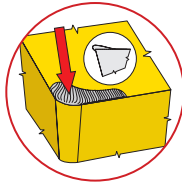


Boring Insert Wear Patterns

Built-up Edge

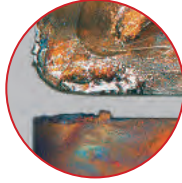
Potential Problem

- Machined material adheres to the cutting edge of insert
- When it breaks, the edge becomes brittle and cracks
- This can negatively affect machined surface



Possible Solution

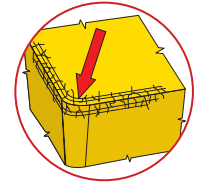
- Increase temperature by increasing speed or feed
- Use an insert with higher lubricity coating
- Choose a freer cutting insert geometry



Comb Cracks

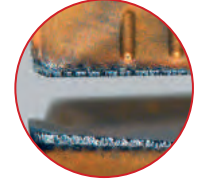
Potential Problem

- Caused by high stress on the cutting edge during interrupted cuts



Possible Solution

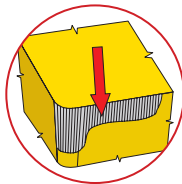
- Switch off coolant or increase coolant flow to obtain an even temperature level
- Reduce cutting speed
- Use tougher insert grade



Flank Wear

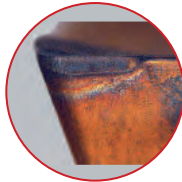
Potential Problem

- Caused by friction between the insert and machined material
- It cannot be fully eliminated, but it can be reduced



Possible Solution

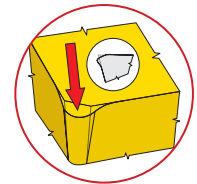
- Use a more wear-resistant grade
- Reduce cutting speed
- Use coolant or increase coolant flow to the cutting edge



Plastic Deformation

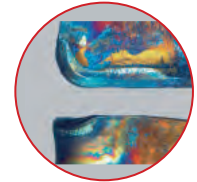
Potential Problem

- Caused by high thermal stress on the cutting edge from excessive feed rate and cutting speed



Possible Solution

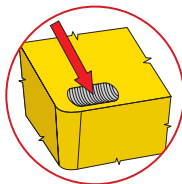
- Use a more wear-resistant grade
- Reduce cutting speed
- Reduce feed rate
- Use coolant or increase coolant flow to the cutting edge



Cratering

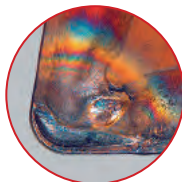
Potential Problem

- Appears when the geometry is too neutral or material is too hard for the substrate



Possible Solution

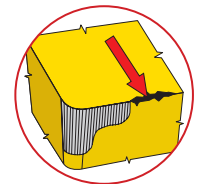
- Use a more wear-resistant grade
- Reduce cutting speed or feed
- Use coolant or increase coolant flow to the cutting edge



Chipping of Cutting Edge (Out of Cut)

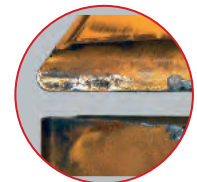
Potential Problem

- Caused by poor chip control
- Can damage the portion of the cutting edge that might not be engaged in the cut



Possible Solution

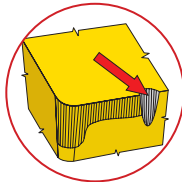
- Change feed rate to gain chip control
- Select a tool with a different approach angle
- Use an insert with a different geometry
- Use a tougher grade of carbide



Notch Wear

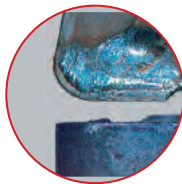
Potential Problem

- Occurs when cutting edge of insert comes in contact with surface of machined material
- Caused by hardening of surface layer of material and burrs
- Often appears on stainless austenitic steels and other high-temperature alloy steels



Possible Solution

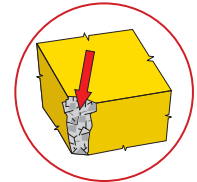
- Use a more wear-resistant grade (Al₂O₃)
- Select a tool with a smaller approach angle
- Vary the radial depth of cut
- Use coolant or increase coolant flow to the cutting edge



Insert Fracture

Potential Problem

- Caused by workpiece material, grade, condition, the rigidity of the machine-tool workpiece, extent of wear, and cutting conditions



Possible Solution

- Use a tougher grade of carbide
- Reduce the feed and depth of cut
- Use an insert with a stronger chip breaker
- Use an insert with a bigger corner radius

