

## Grinding Wheel Safety

Grinders are a frequent source of injury. The most common are injuries to the eyes from flying particles, hand and finger injuries and injuries caused by grinding wheel breakage. Injuries from grinding wheels can be prevented by the use of eye protection, safe work practices and proper care and guarding of the grinding wheel.

### Eye Protection

1. Workers should be required to wear safety glasses with impact-resistant lenses and side shields during all grinding operations.
2. Shatterproof safety glass eye shields should be installed over the point of operation on all stationary grinders used for tool grinding. Eye shields should be set high enough above the point of operation to permit free movement of the operator's hands. The size of the glass shield is dependent upon the distance set from the point of operation. It should be large enough to guard against the widest spread of flying particles. Safety glass in the shield should be replaced when it becomes pitted to assure adequate vision for the safety of the operator.

### Safe Practices for Grinders

1. Because most defective wheels break when starting, new wheels should be run at full operating speeds for at least one minute before work is applied. During this time the operator should stand to one side.
2. Excessive vibration usually indicates a wheel, that is out of round. Such wheels should not be used until they have been properly balanced through wheel dressing.
3. Never force the wheel by exerting excessive pressure on it. The type of abrasive on the wheel governs its cutting power.
4. Always grind away from other workers. The best practice is to grind toward a wall.
5. Never grind on the side of a straight wheel. The straight wheel is designed for grinding on the edge surface only.
6. Never jam tools or parts against the grinding wheel. Make a gradual contact exerting an even pressure.
7. Never use a grinder with a tool rest that is more than 1/8 of an inch away from the wheel.

### (For Portable Grinders)

8. When electrically driven portable grinders are used, the third wire should be affixed to a positive ground. This wire grounds the case of

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9. the motor and prevents electric shock to the operator should any part of the electrical unit become shorted.
10. When starting a portable grinder, hold it under a bench or inside a casting for a minute or so before starting to work. A cracked wheel usually explodes at the point where it reached maximum revolutions.
11. The grinding operations should be located in order to keep the cord or air line in a position which will prevent it from becoming a tripping hazard.
12. All portable grinders should be handled with care. Unless a stand is provided for holding the grinder when it is not used, the wheel should be stopped before it is set down.
13. A portable grinder should always rest on its guard when it is not in use if a stand is not provided. Resting the grinder on the wheel may cause damage to the wheel. Any grinder that is dropped should be started under a work bench or inside a casting to check whether or not the wheel has become cracked.
14. Bumping a grinder against the work will not sharpen the wheel. This procedure can cause a wheel to explode.

### **Guarding**

1. All grinders should be used with a protective hood over the wheel.
2. The hood should be strong enough to withstand the shock of the bursting wheel.
3. The hood should be mounted in order to maintain proper alignment with the wheel at all times under operating conditions.
4. As much of the wheel should be covered by guarding as the operation will permit.
5. On bench and stand grinders, the opening in the hood should seldom have a maximum angular exposure exceeding 90 degrees and the top of opening should not be more than 65 degrees from the horizontal plane of the spindle.
6. The adjustable tongue or similar device should be adjusted frequently to allow for the ever decreasing diameter of the wheel.
7. With portable grinders, when the nature of the job requires removal of a guard, authorization for removal should be made by the supervisor in charge. Grinding with an unguarded grinder should be performed at a location which will ensure the safety of other workers. The operator should be instructed as to job positions which will afford him maximum safety, should the wheel break. The guard should be replaced as soon as the particular job has been completed.

### **Wheels and Grinders**

The grinding wheel manufacturer's maximum operating speed should be regarded as the absolute maximum in all cases. (Whenever there is a question as to size and type of wheel for grinders, consult the supplier of such equipment.) All grinders should have the maximum diameter of the wheel and the operating r.p.m. clearly marked on the body of the machine.

Stationary grinders used for continuous grinding operations should be equipped with an adequate exhaust system. (Exhaust systems not only reduce the possibility of harmful dust, but prevent damage to the bearings of other valuable equipment.)

### **Mounting**

1. Grinding wheel should be inspected and ring tested to detect cracks before they are mounted.
2. Compression washers should be used to compensate for unevenness of the wheel or flanges. Blotting paper used for this purpose should be no thicker than 0.025 inch.
3. Only standard recessed flanges should be used in mounting grinding wheels. (Flat washers should never be used as a substitute for standard flanges.)
4. Spindle end nuts should be turned up for a snug fit, but excessive pressure should be avoided to prevent cracking the wheel.
5. Check and adjust to proper r.p.m.
6. Before turning on the power, the operator should turn the wheel by hand for a few revolutions to see that it clears both the work rest and the hood guard.
7. Many wheels have broken because work became wedged between the work rest and the wheel. The work rest should be substantially constructed and securely clamped in position not more than 1/8 inch from the wheel.

### **Maintenance**

1. The shop maintenance department should inspect all grinders at least once every 30 days. Necessary adjustments and repairs should be made immediately.
2. The department supervisor should inspect all grinders daily to make certain that grinding wheels are properly mounted, that there is no excessive vibration, standard flange and arbor nuts are used, and that guards are properly adjusted. Identification tags should be checked to make sure that the proper wheel and wheel speed combination is used.

### **Storing**

Abrasive wheels should be stored in racks in a central storage room under the control of a person trained in the care and handling of such equipment.

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