



Trouble Shooting Guide For Problems With End Mills

Problem/ Cause	Solution
Chip Packing Cut too heavy Not enough chip clearance Not enough coolant	<ul style="list-style-type: none">✓ Decrease width and depth of cut✓ Use end mill with less flutes✓ Use higher coolant pressure and reposition nozzle to point of cut or use air pressure
Chipped Cutting Edge Feed rate too heavy Feed too heavy on first cut Lack of rigidity (machine & holder) Lack of rigidity (tool) Tool cutting corner too sharp	<ul style="list-style-type: none">✓ Reduce feed rate✓ Reduce feed rate on first cut✓ Use better machine or tool holder or change parameters✓ Use shorter tool, hold shank deeper, try climb milling✓ Decrease primary relief and cutting angle, reduce radial width-of cut
Excessive Wear Speed is too fast Hard work material Improper feed and speed (too slow) Improper helix angle Primary relief angle is too large Recutting chips	<ul style="list-style-type: none">✓ Decrease spindle speed, use another coolant✓ Use coatings (TiN, TiCN, TiAlN, TiAlN+, etc.)✓ Increase feed and speed✓ Change to correct helix angle✓ Change to smaller relief angle✓ Change feed & speed, Change chip size or clear chips with more coolant or air pressure
No Dimensional Accuracy Cut is too heavy Lack of accuracy (machine & holder) Rigidity is not enough (machine & holder) Too few flutes	<ul style="list-style-type: none">✓ Decrease width and depth of cut✓ Repair machine or holder✓ Change machine or holder or change parameters✓ Use multiflute end mills, use end mill with higher rigidity
Reduced Tool Life Cutting friction is too much Hard work material Improper helix & relief angle	<ul style="list-style-type: none">✓ Regrind at earlier stage✓ Use coatings (TiN, TiCN, TiAlN, TiAlN+, etc.)✓ Change to correct helix angle and primary relief
Rough Surface Finish Feed rate too heavy Cutting speed is too slow Wear is too much No end tooth concavity Recutting chips	<ul style="list-style-type: none">✓ Reduced feed rate✓ Increase RPM✓ Regrind at earlier stage✓ Grind concave angle on bottom teeth✓ Change feed & speed, change chip size or clear chips with coolant or air pressure
Side Wall Taper in Workpiece Feed rate too heavy Overhang of tool is too much Too few flutes	<ul style="list-style-type: none">✓ Reduce feed rate✓ Hold shank deeper, use shorter end mill✓ Use multiflute end mills, use end mill with higher rigidity
Squeal and Chattering Feed and speed too fast Lack of rigidity (machine & holder) Poor set up Cut is too heavy Overhang of tool is too much Lack of relief	<ul style="list-style-type: none">✓ Correct feed and speed✓ Use better machine or tool holder or change parameter✓ Improve clamping rigidity✓ Decrease width and depth of cut✓ Hold shank deeper, use shorter end mill✓ Decrease relief angle, make margin; hone primary with oil stone
Tool Breakage Feed is too heavy Cut is too heavy Overhang of tool is too much Wear is too much	<ul style="list-style-type: none">✓ Reduce feed rate✓ Decrease width and depth-of-cut✓ Hold shank deeper, use shorter end mill✓ Regrind at earlier stage
Work Piece Burrs Wear on primary relief is too much Incorrect feed and speed rates Improper helix angle	<ul style="list-style-type: none">✓ Regrind at earlier stage✓ Correct cutting parameters✓ Change to correct cutting angle