

MACHINING OF NOLATHANE

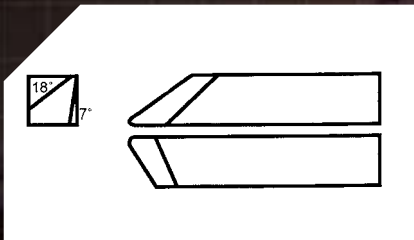
INTRODUCTION

To make bushes from solid rod stock (see page 12 for available sizes) or to modify existing bushes. The machining operations should all be carried out on a lathe.

The theory of machining urethane is "get in quick and get away" - this is best done by hand and feel.

Machining of Nolathane is best carried out with high speed steel grade tooling. You need tools specially ground for the durometer of the urethane to be machined. Tool clearance is very critical. The material has to slide away with no resistance at all, avoiding chips. You want to leave the waste material in one piece, like a ribbon if possible.

TURNING URETHANE



It is best to bore Nolathane solid rod and mount it on a mandrel for the best turning results - the same applies when modifying moulded bushes. Having the tool approximately 1mm below centre height removes material a lot easier, No coolant is necessary if these procedures are followed.

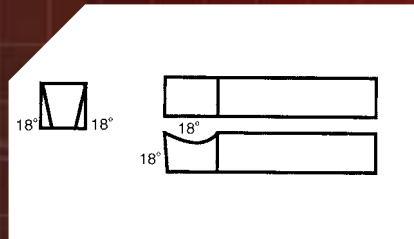
A feed rate of approximately 0.4 mm (.017") per second is acceptable. Head speed of the lathe should run at 980 to 1200 RPM, resulting in a surface feed of between 30 to 50 metres (100' to 150') per minute - this will be ultimately determined by the outside diameter of the part you are turning.

Grind your tool with a 7° front rake and an 18° top rake.

Rapidly plunge into the material, up to 1.25 mm (0.50") per second hand feed. It is almost impossible to go too fast. Remember to remove the tool quickly to keep from leaving tool marks and urethane buildup on the finished urethane cut.

When machining urethane, any resistance from your tool when cutting will result in melting or burning of the material.

GROOVING URETHANE



In some applications you will want to machine a groove or recess into the outside dimension of the part you are making. This is best carried out by plunging a shaped tool into the part. Head speed and surface feed should be the same as for turning procedures.

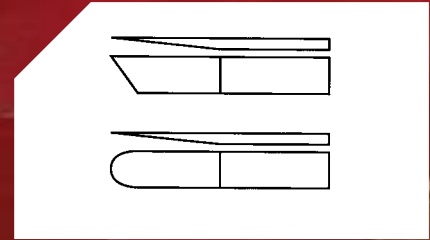
Rapidly plunge into the material, up to 1.25 mm (0.50") per second hand feed. You must get in and out fast so shaving does not wrap back around the work piece.

Your tool should be shaped to the configuration of the groove you want - looking from the top of your tool down, it should resemble the cut you are seeking. Allow approximately 2 mm (1/16") wider width on your tool to compensate for the urethane pushing away from the tool and then contracting back.

Your tool needs as much rake on the sides and the top as you can get, 18° if possible.

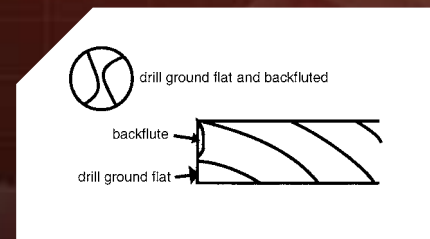
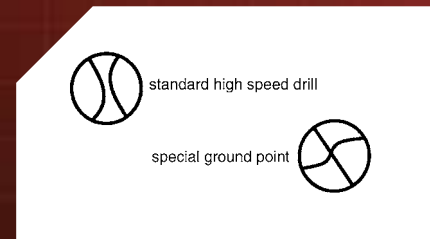
PARTING (KNIFING) URETHANE

The hardest thing about knifing urethane is that the material wants to pull into the tool causing a dishing affect - this makes it very difficult to hold any tolerances. The best procedure is to cut the bulk of your material away in your first cuts, leaving a 1-2 mm (1/32 - 1/16") finish cut, which you do at a slow feed, usually by hand. (not auto feed)



Either a parting tool or old power hacksaw blade can be used. For best results sharpen your tool to a razor edge point - a bull nose or flat nose with slight backrake can be used.

DRILLING URETHANE



There are two methods of drilling that are effective:-

1. Good results can be achieved by grinding a 60° angle on a standard high speed drill - then grind a special razor sharp point.
2. Grind a standard high speed drill flat nosed like a mill cutter - then backflute the two spirals to a razor sharp edge.

Either of these two methods will permit the swarf to be drawn up the fluting and not cause excessive heat buildup. The urethane will melt, so use a slow RPM drill and a fast feed.

Nolathane provides this information to assist in the use of its products. Please ensure due care is taken and appropriate safety equipment is used.