

ABRASIVE WHEELS/GRINDERS – BENCH, FLOOR, AND HAND

(For assistance, please contact EHS at (402) 472-4925, or visit our web site at <http://ehs.unl.edu/>)

There are two basic types of grinders: stationary grinders, such as bench or pedestal grinders; and portable hand grinders. This SOP applies to both types of grinders. The content of this SOP is based on federal Occupational Safety and Health Administration (OSHA) standards, as well as recognized safe practices. This SOP supplements general tool safety considerations presented in the EHS SOP, **Hand and Power Tool Safety**.

General Safety Considerations

- Keep the floor and work area clean. Store flammable and combustible materials a safe distance (e.g., a minimum of 35 feet) away from the grinding operation. Sparks can ignite debris and flammable vapors. In some cases, a hot work permit may be required. See the EHS SOP, **Hot Work Operations** for additional information.
- Before working with a grinder, secure or remove loose clothing (i.e., snap, button, zip, tie, etc.) and confine long hair, scarves, ties, and dangling jewelry, which can be snagged by the grinder and wrap around the shaft quickly.
- Always wear eye protection. At a minimum, goggles are required. Safety glasses with side shields are acceptable only when combined with a faceshield. Wear gloves to protect hands from flying particles and sharp edges created during the grinding operation. Other PPE may also be needed based on circumstances (e.g., respirator, hearing protectors, etc.).
- Keep hands, fingers, and other body parts from coming into contact with the revolving wheel.
- When installing a new wheel, observe all instructions provided by the manufacturer. Ensure the recommended speed (as posted on the wheel) is compatible with the grinder, and that the type of wheel is compatible with the material being ground. An improperly installed or incompatible wheel can break or explode and cause injury. All wheels must be sound (ring) tested before use. Grinding wheels should fit freely on the spindle and remain free under all grinding conditions. The spindle nut must be tightened enough to hold the wheel in place without distorting the flange. When a bushing is used in the wheel hole it should not exceed the width of the wheel and or contact the flanges.
- Avoid grinding aluminum and steel on the same wheel to prevent residual aluminum particles from heating up and flying back at the operator when harder surfaces such as steel are being ground later.
- To avoid burring, loading, and uneven wear on the wheel, use the minimum pressure necessary and keep work in motion evenly across the face of wheel.
- Never grind on the side of the wheel.

- Use vise-grip pliers or a clamp to handle/secure work pieces.
- All contact surfaces of wheels, blotters and flanges must be flat and free of foreign matter.

Bench and Pedestal Grinders

- The grinder should be positioned by height and location to eliminate the need to overreach while grinding; and securely anchored.
- The transmission cover and outer wheel guard must be secured in the proper position prior to operation. In addition, adjustable guards must be properly secured before use. Do not make adjustments with the wheel in motion.
 - Side guards should cover the spindle, nut, flange, and seventy-five percent of the wheel diameter.
 - Adjust the tongue guard on the top side of the grinder to within ¼-inch (0.6350cm) of the wheel.
 - Adjust the tool rest to within 1/8- inch of the grinding wheel.
- Before starting the grinder, inspect the wheel to make sure it is not cracked or broken. Never use a wheel that has been dropped or received a heavy blow, even if there is no apparent damage. To minimize hazards from undetected defects or imbalance, stand to one side of the wheel until it has reached full speed. Do not begin grinding until the wheel has reached full speed.
- As the wheel wears down, readjust the tool rest and tongue guard. When you can no longer adjust them, replace the wheel. Visually inspect the wheel for cracks before mounting.
- All flanges must be maintained in good condition. When the bearing surfaces become worn, warped, sprung, or damaged they should be trued, refaced, or replaced, in accordance with manufacturer recommendations.

Portable Hand Grinders

- Guards must be in place and properly positioned such that sparks fly away from the operator.
 - The clearance between the wheel side and the guard shall not exceed one-sixteenth inch.
 - Safety guards used on machines known as right angle head or vertical portable grinders shall have a maximum exposure angle of 180 deg., and the guard shall be located so as to be between the operator and the wheel during use. Adjustment of guard shall be such that pieces of an accidentally broken wheel will be deflected away from the operator.
 - The maximum angular exposure of the grinding wheel periphery and sides for safety guards used on other portable grinding machines shall not exceed 180 deg. and the top half of the wheel shall be enclosed at all times
- Before using the tool on a workpiece, let it run for several minutes. Watch for flutter or excessive vibration that might be caused by poor installation or a poorly balanced wheel. Do not stand in the plane of rotation of the wheel as it accelerates to full operating speed.
- Never use a grinding wheel on an air sander. Pistol-grip, high speed air sanders operate at speeds exceeding the maximum-rated speeds for grinding wheels.

- Never clamp a hand-held grinder in a vise.
- Always engage the OFF switch and wait for the wheel to come to a complete stop before adjusting or removing the wheel or changing its work position or angle.