



ACE

technical reference

DRILL NOMENCLATURE AND DEFINITIONS

Drill - A drill consists of a shank, neck, body, and point. In some sizes, necking is omitted.

Body - The body is the portion of the drill extending from the shank or neck to the outer corners of the cutting lips.

Shank - The shank is the portion of the drill by which it is held in a chuck and driven.

Neck - The neck is the diametrically undercut portion between the drill body and shank.

Tang - The tang is the flattened end of the shank, intended to fit into a driving slot in the drill holder or socket. Tangs are most common on taper shanks.

Point - The point is the cutting end of a drill, made up of the ends of the lands and the web forming the lips. In form it resembles a cone, but it departs from a true cone in order to furnish clearance on the cutting edges.

Overall Length - On straight shank drills the length from the end of the full diameter of the shank end to the outer corners of the cutting lips is called overall length.

On taper shank drills the length from the extreme end of the shank end to the outer corners of the cutting lips is called the overall length.

Flute Length - The flute length is the length from the outer corners of the cutting lips to the extreme back end of the flutes. This is often referred to as the length of twist. It includes the sweep of the tool used to generate the flutes, and therefore, does not indicate the usable length of flutes.

Flutes - The helical or straight grooves cut or formed in the body of the drill to provide cutting edges, to permit removal of chips, and to allow cutting fluid to reach the drill's cutting edges are called flutes.

Land - The land is the portion of the periphery of the drill body not cut away by the flutes.

Margin - The margin is the portion of the land which is not cut away to provide clearance. The margin forms the full diameter of the drill.

Body Diameter Clearance - The portion of the land that has been cut away so it will not rub against the walls of the hole is designated as body diameter clearance. It is sometimes called land clearance. Its purpose is to reduce friction. Its length is approximately equal to flute length minus the sweep of the tool used to form flutes.

Clearance Diameter - Clearance diameter is the diameter over the cut-away portion of the drill land.

Web - The central portion of the drill body that joins the lands is called the web.

Web Thickness - The minimum thickness of the web at the point after fabrication is called the web thickness. Web thickness may vary along the length of the flute in accordance with the manufacturers' practice.

Web Thinning - The operation of reducing the web thickness at the point to reduce drilling thrust is called web thinning.

Chisel Edge - The edge that is formed at the end of the web that connects the cutting edges is called the chisel edge.

Lips - The cutting edges of the drill extending from the chisel edge to the periphery are called the lips.

Helix Angle - The helix angle is the angle of the leading edge of the land with the axis of the drill. The helix angle is identical with the rake angle of the cutting edges at the periphery of the drill. A straight flute drill would have a zero-degree helix angle.

Rake Angle (in relation to work) - The rake angle is the angle between the leading edge of the land and the axis at the drill point.

Point Angle - The angle included between the lips projected upon a plane parallel to the drill axis and parallel to the two cutting lips is known as the point angle.

Lip Relief Angle - This is the angle measured between a tangent on the surface back of the cutting edge at the periphery and a plane at right angles to the axis of the drill.

Chisel Edge Angle (Center Angle) - The angle included between the chisel edge and the cutting edge as seen from the end of the drill is called the chisel edge angle.

Back Taper (Longitudinal Relief) - Drills are usually made slightly smaller in diameter at the shank end than at the point. This is known as back taper.

Axis - The axis is the longitudinal center line projected through the drill body.

Twist Drills - Twist drills are end cutting tools having one or more cutting edges, and helical or straight flutes or grooves adjacent thereto for passage of cuttings or chips. Twist drills are used for originating holes.