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Kennecott Utah Copper Corporation Safety and Health Standards		Standard No. 16.18 Grinding Wheels

16.18.1      **INTRODUCTION**

16.18.1.1      This standard provides general guidance to individuals involved with the use and care of grinding equipment.

16.18.2      **REQUIREMENTS**

16.18.2.1      All persons using a fixed or portable grinding machine must wear proper personal protective equipment including:

- A full face shield in addition to safety glasses and safety shoes.
  - A face shield must be provided at each pedestal grinder location and at storage locations for portable grinders.
- Respiratory equipment (unless an assessment shows otherwise).
  - All materials should be properly cleaned, if the material contains potential hazardous materials (i.e. dust, grease, solvents) which cannot be removed, an assessment must be made as to the use of respiratory protection.

16.18.2.2      Grinding applications in non-designated areas shall follow all elements of KUCC Safety and Health Standard 16.1 Hot Work Permit.

16.18.2.3      Pedestal grinders must be securely mounted to the floor. Bench grinders must be securely mounted to a workbench.

16.18.2.4      Use only the grinding wheels designed for the job to be performed. Grinding wheels must be mounted using bushings that are designed specifically for that purpose.

16.18.2.5      The speed at which the abrasive wheel revolves is extremely important. Centrifugal force is the ultimate cause of wheel bursts. Therefore, ensure that the correct type of wheel is installed on the grinder and the maximum RPM specified by the manufacturers of the wheel is clearly marked on the wheel. Also, the maximum RPM specified by manufacturer of the grinder must be clearly identified on the machine or at the grinding machine locations.

- Before grinding, allow the grinding wheel to reach operating speed. Do not stand directly in front of the grinding wheel when it is first started.

16.18.2.6      Stationary grinding machines must be equipped with a peripheral hood and an adjustable tool rest adjusted to within 1/8 inch of the wheel. Before using a grinder, it must be inspected to be sure that all guards are properly adjusted and secured in place.

References: OSHA CFR 1910.215 KUCC Safety and Health Standard 16.1 Hot Work Permit					
<b>Signatures</b>					
Original signed by: Frank Klobchar	05/09/06	Original signed by: Scott Lawson	06/21/06	Original signed by: Bill Champion	06/22/06
Standards Committee Chairman	Date	VP and GM Engineering and Technical Services	Date	President, KUCC	Date

- The abrasive wheel must be inspected prior to use to make sure it is unbroken, balanced on the shaft and running "true." If, upon inspection, the wheel shows any of the above problems or maladjustment, the machine will not be operated until the wheel is put into an acceptable operating condition or replaced.
- 16.18.2.7 Bring work into contact with the grinding wheel slowly and smoothly without impacting or bumping. Do not strike the wheel with the work. The best conditions for grinding occur when the work contacts the grinding wheel *at a horizontal plane passing through the wheel center*. This requires a work rest that can be adjusted vertically and horizontally.
- 16.18.2.8 Use only the pressure required to complete the job when holding work against the wheel. Excessive pressure against the wheel must be avoided as it will cause overheating, possible damage to the wheel or work and potential injury to the worker.
- 16.18.2.9 Grinding on the side of a wheel is prohibited unless it is specifically designed for side grinding. Most wheels used on bench and pedestal grinders are only designed for peripheral grinding.
- 16.18.2.10 To avoid damage / breakage all grinding wheels must be handled and stored carefully and properly. Grinding wheels are not to be struck, bumped or dropped.
- When storing grinding wheels, keep them away from grease, water or solvents. Do not store grinding wheels in freezing temperatures. Always allow wheels to reach room temperature before mounting and use.
- 16.18.2.11 Grinding wheels must be carefully checked for cracks and any other possible damage before they are mounted.
- The "ring" test can be an effective method for determining cracks in grinding wheels. It is subject to interpretation by the installer and is primarily applicable to vitrified bonded wheels. The "ring" test may not be effective on grinding wheels that have been bonded with organic materials, such as rubber. Grinding wheels must be clean and free from debris or other dampening foreign matter when given the "ring" test.
  - The "ring" test is administered on a small wheel by supporting it at the hole with a small shaft or rod. A wooden or plastic screwdriver handle or other nonmetallic object is used to lightly tap on the side off the wheel, about two inches (5 cm) from the periphery. Tapping should be done at 45 degree angles on either side of a vertical line. The procedure involves turning the wheel 45 degrees and tapping again until the wheel has been tapped all the way around its circumference. If the wheel gives a clear bell-like metallic tone, it is probably undamaged.
  - If the tone is absent and the tapping sound is dead, the wheel may be cracked. If the wheel is tapped directly along a line that is vertical to the hole, the ring or tone is sometimes muffled and the wheel could appear to be cracked. This may occur more frequently when large wheels are being tested. When testing large wheels, they should be set on their periphery on clean hard surfaces or floors and tapped lightly with a wooden mallet
- 16.18.3 **RESPONSIBILITIES**
- 16.18.3.1 Any person using a fixed or portable grinding machine is responsible for conducting a visual inspection to be sure that all guards are properly adjusted and secured in place, the tool rest is properly adjusted, and the abrasive wheel is unbroken and balanced on the shaft.