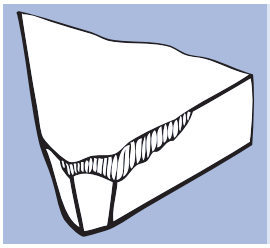
Technical Data

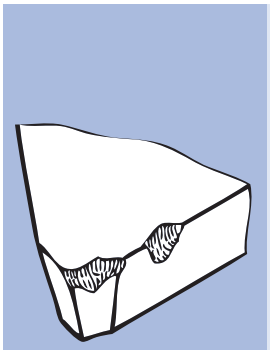
Trouble Shooting for Milling Applications



Flank Wear

General criteria for end of tool life, characterized by an admissible amount of flank wear

Remedy:
- select more wear resistant grade
- reduce cutting speed



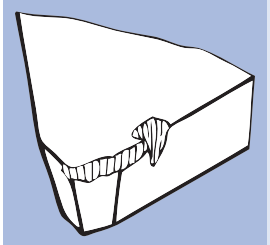
Edge Chipping

Minor chipping along the cutting edge, usually accompanied by flank wear and therefore not always identifiable. Danger of breakage! Edge chipping outside the cutting area is the result of chip impact due to unfavorable chip removal.

Remedy:
- select tougher grade
- use insert with stronger cutting edge geometry
- reduce feed when starting the cut

Damage caused by chip impact:

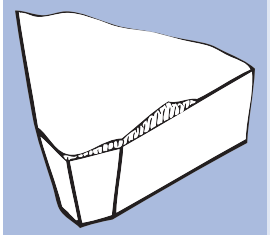
- vary feed
- change chipbreaker geometry
- change cutting edge angle



Notch Wear

Occurs locally in the area of the primary cutting edge where it contacts the workpiece surface. Caused by hard surface layers and work-hardened burrs, especially on austenitic stainless steels. Danger of breakage!

Remedy:
- strengthen cutting edge
- select smaller cutting edge angle (45°)
- reduce feed

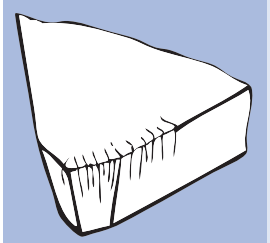


Built-Up Edges

Edge build-up occurs on the rake face as a result of the work material welding together with the cutting material, especially when cutting difficult-to-machine materials.

From time to time the built-up edge will break off and may cause damage to the cutting edge. Built-up edges result in poor surface finish.

Remedy:
- increase cutting speed
- use coated carbides or cermets
- select positive cutting edge geometry
- use cutting fluid



Thermal Cracks

Small cracks running across the cutting edge, caused by thermal shock loads in interrupted cutting operations, particularly in milling. Danger of breakage!

Remedy:
- use grade with greater resistance to thermal shock
- check use of cutting fl uid; cutting fl uid should not generally be used for milling, except with special grades for wet milling, e.g. TN 450, aluminum and titanium alloys, and high-temperature materials
- use compressed air to remove chips in slot milling

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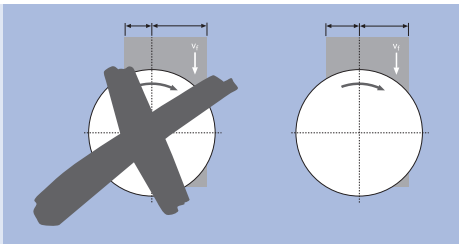
Burring

Chipping of the workpiece edge when cutter leaves the cut (mainly in cast iron)

Remedy:
- select smaller cutting edge angle for the tool
- select more positive cutting edge geometry
- change cutter position relative to workpiece



Workpiece Vibrations

Remedy:
- clamp workpiece more rigidly
- change cutter position relative to workpiece
- select a cutter with a smaller cutting edge angle

Cutter Vibrations

Remedy:
- minimize cutter overhang
- increase feed
- reduce cutting speed

Use of Cutting Fluids in Milling

Remedy:
- cutting fluid should preferably not be used
- if cutting fluid is essential, then in copious amounts at low pressure