

Experiment No. 12

Statement:

Demonstration of drill press various operations.

Apparatus:

1. Drilling Press
2. Drill Press Tools

Theory:

Drilling - A center drill should be used to aid with the drilling.

2. A center drill has short flutes and a thick shaft. Therefore, it is very stiff and will not wander. Since a center drill doesn't cut as easily as a drill bit, use cutting oil.
3. The hole is ready to be cut with a drill bit now.
4. It is recommended to use a smaller pilot hole before drilling the final one if the hole is large. This increases the accuracy of the hole and allow the bits to last longer.
5. If the hole is deeper than the diameter of the hole, use cutting liquid and back off occasionally.
6. The spindle speed should be reduced as drill size is increased.
7. When drilling a through hole, make sure the bit will not drill into the table after drilling through the work.
8. Set a depth stop on the quill to reach a desired depth of the hole.

Countersinking – Countersinking is an operation in which a cone-shaped enlargement is cut at the top of a hole to form a recess below the surface. A conical cutting tool is used to produce this chamfer. When countersinking, the cutter must be properly aligned with the existing hole, and should be rotated about 1/3 the cutting speed of the drilling operation for the hole. Countersinking is useful in removing burrs from edges of holes, as well as providing a flush fit for flat-headed fasteners.

Counterboring – Counterboring is the process of cylindrically enlarging a hole part way along its length. A counterbore cutter is similar to a drill bit in that it has a shank and fluted body, but instead of a point, it has a smaller diameter pilot portion. The pilot fits into a pre-drilled hole, and guides the counterbore. Therefore, the counterbore must be aligned with the original hole, so the pilot will follow the hole properly. Counterbores are used to accommodate studs, bolts, or socket head caps crews where a flush surface application is required.

