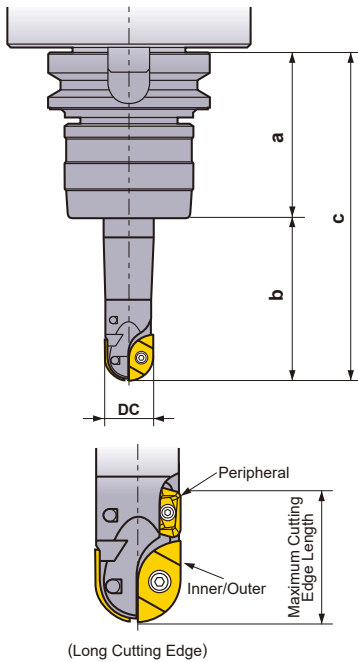


RECOMMENDED CUTTING CONDITIONS

SRM2 $\varnothing 16 - \varnothing 32$



Tool Overhang

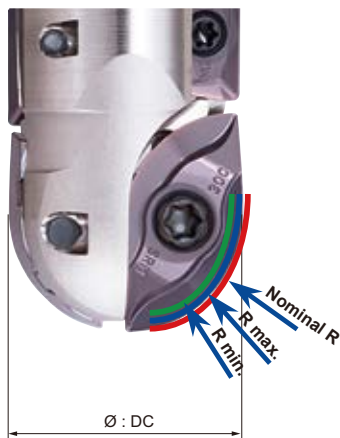
The recommended cutting conditions are chosen based on deflection, vibration and surface finish when using a BT50 arbor under the conditions below -"a", a length from the gauge line to the arbor end face and "b", neck length (tool overhang from the arbor).

Cutting Edge Diameter:DC	Type	a	b	c
16	Standard	105	50	155
	Long Neck		70	175
	Extra Long		—	—
20	Standard		70	175
	Long Neck		100	205
	Extra Long		150	255
25	Standard		80	185
	Long Neck		120	225
	Extra Long		200	305
30	Standard		100	205
	Long Neck	150	255	
	Extra Long	250	355	

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 1.4-1.5DC. The peripheral insert's main purpose is to remove the small un-machined portions of the pre-machined surface above the main cutting edge. Please refer to recommended cutting conditions for recommended depth of cut **ap**.

Radius tolerance and other dimensions with an insert mounted in the body



Radial tolerance

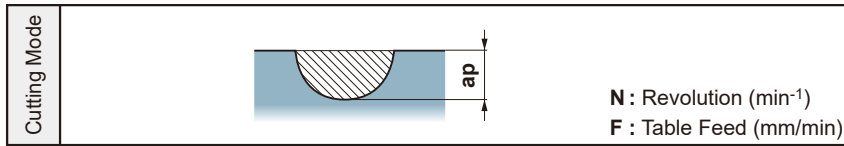
Cutting Edge Diameter DC	Nominal R	Tolerance	R min.	R max.
16	8	G	7.925	7.975
		M	7.910	7.970
20	10	G	9.925	9.975
		M	9.910	9.970
25	12.5	G	12.425	12.475
		M	12.410	12.470
30	15	G	14.925	14.975
		M	14.910	14.970

Dimensions with an insert mounted in the body

Cutting Edge Diameter DC	Tolerance	DC min.	DC max.
16	G	15.800	16.000
	M	15.770	15.990
20	G	19.800	20.000
	M	19.770	19.990
25	G	24.800	25.000
	M	24.770	24.990
30	G	29.800	30.000
	M	29.770	29.990

*M : Precision M class

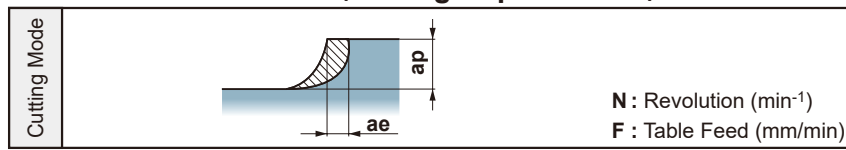
■ SLOT MILLING



Work Material	Hardness	Cutting Speed (m/min)	Insert Grade, Type	Holder Type	φ16			φ20			φ25			φ30				
					N	F	ap	N	F	ap	N	F	ap	N	F	ap		
P Carbon Steel Alloy Steel	180-280HB	160 (120-200)	MP6120 VP15TF Low Resistance Type	Standard	3183	382	6	2546	306	8	2037	489	12.5	1698	407	15		
				Long Neck	3183	382	4	2546	306	4	2037	489	6	1698	407	7.5		
				Extra Long	-	-	-	2546	306	2	2037	489	4	1698	407	3		
			280-350HB	140 (120-160)	MP6120 VP15TF Low Resistance Type	Standard	2785	334	6	2228	267	8	1783	428	12.5	1485	357	15
						Long Neck	2785	334	4	2228	267	4	1783	428	6	1485	357	7.5
						Extra Long	-	-	-	2228	267	2	1783	428	4	1485	357	3
	Pre-Hardened Steel	35-45HRC	120 (100-160)	MP6120 VP15TF Low Resistance Type	Standard	2387	286	6	1910	229	8	1528	367	12.5	1273	306	15	
					Long Neck	2387	286	4	1910	229	4	1528	367	6	1273	306	7.5	
					Extra Long	-	-	-	1910	229	2	1528	367	4	1273	306	3	
	Alloy Tool Steel	≤350HB	140 (120-160)	MP6120 VP15TF Low Resistance Type	Standard	2785	334	6	2228	267	8	1783	535	10	1485	594	12	
					Long Neck	2785	334	4	2228	267	4	1783	535	5	1485	594	4.5	
					Extra Long	-	-	-	2228	267	2	1783	535	2.5	1485	594	1.5	
M Stainless Steel	≤270HB	200 (100-250)	VP15TF Low Resistance Type	Standard	3979	477	4	3183	382	5	2546	764	6	2122	849	7.5		
				Long Neck	3979	477	3	3183	382	3	2546	611	4	2122	637	4.5		
				Extra Long	-	-	-	3183	382	1.5	2546	509	1.5	2122	509	1.5		
K Gray Cast Iron	≤350MPa	200 (150-300)	VP15TF Low Resistance Type	Standard	3979	796	6	3183	637	8	2546	1019	12.5	2122	849	15		
				Long Neck	3979	796	4	3183	637	4	2546	1019	7.5	2122	849	4.5		
				Extra Long	-	-	-	3183	637	2	2546	1019	4	2122	849	3		
	Ductile Cast Iron	≤500MPa	180 (150-240)	VP15TF Low Resistance Type	Standard	3581	716	6	2865	573	8	2292	917	12.5	1910	764	15	
					Long Neck	3581	716	4	2865	573	4	2292	917	7.5	1910	764	4.5	
					Extra Long	-	-	-	2865	573	2	2292	917	4	1910	764	1.5	
	Ductile Cast Iron	≤800MPa	160 (150-250)	VP15TF Low Resistance Type	Standard	3183	637	6	2546	509	8	2037	815	12.5	1698	679	15	
					Long Neck	3183	637	4	2546	509	4	2037	815	7.5	1698	679	4.5	
					Extra Long	-	-	-	2546	509	2	2037	815	4	1698	679	1.5	
H Hardened Steel	45-50HRC	100 (60-120)	VP15TF Strong Cutting Edge Type	Standard	1989	239	4	1591	191	4	1273	255	6	1061	212	7.5		
				Long Neck	1989	239	2	1591	191	2	1273	255	4	1061	212	3		
				Extra Long	-	-	-	1591	191	1	1273	255	2.5	1061	212	1.5		
	Hardened Steel	50-60HRC	60 (40-100)	VP15TF Strong Cutting Edge Type	Standard	1194	143	4	955	115	4	764	153	6	637	127	7.5	
					Long Neck	1194	143	2	955	115	2	764	153	4	637	127	3	
					Extra Long	-	-	-	955	115	1	764	153	2.5	637	127	1.5	
S Titanium Alloy	≤350HB	50 (30-60)	MP9120	Standard	995	100	4	796	80	4	637	64	6	531	53	7.5		
				Long Neck	995	100	2	796	80	2	637	64	4	531	53	3		
				Extra Long	-	-	-	796	80	1	637	64	2.5	531	53	1.5		
	Heat Resistant Alloy	-	40 (30-60)	MP9120	Standard	796	80	4	637	64	4	510	51	6	425	43	7.5	
					Long Neck	796	80	2	637	64	2	510	51	4	425	43	3	
					Extra Long	-	-	-	637	64	1	510	51	2.5	425	43	1.5	

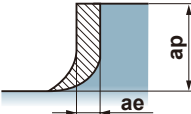
RECOMMENDED CUTTING CONDITIONS

■ SHOULDER MILLING (Cutting Depth : Small)



Work Material	Hardness	Cutting Speed (m/min)	Insert Grade, Type	Holder Type	φ16				φ20				φ25				φ30				
					N	F	ap	ae	N	F	ap	ae	N	F	ap	ae	N	F	ap	ae	
P Carbon Steel Alloy Steel	180-280HB	200 (160-250)	MP6120 VP15TF Low Resistance Type	Standard	3979	796	4	6	3183	955	5	8	2546	1273	6	10	2122	1273	7.5	10	
				Long Neck	3979	637	4	4	3183	637	5	6	2546	1273	6	7.5	2122	1273	7.5	7.5	
				Extra Long	—	—	—	—	3183	382	5	4	2546	1019	6	5	2122	637	7.5	3	
	280-350HB	160 (120-200)	MP6120 VP15TF Low Resistance Type	Standard	3183	509	4	6	2546	509	5	8	2037	815	6	10	1698	849	7.5	10	
				Long Neck	3183	382	4	4	2546	407	5	6	2037	611	6	7.5	1698	509	7.5	7.5	
				Extra Long	—	—	—	—	2546	306	5	4	2037	489	6	5	1698	407	7.5	3	
	Pre-Hardened Steel	35-45HRC	160 (120-200)	MP6120 VP15TF Low Resistance Type	Standard	3183	509	4	6	2546	509	5	8	2037	815	6	10	1698	849	7.5	10
					Long Neck	3183	382	4	4	2546	407	5	6	2037	611	6	7.5	1698	679	7.5	7.5
					Extra Long	—	—	—	—	2546	306	5	4	2037	489	6	5	1698	509	7.5	3
	Alloy Tool Steel	≤350HB	160 (120-200)	MP6120 VP15TF Low Resistance Type	Standard	3183	509	4	6	2546	509	5	8	2037	815	6	10	1698	849	7.5	10
					Long Neck	3183	382	4	4	2546	407	5	6	2037	611	6	7.5	1698	509	7.5	7.5
					Extra Long	—	—	—	—	2546	306	5	4	2037	489	6	2.5	1698	407	7.5	1.5
M Stainless Steel	≤270HB	200 (100-250)	VP15TF Low Resistance Type	Standard	3979	477	4	6	3183	509	5	8	2546	764	6	10	2122	849	7.5	10	
				Long Neck	3979	477	4	4	3183	382	5	6	2546	611	6	7.5	2122	849	7.5	7.5	
				Extra Long	—	—	—	—	3183	382	5	4	2546	509	6	5	2122	424	7.5	1.5	
K Gray Cast Iron	≤350MPa	200 (150-300)	VP15TF Low Resistance Type	Standard	3979	1592	4	8	3183	1592	5	10	2546	1528	6	10	2122	1485	7.5	10	
				Long Neck	3979	1194	4	6	3183	1273	5	8	2546	1528	6	10	2122	1485	7.5	6	
				Extra Long	—	—	—	—	3183	955	5	6	2546	1273	6	7.5	2122	1061	7.5	3	
	Ductile Cast Iron	≤500MPa	200 (150-280)	VP15TF Low Resistance Type	Standard	3979	1592	4	8	3183	1592	5	10	2546	1528	6	10	2122	1273	7.5	10
					Long Neck	3979	1194	4	6	3183	1273	5	8	2546	1528	6	10	2122	1273	7.5	6
					Extra Long	—	—	—	—	3183	955	5	6	2546	1273	6	7.5	2122	1061	7.5	3
	Ductile Cast Iron	≤800MPa	180 (150-250)	VP15TF Low Resistance Type	Standard	3581	1432	4	8	2865	1433	5	10	2292	1375	6	10	1910	1146	7.5	10
					Long Neck	3581	1074	4	6	2865	1146	5	8	2292	1375	6	10	1910	1146	7.5	6
					Extra Long	—	—	—	—	2865	860	5	6	2292	1146	6	7.5	1910	955	7.5	3
H Hardened Steel	45-50HRC	100 (60-120)	VP15TF Strong Cutting Edge Type	Standard	1989	239	4	4	1591	191	5	5	1273	255	6	7.5	1061	212	7.5	3	
				Long Neck	1989	239	4	2	1591	191	5	3	1273	255	6	4	1061	212	7.5	1.5	
				Extra Long	—	—	—	—	1591	191	5	2	1273	204	6	1.5	1061	170	7.5	1	
	50-60HRC	60 (40-100)	VP15TF Strong Cutting Edge Type	Standard	1194	143	4	4	955	115	5	5	764	153	6	7.5	637	127	7.5	3	
				Long Neck	1194	143	4	2	955	115	5	3	764	153	6	4	637	127	7.5	1.5	
				Extra Long	—	—	—	—	955	115	5	2	764	122	6	1.5	637	102	7.5	1	
S Titanium Alloy	≤350HB	50 (30-60)	MP9120	Standard	995	299	4	4	796	239	4	5	637	191	6	7.5	531	159	7.5	3	
				Long Neck	995	299	2	2	796	239	2	3	637	191	4	4	531	159	3	1.5	
				Extra Long	—	—	—	—	796	239	1	2	637	191	2.5	1.5	531	159	1.5	1	
	Heat Resistant Alloy	—	40 (30-60)	MP9120	Standard	796	239	4	4	637	191	4	5	510	153	6	7.5	425	128	7.5	3
					Long Neck	796	239	2	2	637	191	2	3	510	153	4	4	425	128	3	1.5
					Extra Long	—	—	—	—	637	191	1	2	510	153	2.5	1.5	425	128	1.5	1

SHOULDER MILLING (Cutting Depth : Large)

Cutting Mode	
	<p>N : Revolution (min⁻¹)</p> <p>F : Table Feed (mm/min)</p>

Note: Machining Stainless Steels

When up-cut milling stainless steels at large depths and widths of cut, the machined surface is liable to burrs and welding due to chip jamming. For stainless steels, down-cutting (climb milling) is recommended.

Work Material	Hardness	Cutting Speed (m/min)	Insert Grade, Type	Holder Type	φ16				φ20				φ25				φ30				
					N	F	ap	ae	N	F	ap	ae	N	F	ap	ae	N	F	ap	ae	
P Carbon Steel Alloy Steel	180-280HB	200 (160-250)	MP6120 VP15TF Low Resistance Type	Standard	3979	637	8	4	3183	764	10	4	2546	1273	12.5	5	2122	1273	15	4.5	
				Long Neck	3979	477	8	3	3183	509	10	3	2546	1019	12.5	4	2122	849	15	3	
				Extra Long	—	—	—	—	3183	382	10	2	2546	764	12.5	2.5	2122	849	15	1.5	
	280-350HB	160 (120-200)	MP6120 VP15TF Low Resistance Type	Standard	3183	382	8	4	2546	509	10	4	2037	815	12.5	5	1698	849	15	4.5	
				Long Neck	3183	382	8	3	2546	306	10	3	2037	611	12.5	4	1698	509	15	3	
				Extra Long	—	—	—	—	2546	306	10	2	2037	489	12.5	2.5	1698	407	15	1.5	
	Pre-Hardened Steel	35-45HRC	160 (120-200)	MP6120 VP15TF Low Resistance Type	Standard	3183	382	8	4	2546	509	10	4	2037	815	12.5	5	1698	849	15	4.5
					Long Neck	3183	382	8	3	2546	306	10	3	2037	611	12.5	4	1698	509	15	3
					Extra Long	—	—	—	—	2546	306	10	2	2037	489	12.5	2.5	1698	407	15	1.5
	Alloy Tool Steel	≤350HB	160 (120-200)	MP6120 VP15TF Low Resistance Type	Standard	3183	382	8	4	2546	509	10	4	2037	815	12.5	5	1698	849	15	4.5
					Long Neck	3183	382	8	3	2546	306	10	3	2037	611	12.5	2.5	1698	509	15	3
					Extra Long	—	—	—	—	2546	306	10	2	2037	489	12.5	1.5	1698	407	15	1.5
M Stainless Steel	≤270HB	200 (100-250)	VP15TF Low Resistance Type	Standard	3979	477	8	4	3183	509	10	4	2546	764	12.5	10	2122	849	15	10	
				Long Neck	3979	477	8	3	3183	382	10	3	2546	611	12.5	4	2122	509	15	4.5	
				Extra Long	—	—	—	—	3183	382	10	2	2546	489	12.5	1.5	2122	340	15	1.5	
K Gray Cast Iron	≤350MPa	200 (150-300)	VP15TF Low Resistance Type	Standard	3979	1194	8	8	3183	1273	10	8	2546	1273	12.5	10	2122	1485	15	10	
				Long Neck	3979	955	8	5	3183	955	10	4	2546	1273	12.5	7.5	2122	1061	15	4.5	
				Extra Long	—	—	—	—	3183	764	10	2	2546	1019	12.5	1.5	2122	849	15	3	
	Ductile Cast Iron	≤500MPa	200 (150-280)	VP15TF Low Resistance Type	Standard	3979	1194	8	8	3183	1273	10	8	2546	1273	12.5	10	2122	1273	15	10
					Long Neck	3979	955	8	5	3183	955	10	4	2546	1273	12.5	7.5	2122	849	15	4.5
					Extra Long	—	—	—	—	3183	764	10	2	2546	1019	12.5	5	2122	849	15	1.5
	Ductile Cast Iron	≤800MPa	180 (150-250)	VP15TF Low Resistance Type	Standard	3581	1074	8	8	2865	1146	10	8	2292	1146	12.5	10	1910	1146	15	10
					Long Neck	3581	859	8	5	2865	860	10	4	2292	1146	12.5	7.5	1910	764	15	4.5
					Extra Long	—	—	—	—	2865	688	10	2	2292	917	12.5	5	1910	764	15	1.5
	H Hardened Steel	45-50HRC	100 (60-120)	VP15TF Strong Cutting Edge Type	Standard	1989	239	8	2	1591	191	10	3	1273	255	12.5	4	1061	212	15	3
					Long Neck	1989	239	8	1	1591	191	10	2	1273	204	12.5	1.5	1061	106	15	1.5
					Extra Long	—	—	—	—	1591	191	10	1	—	—	—	—	—	—	—	—
50-60HRC		60 (40-100)	VP15TF Strong Cutting Edge Type	Standard	1194	143	8	2	955	115	10	3	764	153	12.5	4	637	127	15	3	
				Long Neck	1194	143	8	1	955	115	10	2	764	122	12.5	1.5	637	64	15	1.5	
				Extra Long	—	—	—	—	955	115	10	1	—	—	—	—	—	—	—	—	
S Titanium Alloy	≤350HB	50 (30-60)	MP9120	Standard	995	199	4	2	796	159	4	3	637	127	6	4	531	106	7.5	3	
				Long Neck	995	199	2	1	796	159	2	2	637	127	4	1.5	531	106	3	1.5	
				Extra Long	—	—	—	—	796	159	1	1	637	127	2.5	—	531	106	1.5	—	
	Heat Resistant Alloy	—	40 (30-60)	MP9120	Standard	796	159	4	2	637	127	4	3	510	102	6	4	425	85	7.5	3
					Long Neck	796	159	2	1	637	127	2	2	510	102	4	1.5	425	85	3	1.5
					Extra Long	—	—	—	—	637	127	1	1	510	102	2.5	—	425	85	1.5	—