

Guidelines for Machining HRSA Materials

Application Introduction

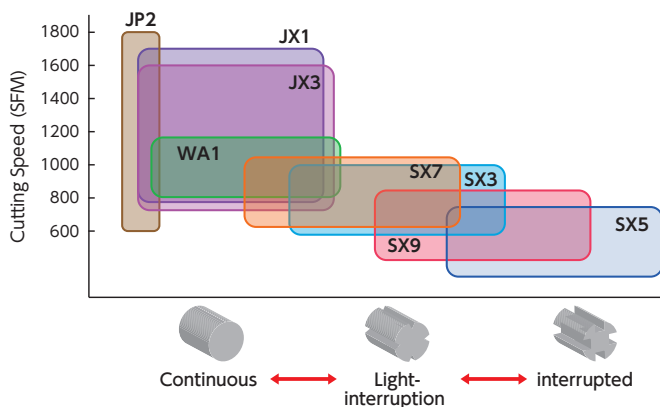
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Insert Grade

Category	Grade	Attributes	Applications						
			Scale	No scale	Profiling	Finishing	Grooving	Milling	End milling
BIDEMICS	JX1	Special grade with higher speed and longer tool life potential		●	●	●	●		
	JP2	Special grade for finish turning				●			
	JX3	Added toughness in BIDEMICS		●	●	●	●		
Whisker	WA1	General versatile grade for turning		●	●		●		
SIALON	SX3	Best balance of toughness and hardness	●	●	●		●	●	
	SX5	Best grade for Waspaloy with scale	●				●		
	SX7	Versatile grade for turning and milling	●	●	●		●	●	
	SX9	Best grade for scale of Inco718	●	●	●			●	●

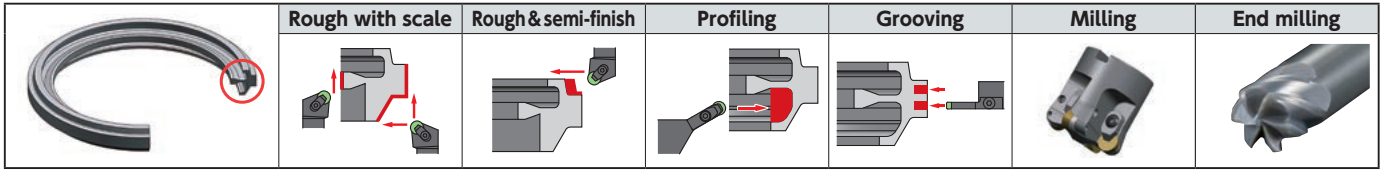
● 1st Choice ● 2nd Choice

Grade Map



	Grade	Rough with Scale	Rough	Semi-Finishing	Finishing
BIDEMICS	JP2			●	●
	JX1		●	●	●
	JX3		●	●	●
Whisker	WA1	●	●	●	●
SIALON	SX7		●	●	●
	SX3		●	●	●
	SX9	●	●	●	●
	SX5	●	●	●	●

Applications



Applications

Application	Grade	Work material	Cutting speed					Feed					Depth of cut					Coolant
			600	800	1000	1200	1400	1600	.004	.008	.012	.016	.020	.020	.040	.060	.080	
Rough with Scale 	SX5	Waspaloy	650 (600-800) SFM					.012 (.008-.014) IPR					.080 (.040-.200)"					WET
	SX9	Inco718	650 (600-800) SFM					.012 (.008-.014) IPR					.080 (.040-.200)"					
	SX3	Overall	800 (600-900) SFM					.008 (.004-.009) IPR					.080 (.040-.200)"					
Rough no Scale 	JX1 JX3	Overall	700-1300 (600-1600) SFM					.008 (.005-.011) IPR					.070 (.040-.100)"					WET
	SX9 SX3 SX7	Overall	700 (600-900) SFM					.009 (.006-.012) IPR					.080 (.040-.100)"					
	WA1	Overall	800 (600-1000) SFM					.008 (.005-.010) IPR					.070 (.040-.100)"					
Profiling & Semi-Finish 	JX1 JX3	Overall	700-1500 (600-1600) SFM					.008 (.004-.010) IPR					.060 (.040-.080)"					WET
	SX3 SX7	Overall	800 (600-900) SFM					.008 (.005-.010) IPR					.060 (.040-.080)"					
	WA1	Overall	800 (600-1100) SFM					.008 (.004-.010) IPR					.060 (.040-.080)"					
Finishing 	JP2	Overall	700-1600 (600-1700) SFM					.004 (.002-.007) IPR					.010 (.005-.030)"					WET
Grooving 	JX1 JX3	Overall	1200 (600-1600) SFM					.003 (.002-.004) IPR					When using SX7/SX3/SX5, increase feed rates 100% vs. Whisker Ceramics					WET
	SX5	Waspaloy	700 (600-800) SFM					.006 (.003-.007) IPR										
	SX3 SX7	Overall	750 (600-900) SFM					.0045 (.003-.006) IPR										
	WA1	Overall	800 (600-1100) SFM					.003 (.002-.004) IPR										

Application	Grade	Work material	Cutting speed							Feed					Depth of cut					Coolant
			1500	2000	2500	3000	3500	4000	.002	.003	.004	.005	.006	.020	.040	.060	.080	.100		
Milling 	SX3 SX7	Overall	2700 (2000-4000) SFM							.004 (.003-.005) IPT					.070 (.040-.100)"					DRY
	SX9	Overall	2500 (1500-3500) SFM							.005 (.004-.006) IPT					.080 (.040-.100)"					
End milling 	SX9	Overall	2000 (980-3300) SFM							.0008-.0013 IPT										DRY

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