



PTM&W Industries, Inc.

10640 S. Painter Avenue Santa Fe Springs, CA 90670-4092
562-946-4511 800-421-1518 FAX: 562-941-4773
Visit Us At: www.ptm-w.com Send Questions To: info@ptm-w.com

INSTRUCTION BULLETIN:

Techniques for Machining Urethane Elastomers

The chemical composition and physical properties of polyurethane elastomers will vary with the specific task for which they are tailored. The machinist must use his experience in evaluating cutting action, rather than rely entirely on tool geometry.

A good surface finish and conformance to established tolerances are maintained with a combination of high speed and fine feed. Polyurethanes build heat rapidly, and require constant application of a coolant. Excellent surfaces and production speed are easier to maintain with a Durometer of Shore A95 or harder.

Movement away from the tool is apparent when a cut is started, and can never be entirely eliminated. The importance of a sharp cutting edge cannot be overemphasized. An edge that is sharp enough for metal might be wholly unsatisfactory for polyurethane elastomers.

DRILLING

A sharply honed standard wood auger bit will produce the best drilling, but an oversized drill must be used because the drilled hole will be smaller than the drill size. A twist drill ground to the desired size is often utilized instead of an auger bit, which is only available in standard sizes.

MILLING

Milling elastomers requires sharp tools with more clearance than required with other materials. An excellent job can be done with a fly cutter. Distortion and heat buildup are two areas that require constant attention. Moderate speeds and a light feed will ensure excellent results.

TURNING

Polyurethanes can be cast close to the required finished dimension, and there is no requirement for hogging off large quantities. However, hogging is feasible if the operator controls tearing. Turning with a round nosed tool produces a fine chip.

TREPANNING

Short parts are trepanned with a knife-type tool positioned parallel to the lathe bed and lightly fed into the end of the polyurethane. An excellent finish is obtained with material having a Durometer of Shore A60 or harder.

FACING

Facing and cutting off can be accomplished with round-nosed or knife-type tools. A round-nosed type will produce better results on facing harder compounds. Bar stock is usually sliced with a circular slitting knife. The blade is excellent for slicing disks, and should have an included angle of 8 degrees. Boring of inside diameters can be accomplished with a boring tool or with a style tool.

GRINDING

The best method to achieve a finished polyurethane elastomer product with close tolerances is by grinding. Excessive heat buildup is still a major problem, but with care a breakdown of material can be avoided. The use of a poly-bond wheel has provided excellent results.