

DRILLING ABS

Drilling is a common post-molding machining operation, largely for economic reasons. Construction of moulds with plugs in any position but vertical to the mould surfaces, necessitating plug withdrawal before mould release, is likely to be very expensive. Part design or configuration and production volume will help determine the most economical method used to produce holes.

ASTALAC™ brand ABS may be drilled effectively because of its hardness and rigidity. The most important factor is the removal of chips by the drill. Chips will tend to pack in the flutes and, as a result of frictional heat, fuse together. To minimize fusion, highly polished flutes with a slow helix are recommended, with generous side relief, and the use of coolants. Cutting speeds and feed rates also influence the drilling of clear, true holes.

A standard drill press is adequate for ABS, however the drill bit should be ground to scrape rather than cut. Customary high-speed, double-fluted twist drills are satisfactory, but superior finish will result from bits having a point with a 90° included point angle, 300° helix angle, and wide, polished flutes. Backing up the drilling surface is generally desirable, and is mandatory with thick stock.

A moderate feed rate of 0.025 - 0.05 mm per revolution will tend to avoid burring and overheating.

A slow feed rate and consequent residence time may cause heat build-up and tool drift. Drill surface speed of 18 - 54 m/m is recommended.

Holes with a depth of up to five times diameter may be cooled with a jet of forced air for deeper holes, cooling with **water** is recommended.

Single-fluted drills, with the required frictional characteristics for piloting and chip removal capacity, allow relatively good heat dissipation with surface speeds of 19 to 152 m/m for small diameters, depth-to-diameter ratios of 25:1 and with plunging feed rates.

Burnishing double-fluted, small twist drills having 118° point angles and 0.25 - 1.4 mm off centre, allow 19 - 30 m/m with feed rates of 0.075 - 0.125 mm / revolution.

Hole saws with a skip tooth blade can be mounted in the drill press to cut larger holes.

TAPPING

Standard metal working tools are used in tapping or threading ASTALAC™ ABS. Taps should have a slight negative rake and should produce threads with the root diameters slightly rounded in order to avoid any possibility of notch-effect weakening of the part. Taps and dies for copper and brass may be used effectively. Lubricants should always be used, and turning speeds should be very slow.