



ALABAMA MUNICIPAL INSURANCE CORPORATION MUNICIPAL WORKERS COMPENSATION FUND, INC.



Loss Control Division

GRINDING WHEEL SAFETY

Date: _____ Time: _____ Department: _____ Person Conducting: _____

Meeting objectives: To review the hazards associated with grinding wheel operations and normal precautions and safety rules employees should follow when using a grinding wheel.

The most common injuries suffered when using a grinding wheel are foreign body in eye and hand abrasions. Failing to wear adequate eye protection because "this will only take a second" or "somebody forgot to leave the glasses on the hook above the grinding wheel and I'll have to find another pair before using the grinder" is the main ingredient in an accident waiting to happen. Following the safety policies and rules that have been established will greatly reduce the possibility of being injured while operating a grinding wheel. Small metal shavings flying off a grinding wheel are often traveling over 200 miles per hour over a distance of less than 18 inches. The old baseball adage of "you can't hit what you can't see" certainly holds true for anyone who thinks eye protection isn't needed.

HAZARDS ASSOCIATED WITH GRINDING WHEELS

1. Failure to use eye protection by the operator in addition to the eye shield mounted on the grinder
2. Incorrectly holding the work.
3. Incorrect adjustment or lack of work rest.
4. Wrong type, poorly maintained or unbalanced wheel or disk.
5. Grinding on the side of the wheel not designed for grinding.
6. Taking too heavy a cut.
7. Applying work to too quickly to a cold wheel or disk.
8. Grinding too high above the wheel center.
9. Failure to use wheel washers (blotters).
10. Vibration and/or excessive operation speed which leads to a bursting wheel or disk.
11. Using bearing boxes with insufficient bearing surface.
12. Using spindles with an incorrect diameter, or threads cut so that the nut loosens as the spindle revolves.
13. Installing flanges of the wrong size with unequal diameters or unrelieved centers.
14. Incorrect wheel dressings.
15. Contacting unguarded moving parts.
16. Using controls that are out of the operator's normal reach.
17. Using an abrasive saw blade rather than a grinder disk.
18. Failure to run a wet wheel dry (without coolant) for a period of time before turning off the machine. A wet wheel can become unbalanced if the coolant is allowed to accumulate on a portion of the wheel. This unbalanced condition can cause a wheel to disintegrate upon restarting.
19. Using an untested, broken, or cracked grinding wheel.
20. Reaching across or near the rotating grinding wheel to load, unload, or adjust the machine during setup.

INSPECTION, HANDLING AND STORAGE

1. Grinding wheels and disks should be inspected after they have been unpacked for shipping damage, and then “ring” tested prior to use.
2. The "ring" test consists of suspending the wheel from its hole on a small pin or finger and gently tapping it with a light tool such as a wooden screw driver handle. The tapping should occur within 45 degrees of the vertical centerline. A wheel or disk in good condition will give a clear metallic ring.
3. Large disks and wheels should not be rolled on the floor.
4. Abrasive disks should be stored in dry areas not subject to extreme temperature changes, below freezing temperatures should be avoided. Undetectable cracks or fractures not visible to the eye may occur in wet wheels if they are exposed to temperatures below 32 degrees Fahrenheit.
5. Breakage can occur if wheels are taken from a cold storage area and grinding operations begun before the wheel assumes room temperature.
6. Grinding wheels and disks should be stored as close as possible to areas of use to reduce handling.

WHEEL MOUNTINGS

1. Abrasive grinding wheels should be mounted between flanges, exceptions include: mounted wheels; threaded wheels (plugs and cones); plate mounted wheels; and cylinder, cup or segmental wheels mounted in chucks. Flange diameter should be at least 1/3 the diameter of wheels, preferably more.
2. Inner flanges can be keyed, shrunk, screwed, or pressed onto spindles in order to run true with the spindles. A flange that is defective in any manner should be immediately removed and replaced.
3. Compression washers can be used to offset any unevenness in wheels or flanges.
4. Before wheels are mounted, they should undergo a visual inspection and "ring" test.
5. Wheels should fit properly on spindles; they should be neither too loose nor too tight. A wheel that is too loose will run off center causing stresses and vibrations that may lead to breaking. A wheel that is mounted too tightly can cause the flanges to distort allowing the wheel to break.
6. Wheels should be rotated by hand several times prior to use to check hood guard and tool rest clearance
7. Persons should stand to one side of the wheel when it is first turned on and allow at least one minute of warm up time before attempting to true the wheel or do any type of grinding.
8. Never attempt to remove a fastener, tool rest or guard while a wheel is turning.

SAFE OPERATING PROCEDURES

1. A guard should enclose a wheel as much as possible, and as the diameter of the wheel decreases the protection should not be lessened.
2. The maximum distance between a wheel and the top of a guard opening should not exceed 1/4 inch.
3. Safety guards should cover the ends of the arbor ends.
4. Wheels should always be operated at speeds not to exceed those set by the manufacturer.
5. Spindle speed is often increased as the wheel wears down. When a new wheel is installed the spindle speed must be checked and adjusted in order to not exceed the manufacturer's recommendations.
6. The work rest or tool rest must be of substantial construction and never adjusted more than 1/8 inch from the grinding surface.
7. Guides should be used to hold work in place and prevent the wheel from twisting and bending when slot grinding.
8. Wheel dressing to true or balanced wheels should only be done by a trained, experienced operator that has the correct dressing tools.

Discuss the types of grinders used in your work place and determine if any of the proper safety procedures listed above are not followed. Indicate to employees that management requires all safety procedures discussed to be followed by all employees without exception.

SIGNATURES OF ALL THOSE IN ATTENDANCE

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NOTE: This document is not intended to be legal advice. It does not identify all the issues surrounding the particular topic. Public agencies are encouraged to review their procedures with an expert or an attorney who is knowledgeable about the topic. Reliance on this information is at the sole risk of the user.¹
