



## Formulas for Milling Operations

### Variable

Speed (Surface Feet per Minute)  
Feed (Inches per Minute)  
Feed per Tooth  
Adjusted Feed per Tooth (Chip Thinning)  
Feed per Revolution  
Depth of Cut  
Width of Cut  
Tool Diameter  
# of Teeth in Cutter  
Metal Removal Rate (Cubic Inches per Minute)

### Abbreviation

SFM  
IPM  
FPT  
AFPT  
FPR  
DOC  
WOC  
D  
Z  
MRR

### To Get:

### Formula

**Speed** (RPM)

$$\frac{(\text{SFM} \times 3.82)}{D}$$

**Feed** (Inches per Minute)

$$\text{RPM} \times \text{FPT} \times Z$$

**SFM** (Surface Feet per Minute)

$$\frac{(\text{RPM} \times D)}{3.82}$$

**IPT** (Inches per Tooth)

$$\frac{(\text{IPM} / \text{RPM})}{Z}$$

**MRR** (Cubic Inches per Minute)

$$\text{IPM} \times \text{WOC} \times \text{DOC}$$

**AFPT** (@ less than 1/2 dia. WOC)

$$\text{IPM} \times (\text{sqrt}) \frac{D}{\text{WOC}}$$

**HP** (Horsepower Consumption)

$$\text{MRR} \times \text{mf}$$

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