

Machining Polyurethanes: Sawing & Shearing

One of the best machines for sawing urethanes is a band saw. Long blades of 125 to 175 inches are desirable because they stay cooler and keep the urethane from melting. A band type that we have found to work well is a 4 tooth per inch with raker set. A raker set blade is one that has its teeth alternating to the left and right of center.

Band speeds in the range of 3200 feet per minute work well on almost all durometers. Feed rate is controlled by hand, so it is operator dependent. Any moderate hand feed will suffice, but do not force the work.

On softer urethanes, a faster blade speed helps prevent the urethane from pulling down into the cut, rubbing on the blade, and building up heat. When cutting thin, low durometer sheet stock, the work must have some support. A sheet of cardboard, for example, will help prevent the workpiece from being pulled through the table slot by the blade.

If a finer finish is needed, change to a 10 tooth per inch blade with raker set. When cutting 90A durometer and below, use a spray mist of water soluble oil (50 – 50 mix) to help keep the heat down and to improve the finish. This spray coolant is also helpful on thick cuts where feeds are slow, and on long cuts where the blade will contact urethane for a long period.

A good alternative to saw cutting thinner and lower durometer sheets is a shear. Shearing, punching, and die cutting are possible on sheet stock up to 1" thick if the hardness is low and the tools are sharp. Remember, though, as the thickness increases, so does the tendency for the cut edge to have a "dish" due to the elasticity of the urethane. Shearing and punching are also possible on 50D to 75D urethanes, but it's only practical up to 1/4 inch thickness.