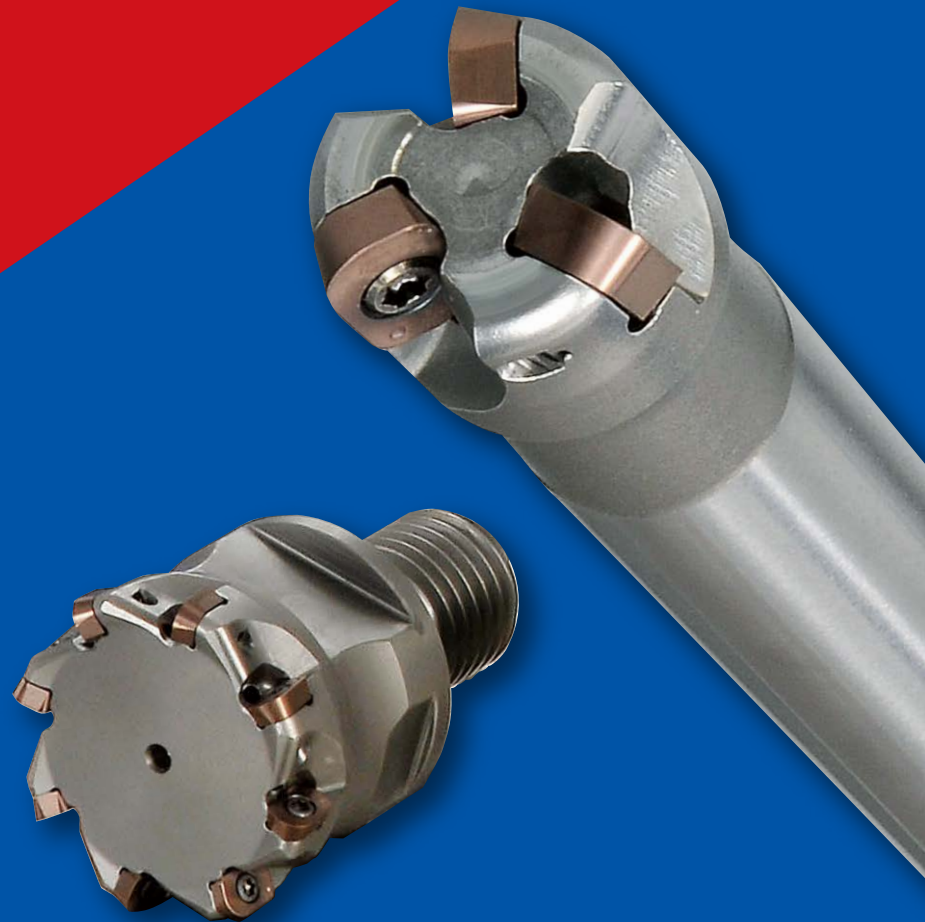


# ***RH2P*** type

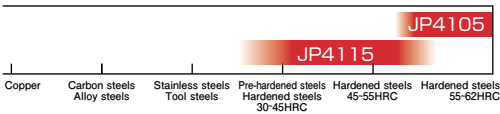
High hard Radius Mill RH2P



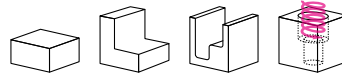
**MOLDINO Tool Engineering, Ltd.**

New Product News | No.1303E-9 | 2022-11

**RH2P, indexable cutter, will go to the field for conventional solid endmills. High-accuracy-ground inserts and high-accuracy bodies are in harmony.**



Applications



**Features 01** RH2P adopts high-accuracy-ground inserts (H grade) and high-accuracy bodies.

- Combination of high-accuracy-ground inserts (H grade) and high-accuracy bodies improves edge runout accuracy and stable cutting performance.

**Features 02** RH2P adopts cornerR 2mm

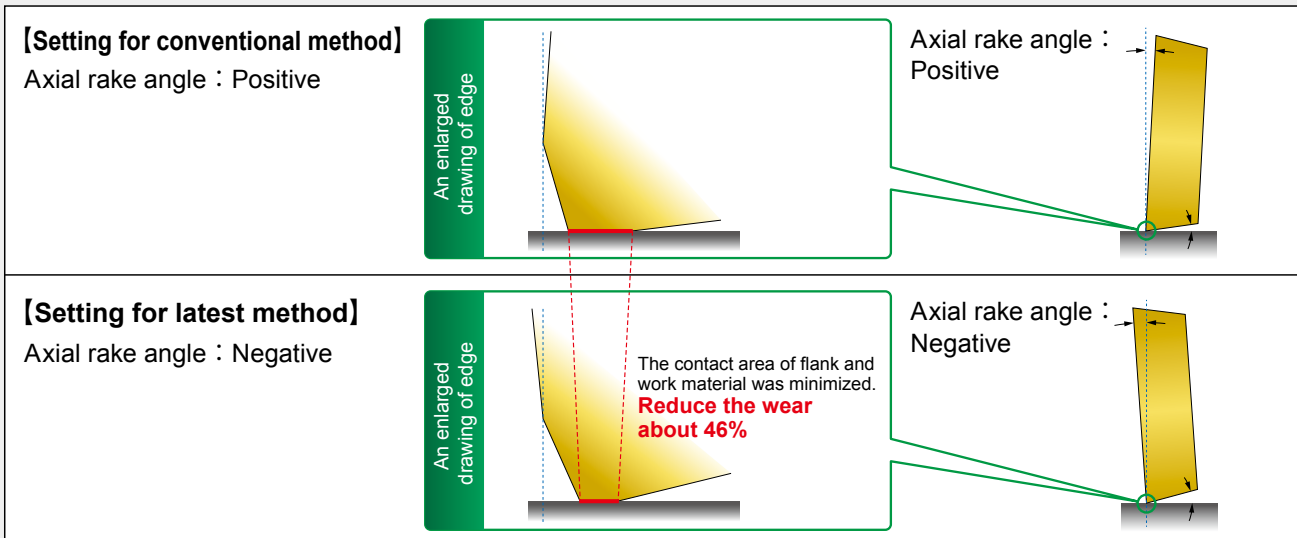
- RH2P adopts cornerR 2mm in order to reduce the remains by programming R.



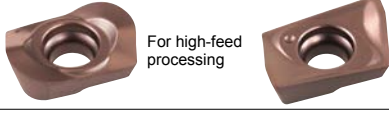

**Features 03** RH2P adopts exclusive negative edge shape.

- By having negative setting of the rake angle against the axial direction, RH2P improves toughness of edges and reduces wear.

Figure: Wear reduction effect of negative edge shape



## Comparison between ASM and RH2P

ASM type	Category	RH2P type
	Inserts	
Type of low cutting resistance with breaker	Edge shape	Flat type inserts high-toughness
M grade	Accuracy	H grade
<ul style="list-style-type: none"> <li>• ASM can perform high-feed processing and shoulder face milling processing.</li> <li>• Low cutting force due to inserts has breaker.</li> <li>• Economical inserts (M grade).</li> </ul>	Features	<ul style="list-style-type: none"> <li>• RH2P performs high-accuracy processing by combination of high-accuracy-ground inserts and hi-accuracy bodies.</li> <li>• Edge toughness is fine, due to flat type inserts.</li> <li>• RH2P reduces the wear of flank, by adopting the negative edge shape.</li> </ul>
<ul style="list-style-type: none"> <li>• For roughing process for carbon steels and stainless steels.</li> <li>• Shoulder face milling as depth of cut under 2mm.</li> </ul>	Recommended cutting applications	<ul style="list-style-type: none"> <li>• For roughing process and semi-finishing process of pre-hardened steels.</li> <li>• For roughing process and semi-finishing process of hardened steels (over 55HRC).</li> <li>• For unstable cutting (for example :nitrided materials).</li> </ul>

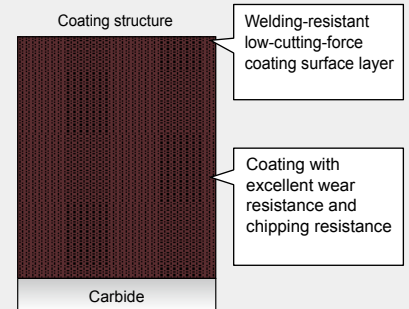
## Features of AJ Coating series

- Employs an AlTiN layer with a new composition created by increasing the Al content of conventional layers.
- Excellent wear resistance, chipping resistance, and heat resistance!

## New technology!!

- The new layer with high Al content employs a new composition and optimizes the structure to improve wear resistance and chipping resistance!
- Employs a low-friction-effect coating with excellent welding resistance as the top-most surface layer. This reduces welding of the work and decreases cutting force!

## Layer structure AJ Coating



## PVD Technology

## Grade for machining pre-hardened or hardened materials JP4115

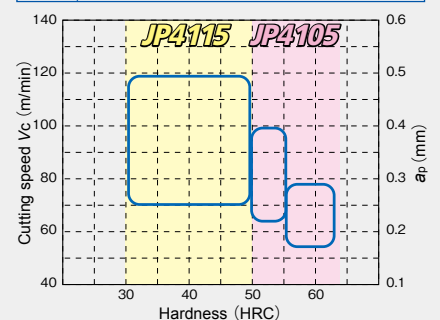
## Features

- Employs a fine carbide substrate with an excellent wear resistance and toughness and the new "AJ coating" to provide improved cutting performance.
- Exhibits excellent cutting performance when high-efficiency processing for less than 50HRC.

## Strong fields

- Hardened steel of less than 50HRC, pre-hardened steels.

Figure Recommended grades map



## PVD Technology

## Grade for machining high-hardness materials JP4105

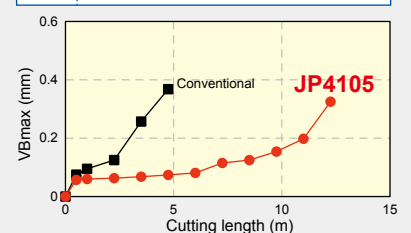
## Features

- Employs an ultra-fine cemented carbide substrate and the new "AJ Coating" to improve wear resistance.
- Excellent wear resistance when machining high hardness materials of 50HRC or higher.

## Strong fields

- Hardened steels (50 to 60 HRC): SKD11, SKD61, SKH, SUS420, etc.

Figure Cutting performance



Work material : SKD11(61HRC) Tool : ASRS2032-5  
 Insert : EPNW0603TN-8  
 Cutting conditions :  
 $V_c=80\text{m/min}$   $f_z=0.2\text{mm/t}$   $a_p \times a_e=0.5 \times 21\text{mm}$   
 Dry ※Single-flute cutting

# Line Up

## Shank type

### RH2P1 $\circ\circ\circ\circ$ S $\circ(\circ\circ)-\circ$

Numeric figure in a circle  $\circ$ .

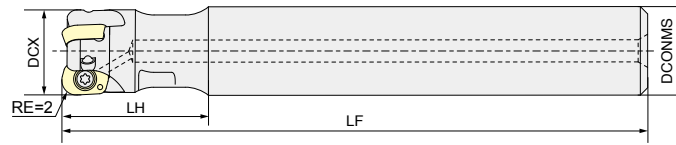
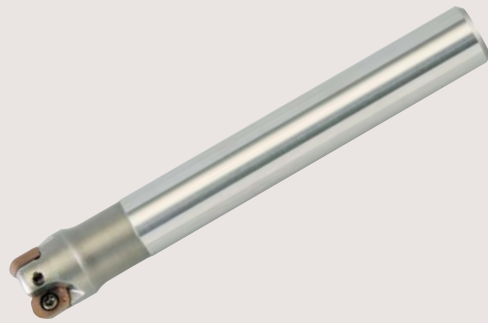


Fig-1 Regular type

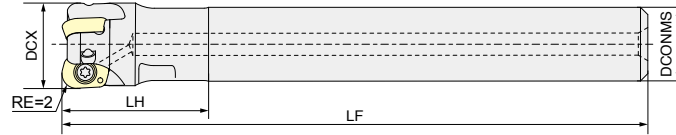


Fig-2 Undercut type

Recommended fastening torque  
**0.5N·m**

Item code	Stock	No. of flutes	Size (mm)				Shape
			DCX	LF	DCONMS	LH	
RH2P1008S-1	●	1	8	75	10	16	Fig-1
RH2P1010S-2	●	2	10	80	10	20	Fig-1
RH2P1010S08-2	●	2	10	80	8	20	Fig-2
RH2P1012S-3	●	3	12	80	12	20	Fig-1
RH2P1012S10-3	●	3	12	80	10	20	Fig-2
RH2P1016S-4	●	4	16	90	16	25	Fig-1
RH2P1020S-5	●	5	20	105	20	25	Fig-1

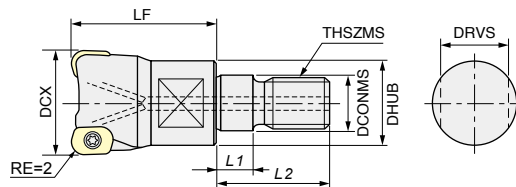
## Modular Type

### RH2P1 $\circ\circ\circ\circ$ M- $\circ$

Numeric figure in a circle  $\circ$ .



Fig-3 Modular type

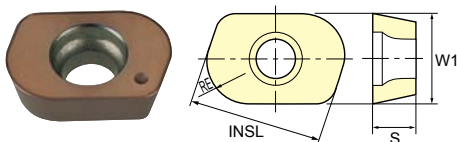


Recommended fastening torque  
**0.5N·m**

Item code	Stock	No. of flutes	Size (mm)							
			DCX	LF	DCONMS	THSZMS	DHUB	L1	L2	DRVS
RH2P1008M-1	●	1	8	19	6.5	M6	9.4	5.5	14.5	7
RH2P1010M-2	●	2	10	17	6.5	M6	9.4	5.5	14.5	7
RH2P1012M-3	●	3	12	17	6.5	M6	9.8	5.5	14.5	7
RH2P1016M-4	●	4	16	22	8.5	M8	12.8	5.5	17	10
RH2P1020M-5	●	5	20	25	10.5	M10	17.8	5.5	19	15
RH2P1025M-6	●	6	25	25	12.5	M12	20.8	5.5	22	17
RH2P1032M-8	●	8	32	27	17	M16	28.8	6	23	22

**[Note]** Do not apply lubricants such as grease, etc. to the "contact faces" and "modular screws" of the "modular mill", "special shanks" and "special arbor".




## Inserts



Item code	Tolerance class	AJ Coating		Size (mm)			
		JP4105	JP4115	RE	INSL	S	W1
		EPHW0402TN-2	H	●	●	2	6.215

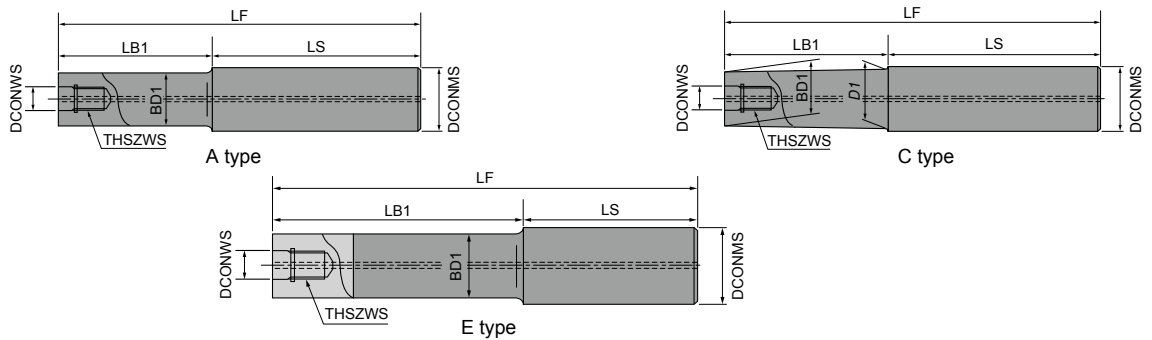
● : Stocked Items.

## Parts

Parts	Clamp screw		Screw driver	Screw anti-seizure agent
Cutter body	Shape			
		Fastening torque (N·m)		
RH2P10...	240-140	0.5	104-T6	P-37

## The Shanks for Modular Mill

### Carbide Shank

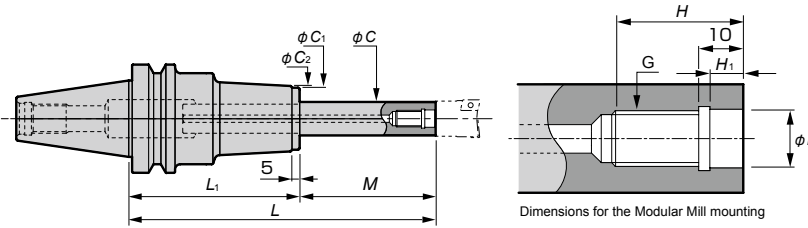


Item code	Stock	Size (mm)									Type	Cutter body	With/without air hole
		DCONWS	THSZWS	LF	LB1	LS	BD1	DCONMS	D1				
ASC10-6.5-74-24Z	●	6.5	M6	74	24	50	9.3	10	-	A	φ8 <sup>※2</sup> φ10 <sup>※1</sup> φ12 <sup>※1</sup>	-	
ASC10-6.5-84-34Z	●			84	34	50							
ASC10-6.5-114-49Z	●			114	49	65							
ASC10-6.5-114-24Z	●			114	24	90							
ASC12-6.5-74-24Z	●	6.5	M6	74	24	50	11	12	11.5	C	φ8 <sup>※2</sup> φ10 <sup>※2</sup> φ12	-	
ASC12-6.5-94-44Z	●			94	44	50							
ASC12-6.5-129-64Z	●			129	64	65							
ASC12-6.5-129-24Z	●			129	24	105							
ASC16-8.5-95-30Z	●	8.5	M8	95	30	65	14.5	16	15.5	C	φ16	○	
ASC16-8.5-120-55Z	●			120	55	65							
ASC16-8.5-140-75Z	●			140	75	65							
ASC16-8.5-160-95Z	●			160	95	65							
ASC16-8.5-160-30Z	●			160	30	130							
ASC20-10.5-120-50Z	●	10.5	M10	120	50	70	18.5	20	19.5	C	φ20	○	
ASC20-10.5-170-90Z	●			170	90	80							
ASC20-10.5-220-120Z	●			220	120	100							
ASC20-10.5-270-150Z	●			270	150	120							
ASC20-10.5-220-50Z	●	10.5	M10	220	50	170	18.5	20	19.5	C	φ20	○	
ASC20-10.5-270-50Z	●			270		220							
ASC25-12.5-145-65	●	12.5	M12	145	65	80	23	25	-	E	φ25	○	
ASC25-12.5-215-115	●			215	115	100							
ASC25-12.5-265-145	●			265	145	120							
ASC25-12.5-315-195	●			315	195	120							
ASC25-12.5-265-65	●	12.5	M12	265	65	200	23	25	-	E	φ25	○	
ASC25-12.5-315-65	●			315		250							
ASC32-17-160-80	●	17	M16	160	80	80	28	32	-	E	φ32	○	
ASC32-17-210-110	●			210	110	100							
ASC32-17-260-140	●			260	140	120							
ASC32-17-310-190	●			310	190	120							
ASC32-17-360-240	●			360	240	120							
ASC32-17-260-80	●	17	M16	260	80	180	28	32	-	E	φ32	○	
ASC32-17-310-80	●			310		230							
ASC32-17-360-80	●			360		280							

- [Note]** ① Commercial milling chucks or shrink-fit holders can be used.  
 ② Dimensions of black figure are when RH2P-M is attached.  
 ③ Dimensions of blue figure are when RH2P-M(φ8) is attached.  
 ④ Dimensions of red figure are when RH2P-M(φ10, φ12) is attached.  
 ⑤ For ※1, since the cutter diameter is larger than the shank diameter, there is no interference at the shank.  
 ⑥ For ※2, since the diameter of the cutter is smaller than that of the shank, interference may be a concern.

# Line Up

## Red screw arbor



Dimensions for the Modular Mill mounting

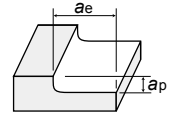
### Caution

- Some of the indexable end mills cannot be attached to the RED screw arbor. Please check your indexable end mills for conformance to the dimensions, or please contact MOLDINO Tool Engineering, Ltd.
- Because cutting resistance is greater than the tool holder connection force associated with the machine spindle, please reduce the recommended cutting conditions by 50% for the RED screw arbors marked with ※. Otherwise, the tool holder shank may experience fretting corrosion or fall out of the machine spindle.

Item code	Stock	Size(mm)										Weight (kg)	Rigidity value (μm) ↓	
		G	φD	H	H <sub>1</sub>	φC	L	M	L <sub>1</sub>	φC <sub>1</sub>	φC <sub>2</sub>			
BT40-RSG8-105-M25						105		80					1.4	0.6
BT40-RSG8-135-M25						135	25	110					1.8	0.7
BT40-RSG8-165-M25						165		140					2.1	0.8
BT40-RSG8-130-M50						130		80					1.4	1.5
BT40-RSG8-160-M50						160	50	110					1.8	1.7
BT40-RSG8-190-M50						190		140					2.1	1.8
BT40-RSG8-155-M75						155		80					1.5	3.1
BT40-RSG8-185-M75	M8	8.5	18	6.5	15	185	75	110	30	32			1.9	3.4
BT40-RSG8-215-M75						215		140					2.2	3.5
BT40-RSG8-170-M90						170		140					1.5	4.5
BT40-RSG8-200-M90						200	90	110					1.9	4.8
BT40-RSG8-230-M90						230		140					2.2	4.9
BT40-RSG8-185-M105						185		80					1.6	6.2
BT40-RSG8-215-M105						215	105	110					2.0	6.7
BT40-RSG8-245-M105						245		140					2.3	6.8
BT40-RSG10-125-M25						125		100					1.8	0.4
BT40-RSG10-155-M25						155	25	130					2.2	0.5
BT40-RSG10-185-M25						185		160					2.4	0.7
BT40-RSG10-150-M50						150		100					1.9	0.8
BT40-RSG10-180-M50						180	50	130					2.3	1.0
BT40-RSG10-210-M50						210		160					2.5	1.2
BT40-RSG10-175-M75						175		100					2.0	1.6
BT40-RSG10-205-M75	M10	10.5	22	6.5	19	205	75	130	36	38			2.4	1.8
BT40-RSG10-235-M75						235		160					2.6	2.0
BT40-RSG10-200-M100						200		100					2.0	2.7
BT40-RSG10-230-M100						230	100	130					2.4	3.0
BT40-RSG10-260-M100						260		160					2.6	3.3
BT40-RSG10-220-M120						220		100					2.1	4.0
BT40-RSG10-250-M120						250	120	130					2.5	4.3
BT40-RSG10-280-M120						280		160					2.7	4.6
BT40-RSG12-125-M25						125		100					2.0	0.3
BT40-RSG12-155-M25						155	25	130					2.4	0.4
BT40-RSG12-185-M25						185		160					2.7	0.5
BT40-RSG12-150-M50						150		100					2.1	0.5
BT40-RSG12-180-M50						180	50	130					2.5	0.7
BT40-RSG12-210-M50						210		160					2.8	0.9
BT40-RSG12-175-M75						175		100					2.3	0.9
BT40-RSG12-205-M75	M12	12.5	22	6	24	205	75	130	43	45			2.7	1.1
BT40-RSG12-235-M75						235		160					3.0	1.3
BT40-RSG12-200-M100						200		100					2.4	1.4
BT40-RSG12-230-M100						230	100	130					2.8	1.6
BT40-RSG12-260-M100						260		160					3.1	1.9
BT40-RSG12-225-M125						225		100					2.6	2.1
BT40-RSG12-255-M125						255	125	130					3.0	2.4
BT40-RSG12-285-M125						285		160					3.3	2.8
BT40-RSG16-125-M25						125	25						2.6	0.2
BT40-RSG16-150-M50						150	50						2.8	0.3
BT40-RSG16-175-M75	M16	17	25	6	29	175	75	100	52	54			3.0	0.5
BT40-RSG16-200-M100						200		100					3.2	0.8
BT40-RSG16-225-M125 ※						225	125						3.4	1.2
BT50-RSG8-120-M25						120		95					4.0	0.6
BT50-RSG8-150-M25						150	25	125					4.3	0.7
BT50-RSG8-180-M25						180		155					4.8	0.7
BT50-RSG8-145-M50						145		95					4.0	1.5
BT50-RSG8-175-M50						175	50	125					4.3	1.7
BT50-RSG8-205-M50						205		155					4.8	1.7
BT50-RSG8-170-M75						170		95					4.1	3.1
BT50-RSG8-200-M75	M8	8.5	18	6.5	15	200	75	125	30	32			4.4	3.4
BT50-RSG8-230-M75						230		155					4.9	3.4
BT50-RSG8-185-M90						185		155					4.9	4.4
BT50-RSG8-215-M90						215	90	125					4.4	4.8
BT50-RSG8-245-M90						245		155					4.9	4.8
BT50-RSG8-200-M105						200		95					4.2	6.2
BT50-RSG8-230-M105						230	105	125					4.5	6.6
BT50-RSG8-260-M105						260		155					5.0	6.6
BT50-RSG10-140-M25	M10	10.5	22	6.5	19	140	25	115	36	38			4.3	0.4
BT50-RSG10-170-M25						170		145					4.6	0.5
BT50-RSG10-200-M25						200		175					5.6	0.5
BT50-RSG10-165-M50						165		115					4.4	0.8
BT50-RSG10-195-M50						195	50	145					4.7	0.9
BT50-RSG10-225-M50						225		175					5.7	1.0
BT50-RSG10-190-M75						190		115					4.5	1.6
BT50-RSG10-220-M75						220	75	145					4.8	1.7
BT50-RSG10-250-M75						250		175					5.8	1.8
BT50-RSG10-215-M100	M10	10.5	22	6.5	19	215	115	115	36	38			4.5	2.7
BT50-RSG10-245-M100						245	100	145					4.8	2.9
BT50-RSG10-275-M100						275		175					5.8	2.9
BT50-RSG10-235-M120						235		115					4.6	3.9
BT50-RSG10-265-M120						265	120	145					4.9	4.2
BT50-RSG10-295-M120						295		175					5.9	4.2
BT50-RSG10-255-M140						255		115					4.7	5.5
BT50-RSG10-285-M140						285	140	145					5.0	5.8
BT50-RSG10-315-M140						315		175					6.0	5.8
BT50-RSG12-140-M25						140		115					4.6	0.2
BT50-RSG12-170-M25						170	25	145					5.0	0.3
BT50-RSG12-200-M25						200		175					5.8	0.4
BT50-RSG12-165-M50						165		115					4.7	0.5
BT50-RSG12-195-M50						195	50	145					5.1	0.6
BT50-RSG12-225-M50						225		175					5.9	0.6
BT50-RSG12-190-M75	M10	10.5	22	6.5	19	190	115	115	36	38			4.9	0.8
BT50-RSG12-220-M75						220	75	145					5.3	1.0
BT50-RSG12-250-M75						250		175					6.1	1.0
BT50-RSG12-215-M100	M12	12.5	22	6	24	215	115	115	43	45			5.0	1.3
BT50-RSG12-245-M100						245	100	145					5.4	1.5
BT50-RSG12-275-M100						275		175					6.2	1.6
BT50-RSG12-240-M125						240		115					5.2	2.1
BT50-RSG12-270-M125						270	125	145					5.6	2.3
BT50-RSG12-300-M125						300		175					6.4	2.4
BT50-RSG12-265-M150						265		115					5.3	3.0
BT50-RSG12-295-M150						295	150	145					5.7	3.3
BT50-RSG12-325-M150						325		1						

Item code	Stock	Size(mm)										Weight (kg)	Rigidity value ( $\mu\text{m}$ ) $\delta \downarrow$
		G	$\phi D$	H	H <sub>1</sub>	$\phi C$	L	M	L <sub>1</sub>	$\phi C_1$	$\phi C_2$		
A63-RSG8-130-M50						130		80				1.3	1.5
A63-RSG8-160-M50						160	50	110				1.4	1.7
A63-RSG8-190-M50						190		140				1.9	1.7
A63-RSG8-155-M75						155		80				1.4	3.1
A63-RSG8-185-M75						185	75	110				1.5	3.4
A63-RSG8-215-M75						215		140				2.0	3.4
A63-RSG8-170-M90						170		80				2.0	4.4
A63-RSG8-200-M90						200	90	110				1.5	4.8
A63-RSG8-230-M90						230		140				2.0	4.9
A63-RSG8-185-M105						185		80				1.5	6.2
A63-RSG8-215-M105						215	105	110				1.6	6.6
A63-RSG8-245-M105						245		140				2.1	6.7
A63-RSG10-125-M25						125		100				1.6	0.4
A63-RSG10-155-M25						155	25	130				1.9	0.5
A63-RSG10-185-M25						185		160				2.3	0.6
A63-RSG10-150-M50						150		100				1.7	0.8
A63-RSG10-180-M50						180	50	130				2.0	1.0
A63-RSG10-210-M50						210		160				2.4	1.2
A63-RSG10-175-M75						175		100				1.8	1.6
A63-RSG10-205-M75						205	75	130				2.1	1.8
A63-RSG10-235-M75						235		160				2.5	2.0
A63-RSG10-200-M100						200		100				1.8	2.7
A63-RSG10-230-M100						230	100	130				2.1	2.9
A63-RSG10-260-M100						260		160				2.5	3.2
A63-RSG10-220-M120						220		100				1.9	4.0
A63-RSG10-250-M120						250	120	130				2.2	4.2
A63-RSG10-280-M120						280		160				2.6	4.5
A63-RSG10-240-M140						240		100				2.0	5.6
A63-RSG10-270-M140						270	140	130				2.3	5.9
A63-RSG10-300-M140						300		160				2.7	6.2
A63-RSG12-125-M25						125		100				1.9	0.3
A63-RSG12-155-M25						155	25	130				2.3	0.4
A63-RSG12-185-M25						185		160				2.7	0.5
A63-RSG12-150-M50						150		100				2.0	0.5
A63-RSG12-180-M50						180	50	130				2.4	0.6
A63-RSG12-210-M50						210		160				2.8	0.8
A63-RSG12-175-M75						175		100				2.2	0.9
A63-RSG12-205-M75						205	75	130				2.6	1.0
A63-RSG12-235-M75						235		160				3.0	1.3
A63-RSG12-200-M100						200		100				2.3	1.4
A63-RSG12-230-M100						230	100	130				2.7	1.6
A63-RSG12-260-M100						260		160				3.1	1.9
A63-RSG12-225-M125						225		100				2.5	2.1
A63-RSG12-255-M125						255	125	130				2.9	2.4
A63-RSG12-285-M125						285		160				3.3	2.7
A63-RSG12-250-M150						250		100				2.6	3.1
A63-RSG12-280-M150						280	150	130				3.0	3.4
A63-RSG12-310-M150						310		160				3.4	3.8
A63-RSG16-140-M25						140	25					2.8	0.2
A63-RSG16-165-M50						165	50					3.2	0.4
A63-RSG16-190-M75						190	75					3.6	0.6
A63-RSG16-215-M100						215	100	115	52	54		2.8	0.9
A63-RSG16-240-M125						240	125					2.8	1.3
A63-RSG16-265-M150						265	150					3.2	1.9
A63-RSG16-290-M175						290	175					3.6	2.5
A100-RSG8-120-M25						120		95				2.6	0.6
A100-RSG8-150-M25						150	25	125				2.9	0.8
A100-RSG8-180-M25						180		155				3.4	0.8
A100-RSG8-145-M50						145		95				2.6	1.5
A100-RSG8-175-M50						175	50	125				2.9	1.7
A100-RSG8-205-M50						205		155				3.4	1.7
A100-RSG8-170-M75						170		95				2.7	3.1
A100-RSG8-200-M75						200	75	125				3.0	3.4
A100-RSG8-230-M75						230		155				3.5	3.4
A100-RSG8-185-M90						185		95				2.7	4.5
A100-RSG8-215-M90						215	90	125				3.0	4.9
A100-RSG8-245-M90						245		155				3.5	4.8
A100-RSG8-200-M105						200	105	95				2.8	6.3
A100-RSG8-230-M105						230		125				3.2	6.6
A100-RSG10-140-M25						140		115				1.4	0.4
A100-RSG10-170-M25						170	25	145				1.7	0.5
A100-RSG10-200-M25						200		175				2.0	0.5
A100-RSG10-165-M50						165		115				1.6	0.8
A100-RSG10-195-M50						195	50	145				1.9	1.0
A100-RSG10-225-M50						225		175				2.5	1.0
A100-RSG10-190-M75						190		115				1.9	1.6
A100-RSG10-220-M75						220	75	145				2.2	1.8
A100-RSG10-250-M75						250		175				2.5	1.8
A100-RSG10-215-M100						215		115				2.1	2.7
A100-RSG10-245-M100						245	100	145				2.4	2.9
A100-RSG10-275-M100						275		175				2.7	2.9
A100-RSG10-235-M120						235		115				2.3	4.0
A100-RSG10-265-M120						265	120	145				2.6	4.2
A100-RSG10-295-M120						295		175				2.9	4.2
A100-RSG10-255-M140						255		115				2.5	5.6
A100-RSG10-285-M140						285	140	145				2.8	5.8
A100-RSG10-315-M140						315		175				3.1	5.8
A100-RSG12-140-M25						140		115				1.4	0.3
A100-RSG12-170-M25						170	25	145				1.7	0.4
A100-RSG12-200-M25						200		175				2.0	0.4
A100-RSG12-165-M50						165		115				1.6	0.5
A100-RSG12-195-M50						195	50	145				1.9	0.6
A100-RSG12-225-M50						225		175				2.5	0.6
A100-RSG12-190-M75						190		115				1.9	0.8
A100-RSG12-220-M75						220	75	145				2.2	1.0
A100-RSG12-250-M75						250		175				2.5	1.0
A100-RSG12-215-M100						215		115				2.1	1.4
A100-RSG12-245-M100						245	100	145	43	45		2.4	1.6
A100-RSG12-275-M100						275		175				2.7	1.6
A100-RSG12-240-M125						240		115				2.4	2.1
A100-RSG12-270-M125						270	125	145				2.7	2.4
A100-RSG12-300-M125						300		175				3.0	2.4
A100-RSG12-265-M150						265		115				2.6	3.0
A100-RSG12-295-M150						295	150	145				2.9	3.4
A100-RSG12-325-M150						325		175				3.2	3.4
A100-RSG12-290-M175						290		115				2.9	4.3
A100-RSG12-320-M175						320	175	145				3.2	4.6
A100-RSG12-350-M175						350		175				3.5	4.6
A100-RSG16-140-M25						140		115				1.4	0.2
A100-RSG16-170-M25						170	25	145				1.7	0.2
A100-RSG16-200-M25						200		175				2.0	0.2
A100-RSG16-165-M50						165		115				1.6	0.3
A100-RSG16-195-M50						195	50	145				1.9	0.4
A100-RSG16-225-M50						225		175				2.5	0.4
A100-RSG16-190-M75						190		115				1.9	0.5
A100-RSG16-220-M75						220	75	145				2.2	0.6
A100-RSG16-250-M75						250		175				2.5	0.6
A100-RSG16-215-M100						215		115				2.1	0.8
A100-RSG16-245-M100						245	100	145				2.4	0.9
A100-RSG16-275-M100						275		175				2.7	0.9
A100-RSG16-240-M125						240		115				2.4	1.1
A100-RSG16-270-M125						270	125	145	52	54		2.7	1.3
A100-RSG16-300-M125						300		175				3.0	1.3
A100-RSG16-265-M150						265		115				2.6	1.6
A100-RSG16-295-M150						295	150	145				2.9	1.8
A100-RSG16-325-M150						325		175				3.2	1.8
A100-RSG16-290-M175						290		115				2.9	2.2
A100-RSG16-320-M175						320	175	145				3.2	2.4
A100-RSG16-350-M175						350		175				3.5	2.5
A100-RSG16-315-M200						315		115				3.1	3.0
A100-RSG16-345-M200						345	200						

# Recommended Cutting Conditions



\*Red indicates primary recommended grade.

Work material	Recommended grade	Cutting conditions	φ8 / 1 flute	φ10 / 2 flutes	φ12 / 3 flutes	φ16 / 4 flutes	φ20 / 5 flutes	φ25 / 6 flutes	φ32 / 8 flutes
Pre-hardened steels (40HRC or less)	※ JP4115	vc (m/min)	130	130	130	130	130	130	130
		n (min <sup>-1</sup> )	5,180	4,140	3,450	2,590	2,070	1,660	1,290
		fz (mm/t)	0.4	0.5	0.5	0.5	0.5	0.5	0.5
		vf (mm/min)	2,070	4,140	5,170	5,180	5,170	4,980	5,160
		ap (mm)	0.3	0.35	0.4	0.4	0.4	0.4	0.4
		ae (mm)	4.5	5	7	9.5	12	15	19
		Q (cm <sup>3</sup> /min)	2.8	7.2	14.5	19.7	24.8	29.9	39.2
Pre-hardened steels (40~50HRC)	JP4115	vc (m/min)	100	100	100	100	100	100	100
		n (min <sup>-1</sup> )	3,980	3,180	2,650	1,990	1,590	1,270	1,000
		fz (mm/t)	0.4	0.5	0.5	0.5	0.5	0.5	0.5
		vf (mm/min)	1,590	3,180	3,970	3,980	3,970	3,810	4,000
		ap (mm)	0.3	0.35	0.4	0.4	0.4	0.4	0.4
		ae (mm)	4.5	5	7	9.5	12	15	19
		Q (cm <sup>3</sup> /min)	2.1	5.6	11.1	15.1	19.1	22.9	30.4
Hardened steels (50~55HRC)	JP4105 JP4115	vc (m/min)	90	90	90	90	90	90	90
		n (min <sup>-1</sup> )	3,580	2,870	2,390	1,790	1,430	1,150	900
		fz (mm/t)	0.4	0.4	0.4	0.4	0.4	0.4	0.4
		vf (mm/min)	1,430	2,290	2,860	2,860	2,860	2,760	2,880
		ap (mm)	0.2	0.3	0.3	0.3	0.3	0.3	0.3
		ae (mm)	4.5	5	7	9.5	12	15	19
		Q (cm <sup>3</sup> /min)	1.3	3.4	6.0	8.2	10.3	12.4	16.4
Hardened steels (55~60HRC)	JP4105	vc (m/min)	75	75	75	75	75	75	75
		n (min <sup>-1</sup> )	2,990	2,390	1,990	1,490	1,190	960	750
		fz (mm/t)	0.3	0.4	0.4	0.4	0.4	0.4	0.4
		vf (mm/min)	890	1,910	2,380	2,380	2,380	2,300	2,400
		ap (mm)	0.15	0.2	0.2	0.2	0.2	0.2	0.2
		ae (mm)	3	4	5	6.5	8	10	13
		Q (cm <sup>3</sup> /min)	0.4	1.5	2.4	3.1	3.8	4.6	6.2
Hardened steels (60~62HRC)	JP4105	vc (m/min)	65	65	65	65	65	65	65
		n (min <sup>-1</sup> )	2,590	2,070	1,730	1,290	1,040	830	650
		fz (mm/t)	0.25	0.3	0.3	0.3	0.3	0.3	0.3
		vf (mm/min)	640	1,240	1,550	1,540	1,560	1,490	1,560
		ap (mm)	0.15	0.15	0.15	0.15	0.15	0.15	0.15
		ae (mm)	3	4	5	6.5	8	10	13
		Q (cm <sup>3</sup> /min)	0.3	0.7	1.2	1.5	1.9	2.2	3.0

- [Note]**
- ① Use the appropriate coolant for the work material and machining shape.
  - ② These conditions are for general guidance; in actual cutting 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 recommended cutting conditions.
  - ④ When using an RH2P1010S08-2 or RH2P1012S10-3 undercut type shank, as a general rule the feed rate per flute (fz) should be reduced to 50~70% of the value listed in the recommended cutting conditions.
  - ⑤ Ensure to exchange the insert at the correct time to ensure safety of the tool-body.
  - ⑥ 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.
  - ⑦ Due to fire risks do not use cutting oil as a coolant.

## ○ Ramping / Helical milling

(mm)

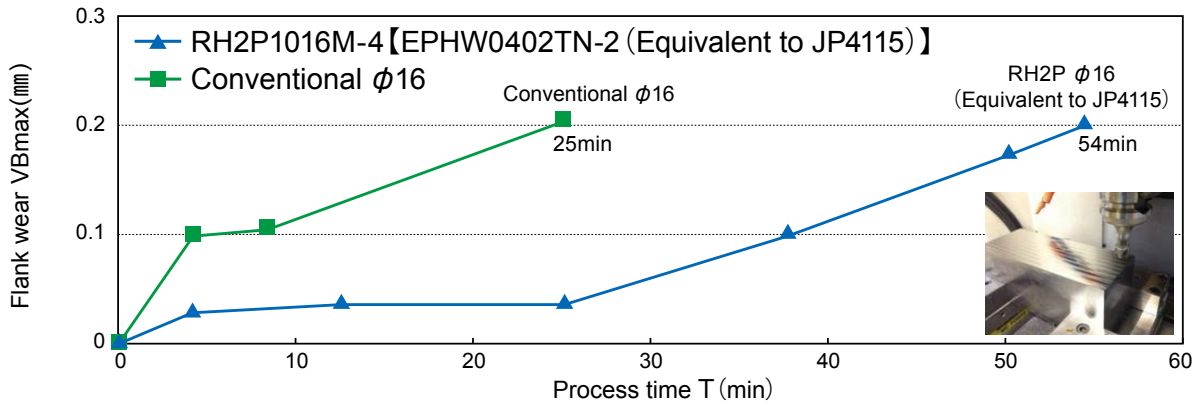
Tool dia.(mm)	φ8	φ10	φ12	φ16	φ20	φ25	φ32
Max. ramp angle °	Less than 0.5 ° (max. 1.0 °)						
Helical milling / Hole dia.(mm)	10-15	13-19	17-23	25-31	33-39	43-49	57-63

For hole diameters outside the ranges listed above, a pilot hole should be drilled before milling.



## 01 Comparison of tool life for pre-hardened steels [HPM-Pro (40HRC)]

**Cutting condition** | Work material : HPM-Pro  $v_c=120\text{m/min}$  ( $n=2,387\text{min}^{-1}$ )  $f_z=0.5\text{mm/t}$  ( $v_f=1,193\text{mm/min}$ )  
 $a_p \times a_e=0.3 \times 10\text{mm}$  Single-tip cutting Air-blow  
 Machine : Vertical type Machining center (Equivalent to BT30)



**Improved tool life by reduced wear of flank surface.**

## 02 Field data for pre-hardened steels [HPM38 (52HRC)]

**Cutting condition** | Work material : HPM38 (52HRC)  
 $v_c=70\text{m/min}$  ( $n=1,858\text{min}^{-1}$ )  $f_z=0.4\text{mm/t}$  ( $v_f=2,453\text{mm/min}$ )  $a_p \times a_e=0.15 \times 5\text{mm}$   
 Machine : Vertical type Machining center (Equivalent to BT40)

Model shape

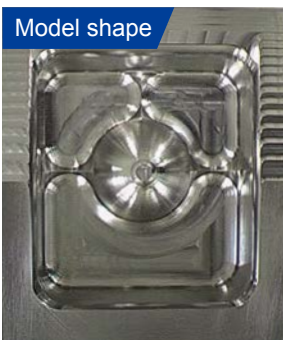
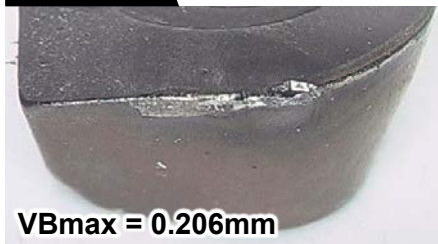
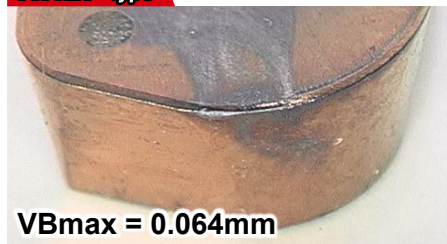


Figure | Wear condition : after 60 minutes of cutting

Conventional



RH2P type

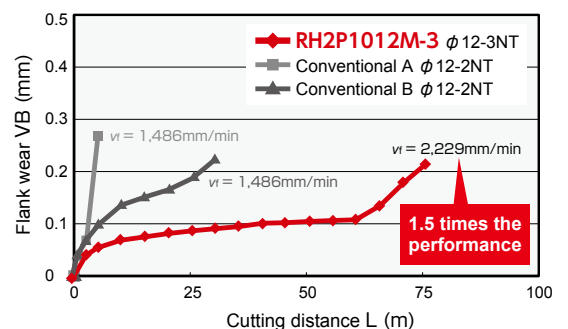


**Flank wear to be 1/3 as that by conventional tool.**

## 03 Field data for hardened steels [SKD11 (60HRC)]

Tool : RH2P1012M-3 ( $\phi 12\text{-R}2$ , 3 flutes), EPHW0402TN-2 (Equivalent to JP4105)  
 Conventional A : Radius tool ( $\phi 12\text{-R}3.5$ , 2 flutes)  
 Conventional B : Radius tool ( $\phi 12\text{-R}3.5$ , 2 flutes)  
 $v_c=70\text{m/min}$   $f_z=0.4\text{mm/t}$   $a_p \times a_e=0.15 \times 6\text{mm}$  Dry cutting

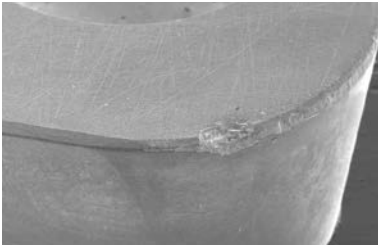
- More multi-flute design improves the cutting efficiency than conventional tool.
- Less cutting force by 30%
- Improved tool life by grade for hardened steels.



## 04 Nitrided die and mold for automotive parts [SKD61+ nitriding process]

**Cutting condition** | Item code : EPHW0402TN-2 Tool dia. :  $\phi 10$  (mm) 2 flutes Grade : Equivalent to JP4115  
 $v_c=78\text{m/min}$  ( $n=2,480\text{min}^{-1}$ )  $f_z=0.25\text{mm/t}$  ( $v_f=1,240\text{mm/min}$ )  $a_p \times a_e=0.2 \times 4\text{mm}$   
 Swarf amount :  $0.992\text{cm}^3/\text{min}$  Tool life : 50min. Process time : 420min

Figure | Wear condition photo: After 50 - minutes processing



- Direct milling of re-sink, conventionally exclusively by electro-discharge.
- The process of making an electrode can be reduced.
- Can reduce polishing time, after electric discharge machining.

## 05 Comparison of performance with RH2P and solid end mill on diecasting

**Target** | Cost reduction in cutting process for 5DCX roughing

**Cutting condition** | Work material : Equivalent to SKD61 (50HRC) Roughing process (Overhang:62mm)  
 Tool : RH2P1012M-3 ( $\phi 12$ -R2, 3 flutes), EPHW0402TN-2 (Equivalent to JP4105)  
 $v_c=110\text{m/min}$   $f_z=0.5\text{mm/t}$  ( $v_f=4,400\text{mm/min}$ )  $a_p=0.25\text{mm}$   $Q=8.8\text{cm}^3$   
 4 flutes Solid end mill ( $\phi 12$ -R1.5, 4 flutes)  
 $v_c=143\text{m/min}$   $f_z=0.25\text{mm/t}$  ( $v_f=3,800\text{mm/min}$ )  $a_p=0.15\text{mm}$   $Q=4.5\text{cm}^3$

### Comparison of process cost

		Conventional	Improved condition
Cutting conditions	Tools	Solid end mill	RH2P1012M-3
	Tool dia., flutes	$\phi 12\text{mm}$ 4 flutes	$\phi 12\text{mm}$ 3 flutes
	Cutting speed	143m/min (3,800min <sup>-1</sup> )	110m/min (2,900min <sup>-1</sup> )
	Feed speed	3,800mm/min (0.25mm/t)	4,400mm/min (0.5mm/t)
	$a_p$	0.15mm	0.25mm
	$a_e$	8mm	8mm
	Swarf amount	4.5cm <sup>3</sup>	8.8cm <sup>3</sup>
Comparison of process cost	Tool life	400min	200min
	Process time	300min	150min
	Machining cost	41,300JPY	22,400JPY
	Conventional	41,300JPY	
	Improved condition	22,400JPY (▲46%)	
Result	Process time : Reduce 150minutes. Processing costs : Reduce about 18,900JPY (▲46%) Don't need control re-grinding items.		

- Tool cost is reduced by replacing solid endmill to RH2P.
- Re-grinding operation is not necessary.
- Tool life deviation control after re-grinding is not necessary.

Product items	Work material	Tool dia. DCX (mm)	Item code	Cutting conditions	Result
Plastic mold	SKD61 (40HRC)	10	RH2P1010M-2 EPHW0402TN-2 (Equivalent to JP4115)	$v_c = 110\text{m/min}$ $v_f = 3,500\text{mm/min}$ $a_p = 0.3\text{mm}$	Performance of RH2P is improved as compared with the conventional 4-flutes solid end mill. Wear is 0.05mm and below after 100minutes process.
Nitriding materials	SKD61 + nitriding process	10	RH2P1010S-2 EPHW0402TN-2 (Equivalent to JP4115)	$v_c = 78\text{m/min}$ $v_f = 1,120\text{mm/min}$ $a_p = 0.2\text{mm}$	RH2P can perform the nitriding treatment material, it could process only by electrical discharge machining before.
Parts making	YXR3 (60HRC)	12	RH2P1012M-3 EPHW0402TN-2 (Equivalent to JP4105)	$v_c = 65\text{m/min}$ $v_f = 1,530\text{mm/min}$ $a_p = 0.15\text{mm}$	1/2 process time, 2 times tool life compared to conventional solid endmill.
Forging die	SKD61 (45HRC)	12	RH2P1012M-3 EPHW0402TN-2 (Equivalent to JP4115)	$v_c = 104\text{m/min}$ $v_f = 4,000\text{mm/min}$ $a_p = 0.4\text{mm}$	Still normal wear even after 120 minutes processing.
Forging die	SKD11 (56HRC)	25	RH2P1025M-6 EPHW0402TN-2 (Equivalent to JP4105)	$v_c = 60\text{m/min}$ $v_f = 2,760\text{mm/min}$ $a_p = 0.2\text{mm}$	Twice as long tool life upon interrupted cutting of grooved surface.
Die casting mold	SKD61 (49HRC)	25	RH2P1025M-6 EPHW0402TN-2 (Equivalent to JP4105)	$v_c = 110\text{m/min}$ $v_f = 4,200\text{mm/min}$ $a_p = 0.3\text{mm}$	Twice as much swarf as conventional corner radius insert.



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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