

Machining of Polyurethanes: Contouring O.D.

Machining tapers, chamfers, grooves, and other surface configurations into wheels, roller, and other round parts all fall into the general category of contouring.

Tools for grooving the o.d's of hard urethanes - 95A to 75D - all have the same basic tool geometry. We have found that a 10 to 20 degree front rake works well with no top rake. Use high rpm (depending on the diameter of the work piece) and moderately fast hand feeds.

The tool works best when positioned .025" to .075" below the center of the work piece. The chip should come off in a continuous ribbon. Try to keep the chip from wrapping around the work piece.

Large tools work well on hard durometers, but your machine must be heavy and have the horsepower to maintain constant rpm's during the cutting cycle. See figure 5.

Fixturing of parts when contouring is very important. It is possible to pull workpieces out of the machine if your fixturing isn't rock solid. When possible, pinch the workpiece between the chuck and the tailstock. Another possibility would be to hold the workpiece on a fixture in a lathe chuck or collet by bolting a plate to the fixture and sandwiching the part between the plate and the fixture. This type of fixturing is especially good when cuts are heavy, "plunge" type.

Contouring and chamfering urethane wheels and rollers is done with tools that are ground and radiused to the specific dimensions of the desired final shape. For 95A to 75D durometers, the contouring tool needs no top rake. Coolant applied with a brush will help the surface finish. The work must be kept wet during the entire cutting cycle. Remember: most contouring tools have large cutting surfaces that build up heat. This heat must be kept under control.

When contouring urethanes softer than 95A, use a tool with 15 to 30 degrees of top rake. Lathe speed depends on the o.d. of the part. In general, high RPM works best.

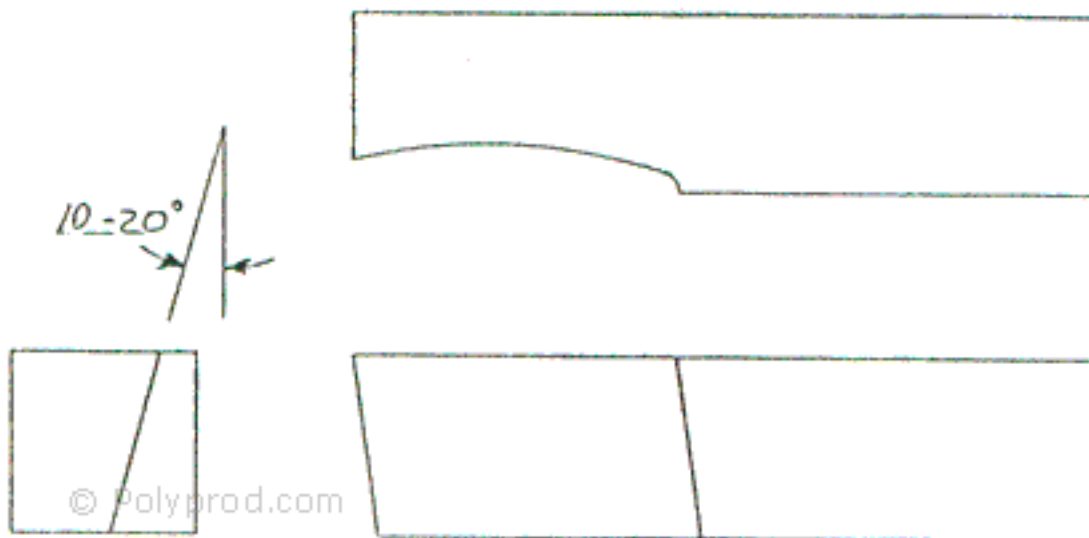


Figure 5. CONTOURING TOOL