# Common Milling Calculations

**RPM** = $\frac{SFM \times 3.82}{D}$

*Revolutions per Minute*

**SFM** = RPM x D x .262

*Surface Feet per Minute*

**IPM** = RPM x FPT x Z

*Inches per Minute*

**IPR** = $\frac{IPM}{RPM}$

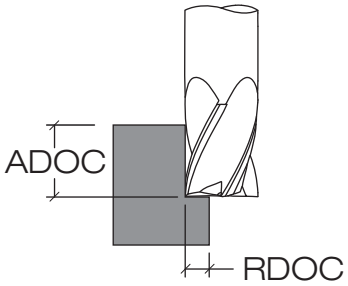
*Inches per Revolution*

**FPT** = $\frac{IPR}{Z}$

*Feed per Tooth*

**MRR** = RDOC x ADOC x IPM

*Metal Removal Rate (cu. in./min.)*




**KEY**

| | |
|---|---|
| **D** | Tool Cutting Diameter |
| **R** | Tool Radius |
| **Z** | Number of Flutes |
| **RPM** | Revolutions per Minute |
| **SFM** | Surface Feet per MInute |
| **IPM** | Inches per Minute |
| **IPR** | Inches per Revolution |
| **FPT** | Feed per Tooth |
| **MRR** | Metal Removal Rate |
| **RDOC** | Radial Depth of Cut |
| **ADOC** | Axial Depth of Cut |
| **$r_i$** | Part Radius (inside arc) |
| **$r_o$** | Part Radius (outside arc) |

**Radial Chip Thinning Adjustment**

$$FPT_{adj} = \frac{CLPT \times (D/2)}{\sqrt{(D * RDOC) - RDOC^2}}$$

*See additional technical information on page 102.*

**Feed Rate Adjustment - Outside Arc**

$$F_o = \frac{IPM \times (r_o + (R/2))}{r_o}$$

*See additional technical information on pages 102-103.*

**Feed Rate Adjustment - Inside Arc**

$$F_i = \frac{IPM \times (r_i - (R/2))}{r_i}$$

*See additional technical information on pages 102-103.*

**Ball Nose "Effective Diameter"**

$$D_{eff} = 2 \times \sqrt{R^2 - (R - ADOC)^2}$$

*See additional technical information on page 108-109.*

**Ball Nose Velocity Adjustment**

$$V_{adj} = \frac{SFM \times 3.82}{D_{eff}}$$

*See additional technical information on page 108-109.*

*We have many self-computing electronic calculators available for your use.*
*Please visit our website* **www.1helical.com** *and you will find them under the "calculators" tab*