One of the most common pieces of machinery used in maintenance shops and manufacturing facilities is the abrasive wheel grinder. Abrasive wheel grinders are very useful for removing metal from flat or cylindrical surfaces, but they can also be very dangerous if not properly used or maintained. The following precautions should be taken to keep employees safe when working around abrasive wheel grinders.

Guarding
Improper guarding of abrasive wheel grinders is one of the most frequently cited OSHA standards each year. According to OSHA, a properly guarded abrasive wheel grinder should be guarded as follows:

- Side guards cover the spindle, nut, flange, and at least 75% of the wheel diameter.
- The work rest is present and is adjusted to within one-eighth inch of the wheel.
- The adjustable tongue guard is present and adjusted to within one-quarter inch of the wheel.
- Eye shields provide added protection when used in conjunction with safety glasses or face shields.

Testing
OSHA requires that each wheel be tested before its initial use. The maximum RPM rating of each abrasive wheel should be checked to make sure it is compatible with the RPM rating of the grinder motor. Using an abrasive wheel designed for low RPM motors on a high RPM grinder may cause the wheel to break apart, increasing the risk of injury.

In addition, abrasive wheels should be inspected to make sure they have not been damaged while being moved or stored. This can be quickly accomplished through visual inspection and by using the “ring test”. To perform the “ring test”, gently tap a dry clean wheel with a light, non-metallic tool such as a screwdriver handle or a wooden mallet. If the wheel is in good working condition, the tap should produce a clear “ping”. If the sound is more like a thud, the wheel is damaged and should not be used.

Personal Protective Equipment
Abrasive wheel grinding creates several additional hazards that can be controlled through the use of personal protective equipment (PPE). Recommended PPE for grinding operations includes:

- Safety glasses with side shields to prevent chips from reaching the eyes.
- Tight-fitting gloves to protect the hands if sharp parts are being handled.
- Hearing protection to prevent hearing damage from the noise that grinding creates.
- Filtering face masks to prevent breathing in dust.

Additional Safeguards
- Abrasive wheel grinders should be permanently mounted to a bench or pedestal using bolts of adequate strength.
- The work area should remain free of combustible material that could be ignited by sparks.
- The work area should be well lit, so operators can easily see the workpiece and wheel at all times.
- A dust collection system should be provided on
all grinders that produce large amounts of dust.

- Each grinder should have its own on and off control switch.
- The grinder should be allowed to come up to full speed before use.
- The grinder should be turned off when not in use, as accidental contact could occur with a grinder in motion.

**Combustible Metal Precautions**

Special precautions should be taken when grinding combustible metals. According to NFPA® 484: Standard for Combustible Metals, Metal Powders, and Metal Dusts, the following metals are combustible and require additional safeguards: aluminum, lithium, magnesium, tantalum, titanium, and zirconium. These safeguards include:

- Minimize accumulations of combustible metal chips, shavings, powders, flakes, or dusts by frequently cleaning the grinding area. A hand brushing technique should be used for cleanup, such as using a broom with natural fiber bristles and nonsparking, conductive dustpan.
- Ensure that all ignition sources (e.g., welding, cigarette smoking, grinding of ferrous metals) are controlled in the areas of combustible metal grinding.
- A listed Class D extinguisher, or other extinguishing agent tested and shown to be effective on combustible metal fires, should be provided within 75 feet of the grinder. Be aware that a given agent may not necessarily control all combustible metal fires, so ensure that the Class D extinguisher provided in the grinding area is designed for the type of metal in use.
- Grinding of multiple types of metals, especially ferrous metals with combustible metals should be avoided.

**For Additional Information**

EMC Insurance Companies: [www.emcins.com](http://www.emcins.com)

OSHA: [www.osha.gov](http://www.osha.gov)

- Machine Safeguarding e-tool