Assured Grounding Safety Talk

Safety Talk

WHAT'S AT STAKE?

The assured equipment grounding conductor program covers all cord sets, receptacles which are not a part of the permanent wiring of the building or structure, and equipment connected by cord and plug which are available for use or used by employees. The requirements which the program must meet are stated in 29 CFR 1926.404(b)(1)(iii), but employers may provide additional tests or procedures. (See Appendix.) OSHA requires that a written description of the employer's assured equipment grounding conductor program, including the specific procedures adopted, be kept at the jobsite. This program should outline the employer's specific procedures for the required equipment inspections, tests, and test schedule. The required tests must be recorded, and the record maintained until replaced by a more current record. The written program description and the recorded tests must be made available, at the jobsite, to OSHA and to any affected employee upon request. The employer is required to designate one or more competent persons to implement the program.

Electrical equipment noted in the assured equipment grounding conductor program must be visually inspected for damage or defects before each day's use. Any damaged or defective equipment must not be used by the employee until repaired.

WHAT'S THE DANGER?

Continued use of damaged electrical equipment (power tools, extension cords, etc) poses an extremely hazardous risk for workers:

- Power tools that have three prongs (hot, neutral and ground) may have the grounding pin missing. This is an extremely hazardous situation because if a short develops in the tool,

the user may become the ground in the system and electricity will travel through him or her.

- Sometimes during use, the third prong, or the grounding pin, may become loose or fall out. No one should be allowed to bypass the grounding pin by bending it out of the way or removing it completely.
- Flat-wire cords are prohibited from use on construction sites because they do not provide the protection that double-insulated cords do.
- Double-insulated tools should be used. This generally means the tool is encased in plastic, which will prevent the user from electrocution if the tool develops a short circuit. If there are any defects, such as insulation missing from a cord or a piece of the protective shell broken from the tool, workers are put at risk for electrocution.

Your workplace probably has countless electrical tools and devices capable of delivering a fatal electrical shock.

That’s why it’s a good idea to have frequent reminders about electrical safety – like this safety talk.

Here are some practices to help you work more safely around electricity:

- Do not work near electrical equipment or outlets when hands, feet, counters, floors or equipment are wet.
- Consider defective any device that trips a circuit breaker and prohibit its use until inspected.
- Do not use electrical equipment, appliances or wall receptacles that appear to be damaged or in poor repair.

Report all shocks immediately. Even small tingles may indicate trouble and precede major shocks. Do not use the equipment until it has been inspected and repaired. Use a sign-out system for extension cords to help track the number and location of extension cords in use.

Equipment with these characteristics must be considered incorrectly grounded and unsafe:

- Three-wire plugs attached to two-wire cords.
- Grounding prongs that are bent or cut off.
- Ungrounded appliances resting on metal surfaces.
- Extension cords with improper grounding.
- Ungrounded, multiple-plug “spiders” typically found in offices.
- Personal electrical appliances, such as radios, coffeepots, fans, power tools and electric heaters – brought by workers from home – that are not grounded, have frayed cords or show other signs of wear or damage.

Toasters, blenders, hand mixers, fans, refrigerators and radios should be grounded or double-insulated. Items designed for household use should be checked to ensure proper grounding for workplace application.

Why Does OSHA Have an Electrical Standard for Construction?

With the wide use of portable tools on construction sites, the use of flexible cords often becomes necessary. Hazards are created when cords, cord connectors, receptacles, and cord- and plug-connected equipment are improperly used and maintained. Generally, flexible cords are more vulnerable to damage than is fixed wiring. Flexible cords must be connected to devices and to fittings so as to prevent tension at joints and terminal screws. Because a cord is exposed, flexible and unsecured joints and terminals become more vulnerable. Flexible cord conductors are finely stranded for flexibility, but the strands of one conductor may loosen from

under terminal screws and touch another conductor, especially if the cord is subjected to stress or strain.

A flexible cord may be damaged by activities on the job, by door or window edges, by staples or fastenings, by abrasion from adjacent materials, or simply by aging. If the electrical conductors become exposed, there is a danger of shocks, burns, or fire. A frequent hazard on construction site is a cord assembly with improperly connected terminals.

Also, when a cord connector is wet, hazardous leakage can occur to the equipment grounding conductor and to humans who pick up that connector if they also provide a path to ground. Such leakage is not limited to the face of the connector but also develops at any wet portion of it.

When the leakage current of tools is below 1 ampere, and the grounding conductor has a low resistance, no shock should be perceived. However, should the resistance of the equipment grounding conductor increase, the current through the body also will increase. Thus, if the resistance of the equipment grounding conductor is significantly greater than 1 ohm, tools with even small leakages become hazardous.

The Occupational Safety and Health Administration's (OSHA) electrical standard for construction, title *29 Code of Federal Regulations Part 1926, Subpart K*, contains the requirements for ground fault circuit interrupters (GFCIs) and for assured equipment grounding conductor programs which are included in the Appendix of this booklet. These requirements will help reduce the number of injuries and accidents from electrical hazards. Work disruptions should be minor, and the necessary inspections and maintenance should require little time.

This information is intended to help employers and employees responsible for electrical equipment provide protection against 120-volt electrical hazards on the construction site—the most common being ground fault electrical shock—through the use of GFCIs or through the assured equipment grounding conductor program.

HOW TO PROTECT YOURSELF

The assured grounding program consists of a written program, daily visual inspections and a method to detect a faulty grounding wire in an extension cord or hand tool. The objective is to prevent electrocution by ensuring the grounding wire is electrically continuous from the power tool to the power source. An Assured Grounding Program contains four parts:

- **Worker training: All workers using extension cords and power tools under an Assured Grounding Program must be trained on the program.**
- Daily visual inspection: Extension cords and power tools must be checked daily for damage by the persons who will be using them. Any damage found must be repaired before the cord or tool is used. Damaged extension cords and power cords of tools must not be spliced. The cords can either be replaced or shortened to remove the damaged portion.
- Continuity and polarity testing: A qualified worker must test every extension cord and power tool for circuit continuity, terminal connection test, and correct polarity. Tests are mandatory before tools are used for the first time, following repairs, and at designated times of the year. A qualified worker is a person who has been authorized by a supervisor and who has received appropriate training.
- Color-coding extension cords and power tools: Extension cords and power tools that have been tested must be tagged with a colored band about 4 inches (10 centimeters) from the male plug. Colored electrical tape is suitable for this purpose. A different color is required at the beginning of each quarter in Canada and at the beginning of each quarter and month in the US (see boxes below). These colors are standard for all worksites.

Here’s more good advice:

Turn off switches and pull plugs before adjusting or cleaning power equipment such as slicers, grinders and mixers. Equipment being serviced or cleaned should be tagged as “out of service.”

When permanently-wired equipment is being serviced by qualified personnel, the electrical power to the equipment must be disconnected and safe lockout procedures must be followed. To prevent someone from unintentionally turning the power on while the unit is being serviced, a lock and a tag should be placed on each disconnecting means used to de-energize the equipment. Each worker should apply his own lock and only the person who applies the lock should remove it.

Electrical repairs must be carried out only by persons who are qualified and authorized to do so. Makeshift repairs of electrical equipment have resulted in many deaths in the workplace. Remember, you are in danger of electrocution if testing and repairs are done incorrectly.

FINAL WORD

The technical aspect of assured grounding program must be advanced and taught to workers by real live demonstrations before workers come into contact with this program in real time.