WOODHEAD ELECTRICAL SAFETY PROGRAM ›

WORKING TOGETHER FOR A SAFER WORKPLACE

molex

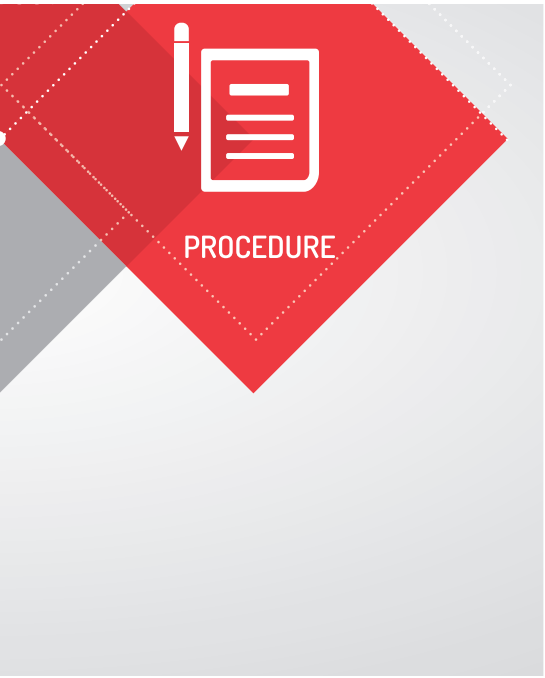
Because nobody should feel overwhelmed by regulations intended to promote a safer work environment, it is Molex's goal to help customers understand OSHA and NEC standards. By outlining typical problem areas and solutions, we aim to help our customers maintain a safe workplace.

The information on the following pages is intended to provide an overview of Woodhead electrical solutions and how they can be used to maintain a safe work environment.

When used properly and maintained under normal operating conditions, Woodhead products comply with the OSHA and NEC* standards covered on the following pages.

For additional information on any of our products, contact your Molex Sales Engineer or local distributor.

*2017 NFPA 70, National Electrical Code (NEC) Handbook.



Your Choice of Electrical Safety Products Shouldn’t Be Accidental

Since 1922, the industry has relied on Woodhead product solutions from Molex to develop and manufacture the highest quality electrical safety products for demanding environments. The safety of people and protection of plant/site equipment is of paramount importance to businesses today.

Woodhead product solutions provide unparalleled safety, reliability and performance in portable lighting, power distribution and more for industries such as:

- Food and Beverage
- Petrochemical
- Manufacturing
- Shipyard
- Commercial Construction
- Automotive
- Utilities
- Wastewater
- OEM
- Maintenance and Repair Operations
- Chemical Processing
- Distribution Warehouses

Portable Lighting
Hand Lamps

molex

OSHA Regulations

1926.405(J)(1)(III)
Portable lamps shall be wired with flexible cord and an attachment plug of the polarized or grounding type. If the portable lamp uses an Edison-based lampholder, the grounded conductor shall be identified and attached to the screw shell and the identified blade of the attachment plug. In addition, portable hand lamps shall comply with the following:

1926.405(J)(1)(III)A
Metal shell, paperlined lampholders shall not be used;

1926.405(J)(1)(III)B
Hand lamps shall be equipped with a handle of molded composition or other insulating material;

1926.405(J)(1)(III)C
Hand lamps shall be equipped with a substantial guard attached to the lampholder or handle;

1926.405(J)(1)(III)D
Metallic guards shall be grounded by the means of an equipment grounding conductor run within the power supply cord.

NEC References

ARTICLE 410
LUMINAIRES, LAMPHOLDERS AND LAMPS
410.82(A) General
410.82(B) Portable Hand Lamps
410.84 Cord Bushings

Non-Compliant

- Portable hand lamps are wired with cable, such as “zip” cords (2-wire electrical cords used in most homes) and attachment plugs are 2-wire, non-polarized.
- Portable hand lamps with metallic guards that are not grounded.
- The cord entry on the portable hand lamp has no bushing, thereby possibly allowing cable abrasion to occur, which would expose live conductors.

Compliant

- With portable hand lamps, use flexible cords that are covered under NEC 400-4, and use an attachment plug that is either polarized or of the grounding type.
- Use portable hand lamps in which: the metal shell is surrounded by adequate insulation material; an insulated handle is incorporated into the design; a guard is installed on the handle; and, for those lamps with a metal guard, it must be properly grounded through the power supply cord.
- Portable hand lamp has a bushing, or equivalent, at the point of cord entry.

Where to Look

Anywhere portable hand lamps are used, including shipping and receiving bays, tool rooms, maintenance shops, manufacturing floor, sub-assembly and quality control areas and packaging lines.

Woodhead Options

Woodhead hand lamps are built to endure years of rigorous use and feature easy-to-replace parts. Heavy-duty zinc-plated guards and thick vulcanized rubber or phenolic plastic handles protect bulbs and electrical components.

Portable Lighting
Low Voltage Lights

molex

OSHA Regulations

1926.405(A)(2)(II)(G)
Portable electric lighting used in wet and/or other conductive locations, as for example, drums, tanks, and vessels, shall be operated at 12 volts or less. However, 120-volt lights may be used if protected by a ground-fault circuit interrupter.

Non-Compliant

- In situations where temporary lighting is required within a highly conductive environment — wet locations, all-metal tanks and vessel entry — 120 volt lighting products are used to illuminate the worksite. This presents the opportunity to accidentally energize the area through a pinched cord or a dropped light.

Compliant

- When working in wet and/or conductive locations, low voltage lighting products (12 volts or less) should be used.
- 120 volt portable lights can be used in wet and/or conductive locations, but only if protected by a ground fault circuit interrupter.

Where to Look

Any wet location.

Any application with confined space entry such as metal vessels and tanks, waste water treatment facilities, water purification plants, utilities, breweries and food processing plants.

Woodhead Options

Woodhead Low Volt Lights have an in-line transformer to safely convert 120 volts to 12 volts. Our extensive family of hand lamps, spotlights and floodlights are UL Listed for NEMA 4X wet and damp locations. Woodhead also offers a complete line of GFCI protected hand lamps for a variety of applications. To further ensure safety, the transformer must be kept out of the conductive environment at all times.

Portable Lighting
Hazardous Duty Lights

molex

OSHA Regulations

1910.307(C) – ELECTRICAL INSTALLATIONS
Equipment, wiring methods, and installations of equipment in hazardous (classified) locations shall be intrinsically safe, approved for the hazardous (classified) location, or safe for the hazardous (classified) location. Requirements for each of these options are as follows:

1910.307(C)(1) – INTRINSICALLY SAFE
Equipment and associated wiring approved as intrinsically safe shall be permitted in any hazardous (classified) location for which it is approved.

1910.307(C)(2) – APPROVED FOR THE HAZARDOUS (CLASSIFIED) LOCATION
(i) – Equipment shall be approved not only for the class of location but also for the ignitable or combustible properties of the specific gas, vapor, dust, or fiber that will be present.

1926.407(B) – ELECTRICAL INSTALLATIONS
Equipment, wiring methods, and installations of equipment in hazardous (classified) locations shall be approved as intrinsically safe or approved for the hazardous (classified) location or safe for the hazardous (classified) location.

1926.407(B)(1) – INTRINSICALLY SAFE
Equipment and associated wiring approved as intrinsically safe is permitted in any hazardous (classified) location included in its listing or labeling.

1926.407(B)(2) – APPROVED FOR THE HAZARDOUS (CLASSIFIED) LOCATION
(l) – Equipment shall be approved not only for the class of location but also for the ignitable or combustible properties of the specific gas, vapor, dust, or fiber that will be present.

NEC References

ARTICLE 501 CLASS I LOCATIONS
501.130(B)(4)
Portable Lighting Equipment

ARTICLE 502 CLASS II LOCATIONS
502-130(B)(1)
Portable Lighting Equipment

Non-Compliant

- Portable lighting equipment is used in hazardous (classified) locations for which it is not approved.
- Portable lighting equipment approved for use in a specific hazardous (classified) locations is used in a different classified location for which it is not approved.

Compliant

- Use only portable lighting equipment that is approved for use in hazardous (classified) locations.
- Only use portable lighting equipment in the hazardous (classified) locations for which it is approved.

Where to Look

Environments where potentially explosive dust, vapors or gases might be present.

Any hazardous (classified) location such as refineries, chemical processing facilities, steel mills, grain elevators, aircraft hangers, commercial garages and repair operations.

Woodhead Options

Woodhead Hazardous-Duty Portable Lights are UL Listed and CSA Certified for Class I, Division I, Groups C & D (flammable gases and vapors) and Class II, Division I Groups F & G (ignitable dust).

Hand lamps feature non-sparking aluminum guards, shock-resistant tempered glass globes and both nylon and ribbed anti-slip metal handles.

Durable and compact, hazardous-duty fluorescent, incandescent and LED lamps feature non-sparking aluminum guards, shock-resistant tempered glass globes and both nylon and ribbed anti-slip metal handles.

Portable Lighting
Stringlights

molex

OSHA Regulations

1926.405(A)(2)(II)E
All lamps for general illumination shall be protected from accidental contact or breakage. Metal-case sockets shall be grounded.

1926.405(A)(2)(II)F
Temporary lights shall not be suspended by their electric cords unless cords and lights are designed for this means of suspension.

NEC References

ARTICLE 590 TEMPORARY INSTALLATIONS
590.4(C) Branch Circuits

Non-Compliant

- Stringlights without guards do not provide adequate protection against lamp breakage, or protect employees from potentially energized sockets.
- Stringlights suspended from their cord or cable can potentially damage the cable jacket and expose live conductors.

Compliant

- Protect lamps in stringlights from accidental contact or breakage with a suitable fixture or guard.
- Suspend stringlights by using messenger wires or eyelets to relieve stress on current-carrying cables.

Where to Look

Construction sites.

Areas where temporary maintenance or clean-up operations are being conducted, such as plant renovation or rebuilding after natural disasters.

Any temporary worksite with insufficient lighting, such as tunneling operations.

Woodhead Options

When it comes to having strands of temporary worklights, Woodhead has a full offering of stringlight products in both 50' and 100' lengths. From assembled to molded configurations, our stringlights are made of durable vulcanized rubber or thermoplastic and are available with metal or insulated construction guards. Incandescent, fluorescent, weatherproof and LED models are available for indoor and outdoor jobsites.

Woodhead's assembled stringlights feature hand-assembled sockets placed 10' apart on the string. Molded stringlights feature all wire connections enclosed in molded vulcanized rubber or thermoplastic.

OSHA Regulations

1910.305(A)(2)(X)
Flexible cords and cables shall be protected from accidental damage, as might be caused, for example, by sharp corners, projections, and doorways or other pinch points.

1910.305(A)(2)(XI)
Cable assemblies and flexible cords and cables shall be supported in place at intervals that ensure that they will be protected from physical damage. Support shall be in the form of staples, cables ties, straps, or similar type fittings installed so as not to cause damage.

NEC References

ARTICLE 590 TEMPORARY INSTALLATIONS
590.4(H) Protection From Accidental Damage

Non-Compliant

- Cordsets used for temporary wiring across aisles, through doorways or around sharp corners are not protected against possible pinch points.

Compliant

- Flexible cords and cables shall be protected against accidental damage.

Where to Look

Anywhere cordsets are used for temporary power during maintenance and repair or construction.

Woodhead Options

Woodhead Super-Safeway Cable Protectors protect the cable nesting inside from cuts, abrasions and industrial material handling equipment. These cable protectors are designed to stand up to the damaging effects of the most demanding industrial environments, including both pedestrian and vehicle traffic.

For electrical power applications that are temporary in nature or for equipment that is moving, Woodhead cable reels help keep the electrical cable safely out of the way, protecting workers from trip hazards and extending the life of the cable by eliminating damage during use.

Cable Management
Strain Relief Grips

molex

OSHA Regulations

1910.305(G)(2)(III)
Flexible cords and cables shall be connected to devices and fittings so that strain relief is provided that will prevent pull from being directly transmitted to joints or terminal screws.

1926.405(G)(2)(IV)
Strain relief. Flexible cords shall be connected to devices and fittings so that strain relief is provided which will prevent pull from being directly transmitted to joints or terminal screws.

1910.305(B)(1)
Conductors entering boxes, cabinets, or fittings.

1926.405(B)(1)
Conductors entering boxes, cabinets, or fittings. Conductors entering boxes, cabinets, or fittings shall be protected from abrasion, and openings through which conductors enter shall be effectively closed. Unused openings in cabinets, boxes, and fittings shall also be effectively closed.

NEC References

314 OUTLET, DEVICE, PULL, AND JUNCTION BOXES; CONDUIT BODIES; FITTINGS; AND HANDHOLE ENCLOSURES
314.17 Conductors Entering Boxes, Conduit Boxes or Fittings

ARTICLE 400 FLEXIBLE CORDS AND FLEXIBLE CABLES
400.14 Pull at Joints and Terminals
400.17 Protection From Damage

Non-Compliant

- Conductors entering boxes, conduit bodies or fittings are not protected from excessive flexing or vibration, resulting in breakdown of the insulating material and possibly exposing live wires.
- Improper bushings are used, causing the outer jacket to be unsecure in the fitting, which can expose the inner conductors and can create stress on internal terminations.
- Flexible cords and cables have no bushings or fittings for protection when entering enclosures.

Compliant

- Secure conductors entering boxes, conduit bodies or fittings in high-flex applications to limit the range of movement and eliminate abrasion.
- Bushings should be properly sized to eliminate tension on terminals.
- Install a bushing or fitting to protect the flexible cord or cable where it enters an enclosure.

Where to Look

All enclosures.

Woodhead Options

Woodhead UL Listed Strain Relief Grips are designed to prevent cable or conduit from being pulled out and to reduce the stress placed on the inner conductors at the point of termination.

MAX-LOC Cord Sealing grips are nylon devices used to connect electrical cables to boxes, cabinets, pushbuttons, enclosures, etc.

Deluxe Cord Grips are woven of stainless steel mesh with an aluminum body for corrosion resistance. They are offered in single/double weave construction. Recommended for indoor or outdoor use where subjected to moisture in the wiring of pendant stations, processing equipment, hand tools and extension cordsets.

Liquid-Tight Grips are used to connect liquid-tight flexible metal conduit to electrical enclosures to prevent conduit pull-out. Liquid-tight grips are recommended in the wiring of motors and any electrical enclosure where liquid-tight conduit is subject to motion or strain.

OSHA Regulations

1926.405(A)(2)(II)(J)
Extension cord sets used with portable electric tools and appliances shall be of three-wire type and shall be designed for hard or extra-hard usage. Flexible cords used with temporary and portable lights shall be designed for hard or extra-hard usage.

NOTE: The National Electrical Code, ANSI/NFPA 70, in Article 400, Table 400.4, lists various types of flexible cords, some of which are noted as being designed for hard or extra-hard usage. Examples of these types of flexible cords include hard service cord (types S, ST, SO, STO) and junior hard service cord (types SJ, SJO, SJT, SJTO).

NEC References

ARTICLE 400
FLEXIBLE CORDS AND FLEXIBLE CABLES
400.10 Uses Permitted
400.10(B) Attachment Plugs
400-12 Uses Not Permitted

Non-Compliant

- Using non-hard usage cable, such as zip cords (2-wire electrical cords used in most homes) for pendants, wiring of fixtures, connection of portable lamps or appliances, connection of stationary equipment, prevention of transmission of noise or vibration, appliances designed for ready removal in maintenance and repair, data processing cables, connection of moving parts or temporary wiring.
- Flexible cord or cable without a plug is used for connection of portable lamps, appliances, stationary equipment or appliances designed for ready removal in maintenance and repair.
- Using flexible cord or cable as a substitute for permanent wiring and installed raceways.

Compliant

- Use cable designated for hard or extra-hard usage in applications permitting flexible cord.
- Flexible cord or cable must have an attachment plug which is energized from a receptacle outlet.
- Flexible cord or cable should not be used as a replacement for permanent wiring.

Where to Look

Anywhere portable electric cords are stored.

Places where portable electric equipment or appliances are used.

Woodhead Options

Woodhead Watertite Cordsets are designed for hard and extra-hard usage, and meet NEMA 4X, 6, 6P and IP 66 and 67 ratings. These cordsets also withstand hose-down pressures to 1000 PSI.

Woodhead Super-Safeway Cordsets are designed for hard or extra-hard usage.

Constructed of vulcanized rubber, both Watertite and Super-Safeway cordsets can withstand the vigorous abuse normally associated with industrial facilities as opposed to nylon devices which may stress crack under similar conditions.

Wet Location
Watertite Plugs and Receptacles

molex

OSHA Regulations

1910.303(B)(1)(VIII) AND 1926.403(B)(1)(VII)
Other factors that contribute to the practical safeguarding of persons using or likely to come in contact with the equipment.

1926.432(A)(1)(I)
Deteriorating agents – Unless identified for use in the operating environment, no conductors or equipment shall be located: in damp or wet locations.

1926.405(J)(2)(II) AND 1910.305(J)(2)(IV)
Damp and wet locations. A receptacle installed in a wet or damp location shall be designed for the location.

NEC References

ARTICLE 100 DEFINITIONS – WATERTIGHT

ARTICLE 110 REQUIREMENTS FOR ELECTRICAL INSTALLATIONS
110.11 Deteriorating Agents

Non-Compliant

- Wiring devices used in a wet or damp area for which they were not intended.
- Devices that are not constructed to keep moisture from entering the enclosure.
- Using devices that are not approved to be used in a wet or damp area.

Compliant

- Using wiring devices that are intended for use in a wet or damp environment.
- Using devices that are constructed to keep moisture out of the enclosure under specific test conditions.
- Using devices that are listed or recognized for use in wet or damp locations.

Where to Look

Any wet environment where power is present.

Indoor and outdoor applications.

Woodhead Options

Woodhead offers Watertite vulcanized rubber devices listed at a NEMA 6P, IP67 and IP69K rating that can withstand 1000 PSI and prolonged submersion.

Woodhead Watertite products' rubber construction allows peak performance against extreme temperature, chemicals and abrasive environments.

The compression-type cord grip provides high-resistance pull-out strength, and closure caps seal the connector when not in use.

Our patented design protects contacts from the corrosion build-up of rust and other contaminants that can cause extreme heat, leading to fire or arc blast.

Wet Location
Watertite Duplex Receptacles

molex

OSHA Regulations

1910.303 (B)(1)(VII) & 1926.403 (B)(1)(VII)
Deteriorating Agents – Unless identified for use in the operating environment, no conductors or equipment shall be located: In damp or wet locations.

1926.405(J)(1)(V)

19.10.305(J)(1)(IV)
Fixtures installed in wet or damp locations shall be identified for the purpose and shall be installed so that water cannot enter or accumulate in wireways, lampholders, or other electrical parts.

NEC References

ARTICLE 100 DEFINITIONS – WATERTIGHT

ARTICLE 110 REQUIREMENTS FOR ELECTRICAL INSTALLATIONS
110.11 Deteriorating Agents

Non-Compliant

- Using a non-protected receptacle in a wet or damp area.
- Allowing moisture to enter one outlet while the other is in use in a damp or wet area.

Compliant

- Using flip lid protected outlets suitable for the location in which it is installed.
- Using a duplex receptacle that offers individual flip lid protection for both outlets to prevent moisture from entering an unused outlet when an attachment plug is inserted.

Where to Look
Any wet environment where power is present.

Woodhead Options
Woodhead's Watertite Duplex Flip Lid Receptacle fits all standard FS/FD boxes and prevents moisture, oil, grease and other solutions from damaging receptacles. When the receptacle is in use, it meets the requirements of NEMA Type 4X. Additionally, the padlock rings satisfy OSHA's lockout/tagout requirements.

Personal Protection
Portable GFCI and GFCI Outlet Boxes

molex

OSHA Regulations

1926.404(B)(1)(II)
Ground-fault circuit interrupters. All 120-volt, single-phase 15- and 20-ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure and which are in use by employees, shall have approved ground-fault circuit interrupters for personnel protection. Receptacles on a two-wire, single-phase portable or vehicle-mounted generator rated not more than 5kW, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, need not be protected with ground-fault circuit interrupters.

NEC References

ARTICLE 590
TEMPORARY INSTALLATIONS
590.6 Ground-Fault Protection for Personnel

Non-Compliant

- Using temporary power on construction sites or for maintenance and repair activities that are not ground fault circuit interrupter protected.
- Using portable power without the proper strain relief can cause damage to cable conductors and expose live parts.

Compliant

- Provide personnel with Ground-Fault Circuit-Interrupters on receptacles and cordsets used for temporary electric power up to and including the requirement for 30A.
- Provide portable power to employees that safeguards them from live parts by using proper strain relief.

Where to Look

Any application where temporary power is used to run hand-held portable electric equipment such as maintenance/repair centers and construction sites.

Woodhead Options

Molex manufactures Woodhead GFCI boxes in a variety of configurations that meet all NEC specifications.

Constructed of oil-, shock-, chemical- and scratch-resistant vulcanized rubber for impact resistance and longer product life.

OSHA Regulations

1926.404(B)(1)
Ground-fault protection.

1926.404(B)(1)(I)
General. The employer shall use either ground fault circuit interrupters as specified in paragraph (b)(1)(ii) of this section or an assured equipment grounding conductor program as specified in paragraph (b)(1)(iii) of this section to protect employees on construction sites. These requirements are in addition to any other requirements for equipment grounding conductors.

1926.404(B)(1)(II)
Ground-fault circuit interrupters. All 120-volt, single-phase 15- and 20-ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure and which are in use by employees, shall have approved ground-fault circuit interrupters for personnel protection. Receptacles on a two-wire, single-phase portable or vehicle-mounted generator rated not more than 5kW, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, need not be protected with ground-fault circuit interrupters.

1926.404(B)(1)(III)
Assured equipment grounding conductor program. The employer shall establish and implement an assured equipment grounding conductor program on construction sites covering all cord sets, receptacles which are not a part of the building or structure, and equipment connected by cord and plug which are available for use or used by employees. This program shall comply with the following minimum requirements:

1926.404(B)(1)(III)(A)
A written description of the program, including the specific procedures adopted by the employer, shall be available at the jobsite for inspection and copying by the Assistant Secretary and any affected employee.

1926.404(B)(1)(III)(B)
The employer shall designate one or more competent persons (as defined in 1926.32(f)) to implement the program.

1926.404(B)(1)(III)(C)
Each cord set, attachment cap, plug and receptacle of cord sets, and any equipment connected by cord and plug, except cord sets and receptacles which are fixed and not exposed to damage, shall be visually inspected before each day's use for external defects, such as deformed or missing pins or insulation damage, and for indications of possible internal damage. Equipment found damaged or defective shall not be used until repaired.

1926.404(B)(1)(III)(D)
The following tests shall be performed on all cord sets, receptacles which are not a part of the permanent wiring of the building or structure, and cord- and plug-connected equipment required to be grounded:

1926.404(B)(1)(III)(D)(1)
All equipment grounding conductors shall be tested for continuity and shall be electrically continuous.

1926.404(B)(1)(III)(D)(2)
Each receptacle and attachment cap or plug shall be tested for correct attachment of the equipment grounding conductor. The equipment grounding conductor shall be connected to its proper terminal.

1926.404(B)(1)(III)(E)
All required tests shall be performed:

1926.404(B)(1)(III)(E)(1)
Before first use;

1926.404(B)(1)(III)(E)(2)
Before equipment is returned to service following any repairs;

1926.404(B)(1)(III)(E)(3)
Before equipment is used after any incident which can be reasonably suspected to have caused damage (for example, when a cord set is run over); and

1926.404(B)(1)(III)(E)(4)
At intervals not to exceed 3 months, except that cord sets and receptacles which are fixed and not exposed to damage shall be tested at intervals not exceeding 6 months.

1926.404(B)(1)(III)(F)
The employer shall not make available or permit the use by employees of any equipment which has not met the requirements of this paragraph (b)(1)(iii) of this section.

1926.404(B)(1)(III)(G)
Tests performed as required in this paragraph shall be recorded. This test record shall identify each receptacle, cord set, and cord- and plug-connected equipment that passed the test and shall indicate the last date it was tested or the interval for which it was tested. This record shall be kept by means of logs, color coding, or other effective means and shall be maintained until replaced by a more current record. The record shall be made available on the jobsite for inspection by the Assistant Secretary and any affected employee.

NEC References

ARTICLE 590 TEMPORARY INSTALLATIONS
590.6(B)(3) Assured Equipment Grounding Conductor Program

Personal Protection
Ground Continuity Monitors

molex

Continuous Monitoring Equipment Grounding Conductor Program

- Written Description
- Competent Person to Implement
- Inspection and Tests
- Record of Tests

Inspection

- Cordsets
- Cap, plug and receptacle of cordsets
- Equipment connected by cord and plug

Exceptions:
- Receptacles and cordsets that are fixed and not exposed to damage

Frequency of Inspection:
- Before each day's use

Tests

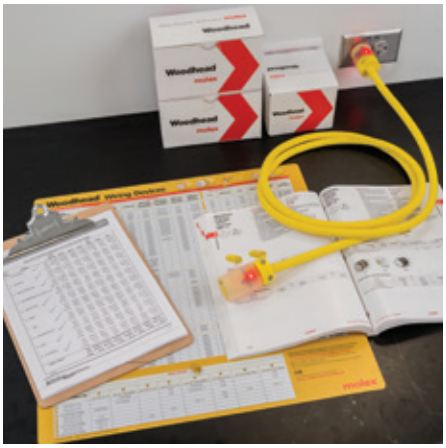
Conduct Test For:
- Continuity of equipment grounding conductor
- Proper terminal connection of equipment
- Grounding conductor

Frequency of Tests:
- Before first use.
- After repair, and before placing back in service.
- Before use, after suspected damage.
- Every 3 months, exception that cordsets and receptacles that are fixed and not exposed to damage can be tested every 6 months.

Key = • Eliminated with use of a ground continuity monitor and a documented training program.

Non-Compliant

- When GFCI protection devices are not used in place of conventional cordsets, and when no inspection, testing or record keeping is performed.



Compliant

- GFCI protected devices are used in place of conventional cordsets.
- Assured Equipment Grounding Conductor Program is implemented.
- Using a connector that incorporates a continuous monitor of the ground wire, thus reducing the inspection testing and record-keeping required to meet OSHA regulations.

Where to Look

Construction sites.

Temporary cordsets for maintenance operations.

Woodhead Options

Woodhead Ground Continuity Monitors (GCM) satisfy OSHA extension cord testing requirements on cordsets and temporary wiring on construction sites, under the Assured Equipment Grounding Conductor Program. In addition, they cut down the required paperwork by as much as 85%.

Wired into an extension cord in place of a conventional connector, a lamp in the GCM glows when the cord is plugged into a receptacle, indicating that the ground conductor has continuity. By not lighting, the GCM alerts workers that there is a problem.

Personal Protection
Rubber Outlet Boxes

molex

OSHA Regulations

1910.303(B)(1)
Examination. Electric equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined using the following considerations:

1910.303(B)(1)(VIII)
Other factors that contribute to the practical safeguarding of persons using or likely to come in contact with the equipment.

1926.403(B)(1)
Examination. The employer shall ensure that electrical equipment is free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined on the basis of the following considerations:

1926.403(B)(1)(VII)
Other factors which contribute to the practical safeguarding of employees using or likely to come in contact with the equipment.

NEC References

ARTICLE 314 OUTLET, DEVICE, PULL, AND JUNCTION BOXES; CONDUIT BODIES; FITTINGS; AND HANDHOLE ENCLOSURES
314.15 Damp or Wet Locations
314.17(A) Unused Openings
314.23(B) Structural Mounting

Non-Compliant

- Inappropriate outlet boxes used in damp or wet locations can allow moisture to enter or accumulate within the box.
- Missing cover plates, knockouts or unused openings that can't be closed off can potentially expose workers to live conductors.
- Metal boxes are used in applications that do not have any means of rigid support.

Compliant

- In damp or wet locations, outlet boxes and fittings that are designed to prevent moisture from entering or accumulating within the box.
- Outlet boxes that incorporate a design that closes off any unused opening.
- In places without structural support, use outlet boxes that are acceptable for pendant applications.

Where to Look

Anywhere portable power is used such as:
- Pendant Drops
- Portable Equipment
- Maintenance/Repair Centers
- Commercial Garages
- Aircraft Hangers
- Ship Builders
- Exhibition Halls
- Machine Shops
- Construction Sites

Woodhead Options

Woodhead manufactures a full line of outlet boxes built with weather-resistant vulcanized rubber construction, rubber-lined, spring-loaded flip covers and MAX-LOC strain-relief sealing grips. Available with variable cord lengths and receptacle/plug configurations.

OSHA Regulations

1910.333(B)(2)
"Lockout and Tagging." While any employee is exposed to contact with parts of fixed electric equipment or circuits which have been deenergized, the circuits energizing the parts shall be locked out or tagged or both in accordance with the requirements of this paragraph. The requirements shall be followed in the order in which they are presented.

1926.417(B)
Equipment and circuits. Equipment or circuits that are deenergized shall be rendered inoperative and shall have tags attached at all points where such equipment or circuits can be energized.

Non-Compliant

- While performing maintenance on equipment or a circuit that is de-energized, the possibility exists for the same circuit or equipment to become accidentally re-energized and jeopardize worker safety.

Compliant

- Use a lockout or tagout device when performing maintenance to prevent a circuit from becoming re-energized.

Where to Look	Woodhead Options
Maintenance department. Anywhere maintenance procedures are being performed on electrical equipment.	Woodhead ArcArrest provides lockout capability on the male plug and receptacle using a standard 1/4" diameter lock shackle. The male plug can also accept a hasp for multiple locks and tags.

Power Safety
Line of Sight Disconnect

molex

NEC Regulations

ARTICLE 430 - MOTORS, MOTOR CIRCUITS AND CONTROLLERS

430.102 LOCATION

430.102(B) MOTOR
A disconnecting means shall be provided for a motor in accordance with (B)(1) or (B)(2):

(1) Separate Motor Disconnect – A disconnecting means for the motor shall be located in sight from the motor location and the driven machinery location.

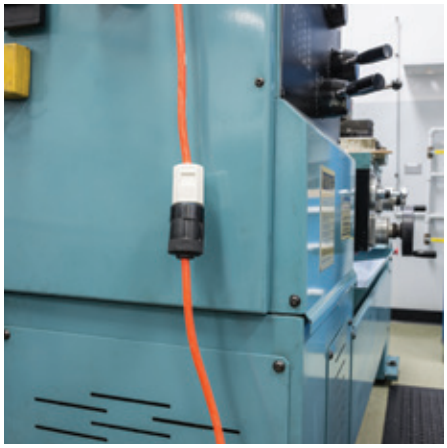
430.103 OPERATION

430.104 TO BE INDICATING
The disconnecting means shall plainly indicate whether it is in the open (off) or closed (on) position.

430.107 READILY ACCESSIBLE
At least one of the disconnecting means shall be readily accessible.

430.109 TYPE
(A) General

(1) Motor Circuit Switch – A listed motor-circuit switch rated in horsepower



Non-Compliant

- Using a disconnect that is not within sight (at least 50') of a motor-driven application.

Compliant

- Using a switch-rated plug and receptacle as a means of disconnecting motors from the circuit.

Where to Look

Any motor or electrically powered equipment.

Woodhead Options

Woodhead ArcArrest devices are plugs and receptacles that provide the safety and functionality of a switch.

Plugs and receptacles listed under UL 2682 can operate as switches and be used to disconnect motor loads, even while energized, due to its unique contact design.

The user is completely shielded from this energy because the plug maintains a connection with the receptacle during operation. A twisting motion must be applied by the user to remove the plug after the circuit has been interrupted.

Notes:

molex

Get customized insights at: **www.molex.com/woodhead**

molex

one company › a world of innovation

Order No. 987650-3341 Rev. 2 USA/5K/JP/KC/2019.06