

Machining of Polyurethanes: Drilling

Slow, spiral drills perform best because the large flute area permits free discharge of chips with a minimum of binding and heat build-up.

Frequent retraction of the drill aids in eliminating chip blockage of the flutes. Break-out tearing at the exit side can be reduced by slowing the drill at the bottom of the hole, or by backing with another material.

When drilling a series of small holes, inserting a pin in each completed hole prevents the force of the drill from pushing material into adjacent holes and causing subsequent distortion.

Sharp cutting edges will minimize elastic deformation as the chip is formed. Polished flutes should be used to aid in chip clearance and coolant is required for good drilling performance. The rake angle should be reduced to 0 degree or negative angle and a generous lip clearance, (approximately 16 degrees) provided for proper relief.

The point angle is governed by the final wall thickness. Sharp points of 90 to 110 degrees are best for heavy walls and large diameters, while blunt angles of 115 to 130 degrees are better for thin walls. Close tolerances call for feed ranges of 0.004 to 0.006 ipr. Feed rate of 0.015 ipr can be used where tolerances permit.

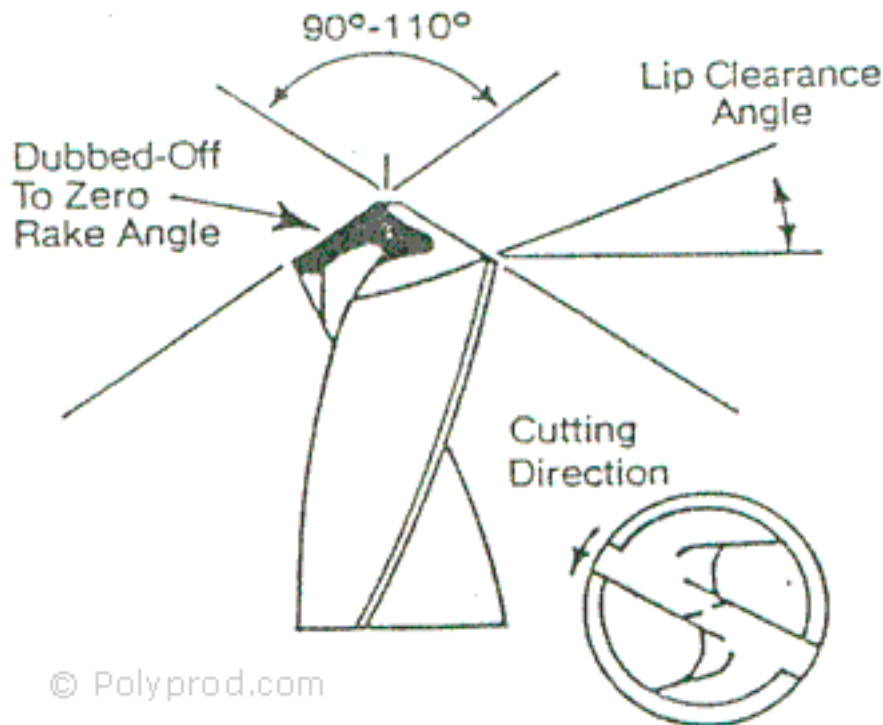


Figure 6. TOOL FOR DRILLING