

Trouble Shooting Carbide Endmills

Problem	Cause	Solution
Chipping	<ul style="list-style-type: none"> • Feed rate too high • Up milling (conventional) • Cutting edge too sharp • Chattering • Loose tool • Workpiece rigidity • Tool rigidity • Low cutting speed • Loose toolholder 	<ul style="list-style-type: none"> • Reduce feed rate • Change to down milling (climb) • Hone cutting edge or allow break-in • Reduce RPM • Remove, clean, and retighten • Tighten workpiece holding method • Shorten LOC, place shank further up holder • Increase RPM • Remove from spindle, clean and replace
Wear	<ul style="list-style-type: none"> • High cutting speed • Low feed rate • Up milling (conventional) • Hard material • Poor chip evacuation • Improper cutter helix • Poor coolant 	<ul style="list-style-type: none"> • Reduce RPM • Increase feed rate • Change to down milling (climb) • Use coated tool • Reposition coolant lines, use air blasting • Change to recommended helix angle • Replace coolant or correct mixture
Breakage	<ul style="list-style-type: none"> • Feed rate too high • Depth of cut too large • Poor tool rigidity • Tool wear • Poor chip evacuation 	<ul style="list-style-type: none"> • Reduce feed rate • Reduce depth of cut • Shorten LOC, place shank further up holder • Replace/regrind sooner • Reposition coolant lines, use air blasting
Chattering	<ul style="list-style-type: none"> • Speed and feed too high • Poor toolholder rigidity • Poor spindle rigidity • Workpiece rigidity • Relief angle too high • Depth of cut too large • Poor tool rigidity 	<ul style="list-style-type: none"> • Reduce feed rate • Replace with shorter/more rigid holder • Use larger spindle or different machine tool • Tighten workpiece holding method • Regrind with smaller relief angle • Reduce depth of cut • Shorten LOC, place shank further up holder
Short Life	<ul style="list-style-type: none"> • Cutter/workpiece friction • Hard material • Poor material condition • Improper cutter angle • Poor coolant 	<ul style="list-style-type: none"> • Use coated tool • Use coated tool • Use coated tool, clean material surface • Regrind with proper primary relief angle • Replace coolant or correct mixture
Chip Packing	<ul style="list-style-type: none"> • Feed rate too high • Low cutting speed • Insufficient chip room • Insufficient coolant 	<ul style="list-style-type: none"> • Reduce feed rate or increase speed • Increase RPM or reduce feed rate • Use tool with less flutes, increase helix • Increase volume of coolant
Poor Surface Finish	<ul style="list-style-type: none"> • Feed rate too high • Low cutting speed • Tool wear • Edge build up • Depth of cut too large • Chip welding 	<ul style="list-style-type: none"> • Reduce feed rate • Increase RPM • Replace or regrind tool • Increase RPM, switch to higher helix tool • Reduce depth of cut • Increase volume of coolant
Burring or Workpiece Chipping	<ul style="list-style-type: none"> • Tool wear • Improper helix angle • Feed rate too high • Depth of cut too large 	<ul style="list-style-type: none"> • Replace or regrind tool • Change to recommended helix angle • Reduce feed rate • Reduce depth of cut
Workpiece Inaccuracy	<ul style="list-style-type: none"> • Loose/worn toolholder • Poor toolholder rigidity • Poor spindle rigidity • Insufficient number of flutes • Tool deflection 	<ul style="list-style-type: none"> • Repair or replace • Replace with shorter/more rigid toolholder • Use larger spindle or different machine tool • Use tool with higher flute quantity • Shorten LOC, place shank further up holder