



# WORKPLACE SAFETY

A W A R E N E S S C O U N C I L

## Wiring Methods and GFCI

### **What is a GFCI**

A ground-fault circuit-interrupter (GFCI) is a protective device that compares the amount of current going into electrical equipment with the amount of current returning from the equipment and if a targeted deviation (0.005 amperes) is exceeded, the circuit is quickly broken, often within as little as 25 milliseconds.

The GFCI has proven over time to protect employees from electrical shock. During the late 1970's OSHA determined that GFCI use would be mandatory for 120-volt, single-phase, 15- and 20-ampere temporary receptacle outlets used on construction sites [see 1926.404(b)(1)]. During this time OSHA estimates that between about 650 and 1,100 lives have been saved because of it.

GFCI's can be installed permanently (i.e. GFCI receptacle) or used temporarily to protect workers while performing certain tasks.

**Fast Fact:** Since the OSHA standard requiring GFCI use in the construction industry has been passed between 650 and 1,100 lives have been saved

### **Where are Temporary GFCI's Required**

On a construction site the presence of electrical hazards are very prevalent. A worker could be using an electric drill that is connected to a flexible cord set (extension cord). This cord set travels 100' where the plug head is inserted into a temporary power box.

This new level of protection covers all receptacle outlets on temporary wiring installations that are used during maintenance, remodeling, or repair of buildings, structures, or equipment, or during similar construction like activities. Such activities include cleanup, disaster remediation, and restoration of large electrical installations.

**Fast Fact:** An example of a "construction-like" activity would be a worker laying ceramic tile in a lobby of a bank building. The worker is using a drill with a paddle to mix the mortar. The drill is connected to an extension cord which is plugged into a nearby receptacle. This activity is construction-like in nature and therefore would require a GFCI receptacle or an extension cord with built-in GFCI capabilities.



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## Where are Permanent GFCI's Required

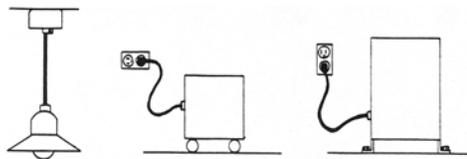
Cord sets and receptacles in wet environments can potentially expose employees to severe ground-fault hazards. Therefore, in a built environment (non-construction) OSHA requires ground-fault circuit protection for all 125-volt, single-phase, 15- and 20-ampere receptacles installed in bathrooms and on rooftops.

This new provision only applies to installations made after the effective date of OSHA's final rule. (August 13, 2007)

## Permitted Use of Flexible Cords

Flexible cords and cables may be used only for:

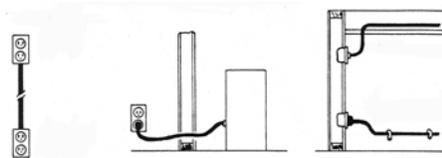
- pendants
- wiring of fixtures
- connection of portable lamps or appliances
- portable and mobile signs
- elevator cables
- wiring of cranes and hoists
- appliances to permit removal for maintenance and repair



## Prohibited Use of Flexible Cords:

Common OSHA violations when using an extension cord include the following:

- As substitute for fixed wiring
- Run through walls, ceilings, or floors
- Run through doorways, windows
- Attached to building surfaces



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## Inspections of Extension Cords

Since extension cords are exposed to damage they must be visually inspected before use on any shift for both external and internal defects.



External defects include:

- deformed pins
- missing grounding pins
- damage to outer jacket or insulation
- loose plug head

Internal damage may be present if:

- pinched outer jacket
- crushed outer jacket
- broken plug head
- use of duct tape or electrical tape if present

Additionally prior to using an extension cord, the employee must examine the outer jacket to determine if the cord is adequate for the load.

Cord and plug connected equipment and flexible cord sets (extension cords) which remain connected once they are put in place and are not exposed to damage need not be visually inspected until they are relocated.

**Fast Fact:** Circuit breakers are designed to protect equipment – not people. Relying on a circuit breaker to trip as a means to protect an employee from electrocution is a deadly mistake!