

Indexable Ball Nose End Mill  
for Finishing

Indexable Corner Radius End Mill  
for Finishing

**SRF**  
**SUF**

New Grade  
Expansion

High accuracy indexable end mill

# Optimum tool for finish machining

High accuracy insert positioning and high rigidity clamping.  
Significant reduction in tool costs for finishing.

New **EP6120** grade for improved tool life when machining  
carbon and alloy steels.



# Indexable Ball Nose End Mill for Finishing



<b>Applications</b>	Finishing of moulds, Copying curved surfaces
<b>Cutting edge radii</b>	R5 , R6 , R8 , R10 , R12.5 , R15 , R16

## Features

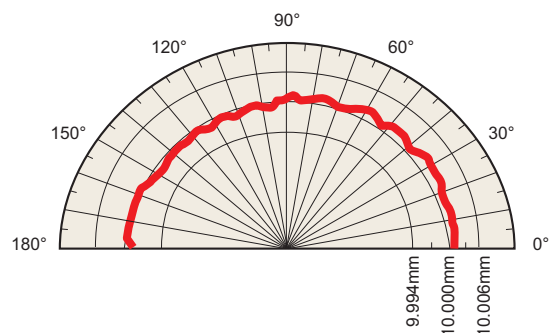
### S-shaped end profile

The S-shaped end profile allows for an edge sharpness similar to solid ball nose end mills.



### Accurate radial tolerance

Radius tolerance of  $\pm 6\mu\text{m}$  for high accuracy finish machining comparable to solid ball nose end mills.



## Insert grades

		<b>NEW</b> <i>EP6120</i>	<i>MP8010</i>	<i>VP15TF</i>
<b>P</b>	Mild Steel	⊙		
	Carbon Steel, Alloy Steel	⊙		○
	Pre-Hardened Steel	⊙		○
	Alloy Steel, Tool Steel	⊙		○
<b>K</b>	Gray Cast Iron		⊙	
	Ductile Cast Iron		⊙	
<b>N</b>	Copper, Copper Alloys	⊙		
<b>H</b>	Hardened Steel		⊙	

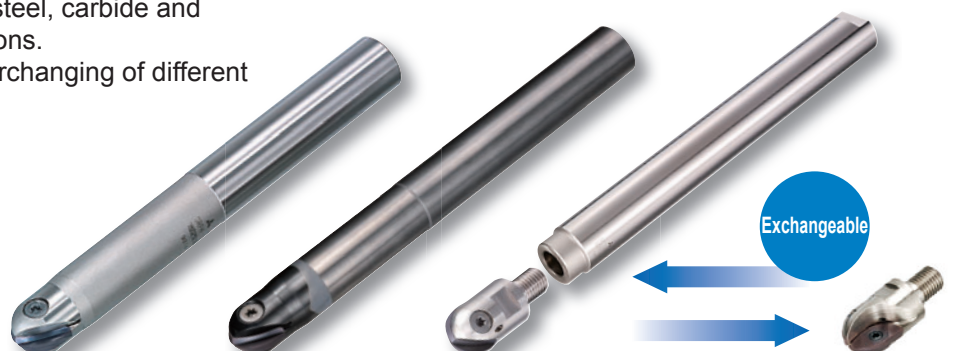
For carbon steel and alloy steel, the new coated grade **EP6120** with excellent wear resistance is recommended.

For cast iron **MP8010** is recommended to cover a wide range of applications, including high speed cutting.

**MP8010** delivers superior performance in hardened steel exceeding 55HRC.

## Wide selection

Holders are available in 3 styles, steel, carbide and screw-in, to suit different applications. The screw-in type also allows interchanging of different heads.



# Indexable Corner Radius End Mill for Finishing

# SUF

<b>Applications</b>	Finishing of moulds
<b>Corner R</b>	R0.5 , R1 , R2 , R3

## Features

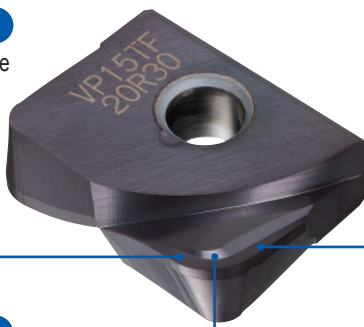
### Insert

#### Wiper edge

Wiper edge geometry provides excellent surface finishes even when the feedrate is increased.

#### Peripheral cutting edge

Short peripheral cutting edge to reduce vibration when wall machining.

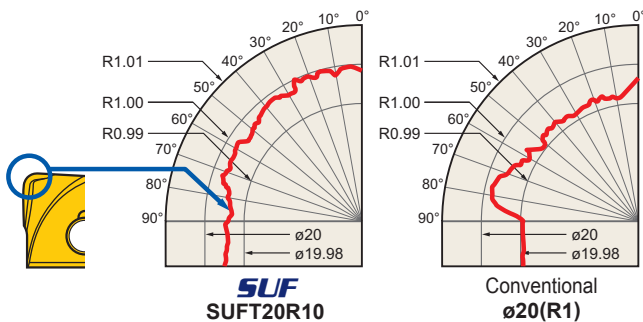


#### Seamless Gash

The smooth twist in the edge geometry achieves an excellent balance of sharpness and cutting edge strength. Highly accurate grinding is used to produce seamless peripheral, corner and bottom edges.

## Accurate tolerance

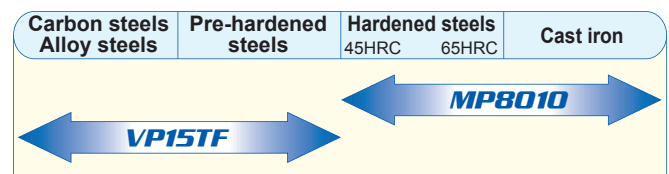
Corner R tolerance :  $\pm 0.010\text{mm}$     Cutting edge diameter tolerance :  $0 \text{ --} -0.020\text{mm}$



## Insert grades

MIRACLE coated **VP15TF** has a good balance of wear and chipping resistance.

**MP8010** demonstrates outstanding cutting performance when machining hardened steel and cast iron.



## Compatibility

SUF inserts can also be used in a wide range of SRF tool bodies.

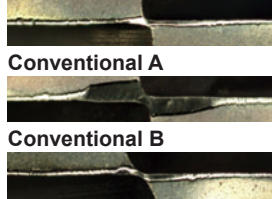


# SRF Cutting Performance

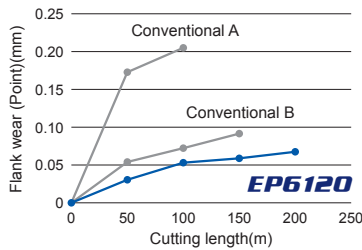
EP6120 provides a long tool life with excellent wear resistance.

## NEW Steel cutting

**EP6120**



<Cutting conditions>  
 Work material : JIS-S55C  
 Insert : SRFT20  
 Protrusion length : 70mm  
 Revolution : 5500min<sup>-1</sup>  
 Cutting speed : 150m/min

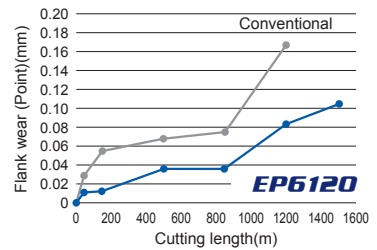


## NEW Prehardened steel cutting

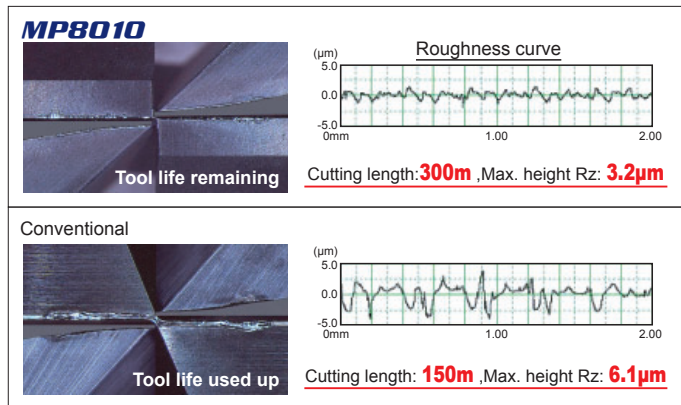
**EP6120**



<Cutting conditions>  
 Work material : NAK80  
 Insert : SRFT20  
 Protrusion length : 70mm  
 Revolution : 3650min<sup>-1</sup>  
 Cutting speed : 100m/min

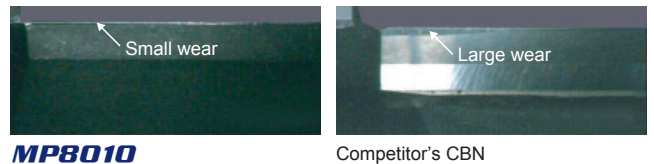


MP8010 gave double tool life and improved surface finishes when compared to a conventional tool.



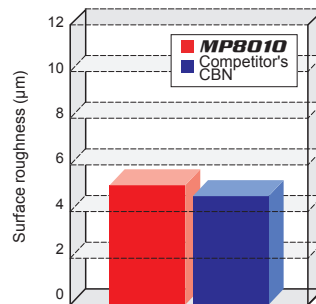
<Cutting conditions>  
 Work material : JIS SKD11(60HRC)  
 Tool : SRFH20S25M  
 Revolution : 5220min<sup>-1</sup>  
 Cutting speed : 80m/min  
 Feed per tooth : 0.2mm/tooth  
 Depth of cut : 0.2mm  
 Pick feed : 0.2mm  
 Dry cutting

MP8010 equaled the performance of CBN during high speed of cutting cast iron.



**MP8010**

Competitor's CBN

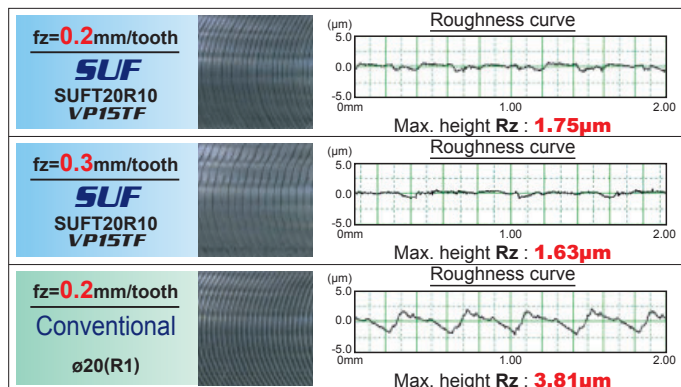


<Cutting conditions>  
 Work material : JIS FC300  
 Tool : SRFH30S32LW  
 Revolution : 10000min<sup>-1</sup>  
 Cutting speed : 150-940m/min  
 Feed per tooth : 0.3mm/tooth  
 Depth of cut : 0.2mm  
 Pick feed : 0.5mm  
 Dry cutting

# SUF Cutting Performance

## Accurate and efficient face milling

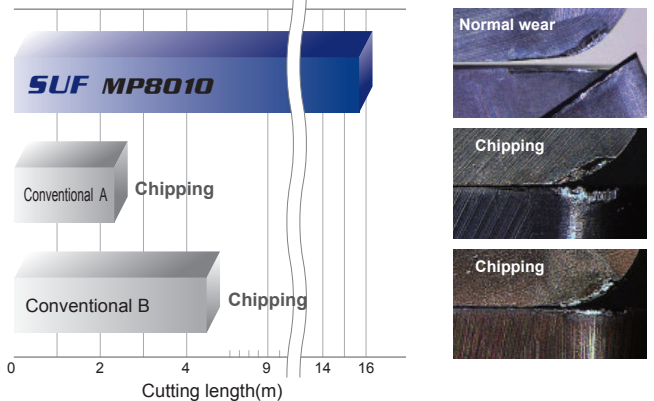
SUF achieves excellent surface finishes even if the feed per tooth is increased.



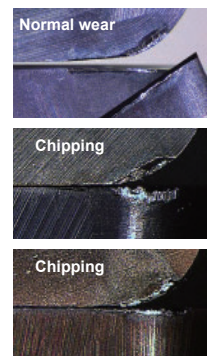
<Cutting conditions>  
 Work material : JIS S55C  
 Tool : SRFH20S25M  
 Revolution : 3180min<sup>-1</sup>  
 Cutting speed : 200m/min  
 Feed per tooth : 0.2, 0.3mm/tooth  
 Depth of cut : 0.3mm  
 Pick feed : 14mm  
 Dry cutting

## Hardened steel milling

MP8010 grade achieved three times tool life compared to a conventional grade.



<Cutting conditions>  
 Work material : JIS SKD11 (59HRC)  
 Tool : SRFH20S20L80  
 Insert : SUFT20R10  
 Revolution : 1270min<sup>-1</sup>  
 Cutting speed : 80m/min  
 Feed per tooth : 0.2mm/tooth  
 Depth of cut : 0.2mm  
 Pick feed : 5mm  
 Dry cutting



# Indexable Ball Nose End Mill for Finishing

## BALL NOSE END MILL



### SRF, SRB

Light Alloy	Cast Iron	Carbon Steel - Alloy Steel	Stainless Steel	Hardened Steel
	➔			➔



- S-shaped cutting edge provides sharpness similar to that of solid ball nose end mills.
- Highly accurate corner radius tolerance allows for high precision finishing.
- Carbide shank type available.

Fig.1

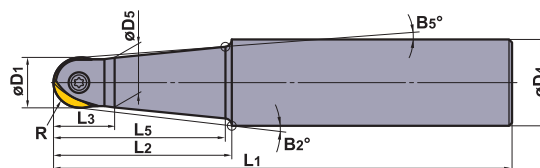


Fig.2

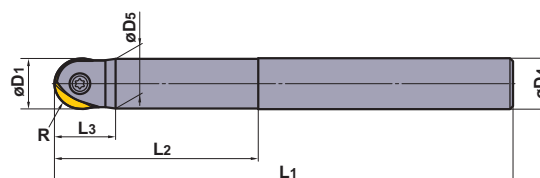
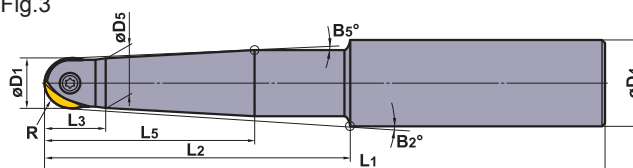


Fig.3



### STEEL SHANK TYPE

Right hand tool holder only.

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)									Type (Fig.)	*  Clamp Screw	Wrench	Insert
				R	D1	D4	L1	D5	L2	L3	B2°	B5°				
Standard	SRFH10S12M	●	1	5	10	12	110	9.5	40	13	1°38'	1°30'	1	RS3008T	①TKY08D	SRFT10 SRBT10
	12S16M	●	1	6	12	16	120	11.5	50	15	2°36'	1°30'	1	RS3510T	①TKY10D	SRFT12 SRBT12
	16S20M	●	1	8	16	20	130	15.5	50	20	2°44'	1°30'	1	RS4015T	②TKY15T	SRFT16 SRBT16
	20S25M	●	1	10	20	25	150	19.5	70	24	2°23'	1°30'	1	RS5020T	②TKY20T	SRFT20 SRBT20
	25S32M	●	1	12.5	25	32	180	24.5	80	30	2°58'	1°30'	1	RS6025T	②TKY25T	SRFT25 SRBT25
	30S32M	●	1	15	30	32	200	29.5	100	35	—	—	2	RS8030T	②TKY30T	SRFT30 SRBT30
	32S32M	●	1	16	32	32	200	31.5	100	35	—	—	2	RS8030T	②TKY30T	SRFT32 SRBT32
Semi-long	SRFH10S12L	●	1	5	10	12	150	9.5	60	13	1°30'	1°30'	1	RS3008T	①TKY08D	SRFT10 SRBT10
	12S16L	●	1	6	12	16	160	11.5	70	15	1°47'	1°30'	1	RS3510T	①TKY10D	SRFT12 SRBT12
	16S20L	●	1	8	16	20	160	15.5	70	20	1°51'	1°30'	1	RS4015T	②TKY15T	SRFT16 SRBT16
	20S25L	●	1	10	20	25	180	19.5	80	24	2°03'	1°30'	1	RS5020T	②TKY20T	SRFT20 SRBT20
	20S20L80	●	1	10	20	20	180	19.5	80	24	—	—	2	RS5020T	②TKY20T	SRFT20 SRBT20
	25S32L	●	1	12.5	25	32	200	24.5	100	30	2°17'	1°30'	1	RS6025T	②TKY25T	SRFT25 SRBT25
	25S25L100	●	1	12.5	25	25	200	24.5	100	30	—	—	2	RS6025T	②TKY25T	SRFT25 SRBT25
30S32L	●	1	15	30	32	230	29.5	130	35	—	—	2	RS8030T	②TKY30T	SRFT25 SRBT25	
Long	SRFH20S25E	●	1	10	20	25	220	19.5	120	24	1°30'	1°30'	3	RS5020T	②TKY20T	SRFT20 SRBT20
	20S20E120	●	1	10	20	20	220	19.5	120	24	—	—	2	RS5020T	②TKY20T	SRFT20 SRBT20
	25S32E	●	1	12.5	25	32	250	24.5	150	30	1°30'	1°30'	3	RS6025T	②TKY25T	SRFT25 SRBT25
	25S25E150	●	1	12.5	25	25	250	24.5	150	30	—	—	2	RS6025T	②TKY25T	SRFT25 SRBT25
	30S32E	●	1	15	30	32	300	29.5	200	35	—	—	2	RS8030T	②TKY30T	SRFT30 SRBT30
Extra Long	SRFH20S25X	▲	1	10	20	25	250	19.5	150	24	1°30'	1°30'	3	RS5020T	②TKY20T	SRFT20 SRBT20
	25S32X	▲	1	12.5	25	32	300	24.5	200	30	1°30'	1°30'	3	RS6025T	②TKY25T	SRFT25 SRBT25
	30S32X	▲	1	15	30	32	350	29.5	250	35	—	—	2	RS8030T	②TKY30T	SRFT30 SRBT30
	32S32X	▲	1	16	32	32	350	31.5	250	35	—	—	2	RS8030T	②TKY30T	SRFT32 SRBT32

(Note) Ensure inserts are fitted correctly. (Refer to page 7.)

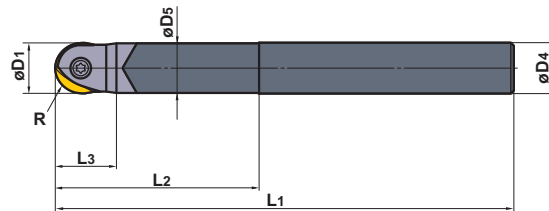
\* Clamp Torque (N · m) : RS3008T=1.5, RS3510T=2.5, RS4015T=3.3, RS5020T=5.0, RS6025T=7.5, RS8030T=10.0

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.

# Indexable Ball Nose End Mill for Finishing






Fig.1



## CARBIDE SHANK TYPE

Right hand tool holder only.

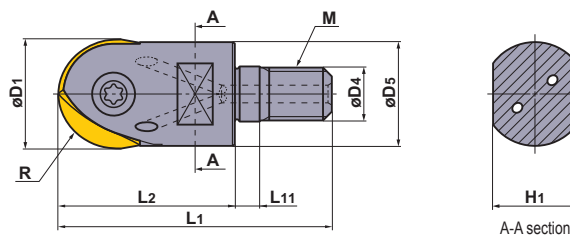
Type	Order Number	Stock	Number of Teeth	Dimensions (mm)							Type (Fig.)	* 	① 	② 
				R	D1	D4	L1	D5	L2	L3				
Standard	SRFH10S10MW	●	1	5	10	10	110	9.5	40	13	1	RS3008T	①TKY08D	SRFT10 SRBT10
	12S12MW	●	1	6	12	12	120	11.5	50	15	1	RS3510T	①TKY10D	SRFT12 SRBT12
	16S16MW	●	1	8	16	16	130	15.5	50	20	1	RS4015T	②TKY15T	SRFT16 SRBT16
	20S20MW	●	1	10	20	20	180	19.5	80	24	1	RS5020T	②TKY20T	SRFT20 SRBT20
	25S25MW	●	1	12.5	25	25	200	24.5	100	30	1	RS6025T	②TKY25T	SRFT25 SRBT25
	30S32MW	●	1	15	30	32	230	29.5	130	35	1	RS8030T	②TKY30T	SRFT30 SRBT30
			16	32	32	231	29.5	131	36	SRFT32 SRBT32				
Long	SRFH10S10LW	●	1	5	10	10	150	9.5	60	13	1	RS3008T	①TKY08D	SRFT10 SRBT10
	12S12LW	●	1	6	12	12	160	11.5	70	15	1	RS3510T	①TKY10D	SRFT12 SRBT12
	16S16LW	●	1	8	16	16	160	15.5	70	20	1	RS4015T	②TKY15T	SRFT16 SRBT16
	16S16EW	●	1	8	16	16	200	15.5	110	20	1	RS4015T	②TKY15T	SRFT16 SRBT16
	20S20LW	●	1	10	20	20	250	19.5	150	24	1	RS5020T	②TKY20T	SRFT20 SRBT20
	25S25LW	●	1	12.5	25	25	300	24.5	200	30	1	RS6025T	②TKY25T	SRFT25 SRBT25
	30S32LW	●	1	15	30	32	350	29.5	250	35	1	RS8030T	②TKY30T	SRFT30 SRBT30
			16	32	32	351	29.5	251	36	SRFT32 SRBT32				

(Note 1) SRFH30S32MW and SRFH30S32LW tool body can use both inserts SRFT30 and SRFT32.

However, the overall length L1 differs.




(Note 2) Ensure inserts are fitted in the correct way. (Refer to page 7.)

\* Clamp Torque (N · m) : RS3008T=1.5, RS3510T=2.5, RS4015T=3.3, RS5020T=5.0, RS6025T=7.5, RS8030T=10.0



## SCREW-IN TYPE

Right hand tool holder only.

Order Number	Stock	Coolant Hole *1	Number of Teeth	Dimensions (mm)								Tool Weight (kg)	*2 			
				R	D1	D4	D5	L1	L2	L11	H1					M
SRFH16AM0830	●	Y	1	8	16	8.5	14.9	48	30	6	10	8	0.1	RS4015T	TKY15T	SRFT16 SRBT16
20AM1035	●	Y	1	10	20	10.5	18.4	54	35	6	14	10	0.1	RS5020T	TKY20T	SRFT20 SRBT20
25AM1240	●	Y	1	12.5	25	12.5	23.5	62	40	6	19	12	0.1	RS6025T	TKY25T	SRFT25 SRBT25
30AM1645	●	Y	1	15	30	17	28.1	68	45	6	24	16	0.2	RS8030T	TKY30T	SRFT30 SRBT30
				16	32	17	28.1	69	46	6	24	16	0.2			SRFT32 SRBT32

(Note 1) SRFH30AM1645 tool body can use both inserts SRFT30 and SRFT32. However, the overall length length L1 differs.


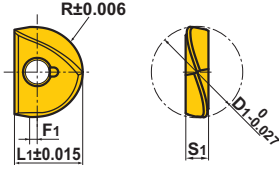
(Note 2) For screw-in type arbors, refer to page 12.

\*1 Y=Yes

\*2 Clamp Torque (N · m) : RS4015T=3.3, RS5020T=5.0, RS6025T=7.5, RS8030T=10.0

● : Inventory maintained in Japan. (2 inserts in one case)

## INSERTS

Shape	Order Number	Coated			Dimensions (mm)					Geometry
		NEW EP6120	VP15TF	MP8010	D1	R	L1	F1	S1	
	<b>SRFT10</b>	●	●	●	10	5	8.5	0.5	2.6	
	<b>12</b>	●	●	●	12	6	10	0.5	3	
	<b>16</b>	●	●	●	16	8	12	1	4	
	<b>20</b>	●	●	●	20	10	15	1	5	
	<b>25</b>	●	●	●	25	12.5	18.5	1	6	
	<b>30</b>	●	●	●	30	15	22.5	1	7	
	<b>32</b>	●	●	●	32	16	23.5	1	7	

## RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed vc (m/min)	Feed per Tooth fz (mm/tooth)	Depth of Cut ap (mm)
<b>P</b>	Mild Steel (SS400, S10C)	≤180HB	<b>EP6120</b>	200 (80–300)	0.2 (0.1–0.3)	≤0.05D1
	Carbon Steel, Alloy Steel (S45C, SCM440)	180–280HB	<b>EP6120</b>	200 (80–300)	0.2 (0.1–0.3)	≤0.05D1
			<b>VP15TF</b>	200 (80–300)	0.2 (0.1–0.3)	≤0.05D1
	Carbon Steel, Alloy Steel (SNCM439)	280–350HB	<b>EP6120</b>	200 (80–300)	0.2 (0.1–0.3)	≤0.05D1
	Pre-Hardened Steel (NAK, PX5)	35–45HRC	<b>EP6120</b>	150 (80–200)	0.2 (0.1–0.3)	≤0.05D1
			<b>VP15TF</b>	150 (80–200)	0.2 (0.1–0.3)	≤0.05D1
Alloy Tool Steel (SKD, SKT)	≤350HB	<b>EP6120</b>	150 (80–200)	0.2 (0.1–0.3)	≤0.05D1	
		<b>VP15TF</b>	150 (80–200)	0.2 (0.1–0.3)	≤0.05D1	
<b>K</b>	Gray Cast Iron (FC300)	Tensile Strength ≤350Mpa	<b>MP8010</b>	250 (80–450)	0.2 (0.1–0.3)	≤0.05D1
	Ductile Cast Iron (FCD450)	Tensile Strength ≤450Mpa	<b>MP8010</b>	200 (80–300)	0.2 (0.1–0.3)	≤0.05D1
	Ductile Cast Iron (FCD700)	Tensile Strength ≤800Mpa	<b>MP8010</b>	200 (80–300)	0.2 (0.1–0.3)	≤0.05D1
<b>N</b>	Copper, Copper Alloys		<b>EP6120</b>	200 (80–300)	0.2 (0.1–0.3)	≤0.05D1
<b>H</b>	Hardened Steel (SKD61, SKT4)	45–55HRC	<b>MP8010</b>	100 (60–120)	0.2 (0.1–0.3)	≤0.05D1
	Hardened Steel (SKD11)	55–65HRC	<b>MP8010</b>	80 (60–120)	0.2 (0.1–0.3)	≤0.01D1

(Note 1) The above values are average condition values at actual cutting speeds. The values change slightly according to the machine conditions, And method of workholding. Adjust the values depending on the actual conditions, referring to the above values.

(Note 2) For end mills with a carbide shank, set the cutting conditions approx 20% higher.

(Note 3) Please note the following when machining hardened steel with MP8010.

- Please shorten the overhang length as much as possible.
- A carbide shank is recommended.
- Please pay special attention to the depth of cut to prevent fracturing.

## CUTTING SPEED FORMULAE

1. Employing  $\theta^\circ$  ➔ Calculate cutting speed at point P.  
(Cutting speed at the cutting depth border for oblique machining)

$$\text{Formula : Cutting Speed} = \frac{\pi \cdot D1 \cdot \sin \theta \cdot n}{1000} \text{ (m/min)}$$

$$\theta^\circ = \cos^{-1} \left( \frac{D1 - 2ap}{D1} \right) + 90 - \alpha$$

n : Spindle Speed ( $\text{min}^{-1}$ )

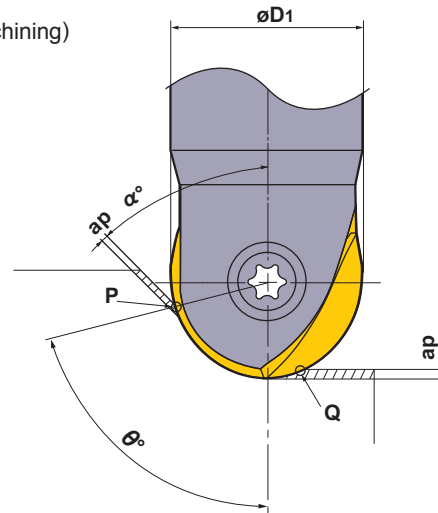
2. Employing ap ➔ Calculate cutting speed at point Q.  
(Cutting speed at the cutting depth border)

$$\text{Formula : Cutting Speed} = \frac{2\pi n \sqrt{ap(D1-ap)}}{1000} \text{ (m/min)}$$

n : Spindle Speed ( $\text{min}^{-1}$ )

D1 : Cutting Edge Diameter (mm)

ap : Depth of Cut (mm)



## FITTING INSERTS ON HOLDERS

### 1. Clean the insert seat

Clean the insert seat in the holder body by blowing air or using a brush.

### 2. Fit the insert

Place the concave mark of the insert into the clamp-screw-fastening part of the holder (only SRF type inserts). Fasten the clamp screw while firmly pressing the insert against the insert seat wall. It is recommended to fasten at the correct torque and use anti-seize lubricant MK1KS.





## RADIUS END MILL



Finishing



# SUF

Light Alloy	Cast Iron	Carbon Steel - Alloy Steel	Stainless Steel	Hardened Steel
	➔			



- Highly accurate corner radius tolerance allows for high precision finishing.
- Seamless gash.

Fig.1

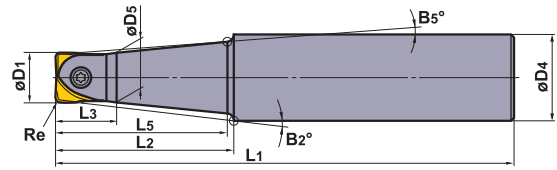


Fig.2

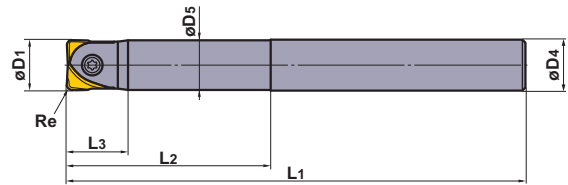
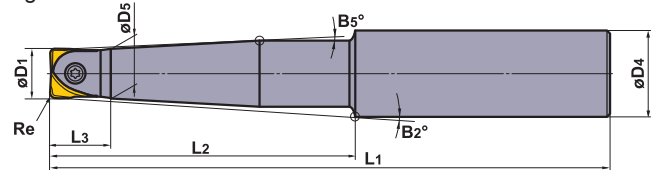

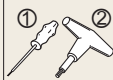



Fig.3



### STEEL SHANK TYPE

Right hand tool holder only.

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)								Type (Fig.)	* 		
				D1	D4	L1	D5	L2	L3	B2°	B5°				
Standard	SRFH10S12M	●	1	10	12	110	9.5	40	13	1°38'	1°30'	1	RS3008T	①TKY08D	SUFT10R
	12S16M	●	1	12	16	120	11.5	50	15	2°36'	1°30'	1	RS3510T	①TKY10D	SUFT12R
	16S20M	●	1	16	20	130	15.5	50	20	2°44'	1°30'	1	RS4015T	②TKY15T	SUFT16R
	20S25M	●	1	20	25	150	19.5	70	24	2°23'	1°30'	1	RS5020T	②TKY20T	SUFT20R
	25S32M	●	1	25	32	180	24.5	80	30	2°58'	1°30'	1	RS6025T	②TKY25T	SUFT25R
	30S32M	●	1	30	32	200	29.5	100	35	—	—	2	RS8030T	②TKY30T	SUFT30R
	32S32M	●	1	32	32	200	31.5	100	35	—	—	2	RS8030T	②TKY30T	SUFT32R
Semi-long	SRFH10S12L	●	1	10	12	150	9.5	60	13	1°30'	1°30'	1	RS3008T	①TKY08D	SUFT10R
	12S16L	●	1	12	16	160	11.5	70	15	1°47'	1°30'	1	RS3510T	①TKY10D	SUFT12R
	16S20L	●	1	16	20	160	15.5	70	20	1°51'	1°30'	1	RS4015T	②TKY15T	SUFT16R
	20S25L	●	1	20	25	180	19.5	80	24	2°03'	1°30'	1	RS5020T	②TKY20T	SUFT20R
	20S20L80	●	1	20	20	180	19.5	80	24	—	—	2	RS5020T	②TKY20T	SUFT20R
	25S32L	●	1	25	32	200	24.5	100	30	2°17'	1°30'	1	RS6025T	②TKY25T	SUFT25R
	25S25L100	●	1	25	25	200	24.5	100	30	—	—	2	RS6025T	②TKY25T	SUFT25R
30S32L	●	1	30	32	230	29.5	130	35	—	—	2	RS8030T	②TKY30T	SUFT30R	
Long	SRFH20S25E	●	1	20	25	220	19.5	120	24	1°30'	1°30'	3	RS5020T	②TKY20T	SUFT20R
	20S20E120	●	1	20	20	220	19.5	120	24	—	—	2	RS5020T	②TKY20T	SUFT20R
	25S32E	●	1	25	32	250	24.5	150	30	1°30'	1°30'	3	RS6025T	②TKY25T	SUFT25R
	25S25E150	●	1	25	25	250	24.5	150	30	—	—	2	RS6025T	②TKY25T	SUFT25R
	30S32E	●	1	30	32	300	29.5	200	35	—	—	2	RS8030T	②TKY30T	SUFT30R
Extra Long	SRFH20S25X	▲	1	20	25	250	19.5	150	24	1°30'	1°30'	3	RS5020T	②TKY20T	SUFT20R
	25S32X	▲	1	25	32	300	24.5	200	30	1°30'	1°30'	3	RS6025T	②TKY25T	SUFT25R
	30S32X	▲	1	30	32	350	29.5	250	35	—	—	2	RS8030T	②TKY30T	SUFT30R
	32S32X	▲	1	32	32	350	31.5	250	35	—	—	2	RS8030T	②TKY30T	SUFT32R

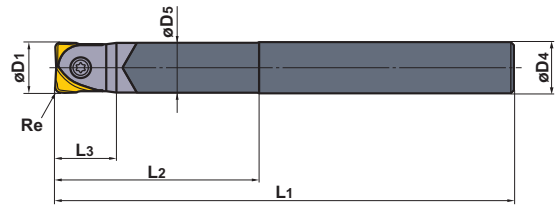
(Note) Ensure inserts are fitted correctly. (Refer to page 10.)

\* Clamp Torque (N · m) : RS3008T=1.5, RS3510T=2.5, RS4015T=3.3, RS5020T=5.0, RS6025T=7.5, RS8030T=10.0

# Indexable Corner Radius End Mill for Finishing



Fig.1



## CARBIDE SHANK TYPE

Right hand tool holder only.

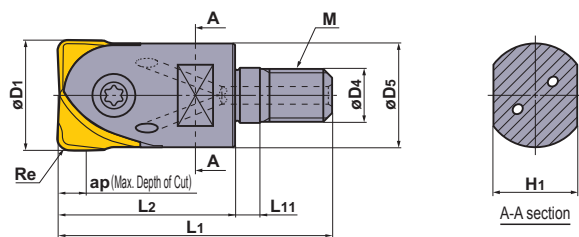
Type	Order Number	Stock	Number of Teeth	Dimensions (mm)						Type (Fig.)	Tools		
				D1	D4	L1	D5	L2	L3		Clamp Screw	Wrench	Insert
Standard	SRFH10S10MW	●	1	10	10	110	9.5	40	13	1	RS3008T	①TKY08D	SUFT10R
	12S12MW	●	1	12	12	120	11.5	50	15	1	RS3510T	①TKY10D	SUFT12R
	16S16MW	●	1	16	16	130	15.5	50	20	1	RS4015T	②TKY15T	SUFT16R
	20S20MW	●	1	20	20	180	19.5	80	24	1	RS5020T	②TKY20T	SUFT20R
	25S25MW	●	1	25	25	200	24.5	100	30	1	RS6025T	②TKY25T	SUFT25R
	30S32MW	●	1	30	32	230	29.5	130	35	1	RS8030T	②TKY30T	SUFT30R
			32	32	231	29.5	131	36	SUFT32R				
Long	SRFH10S10LW	●	1	10	10	150	9.5	60	13	1	RS3008T	①TKY08D	SUFT10R
	12S12LW	●	1	12	12	160	11.5	70	15	1	RS3510T	①TKY10D	SUFT12R
	16S16LW	●	1	16	16	160	15.5	70	20	1	RS4015T	②TKY15T	SUFT16R
	20S20LW	●	1	20	20	250	19.5	150	24	1	RS5020T	②TKY20T	SUFT20R
	25S25LW	●	1	25	25	300	24.5	200	30	1	RS6025T	②TKY25T	SUFT25R
	30S32LW	●	1	30	32	350	29.5	250	35	1	RS8030T	②TKY30T	SUFT30R
			32	32	351	29.5	251	36	SUFT32R				

(Note 1) SRFH30S32MW and SRFH30S32LW tool body can use both inserts SUFT30R and SUFT32R.

However, the overall length L1 differs.

(Note 2) Ensure inserts are fitted correctly. (Refer to page 10.)

\* Clamp Torque (N · m) : RS3008T=1.5, RS3510T=2.5, RS4015T=3.3, RS5020T=5.0, RS6025T=7.5, RS8030T=10.0



## SCREW-IN TYPE

Right hand tool holder only.

Order Number	Stock	Coolant Hole *1	Number of Teeth	Dimensions (mm)								Tool Weight (kg)	Tools		
				D1	D4	D5	L1	L2	L11	H1	M		Clamp Screw	Wrench	Insert
SRFH16AM0830	●	Y	1	16	8.5	14.9	48	30	6	10	8	0.1	RS4015T	TKY15T	SUFT16R
20AM1035	●	Y	1	20	10.5	18.4	54	35	6	14	10	0.1	RS5020T	TKY20T	SUFT20R
25AM1240	●	Y	1	25	12.5	23.5	62	40	6	19	12	0.1	RS6025T	TKY25T	SUFT25R
30AM1645	●	Y	1	30	17	28.1	68	45	6	24	16	0.2	RS8030T	TKY30T	SUFT30R
				32	17	28.1	69	46	6	24	16				SUFT32R

(Note 1) SRFH30AM1645 tool body can use both inserts SUFT30R and SUFT32R.

However, the overall length L1 differs.

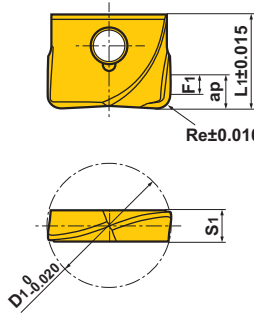
(Note 2) For screw-in type arbors, refer to page 12.

\*1 Y=Yes

\*2 Clamp Torque (N · m) : RS4015T=3.3, RS5020T=5.0, RS6025T=7.5, RS8030T=10.0

● : Inventory maintained. (2 inserts in one case)

## INSERTS

Shape	Order Number	Coated			Dimensions (mm)						Geometry
		MP8010	VP15TF		D1	Re	F1	ap	L1	S1	
	SUFT10R05	●	●		10	0.5	1	1.5	8.5	2.6	
	10R10	●	●		10	1	1	2	8.5	2.6	
	10R20	●	●		10	2	1	3	8.5	2.6	
	12R05	●	●		12	0.5	1.2	1.7	10	3	
	12R10	●	●		12	1	1.2	2.2	10	3	
	12R20	●	●		12	2	1.2	3.2	10	3	
	12R30	●	●		12	3	1.2	4.2	10	3	
	16R05	●	●		16	0.5	1.6	2.1	12	4	
	16R10	●	●		16	1	1.6	2.6	12	4	
	16R15	●	●		16	1.5	1.6	3.1	12	4	
	16R20	●	●		16	2	1.6	3.6	12	4	
	16R30	●	●		16	3	1.6	4.6	12	4	
	20R05	●	●		20	0.5	2	2.5	15	5	
	20R10	●	●		20	1	2	3	15	5	
	20R15	●	●		20	1.5	2	3.5	15	5	
	20R20	●	●		20	2	2	4	15	5	
	20R30	●	●		20	3	2	5	15	5	
	25R05	●	●		25	0.5	2.5	3	18.5	6	
	25R10	●	●		25	1	2.5	3.5	18.5	6	
	25R20	●	●		25	2	2.5	4.5	18.5	6	
	25R30	●	●		25	3	2.5	5.5	18.5	6	
	30R05	●	●		30	0.5	3	3.5	22.5	7	
	30R10	●	●		30	1	3	4	22.5	7	
	30R20	●	●		30	2	3	5	22.5	7	
	30R30	●	●		30	3	3	6	22.5	7	
	32R05	●	●		32	0.5	3.2	3.7	23.5	7	
	32R10	●	●		32	1	3.2	4.2	23.5	7	
	32R20	●	●		32	2	3.2	5.2	23.5	7	



## FITTING INSERTS ON HOLDERS

### 1. Clean the insert seat

Clean the insert seat in the holder body by blowing air or using a brush.

### 2. Fit the insert

Place the concave mark of the insert into the clamp-screw-fastening part of the holder (only SRF type inserts). Fasten the clamp screw while firmly pressing the insert against the insert seat wall. It is recommended to fasten at the correct torque and use anti-seize lubricant MK1KS.



## RECOMMENDED CUTTING CONDITIONS

### SHOULDER MILLING(At small widths of cut)

	Work Material	Hardness	Grade	Cutting Speed vc (m/min)	Depth of Cut ap (mm)	Cutting Width ae (mm)	Feed per Tooth fz (mm/tooth)
P	Carbon Steel Alloy Steel	180–280HB	VP15TF	200 (80–300)	≤0.05D1	≤0.05D1	0.2 (≤0.4)
	Pre-Hardened Steel	≤45HRC	VP15TF	150 (80–200)	≤0.05D1	≤0.05D1	0.15 (≤0.3)
	Alloy Tool Steel	180–380HB	VP15TF	150 (80–200)	≤0.05D1	≤0.05D1	0.15 (≤0.3)
M	Stainless Steel	≤270HB	VP15TF	150 (100–200)	≤0.05D1	≤0.05D1	0.2 (≤0.4)
K	Gray Cast Iron	Tensile Strength ≤350MPa	MP8010	250 (180–450)	≤0.05D1	≤0.1D1	0.3 (≤0.4)
	Ductile Cast Iron	Tensile Strength ≤800MPa	MP8010	200 (80–300)	≤0.05D1	≤0.1D1	0.3 (≤0.4)
H	Hardened Steel	45–55HRC	MP8010	100 (80–120)	≤0.05D1	≤0.02D1	0.1 (≤0.2)
	Hardened Steel	55–65HRC	MP8010	80 (60–100)	≤0.05D1	≤0.02D1	0.1 (≤0.2)

### SLOTTING•SHOULDER MILLING(At large widths of cut)

	Work Material	Hardness	Grade	Cutting Speed vc (m/min)	Depth of Cut ap (mm)	Cutting Width ae (mm)	Feed per Tooth fz (mm/tooth)
P	Carbon Steel Alloy Steel	180–280HB	VP15TF	200 (80–300)	≤0.02D1	≤D1	0.2 (≤0.4)
	Pre-Hardened Steel	≤45HRC	VP15TF	150 (80–200)	≤0.02D1	≤D1	0.15 (≤0.3)
	Alloy Tool Steel	180–380HB	VP15TF	150 (80–200)	≤0.02D1	≤D1	0.15 (≤0.3)
M	Stainless Steel	≤270HB	VP15TF	150 (100–200)	≤0.02D1	≤D1	0.2 (≤0.4)
K	Gray Cast Iron	Tensile Strength ≤350MPa	MP8010	250 (180–450)	≤0.03D1	≤D1	0.3 (≤0.4)
	Ductile Cast Iron	Tensile Strength ≤800MPa	MP8010	200 (80–300)	≤0.03D1	≤D1	0.3 (≤0.4)
H	Hardened Steel	45–55HRC	MP8010	100 (80–120)	≤0.01D1	≤D1	0.1 (≤0.2)
	Hardened Steel	55–65HRC	MP8010	70 (60–80)	≤0.01D1	≤D1	0.1 (≤0.2)

(Note 1) These cutting conditions are standard when using a standard steel shank. If vibration or insert edge chipping occurs, decrease the width and depth of cut and the feed rate accordingly.

(Note 2) The value of cutting speed is calculated at the peripheral diameter of the tool. Please calculate the spindle speed of tool in the following way.

$$\text{Spindle speed of cutting tool } n(\text{min}^{-1}) = 1000 \times \text{Cutting speed } vc \div \text{Diameter of cutting tool } D1 \div 3.14$$

(Note 3) Please note the following when machining hardened steel with MP8010.

- Please shorten the overhang length as much as possible.
- A carbide shank is recommended.
- Please pay special attention to the depth of cut to prevent fracturing.

# ARBORS

## ARBORS FOR SCREW-IN TOOLS

### STRAIGHT SHANK ARBOR

Type	Order Number	Stock	Dimensions (mm)						
			D9	D4	D5	L1	L2	H1	M
STEEL SHANK TYPE	SC16M08S100S	●	8.5	16	14.5	100	10	10	M8
	08S200L	●	8.5	16	14.5	200	10	10	M8
	SC20M10S120S	●	10.5	20	18.5	120	10	14	M10
	10S220L	●	10.5	20	18.5	220	10	14	M10
	SC25M12S125S	●	12.5	25	23.5	125	10	19	M12
	12S245L	●	12.5	25	23.5	245	10	19	M12
CARBIDE SHANK TYPE	SC32M16S140S	●	17	32	28.5	140	15	24	M16
	16S280L	●	17	32	28.5	280	15	24	M16
	SC16M08S100SW	●	8.5	16	14.5	100	10	10	M8
	08S200LW	●	8.5	16	14.5	200	10	10	M8
	SC20M10S120SW	●	10.5	20	18.5	120	10	14	M10
	10S220LW	●	10.5	20	18.5	220	10	14	M10
CARBIDE SHANK TYPE	SC25M12S125SW	●	12.5	25	23.5	125	10	19	M12
	12S245LW	●	12.5	25	23.5	245	10	19	M12
	SC32M16S140SW	●	17	32	28.5	140	15	24	M16
	16S280LW	●	17	32	28.5	280	15	24	M16

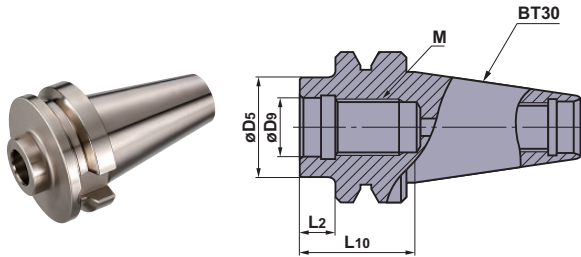
### HOW TO INSTALL THE SCREW-IN HEAD

- ① Thoroughly clean the clamp section of the head and the arbor with an air blower or brush before installation.
- ② Tighten the head at to recommended torque and ensure that there is no gap between the head and arbor.

Screw Size	Recommended Torque	Wrench Size
M8	23	10
M10	46	14
M12	80	19
M16	90	24

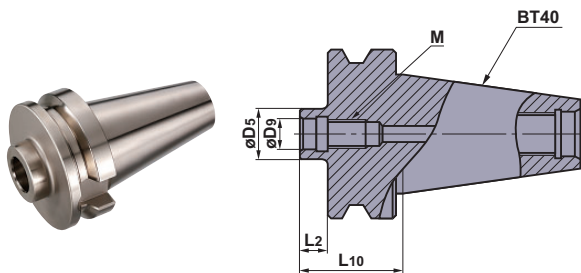
- Cutting tools become extremely hot during cutting. Never touch them with bare hands after operation as this may produce risk of injuries or burns.
- Do not handle cutting tools with bare hands as this may cause injuries.

**BT30 SHANK ARBOR**



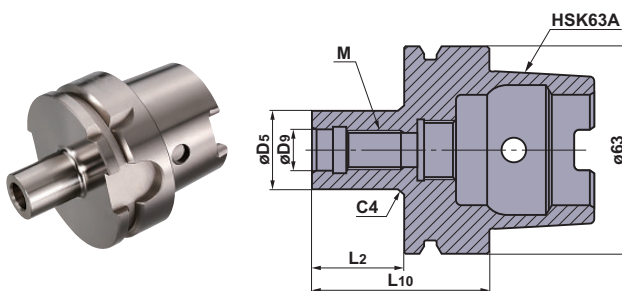
Order Number	Stock	Dimensions (mm)				
		D <sub>9</sub>	D <sub>5</sub>	L <sub>10</sub>	L <sub>2</sub>	M
<b>SC16M08S10-BT30</b>	●	8.5	14.5	32	10	M8
<b>20M10S10-BT30</b>	●	10.5	18.5	32	10	M10
<b>25M12S10-BT30</b>	●	12.5	23.5	32	10	M12
<b>32M16S10-BT30</b>	●	17.0	28.5	32	10	M16

**BT40 SHANK ARBOR**



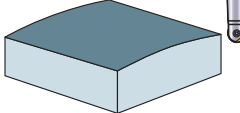
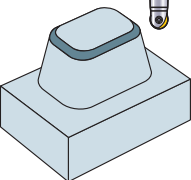
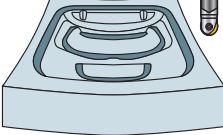
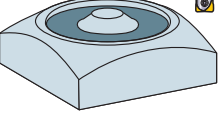
Order Number	Stock	Dimensions (mm)				
		D <sub>9</sub>	D <sub>5</sub>	L <sub>10</sub>	L <sub>2</sub>	M
<b>SC16M08S10-BT40</b>	●	8.5	14.5	37	10	M8
<b>20M10S10-BT40</b>	●	10.5	18.5	37	10	M10
<b>25M12S10-BT40</b>	●	12.5	23.5	37	10	M12
<b>32M16S10-BT40</b>	●	17.0	28.5	37	10	M16

**HSK63A SHANK ARBOR**



Order Number	Stock	Dimensions (mm)				
		D <sub>9</sub>	D <sub>5</sub>	L <sub>10</sub>	L <sub>2</sub>	M
<b>SC16M08S22-HSK63A</b>	●	8.5	14.5	48	22	M8
<b>20M10S24-HSK63A</b>	●	10.5	18.5	50	24	M10
<b>25M12S27-HSK63A</b>	●	12.5	23.5	53	27	M12
<b>32M16S28-HSK63A</b>	●	17.0	28.5	54	28	M16

## APPLICATION EXAMPLES

Tool		SRFH20S25M	SRFH20S25M	SRFH30S32LW	SRFH20S20LW
Insert		SRFT20	SRFT20	SRFT30	SUFT20R10
Grade		VP15TF	MP8010	MP8010	VP15TF
Machine		Bridge column machining centre	Vertical type M/C	Bridge column machining centre	Vertical type M/C
Work Material		PX5(HRC33) 	SKD11(HRC60) 	JIS FC300 	JIS SCM445 (HRC35) 
Component		Resin mould	Press mould	Press mould	Resin mould
Cutting Conditions	Actual Cutting Speed (m/min)	250	30-100	150-940	188
	Table Feed (mm/min)	1400	636	10000	1800
	Feed per Tooth (mm/tooth)	0.18	0.2	0.3	0.3
	Depth of Cut (mm)	0.2	0.2	0.2	0.1
	Width of Cut (mm)	1.2	0.3	0.5	0.3
Coolant		Water soluble	Air blow	Air blow	Air blow
Results		Low cutting noise and good surface finish.	Higher efficiency machining is achieved and the cutting time can be decreased compared with conventional PVD coated carbide.	Using the same conditions as a CBN grade, a cut length of 10000m was achieved. Surface quality was excellent and tool costs were reduced.	The surface finish on the bottom face is improved compared to a competitor's grade. VP15TF also achieved double tool life.



**Indexable Ball Nose End Mill  
for Finishing**

**Indexable Corner Radius End Mill  
for Finishing**

# **SRF/SUF**

**For Your Safety**

●Don't handle inserts and chips without gloves. ●Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage. ●Please use safety covers and wear safety glasses. ●When using compounded cutting oils, please take fire precautions. ●When attaching inserts or spare parts, please use only the correct wrench or driver. ●When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

## **MITSUBISHI MATERIALS CORPORATION**

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