

DYNAMIC MOTION TECHNOLOGY

Presented by:

Mastercam®

Created by John McCord, MLC CAD Systems
Presented by Daniel Morales, South Texas College
& Edgar Turrubiates, South Texas College

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DECREASE CYCLE TIME WHILE
INCREASING TOOL LIFE

Mastercam.

EVER USE A DULL PAIR? WHAT HAPPENS?



Shearing vs. Tearing



ENEMIES OF TOOL LIFE AND EFFICIENCY

Heat

Physical Damage

Non-optimized Motion



SOLUTION TO HEAT AND EDGE DAMAGE

- Keep tools in optimum, safe cutting condition
- Focus on shearing maximum material over time
- Minimize damage to the cutting tool surface



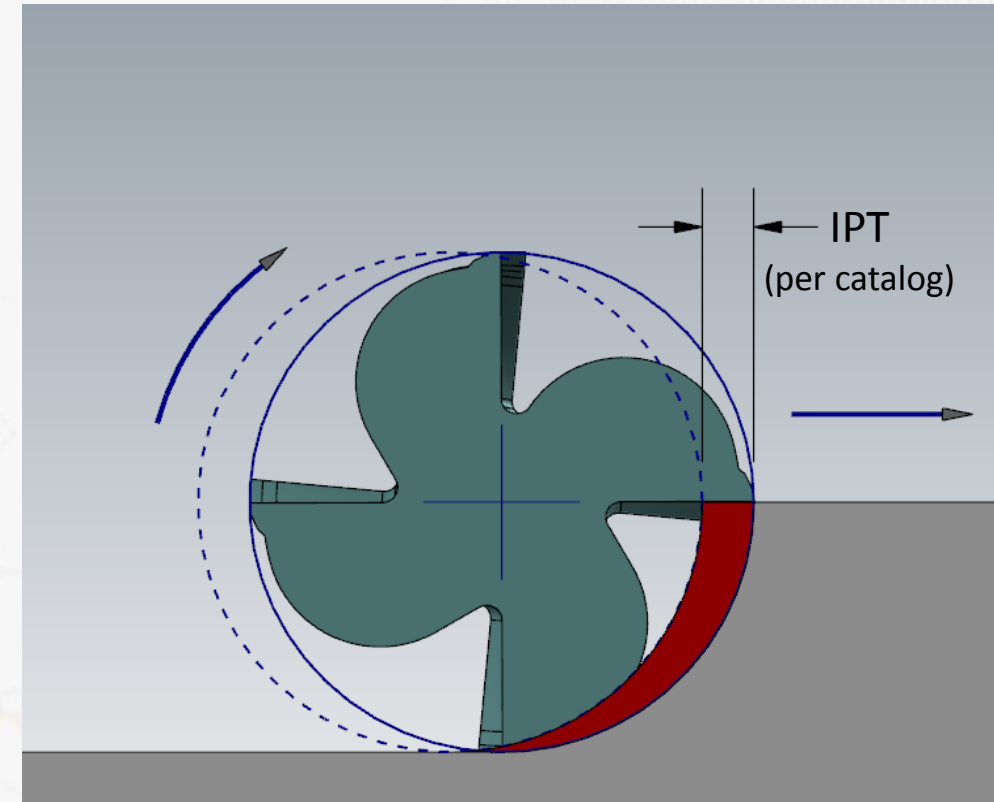
TODAY'S METHODS FOR ADDRESSING ISSUE

- Traditional machining approach
- Radial Chip Thinning (Side/Peripheral Milling & Facing)
- Safe, More Effective RCT - Dynamic Motion



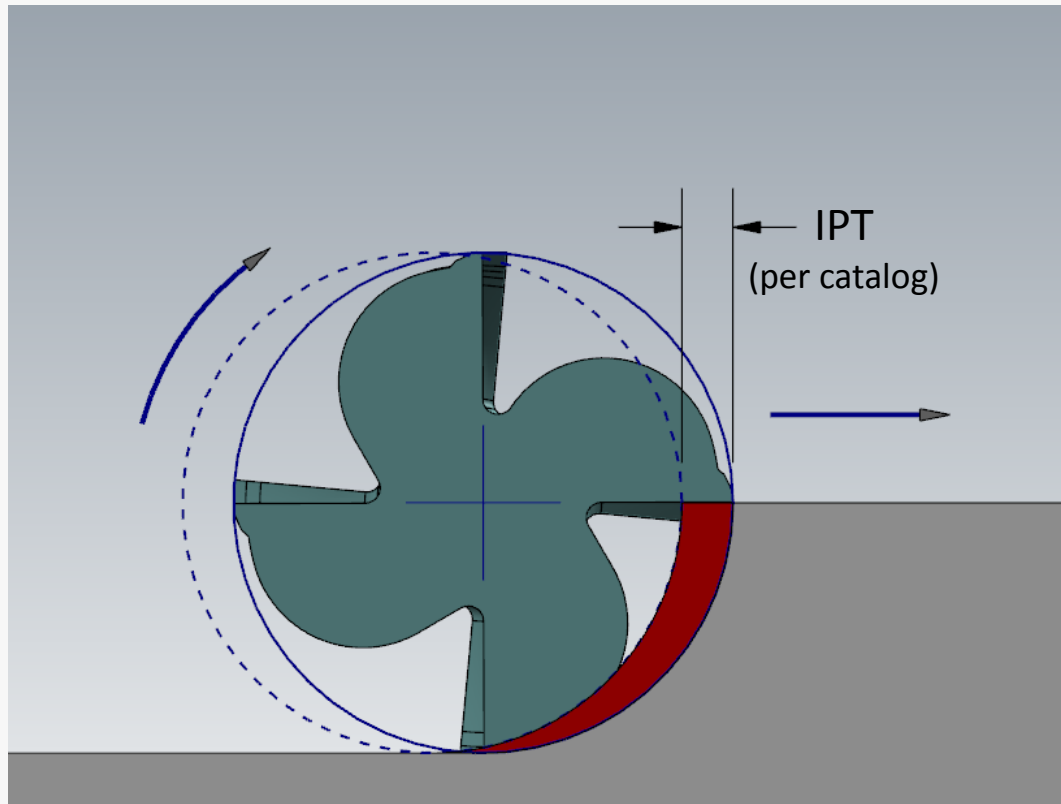
WHAT IS RADIAL CHIP THINNING?

- When $WOC < \text{the tool radius}$
- Or... chips are thinner than the feed per tooth (ex. a 0.008 FPT resulting in a chip thickness of .004")
- Higher feed rates are needed to maintain chip thickness
- Nothing new, theory is decades old

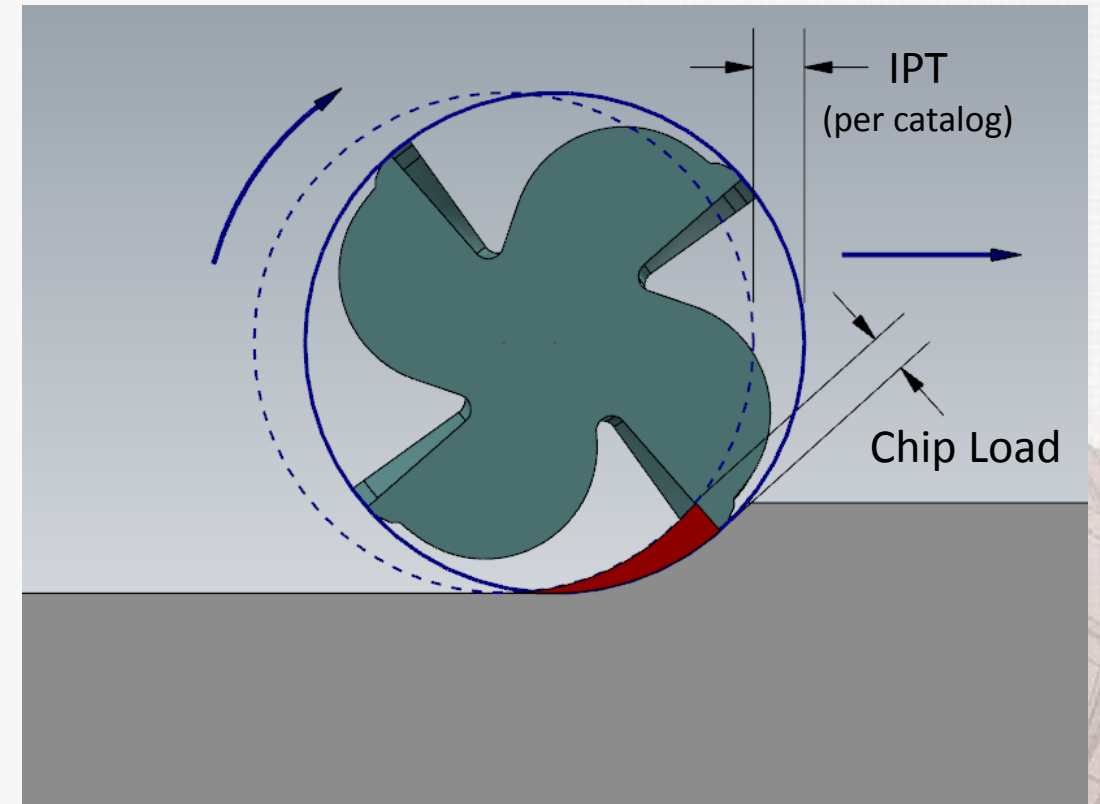


TRADITIONAL VS RADIAL CHIP THINNING

Traditional

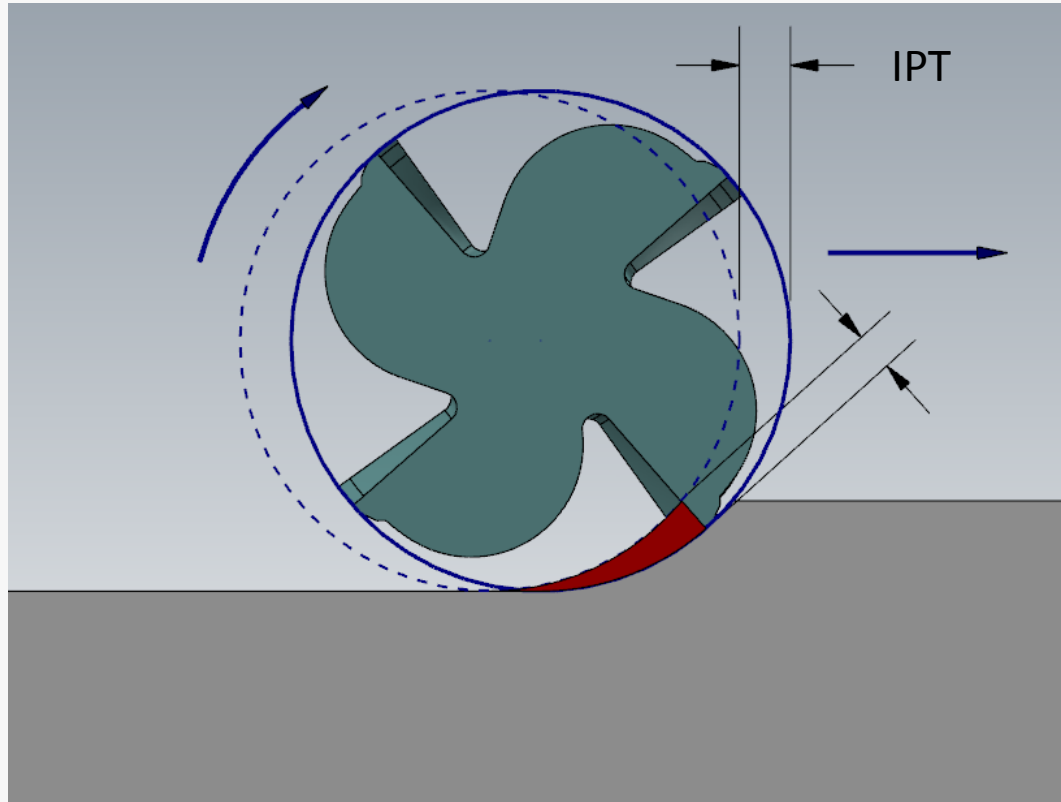


Radial Chip Thinning

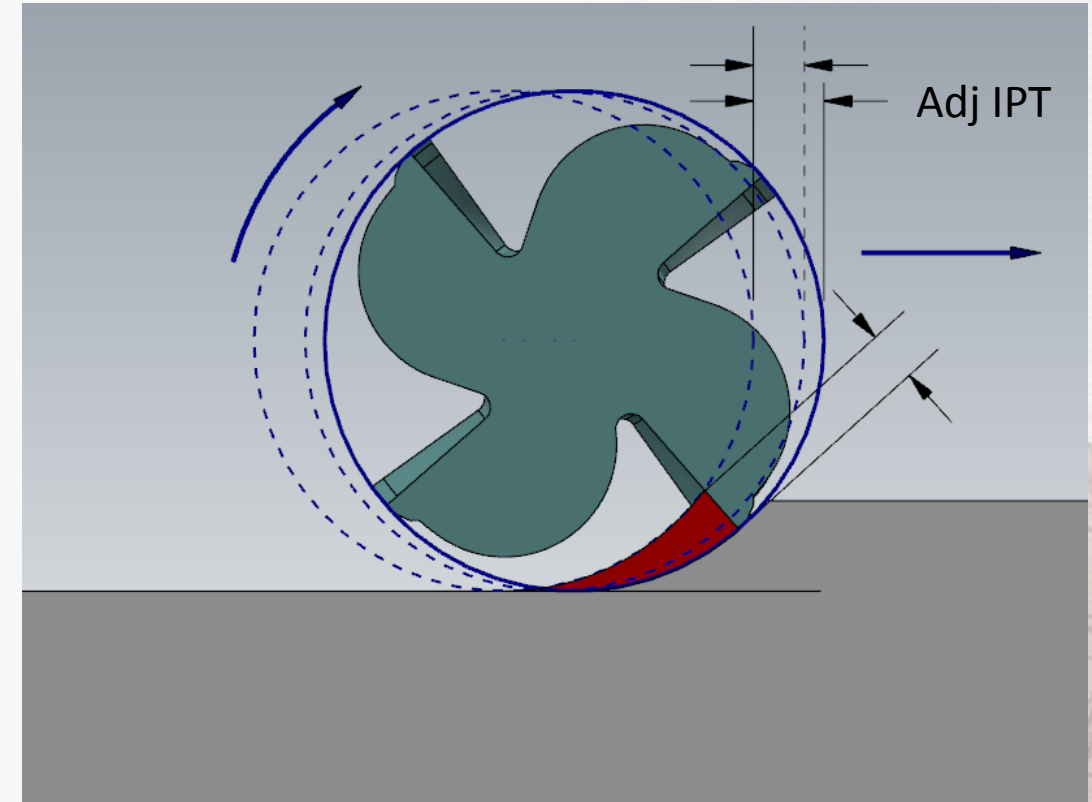


TRADITIONAL VS RADIAL CHIP THINNING

Prior to Adjusted IPT

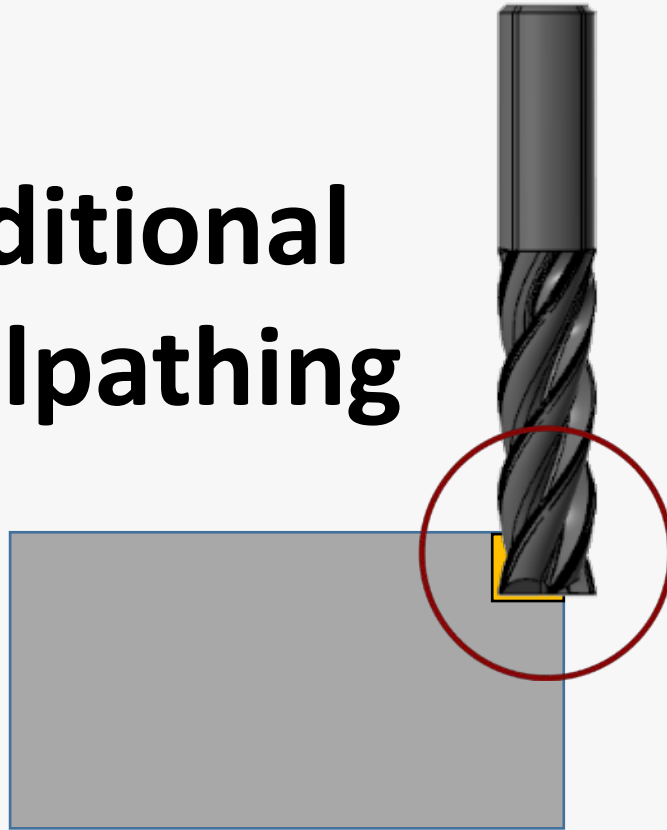


Adjusted IPT

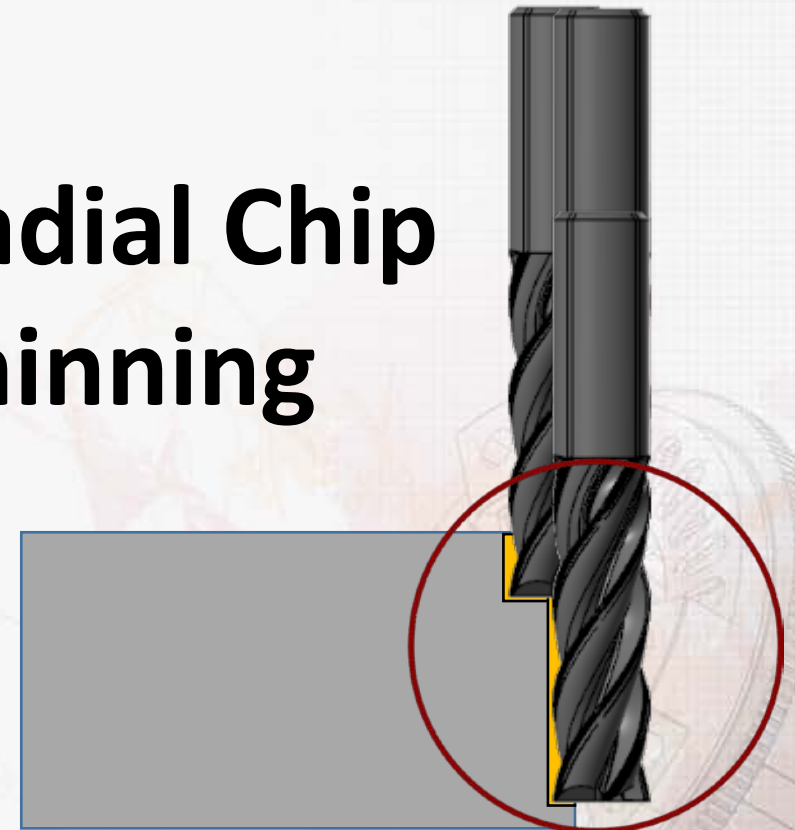


RADIAL CHIP THINNING – PERIPHERAL MILLING

**Traditional
Toolpathing**



**Radial Chip
Thinning**



SMALLER STEP-OVER + DEEPER STEP-DOWN =

- Longer tool life
- Increased feed rates, higher material removal rates
- Less tool deflection, less chance of tool breakage
- Reduced machine wear/tear (lower spindle load)
- Lower your horsepower requirement
- Allows lighter-duty machine tools to achieve higher productivity



TRADITIONAL VS RCT BY THE NUMBERS

1018 Steel

½" HP Carbide Endmill

4 Flutes

IPT = .0032

SFM = 400

● $A_e = .25''$
 $A_p = .25''$
RPM = 3060
IPM = 39.1
MMR = 2.44

● $A_e = .075''$
 $A_p = 1.0''$
RPM = 3060
IPM = 54.7
MMR = 4.11

**68%
Increase**





DYNAMIC MOTION

