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TOOL NEWS
2007.9 Update B020A

Ball-nose Endmill for Rough to Semi-finish Cutting

SRM2 Series

Series Expansion

SRM2 applications offer you the strength of a large radius insert, or the ability to penetrate hard to reach cavities.

Ball-nose Endmill for Rough to Semi-finish Cutting

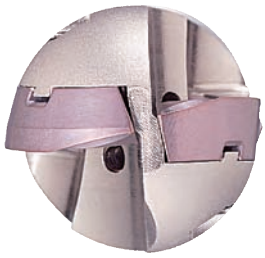
SRM2

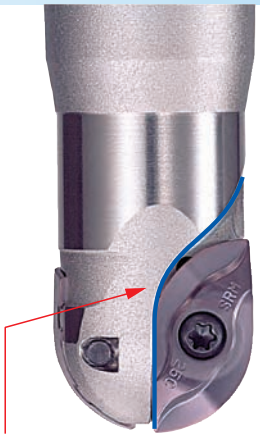
Features

Cutting Edge Diameter	NEW Ø.625", Ø.75", Ø1.0", Ø1.25"
Application	SRM2 applications offer you the strength of a large radius insert, or the ability to penetrate hard to reach cavities.

High Rigidity

- Large insert thickness guards against fracture.
- Thick body core resists body web fracture.



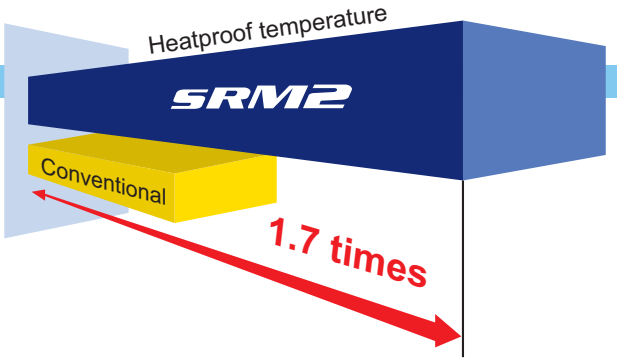


- "Streamlined pocket" optimizes a balance of chips flow and body rigidity.

- "Heel cut" achieves high body rigidity and good chip control, avoiding damage from chips welding to the body.

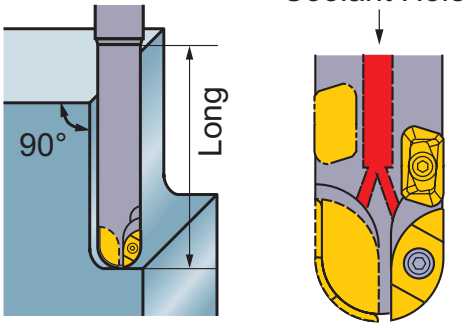
Highly Heat-resistant Body

- The body of the SRM2 is made of a special alloy steel with excellent high-temperature strength, enhanced by a corrosion-resistant surface treatment.



Series Expansion

- In addition to the standard and long cutting edge types, this series has been expanded with a long type which can machine vertical faces. The series is now equipped with a coolant hole as standard, enabling it to tackle a wider range of die mold cutting applications.

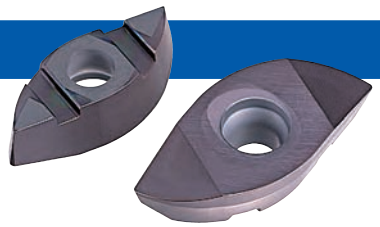


High Precision, Low Resistance

- High rigidity means the body does not deform, even when cutting under large loads.
- Low resistance means high quality finished surfaces.
- The key-type clamp grips the insert securely.

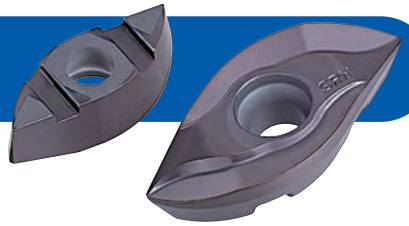
Strong Cutting Edge Type Inserts

Tolerance close to that of G-class inserts at M-class prices.

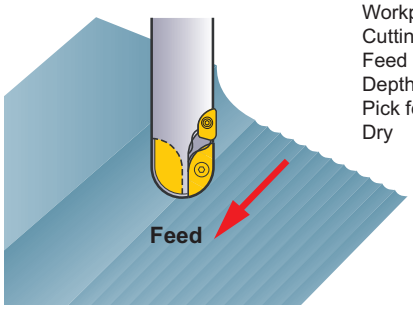


Sharp, Low-resistance Cutting Edge Type Inserts (With Breakers)

Tolerance close to that of G-class inserts at M-class prices.

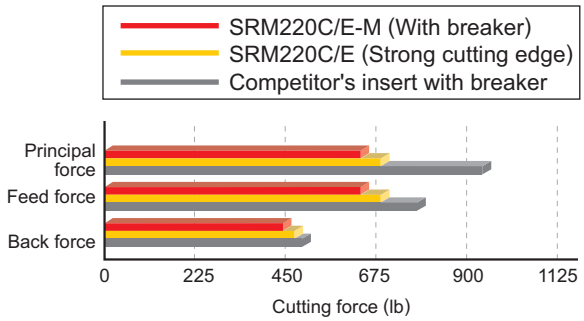


■Cutting performance

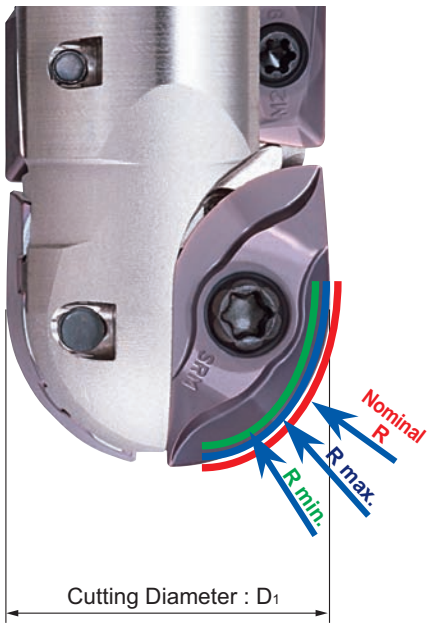


<Cutting conditions>

Workpiece	:	4140
Cutting speed	:	525 SFM
Feed per tooth	:	.010 IPT
Depth of cut	:	.394 inch
Pick feed	:	.079 inch
Dry		



■Radius tolerance and other dimensions when an insert is set in a body



<Radius tolerance>

Cutting Diameter	Nominal R	R min.	R max.
.625	.318	.309	.312
.75	.375	.371	.374
1.0	.500	.496	.499
1.25	.625	.621	.624

<Dimensions when an insert is set in a body>

Cutting Dia.	D_1 min.	D_1 max.
.625	.616	.625
.75	.741	.7496
1.0	.991	.9996
1.25	1.241	1.2496

Ball-nose Endmill for Rough Cutting

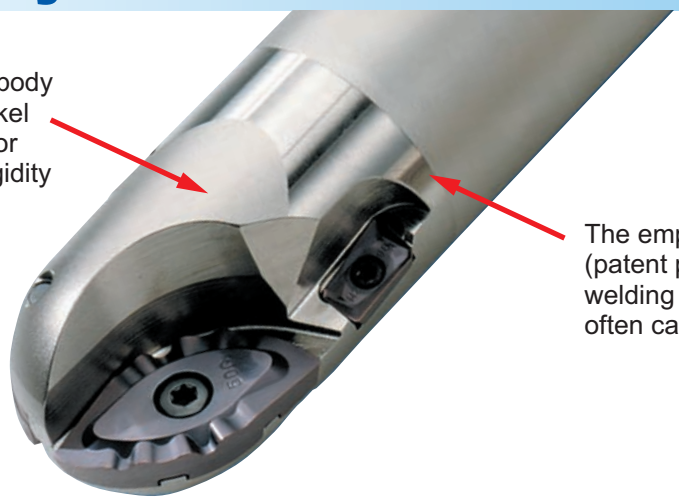
SRM2 Ø40 Ø50

Features

Cutting Edge Diameter 1.575" (ø40mm), 1.969" (ø50mm)

High Rigidity

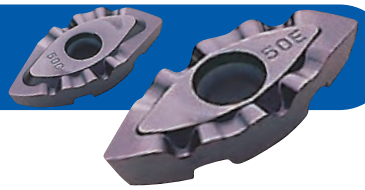
The specially designed silver body employs special alloy with nickel based coating on its surface for significantly improved body rigidity and durability.



The employment of heel cut (patent pending) prevents welding and damage to the body often caused by generated chips.

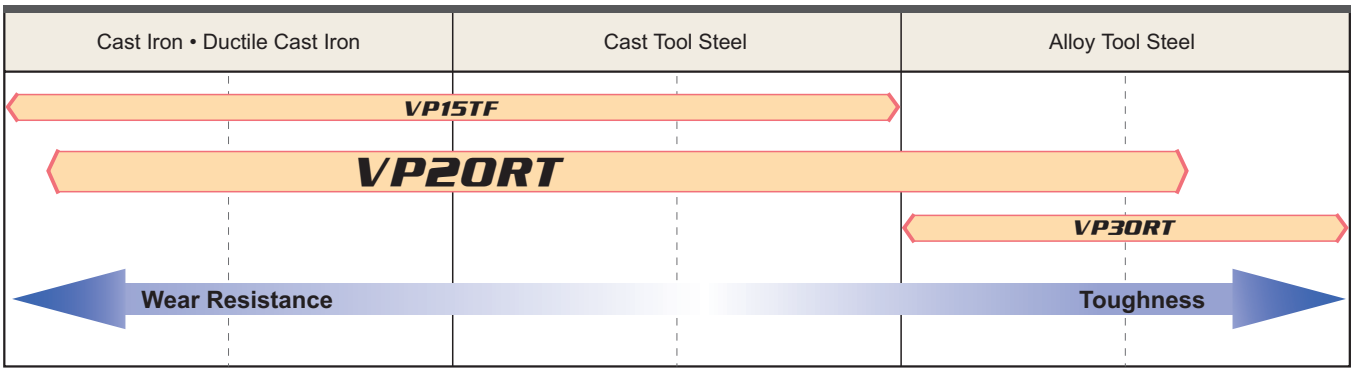
Low Resistance

Low-resistance Cutting Edge Type Inserts (With Breakers)



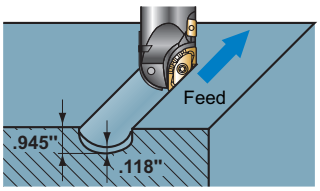
Unique design, 3-dimensional cutting edge:- Variable Radial Undulation (V.R.U. Pat. pending) for efficient chip breaking to significantly lower cutting resistance and vibration. Screw, slot and key type insert location and clamping for extra security.

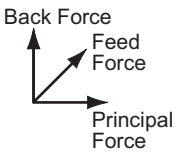
Insert Grade Application Guide



Cutting Performance

●Comparison of Cutting Resistance



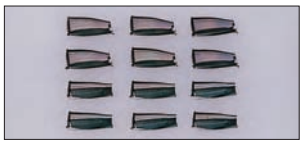


Cutting Condisions

Workpiece	Ductile cast iron
Tool	Ball nose end mill with 50mm cutting edge diameter
Cutting Speed	615 SFM
Table Feed	42.5 IPM
Depth of Cut	.118 inch
Coolant	Dry cutting

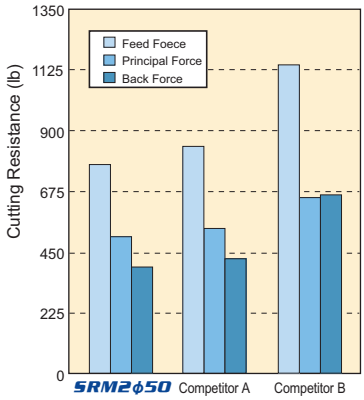
Chip Geometry

SRM2ϕ50



Competitor A

Competitor B

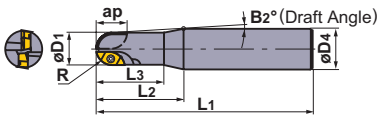


Ball-nose Endmill for Rough to Semi-finish Cutting

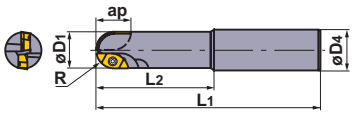
SRM2

Short Type

SRM210SA32
SRM212SAS2

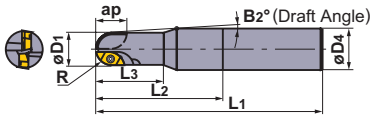


SRM216SAS2
SRM220SAS2

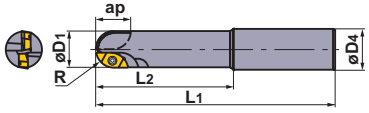


Medium Type

SRM210SAM2
SRM212SAM2

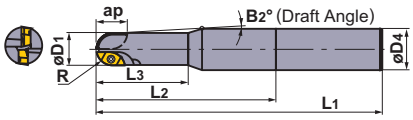


SRM216SAM2
SRM220SAM2

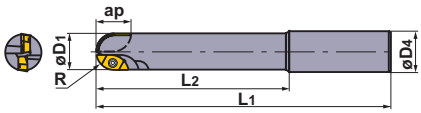


Long Type

SRM210SAL2
SRM212SAL2
SRM216SAL2

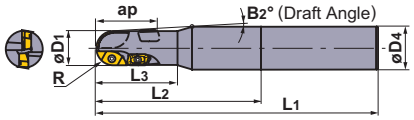


SRM220SAL2

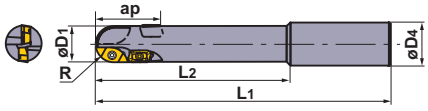


Long Edge Type

SRM212SAL4
SRM216SAL4



SRM220SAL4

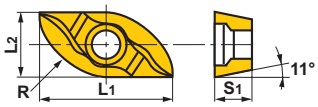
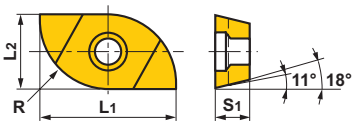
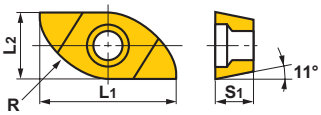
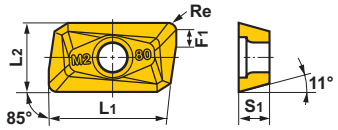
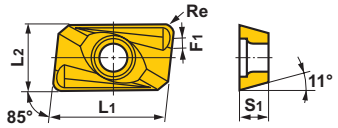


Right hand tool holder only.

Type	Order Number	Stock R	Number of Teeth	Dimensions (inch) R	D1	L1	D4	L2	L3	ap	B2°	Insert: Inner	Insert: Outer	Insert: Peripheral	Insert Screw: Inner, Outer	Insert Screw: Peripheral	Wrench: Inner, Outer	Wrench: Peripheral
Short	NEW SRM2100SAS2	●	2	.313	.625	4	.75	1.5	1.0	.625	3°	SRM210C-M	SRM210E-M	—	TS25H	—	① TKY08D	—
	212SAS2	●	2	.375	.75	4	1	1.5	1.25	.750	6° 30'	SRM212C SRM212C-M	SRM212E SRM212E-M	—	TS32	—	① TKY08D	—
	216SAS2	●	2	.500	1	4.5	1	2	—	.945	—	SRM216C SRM216C-M	SRM216E SRM216E-M	—	TS43	—	② TKY15T	—
	220SAS2	●	2	.625	1.25	5	1.25	2	—	1.102	—	SRM220C SRM220C-M	SRM220E SRM220E-M	—	TS55	—	② TKY25T	—
Medium	NEW SRM210SAM2	●	2	.313	.625	5	.75	2.5	1.0	.625	1° 30'	SRM210C-M	SRM210E-M	—	TS25H	—	① TKY08D	—
	212SAM2	●	2	.375	.75	5	1	2.5	1.25	.750	1° 30'	SRM212C SRM212C-M	SRM212E SRM212E-M	—	TS32	—	① TKY08D	—
	216SAM2	●	2	.500	1	5.5	1	3	—	.945	—	SRM216C SRM216C-M	SRM216E SRM216E-M	—	TS43	—	② TKY15T	—
	220SAM2	●	2	.625	1.25	6.5	1.25	3.5	—	1.102	—	SRM220C SRM220C-M	SRM220E SRM220E-M	—	TS55	—	② TKY25T	—
Long	NEW SRM210SAL2	●	2	.313	.625	6	.75	3.5	1.0	.625	1° 30'	SRM210C-M	SRM210E-M	—	TS25H	—	① TKY08D	—
	212SAL2	●	2	.375	.75	6	1	3.5	1.50	.750	1° 30'	SRM212C SRM212C-M	SRM212E SRM212E-M	—	TS32	—	① TKY08D	—
	216SAL2	●	2	.500	1	6.5	1.25	4	1.75	.945	1° 30'	SRM216C SRM216C-M	SRM216E SRM216E-M	—	TS43	—	② TKY15T	—
	220SAL2	●	2	.625	1.25	8	1.25	5	—	1.102	—	SRM220C SRM220C-M	SRM220E SRM220E-M	—	TS55	—	② TKY25T	—
Long Edge	SRM212SAL4	●	4	.375	.75	6	1	3.5	1.50	1.180	1° 30'	SRM212C SRM212C-M	SRM212E SRM212E-M	APMT1135 PDER-□2	TS32	TS25	① TKY08D	① TKY08D
	216SAL4	●	4	.500	1	6.5	1.25	4	1.75	1.457	1° 30'	SRM216C SRM216C-M	SRM216E SRM216E-M	APMT1135 PDER-□2	TS43	TS25	② TKY15T	③ TKY08F
	220SAL4	●	4	.625	1.25	8	1.25	5	—	1.732	—	SRM220C SRM220C-M	SRM220E SRM220E-M	APMT1604 PDER-□2	TS55	TS43	② TKY25T	③ TKY15F

● : Inventory maintained.

Inserts

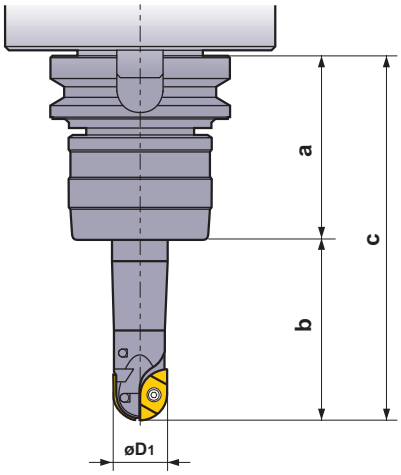
Type		Shape	Order Number	Class	Coated VP15TF		Dimensions (inch) R	L_1	L_2	S_1	F_1	Re	Geometry
Inner	With Breaker		NEW **SRM210C-M**	M	●		.313	.630	.323	.138	—	—	
			212C-M	M	●		.375	.748	.385	.169	—	—	
			216C-M	M	●		.500	.945	.512	.216	—	—	
			220C-M	M	●		.625	1.102	.638	.275	—	—	
Outer	With Breaker		NEW **SRM210E-M**	M	●		.313	.531	.258	.138	—	—	
			212E-M	M	●		.375	.610	.315	.169	—	—	
			216E-M	M	●		.500	.807	.409	.216	—	—	
			220E-M	M	●		.625	.964	.520	.275	—	—	
Inner	No Breaker	Strong Cutting Edge Type 	**SRM212C**	M	●		.375	.748	.385	.169	—	—	
			216C	M	●		.500	.945	.512	.216	—	—	
			220C	M	●		.625	1.102	.638	.275	—	—	
Outer	No Breaker	Strong Cutting Edge Type 	**SRM212E**	M	●		.375	.610	.315	.169	—	—	
			216E	M	●		.500	.807	.409	.216	—	—	
			220E	M	●		.625	.964	.520	.275	—	—	
Peripheral	With Breaker	M breaker 	**APMT1135PDER-M2**	M	●		—	.433	.250	.138	.047	.031	
			1604PDER-M2	M	●		—	.650	.375	.187	.055	.031	
	With Breaker	H breaker 	**APMT1135PDER-H2**	M	●		—	.433	.250	.138	.047	.031	
			1604PDER-H2	M	●		—	.650	.375	.187	.055	.031	

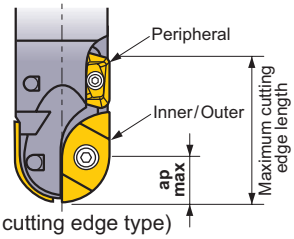
(Note) The **M** type breaker (APMT....PDER-M2) is the first recommendation for its excellent cutting performance.
Please use **H** type breakers (APMT....PDER-H2) due to cutting edge strength.

Ball-nose Endmill for Rough to Semi-finish Cutting

SRM2

Recommended Cutting Conditions





(Long cutting edge type)

Tool Overhang

Recommended cutting conditions on this literature are chosen based on deflection, vibration and machined surface when using a CAT50 arbor. Conditions-**"a"** is the length from a gage line to the arbor end face, and **"b"** is the neck length (tool overhang from the arbor).

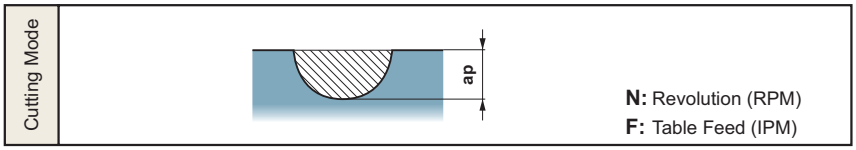
(Inch)

Cutting Diameter : øD1	Type	a	b	c
.625"	Short	4	1.5	5.5
	Medium		2.5	6.5
	Long		3.5	7.5
.75"	Short		1.5	5.5
	Medium		2.5	6.5
	Long		3.5	7.5
1.0"	Short		2.0	6.0
	Medium		3.0	7.0
	Long		4.0	8.0
1.25"	Short		2.0	6.0
	Medium		3.5	7.5
	Long		5.0	9.0

Recommended Depth of Cut for Long Cutting Edge Type

The maximum cutting edge length of the long cutting edge type with a peripheral insert is 1.4-1.5D1. The peripheral insert is for light machining only.
Maximum ap is 0.5D1 or below.

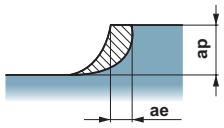
Slot Milling



	Work Material	Hardness	Cutting Speed (SFM)	Grade	Type	ϕ.625"			ϕ.75"			ϕ1.0"			ϕ1.25"		
						N	F	ap	N	F	ap	N	F	ap	N	F	ap
P	Carbon Steel Alloy Steel	180–280HB	500 (375–667)	VP15TF	Short	3056	29	.313	2546	24	.375	1910	18	.500	1528	14	.625
					Medium	3056	29	.313	2546	24	.375	1910	18	.500	1528	14	.625
					Long	3056	29	.208	2546	24	.250	1910	18	.333	1528	14	.417
		280–350HB	458 (375–542)	VP15TF	Short	2801	26	.313	2334	22	.375	1751	17	.500	1401	13	.625
					Medium	2801	26	.313	2334	22	.375	1751	17	.500	1401	13	.625
					Long	2801	26	.208	2334	22	.250	1751	17	.333	1401	13	.417
	Pre-Hardened Steel	35–45HRC	375 (333–500)	VP15TF	Short	2292	22	.313	1910	18	.375	1432	14	.500	1146	11	.625
					Medium	2292	22	.313	1910	18	.375	1432	14	.500	1146	11	.625
					Long	2292	22	.208	1910	18	.250	1432	14	.333	1146	11	.417
	Alloy Tool Steel	≤350HB	458 (375–542)	VP15TF	Short	2801	26	.313	2334	22	.375	1751	17	.500	1401	13	.625
					Medium	2801	26	.313	2334	22	.375	1751	17	.500	1401	13	.625
					Long	2801	26	.208	2334	22	.250	1751	17	.333	1401	13	.417
M	Stainless Steel	≤270HB	500 (333–667)	VP15TF	Short	3056	29	.313	2546	24	.375	1910	18	.500	1528	14	.625
					Medium	3056	29	.313	2546	24	.375	1910	18	.500	1528	14	.625
					Long	3056	29	.208	2546	24	.250	1910	18	.333	1528	14	.417
K	Gray Cast Iron	≤350MPa	667 (500–1000)	VP15TF	Short	4074	38	.313	3395	32	.375	2546	24	.500	2037	19	.625
					Medium	4074	38	.313	3395	32	.375	2546	24	.500	2037	19	.625
					Long	4074	38	.208	3395	32	.250	2546	24	.333	2037	19	.417
	Ductile Cast Iron	≤500MPa	583 (500–750)	VP15TF	Short	3565	34	.313	2971	28	.375	2228	21	.500	1783	17	.625
					Medium	3565	34	.313	2971	28	.375	2228	21	.500	1783	17	.625
					Long	3565	34	.208	2971	28	.250	2228	21	.333	1783	17	.417
		≤800MPa	500 (500–750)	VP15TF	Short	3056	29	.313	2546	24	.375	1910	18	.500	1528	14	.625
					Medium	3056	29	.313	2546	24	.375	1910	18	.500	1528	14	.625
					Long	3056	29	.208	2546	24	.250	1910	18	.333	1528	14	.417
H	Heat Treated Steel	45–50HRC	333 (167–417)	VP15TF	Short	2037	19	.313	1698	16	.375	1273	12	.500	1019	10	.625
					Medium	2037	19	.313	1698	16	.375	1273	12	.500	1019	10	.625
					Long	2037	19	.208	1698	16	.250	1273	12	.333	1019	10	.417
		50–60HRC	188 (125–333)	VP15TF	Short	1146	11	.313	955	9	.375	716	7	.500	573	5	.625
					Medium	1146	11	.313	955	9	.375	716	7	.500	573	5	.625
					Long	1146	11	.208	955	9	.250	716	7	.333	573	5	.417

Shoulder Milling (Cutting Depth : Small)

Cutting Mode

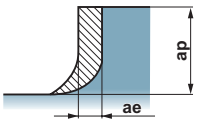


N : Revolution (RPM)
F : Table Feed (IPM)

	Work Material	Hardness	Cutting Speed (SFM)	Grade	Type	ϕ.625"				ϕ.75"				ϕ1.0"				ϕ1.25"			
						N	F	ap	ae	N	F	ap	ae	N	F	ap	ae	N	F	ap	ae
P	Carbon Steel Alloy Steel	180–280HB	625 (375–750)	VP15TF	Short	3820	45	.156	.313	3183	38	.188	.375	2387	28	.250	.500	1910	23	.313	.625
					Medium	3820	36	.156	.250	3183	30	.188	.300	2387	23	.250	.400	1910	18	.313	.500
					Long	3820	36	.156	.188	3183	30	.188	.225	2387	23	.250	.300	1910	18	.313	.375
		280–350HB	500 (375–667)	VP15TF	Short	3056	36	.156	.313	2546	30	.188	.375	1910	23	.250	.500	1528	18	.313	.625
					Medium	3056	29	.156	.250	2546	24	.188	.300	1910	18	.250	.400	1528	14	.313	.500
					Long	3056	29	.156	.188	2546	24	.188	.225	1910	18	.250	.300	1528	14	.313	.375
	Pre-Hardened Steel	35–45HRC	500 (375–667)	VP15TF	Short	3056	36	.156	.313	2546	30	.188	.375	1910	23	.250	.500	1528	18	.313	.625
					Medium	3056	29	.156	.250	2546	24	.188	.300	1910	18	.250	.400	1528	14	.313	.500
					Long	3056	29	.156	.188	2546	24	.188	.225	1910	18	.250	.300	1528	14	.313	.375
	Alloy Tool Steel	≤350HB	500 (375–542)	VP15TF	Short	3056	36	.156	.313	2546	30	.188	.375	1910	23	.250	.500	1528	18	.313	.625
					Medium	3056	29	.156	.250	2546	24	.188	.300	1910	18	.250	.400	1528	14	.313	.500
					Long	3056	29	.156	.188	2546	24	.188	.225	1910	18	.250	.300	1528	14	.313	.375
M	Stainless Steel	≤270HB	625 (333–667)	VP15TF	Short	3820	45	.156	.313	3183	38	.188	.375	2387	28	.250	.500	1910	23	.313	.625
					Medium	3820	36	.156	.250	3183	30	.188	.300	2387	23	.250	.400	1910	18	.313	.500
					Long	3820	36	.156	.188	3183	30	.188	.225	2387	23	.250	.300	1910	18	.313	.375
K	Gray Cast Iron	≤350MPa	625 (500–1000)	VP15TF	Short	3820	51	.156	.313	3183	43	.188	.375	2387	32	.250	.500	1910	26	.313	.625
					Medium	3820	36	.156	.313	3183	30	.188	.375	2387	23	.250	.400	1910	18	.313	.500
					Long	3820	36	.156	.250	3183	30	.188	.300	2387	23	.250	.300	1910	18	.313	.375
	Ductile Cast Iron	≤500MPa	625 (500–750)	VP15TF	Short	3820	45	.156	.313	3183	38	.188	.375	2387	28	.250	.500	1910	23	.313	.625
					Medium	3820	36	.156	.313	3183	30	.188	.375	2387	23	.250	.400	1910	18	.313	.500
					Long	3820	36	.156	.250	3183	30	.188	.300	2387	23	.250	.300	1910	18	.313	.375
		≤800MPa	583 (500–750)	VP15TF	Short	3565	42	.156	.313	2971	35	.188	.375	2228	26	.250	.500	1783	21	.313	.625
					Medium	3565	34	.156	.313	2971	28	.188	.375	2228	21	.250	.400	1783	17	.313	.500
					Long	3565	34	.156	.250	2971	28	.188	.300	2228	21	.250	.300	1783	17	.313	.375
H	Heat Treated Steel	45–50HRC	333 (167–417)	VP15TF	Short	2037	24	.156	.156	1698	20	.188	.188	1273	15	.250	.250	1019	12	.313	.313
					Medium	2037	19	.156	.125	1698	16	.188	.188	1273	12	.250	.200	1019	10	.313	.250
					Long	2037	19	.156	.094	1698	16	.188	.188	1273	12	.250	.150	1019	10	.313	.188
		50–60HRC	188 (125–333)	VP15TF	Short	1146	14	.156	.156	955	11	.188	.188	716	8	.250	.250	573	7	.313	.313
					Medium	1146	11	.156	.125	955	9	.188	.188	716	7	.250	.200	573	5	.313	.250
					Long	1146	11	.156	.094	955	9	.188	.188	716	7	.250	.150	573	5	.313	.188

Shoulder Milling (Cutting Depth : Large)

Cutting Mode



N : Revolution (RPM)
F : Table Feed (IPM)

*Machining Stainless Steels

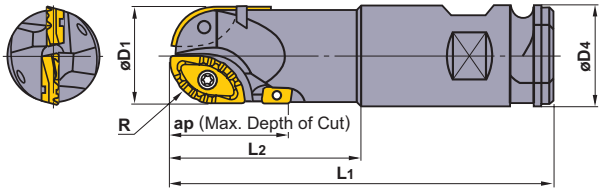
Down cutting (climb milling) is preferred.

	Work Material	Hardness	Cutting Speed (SFM)	Grade	Type	ϕ.625"				ϕ.75"				ϕ1.0"				ϕ1.25"			
						N	F	ap	ae	N	F	ap	ae	N	F	ap	ae	N	F	ap	ae
P	Carbon Steel Alloy Steel	180–280HB	625 (375–750)	VP15TF	Short	3820	45	.313	.156	3183	38	.375	.188	2387	28	.500	.250	1910	23	.625	.313
					Medium	3820	36	.313	.156	3183	30	.375	.188	2387	23	.500	.250	1910	18	.625	.313
					Long	3820	36	.313	.125	3183	30	.375	.150	2387	23	.500	.200	1910	18	.625	.250
		280–350HB	500 (375–667)	VP15TF	Short	3056	36	.313	.156	2546	30	.375	.188	1910	23	.500	.250	1528	18	.625	.313
					Medium	3056	29	.313	.156	2546	24	.375	.188	1910	18	.500	.250	1528	14	.625	.313
					Long	3056	29	.313	.125	2546	24	.375	.150	1910	18	.500	.200	1528	14	.625	.250
	Pre-Hardened Steel	35–45HRC	500 (375–667)	VP15TF	Short	3056	36	.313	.156	2546	30	.375	.188	1910	23	.500	.250	1528	18	.625	.313
					Medium	3056	29	.313	.156	2546	24	.375	.188	1910	18	.500	.250	1528	14	.625	.313
					Long	3056	29	.313	.125	2546	24	.375	.150	1910	18	.500	.200	1528	14	.625	.250
	Alloy Tool Steel	≤350HB	500 (375–542)	VP15TF	Short	3056	36	.313	.156	2546	30	.375	.188	1910	23	.500	.250	1528	18	.625	.313
					Medium	3056	29	.313	.156	2546	24	.375	.188	1910	18	.500	.250	1528	14	.625	.313
					Long	3056	29	.313	.125	2546	24	.375	.150	1910	18	.500	.200	1528	14	.625	.250
M	Stainless Steel	≤270HB	625 (333–667)	VP15TF	Short	3820	45	.313	.208	3183	38	.375	.250	2387	28	.500	.333	1910	23	.625	.417
					Medium	3820	36	.313	.167	3183	30	.375	.200	2387	23	.500	.267	1910	18	.625	.333
					Long	3820	36	.313	.125	3183	30	.375	.150	2387	23	.500	.200	1910	18	.625	.250
K	Gray Cast Iron	≤350MPa	625 (500–1000)	VP15TF	Short	3820	51	.313	.208	3183	43	.375	.250	2387	32	.500	.333	1910	26	.625	.417
					Medium	3820	36	.313	.208	3183	30	.375	.250	2387	23	.500	.267	1910	18	.625	.417
					Long	3820	36	.313	.167	3183	30	.375	.200	2387	23	.500	.200	1910	18	.625	.333
	Ductile Cast Iron	≤500MPa	625 (500–750)	VP15TF	Short	3820	45	.313	.208	3183	38	.375	.250	2387	28	.500	.333	1910	23	.625	.417
					Medium	3820	36	.313	.208	3183	30	.375	.250	2387	23	.500	.267	1910	18	.625	.417
					Long	3820	36	.313	.167	3183	30	.375	.200	2387	23	.500	.200	1910	18	.625	.333
		≤800MPa	583 (500–750)	VP15TF	Short	3565	42	.313	.208	2971	35	.375	.250	2228	26	.500	.333	1783	21	.625	.417
					Medium	3565	34	.313	.208	2971	28	.375	.250	2228	21	.500	.267	1783	17	.625	.417
					Long	3565	34	.313	.167	2971	28	.375	.200	2228	21	.500	.200	1783	17	.625	.333
H	Heat Treated Steel	45–50HRC	333 (167–417)	VP15TF	Short	2037	24	.313	.125	1698	20	.375	.150	1273	15	.500	.200	1019	12	.625	.250
					Medium	2037	19	.313	.100	1698	16	.375	.120	1273	12	.500	.160	1019	10	.625	.200
					Long	2037	19	.313	.075	1698	16	.375	.090	1273	12	.500	.120	1019	10	.625	.150
		50–60HRC	188 (125–333)	VP15TF	Short	1146	14	.313	.125	955	11	.375	.150	716	8	.500	.200	573	7	.625	.250
					Medium	1146	11	.313	.100	955	9	.375	.120	716	7	.500	.160	573	5	.625	.200
					Long	1146	11	.313	.075	955	9	.375	.090	716	7	.500	.120	573	5	.625	.150

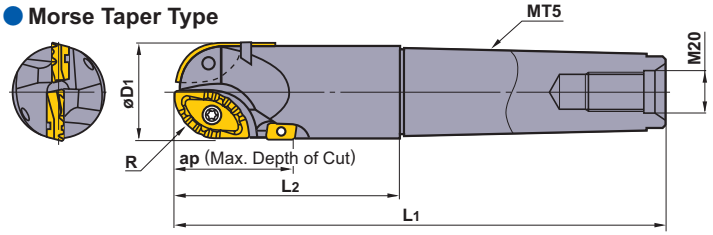
Ball-nose Endmill for Rough Cutting

SRM2 Ø40 (1.575") Ø50 (1.969")

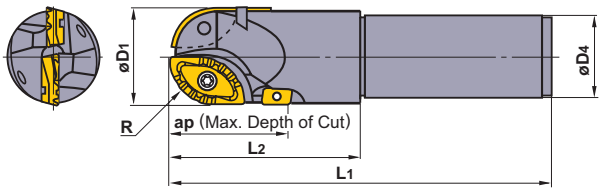
Combination Type



Morse Taper Type



Straight Type

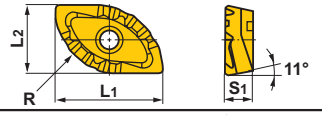
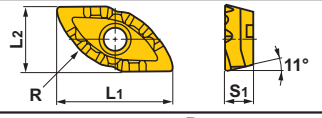
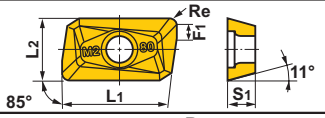
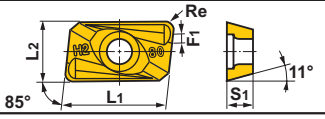


Metric Standard

Right hand tool holder only.

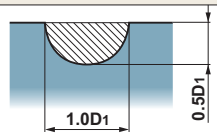
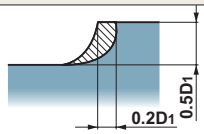
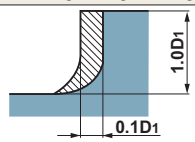
Type		Order Number	Stock	Number of Flutes	Dimensions (inch)						Inner	Outer	Peripheral	Inner, Outer	Peripheral	Inner, Outer	Peripheral
			R		R	D1	D4	L1	L2	ap	Insert			Insert Screw		Wrench	
Combination	Standard	**SRM2400WNLS**	★	2	.787	1.575	2.000	7.874	4.724	2.126	SRG40C	SRG40E	APMT1604 PDER-□2	TS6S	TS43	TKY30T	TKY15F
		2500WNLS	★	2	.984	1.969	2.000	7.874	4.724	2.480	SRG50C	SRG50E	APMT1604 PDER-□2	TS6	TS43	TKY30T	TKY15F
	Long	**2400WNLM**	★	2	.787	1.575	2.000	9.843	6.693	2.126	SRG40C	SRG40E	APMT1604 PDER-□2	TS6S	TS43	TKY30T	TKY15F
		2500WNLM	★	2	.984	1.969	2.000	9.843	6.693	2.480	SRG50C	SRG50E	APMT1604 PDER-□2	TS6	TS43	TKY30T	TKY15F
	Extra Long	**2500WNLL**	★	2	.984	1.969	2.000	11.811	8.661	2.480	SRG50C	SRG50E	APMT1604 PDER-□2	TS6	TS43	TKY30T	TKY15F
		2500WNLX	★	2	.984	1.969	2.000	13.780	10.630	2.480	SRG50C	SRG50E	APMT1604 PDER-□2	TS6	TS43	TKY30T	TKY15F
Straight	Standard	**SRM2400SNLS**	★	2	.787	1.575	1.654	7.874	3.937	2.126	SRG40C	SRG40E	APMT1604 PDER-□2	TS6S	TS43	TKY30T	TKY15F
		2500SNLS	★	2	.984	1.969	1.654	7.874	3.937	2.480	SRG50C	SRG50E	APMT1604 PDER-□2	TS6	TS43	TKY30T	TKY15F
	Long	**2400SNLM**	★	2	787	1.575	1.654	9.843	3.937	2.126	SRG40C	SRG40E	APMT1604 PDER-□2	TS6S	TS43	TKY30T	TKY15F
		2500SNLM	★	2	.984	1.969	1.654	9.843	3.937	2.480	SRG50C	SRG50E	APMT1604 PDER-□2	TS6	TS43	TKY30T	TKY15F
Morse Taper	Standard	**SRM2500MNLS**	★	2	.984	1.969	—	10.079	4.724	2.480	SRG50C	SRG50E	APMT1604 PDER-□2	TS6	TS43	TKY30T	TKY15F
	Long	**2500MNLM**	★	2	.984	1.969	—	11.260	5.906	2.480	SRG50C	SRG50E	APMT1604 PDER-□2	TS6	TS43	TKY30T	TKY15F

Inserts

Application	Shape	Order Number	Class	Coated VP15TF	Coated VP20RT	Coated VP30RT	R	L1	L2	S1	F1	Re	Geometry
Inner		**SRG40C**	G	★	★	★	.787	1.417	.807	.315	—	—	
		50C	G	★	★	★	.984	1.574	1.024	.335	—	—	
Outer		**SRG40E**	G	★	★	★	.787	1.260	.654	.315	—	—	
		50E	G	★	★	★	.984	1.409	.787	.335	—	—	
Peripheral		**APMT1604PDER-M2**	M	●			—	0.650	.375	.188	.055	.031	
	Strong Cutting Edge Type 	**APMT1604PDER-H2**	M	●			—	0.650	.375	.188	.055	.031	

● : Inventory maintained. ★ : Inventory maintained in Japan.

Recommended Cutting Conditions

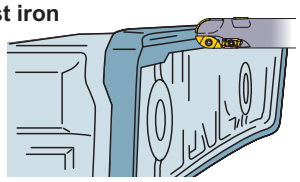
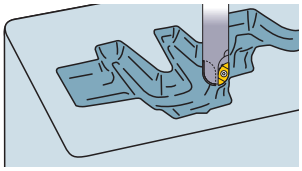
Cutting Mode	A : Slot Milling	B : Shoulder Milling (Standard Type)	C : Shoulder Milling (Long Cutting Edge Type)
			

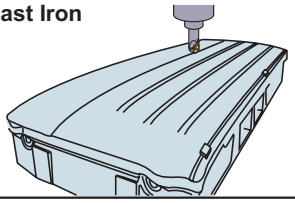
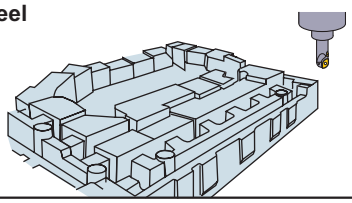
	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed per Tooth (IPR)	Cutting Mode
P	Alloy Tool Steel	≤250HB	**VP20RT VP30RT**	655 (525—820)	.008 (.004—.012)	A
					.008 (.004—.016)	B
					.012 (.004—.016)	C
	Cast Tool Steel	≤230HB	**VP15TF VP20RT**	655 (525—985)	.008 (.004—.012)	A
					.012 (.004—.018)	B
					.008 (.004—.016)	C
K	Ductile Cast Iron	Tensile Strength ≤540MPa	**VP15TF VP20RT**	655 (525—985)	.010 (.004—.016)	A
					.010 (.004—.018)	B
					.014 (.004—.018)	C
	Cast Iron	Tensile Strength ≤250MPa	**VP15TF VP20RT**	655 (525—985)	.010 (.004—.016)	A
					.014 (.004—.018)	B
					.010 (.004—.016)	C

Ball-nose Endmill for Rough to Semi-finish Cutting

SRM2 Series

Application Examples

Tool		SRM220SAL2	SRM220SAM2
Insert		SRM220C-M, SRM220E-M	SRM220C-M, SRM220E-M
Machine		Horizontal machining center	Double housing planing machining center
Workpiece		**Gray cast iron** 	**Alloy steel** 
Component		Press mold	Forging mold
Cutting Conditions	Cutting Speed (SFM)	540	370
	Table Feed (IPM)	27.5	11.8
	Feed per Tooth (IPT)	.009	.005
	Depth of Cut (inch)	.197–.315	.197
	Width of Cut (inch)	.197	.591
	Coolant	Air blow	Air blow
Results		Compared to a competitor's ball nose end mill, the SRM2 has offered better cutting performance, made smaller cutting noise and lengthen tool life 1.5 fold.	Compared to a competitor's ball nose end mill, the SRM2 has offered better cutting performance, made smaller cutting noise and lengthen tool life 1.3 fold.

Tool		SRM2500WNLM	SRM2500WNLS
Grade		VP15TF	VP20RT
Machine		2 way machining	Zigzag machining
Workpiece		**Ductile Cast Iron** 	**Die steel** 
Component		Press mold	Press mold
Cutting Conditions	Revolution (min^{-1})	1200	1200
	Table Feed (IPM)	23.6–47.5	23.6
	Depth of Cut (inch)	.394–.591	.197–.787
	Pick Feed (inch)	.276	.394
	Coolant	Dry Cutting	Dry Cutting
Results		●Compared to a competitor's conventional product, tool life has become about 1.3 - 2 times longer . ●Small cutting noise and excellent chip disposal enabled unmanned machining at night.	●Compared to a competitor's conventional product, tool life has become about 2 times longer. ●Unmanned machining has been achieved without unexpected insert fracture. ●Small cutting noise and stable cutting performance.

Avoiding screws/bolts seizing
●In order to avoid screws/bolts seizing, the application of a special lubricant MK1K (separately sold) is recommended when setting inserts on end mills.

For your safety
●Do not touch cutting or chips without wearing gloves. ●Use tools under recommended cutting conditions, and exchange tools before excessive wear occurs. ●Chips become extremely hot, scattered over and may be stretched. Ensure safety guards and goggles are used. ●In case of using non-water soluble oil, make sure to have a fire prevention countermeasure. ●Use the provided wrench spanner, and ensure the inserts and spare parts are damped securely.

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(Tools specifications subject to change without notice.)

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