



Safety

Don't Screw It Up: Your Guide to Using Power Tools Safely

James Langford | Nov 07, 2024

From nail guns to angle grinders and drills, power tools make machining tasks that might take hours or days by hand the work of only seconds or minutes.

The muscle that they bring to the job, however, can make them hazardous to the health of operators and anyone around them when used incorrectly.

More than 400,000 people a year are treated at U.S. hospital emergency rooms for power tool injuries sustained both in and outside of the workplace, according to Berkshire Hathaway Homestate Companies, a group of insurers. Some 5,800 cases involve power drills and 22,000 are linked to workers using nail guns.

"The force generated by power tools is substantial and for new people using tools it's often underestimated, and as a result when a cutting bit jams, it tends to throw them off balance and from there, only bad things happen," Lorne Davies, a safety adviser with the Manufacturing Safety Alliance of British Columbia, says in a **video** on the organization's website.

"Power tools are designed to quickly machine materials much stronger than human flesh," adds Davies, who has decades of experience managing power tool hazards. "If a cutting bit touches you, it's not going to slow down at all, so we really need to make sure that doesn't happen."

Along with debilitating and even deadly wounds for workers, such **accidents can prove costly to employers** by curbing productivity, increasing the cost of health claims and spurring fines from regulators including the U.S. Occupational Safety and Health Administration.

The agency, which sets an **array of rules** governing the use of such tools in general industry as well as the maritime and construction sectors, imposed more than \$426,000 in fines on manufacturers under **Standard 1910.242**, a broad general industry provision covering hand and portable powered tools, in the year through September. That was about 79 percent of the total for all U.S. businesses.

MSC offers materials for power tool safety training. [Click here to find out more.](#)

"Power tools are 'good friends' that require operator respect in specific ways," says the Power Tool Institute, a trade organization for power tool manufacturers. "They must be used carefully and kept in safe operating condition, whether they are in the hands of a professional tradesman, a beginning do-it-yourselfer or a vocational student. The demands of safety apply to all."

General Safety Tips

Broad safety guidelines for all power tools include:

- **Keeping your work area clean** and well lit.
- Not using power tools in explosive atmospheres or near flammable liquids, gases or dust, **since sparks may ignite dust or fumes.**
- Making sure to plug grounded tools (with three-pronged cords) into properly grounded outlets. Don't remove the grounding prong or use adaptor plugs.
- Storing battery packs away from other metal objects such as nails and screws since they may connect one battery terminal to the other and cause burns or fires.
- In damp areas, plugging the tool into a ground fault circuit interrupter (GFCI) and wearing rubber gloves and shoes.
- Taking care of the device's cord. Don't carry the tool by its cord or pull on the cord to unplug it; keep the cord away from heat, oil, sharp edges or moving parts and replace damaged cords immediately.
- Before using a tool, check it for damage, including misaligned or broken moving parts.
- Making sure the tool is powered off before plugging it in.
- Always reading the operator's manual and instructions for the tool and any attachments before use.
- Never operating power tools under the influence of alcohol, drugs or medication.
- Dressing appropriately. Don't wear loose clothes or jewelry, and make sure to confine long hair.
- **Using appropriate personal protective equipment**, or PPE, for the tool and the job. Gear may include safety goggles, dust masks, hard hats and hearing protection.
- Using power tools only for the jobs for which they were made.
- Securing workpieces, using clamps and a stable work surface. Don't hold workpieces by hand or against your body.
- **Making sure guards are in place and working correctly.**
- Not forcing tools when they're encountering resistance.
- Using only accessories recommended by manufacturers.
- Not touching drill bits, blades, cutters or workpieces immediately after operation since they may be hot enough to cause burns.

Since power tools are built for differing jobs and working conditions, some require different safety precautions than others.

Following are guidelines from regulators; the Power Tool Institute and **Safety+Health** magazine, a publication of the National Safety Council, that can help you reduce the risks that come with using specific types of equipment.

Power Drills

- Make sure drill air vents are clear to allow proper ventilation.
- Keep drill bits sharp.
- Clear the drilling area of all cords during use.
- Disconnect the power supply before changing or adjusting drill bits or attachments.
- Don't use bent drill bits.
- Don't exceed the manufacturer's recommendations for maximum drilling capacities.

- Avoid the use of high-speed steel bits without first cooling the drill or using lubrication.
- Never reach around or under stock that you're drilling.
- Check what's behind or underneath a workpiece before starting work to avoid damaging existing walls, wiring, water or gas pipes.
- For tools with a chuck, make sure it's tightly secured to the spindle since it might loosen and come off the drill otherwise.
- Remove all chuck keys or wrenches before starting the drill.

Portable and Bench Grinders

- Wear *safety goggles, glasses* or *full-face shields* that comply with national standards.
- Use appropriate *masks or respirators*.
- Wear proper *hearing protection*.
- Wear gloves and a shop apron capable of absorbing small metal fragments.
- Never allow wire brushes to rub against guards.
- Use the correct wheel for the job. Attempting to grind with the side of a cutoff wheel, for instance, can cause it to shatter.
- Make sure the outside diameter and thickness of accessories are within the tool's capacity ratings.
- Don't use a grinder that's too heavy to control.
- Make sure you use the correct accessories. If your accessory requires liquid coolant, for example, make sure the tool is designed for use with coolants to avoid shock or electrocution.
- Don't over-tighten the spindle nut; too much pressure can deform the flanges and stress the wheel.
- Test grinding wheels before mounting. A wheel in good condition produces a ringing sound when tapped with a nonmetallic object. If it sounds dull, replace it.
- Never use cracked wheels.
- Make sure that guards are attached securely and provide maximum safety, allowing the least exposure of the wheel to the operator.
- Ensure that bench grinder wheels are trued and dressed when worn out of round.
- Dress and true new bench grinder wheels to get rid of vibration and avoid accidents.

Bandsaws

- Use sharp blades. Remember that damaged or dull blades may throw teeth. A sharp blade is more likely to cut its way out of a pinched situation.
- When installing or changing a blade, make sure to align it properly and that its teeth are running in the right direction.
- Make sure guards are in place and working correctly.
- Don't overreach.
- Always hold the saw firmly with both hands.
- Let the blade reach full speed before making contact with the workpiece.
- Keep hands away from cutting edges and moving parts.
- Never reach under the saw or workpiece where the blade is exposed.
- Wait until the blade has completely stopped rotating before removing it from a cut.
- Release the switch immediately if the blade binds or the saw stalls.

Nail Guns

Injuries when using nail guns are often caused by unintended firing, pressing the contact trigger when the gun isn't being held firmly against a work surface, ricocheting or airborne nails and bypassing

safety features, according to *CPWR-The Center for Construction Research and Training*.

To avoid injury, it suggests:

- Keeping the nail gun pointed away from your body and other workers.
- Disconnecting the compressed air supply when leaving the gun unattended, changing locations, handing it to someone else or performing maintenance.
- Wear PPE including safety glasses that meet **ANSI Z87+ standards**, hearing protection and steel-toed footwear.

Workers in machining and metalworking shops who see colleagues using a hand or power tool incorrectly should step in and help them get the training they need, Davies says. It's a situation that may arise more frequently as highly skilled older workers retire and less experienced workers step into new roles.

"We have a real temptation to laugh at a co-worker attempting to drill a hole while the drill is operating in reverse, but that creates a culture where people are afraid to ask for help," Davies says.

"Demonstrate some leadership and make a difference by helping that person get the training to do it right."

What are your best tips for operating power tools safely? Tell us in the comments below.

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