

Turning

Trouble		Check Item	Insert Grade				Cutting Conditions					Tool Geometry							Setting		Machine		
		Measures	Change to Harder Grade	Change to Tougher Grade	Change to More Thermal Shock Resistant Grade	Change to More Welding Resistant Grade	Vc	f	ap	Tool Path Review	Coolant		Chipbreaker Review	Rake Angle	Corner-R (rε)	Approach Angle	Edge Strength / Honing	Change to Higher Tolerance (M→G)	Toolholder Rigidity	Workpiece / Tool Installation		Overhang Length	Power, Rigidity
											Wet	Dry											
Unstable Dimension	Unstable Workpiece Dimension	Unsuitable Insert Tolerance																●					
		Tool and Workpiece Evacuation											●	● ↑	● ↓	● ↓				●	●	●	●
	Frequent Offset during Cutting	Flank Wear Increase	●												● ↑								
		Unsuitable Cutting Conditions					● ↓	● ↑															
		Built-up Edge				●	● ↑																
Surface Roughness	Poor Surface Roughness	Poor Cutting by Tool Wear	●			●	● ↓				●		●	● ↑	● ↑		● ↓	●					
		Chipping		●				● ↓	● ↓				●		● ↑		● ↑				●	●	●
		Welding, Built-up Edge				●	● ↑				●		●	● ↑			● ↓	●					
		Unsuitable Cutting Conditions					● ↑	● ↓	● ↓		●												
		Unsuitable Tool Geometry											●		● ↑		● ↓	●					
		Vibration, Chattering		●			● ↓	*1 ● ↓	● ↓				●	● ↑	● ↓	● ↓	● ↓			●	●	●	●
Heat	Deterioration of Accuracy or Tool Life by Cutting Heat	Unsuitable Cutting Conditions				● ↓	● ↓	● ↓		●													
		Unsuitable Tool Geometry	●										●	● ↑			● ↓						
Bur, Chipping	Burr	Unsuitable Cutting Conditions				● ↓	● ↑			●	●												
		Unsuitable Tool Geometry	●										●	● ↑	● ↓	● ↓	● ↓						
	Workpiece Chip Off	Unsuitable Cutting Conditions					● ↓	● ↓	●				●	● ↑		● ↑	● ↓			●	●	●	
		Unsuitable Tool Geometry	●										●	● ↑	● ↑	● ↑	● ↓			●	●	●	
	Scuffing	Unsuitable Cutting Conditions				● ↑	*2 ● ↓				●												
		Unsuitable Tool Geometry	●			●							●	● ↑			● ↓						
Edge Damage	Wear Increase at Relief Face, Rake Face	Flank Wear	●				● ↓				●		●	● ↑	● ↑		● ↓						
		Rake Face Wear	●				● ↓	● ↓	● ↓		●		●	● ↑		● ↑							
	Notching	Notching				●	● ↓				●												
	Chipping	Vibration, Chattering		●			● ↓	● ↓				●			● ↑	● ↑			●	●	●	●	
	Crack	Unsuitable Tool Geometry		●	●		● ↓	● ↓				●		● ↑	● ↑	● ↑			●	●	●	●	
	Thermal Crack	Work Hardness, Unsuitable Cutting Conditions			●		● ↓	● ↓	● ↓		●		●	● ↑			● ↓						
	Edge Nose Deformation	Edge Nose Deformation at Interrupted Cutting	●				● ↓	● ↓	● ↓				●	● ↓	● ↑	● ↑	● ↑						
	Built-up Edge	Work Hardness, Unsuitable Cutting Conditions				●	● ↑	● ↑			●		●	● ↑			● ↓	●					
Chip Control	Long, Tangling Chips	Unsuitable Cutting Conditions				*3 ● ↓	● ↑	● ↑	●		●												
		Unsuitable Tool Geometry											●		● ↓	● ↓							
	Chips scattering	Unsuitable Cutting Conditions					● ↓	● ↓			●												
		Unsuitable Tool Geometry											●		● ↑	● ↑							

*1) To prevent chattering, the higher f may be suitable.

*2) To prevent scuffing, the higher f may be suitable.

*3) When using X-chipbreaker insert for soft steel and low carbon steel, the higher Vc cuts chips short.

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Technical Information