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Turning

Trouble	Trouble Item	Countermeasures / Check Item	Insert Grade: Change to Harder Grade	Insert Grade: Change to Tougher Grade	Insert Grade: Change to More Thermal Shock Resistant Grade	Insert Grade: Change to More Welding Resistant Grade	Cutting Conditions: Vc (Higher (Larger) ↑ Lower (Smaller) ↓)	Cutting Conditions: f (Higher (Larger) ↑ Lower (Smaller) ↓)	Cutting Conditions: D.O.C. (Higher (Larger) ↑ Lower (Smaller) ↓)	Cutting Conditions: Tool Path Review	Cutting Conditions: Coolant: Wet	Cutting Conditions: Coolant: Dry	Tool Geometry: Chipbreaker Review	Tool Geometry: Rake Angle (Larger ↑ Smaller ↓)	Tool Geometry: Corner-R (rε) (Larger ↑ Smaller ↓)	Tool Geometry: Approach Angle (Larger ↑ Smaller ↓)	Tool Geometry: Edge Strength / Honing (Larger ↑ Smaller ↓)	Tool Geometry: Change to Higher Tolerance (M→G)	Setting: Toolholder Rigidity	Setting: Workpiece / Tool Installation	Setting: Overhang Length	Machine: Power, Rigidity
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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