

Gear Cutting Reference Guide

Method	Typical Use	Advantages	Limitations	Machine Type
Hobbing	Spur, helical, worm gears	Fast, versatile, accurate	Not for internal gears	Gear Hobbing Machine
Shaping	Internal, external gears	Cuts internal gears	Slower than hobbing	Gear Shaper
Milling	Prototypes, low-volume jobs	Simple setup, flexible	Less accurate, slow	Milling Machine
Broaching	Internal gears, splines	High precision, excellent finish	Expensive tooling, specific profiles	Broaching Machine
Grinding	Finishing hardened gears	High precision, surface finish	Time-consuming, costly	Gear Grinder
Skiving	Internal, hard gears	High speed, hardened materials	Specialized tooling required	Gear Skiving Machine
Form Cutting	Low volume, special forms	Inexpensive custom shapes	Limited accuracy, slow	Manual/CNC Lathe/Mill

Module (mod)	Ratio of pitch diameter to number of teeth (metric)
DP (Diametral Pitch)	Teeth per inch of pitch diameter (imperial)
Pressure Angle	Angle between gear tooth and gear center (e.g., 20°)
Backlash	Clearance between mating teeth
Lead	Distance gear tooth advances in one revolution (helical)
Addendum/Dedendum	Tooth height above/below pitch circle

■ Gear Inspection Checklist

- Check tooth profile accuracy (involute)
- Verify pitch circle diameter
- Confirm backlash is within spec
- Inspect surface finish (especially for ground gears)
- Measure runout & concentricity

■ ■ Tooling Quick Tips

- **Hob Cutter:** Match module/DP, pressure angle
- **Shaper Cutter:** Match internal/external form
- **Grinding Wheel:** Use correct profile dresser
- **CNC Settings:** Always double-check feed rates for gear-specific paths

