IASRF/ASRF-mini

MOLDINO
The Edge To Innovation

Super Radius Indexable Mills with Four Corner Inserts

SHANK STYLE

MODULAR STYLE

FACE MILL STYLE

FEATURES

Economical four corner inserts

Insert design reduces cutting force during high feed rate machining

Three types of chip breakers for various applications

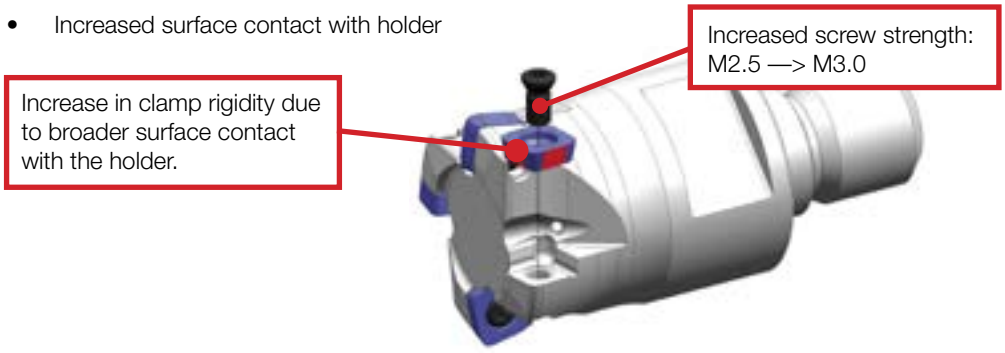
Three insert coatings for machining a wide range of materials

MOLDINO Tool Engineering, Ltd.

1. Improvements in Clamp Rigidity

The improvements in clamp rigidity result in a longer tool life.

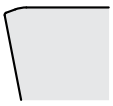
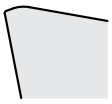
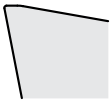
- Size of insert holding screw has increased
- Increased surface contact with holder



2. 3 Types of Shapes for Different Applications

Now offering 3 different types of shapes to complete different cutting applications.

- Economical four corner inserts requires less inserts for cutting applications.
- In addition to the conventional free-cutting breaker, a LF breaker with the emphasis on further cutting performance has been added. This expands the applicable range for high-feed-rate machining.

		
		
Cutting Force 100%	Cutting Force 93%	Cutting Force 85%
SPNW – General Edge Type	SPMT – Sharp Edge Type	SPMT-LF – Ultra Sharp Edge Type

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Shank Style
Inch + Metric

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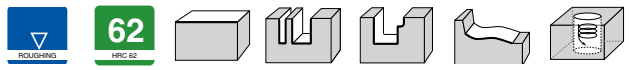

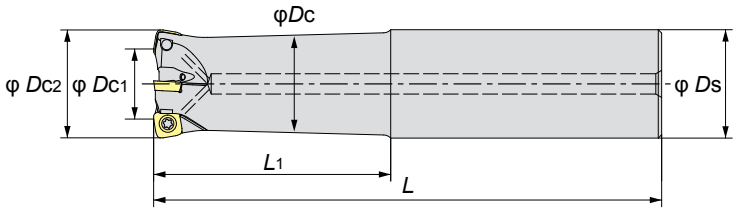

IASRF-mini-Inch (Shank Style)

Part No.	Flutes	φDc2	φDc1	φDc	L	L1	φDs	Insert
IASRFS3012R-2	2	0.75	0.28	Taper	5	2	0.75	SP*07T2**
IASRFS3016R-3	3	1	0.53	Taper	5.5	2.5	1	SP*07T2**
IASRFS3020R-4	4	1.25	0.78	Taper	6	2.75	1.25	SP*07T2**
IASRFS3024R-5	5	1.5	1.03	1.11	6	1.75	1.5	SP*07T2**
IASRFL3012R-2	2	0.75	0.28	0.71	6.25	3.25	0.75	SP*07T2**
IASRFL3016R-3	3	1	0.53	0.91	7	4	1	SP*07T2**
IASRFL3020R-3	3	1.25	0.78	1.14	8	5	1.25	SP*07T2**
IASRFL3024R-3	3	1.5	1.03	1.11	9	1.75	1.5	SP*07T2**

ASRF-mini-Metric (Shank Style)

Part No.	Flutes	φDc2	φDc1	φDc	L	L1	φDs	Insert
ASRFS3020R-2	2	20	8	Taper	130	50	20	SP*07T2**
ASRFS3025R-3	3	25	13	Taper	140	60	25	SP*07T2**
ASRFS3032R-4	4	32	20	Taper	150	70	32	SP*07T2**
ASRFS3040R-5	5	40	28	28.8	150	45	32	SP*07T2**
ASRFL3020R-2	2	20	8	18.0	160	80	20	SP*07T2**
ASRFL3025R-3	3	25	13	23.0	180	100	25	SP*07T2**
ASRFL3032R-3	3	32	20	29.0	200	120	32	SP*07T2**
ASRFL3040R-3	3	40	28	28.8	220	45	32	SP*07T2**

Inserts p.7

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Modular
Inch + Metric

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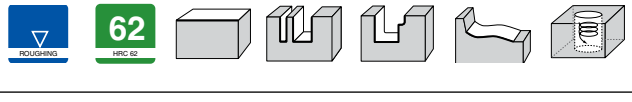

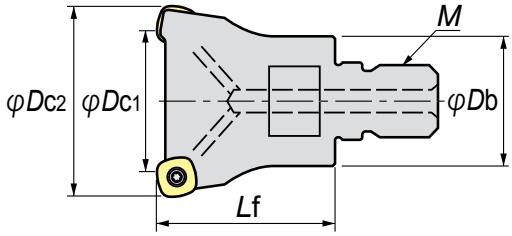

IASRF-mini-Inch (Modular Style)

Part No.	Flutes	φDc2	φDc1	Lf	M	φDb	Wrench Size	Insert
IASRFM3012R-2-M10	2	0.75	0.28	30mm	M10	17.8mm	15mm	SP*07T2**
IASRFM3016R-3-M12	3	1	0.53	35mm	M12	20.8mm	17mm	SP*07T2**
IASRFM3020R-4-M16	4	1.25	0.78	40mm	M16	28.8mm	22mm	SP*07T2**
IASRFM3024R-5-M16	5	1.5	1.03	40mm	M16	28.8mm	22mm	SP*07T2**

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

ASRF-mini-Metric (Modular Style)

Part No.	Flutes	φDc2	φDc1	Lf	M	φDb	Wrench Size	Insert
ASRFM3020R-2-M10	2	20	8	30	M10	17.8	15	SP*07T2**
ASRFM3025R-3-M12	3	25	13	35	M12	20.8	17	SP*07T2**
ASRFM3032R-4-M16	4	32	20	40	M16	28.8	22	SP*07T2**
ASRFM3040R-5-M16	5	40	28	40	M16	28.8	22	SP*07T2**

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

Inserts p.7

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Modular Shank
Inch + Metric

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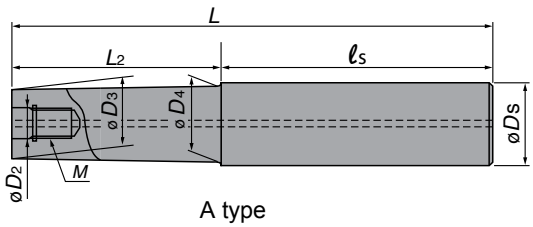
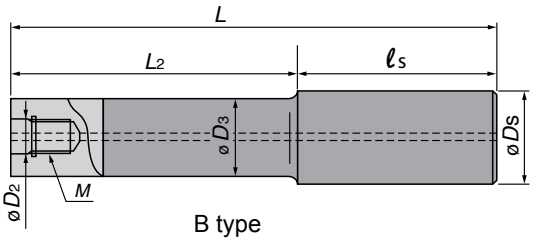


A type



B type

Carbide Shank-Inch

Part No.	Stock	ØD2	M	L	L_2	ℓs	øD3	øDs	øD4	Type	Cutter Body	Coolant Thru
IASC0.75-M10-5-2.5Z	•	10.5mm	M10	5	3	3	0.689	0.75	0.728	A	ø3/4"	○
IASC0.75-M10-8-4Z	•	10.5mm	M10	8	4	4	0.689	0.75	0.728			○
IASC1-M12-6-3Z	•	12.5mm	M12	6	3	3	0.906	1	0.945		ø1"	○
IASC1-M12-8-4Z	•	12.5mm	M12	8	4	4	0.906	1	0.945			○

Carbide Shank-Metric

Part No.	Stock	ØD2	M	L	L_2	ℓs	øD3	øDs	øD4	Type	Cutter Body	Coolant Thru
ASC18-M10-125-0Z	•	10.5	M10	125	-	125	18	18	-	A	ø20	○
ASC20-10.5-120-50Z	□			120	50	70	18.5	20	19.5			
ASC20-10.5-170-90Z	•			170	90	80						
ASC20-10.5-220-120Z	•			220	120	100						
ASC20-10.5-270-150Z	□			270	150	120						
ASC20-10.5-220-50Z	□			220	50	170						
ASC20-10.5-270-50Z	□			270		220						
ASC25-12.5-145-65	□	12.5	M12	145	65	80	23	25	-	B	ø25	○
ASC25-M12-150-0Z	•			150	-	159	25					
ASC25-12.5-215-115	•			215	115	100	23					
ASC25-12.5-265-145	•			265	145	120						
ASC25-12.5-315-195	□			315	195	120						
ASC25-12.5-265-65	□			265	65	200						
ASC25-12.5-315-65	□			315		250						
ASC32-17-160-80	□	17	M16	160	80	80	28	32	-	B	ø32 ø40	○
ASC32-17-210-110	•			210	110	100						
ASC32-17-260-140	•			260	140	120						
ASC32-17-310-190	□			310	190	120						
ASC32-17-360-240	□			360	240	120						
ASC32-17-260-80	□	17	M16	260	80	180	28	32	-	B	ø32 ø40	○
ASC32-17-310-80	□			310		230						
ASC32-17-360-80	□			360		280						

• = Stocked items in US　　□ = Stocked items in Japan　　○ = Tool With Air Hole

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Face Mill Style
Inch + Metric

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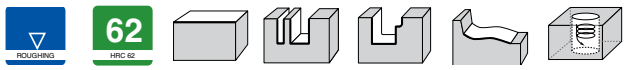

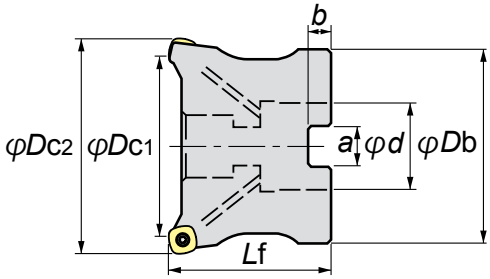

IASRF-mini-Inch (Face Mill Style)

Part No.	Flutes	φDc2	φDc1	Lf	φDb	φd	a	b	Insert
IASRFB3032R-7	7	2	1.53	50mm	40mm	0.75	8.0mm	5.0mm	SP*07T2**
IASRFB3040R-8	8	2.5	2.03	50mm	40mm	1	9.5mm	6.0mm	SP*07T2**

ASRF-mini-Metric (Face Mill Style)

Part No.	Flutes	φDc2	φDc1	Lf	φDb	φd	a	b	Insert
ASRFB3040RM-5-16	5	40	28	40	35	16	8.4	5.6	SP*07T2**
ASRFB3050RM-7-22	7	50	38	50	40	22	10.4	6.3	SP*07T2**
ASRFB3063RM-8-27	8	63	51	50	60	27	12.4	7.0	SP*07T2**

Inserts p.7

IASRF/ASRF-mini

Inserts

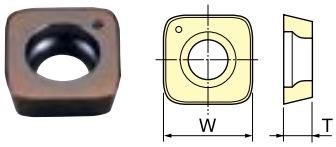

Fig. 1 General Edge Type

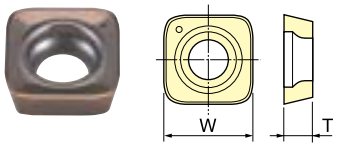

Fig. 2 Sharp Edge Type

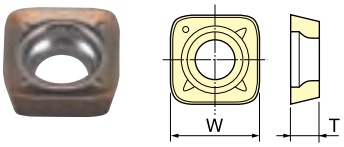

Fig. 3 Ultra Sharp Edge Type

Inserts

Part No.	Shape	JP4105	JP4120	JM4160	GX2140	JS4045	Thickness T(mm)	Width W(mm)
SPNW07T2TR	Fig. 1	•	•	•	•	•	7.8	2.8
SPMT07T2TR	Fig. 2		•	•		•	7.8	2.8
SPMT07T2ER-LF	Fig. 3		•	•			7.8	2.8

COATING MATERIALS FOR INSERTS

Material name ISO Classification	Coating Name Coating Type	Application	Features
JS4045 P30-K30	**JS Coating** PVD	General purpose for steel	Uses rough grain substrate and JS coating Suitble for general steel cutting
GX2140 P40-K40	**GX Coating** CVD	For Steel 35HRC or less	Uses smooth α-Al2O3 layer with excellent welding and chipping resistance characteristics to suppress sudden breakage and provide a stable tool life.
JM4160 M40	**AJ Coating** PVD	General purpose for stainless steel	Uses high toughness substrate and AJ coating. Suitable for cutting of stainless steels.
JP4120 P10-M10-K10	**AJ Coating** PVD	For pre-hardened steel (35-50HRC) and alloy steel	Uses fine grain substrate and AJ coating. Suitable for cutting of common steels through pre-hardened steels.
JP4105 P01-M01	**AJ Coating** PVD	For hardened steel 50HRC or more	Uses micro grain substrate and AJ coating. Suitable for 50HRC or more high hardness material cutting.

** Wrench and screw anti-seizure agent are not included (sold separately)*

Part No.	Clamp Screw	Wrench	Screw Anti-Seizure Agent
All	265-143	104-T10	P-37

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Cutting Conditions
Inch

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	ø	0.75" or 20mm		1" or 25mm		1.25" or 32mm		1.5" or 40mm		1.5" or 40mm	2" or 50mm	2.5" or 63mm
	Type	**Regular**	**Long**	**Regular**	**Long**	**Regular**	**Long**	**Regular**	**Long**	**Bore**	**Bore**	**Bore**
	Flutes	**2**	**2**	**3**	**3**	**4**	**3**	**5**	**3**	**5**	**7**	**8**
Carbon Steel Alloy Steel (<30HRC)	n (min-1)	2710	2390	2170	1910	1690	1490	1350	1190	1350	1080	860
	Vc(sfm)	558	492	558	492	558	492	558	492	558	558	558
	Vf(in/min)	277	244	333	293	346	229	345	183	345	387	352
GX2140	fz(in/t)	0.051	0.051	0.051	0.051	0.051	0.051	0.051	0.051	0.051	0.051	0.051
JS4045	doc(in)	0.031	0.024	0.031	0.024	0.031	0.024	0.031	0.024	0.031	0.031	0.031
	woc(in)	0.472	0.472	0.591	0.591	0.787	0.787	0.945	0.945	0.945	1.181	1.496
	Q(in³/min)	4.12	2.73	6.20	4.09	8.57	4.25	10.28	4.08	10.28	14.38	16.58
Alloy Steel Tool Steel (30-40HRC)	n (min-1)	2390	2070	1910	1660	1490	1290	1190	1040	1190	960	760
	Vc(sfm)	492	426	492	426	492	426	492	426	492	492	492
	Vf(in/min)	226	195	270	235	281	183	281	147	281	317	287
JS4045	fz(in/t)	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047
JP4120	doc(in)	0.031	0.024	0.031	0.024	0.031	0.024	0.031	0.024	0.031	0.031	0.031
	woc(in)	0.472	0.472	0.591	0.591	0.787	0.787	0.945	0.945	0.945	1.181	1.496
	Q(in³/min)	3.36	2.18	5.03	3.28	6.98	3.40	8.37	3.29	8.37	11.80	13.52
Pre-hardened Steel (40-50HRC)	n (min-1)	1590	1430	1270	1150	1000	900	800	720	800	640	510
	Vc(sfm)	328	295	328	295	328	295	328	295	328	328	328
	Vf(in/min)	150	113	180	136	189	106	189	85	189	211	193
JP4120	fz(in/t)	0.047	0.039	0.047	0.039	0.047	0.039	0.047	0.039	0.047	0.047	0.047
JS4045	doc(in)	0.020	0.016	0.020	0.016	0.020	0.016	0.020	0.016	0.020	0.020	0.020
	woc(in)	0.472	0.472	0.591	0.591	0.787	0.787	0.945	0.945	0.945	1.181	1.496
	Q(in³/min)	1.40	0.84	2.09	1.26	2.93	1.32	3.51	1.27	3.51	4.92	5.67
Stainless Steel	n (min-1)	1590	1430	1270	1150	1000	900	800	720	800	640	510
	Vc(sfm)	328	295	328	295	328	295	328	295	328	328	328
JM4160	Vf(in/min)	125	90	150	109	157	85	157	68	157	176	161
	fz(in/t)	0.039	0.031	0.039	0.031	0.039	0.031	0.039	0.031	0.039	0.039	0.039
	doc(in)	0.031	0.020	0.031	0.020	0.031	0.020	0.031	0.020	0.031	0.031	0.031
	woc(in)	0.472	0.472	0.591	0.591	0.787	0.787	0.945	0.945	0.945	1.181	1.496
	Q(in³/min)	1.86	0.83	2.79	1.26	3.91	1.32	4.69	1.26	4.69	6.56	7.57
Cast Iron	n (min-1)	3180	2870	2550	2290	1990	1790	1590	1430	1590	1270	1010
	Vc(sfm)	656	590	656	590	656	590	656	590	656	656	656
JP4120	Vf(in/min)	376	271	452	324	470	254	469	202	469	525	477
GX2140	fz(in/t)	0.059	0.047	0.059	0.047	0.059	0.047	0.059	0.047	0.059	0.059	0.059
	doc(in)	0.031	0.024	0.031	0.024	0.031	0.024	0.031	0.024	0.031	0.031	0.031
	woc(in)	0.472	0.472	0.591	0.591	0.787	0.787	0.945	0.945	0.945	1.181	1.496
	Q(in³/min)	5.59	3.02	8.40	4.53	11.66	4.72	13.97	4.52	13.97	19.52	22.48
Hardened Steel (50-55HRC)	n (min-1)	1270	1110	1020	890	800	700	640	560	640	510	400
	Vc(sfm)	262	230	262	230	262	230	262	230	262	262	262
JP4105	Vf(in/min)	60	44	72	52	76	41	76	33	76	84	76
JP4120	fz(in/t)	0.024	0.020	0.024	0.020	0.024	0.020	0.024	0.020	0.024	0.024	0.024
	doc(in)	0.020	0.012	0.020	0.012	0.020	0.012	0.020	0.012	0.020	0.020	0.020
	woc(in)	0.472	0.472	0.591	0.591	0.787	0.787	0.945	0.945	0.945	1.181	1.496
	Q(in³/min)	0.56	0.24	0.84	0.37	1.17	0.38	1.41	0.37	1.41	1.96	2.23
Hardened Steel (55-62HRC)	n (min-1)	1040	960	830	760	650	600	520	480	520	410	330
	Vc(sfm)	213	197	213	197	213	197	213	197	213	213	213
	Vf(in/min)	33	26	39	31	41	25	41	20	41	45	41
JP4105	fz(in/t)	0.016	0.014	0.016	0.014	0.016	0.014	0.016	0.014	0.016	0.016	0.016
	doc(in)	0.012	0.008	0.012	0.008	0.012	0.008	0.012	0.008	0.012	0.012	0.012
	woc(in)	0.394	0.394	0.472	0.472	0.630	0.630	0.787	0.787	0.787	0.984	1.260
	Q(in³/min)	0.15	0.08	0.22	0.12	0.30	0.12	0.38	0.12	0.38	0.52	0.62

Red indicates primary recommended grade.

This cutting condition table shows general guidelines for cutting conditions when L/D < 3. When performing actual machining, adjust the cutting conditions according to the shape to be machined, purpose, machine being used, etc.

IASRF/ASRF-mini

Cutting Conditions
Metric

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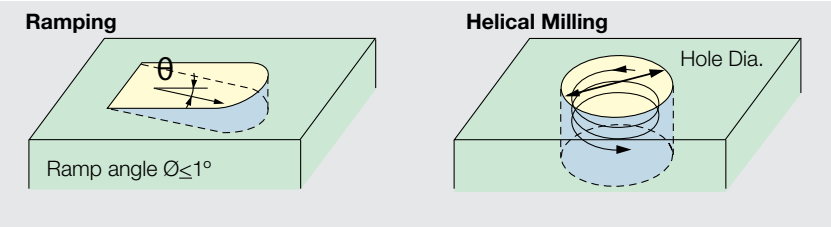
	ø	0.75" or 20mm		1" or 25mm		1.25" or 32mm		1.5" or 40mm		1.5" or 40mm	2" or 50mm	2.5" or 63mm
	Type	**Regular**	**Long**	**Regular**	**Long**	**Regular**	**Long**	**Regular**	**Long**	**Bore**	**Bore**	**Bore**
	Flutes	**2**	**2**	**3**	**3**	**4**	**3**	**5**	**3**	**5**	**7**	**8**
Carbon Steel Alloy Steel (<30HRC)	n(min-1)	2710	2390	2170	1910	1690	1490	1350	1190	1350	1080	860
	Vc(m/min)	170	150	170	150	170	150	170	150	170	170	170
	Vf(mm/min)	7040	6210	8460	7440	8780	5810	8770	4640	8770	9820	8940
GX2140	fz(mm/t)	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
JS4045	ap(mm)	0.8	0.6	0.8	0.6	0.8	0.6	0.8	0.6	0.8	0.8	0.8
	ae(mm)	12	12	15	15	20	20	24	24	24	30	38
	Q(cm³/min)	68	45	102	67	140	70	168	67	168	236	272
Alloy Steel Tool Steel (30-40HRC)	n(min-1)	2390	2070	1910	1660	1490	1290	1190	1040	1190	960	760
	Vc(m/min)	150	130	150	130	150	130	150	130	150	150	150
	Vf(mm/min)	5730	4960	6870	5970	7150	4640	7140	3740	7140	8060	7290
JS4045	fz(mm/t)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
JP4120	ap(mm)	0.8	0.6	0.8	0.6	0.8	0.6	0.8	0.6	0.8	0.8	0.8
	ae(mm)	12	12	15	15	20	20	24	24	24	30	38
	Q(cm³/min)	55	36	82	54	114	56	137	54	137	193	222
Pre-hardened Steel (40-50HRC)	n(min-1)	1590	1430	1270	1150	1000	900	800	720	800	640	510
	Vc(m/min)	100	90	100	90	100	90	100	90	100	100	100
	Vf(mm/min)	3810	2860	4570	3450	4800	2700	4800	2160	4800	5370	4890
JP4120	fz(mm/t)	1.2	1	1.2	1	1.2	1	1.2	1	1.2	1.2	1.2
JS4045	ap(mm)	0.5	0.4	0.5	0.4	0.5	0.4	0.5	0.4	0.5	0.5	0.5
	ae(mm)	12	12	15	15	20	20	24	24	24	30	38
	Q(cm³/min)	23	14	34	21	48	22	58	21	58	81	93
Stainless Steel	n(min-1)	1590	1430	1270	1150	1000	900	800	720	800	640	510
	Vc(m/min)	100	90	100	90	100	90	100	90	100	100	100
JM4160	Vf(mm/min)	3180	2280	3810	2760	4000	2160	4000	1720	4000	4480	4080
	fz(mm/t)	1	0.8	1	0.8	1	0.8	1	0.8	1	1	1
	ap(mm)	0.8	0.5	0.8	0.5	0.8	0.5	0.8	0.5	0.8	0.8	0.8
	ae(mm)	12	12	15	15	20	20	24	24	24	30	38
	Q(cm³/min)	31	14	46	21	64	22	77	21	77	108	124
Cast Iron	n(min-1)	3180	2870	2550	2290	1990	1790	1590	1430	1590	1270	1010
	Vc(m/min)	200	180	200	180	200	180	200	180	200	200	200
JP4120	Vf(mm/min)	9540	6880	11470	8240	11940	6440	11920	5140	11920	13330	12120
GX2140	fz(mm/t)	1.5	1.2	1.5	1.2	1.5	1.2	1.5	1.2	1.5	1.5	1.5
	ap(mm)	0.8	0.6	0.8	0.6	0.8	0.6	0.8	0.6	0.8	0.8	0.8
	ae(mm)	12	12	15	15	20	20	24	24	24	30	38
	Q(cm³/min)	92	50	138	74	191	77	229	74	229	320	368
Hardened Steel (50-55HRC)	n(min-1)	1270	1110	1020	890	800	700	640	560	640	510	400
	Vc(m/min)	80	70	80	70	80	70	80	70	80	80	80
JP4105	Vf(mm/min)	1520	1110	1830	1330	1920	1050	1920	840	1920	2140	1920
JP4120	fz(mm/t)	0.6	0.5	0.6	0.5	0.6	0.5	0.6	0.5	0.6	0.6	0.6
	ap(mm)	0.5	0.3	0.5	0.3	0.5	0.3	0.5	0.3	0.5	0.5	0.5
	ae(mm)	12	12	15	15	20	20	24	24	24	30	38
	Q(cm³/min)	9	4	14	6	19	6	23	6	23	32	36
Hardened Steel (55-62HRC)	n(min-1)	1040	960	830	760	650	600	520	480	520	410	330
	Vc(m/min)	65	60	65	60	65	60	65	60	65	65	65
	Vf(mm/min)	830	670	990	790	1040	630	1040	500	1040	1140	1050
JP4105	fz(mm/t)	0.4	0.35	0.4	0.35	0.4	0.35	0.4	0.35	0.4	0.4	0.4
	ap(mm)	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.3	0.3
	ae(mm)	10	10	12	12	16	16	20	20	20	25	32
	Q(cm³/min)	2	1	4	2	5	2	6	2	6	9	10

Red indicates primary recommended grade.

This cutting condition table shows general guidelines for cutting conditions when L/D < 3. When performing actual machining, adjust the cutting conditions according to the shape to be machined, purpose, machine being used, etc.

Ramping and Helical Milling Data



Tool Diameter	0.75” or Ø20mm	1” or Ø25mm	1.25” or Ø32mm	1.5” or Ø40mm	2” or Ø50mm	2.5” or Ø63mm
Ramp Angle	1° or less					
Hole Diameter (mm)	26 - 38	36 - 48	50 - 62	66 - 78	86 - 98	112 - 124

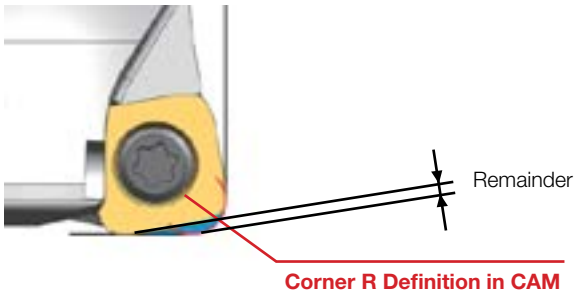
1. Before carrying out the work without operator, be sure to remove the chips and confirm the safe condition for cutting.
2. The steel chips may cause cuts, burns or damage to eyes. Be sure to install the safety cover around the tool and wear the safety glasses when carrying out any work.
3. Replace the insert regularly to avoid any breakage of the tools because of wear and tear.

Programming Radius

Points requiring care when creating the machining program.

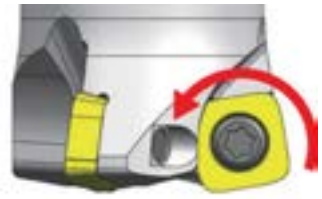
- Define the tool as the shape of the R2.0mm radius.
- Use the axial-direction cutting depths ap of 1.2mm or less.

Corner R Definition in CAM	Remainder	Overcut
R2.0mm/0.0787in	0.62mm/0.0244in	0
R2.8mm/0.1102in	0.5mm/0.0197in	0.17mm/0.0067in
R3.0mm/0.1181in	0.47mm/0.0185in	0.23mm/0.0090in



Attention for the Corner Change

Please turn the insert counterclockwise upon corner change of insert.



Notes

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2017 1st Edition

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