap(mm)	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
	TH308	ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		n (min ⁻¹)	3,979	2,653	2,653	2,984	1,989	1,989	2,387	1,592	1,592	1,910	1,273	1,273	1,492	995	995
		Vc(m/min)	150	100	100	150	100	100	150	100	100	150	100	100	150	100	100
		Vf(mm/min)	398	265	265	597	398	398	716	477	477	764	509	509	746	497	497
		fz(mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Stainless steels SUS	JP4120 JM4160	n (min ⁻¹)	7,958	6,631	6,631	5,968	4,974	4,974	4,775	3,979	3,979	3,820	3,183	3,183	2,984	2,487	2,487
		Vc(m/min)	300	250	250	300	250	250	300	250	250	300	250	250	300	250	250
		Vf(mm/min)	796	663	663	1,194	995	995	1,432	1,194	1,194	1,528	1,273	1,273	1,492	1,243	1,243
		fz(mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		ap(mm)	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
	TH308 JP4120	ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		n (min ⁻¹)	10,610	7,958	7,958	7,958	5,968	5,968	6,366	4,775	4,775	5,093	3,820	3,820	3,979	2,984	2,984
		Vc(m/min)	400	300	300	400	300	300	400	300	300	400	300	300	400	300	300
		Vf(mm/min)	1,592	955	796	2,387	1,432	1,194	2,865	1,719	1,432	3,056	1,833	1,528	2,984	1,790	1,492
		fz(mm/t)	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1
Cast irons FC FCD	TH308 JP4120	ap(mm)	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
		ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		n (min ⁻¹)	21,221	15,915	15,915	15,915	11,937	11,937	12,732	9,549	9,549	10,186	7,639	7,639	7,958	5,968	5,968
		Vc(m/min)	800	600	600	800	600	600	800	600	600	800	600	600	800	600	600
		Vf(mm/min)	2,546	1,910	1,528	1,910	1,432	1,146	1,528	1,146	917	1,222	917	733	955	716	573
	BH250	fz(mm/t)	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08
		ap(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		ae(mm)	8	8	6	11	11	8	14	14	10	18	18	13	22	22	16
		n (min ⁻¹)	21,221	15,915	15,915	15,915	11,937	11,937	12,732	9,549	9,549	10,186	7,639	7,639	7,958	5,968	5,968
		Vc(m/min)	800	600	600	800	600	600	800	600	600	800	600	600	800	600	600
Aluminum alloys Copper alloys	SD5010 PN215	Vf(mm/min)	2,122	1,592	1,592	3,183	2,387	2,387	3,820	2,865	2,865	4,074	3,056	3,056	3,979	2,984	2,984
		fz(mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		ap(mm)	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
		ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		n (min ⁻¹)	10,610	7,958	7,958	7,958	5,968	5,968	6,366	4,775	4,775	5,093	3,820	3,820	3,979	2,984	2,984
	HD7010	Vc(m/min)	400	300	300	400	300	300	400	300	300	400	300	300	400	300	300
		Vf(mm/min)	1,061	796	796	1,592	1,194	1,194	1,910	1,432	1,432	2,037	1,528	1,528	1,989	1,492	1,492
		fz(mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		ap(mm)	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
		ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Heat resistant alloys Super heat resistant alloys	TH308 JP4120	n (min ⁻¹)	1,592	1,061	1,061	1,194	796	796	955	637	637	764	509	509	597	398	398
		Vc(m/min)	60	40	40	60	40	40	60	40	40	60	40	40	60	40	40
		Vf(mm/min)	159	106	106	239	159	159	286	191	191	306	204	204	298	199	199
		fz(mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		ap(mm)	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
Titanium alloys	TH308 JP4120	ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		n (min ⁻¹)	2,653	2,122	2,122	1,989	1,592	1,592	1,592	1,273	1,273	1,273	1,019	1,019	995	796	796
		Vc(m/min)	100	80	80	100	80	80	100	80	80	100	80	80	100	80	80
		Vf(mm/min)	265	212	212	398	318	318	477	382	382	509	407	407	497	398	398
		fz(mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	TH308 JP4120	ap(mm)	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
		ae(mm)															

φ 40			φ 50			φ 63			φ 80			φ 100			φ 125		
6 Flutes			7 Flutes			8 Flutes			8 Flutes			10 Flutes			10 Flutes		
<5DC	5DC -7DC	>7DC	<5DC	5DC -7DC	>7DC	<5DC	5DC -7DC	>7DC	<5DC	5DC -7DC	>7DC	<5DC	5DC -7DC	>7DC	<5DC	5DC -7DC	>7DC
3,183	2,387	2,387	2,546	1,910	1,910	2,021	1,516	1,516	1,592	1,194	1,194	1,273	955	955	1,019	764	764
400	300	300	400	300	300	400	300	300	400	300	300	400	300	300	400	300	300
2,865	1,719	1,432	2,674	1,604	1,337	2,425	1,455	1,213	1,910	1,146	955	1,910	1,146	955	1,528	917	764
0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1
1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
6,366	4,775	4,775	5,093	3,820	3,820	4,042	3,032	3,032	3,183	2,387	2,387	2,546	1,910	1,910	2,037	1,528	1,528
800	600	600	800	600	600	800	600	600	800	600	600	800	600	600	800	600	600
3,820	2,865	2,292	3,565	2,674	2,139	3,234	2,425	1,940	2,546	1,910	1,528	2,546	1,910	1,528	2,037	1,528	1,222
0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08
1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2,387	1,989	1,989	1,910	1,592	1,592	1,516	1,263	1,263	1,194	995	995	955	796	796	764	637	637
300	250	250	300	250	250	300	250	250	300	250	250	300	250	250	300	250	250
1,719	1,194	1,194	1,604	1,114	1,114	1,455	1,011	1,011	1,146	796	796	1,146	796	796	917	637	637
0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1
1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1,989	1,592	1,592	1,592	1,273	1,273	1,263	1,011	1,011	995	796	796	796	637	637	637	509	509
250	200	200	250	200	200	250	200	200	250	200	200	250	200	200	250	200	200
1,194	955	955	1,114	891	891	1,011	808	808	796	637	637	796	637	637	637	509	509
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1,592	1,194	1,194	1,273	955	955	1,011	758	758	796	597	597	637	477	477	509	382	382
200	150	150	200	150	150	200	150	150	200	150	150	200	150	150	200	150	150
955	716	716	891	668	668	808	606	606	637	477	477	637	477	477	509	382	382
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1,194	796	796	955	637	637	758	505	505	597	398	398	477	318	318	382	255	255
150	100	100	150	100	100	150	100	100	150	100	100	150	100	100	150	100	100
716	477	477	668	446	446	606	404	404	477	318	318	477	318	318	382	255	255
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2,387	1,989	1,989	1,910	1,592	1,592	1,516	1,263	1,263	1,194	995	995	955	796	796	764	637	637
300	250	250	300	250	250	300	250	250	300	250	250	300	250	250	300	250	250
1,432	1,194	1,194	1,337	1,114	1,114	1,213	1,011	1,011	955	796	796	955	796	796	764	637	637
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
3,183	2,387	2,387	2,546	1,910	1,910	2,021	1,516	1,516	1,592	1,194	1,194	1,273	955	955	1,019	764	764
400	300	300	400	300	300	400	300	300	400	300	300	400	300	300	400	300	300
2,865	1,719	1,432	2,674	1,604	1,337	2,425	1,455	1,213	1,910	1,146	955	1,910	1,146	955	1,528	917	764
0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1
1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
6,366	4,775	4,775	5,093	3,820	3,820	4,042	3,032	3,032	3,183	2,387	2,387	2,546	1,910	1,910	2,037	1,528	1,528
800	600	600	800	600	600	800	600	600	800	600	600	800	600	600	800	600	600
764	573	458	611	458	367	485	364	291	382	286	229	306	229	183	244	183	147
0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
28	28	20	35	35	25	44	44	32	56	56	40	70	70	50	88	88	63
6,366	4,775	4,775	5,093	3,820	3,820	4,042	3,032	3,032	3,183	2,387	2,387	2,546	1,910	1,910	2,037	1,528	1,528
800	600	600	800	600	600	800	600	600	800	600	600	800	600	600	800	600	600
3,820	2,865	2,865	3,565	2,674	2,674	3,234	2,425	2,425	2,546	1,910	1,910	2,546	1,910	1,910	2,037	1,528	1,528
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
3,183	2,387	2,387	2,546	1,910	1,910	2,021	1,516	1,516	1,592	1,194	1,194	1,273	955	955	1,019	764	764
400	300	300	400	300	300	400	300	300	400	300	300	400	300	300	400	300	300
1,910	1,432	1,432	1,783	1,337	1,337	1,617	1,213	1,213	1,273	955	955	1,273	955	955	1,019	764	764
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
477	318	318	382	255	255	303	202	202	239	159	159	191	127	127	153	102	102
60	40	40	60	40	40	60	40	40	60	40	40	60	40	40	60	40	40
286	191	191	267	178	178	243	162	162	191	127	127	191	127	127	153	102	102
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
796	637	637	637	509	509	505	404	404	398	318	318	318	255	255	255	204	204
100	80	80	100	80	80	100	80	80	100	80	80	100	80	80	100	80	80
477	382	382	446	357	357	404	323	323	318	255	255	318	255	255	255	204	204
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5	1.2	0.8	0.5
0.1	0.1	0.1	0.1	0.													

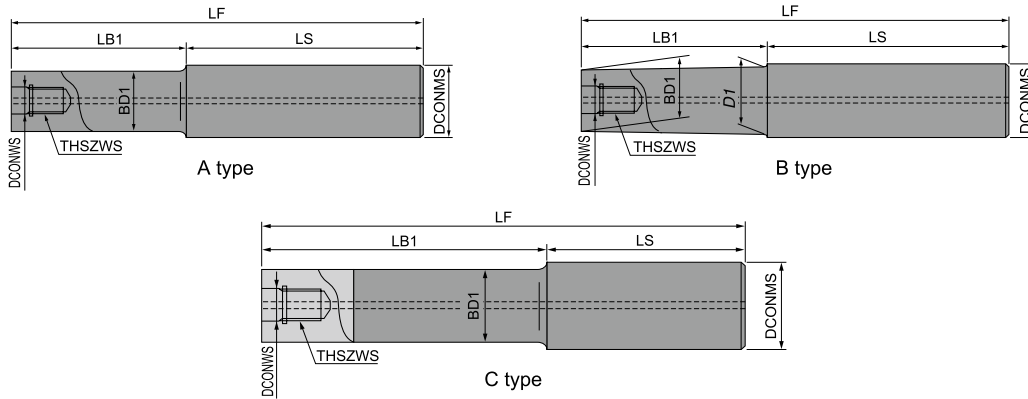
Recommended cutting conditions of ASPV

※ Red indicates primary recommended grade.

Vertical side finishing

Work material	Recommended grade	DC Tool dia. (mm)	φ 12			φ 16			φ 20			φ 25			φ 32		
		Flutes	1 Flutes			2 Flutes			3 Flutes			4 Flutes			5 Flutes		
		Overhang	<5DC	5DC -7DC	>7DC	<5DC	5DC -7DC	>7DC	<5DC	5DC -7DC	>7DC	<5DC	5DC -7DC	>7DC	<5DC	5DC -7DC	>7DC
Carbon steels Alloy steels (30HRC or less)	MZ1000 PN215 JP4120 JS4060	n (min ⁻¹)	10,610	7,958	7,958	7,958	5,968	5,968	6,366	4,775	4,775	5,093	3,820	3,820	3,979	2,984	2,984
		Vc(m/min)	400	300	300	400	300	300	400	300	300	400	300	300	400	300	300
		Vf(mm/min)	1,592	955	796	2,387	1,432	1,194	2,865	1,719	1,432	3,056	1,833	1,528	2,984	1,790	1,492
		fz(mm/t)	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1
		Pf(mm)	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8
	BH250	ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		n (min ⁻¹)	21,221	15,915	15,915	15,915	11,937	11,937	12,732	9,549	9,549	10,186	7,639	7,639	7,958	5,968	5,968
		Vc(m/min)	800	600	600	800	600	600	800	600	600	800	600	600	800	600	600
		Vf(mm/min)	1,485	1,114	796	2,228	1,671	1,194	2,674	2,005	1,432	2,852	2,139	1,528	2,785	2,089	1,492
		fz(mm/t)	0.07	0.07	0.05	0.07	0.07	0.05	0.07	0.07	0.05	0.07	0.07	0.05	0.07	0.07	0.05
Alloy steels (Quenched and tempered steels) (35HRC or less)	MZ1000 PN215 JP4120 JS4060	n (min ⁻¹)	7,958	6,631	6,631	5,968	4,974	4,974	4,775	3,979	3,979	3,820	3,183	3,183	2,984	2,487	2,487
		Vc(m/min)	300	250	250	300	250	250	300	250	250	300	250	250	300	250	250
		Vf(mm/min)	955	663	663	1,432	995	995	1,719	1,194	1,194	1,833	1,273	1,273	1,790	1,243	1,243
		fz(mm/t)	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1	0.12	0.1	0.1
		Pf(mm)	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8
	TH308 PN215 JP4120	ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		n (min ⁻¹)	6,631	5,305	5,305	4,974	3,979	3,979	3,979	3,183	3,183	3,183	2,546	2,546	2,487	1,989	1,989
		Vc(m/min)	250	200	200	250	200	200	250	200	200	250	200	200	250	200	200
		Vf(mm/min)	663	531	531	995	796	796	1,194	955	955	1,273	1,019	1,019	1,243	995	995
		fz(mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Hardened steels (55HRC or less)	TH308 JP4120	n (min ⁻¹)	5,305	3,979	3,979	3,979	2,984	2,984	3,183	2,387	2,387	2,546	1,910	1,910	1,989	1,492	1,492
		Vc(m/min)	200	150	150	200	150	150	200	150	150	200	150	150	200	150	150
		Vf(mm/min)	531	398	398	796	597	597	955	716	716	1,019	764	764	995	746	746
		fz(mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Pf(mm)	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8
	TH308	ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		n (min ⁻¹)	3,979	2,653	2,653	2,984	1,989	1,989	2,387	1,592	1,592	1,910	1,273	1,273	1,492	995	995
		Vc(m/min)	150	100	100	150	100	100	150	100	100	150	100	100	150	100	100
		Vf(mm/min)	398	265	265	597	398	398	716	477	477	764	509	509	746	497	497
		fz(mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Stainless steels SUS	JP4120 JM4160	n (min ⁻¹)	7,958	6,631	6,631	5,968	4,974	4,974	4,775	3,979	3,979	3,820	3,183	3,183	2,984	2,487	2,487
		Vc(m/min)	300	250	250	300	250	250	300	250	250	300	250	250	300	250	250
		Vf(mm/min)	796	663	663	1,194	995	995	1,432	1,194	1,194	1,528	1,273	1,273	1,492	1,243	1,243
		fz(mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Pf(mm)	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8
	TH308 JP4120	ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		n (min ⁻¹)	10,610	7,958	7,958	7,958	5,968	5,968	6,366	4,775	4,775	5,093	3,820	3,820	3,979	2,984	2,984
		Vc(m/min)	400	300	300	400	300	300	400	300	300	400	300	300	400	300	300
		Vf(mm/min)	1,592	955	796	2,387	1,432	1,194	2,865	1,719	1,432	3,056	1,833	1,528	2,984	1,790	1,492
		fz(mm/t)	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1	0.15	0.12	0.1
Cast irons FC FCD	TH308 JP4120	Pf(mm)	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8
		ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		n (min ⁻¹)	21,221	15,915	15,915	15,915	11,937	11,937	12,732	9,549	9,549	10,186	7,639	7,639	7,958	5,968	5,968
		Vc(m/min)	800	600	600	800	600	600	800	600	600	800	600	600	800	600	600
		Vf(mm/min)	1,592	955	796	2,387	1,432	1,194	2,865	1,719	1,432	3,056	1,833	1,528	2,984	1,790	1,492
	BH250	fz(mm/t)	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08	0.1	0.1	0.08
		Pf(mm)	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8
		ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		n (min ⁻¹)	21,221	15,915	15,915	15,915	11,937	11,937	12,732	9,549	9,549	10,186	7,639	7,639	7,958	5,968	5,968
		Vc(m/min)	800	600	600	800	600	600	800	600	600	800	600	600	800	600	600
Aluminum alloys Copper alloys	SD5010 PN215	Vf(mm/min)	2,122	1,592	1,592	3,183	2,387	2,387	3,820	2,865	2,865	4,074	3,056	3,056	3,979	2,984	2,984
		fz(mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Pf(mm)	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8
		ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		n (min ⁻¹)	10,610	7,958	7,958	7,958	5,968	5,968	6,366	4,775	4,775	5,093	3,820	3,820	3,979	2,984	2,984
	HD7010	Vc(m/min)	400	300	300	400	300	300	400	300	300	400	300	300	400	300	300
		Vf(mm/min)	1,061	796	796	1,592	1,194	1,194	1,910	1,432	1,432	2,037	1,528	1,528	1,989	1,492	1,492
		fz(mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Pf(mm)	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8
		ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Heat resistant alloys Super heat resistant alloys	TH308 JP4120	n (min ⁻¹)	1,592	1,061	1,061	1,194	796	796	955	637	637	764	509	509	597	398	398
		Vc(m/min)	60	40	40	60	40	40	60	40	40	60	40	40	60	40	40
		Vf(mm/min)	159	106	106	239	159	159	286	191	191	306	204	204	298	199	199
		fz(mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Pf(mm)	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8
Titanium alloys	TH308 JP4120	ae(mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
		n (min ⁻¹)	2,653	2,122	2,122	1,989	1,592	1,592	1,592	1,273	1,273	1,273	1,019	1,019	995	796	796
		Vc(m/min)	100	80	80	100	80	80	100	80	80	100	80	80	100	80	80
		Vf(mm/min)	265	212	212	398	318	318	477	382	382	509	407	407	497	398	398
		fz(mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	TH308 JP4120	Pf(mm)	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0

Carbide shank regular type



Item code	Stock	Size (mm)									Shape	Cutter body	With/without air hole
		DCONMS	THSZWS	LF	LB1	LS	BD1	DCONMS	D1				
ASC10-6.5-74-24Z	●	6.5	M6	74	24	50	9.3	10	-	A	φ8 ^{*1}	○	
ASC10-6.5-84-34Z	●			84	34	50					φ10	○	
ASC10-6.5-114-49Z	●			114	49	65					φ11 ^{**2}	○	
ASC10-6.5-114-24Z	●			24	90	φ12 ^{**2}					○		
ASC12-6.5-74-24Z	●	6.5	M6	74	24	50	11	12	11.5	B	φ8 ^{*1}	○	
ASC12-6.5-94-44Z	●			94	44	50					φ10 ^{*1}	○	
ASC12-6.5-129-64Z	●			129	64	65					φ11 ^{*1}	○	
ASC12-6.5-129-24Z	●			24	105	φ12					○		
ASC16-8.5-95-30Z	●	8.5	M8	95	30	65	14.5	16	15.5	B	φ16	○	
ASC16-8.5-120-55Z	●			120	55	65					φ17 ^{**2}		
ASC16-8.5-140-75Z	●			140	75	65					φ18 ^{**2}		
ASC16-8.5-160-95Z	●			160	95	65					AHUM 1020R-2-M8 ^{**2}		
ASC16-8.5-160-30Z	●			160	30	130							
ASC20-10.5-120-50Z	●	10.5	M10	120	50	70	18.5	20	19.5	B	φ20	○	
ASC20-10.5-170-90Z	●			170	90	80					φ21 ^{**2}		
ASC20-10.5-220-120Z	●			220	120	100					φ22 ^{**2}		
ASC20-10.5-270-150Z	●			270	150	120					AHUM 1025R-2-M10 ^{**2}		
ASC20-10.5-220-50Z	●	10.5	M10	220	50	170	18.5	20	19.5	B	GF1G	○	
ASC20-10.5-270-50Z	●			270		220					2025M-4-M10 ^{**2}		
ASC25-12.5-145-65	●	12.5	M12	145	65	80	23	25	-	C	φ25	○	
ASC25-12.5-215-115	●			215	115	100					φ26 ^{**2}		
ASC25-12.5-265-145	●			265	145	120					φ28 ^{**2}		
ASC25-12.5-315-195	●			315	195	120					AHUM 1030R-2-M12 ^{**2}		
ASC25-12.5-265-65	●	12.5	M12	265	65	200	23	25	-	C	AHUM 1530R-2-M12 ^{**2}	○	
ASC25-12.5-315-65	●			315		250							
ASC32-17-160-80	●	17	M16	160	80	80	28	32	-	C	φ30	○	
ASC32-17-210-110	●			210	110	100					φ32		
ASC32-17-260-140	●			260	140	120					φ33 ^{**2}		
ASC32-17-310-190	●			310	190	120					φ35 ^{**2}		
ASC32-17-360-240	●			360	240	120					(φ40) ^{**2}		
ASC32-17-260-80	●	17	M16	260	80	180	28	32	-	C	(φ42) ^{**2}	○	
ASC32-17-310-80	●			310		230							
ASC32-17-360-80	●			360		280							

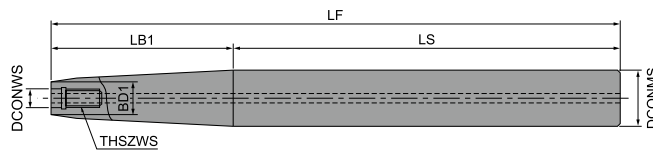
Compatible with commercially-available milling chucks and shrink-fit holders.

For ^{*1}, Interference will occur because the cutter diameter is less than the shank neck diameter (BD1, D1).

For ^{**2}, The cutter diameter is larger than the shank diameter (DCONMS), eliminating shank interference.

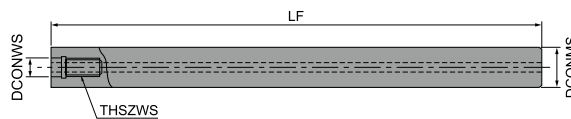
Under normal conditions, the φ40 dimension should be used with overhang lengths up to 200 mm.

Carbide shank tapered type



Item code	Stock	Size (mm)							Compatible wall angle	Cutter body	With/without air hole
		DCONWS	THSZWS	LF	LB1	LS	BD1	DCONMS			
ASC12T-6.5-200-60Z-09	★	6.5	M6	200	60	140	9.3	12	$\cong 0.9^\circ$	Φ10 Φ11	○
ASC16T-6.5-200-115Z-14	★				115	85		16	$\cong 1.4^\circ$		
ASC16T-6.5-200-50Z-29	★				50	150			$\cong 2.9^\circ$		
ASC16T-6.5-200-120Z-09*1	★				120	80	11	16	$\cong 0.9^\circ$	Φ12 Φ13	
ASC16T-6.5-200-75Z-14*1	★				75	125		$\cong 1.4^\circ$			
ASC20T-6.5-200-70Z-29*1	★				70	130		20	$\cong 2.9^\circ$		
ASC20T-8.5-250-120Z-09	★	8.5	M8	250	120	130	14.5	20	$\cong 0.9^\circ$	Φ16 Φ17	○
ASC20T-8.5-250-75Z-14	★				75	175		$\cong 1.4^\circ$			
ASC25T-8.5-250-80Z-29	★				80	170	25	$\cong 2.9^\circ$			
ASC25T-10.5-300-150Z-09	★	10.5	M10	300	150	150	18.5	25	$\cong 0.9^\circ$	Φ20 Φ21	○
ASC25T-10.5-300-95Z-14	★				95	205		$\cong 1.4^\circ$			
ASC32T-10.5-300-105Z-29	★				105	195	32	$\cong 2.9^\circ$			




Carbide shank straight type



Item code	Stock	Size (mm)				Cutter body	With/without air hole
		DCONWS	THSZWS	LF	DCONMS		
ASC10-6.5-80-0Z	★	6.5	M6	80	10	Φ10 Φ11*2	○
ASC10-6.5-130-0Z	★			130			
ASC12-6.5-100-0Z*1	★			100	12	Φ12 Φ13*2	
ASC12-6.5-150-0Z*1	★			150			
ASC15-8.5-210-0Z	★	8.5	M8	210	15	Φ16*2 Φ17*2 Φ18*2	○
ASC16-8.5-130-0Z	★	8.5	M8	130	16	Φ16 Φ17*2 Φ18*2	○
ASC16-8.5-210-0Z	★			210			
ASC18-10.5-240-0Z	★	10.5	M10	240	18	Φ20*2 Φ21*2 Φ22*2	○
ASC20-10.5-150-0Z	★	10.5	M10	150	20	Φ20 Φ21*2 Φ22*2	○
ASC20-10.5-250-0Z	★			250			
ASC23-12.5-300-0Z	★	12.5	M12	300	23	Φ25*2 Φ26*2 Φ28*2	○
ASC25-12.5-175-0Z	★	12.5	M12	175	25	Φ25 Φ26*2 Φ28*2	○
ASC25-12.5-300-0Z	★			300			

- [注意]** ① Compatible with commercially-available milling chucks and shrink-fit holders.
 ② *1 When tools with diameters of Φ10 and Φ11 are combined, interference should be occurred.
 ③ *2 Since the cutter diameter is larger than the shank diameter (DCONMS), there is no interference at the shank.

Lineup of MOLDINO tools for structural component finishing

Type	Feature			Body		Insert		Tool description
	Tolerance class	Efficiency	Economical	Tool dia.	Flutes	Corner R	No. of corners	
ARPF 	◎			φ6~32	2	R0.3~3.0	1	High-precision radius finishing tools featuring unique clamping mechanism and helical cutting edge
ASPVmini 	○	◎	◎	φ10~33	2~8	R0.2~1.0	2	Compact tools offering free cutting with ground chip breaker and high efficiency based on fine-pitch specification
ASPV 	○	○	◎	φ12~125	2~10	R0.2~2.0	2	Multi-function, fine-pitch tools ideal for structural component finishing



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

1. Attentions regarding handling

- (1) When removing the tool from the case (package), be careful not to drop it on your foot or drop it onto the tips of your bare fingers.
- (2) When actually setting the inserts, be careful not to touch the cutting flute directly with your bare hands.

2. Attentions regarding mounting

- (1) When preparing for use, be sure that the inserts are firmly mounted in place and that they are firmly mounted on the arbor, etc.
- (2) If abnormal chattering occurs during use, stop the machine immediately and remove the cause of the chattering.

3. Attentions 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) The inserts 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 installed and safety equipment such as safety glasses should be worn to create a safe environment for work.
 - Do not use where there is a risk of fire or explosion.
 - Do not use non-water-soluble cutting oils. Such oils may result in fire.
- (4) Do not use the tool for any purpose other than that for which it is intended, and do not modify it.

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