MITSUBISHI MITSUBISHI MATERIALS TOOL NEWS
2013.4 Update B065A

Indexable Ball-nose & Corner Radius End Mill for Finishing

SRF

New Insert EP6120 Grade

High accuracy indexable end mill

Optimum tool for finish machining

High accuracy like Solid Carbide End Mills.
High accuracy insert positioning and high rigidity clamping.
Significant reduction in tool costs for finishing.

Indexable Ball Nose End Mill for Finishing

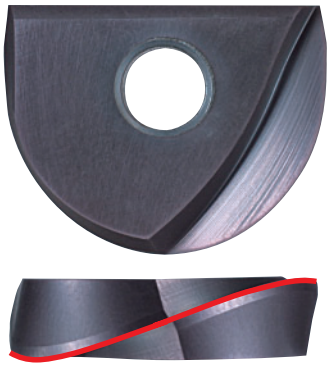
SRF

Applications	**Finishing of molds, copying curved surfaces**
Cutting edge radii	**(Inch) R.1875" , R.2500" , R.3125" , R.3750" , R.5000" , R.6250"** **(Metric) R5 , R6 , R8 , R10 , R12.5 , R15 , R16**

Features

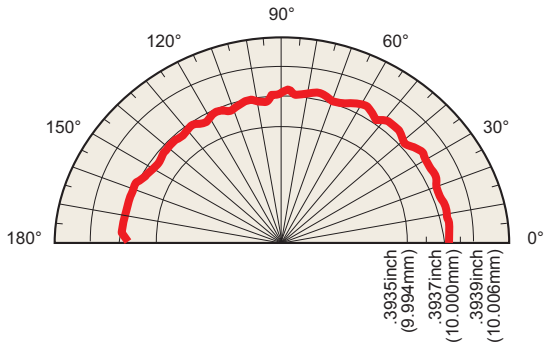
S-shaped end profile

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



Accurate radial tolerance

Radius tolerance of ±6μm for high accuracy finish machining comparable to solid ball nose end mills.



Insert grades

		NEW EP6120	MP8010	VP15TF
P	Mild Steel	+ +		
	Carbon Steel, Alloy Steel	+ +		+
	Pre-Hardened Steel	+ +		+
	Alloy Steel, Tool Steel	+ +		+
K	Gray Cast Iron		+ +	
	Ductile Cast Iron		+ +	
N	Copper, Copper Alloys	+ +		
H	Hardened Steel		+ +	

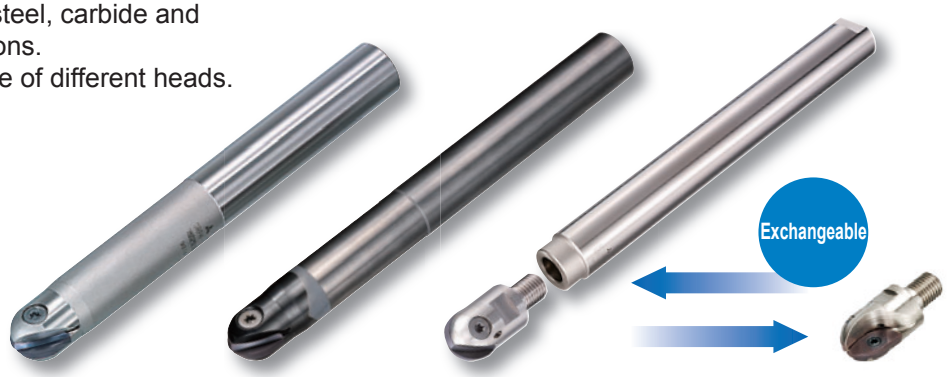
For carbon steel and alloy steel, the new coated grade ***EP6120*** with excellent wear resistance is recommended.

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 allows exchange of different heads.



Indexable Corner Radius End Mill for Finishing

SUF

Applications	**Finishing of molds**
Corner R	**(Metric) R0.5 , R1 , R2 , R3**

Features

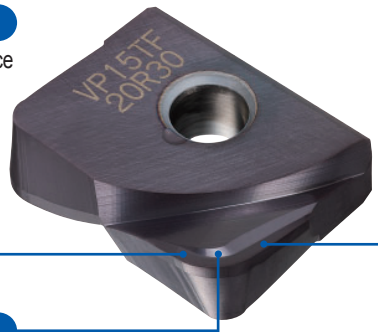
Insert

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.

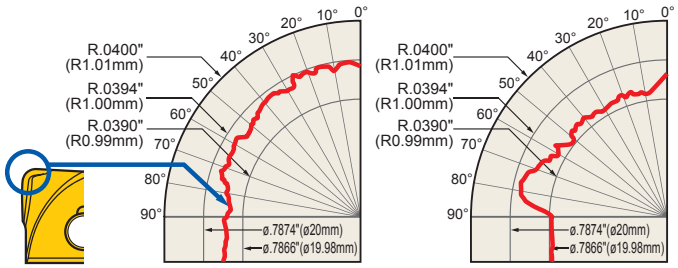


Seamless Gash

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 : ±0.004inch (±0.010mm)
Cutting edge diameter tolerance : 0 / -.008inch (0 / -0.020mm)

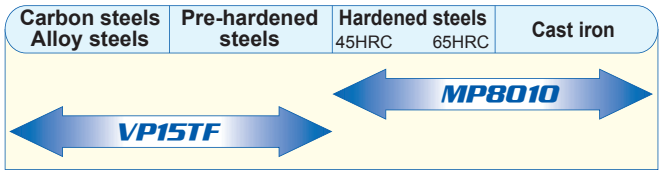


SUF
SUFT20R10

Conventional
ø20mm (R1mm)

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

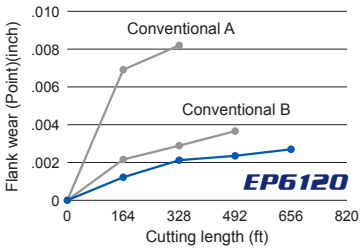
EP6120 provides a long tool life with excellent wear resistance.

NEW Steel cutting

EP6120

Conventional A

Conventional B



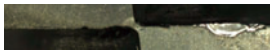
<Cutting conditions>

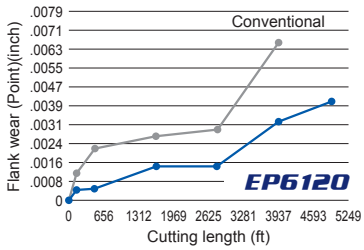
Work material : AISI 1055
Insert : SRFT20
Protrusion length : 2.756 inch
Revolution : 5500 RPM
Cutting speed : 260 SFM
Table feed : 86.614 IPM
Feed per tooth : .008 IPT
Axial depth of cut : .039 inch
Pick feed : .020 inch
Down cut, Air blow

NEW Prehardened steel cutting

EP6120

Conventional



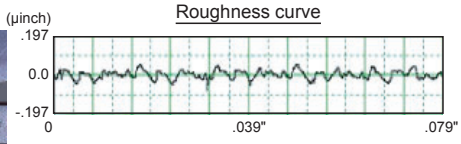


<Cutting conditions>

Work material : AISI P21
Insert : SRFT20
Protrusion length : 2.756 inch
Revolution : 5500 RPM
Cutting speed : 330 SFM
Table feed : 57.48 IPM
Feed per tooth : .008 IPT
Axial depth of cut : .039 inch
Pick feed : .020 inch
Down cut, Air blow

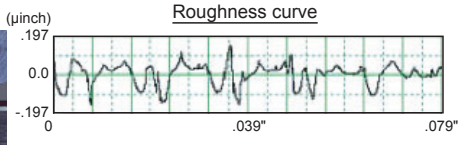
MP8010 demonstrated double tool life and improved surface finishes when compared to a conventional tool.

MP8010



Cutting length: **984ft** ,Max. height Rz: **126.µinch**

Conventional

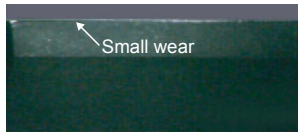


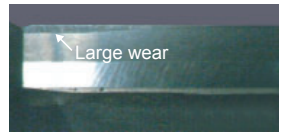
Cutting length: **492ft** ,Max. height Rz: **240.µinch**

<Cutting conditions>

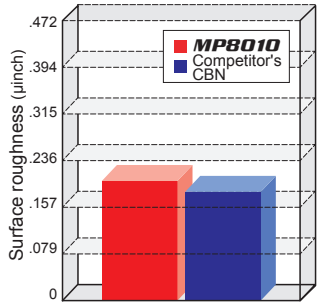
Work material : AISI D2 (60HRC)
Tool : SRFU12S16M
Revolution : 5220 min^{-1}
Cutting speed : 260 SFM
Feed per tooth : .008 IPT
Depth of cut : .008 inch
Pick feed : .008 inch
Dry cutting

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





MP8010 Competitor's CBN



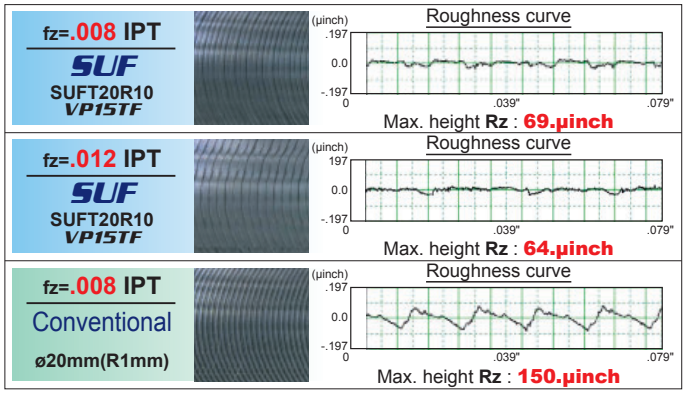
<Cutting conditions>

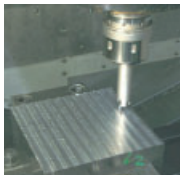
Work material : AISI No40B
Tool : SRFU20S20LW
Revolution : 10000 min^{-1}
Cutting speed : 490-3080 SFM
Feed per tooth : .012 IPT
Depth of cut : .008 inch
Pick feed : .020 inch
Dry cutting

SUF Cutting Performance

Accurate and efficient face milling

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



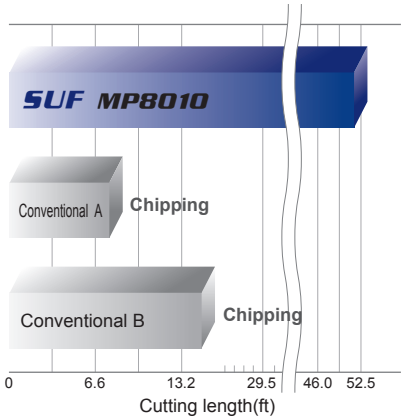


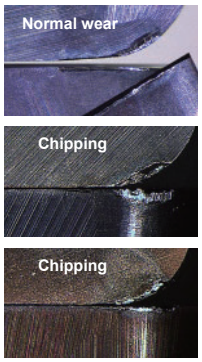
<Cutting conditions>

Work material	: AISI 1055	Depth of cut	: .012 inch
Tool	: SRFH20S25M	Pick feed	: .551 inch
Revolution	: 3180 min^{-1}	Dry cutting	
Cutting speed	: 655 SFM		
Feed per tooth	: .008, .012 IPT		

Hardened steel milling

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





<Cutting conditions>

Work material	: AISI D2 (59HRC)	Feed per tooth	: .008 IPT
Tool	: SRFU12S16L	Depth of cut	: .008 inch
Insert	: SUFT20R10	Pick feed	: .197 inch
Revolution	: 1270min^{-1}	Dry cutting	
Cutting speed	: 265 SFM		

BALL NOSE END MILL

Finishing

Including curved faces

SRF

Light Alloy	Cast Iron	Carbon Steel Alloy Steel	Stainless Steel	Hardened Steel
	▬	▬		▬

Fig. 1

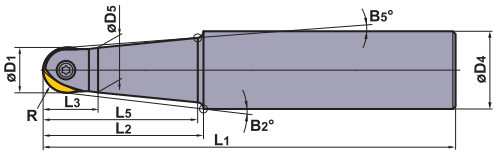


Fig. 2

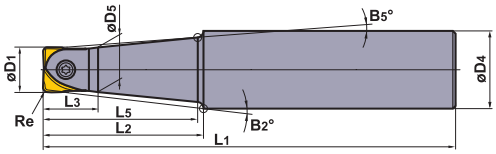


Fig. 3

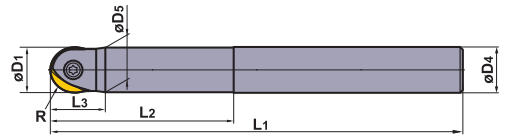


Fig. 4

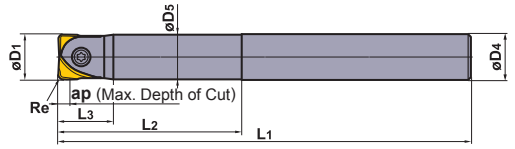


Fig. 5

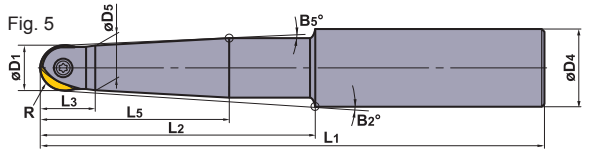
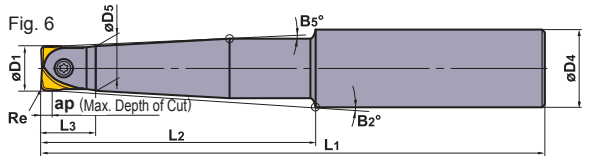


Fig. 6



Right hand tool holder only.
Refer to page 11 for ap &Re.

STEEL SHANK

Type	Order Number	Stock R	Inserts	Dimensions (inch) R	D1	D4	L1	D5	L2	L3	L5	B2°	B5°	Fig.	* Clamp Screw	①② Wrench	Anti-seize Lubricant
Standard	SRFU06S08M	●	SRFT0375	.1875	.375	.500	4.375	.354	1.625	512	1.535	2°30'	1°30'	1	RS3008TS	① TKY08D	MK1KS
			SRFT10	.1969	.394							2°08'	1°30'	1			
			SUFT10R○○	—	.394							2°08'	1°30'	2			
	08S10M	●	SRFT0500	.2500	.500	.625	4.750	.453	2.000	.591	1.902	2°03'	1°30'	1	RS3510T	① TKY10D	MK1KS
			SRFT12	.2362	.472							2°29'	1°30'	1			
			SUFT12R○○	—	.472							2°29'	1°30'	2			
	10S12M	●	SRFT0625	.3125	.625	.750	5.125	.606	2.000	.787	1.909	2°07'	1°30'	1	RS4015T	② TKY15T	MK1KS
			SRFT16	.3150	.630							2°02'	1°30'	1			
			SUFT16R○○	—	.630							2°02'	1°30'	2			
	12S16M	●	SRFT0750	.3750	.750	1.000	6.000	.732	2.875	.945	2.740	2°52'	1°30'	1	RS5020T	② TKY20T	MK1KS
			SRFT20	.3937	.787							2°27'	1°30'	1			
			SUFT20R○○	—	.787							2°27'	1°30'	2			
	16S20M	●	SRFT1000	.5000	1.000	1.250	7.125	.965	3.250	1.181	3.112	2°36'	1°30'	1	RS6025T	② TKY25T	MK1KS
			SRFT25	.4921	.984							2°46'	1°30'	1			
			SUFT25R○○	—	.984							2°46'	1°30'	2			
	20S20M	●	SRFT1250	.6250	1.250	1.250	8.039	1.161	4.164	1.417	—	—	—	3	RS8030T	② TKY30T	MK1KS
			SRFT30	.5906	1.181		8.000		4.125	1.378				3			
			SRFT32	.6299	1.260		8.039		4.164	1.417				3			
			SUFT30R○○	—	1.181		8.000		4.125	1.378				4			
Long	SRFU06S08L	●	SRFT0375	.1875	.375	.500	6.000	.354	2.500	.512	2.465	1°33'	1°30'	1	RS3008TS	① TKY08D	MK1KS
			SRFT10	.1969	.394							1°19'	1°30'	1			
			SUFT10R○○	—	.394							1°19'	1°30'	2			
	08S10L	●	SRFT0500	.2500	.500	.625	6.375	.453	2.875	.591	2.817	1°22'	1°30'	1	RS3510T	① TKY10D	MK1KS
			SRFT12	.2362	.472							1°39'	1°30'	1			
			SUFT12R○○	—	.472							1°39'	1°30'	2			
	10S12L	●	SRFT0625	.3125	.625	.750	7.125	.606	3.625	.787	2.488	1°05'	1°30'	5	RS4015T	② TKY15T	MK1KS
			SRFT16	.3150	.630							1°02'	1°30'	5			
			SUFT16R○○	—	.630							1°02'	1°30'	6			
	12S16L	●	SRFT0750	.3750	.750	1.000	8.500	.732	4.625	.945	4.539	1°41'	1°30'	1	RS5020T	② TKY20T	MK1KS
			SRFT20	.3937	.787							1°25'	1°30'	1			
			SUFT20R○○	—	.787							1°25'	1°30'	2			
	16S20L	●	SRFT1000	.5000	1.000	1.250	9.625	.965	5.750	1.181	5.697	1°22'	1°30'	1	RS6025T	② TKY25T	MK1KS
			SRFT25	.4921	.984							1°27'	1°30'	1			
			SUFT25○○	—	.984							1°27'	1°30'	2			
	20S20L	●	SRFT1250	.6250	1.250	1.250	10.539	1.161	6.664	1.417	—	—	—	3	RS8030T	② TKY30T	MK1KS
			SRFT30	.5906	1.181		10.500		6.625	1.378				3			
			SRFT32	.6299	1.260		10.539		6.664	1.417				3			
			SUFT30○○	—	1.181		10.500		6.625	1.378				4			

(Note) Fit inserts in the right direction. (Refer to page 13 & 14)

* Clamp Torque (lbf-in) : RS3008TS=13, RS3510T=22, RS4015T=29, RS5020T=44, RS6025T=66, RS8030T=88

● : **Inventory maintained.**

<2 inserts in one case>

Fig. 1

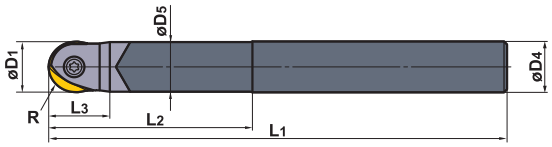
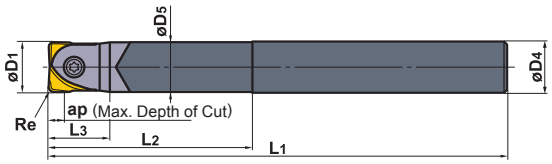


Fig. 2



CARBIDE SHANK

Right hand tool holder only.
Refer to page 11 for ap &Re.

Type	Order Number	Stock R	Inserts	Dimensions (inch) R	D1	D4	L1	D5	L2	L3	Fig.	* Clamp Screw	①② Wrench	Anti-seize Lubricant
Standard	**SRFU06S06MW**	●	SRFT0375	.1875	.375	.375	4.375	.354	1.625	0.512	1	RS3008TS	①TKY08D	MK1KS
			SRFT10	.1969	.394						1			
			SUFT10R○○	—	.394						2			
	08S08MW	●	SRFT0500	.2500	.500	.500	4.750	.453	2.000	0.591	1	RS3510T	①TKY10D	MK1KS
			SRFT12	.2362	.472						1			
			SUFT12R○○	—	.472						2			
	10S10MW	●	SRFT0625	.3125	.625	.625	5.250	.606	2.125	0.787	1	RS4015T	②TKY15T	MK1KS
			SRFT16	.3150	.630						1			
			SUFT16R○○	—	.630						2			
	12S12MW	●	SRFT0750	.3750	.750	.750	7.125	.732	4.000	0.945	1	RS5020T	②TKY20T	MK1KS
			SRFT20	.3937	.787						1			
			SUFT20R○○	—	.787						2			
	16S16MW	●	SRFT1000	.5000	1.000	1.000	8.000	.965	4.125	1.181	1	RS6025T	②TKY25T	MK1KS
			SRFT25	.4921	.984						1			
			SUFT25R○○	—	.984						2			
Long	**SRFU06S06LW**	●	SRFT0375	.1875	.375	.375	6.625	.354	3.125	.512	1	RS3008TS	①TKY08D	MK1KS
			SRFT10	.1969	.394						1			
			SUFT10R○○	—	.394						2			
	08S08LW	●	SRFT0500	.2500	.500	.500	6.625	.453	3.125	.591	1	RS3510T	①TKY10D	MK1KS
			SRFT12	.2362	.472						1			
			SUFT12R○○	—	.472						2			
	10S10LW	●	SRFT0625	.3125	.625	.625	8.000	.606	4.500	.787	1	RS4015T	②TKY15T	MK1KS
			SRFT16	.3150	.630						1			
			SUFT16R○○	—	.630						2			
	12S12LW	●	SRFT0750	.3750	.750	.750	10.000	.732	6.125	.945	1	RS5020T	②TKY20T	MK1KS
			SRFT20	.3937	.787						1			
			SUFT20R○○	—	.787						2			
	16S16LW	●	SRFT1000	.5000	1.000	1.000	12.000	.965	8.125	1.181	1	RS6025T	②TKY25T	MK1KS
			SRFT25	.4921	.984						1			
			SUFT25R○○	—	.984						2			

(Note) Fit inserts in the right direction. (Refer to page 13 & 14)

* Clamp Torque (lbf-in) : RS3008TS=13, RS3510T=22, RS4015T=29, RS5020T=44, RS6025T=66, RS8030T=88

Indexable Ball-nose & Corner Radius End Mill for Finishing

Fig. 1

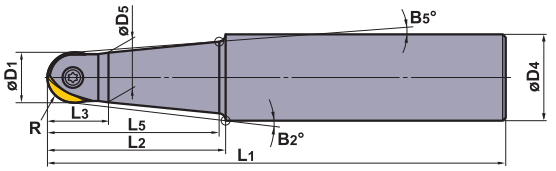


Fig. 2

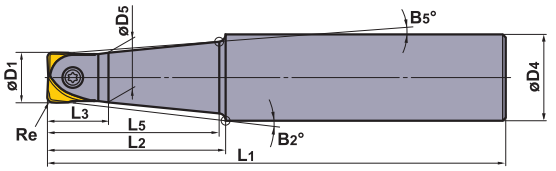


Fig. 3

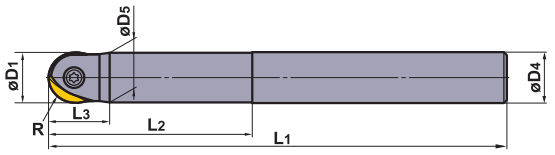


Fig. 4

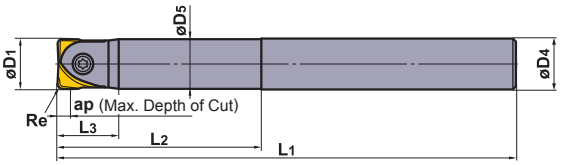


Fig. 5

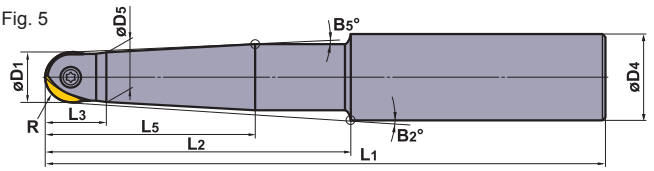
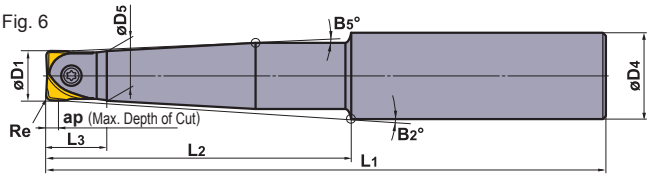


Fig. 6



METRIC Standard

STEEL SHANK

Right hand tool holder only.
Refer to page 11 for ap &Re.

Type	Order Number	Stock R	Inserts	Dimensions (mm) R	D1	D4	L1	D5	L2	L3	L5	B2°	B5°	Fig.	★ Clamp Screw	①② Wrench	Anti-seize Lubricant
Standard	**SRFH10S12M**	★	SRFT10	5	10	12	110	9.5	40	13	39.1	1°38′	1°30′	1	RS3008T	①TKY08D	MK1KS
			SUFT10R○○	—	10	12	110	9.5	40	13	—	1°38′	—	2			
	12S16M	★	SRFT12	6	12	16	120	11.5	50	15	47.9	2°36′	1°30′	1	RS3510T	①TKY10D	MK1KS
			SUFT12R○○	—	12	16	120	11.5	50	15	—	2°36′	—	2			
	16S20M	★	SRFT16	8	16	20	130	15.5	50	20	47.9	2°44′	1°30′	1	RS4015T	②TKY15T	MK1KS
			SUFT16R○○	—	16	20	130	15.5	50	20	—	2°44′	—	2			
	20S25M	★	SRFT20	10	20	25	150	19.5	70	24	67.5	2°23′	1°30′	1	RS5020T	②TKY20T	MK1KS
			SUFT20R○○	—	20	25	150	19.5	70	24	67.5	2°23′	1°30′	2			
	25S32M	★	SRFT25	12.5	25	32	180	24.5	80	30	76.6	2°58′	1°30′	1	RS6025T	②TKY25T	MK1KS
			SUFT25R○○	—	25	32	180	24.5	80	30	76.6	2°58′	1°30′	2			
	30S32M	★	SRFT30	15	30	32	200	29.5	100	35	—	—	—	3	RS8030T	②TKY30T	MK1KS
			SUFT30R○○	—	30	32	200	29.5	100	35	—	—	—	4			
	32S32M	★	SRFT32	16	32	32	200	31.5	100	35	—	—	—	3	RS8030T	②TKY30T	MK1KS
			SUFT32R○○	—	32	32	200	31.5	100	35	—	—	—	4			
Semi Long	**SRFH10S12L**	★	SRFT10	5	10	12	150	9.5	60	13	39.3	1°30′	1°30′	1	RS3008T	①TKY08D	MK1KS
			SUFT10R○○	—	10	12	150	9.5	60	13	—	1°30′	—	2			
	12S16L	★	SRFT12	6	12	16	160	11.5	70	15	68.5	1°47′	1°30′	1	RS3510T	①TKY10D	MK1KS
			SUFT12R○○	—	12	16	160	11.5	70	15	—	1°47′	—	2			
	16S20L	★	SRFT16	8	16	20	160	15.5	70	20	68.4	1°51′	1°30′	1	RS4015T	②TKY15T	MK1KS
			SUFT16R○○	—	16	20	160	15.5	70	20	—	1°51′	—	2			
	20S25L	★	SRFT20	10	20	25	180	19.5	80	24	77.7	2°03′	1°30′	1	RS5020T	②TKY20T	MK1KS
			SUFT20R○○	—	20	25	180	19.5	80	24	77.7	2°03′	1°30′	2			
	20S20L80	★	SRFT20	10	20	20	180	19.5	80	24	—	—	—	3	RS5020T	②TKY20T	MK1KS
			SUFT20R○○	—	20	20	180	19.5	80	24	—	—	—	4			
	25S32L	★	SRFT25	12.5	25	32	200	24.5	100	30	97.2	2°17′	1°30′	1	RS6025T	②TKY25T	MK1KS
			SUFT25R○○	—	25	32	200	24.5	100	30	97.2	2°17′	1°30′	2			
	25S25L100	★	SRFT25	12.5	25	25	200	24.5	100	30	—	—	—	3	RS6025T	②TKY25T	MK1KS
			SUFT25R○○	—	25	25	200	24.5	100	30	—	—	—	4			
	30S32L	★	SRFT30	15	30	32	230	29.5	130	35	—	—	—	3	RS8030T	②TKY30T	MK1KS
			SUFT30R○○	—	30	32	230	29.5	130	35	—	—	—	4			

(Note 1) Fit inserts in the right direction. (Refer to page 13 & 14)
(Note 2) Inch type insert can not be installed on the metric holder.
★ Clamp Torque (lbf-in) : RS3008T=13, RS3510T=22, RS4015T=29, RS5020T=44, RS6025T=66, RS8030T=88

★ : Inventory maintained in Japan.

Type	Order Number	Stock	Inserts	Dimensions (mm)										Fig.	Clamp Screw *	Wrench	Anti-seize Lubricant
		R		R	D_1	D_4	L_1	D_5	L_2	L_3	L_5	$B_2°$	$B_5°$				
Long	**SRFH20S25E**	★	SRFT20	10	20	25	220	19.5	120	24	82.4	1°30′	1°30′	5	RS5020T	②TKY20T	MK1KS
			SUFT20R○○	—	20	25	220	19.5	120	24	82.4	1°30′	1°30′	6			
	20S20E120	★	SRFT20	10	20	20	220	19.5	120	24	—	—	—	3	RS5020T	②TKY20T	MK1KS
			SUFT20R○○	—	20	20	220	19.5	120	24	—	—	—	4			
	25S32E	★	SRFT25	12.5	25	32	250	24.5	150	30	125.5	1°30′	1°30′	5	RS6025T	②TKY25T	MK1KS
			SUFT25R○○	—	25	32	250	24.5	150	30	125.5	1°30′	1°30′	6			
	25S25E150	★	SRFT25	12.5	25	25	250	24.5	150	30	—	—	—	3	RS6025T	②TKY25T	MK1KS
			SUFT25R○○	—	25	25	250	24.5	150	30	—	—	—	4			
	30S32E	★	SRFT30	15	30	32	300	29.5	200	35	—	—	—	3	RS8030T	②TKY30T	MK1KS
			SUFT30R○○	—	30	32	300	29.5	200	35	—	—	—	4			
Extra Long	**SRFH20S25X**	★	SRFT20	10	20	25	250	19.5	150	24	82.4	1°30′	1°30′	5	RS5020T	②TKY20T	MK1KS
			SUFT20R○○	—	20	25	250	19.5	150	24	82.4	1°30′	1°30′	6			
	25S32X	★	SRFT25	12.5	25	32	300	24.5	200	30	123.1	1°30′	1°30′	5	RS6025T	②TKY25T	MK1KS
			SUFT25R○○	—	25	32	300	24.5	200	30	123.1	1°30′	1°30′	6			
	30S32X	★	SRFT30	15	30	32	350	29.5	250	35	—	—	—	3	RS8030T	②TKY30T	MK1KS
			SUFT30R○○	—	30	32	350	29.5	250	35	—	—	—	4			
	32S32X	★	SRFT32	16	32	32	350	31.5	250	35	—	—	—	3	RS8030T	②TKY30T	MK1KS
			SUFT32R○○	—	32	32	350	31.5	250	35	—	—	—	4			

(Note 1) Fit inserts in the right direction. (Refer to page 13 & 14)
(Note 2) Inch type insert can not be installed on the metric holder.
* Clamp Torque (lbf-in) : RS3008T=13, RS3510T=22, RS4015T=29, RS5020T=44, RS6025T=66, RS8030T=88

Indexable Ball-nose & Corner Radius End Mill for Finishing

Fig. 1

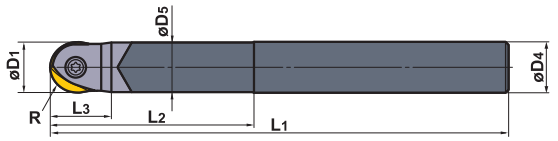
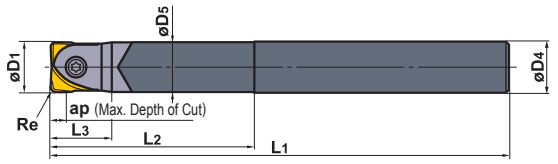


Fig. 2



METRIC Standard

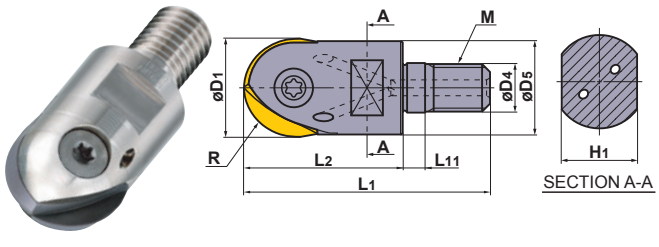
CARBIDE SHANK

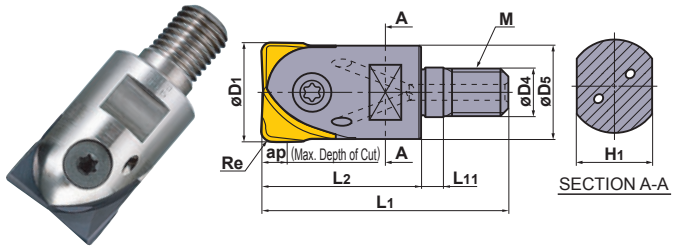
Right hand tool holder only.
Refer to page 11 for ap &Re.

Type	Order Number	Stock R	Inserts	Dimensions (mm) R	D1	D4	L1	D5	L2	L3	Fig.	* Clamp Screw	①② Wrench	Anti-seize Lubricant
Standard	**SRFH10S10MW**	★	SRFT10	5	10	10	110	9.5	40	13	1	RS3008T	①TKY08D	MK1KS
			SUFT10R○○	—	10	10	110	9.5	40	13	1			
	12S12MW	★	SRFT12	6	12	12	120	11.5	50	15	1	RS3510T	①TKY10D	MK1KS
			SUFT12R○○	—	12	12	120	11.5	50	15	1			
	16S16MW	★	SRFT16	8	16	16	130	15.5	50	20	1	RS4015T	②TKY15T	MK1KS
			SUFT16R○○	—	16	16	130	15.5	50	20	1			
	20S20MW	★	SRFT20	10	20	20	180	19.5	80	24	1	RS5020T	②TKY20T	MK1KS
			SUFT20R○○	—	20	20	180	19.5	80	24	2			
	25S25MW	★	SRFT25	12.5	25	25	200	24.5	100	30	1	RS6025T	②TKY25T	MK1KS
			SUFT25R○○	—	25	25	200	24.5	100	30	2			
	30S32MW	★	SRFT30	15	30	32	230	29.5	130	35	1	RS8030T	②TKY30T	MK1KS
			SRFT32	16	32	32	231	29.5	131	36				
			SUFT30R○○	—	32	32	230	29.5	130	35	2			
Long	**SRFH10S10LW**	★	SRFT10	5	10	10	150	9.5	60	13	1	RS3008T	①TKY08D	MK1KS
			SUFT10R○○	—	10	10	150	9.5	60	13	1			
	12S12LW	★	SRFT12	6	12	12	160	11.5	70	15	1	RS3510T	①TKY10D	MK1KS
			SUFT12R○○	—	12	12	160	11.5	70	15	1			
	16S16LW	★	SRFT16	8	16	16	160	15.5	70	20	1	RS4015T	②TKY15T	MK1KS
			SUFT16R○○	—	16	16	160	15.5	70	20	1			
	16S16EW	★	SRFT16	8	16	16	200	15.5	110	20	1	RS4015T	②TKY15T	MK1KS
	20S20LW	★	SRFT20	10	20	20	250	19.5	150	24	1	RS5020T	②TKY20T	MK1KS
			SUFT20R○○	—	20	20	250	19.5	150	24	2			
	25S25LW	★	SRFT25	12.5	25	25	300	24.5	200	30	1	RS6025T	②TKY25T	MK1KS
			SUFT25R○○	—	25	25	300	24.5	200	30	2			
	30S32LW	★	SRFT30	15	30	32	350	29.5	250	35	1	RS8030T	②TKY30T	MK1KS
			SRFT32	16	32	32	351	29.5	251	36				
			SUFT30R○○	—	30	32	350	29.5	250	35	2			

(Note 1) Fit inserts in the right direction. (Refer to page 13 & 14)
(Note 2) Inch type insert can not be installed on the metric holder.
* Clamp Torque (lbf-in) : RS3008T=13, RS3510T=22, RS4015T=29, RS5020T=44, RS6025T=66, RS8030T=88

★ : Inventory maintained in Japan.





METRIC Standard

SCREW-IN TYPE

Right hand tool holder only.

Order Number	Stock	Coolant Hole *1	Insert	Dimensions (mm)									Mass (kg)	*2 Clamp Screw	Wrench	Anti-seize Lubricant
	R			R	D_1	D_4	D_5	L_1	L_2	L_{11}	H_1	M				
SRFH16AM0830	★	Y	SRFT16	8	16	8.5	14.9	48	30	6	10	M8	0.1	RS4015T	TKY15T	MK1KS
			SUFT16R○○	—	16	8.5	14.9	48	30	6	10	M8				
20AM1035	★	Y	SRFT20	10	20	10.5	18.4	54	35	6	14	M10	0.1	RS5020T	TKY20T	MK1KS
			SUFT20R○○	—	20	10.5	18.4	54	35	6	14	M10				
25AM1240	★	Y	SRFT25	12.5	25	12.5	23.5	62	40	6	19	M12	0.1	RS6025T	TKY25T	MK1KS
			SUFT25R○○	—	25	12.5	25.5	62	40	6	19	M12				
30AM1645	★	Y	SRFT30	15	30	17	28.1	68	45	6	24	M16	0.2	RS8030T	TKY30T	MK1KS
			SRFT32	16	32	17	28.1	69	46	6	24	M16	0.2			
			SUFT30R○○	—	32	17	28.1	69	46	6	24	M16				

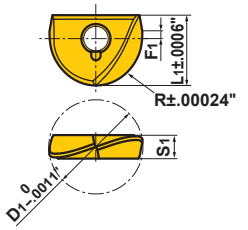
(Note 1) Fit inserts in the right direction. (Refer to page 13 & 14)
(Note 2) Inch type insert can not be installed on the metric holder.

*1 Y=Yes

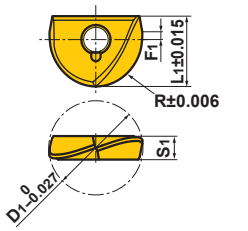
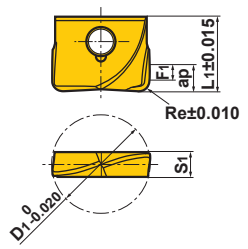
*2 Clamp Torque (lbf-in) : RS4015T=29, RS5020T=44, RS6025T=66, RS8030T=88

INSERTS

INCH Standard

Shape	Order Number	Coated			Dimensions (inch)							Geometry
		MP8010	EP6120 (NEW)	VP15TF	D1	R	Re	L1	F1	S1	ap	
	SRFT0375	●	●	●	.375	.1875	—	.335	.020	.102	—	
	0500	●	●	●	.500	.2500	—	.394	.020	.118	—	
	0625	●	●	●	.625	.3125	—	.472	.039	.158	—	
	0750	●	●	●	.750	.3750	—	.591	.039	.197	—	
	1000	●	●	●	1.000	.5000	—	.728	.039	.236	—	
	1250	●	●	●	1.250	.6250	—	.925	.039	.276	—	

METRIC Standard

Shape	Order Number	Coated			Dimensions (mm)							Geometry
		MP8010	EP6120 (NEW)	VP15TF	D1	R	Re	L1	F1	S1	ap	
	SRFT10	★	★	★	10	5 (.1969")	—	8.5	0.5	2.6	—	
	12	★	★	★	12	6 (.2362")	—	10	0.5	3	—	
	16	★	★	★	16	8 (.3150")	—	12	1	4	—	
	20	★	★	★	20	10 (.3937")	—	15	1	5	—	
	25	★	★	★	25	12.5 (.4921")	—	18.5	1	6	—	
	30	★	★	★	30	15 (.5906")	—	22.5	1	7	—	
	32	★	★	★	32	16 (.6299")	—	23.5	1	7	—	
	SUFT10R05	★	★	★	10	—	0.5 (.0197")	8.5	1	2.6	1.5	
	10R10	★	★	★	10	—	1 (.0394")	8.5	1	2.6	2	
	10R20	★	★	★	10	—	2 (.0787")	8.5	1	2.6	3	
	12R05	★	★	★	12	—	0.5 (.0197")	10	1.2	3	1.7	
	12R10	★	★	★	12	—	1 (.0394")	10	1.2	3	2.2	
	12R20	★	★	★	12	—	2 (.0787")	10	1.2	3	3.2	
	12R30	★	★	★	12	—	3 (.1181")	10	1.2	3	4.2	
	16R05	★	★	★	16	—	0.5 (.0197")	12	1.6	4	2.1	
	16R10	★	★	★	16	—	1 (.0394")	12	1.6	4	2.6	
	16R15	★	★	★	16	—	1.5 (.0591")	12	1.6	4	3.1	
	16R20	★	★	★	16	—	2 (.0787")	12	1.6	4	3.6	
	16R30	★	★	★	16	—	3 (.1181")	12	1.6	4	4.6	
	20R05	★	★	★	20	—	0.5 (.0197")	15	2	5	2.5	
	20R10	★	★	★	20	—	1 (.0394")	15	2	5	3	
	20R15	★	★	★	20	—	1.5 (.0591")	15	2	5	3.5	
	20R20	★	★	★	20	—	2 (.0787")	15	2	5	4	
	20R30	★	★	★	20	—	3 (.1181")	15	2	5	5	
	25R05	★	★	★	25	—	0.5 (.0197")	18.5	2.5	6	3	
	25R10	★	★	★	25	—	1 (.0394")	18.5	2.5	6	3.5	
	25R20	★	★	★	25	—	2 (.0787")	18.5	2.5	6	4.5	
	25R30	★	★	★	25	—	3 (.1181")	18.5	2.5	6	5.5	
	30R05	★	★	★	30	—	0.5 (.0197")	22.5	3	7	3.5	
	30R10	★	★	★	30	—	1 (.0394")	22.5	3	7	4	
	30R20	★	★	★	30	—	2 (.0787")	22.5	3	7	5	
	30R30	★	★	★	30	—	3 (.1181")	22.5	3	7	6	
	32R05	★	★	★	32	—	0.5 (.0197")	23.5	3.2	7	3.7	
	32R10	★	★	★	32	—	1 (.0394")	23.5	3.2	7	4.2	
	32R20	★	★	★	32	—	2 (.0787")	23.5	3.2	7	5.2	

● : Inventory maintained. ★ : Inventory maintained in Japan.
<2 inserts in one case>

Recommended Cutting Conditions for SRFT Ball-nose inserts

	Work Material	Hardness	Insert Grades	Cutting Speed **vc** (SFM)	Feed per Tooth **fz** (IPT)	Depth of Cut **ap** (inch)
P	Mild Steel	180HB	**EP6120**	655 (260—985)	.008 (.004—.012)	≤0.05D1
P	Carbon Steel Alloy Steel	180—280HB	**EP6120**	655 (260—985)	.008 (.004—.012)	≤0.05D1
P			**VP15TF**	655 (260—985)	.008 (.004—.012)	≤0.05D1
P		280—350HB	**EP6120**	655 (260—985)	.008 (.004—.012)	≤0.05D1
P	Pre-hardened steels	35—45HRC	**EP6120**	490 (260—655)	.008 (.004—.012)	≤0.05D1
P			**VP15TF**	490 (260—655)	.008 (.004—.012)	≤0.05D1
P	Alloy Tool Steel	350HB	**EP6120**	490 (260—655)	.008 (.004—.012)	≤0.05D1
P			**VP15TF**	490 (260—655)	.008 (.004—.012)	≤0.05D1
K	Gray Cast Iron	350MPa	**MP8010**	820 (260—1475)	.008 (.004—.012)	≤0.05D1
K	Ductile Cast Iron	450MPa	**MP8010**	655 (260—985)	.008 (.004—.012)	≤0.05D1
K		800MPa	**MP8010**	655 (260—985)	.008 (.004—.012)	≤0.05D1
N	Copper,Copper Alloys		**EP6120**	655 (260—985)	.008 (.004—.012)	≤0.05D1
H	Hardened Steel	45—55HRC	**MP8010**	330 (195—395)	.008 (.004—.012)	≤0.05D1
H		55—65HRC	**MP8010**	260 (195—395)	.008 (.004—.012)	≤0.01D1

(Note 1) The values above are for average machining conditions. The optimum values can change slightly according to the condition and rigidity of the machine and work holding. Adjust the values accordingly.
(Note 2) For end mills with a carbide shank, up to 20 percent higher cutting conditions are possible.
(Note 3) Please note the following when machining hardened steel with MP8010.
- Please shorten the overhang length as much as possible.
- Use with carbide shank recommended.
- Take special care with the depth of cut to prevent fracture.

Calculating Actual Cutting Speed

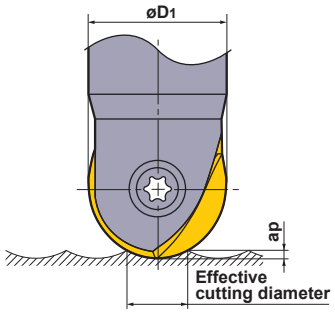
1. Effective cutting diameter = $2\sqrt{ap\ (D_1\text{-}ap)}$

D_1 : Tool diameter (inch)
ap : Depth of Cut (inch)

2. Using ap ➡ Calculate cutting speed at the depth of cut line.

$$vc = \frac{2\pi n\sqrt{ap\ (D_1\text{-}ap)}}{12}$$

vc : Actual cutting speed (SFM)
n : Revolution (min^{-1})



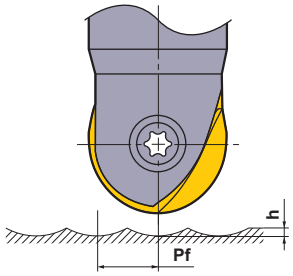
Selecting Pick Feed

Theoretical $h = \frac{(Pf)^2}{8R}$

h : Cusp height
pf : Pick feed
R : Ball nose or corner radius

Actual surface roughness Rz will be about 3 times worse than theoretical h.
This is because of the effect of a built-up edge.
To determine Pf, use the formula below based on a particular Rz value.

$$Pf = \sqrt{\frac{8xRxRz}{3}}$$



Insert Installation

1. Clean the insert and the insert pocket

Thoroughly clean the insert and the insert pocket on the holder body.

2. Fitting the insert

Place the concave mark on the insert uppermost as shown with the clamp screw inserted from above. Fasten the clamp screw while firmly pressing the insert against the insert pocket wall. Use of a special anti seize lubricant MK1KS is recommended. Tighten at the recommended torque range.

Recommended Cutting Conditions for SUFT Corner Radius insert

Shoulder milling(When small width of cut.*)

	Work Material	Hardness	Insert Grades	Cutting Speed **vc** (SFM)	Depth of Cut **ap** (inch)	Wide of Cut **ae** (inch)	Feed per Tooth **fz** (IPT)
P	Carbon Steel Alloy Steel	180−280HB	**VP15TF**	655 (260−985)	≤0.05D_1	≤0.05D_1	.008 (≤.016)
	Pre-hardened steels	≤45HRC	**VP15TF**	490 (260−655)	≤0.05D_1	≤0.05D_1	.006 (≤.012)
	Alloy Tool Steel	180−380HB	**VP15TF**	490 (260−655)	≤0.05D_1	≤0.05D_1	.006 (≤.012)
M	Stainless Steel	≤270HB	**VP15TF**	490 (330−655)	≤0.05D_1	≤0.05D_1	.008 (≤.016)
K	Cast Iron	Tensile Strength ≤350MPa	**MP8010**	820 (590−1475)	≤0.05D_1	≤0.1D_1	.012 (≤.016)
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MP8010**	655 (260−985)	≤0.05D_1	≤0.1D_1	.012 (≤.016)
H	Hardened Steel	45−55HRC	**MP8010**	330 (260−395)	≤0.05D_1	≤0.02D_1	.004 (≤.008)
	Hardened Steel	55−65HRC	**MP8010**	260 (195−330)	≤0.05D_1	≤0.02D_1	.004 (≤.008)

* When the pick feed direction is along the axis of the tool such as finish machining at the wall part.

Slot milling / Shoulder milling(When large width of cut.*)

	Work Material	Hardness	Insert Grades	Cutting Speed **vc** (SFM)	Depth of Cut **ap** (inch)	Wide of Cut **ae** (inch)	Feed per Tooth **fz** (IPT)
P	Carbon Steel Alloy Steel	180−280HB	**VP15TF**	655 (260−985)	≤0.02D_1	≤D_1	.008 (≤.016)
	Pre-hardened steels	≤45HRC	**VP15TF**	490 (260−655)	≤0.02D_1	≤D_1	.006 (≤.012)
	Alloy Tool Steel	180−380HB	**VP15TF**	490 (260−655)	≤0.02D_1	≤D_1	.006 (≤.012)
M	Stainless Steel	≤270HB	**VP15TF**	490 (330−655)	≤0.02D_1	≤D_1	.008 (≤.016)
K	Cast Iron	Tensile Strength ≤350MPa	**MP8010**	835 (590−1475)	≤0.03D_1	≤D_1	.012 (≤.016)
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MP8010**	655 (260−985)	≤0.03D_1	≤D_1	.012 (≤.016)
H	Hardened Steel	45−55HRC	**MP8010**	330 (260−395)	≤0.01D_1	≤D_1	.004 (≤.006)
	Hardened Steel	55−65HRC	**MP8010**	230 (195−330)	≤0.01D_1	≤D_1	.004 (≤.008)

* When the pick feed direction is along the radius of the tool such as finish face machining.

(Note 1)This cutting condition is the standard condition when using the steel standard shank type.
If vibration or chipping on cutting edge occurs, please decrease the cutting condition as width of cut, depth of cut and feed per tooth depending on the situation.

(Note 2)Recommended cutting speeds apply to tool outside diameter.
Please calculate the spindle speed of tool in the following expressions.
Spindle speed of cutting tool n(min^{-1})=12×Cutting speed vc ÷ Diameter of cutting tool D_1 ÷ 3.14

Insert Installation

1. Clean the insert and insert pocket

Thoroughly clean the insert and the insert pocket on the holder body.

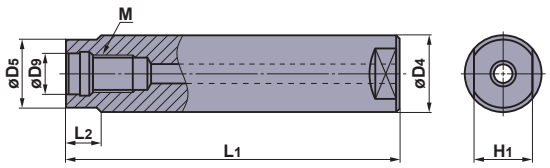
2. Fitting the insert

Place the concave mark on the insert uppermost as shown with the clamp screw inserted from above. Fasten the clamp screw while firmly pressing the insert against the insert pocket wall. Use of a special anti seize lubricant MK1KS is recommended. Tighten at the recommended torque range.

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
	SC32M16S140S	★	17	32	28.5	140	15	24	M16
	16S280L	★	17	32	28.5	280	15	24	M16
CARBIDE SHANK TYPE	**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
	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

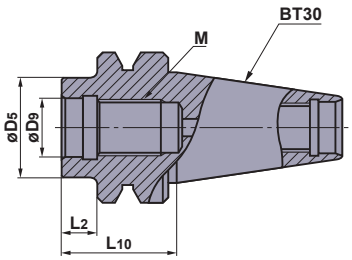
①Thoroughly clean the clamp section of the head and the arbor with an air blower or brush before installation.
②Tighten the head at the recommended torque and ensure that there is no gap between the head and arbor.

Screw Size	Recommended Torque (lbf-ft)	Wrench Size (mm)
M8	17.1	10
M10	33.8	14
M12	59.2	19
M16	66.7	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 the cutting tools with bare hands as this may cause injuries.

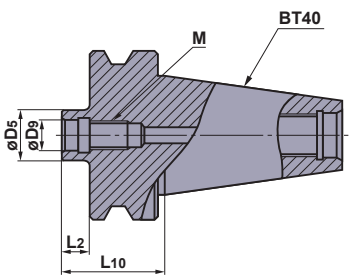
★ : Inventory maintained in Japan.

BT30 SHANK ARBOR



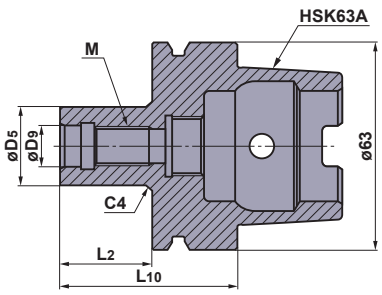
Order Number	Stock	Dimensions (mm)				
		D9	D5	L10	L2	M
SC16M08S10-BT30	★	8.5	14.5	32	10	M8
20M10S10-BT30	★	10.5	18.5	32	10	M10
25M12S10-BT30	★	12.5	23.5	32	10	M12
32M16S10-BT30	★	17.0	28.5	32	10	M16

BT40 SHANK ARBOR



Order Number	Stock	Dimensions (mm)				
		D9	D5	L10	L2	M
SC16M08S10-BT40	★	8.5	14.5	37	10	M8
20M10S10-BT40	★	10.5	18.5	37	10	M10
25M12S10-BT40	★	12.5	23.5	37	10	M12
32M16S10-BT40	★	17.0	28.5	37	10	M16

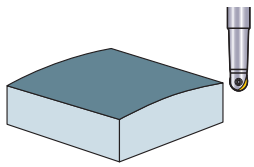
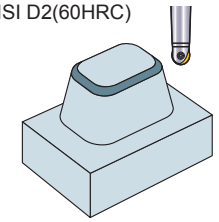
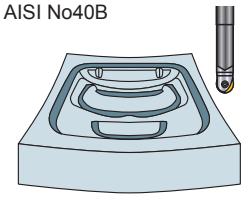
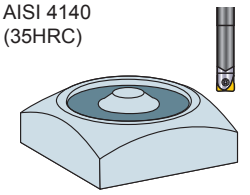
HSK63A SHANK ARBOR



Order Number	Stock	Dimensions (mm)				
		D9	D5	L10	L2	M
SC16M08S22-HSK63A	★	8.5	14.5	48	22	M8
20M10S24-HSK63A	★	10.5	18.5	50	24	M10
25M12S27-HSK63A	★	12.5	23.5	53	27	M12
32M16S28-HSK63A	★	17.0	28.5	54	28	M16

★ : Inventory maintained in Japan.

APPLICATION EXAMPLES

Tool		SRFU12S16M	SRFU12S16M	SRFH30S32LW	SRFH20S20LW
Insert		SRFT0750	SRFT0750	SRFT30	SUFT20R10
Grade		VP15TF	MP8010	MP8010	VP15TF
Machine		Bridge-column machining center	Vertical type M/C	Bridge-column machining center	Vertical type M/C
Work Material		Die steel (33HRC) 	AISI D2(60HRC) 	AISI No40B 	AISI 4140 (35HRC) 
Component		Mold for forming resin	Press mold	Press mold	Mold for forming resin
Cutting Conditions	Actual Cutting Speed (SFM)	820	100-330	490-3080	615
	Table Feed (IPM)	55	25	394	71
	Feed per Tooth (IPT)	.007	.008	.012	.012
	Depth of Cut (inch)	.008	.008	.008	.004
	Width of Cut (inch)	.047	.012	.020	.012
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 cutting conditions as a conventional CBN grade, a cutting length of 32800 ft is achievable and also gives a surface finish quality equal to when CBN is used. The cost of cutting tools can be reduced.	The surface finish on the bottom face is improved compared to a conventional grade. VP15TF also achieved double tool life.

Memo

Indexable Ball-nose & Corner Radius End Mill for Finishing

SRF

For your safety
●Don't touch breakers and chips without gloves. ●Please machine within recommended application range, and exchange expired tools with new parts in advance. ●Please use safety cover and wear safety glasses. ●When using compounded cutting oils, please take fire prevention. ●When attaching chips or spare parts, please use the attached wrench or spanner. ●When using tools in revolution machining, please make a trial run to check run-out, vibration, abnormal sounds etc.

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