End Mill Construction

**Core Diameter**: The diameter measured tangent from bottom of all flutes. This diameter dictates the strength of your end mill.

**Cutting Diameter**: Measured from margin-to-margin on cutting end of tool. An even number of flutes can be measured 180° apart.

**Dish Angle**: Angle perpendicular to centerline of tool and allows proper end cut characteristics - reduces full diameter contact.

**Flute Wash**: Amount of non-cutting flute area past the length of cut.

**Gash Angle**: The diameter measured tangent from bottom of all flutes. This diameter dictates the strength of your end mill.

**Helix Angle**: This is the angle formed by a line tangent to the angle of the flute grind and parallel to the centerline of the tool.

**Length Below Shank (LBS)**: A length measured from front of tool back to the shank, allowing extra room for deep pocketing conditions.

**Length of Cut (LOC)**: This is the actual cutting depth of the tool in the axial direction.

**Overall Length (OAL)**: A measurement taken from end-to-end of the tool.

**Cylindrical Margin**: Portion of the “uncleared” area on the peripheral area of the tool, allowing for a small area of contact with the work piece.

**Pitch**: This is an equal angular measurement from flute-to-flute. If the tool is a variable pitch style then this spacing is unequal.

**Radial Rake**: The angle of the rake face measured from center of the tool.

**Radial Relief**:
- **Cylindrical**: Area where cutting face is relieved behind the cutting edge in order to avoid rubbing, while maintaining maximum cutting tool strength.
  - A very effective relief for non-ferrous alloys. Includes a primary and secondary relief angle.
- **Eccentric**: A powerful edge design for ferrous and tough material cutting. This design includes a primary relief measured radially along its edge.
- **Standard**: A traditional grind allowing for moderate edge strength and high degree of primary and secondary radial relief.

**Shank Diameter**: The end of the tool that is held in the holder and requires a high degree of accuracy and roundness.

**Radial Relief Types**

- **Cylindrical**
- **Eccentric**
- **Standard**