

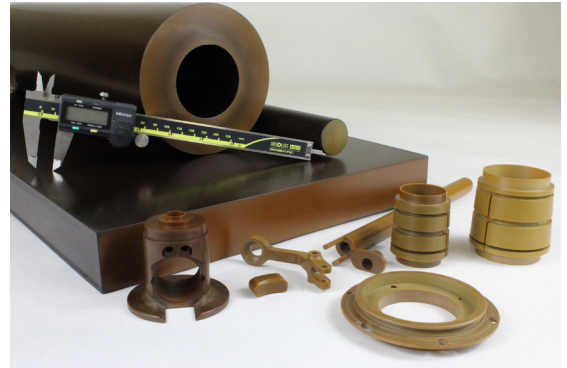


# MACHINING GUIDE – TORLON® PAI

## MACHINING NOTES – TORLON:

- **Fixturing is critical:** Torlon shapes are stronger & stiffer than most plastics, but considerably softer than most metals.
- **All grades are abrasive on tooling:**
  - **Short runs** – consider carbide tooling
  - **Long runs/Tight tolerances/Reinforced grades** – always consider Polycrystalline (PCD) tooling
- **Lower elongation than many other plastics:** Excessive tool rubbing during machining can cause material pullout resembling localized porosity. Deep hole drilling without sufficient coolant can lead to cracking.
- **All extruded Torlon shapes have a 0.010-0.020” cured outer skin\*:** It is harder than interior sections and can be machined off or left on. It offers the best wear and chemical resistance.

*\*Machined Torlon parts can be recured after machining if maximum wear resistance and chemical resistance is required. Contact Drake prior to ordering if a post cure is planned.*



## TURNING

Positive geometries with ground peripheries are suggested for inserts. Fine grained C-2 carbide or PCD inserts are best.

360° chuck pressure is suggested to avoid distortion. Pie jaws and/or soft jaws should be used when turning thin-walled tubular shapes.

## THREADING

Single point inserts with flood coolant should be used for threading. Two fluted, coated taps and suggested for tapped holes.

*Tapping should be done with coolant.*

## DRILLING

Low helix drill bits and flood coolant are best for holes below 1” diameter. **Peck drilling** is suggested for swarf removal.

Larger diameter holes are best approached using a 2-step process incorporating a drilled pilot hole (1/2” diameter max) and a boring to finish diameter.

## MILLING

Part fixturing is critical for milling, as high spindle speeds and fast travel are preferred to minimize frictional heat buildup and material pullout. Cutters should be designed with positive geometry. **Climb milling is recommended over conventional milling.**

# Torlon® Machining Parameters

TURNING		
	METRIC	U.S. IMPERIAL
Cutting Speed	90 m/min	240 ft./min
Feed	0.1 mm/rev	0.6 in./rev
Relief Angle	5°	15°
Rake Angle	7°	15°
Cutting Depth	0.6 mm	
CIRCULAR SAWING		
Cutting Speed	1830 m/min	2440 ft./min
Feed (mm/rev)	fast & steady	
Relief Angle	15°	
Rake Angle	15°	
Set	slight	
MILLING		
Cutting Speed	150 m/min	240 ft./min
Feed	0.15 mm/rev	0.9 in./rev
Relief Angle	5°	15°
Rake Angle	7°	15°
Cutting Depth	0.9 mm	
DRILLING		
Cutting Speed	90 m/min	240 ft./min
Feed	0.1 mm/rev	0.4 in/rev
Relief Angle	0°	
Point Angle	118°	
REAMING		
Slow Speed	150 rpm	

*Note: PCD Coated Carbide or sharp Carbide tools are recommended for optimal results.*