Metalworking

Daily Grind: Your Guide to Using Abrasives Safely

Kip Hanson | Jun 25, 2024

Removing guards from grinding machines and failing to reinstall them. Not wearing the correct personal protective equipment. Using the wrong size of wheel. Not maintaining equipment properly. Inadequate—or even nonexistent—training.

Those are some of the dangerous—and potentially deadly—safety issues in industrial grinding today.

“I know of a worker who was using the wrong wheel for the material,” says Norton | Saint-Gobain Abrasives Senior Product Safety Engineer Adam Bujnowski. “When the wheel failed, a piece hit him in the jugular vein. He survived, but it could have easily been fatal.”

Grinding is a common metalworking operation, performed each day by countless machine shops, welding houses, sheet metal fabricators, tool and die makers and even construction crews throughout North America.

Many forms exist, from cylindrical and centerless grinding to weld preparation and cleanup, belt sanding and cutting-tool grinding. Each carries distinct risks that include airborne particles, vibration, noise and physical injury, all of which are easily mitigated through education, vigilance and adherence to some basic safety guidelines.

Read the Instructions

One of the best places to learn those guidelines? The documentation that came with your abrasives product.

“Everyone gets busy,” however, “so it’s easy to ignore the usage recommendations and warnings that come with the products,” Bujnowski says.

Learn More: ***How to Ring-Test, Mount, Balance and Store Your Grinding Wheels***

To improve worker safety, Norton | Saint-Gobain and other abrasive manufacturers have introduced an icon-based warning system that includes easily recognizable symbols like a skull and crossbones or a red circle with a line through it to alert workers to potential hazards.

Even with those warning symbols in place, however, it's important for workers and their employers to read usage recommendations carefully and adhere to them.

Seek Expert Advice

If the instructions are not clear, call an expert.

"Part of my job is to field questions from customers, whether it's someone on the shop floor trying to solve a grinding problem or a homeowner who just bought a grinder at the hardware store and is unsure of what wheel to use," Bujnowski says.

He and his colleagues on the Norton | St. Gobain help desk are one source of grinding advice, as are its website, product manuals and YouTube channel.

Comparable support is available from 3M, where Bill Veeninga, a key account manager for the company's Safety & Industrial Business Group, has some good news: People are taking grinding safety more seriously today than ever before.

"They're doing so for several very good reasons, among them the fact that failing to do so jeopardizes manufacturing's most precious resource—its people," he says. "If an accident occurs, it can not only affect that person's ability to work but can end up costing their employer significant sums of money."

Keep Your Guard Up

The two experts offered strikingly similar safety recommendations, starting with the need for guarding.

"It's true you can run some grinding products without guards, but those are definitely in the minority," Veeninga says. "We probably see the most safety abuses with portable abrasives like cutoff and depressed center wheels. These and other bonded products must be respected and handled carefully to prevent damage, and always be used with a guard. Some pretty bad things can happen if you don't.

> **It's crucial to ensure the correct guard is used to contain sparks and minimize the risk of injury in case a wheel fails.**

Organizations have had to quickly onboard a new generation of workers in the aftermath of the pandemic, Bujnowski acknowledges.

That has increased the potential for mistakes, such as using a Type 27 grinding wheel designed for a 10,000-rpm angle grinder on a pistol-grip air sander that spins at 30,000 rpm or mounting a 3-inch cutoff wheel on a die grinder.

While such errors are common, they can pose serious dangers, even with the guard in place. It's crucial to find the appropriate grinding wheel for the task, material and intended stock removal, and to ensure the correct guard is used to contain sparks and minimize the risk of injury in case a wheel fails.

Eyes, Ears and Nose

Another concern is air quality. Veeninga recommends that anyone with a beard use a PAPR (powered air-purifying respirator) hood rather than more common N95 and "half-face" masks since facial hair can break the seal and allow outside contaminants to bypass the filter.

“With your choice of facial hair, it’s critical to make sure it’s groomed so it doesn’t interfere where the respirator’s elasticized face seal comes into contact with the skin, do a fit test and also make certain your respirator has been rated for whatever material you’re grinding,” he adds. “For example, grinding stainless steel can release hexavalent chromium, potentially causing cancer.”

Ear protection is similarly important. Foam “roll down” and push-in earplugs are good choices for many applications, but they should always be inserted with clean hands and disposed of after use.

Earmuffs are generally more effective, however, as is a new 3M offering, the PIC-100 Professional In-Ear Communication Headset.

“It’s a neat product,” Veeninga says. “You can be part of a large workgroup and communicate very clearly, yet you still have the protection you need in a loud environment.”

The need for eye protection goes without saying, but as with respirators, a good seal is paramount.

“It’s ironic, but eye injuries can happen when people are wearing safety glasses,” Veeninga points out. “That’s why we and others now offer gasketed, secure-fit eyewear, which provides additional protection, and for very dirty environments, we will also recommend a face shield.”

Don’t Hesitate to Ask

He and Bujnowski ticked off several other safety and usage considerations from their years in the industry.

Always use the mounting hardware (and backup pads, if equipped) that came with the wheel, they say. Remember that grinding-wheel users should follow the manufacturer’s speed and feed recommendations. Similarly, use the correct abrasive for the workpiece material.

And as noted earlier, learn all you can about the product before using it.

Early in Bujnowski’s career, he had the good fortune to work with experienced colleagues who would correct him if he made mistakes or performed his job unsafely. Access to that kind of institutional knowledge is dwindling, however, as waves of skilled workers retire.

To bridge the resulting knowledge gap, he suggests users turn to wheel manufacturers for guidance, from instructional literature and how-to videos to contacting customer support teams.

Equipment users shouldn’t hesitate to ask questions, Bujnowski says.

Veeninga seconds that. “If a client is not interested in maintaining a safe work environment, we won’t offer product demos or come on-site for application support,” he says. “That’s how strongly 3M feels about safety in general, but specifically with abrasives.”

What are your best tips for using grinding equipment safely? Tell us in the comments below.

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