Formulas for Milling Operations

**Variable** | **Abbreviation**
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Speed (Surface Feet per Minute) | SFM
Feed (Inches per Minute) | IPM
Feed per Tooth | FPT
Adjusted Feed per Tooth (Chip Thinning) | AFPT
Feed per Revolution | FPR
Depth of Cut | DOC
Width of Cut | WOC
Tool Diameter | D
# of Teeth in Cutter | Z
Metal Removal Rate (Cubic Inches per Minute) | MRR

To Get: | Formula
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Speed (RPM) | \( \frac{(SFM \times 3.82)}{D} \)
Feed (Inches per Minute) | \( RPM \times FPT \times Z \)
SFM (Surface Feet per Minute) | \( \frac{(RPM \times D)}{3.82} \)
IPT (Inches per Tooth) | \( \frac{(IPM \div RPM)}{Z} \)
MRR (Cubic Inches per Minute) | IPM x WOC x DOC
AFPT (@ less than 1/2 dia. WOC) | IPM x \( \frac{D}{WOC} \)
HP (Horsepower Consumption) | MRR x \( mf \)

- \( mf - steel = 1 \)
- \( mf - gray iron = .65 \)
- \( mf - aluminum = .3 \)
- * - 1.5% from total for every degree positive