

Section #3 Fluoroplastics

Slab mills are sometimes used. However, this must be done with care and slower spindle speeds usually eliminate chatter marks.

Burrs at the end of a run-out cut can be eliminated by putting a piece of slightly harder material such as nylon, brass or aluminum at the end of the work where the cutter will run out, allowing the cutter to continue past the work and into the harder material.

It is advisable to use a jet of air to blow the chips away from the work area and the cutter. Coolants are not usually necessary. However, when undue heat is generated by the cut, mist coolants or water soluble oils are recommended to minimize thermal expansion.

Section #4 Polycarbonate

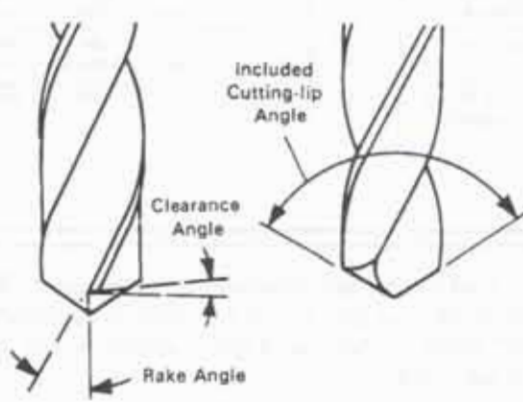
Polycarbonate is readily machined with conventional metal working tools. Many close tolerance prototype and production parts have been made more easily from it than from common metals. However such results can be achieved only when the greater heat sensitivity and lower thermal conductivity of the resin is compensated for by close adherence to the suggestions and recommendations which follow.

Drilling, Tapping, & Threading

Standard steel working twist drills may be used for drilling Polycarbonate. For long runs, carbide tipped drills may be used to advantage as they retain the sharp cutting edge required for high speed work. Very clean holes are obtained with no gumming even without air or liquid cooling. High speed drills may be used if the work is lubricated with a light machine oil. There is no tendency for the drill to break out of the bottom of the piece or chip the edge of the hole even when the drill is forced. Holes can be enlarged with larger drills without hogging or chipping. Steel working tap drills will perform similarly. No advantage can

be obtained by the use of special drills designed for plastics.

For tapping Polycarbonate, standard steel working taps are recommended. Taps that will produce threads with root diameters slightly rounded are preferable as are those which give best chip clearance. A 100 percent thread utilization is permissible but considerable resistance to the tap may be observed. To avoid tap wear a light machine oil lubricant is recommended. Avoid cutting oils and emulsions.



Drills for Polycarbonate

Included angle	118°
Clearance angle	5°
Rake angle	Depends on drill spiral — may be ground-to-zero or five negative for thin sheet drilling.

The torque resistance of the thread tapped in Polycarbonate is high. A 1/2 inch diameter bolt of 13 threads per inch, penetrating a block of Lexan resin to a depth of 9/16 inch required 48 foot pounds of torque to strip the threads. In another test a 3/16 inch steel bolt of 24 threads/inch with a 9/16 inch penetration required a torque of 50 inch pounds to shear the bolt head. In this case the threads tapped in the Polycarbonate block were unaffected.