UW Physics Student Machine Shop

Standard Operating Procedures

Drill Presses

Purpose

Drill presses are used to produce round holes in a variety of materials. Although the majority of drill press tooling consists of various types of drill bits, specialty tooling is available for countersinking, hole sawing, center-punching, and mortising. Drill presses may be smaller bench-mounted units or larger self-standing tools.

As always, whenever you have any questions regarding the safe operation of Student Shop equipment, find the Shop Instructor or another Instrument Maker and ask before you act.

Limitations

- Drill presses are largely limited to the creation of complete round holes and countersinks in work pieces.
- This is because the Drill Press is limited to making all of its cuts straight downward along the "Z Axis."
- The family of tools limited to cutting in this type of motion include drills, reamers, counterbores, countersinks, taps, etc.
- Drill presses can generate significant torque upon contact with the workpiece. Never hold the workpiece by hand. Instead, use the tool vise, clamps, or a dedicated jig.
- Similarly, never fixture a workpiece in the chuck of a drill press.
- Other methods of material removal require different tools – consult your supervisor or instructor for guidance.

Hazards

There are a number of particular hazards associated with the operation and use of tool, including but not limited to:

- Rotating Drill Bit, Drill Chuck, and Spindle: Large amounts of energy embodied in rotating parts • Potential for loose clothing, jewelry, hair, or other items to become entangled in rotating parts, potentially drawing operator close to or into the rotation with serious consequences.
- Sharp Tooling and Edges on Workpiece: Potential for cuts, lacerations, and puncture wounds
- Fresh cuts on workpiece may produce burrs and other sharp edges
- Flying or Rotating Objects: Cutting activities can generate sharp flying chips or clinging and wrapping sharp spinning chips posing skin and especially hand injury hazards.
- Workpieces, drill bits/tooling, or clamps can become disengaged and rotate or be flung across the room. Insufficiently secured work pieces can be rotated at high speed, potentially striking or crushing fingers, hands, or other close body parts.
- Hot Objects and Components: The friction associated with drilling and cutting generates significant amounts of heat that can cause skin burns, flying sparks, and fire hazards.

Required Personal Protective Equipment (PPE)

- Safety Glasses and/or Face Shield. Eye protection should be worn at all times, including when handling or changing gear belts as well during saw operation.
- Closed-toe, sturdy footwear. Sturdy sneakers and other such footwear is the minimum level of allowable foot protection. Proper safety shoes or boots, with steel toes, electrical protections, etc. are preferred. Extremely lightweight sneakers and all sandals and flip-flops are not safe for drill presses or machine shops in general.
- Hearing protection is recommended in areas which exceed 85 decibels. Higher decibel levels can cause permanent hearing loss very quickly so hearing protection is always recommended in machine shop.
- If sufficient dust is created, a particle mask or respirator is advised.

- Hair ties, hats, etc. to safely contain long hair if needed
- Sturdy, well-covering and comfortable clothing WITH NO LOOSE SLEEVES, SCARVES, etc. that could get pinched and pulled through the rotating spindle.
- ABSOLUTELY NO GLOVES ARE TO BE WORN WHILE THE DRILL SPINDLE IS RUNNING.