THE 2021 COMPLIANCE ISSUE

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Dropped Object Prevention: ANSI/ISEA 121-2018

"This is big, because it establishes tethering systems as a best practice when it comes to falling object safety," said Tim Gallant, Product Director, Ergodyne. "To date, many have been content with PPE, such as hard hats, or administrative controls, such as barricade tape, but those do not prevent items from falling, nor do they eliminate potential injury. Tethering systems prevent the item from falling altogether, and without this standard, there would be nothing to differentiate duct tape and string from a properly rated tool lanyard and attachment point." *— Tim Gallant, Product Director, Ergodyne, 800-225-8238. www.ergodyne.com*

Important to Know:

Any object has the potential for becoming a dropped object when used at height. Tools, material and loads that are being moved from one place to another can all cause broken bones, head injuries or worse if they fall unexpectedly onto someone who is at a lesser height.

In 2020 alone, OSHA recorded fatalities due to workers being struck by wooden beams, a 570-lb rack being used to hook up parts, a banded stack of trusses, pieces of marble and an I-beam. However, falling objects don't necessarily have to be heavy to be deadly. In New York City in 2014, a one-pound measuring tape killed a construction worker – after it slipped from the grasp of a co-worker who was high above him and fell 500 feet.

Likewise, people needn't be on the ground to be at risk. Last June, in Riverside, California, a worker on a scaffold 40 feet in the air suffered a head injury when he was struck by a falling spool of wire. A construction worker in Manhattan was killed in April 2019 by falling debris, as he stood on a scaffold, repairing a building's exterior masonry.

The Occupational Safety and Health Administration (OSHA) considers struck by objects one of the four leading causes of on-the-job deaths in the construction industry. According to the Bureau of Labor Statistics, there were 52,000 injuries and 278 fatalities in 2018 caused by falling objects or equipment, amounting to a 17% increase of incidents in that category.

Standard Requirements:

ANSI/ISEA 121-2018 is groundbreaking in that it is the first of its kind to address equipment used to tether and/or contain many of the kinds of objects that are capable of falling from height.

The standard, which was developed by the International Safety Equipment Association's (ISEA) Dropped Objects working group in conjunction with industry stakeholders, focuses on four categories of equipment used by workers to mitigate the hazards of falling objects in industrial and occupational settings: 1) anchor attachments, 2) tool attachments, 3) tool tethers and 4) containers. It establishes minimum design, performance, testing and labeling requirements for that equipment.

For the purposes of the standard, anchor and tool attachments are retrofitted onto fixed anchor locations or tools and equipment. Tool tethers are lanyards that connect tools to an anchor point. Containers are used to transport tools or material to and from at-height work zones.

Dropped objects include hand tools, instrumentation, small parts, structural components and other items that need to be transferred and used at heights. These items may become dropped objects, potentially resulting in a struck-by injury or fatality or in damage to equipment.

What isn't addressed in this standard:

- hand tools, fasteners and power tools that will be tethered
- the human body, lifts or structures that will be anchored
- passive preventative solutions such as netting, barricades and toe boards
- personal protective equipment (PPE) that minimizes damage from falling objects
- hoisting or lifting requirements for material handling

Increase Your Knowledge:

→ Copies of the standard can be purchased online at https://tinyurl.com/y3fzj9bd. While this standard is not enforceable by OSHA, the agency does require that all materials, equipment, and tools, which are not in use while aloft, shall be secured against accidental displacement.[1] ***WMHS***

Did You Know?

An Intercontinental Ballistic Missile (ICBM) launch complex in Damascus, Arkansas was destroyed in 1980 because of a dropped object. The incident in a silo housing a U.S. Air Force Titan II ICBM loaded with a 9 megaton W-53 nuclear warhead began when a missile technician dropped a socket from a socket wrench. The 8lb. socket plunged 70 feet and punctured a Titan II missile, causing a release of pressurized rocket fuel from its fuel tank, which exploded. Senior Airman David Lee Livingston was killed and 21 others were injured in the blast.

1 https://tinyurl.com/y2ebdgma

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Safety Requirements For Baling Equipment: ANSI Z245.5-2013

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Important to Know:

Used to compress and bind solid waste, recyclables and other materials into a dense, moveable form, balers are powerful pieces of equipment that can pose a significant risk to those working with or near them.

Injuries and fatalities have been caused by:

- The automated binding mechanism
- The ejection mechanism
- The powered ram that compacts the compression chamber's contents
- The material being compacted, if it's jammed inside the baler

In addition to the complying with the standard, there are other ways employers can ensure safe baler operations:

- Train employees on how to operate balers according to the manufacturer's instructions and how to recognize the hazards of operating or working near balers.
- Inspect the baler prior to use. Correct any deficiencies that are found before using it.
- Establish procedures to shut down the power supply whenever repair or maintenance is needed. Make sure baler operators know to NEVER bypass locks or tags placed on the baler by maintenance personnel.
- Before a jam is cleared, ensure that the baler's electrical power has been disconnected, the disconnecting device has been locked and tagged, and the ram pressure has been dissipated.
- Have a procedure in place for machine operators to account for the location of co-workers before activating a baler ram.
- Make sure employees wear personal protective equipment when operating balers such as safety boots, eye and hearing protection, and safety gloves.
- Prevent undesirable materials from entering your baler. Glass, metal and wood have the potential to cause injuries and damage; aerosols and gas containers can explode.
- When the baler is not in use, the key should be removed from the switch, to prevent use by unauthorized personnel.
- Workers should not stand near the front of the baler during compaction.
- Keep wire and tools away from the machine and keep liquids away from the electrical controls.

Standard Requirements:

Baling Equipment - Safety Requirements for Installation, Maintenance, and Operation – otherwise known as ANSI Z245.5-2013 - revises safety requirements concerning the installation, operation, maintenance, service, repair, modification, and reconstruction (where applicable) of baling equipment that were covered by ANSI Z245.5-2008, Baling Equipment - Safety Requirements.

Like all American National Standards Institute (ANSI) standards, this is a voluntary consensus standard. It applies to balers rated at 600 volts or less, for outdoor or indoor use.

A companion standard, ANSI Z245.51–2013 establishes safety requirements for the design and construction of commercial baling equipment commonly used in recycling, solid waste disposal and raw materials handling. Both these standards taken together revise and replace ANSI Z245.5 –2008.

This standard applies to balers manufactured after its effective date. It is not intended to be retroactive for balers manufactured to comply with earlier revisions. That makes it even more important to follow safety procedures because older machines still in use may not have:

- point-of-operation guards to prevent injuries if a worker reaches into an operating machine or
- interlocked control systems to interrupt the movement of the baler's powered ram when the compression chamber doors are opened.

Increase Your Knowledge:

→ Copies of the standard can be purchased online, at the ANSI Webstore: https://tinyurl.com/y47hweo6. ***WMHS***

Did You Know?

Workers have been killed or sustained crushing or amputation injuries from the compacting ram after they reached into, entered or fell into the compression chamber when the ram was automatically activated. Injuries also occurred while workers were clearing jammed material or attempting to retrieve unbalable material from an operating machine.

Other incidents occurred because the machine's power supply wasn't shut down and ram pressure dissipated before workers attempted to clear material jams, and because the area wasn't cleared of employees before the machine was operated.

Additional baler-related hazards to keep in mind: loose clothing that could become trapped in a baler door; sharp wire that can cause cuts and non-ergonomic lifting or loading movements that can result in back injuries.


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Powered Industrial Trucks: OSHA 1917.43

"Two key clauses in this standard address how important it is to safety that forklift operators can see where they're going, and that they be protected from overhead hazards. Maintaining visibility is especially challenging outdoors, during inclement weather. That's why I designed forklift covers that keep both water and sunshine glare from affecting the operator's vision. They also offer protection from falling items with the same high-impact polycarbonate plastic that is used in riot shields." *—Steve Puls, Founder, Wy'East Products, Inc, 888-401-5500, clearcap.com*

Important to Know:

Forklifts, also known as powered industrial trucks, are used in countless industries, including manufacturing, warehousing and construction. They can do what humans cannot: lift and move bulky or heavy loads. Whether they're unloading goods from trucks or raising boxes of products to shelf height in a distribution center, forklifts are indispensable in many workplaces.

They're also potentially dangerous. According to the Bureau of Labor Statistics (BLS), forklifts were involved in 9,050 nonfatal workplace injuries or illnesses with days away from work in 2017 in the U.S. These cases resulted in workers taking a median of 13 days away from work – higher than the median of eight days for all cases. That same year, there were 74 fatal work injuries involving forklifts.[1]

1 www.bls.gov/iif/oshwc/cfoi/forklifts-2017.htm

Injuries and fatalities involving forklifts include striking pedestrians, falling to a lower level and being hit by a falling object or objects.

Standard Requirements Include:

- When operators are exposed to overhead falling hazards like boxes, cartons or packages, forklift trucks must be equipped with securely attached overhead guards that protect the operator.
- Overhead guards shall not obstruct the operator's view, and openings in the top of the guard shall not exceed 6in (15.24cm) in one of the two directions, width or length. Larger openings are permitted if no opening allows the smallest unit of cargo being handled to fall through the guard.
- Overhead guards shall be large enough to extend over the operator during all truck operations, including forward tilt.
- Modifications that might affect the vehicle's capacity or safety – like counterweights – cannot be added without approval from the manufacturer or an engineer who has consulted with the manufacturer.
- Unauthorized personnel are prohibited from riding on powered industrial trucks. A safe place to ride shall be provided when riding is authorized.
- Only stable and safely arranged loads within the rated capacity of the truck shall be handled.
- The employer shall direct drivers to slow down and sound the horn at cross-aisles and other locations where visibility is obstructed.
- When cargo is being towed on pipe trucks or similar equipment, a safe means shall be provided to protect the driver from sliding loads.
- Powered industrial trucks must be maintained in safe working order. Safety devices must not be removed or made inoperative. Only designated persons shall perform maintenance and repair.

- Employees may be elevated by forklift trucks only when a platform is secured to the lifting carriage, or forks, and meets requirements specified in the standard.

Increase Your Knowledge:

→ You can find the complete details of the standard on the OSHA website at: www.osha.gov ***WMHS***

Did You Know?

In addition to complying with the standard and making sure vehicles are safe, employers should ensure that employees:

- Not operate a forklift unless they have been trained and licensed
- Wear seatbelts if they are available
- Report any damage or problems that occur to a forklift during their shift
- Exit from a stand-up type forklift with rear-entry access by stepping backward if a lateral tip over occurs
- Use extreme caution on grades or ramps
- On grades, tilt the load back and raise it only as far as needed to clear the road surface
- Not raise or lower the forks while the forklift is moving
- Not handle loads that are heavier than the weight capacity of the forklift
- Operate the forklift at a speed that will permit it to be stopped safely
- Look toward the travel path and keep a clear view of it
- Not use a forklift to elevate workers who are standing on the forks
- Not drive to another location with the work platform elevated

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Safety Requirements for Industrial Scissor Lifts

"Over 20 years ago, Advance Lifts and a number of other leading manufacturers of industrial scissors lifts formed a group that worked on developing the first version of Safety Requirements for Industrial Scissors Lifts. This became known as the ANSI MH29.1 standard. Advance Lifts has continued to be active in the development of the subsequent revisions to the standard and, in 2015, the International Code Council (ICC) incorporated ANSI MH29.1 as a reference standard in section 3001.2 in chapter 30 of the International Building Code (IBC). All of the Advance Lifts scissors lift products are designed, tested and manufactured to comply with ANSI MH29.1. Consequently, when we ship a product to a customer, we are confident that we are providing them with reliable, durable and safe products. ANSI MH29.1 is a very important part of our company's business philosophy." *Advance Lifts, Inc., 800-843-3625, www.advancelifts.com*

Important to Know:

Scissor lifts are work platforms used to safely move workers vertically and to different locations in a variety of industries, including construction, retail, entertainment and manufacturing. Scissor lifts are different from aerial lifts because the lifting mechanism moves the work platform straight up and down using crossed beams functioning in a scissor-like fashion.

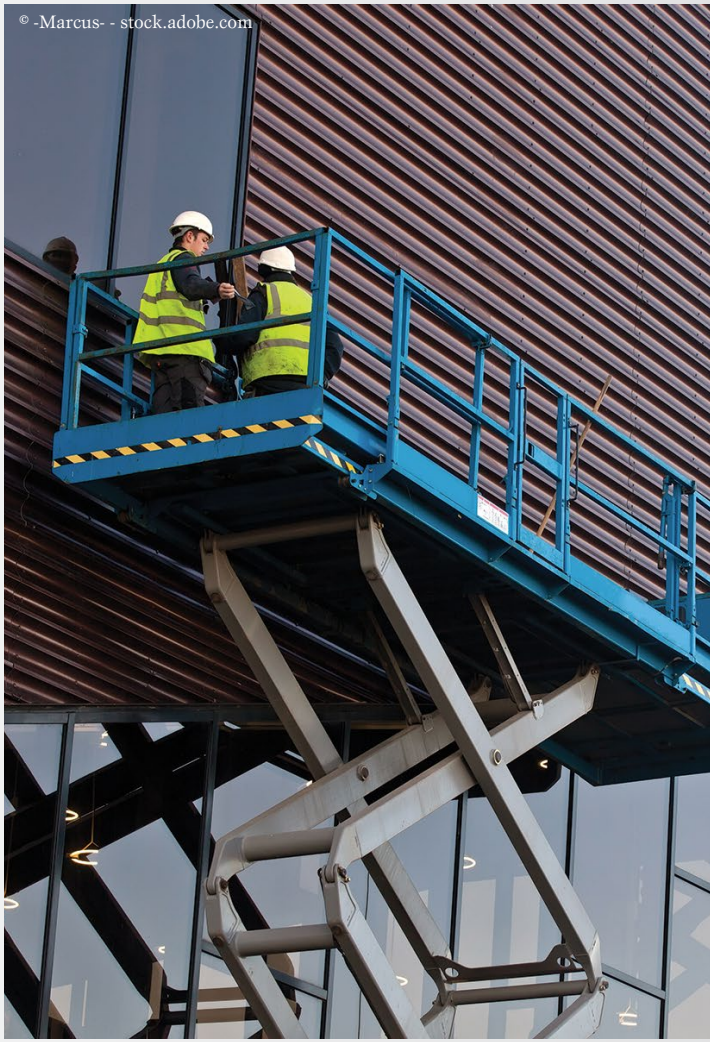
Scissor lifts provide a safe and reliable platform for workers to perform job tasks when used according to the manufacturer's instructions. However, scissor lifts can present a serious hazard to workers when not used safely, which depends on considering equipment capabilities, limitations and safe practices.

Over a 10-year period, OSHA investigated 10 preventable fatalities and more than 20 preventable injuries involving scissor lifts. The agency's investigations determined that most of the incidents were the result of employers not addressing fall protection, stabilization or positioning.

Standard Requirements:

The standard addresses:

- **Responsibilities of Manufacturers:** Basic Principles, Electrical Wiring and Equipment, Structural Strength Factor, Bursting Factors, Stability, Deflection at the Platform Edges, Vertical Creep, Welding, Operator Controls, System Protection, Platform Guarding, Hinged Bridges, Guardrail System, Maintenance Device, Markings, Operating/Maintenance Manual and Quality Control.
- **Responsibilities of Owners/Users:** Basic Principles, Manuals, Inspection and Maintenance, Maintenance Safety Precautions, Replacement Parts, Maintenance Training, Operator Training and Modifications.
- **Responsibilities of Operators:** Basic Principles, General Training, Prestart Inspection, Problems



Did You Know?

Only trained workers should be allowed to use scissor lifts, and employers should make sure that those workers show that they can use a scissor lift properly. Employers should train workers to: check to see that a guardrail system is in place before working on the scissor lift; only stand on the work platform; never stand on the guardrails and keep work within easy reach to avoid leaning away from the scissor lift.

or Malfunctions, Before Operations, Workplace Inspections, Operator Warnings and Instructions and Safety Requirements for Industrial Scissors Lifts.

MH29.1 was revised in 2012 to better illustrate that personnel operate and may themselves be raised or lowered by industrial scissor lifts. This standard now defines dock lifts, work access lifts and lift tables as the three categories of industrial scissor lifts and identifies their differences and similarities. The responsibilities of manufacturers, users, owners and operators have been reordered, consolidated and enhanced. Lastly, the requirements within the standard have been revised where needed to ensure they are stated using mandatory language.

This standard was developed under Material Handling Industry's (MHI) ANSI-approved procedures and represents suggested design practices and operational requirements for industrial scissor lifts. It was developed by the Lift Manufacturers Product Section (LMPS) and is intended to provide useful information and guidance for owners, users, designers, purchasers and/or specifiers of material handling equipment or systems. It is advisory only and should only be regarded as a simple tool that its intended audience may or may not choose to follow, adopt, modify or reject.

Increase Your Knowledge:

→ Copies of the standard can be purchased online at https://tinyurl.com/y4a9qfow. ***WMHS***

Additional measures for safely using scissor lifts:

- Follow the manufacturer's instructions for safe movement, which usually rules out moving the lift in an elevated position.
- Isolate the scissor lift or implement traffic control measures to ensure that other equipment cannot contact the scissor lift.
- Select work locations with firm, level surfaces away from hazards that can cause instability (e.g., dropoffs, holes, slopes, bumps, ground obstructions, or debris).
- Use the scissor lift outside only when weather conditions are good. Scissor lifts rated for outdoor use are generally limited to wind speeds below 28 miles per hour.
- Position the scissor lift to avoid electrocution, arc flash, and thermal burns, as well as crushing hazards.
- Employers must regularly maintain scissor lifts to ensure that they are safe to use (e.g., prevent the lifting mechanism from collapsing). Manufacturers' maintenance and inspection instructions will generally include how to: test and inspect controls and components before each use; ensure that guardrail systems are in good working condition and verify that brakes once set will hold the scissor lift in position.

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Advance Lifts was founded in 1974 and quickly became the leading dock lift manufacturer in the country. Over the years our product lines expanded to include production scissors lift tables, tilters, turntables, dumpers, work access lifts, and mezzanine access lifts. Since the beginning "engineering excellence" has been the trade mark of Advance Lifts products. Over the last decade, we have intensified our research and development program and the value gap between our products and our competitors has increased significantly. Through our R and D efforts Advance Lifts has developed our patented "Platform Centering Device" which is now standard on all of our In-Plant production tables and greatly reduces the single greatest cause of lift wear. Our "Ultra High Cycle" lift is the industries only scissors lift with a 3,000,000 cycle warranty. We also have designed a positioning control system for production scissors lifts with a repeatable accuracy of +/- .030". The point of all this research is to provide customers with superior value and service. Some of our breakthroughs can be applied to many of our standard products, while others are reserved for custom high performance applications.

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Crystalline Silica General Industry and Maritime Standard

Important to Know:

Crystalline silica is all around us: in sand, stone, concrete and mortar. This common mineral found in the earth's crust is also used to make products such as glass, pottery, ceramics, bricks and artificial stone.

However, when it's turned into tiny particles by workplace activities like cutting, sawing, grinding, drilling and crushing stone, rock, concrete, brick and mortar, crystalline silica becomes respirable – and dangerous to human health.

Approximately 2.3 million people in the U.S. are exposed to respirable crystalline silica at work. Exposure can occur during the manufacture of glass, pottery, ceramic, brick, concrete, asphalt roofing, jewelry, artificial stone, dental, porcelain or structural clay products; the use of industrial sand in operations such as foundry work and hydraulic fracturing; and the use of sand for abrasive blasting (e.g., maritime operations).

Breathing in very small crystalline silica particles can cause a number of life-altering and life-threatening diseases. Silicosis, which results in scar tissue forming on the lungs, is incurable and can be fatal. It typically occurs after 15–20 years of occupational exposure to respirable crystalline silica. Because silicosis affects the immune system, it increases the risk of lung infections, such as tuberculosis. Exposure to respirable crystalline silica increases the risk of developing lung cancer, in which abnormal cells grow uncontrollably into tumors, interfering with lung function and often metastasizing to other parts of the body. Chronic obstructive pulmonary disease (COPD) causes shortness of breath due to difficulty breathing air into the lungs. It is usually irreversible. Exposure to respirable crystalline silica is also related to kidney failure, the development of autoimmune disorders and cardiovascular impairment.

Standard Requirements:

1910.1053 requires employers to:

- Determine the amount of silica that workers are exposed to if it is, or may reasonably be expected to be, at or above the action level of 25 µg/m3 (micrograms of silica per cubic meter of air), averaged over an 8-hour day.
- Protect workers from respirable crystalline silica exposures above the permissible exposure limit (PEL) of 50 µg/m3, averaged over an 8-hour day.
- Limit access to areas where workers could be exposed above the PEL.
- Use dust controls and safer work methods to protect workers from silica exposures above the PEL.
- Provide respirators to workers when dust controls and safer work methods cannot limit exposures to the PEL.
- Establish and implement a written exposure control plan that identifies tasks that involve exposure and methods used to protect workers.
- Restrict housekeeping practices that expose workers to silica, such as use of compressed air without a ventilation system to capture the dust and dry sweeping, where effective, safe alternatives are available.
- Offer medical exams—including chest X-rays and lung function tests—every three years to workers exposed at or above the action level for 30 or more days per year.
- Train workers on the health effects of silica exposure, workplace tasks that can expose them to silica, and ways to limit exposure.
- Keep records of workers' silica exposure and medical exams.

Increase Your Knowledge:

→ Details of the standard's requirements can be found at: https://tinyurl.com/yxu49g8l and FAQs about it at: www.osha.gov/silica-crystalline/general-industry-info. ***WMHS***

Did You Know?

Dust control efforts can include HEPA-filtered vacuuming; wet methods that apply water at the point where silica dust is made; local exhaust ventilation that removes silica dust at or near the point where it is made; and enclosures that isolate the work process or the worker.

Workers must not allow dry sweeping or dry brushing where they could contribute to employee exposure to respirable crystalline silica unless methods like the ones mentioned above are not feasible. In addition, employers must not allow compressed air to be used to clean clothing or surfaces unless (1) the compressed air is used in conjunction with a ventilation system that effectively captures the dust cloud created by the compressed air, or (2) no alternative method is feasible.

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Fall Protection Systems and Falling Object Protection: OSHA 1910.29

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Important to Know:

Employers must examine the workplace to identify hazards and then implement measures to prevent employees from falling off of overhead platforms, elevated workstations or into holes in the floor and walls.

OSHA requires that fall protection be provided at elevations of 4ft in general industry workplaces, 5ft in shipyards, 6ft in the construction industry and 8ft in longshoring operations. In addition, OSHA requires that fall protection be provided when working over dangerous equipment and machinery, regardless of the fall distance.

To prevent employees from being injured from falls, employers must:

- Guard every floor hole into which a worker can accidentally walk (using a railing and toe-board or a floor hole cover).
- Provide a guard rail and toe-board around every elevated open sided platform, floor or runway.
- Regardless of height, if a worker can fall into or onto dangerous machines or equipment (such as a vat of acid or a conveyor belt) employers must provide guardrails and toe-boards to prevent workers from falling and getting injured.
- Other means of fall protection that may be required on certain jobs include safety harness and line, safety nets, stair railings and handrails.

Standard Requirements:

1910.29 contains very specific requirements for a variety of fall protection structures.

Guardrail requirements include:
The top edge height of top rails, or equivalent guardrail system members, must be 42in (107cm), plus or minus 3in (8cm), above the walking-working surface (unless it meets other criteria).

Midrails must be installed at a height midway between the top edge of the guardrail system and the walking-working surface.

Screens and mesh should extend from the walking-working surface to the top rail and along the entire opening between top rail supports.

Guardrail systems must be capable of withstanding, without failure, a force of at least 200lbs (890N) applied in a downward or outward direction within 2in (5cm) of the top edge, at any point along the top rail.

They must also be smooth surfaced to protect employees from injury, such as punctures or lacerations, and to prevent catching or snagging of clothing.

When guardrail systems are used around holes, they must be installed on all unprotected sides or edges of the hole.

Guardrail systems on ramps and runways should be installed along each unprotected side or edge.

Did You Know?

Falls are among the most common causes of serious work-related injuries and deaths. Falls can occur while climbing a ladder or while doing maintenance on a cell tower, hundreds of feet in the air.

According to the Bureau of Labor Statistics' National Census of Fatal Occupational Injuries In 2018, workplace falls claimed the lives of 791 workers in the U.S. that year.[1] These included slips, trips and falls; falls to a lower level; falls from collapsing structures or equipment and falls through surfaces or existing openings. The construction industry had the highest number of fall-related deaths. There were 244,000 falls in 2018[2] that involved one or more days away from work.

1 www.bls.gov/news.release/pdf/cfoi.pdf
2 www.bls.gov/iif/oshwc/osh/case/cd_r31_2019.htm

Handrail and stair rail systems requirements include:
Handrails cannot be less than 30in (76cm) and not more than 38in (97cm), as measured from the leading edge of the stair tread to the top surface of the handrail.

The top rail of a stair rail system may serve as a handrail only when the height of the stair rail system is not less than 36in (91cm) and not more than 38in (97cm) as measured at the leading edge of the stair tread to the top surface of the top rail.

The minimum finger clearance between handrails and any other object is 2.25in.

Handrails and stair rail systems must be smooth surfaced to protect employees from injury, such as punctures or lacerations, and to prevent catching or snagging of clothing.

Handrails have the shape and dimension necessary so that employees can grasp the handrail firmly.

Cages, wells and platforms used with fixed ladders must be:

- Designed, constructed and maintained to permit easy access to, and egress from, the ladder that they enclose.
- Continuous throughout the length of the fixed ladder, except for access, egress and other transfer points.
- Designed, constructed and maintained to contain employees in the event of a fall, and to direct them to a lower landing.

Increase Your Knowledge:

→ Details of the standard, including figures of guardrail systems, fixed ladders in wells and cages can be found on the OSHA website at: https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.29. ***WMHS***

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OSHA 29 CFR 1910.28(b)(1)(i)&A

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OSHA 29 CFR 1910.28(b)(3)(iv)

ROOF HATCH GUARDS/
FOR OPEN HOLES

OSHA 29 CFR 1910.29(b)(13)(i)(ii)

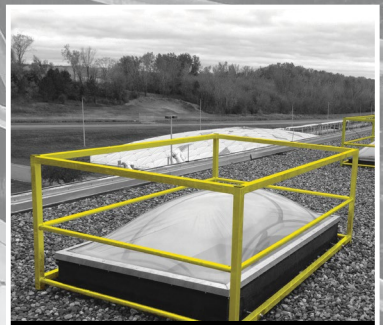
FIXED LADDER ACCESS/
FOR LEADING EDGES

OSHA 29 CFR 1910.28(c)(1)

GUARDRAILS/
FOR FALLING OBJECTS

OSHA 29 CFR 1910.28(b)(13)(i-iii)&(A)

WARNING LINES/
FOR DESIGNATED AREAS



OSHA 29 CFR 1910.28(b)(3)(i)(A-B)

SKYLIGHT PROTECTION/
FOR OPEN HOLES

(Note: OSHA standards cited are intended as an initial reference point. Other OSHA standards may also apply.)

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NFPA 652-Standard on The Fundamentals of Combustible Dust, 2019 Edition

"Proper housekeeping is a powerful and essential line of defense against many types of workplace hazards, and combustible dust is no exception. NFPA 652 recommends cleaning methods, such as vacuuming, but also outlines specific design requirements to ensure the equipment can meet the demands of collecting combustible dust. In the absence of a formal OSHA rule, NFPA 652 is vital to guiding our manufacturing customers on how to identify, measure and, most importantly, choose the proper industrial vacuum to safely mitigate their combustible dust risk." *Nilfisk, 800-989-2235, www.nilfisk.us*

Important to Know:

Combustible dust is finely divided material that presents a flash fire or explosion hazard when suspended in the air or a process-specific oxidizing medium in certain concentrations. Materials that can be explosible when in dust form include types of candy, sugar, spice, starch, flour, feed, grain, tobacco, plastics, wood, paper, pulp, rubber, rubber, pesticides, pharmaceuticals, dyes, coal and metals like aluminum, chromium, iron, magnesium and zinc. (Even if a substance doesn't burn when it is in larger pieces, such as aluminum or iron, in dust form it can be explosible.)

Potentially explosible materials are used in agriculture, chemical manufacturing, pharmaceutical production, furniture, textiles, fossil fuel power generation, recycling operations and metal working and processing, which includes additive manufacturing and 3D printing.

The force from a combustible dust explosion can cause death and injuries to people and destruction to buildings:

- In 2008, a massive explosion and fire at the Imperial Sugar refinery in Port Wentworth, Georgia killed 14 people and injured 38 others.
- A 2010 combustible dust incident at the AL Solutions metal recycling facility in New Cumberland, West Virginia killed three employees and injured a contractor.
- In 2012, three combustible dust-caused flash fires that occurred over a six-month period at the Hoeganaes Corporation facility in Gallatin, Tennessee resulted in fatal injuries to five workers.

These are not isolated incidents. The U.S. Chemical Safety and Hazard Investigation Board (CSB) identified 281 combustible dust incidents between 1980 and 2005 that led to the deaths of 119 workers, injured 718, and extensively damaged numerous industrial facilities.

Standard Requirements:

NFPA 652 provides the basic principles of and requirements for identifying and managing the fire and explosion hazards of combustible dusts and particulate solids. It includes the minimum general requirements necessary to manage the fire, flash fire and explosion hazards posed by combustible dusts.

The standard pertains to all operations and facilities that process, manufacture, convey, blend generate, repackage or handle combustible particulate solids or combustible dusts.

NFPA 652 specifies that:

- All areas of a facility where combustible dust is present must be reviewed and a dust hazard analysis (DHA) conducted every five years.
- The DHA must be conducted by a "qualified person" or team, which could include owners, facility operators, engineers, equipment manufacturers or consultants – ideally, people who are familiar with the operations, process equipment, properties of the material and emergency procedures of the facility.
- The DHA will categorize locations where dust is present as Not a Hazard; Might be a Hazard or Deflagration Hazard. Area that Might be a Hazard should be subjected to additional analysis to determine if a hazard exists.
- Safe operating ranges and hazard management methods must be defined for any areas identified as hazardous.

2019 changes to the standard include an expanded Hazard Management: Mitigation and Prevention section with requirements on equipment design and operation, such as air-material separators (AMS), air moving devices (AMDs), duct systems, sight glasses, abort gates and dampers, bulk storage enclosures, size reduction equipment, pressure protection systems, material feeding devices, bucket elevators, enclosed conveyors, mixers and blenders, and dryers.

Increase Your Knowledge:

→ Copies of the standard can be purchased online at https://webstore.ansi.org/standards/ ***WMHS***

Did You Know?

Combustible dust hazards can be mitigated by: the use of vacuum cleaners approved for dust collection; minimizing the escape of dust from process equipment or ventilation systems; dust collection systems and filters; cleaning dust residues at regular intervals using methods that do not generate dust clouds (if ignition sources are present) and locating relief valves away from dust hazard areas.

NFPA 652 complements NFPA 654: Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids by establishing guidelines for conducting a DHA and providing more detailed information about dust combustibility. Both are among the more than 300 consensus codes and standards developed by the NFPA to minimize the occurrence and effects of fire and other risks. Virtually every building, process, service, design and installation in society today is affected by NFPA documents.

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Mitigate the risks of combustible dust

Keep your people and facility safe

Let Nilfisk help mitigate the risks of combustible dust explosions in your facility by securing a free dust mitigation assessment.

Nilfisk offers a full line of industrial vacuum cleaners to meet NFPA 652 housekeeping requirements for collecting combustible dust in Class I, Group D and Class II and non-classified environments, in addition to floor scrubbers, sweepers and high pressure washers to achieve a superior level of clean facility-wide.

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1255 1/2021

Hand Impact Protection: ANSI/ISEA 138

"Before the ANSI/ISEA 138 standard, it was nearly impossible to compare impact-resistant gloves or substantiate claims made by manufacturers. Methods for testing impact resistance weren't standardized. ANSI/ISEA 138 leveled the playing field, ensuring safety professionals could compare products accurately to choose the best protection for workers. As a manufacturer, it helps us highlight product effectiveness. With it, we developed one of the first impact-resistant gloves to receive the industry's highest impact rating." *Superior Glove, 800-265-7617, Superiorglove.com/impact*

Important to Know:

In 2019, leading U.S. glove manufacturers and material suppliers collaborated to develop new, voluntary standards from the International Safety Equipment Association (ISEA, an American National Standards Institute-accredited standards developing organization). The standard essentially creates a homogenous classification system for impact protection—across all manufacturers—and helps those in industries where impact protection is critical to make better choices for impact-resistant gloves.

Thus, the ANSI/ISEA 138, American national standard for performance and classification for impact-resistant hand protection was created. The aim was to improve on the somewhat-limited treatment of impact performance recently incorporated into the main European hand protection standard, EN 388. That standard took its cues from an existing motorcycle impact standard for hand protection. [For more on EN 388, see pg 34.]

Whereas EN 388 covers the knuckles, ANSI/ISEA 138 covers knuckles and fingers, which is critical for industrial glove-users whose fingers are frequently at risk. In 2016, the oil and gas sector, which is a large consumer of impact-protection gloves, collected figures through the International Association of Drilling Contractors. This data demonstrated that fingers remained the most vulnerable part of the body, resulting in both lost recordable injuries and lost time from work.

Specifically, the ANSI/ISEA 138 standard was designed for industrial gloves and the special protections they offer. The defined ISEA 138 levels give greater choice and flexibility to the end-user. Scaled performance levels help employers make a choice that meets the needs of their workforce, giving them the confidence to choose protective gloves that are both appropriate to potential risk and hazard levels.

The standard provides a reliable starting point to which end-users can apply all the variables affecting their specific workforce needs, including tasks, work environments, budgets, etc.

Standard Requirements:

- Define an agreed test method
- Include defined performance levels
- Specify a pictogram mark for each of the defined levels for compliant gloves
- Require that product be tested in a laboratory having a certificate of accreditation meeting the requirements in ISO/IEC 17025:2017, General Requirements for the competence of testing and calibration laboratories

Increase Your Knowledge:

- OSHA's library contains a general PPE assessment for employers, with checklists for specific topics, including hand/arm protection: https://bit.ly/2r8F1T9.
- To download a copy of the standard, to go ANSI's webstore: https://bit.ly/2J5r69k. ***WMHS***

Did You Know?

Of the 145,000 recordable injuries in today's workplace and government agencies, 63% are made up of cuts; 18% are due to crush and bone breakage, says OSHA. These numbers represent an opportunity to improve and educate buyers and end-users of workplace gloves.

ANSI/ISEA 138 was specifically designed for industrial gloves and the special protection they offer to workers. Many people mistakenly believe hand impact injuries only affect a narrow range of industries, such as the offshore oil and gas sector, mining and construction. In reality, the market is much wider, with impact-related injuries a common danger for manufacturing, warehouse and transport workers. The bones and soft tissues in the back of the hand are all vulnerable to impact injuries, varying from bumps and bruises to severe fractures.

Up until this standard was written in 2019, there had been no commonly agreed performance standard or test method in North America for dorsal (back of hand) impact protection. Although many PPE manufacturers produce a wide range of protective gloves with new designs and materials constantly entering the market, there was either little differentiation between the materials used for impact protection; or performance claims could not be readily validated.

The lack of any objective performance standard resulted in a serious challenge for employers responsible for selecting appropriate PPE for industrial workers. Thankfully, the wait is now over.

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ARE YOUR HANDS READY FOR IMPACT?

#MXVSB

ANSI / ISEA 138

1

HIGH-VIZ

ADDED CUT PROTECTION

#378G0BKVB

ANSI / ISEA 138

2

HIGH CUT-RESISTANCE

ARC FLASH PROTECTION

#378GKG4P

ANSI / ISEA 138

3

HIGH CUT-RESISTANCE

ARC FLASH PROTECTION

*superiorglove.com/**impact***

HazCom Standard: OSHA 1910.1200

"OSHA's Hazard Communication Standard was aligned with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) in order to improve the safety and health of workers that handle or are exposed to hazardous chemicals. Ensuring that hazardous chemicals are labeled properly is an important component of creating a safe working environment and staying compliant with OSHA." *Avery Products Corporation, industrial@avery.com, www.avery.com/industrial.*

Important to Know:

In June 2016, the Hazard Communication Standard (HCS) required employers to have updated, alternative workplace labeling and hazard communication programs in effect and to provide additional employee training for newly identified physical or health hazards. These were considered significant changes to the standard.

Major changes to the Hazard Communication Standard:

- Hazard classification: Provides specific criteria for classification of health and physical hazards, as well as classification of mixtures.
- Labels: Chemical manufacturers and importers are required to provide a label that includes a harmonized signal word, pictogram and hazard statement for each hazard class and category. Precautionary statements must also be provided.
- Safety Data Sheets: Must have a specified 16-section format.
- Information and training: Employers are required to train workers on the label elements and safety data sheets to facilitate recognition and understanding.

Standard Requirements:

The OSHA Hazard Communication Standard is composed of five key elements:

1. **Materials Inventory:** A list of the hazardous materials present in your work area
2. **Material Safety Data Sheets:** A detailed description of each hazardous material listed in the Materials Inventory
3. **Labeling:** Containers of hazardous materials must have labels which identify the material and warn of its potential hazard to employees
4. **Training:** All employees must be trained to identify and work safely with hazardous materials
5. **Written Program:** A written program must be developed which ties all the above together

In addition:

- Chemical manufacturers and importers are to evaluate the hazards of the chemicals they produce or import and prepare labels and safety data sheets to convey the hazard information to their downstream customers.
- All employers with hazardous chemicals in their workplaces must have labels and safety data sheets for their exposed workers and train them to handle the chemicals appropriately.

OSHA cites the most penalized industries as follows:

- → Foundation, structure and building exterior contractors
- → Automotive repair and maintenance
- → Building finishing contractors
- → Architectural and structural metals manufacturing
- → Machine shops; turned product; and screw, nut and bolt manufacturing
- → Specialty trade contractors
- → Merchant wholesalers, durable goods
- → Food manufacturing

Increase Your Knowledge:

- → The Hazard Communication page on OSHA.gov includes downloadable versions of the revised 1910.1200 Final Rule and appendices, updated to align with the GHS; a comparison of the Hazard Communication Standard, issued in 1994 (HazCom 1994), with the revised Hazard Communication Final Rule issued in 2012 (HazCom 2012); as well as FAQs on the revisions. It also includes new guidance materials on the revisions. The page includes the full regulatory text and appendices of HazCom 1994.
- → Visit https://bit.ly/2zHZcsd to see the standard. ***WMHS***

Did You Know?

On March 26, 2012, OSHA amended the 1983 Hazard Communication Standard to align with the Globally Harmonized System for the Classification and Labelling of Chemicals (GHS). The HSC of 1983 gave the workers the "right to know," but the updated Globally Harmonized System gave workers the "right to understand."

To ensure chemical safety in the workplace, information about the identities and hazards of the chemicals must be available and understandable to workers.

As a result, OSHA refers to this HCS as the one "that gave workers the right to know; now [it] gives them the right to understand."

The standard covers more than 43 million workers who produce or handle hazardous chemicals in more than 5 million workplaces across the country. The modification is expected to prevent 500+ workplace injuries and illnesses and some 40+ fatalities, annually.

Also, in 2012, OSHA updated its HCS to align U.S. regulations with the United Nations' Globally Harmonized System of Classification and Labelling of Chemicals (GHS), in order to standardize important chemical safety information for employees. The GHS can help to reduce trade barriers by simplifying the classification and labeling of chemicals sold internationally.

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Emergency Eyewash & Shower Equipment: ANSI/ISEA Z358.1-2014

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Important to Know:

Most chemical injuries occur in the workplace. The severity of the injury, as well as its effects, are determined by the specific chemical that caused the burn, the duration of contact and how quickly and effectively first aid is rendered. The consequences can range from temporary discomfort to permanent skin and eye damage, including blindness.

When any chemical injury occurs, the eye should be immediately and thoroughly irrigated or the skin flushed with water. The longer a chemical is in the eye or on the body, the more damage can occur. The eyelids of the injured person should be opened as wide as possible during the rinsing process – even if that is uncomfortable. Any clothing the chemical has penetrated must be removed from the victim.

Positioning emergency showers and eyewash stations in highly visible, easily accessible locations in factories, laboratories or other facilities where workers may be exposed to corrosive chemicals can help workers get the first aid they need fast, and hopefully, avoid the worst effects.

Standard Requirements:

This standard establishes minimum performance, use, installation, test procedures, maintenance and training requirements for eyewash and shower equipment for the emergency treatment of the eyes or body of a person who has been exposed to hazardous materials. It covers:

- emergency shower
- eyewashes
- eye/face washes, and
- combination units.

This standard also includes performance and use requirements for personal wash units and drench hoses, which are considered supplemental to emergency eyewash and shower equipment.

Key provisions of the standard:

- The flushing liquid's velocity and quantity should be controlled on all the equipment, by a control valve that is simple to operate and capable of going from off to on in one second or less.
- The control valve should be resistant to corrosion.
- Emergency showers and eyewashes should deliver tepid flushing fluid (16-38°C or 60-100°F). However, there are certain circumstances in which a facilities safety/health advisor should be consulted for optimum temperature.
- The installer is responsible for positioning the shower or eyewash station in locations that take no more than 10 seconds to reach.
- The installer must ensure that the equipment is maintained in proper working condition.

By addressing minimum equipment performance criteria for flow rates, temperature delivery and drenching patterns, the standard includes all of the characteristics necessary for a contaminant to be adequately rinsed from the eyes, face and body in an emergency situation.

While OSHA does require employers, in its first aid regulation (29 CFR Part 1910.151c), to have "suitable facilities for quick drenching or flushing of the eyes and body" where workers may be exposed to "injurious corrosive materials," agency inspectors often use the more detailed ANSI/ISEA Z358.1-2014 to ensure that employers are in compliance with that rule.

This standard was written and published by the International Safety Equipment Association (ISEA) and has been adopted by governmental agencies in many countries.

Increase Your Knowledge:

→ Copies of the standard can be purchased online at https://webstore.ansi.org. ***WMHS***

Did You Know?

The National Institute for Occupational Safety and Health (NIOSH) has produced a NIOSH Pocket Guide to Chemical Hazards to provide easy access to information for workers, employers and occupational health professionals. The Pocket Guide covers 677 chemicals or substance groupings (e.g., manganese compounds, tellurium compounds, inorganic tin compounds, etc.) that are found in the work environment, including all those for which NIOSH has recommended exposure limits (RELs) and OSHA specified permissible exposure limits (PELs).

The Pocket Guide includes a description of the chemical, the exposure route, symptoms, target organs and, most important, the first aid that should be administered. The guide can be found at: https://www.cdc.gov/niosh/npg/default.html

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Haws® provides the most comprehensive service offering in the market today with in-depth, on-site evaluation and testing of your emergency eye/face wash and showers against ANSI Z358.1 requirements. With detailed reporting, gap identification and mitigation recommendations performed by experienced ANSI compliance experts, our team will work with your facility to make sure your equipment meets the annual standard.

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Hand Protection: OSHA 1910.138

"The OSHA 1910.138 statute is instrumental in defining that the proper glove protection should be chosen when hazards are present. This selection process is a complex one when consumers realize the multiple hazards that a workforce can be exposed to, along with the vast amount of hand protection options in the market. At SHOWA, resources for consumer inquiries for hand protection selection is top priority so consumers receive the proper recommendation for the hazard(s) at hand. Regardless of the hazard(s), SHOWA is always there to make sure that our customers have the correct hand PPE option for their workforce to get any job done." *Brian Moseley - R&D/Technical Manager: Showa Group, 1-800.241.0323, www.showagroup.com/us/en*

Important to Know:

Hands are complex and extraordinary body parts, capable of gripping and manipulating objects and performing a tremendous range of tasks. To accomplish all this, they rely on a structure composed of 27 bones (about a quarter of the total bones found in the human body), along with muscles, tendons, nerve fibers and blood vessels. Aside from tendons that pad the palm, hands don't have much in the way of natural protection, which makes them vulnerable to wear and tear - and injuries.

Hand injuries send thousands of workers to hospital emergency departments each year. They are costly and can have both short- and long-term effects. According to the National Safety Council, there were 121,000 hand injuries and 79,280 finger injuries that resulted in days away from work in 2019[1]. Fingers and hand are the most frequent body parts injured at work and treated in hospital emergency departments, according to the National Electronic Injury Surveillance System.

A 2002 study[2] published by the National Institutes of Health National Library of Medicine looked at 1,166 hand injuries suffered by machinists and managers, structural and clerical workers and found that the majority (62.6%) of the injuries were lacerations, followed by crush injuries (13.1%), avulsions, or tears (8%) and punctures (6.1%). Metal items like nails, metal stock and burrs accounted for 38.4% of the injuries, followed by hand tools with blades (24.4%) and powered machinery (12.3%).

Standard Requirements:

When employees' hands are exposed to hazards, employers must select—and require employees to use—appropriate hand protection. The hazards include harmful substances that can be absorbed through the skin, chemical burns, thermal burns and harmful temperature extremes, as well as severe abrasions, punctures, and severe cuts or lacerations (some of which are addressed in ANSI 105/EN 388: Standards for Hand Protection).

According to 1910.138(b), selection of the appropriate hand protection must be based on an evaluation of the performance characteristics of the hand protection relative to the task(s) to be performed, conditions present, duration of use and the hazards and potential hazards identified.

As with all personal protective equipment (PPE), workplace hand protection comes into play when engineering, work practice and administrative controls do not provide sufficient protection. Safety gloves should:

- Be safely designed and constructed
- Be maintained in a clean and reliable fashion
- Fit comfortably

The last feature is essential to ensuring that workers actually use the PPE, potentially making the difference between being safely covered or dangerously exposed.

Additionally, employees must be trained so that they know: when hand protection is necessary; what kind is necessary; how to properly put it on, adjust it, wear it and take it off and what its limitations are.

If PPE is to be used, a PPE program should be implemented, one which addresses hazards; the selection, maintenance, and use of PPE; the training of employees; and monitoring the program to ensure its ongoing effectiveness.

Increase Your Knowledge:

→ OSHA has a list of fact sheets, publications and letters of interpretation that provide hand protection information for specific hazards or industries, including Energized vs. Deenergized Work: Live Line/Bare Hand Work and Tools; OSHA Fact Sheet: Hand Hygiene and Protective Gloves in Hurricane - Affected Areas, PPE Selection in Shipbreaking; and Selection of Hand Protection for Cold Environments. You can find the list at: https://tinyurl.com/y3jt5n36. ***WMHS***

Did You Know?

Things to consider when selecting gloves:

- **Dexterity.** If chemical resistance is needed, dexterity could be improved by wearing a tight-fitting glove over a looser glove. In the event of contamination, the outer glove could be removed immediately.
- **Thickness.** Thinner gloves offer better touch sensitivity and flexibility, but less protection.
- **Length.** Will the arm be immersed or potentially exposed to chemical splash?
- **Size.** Too-tight gloves cause fatigue. Gloves which are too loose could make certain tasks difficult.

1 https://tinyurl.com/y33zntko
2 https://pubmed.ncbi.nlm.nih.gov/11977421/

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"The OSHA 1910.138 statute is instrumental in defining that the proper glove protection should be chosen when hazards are present. This selection process is a complex one when consumers realize the multiple hazards that a work force can be exposed to along with the vast amount of hand protection options in the market. At SHOWA, resources for consumer inquiries for hand protection selection is top priority so consumers receive the proper recommendation for the hazard(s) at hand. Regardless of the hazard(s), SHOWA is always there to make sure that our customers have the correct hand PPE option for their workforce to get any job done."

Brian Moseley - R&D/Technical Manager: Showa Group

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Medical and First Aid: OSHA 1910.151(b)

"Preparing for medical issues at work is critical for safety leaders across all industries. Employees can be reluctant to help in these situations if they are not sure what to do. ZOLL Public Safety products are designed to offer bystanders the equipment and guidance they need to manage a variety of medical emergencies. ZOLL® automated external defibrillators (AEDs) and Mobilize Rescue Systems™ provide real-time, step-by-step instructions, giving bystanders the confidence and support needed." *ZOLL Medical Corporation, 800-804-4356, zoll.com/public-safety*

Important to Know:

Sudden cardiac arrest (SCA) is a condition in which the heart suddenly and unexpectedly stops beating, causing blood to stop flowing to the brain and other vital organs. About 220,000 SCAs take place in the U.S. each year – 10,000 of them at work. Although it's important to immediately call 9-1-1 when you witness an SCA, not administering immediate defibrillation to the victim while waiting for emergency medical technicians to arrive sharply reduces his or her chances of survival, from up to 60% to only 5-7%. According to OSHA, the chances of survival from SCA diminish by 7-10% for each minute without immediate CPR or defibrillation. After 10 minutes, resuscitation rarely succeeds.

This lifesaving measure is delivered by an automated external defibrillator (AED), a device that analyzes the heart rhythm and administers an electric shock to restore that rhythm to normal. (A heart rhythm in ventricular fibrillation – when the heart beats with rapid, erratic electrical impulses may only be restored to normal by an electric shock.)

Standard Requirements:

OSHA standards do not specifically address automated external defibrillators (AEDs). However, the Medical and First Aid Standard, 1910.151(b), states that "in the absence of an infirmary, clinic or hospital in near proximity to the workplace which is used for the treatment of all injured employees, a person or persons shall be adequately trained to render first aid. Adequate first aid supplies shall be readily available."

In its publication, Saving Sudden Cardiac Arrest Victims in the Workplace[1], OSHA lists the following reasons for having AEDs in the workplace: workers may suffer sudden cardiac arrest while on the job, onsite AEDs save precious treatment time and can improve survival odds because they can be used before emergency medical service (EMS) personnel arrive; and the AED is compact, lightweight, portable, battery operated, safe and easy to use. The publication also contains resources for using AEDs and obtaining qualified training.

The agency estimates that an AED program will cost $1,200-$3,000 per device, with additional costs for training and annual retraining.

Increase Your Knowledge:

→ Information about AEDs and AED programs can be found in OSHA's Best Practices Guide: Fundamentals of a Workplace First-Aid Program publication[2] as well as on OSHA's AED webpage, www.osha.gov/aed#aedsintheworkplace. ***WMHS***

Did You Know?

Many victims of SCA have no prior history of heart disease and are stricken without warning.

In addition to heart attacks, SCA can be caused by work-related incidents such as electrocution and asphyxiation (loss of consciousness and death caused by inadequate oxygen in the work environment, such as in a confined space).

AEDs should be installed in the workplace:

- Where a response can happen within 3-5 minutes
- In areas where many people work closely together, such as assembly lines and office buildings
- Close to a confined space
- In areas where electric-powered devices are used
- At outdoor worksites where lightning may occur
- In health units where workers may seek treatment for heart attack symptoms
- In company fitness units and cafeterias
- At remote sites, such as offshore drilling rigs, construction projects, marine vessels, power transmission lines and energy pipelines

Employees should be trained to:

- Recognize SCA and notify EMS personnel
- Perform cardiopulmonary resuscitation (CPR)
- Provide early defibrillation with an AED, and
- Care for the victim until EMS personnel arrive.

1 www.osha.gov/Publications/osha3185.pdf
2 www.osha.gov/Publications/OSHA3317first-aid.pdf

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Is your facility ready? Each year 10,000 sudden cardiac arrest events occur in the workplace.[1] Ensure you're prepared with a best-in-class automated external defibrillator (AED) from ZOLL.

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[1]osha.gov/Publications/3185.html

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Respiratory Fit Testing Methods: ANSI/AIHA/ASSP Z88.10-2010

"A standard for carrying out the proper way to carry out fit testing was long overdue and has been immensely helpful in the field of respiratory protection. At OHD, we commend those who further our mission of protecting the world's workforce." – Dr. Stephanie Lynch, PhD, OHD, LLP, Product Manager, Occupational Health Dynamics (OHD). Occupational Health Dynamics (OHD). *205-980-0180. www.ohdglobal.com*

Important to Know:

Breathing in hazardous substances can cause severe lung damage in a worker – or even result in a fatality. That's why fit testing of respirators is such an important component of a respiratory protection program. If done correctly, it can greatly reduce the risk of contaminated air leaking into an employee's respiratory facepiece. It can also verify that the employee is wearing a correctly fitting model and size of respirator.

In simple terms, a fit test tests the seal between a person's face and the respirator's facepiece.

During quantitative fit testing, which is used for tight-fitting respirators, a device measures the amount of leakage into the facepiece. Qualitative fit testing is used for half-mask respirators. It is a pass/fail test that relies on an individual's sensory detection of the test substance to determine if there is leakage of the test substance into the respiratory facepiece.

Ways to help make your fit testing program a success:

- Use the same make, model and size of respirator that will be worn during work activities.
- Make sure workers who wear prescription glasses or personal protective equipment (PPE), like safety goggles or earmuffs, while on the job wear these items during the fit test.
- Perform fit tests at least annually.
- If a worker has lost or gained a significant amount of weight, grown a beard or had facial or dental alterations, do a fit test again – even if the previous one was performed less than a year ago.
- Once a fit test has determined the best model and size of respirator for a particular user, make sure the user does a seal check (or fit check) every time the respirator is to be worn.


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Standard Requirements:

This standard provides clear and consistent guidance to respiratory protection program managers on specific methods used to conduct fit testing, which is used to evaluate sealing surface leakage. It lists the knowledge and skills someone must have in order to perform as a qualified fit test operator. It specifies how to interpret test results to arrive at a fit factor, which is a numeric expression of how well a tight-fitting respirator fits a wearer during a quantitative fit test. It also includes detailed information about respirator face pieces, selection of face pieces, and additional considerations can affect fit testing outcomes, like how other personal protective equipment might interfere with the respirator.

Because a single fit test exercise protocol cannot model all workplace activities encountered by respirator users, the standard provides flexibility regarding fit test exercise protocols. Exercises may be selected that are more representative of actual workplace activities, including repeated respirator donning.

Increase Your Knowledge:

→ Copies of the standard can be purchased online at the ANSI website at: https://webstore.ansi.org. ***WMHS***

Did You Know?

Respirator sizing is not standardized across models or brands. For example, a medium in one model may not offer the same fit as a different manufacturer's medium model. That's one reason why a user should only wear the specific brand, model and size respirators that he or she wore during successful fit tests.

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Walking-Working Surfaces: OSHA 1910 Subpart D

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Important to Know:

Slips, trips and falls can result in injuries ranging from fractures, sprains and strains and can even be fatal, especially if the falls are to a lower level. Falls from heights and working surfaces (on the same level) are among the leading causes of serious occupational injuries and deaths, ranking third in 2018, according to the Bureau of Labor Statistics.

Walking-working surfaces can become hazardous due to damage; wear; weather conditions; contaminants on the floor; poor drainage; lack of or broken stairs and handrails; tripping hazards such as clutter, loose cords, hoses, wires and improper use of floor mats and runners. Inadequate lighting and flooring that does not have the same degree of traction in all areas can also add to the risk.

OSHA's Walking-Working Surfaces standard, 29 CFR Part 1910, Subpart D is intended to reduce the number of worker deaths and injuries caused by those hazards. The agency estimates that approximately 202,066 serious (lost workday) injuries and 345 fatalities occur annually among workers directly affected by the standard. The majority (67%) of workplace falls happen on the same level.

The rule, which went into effect on January 17, 2017, revised a standard that had not been updated since 1971. It incorporates advances in technology and industry best practices, as well as national consensus standards.

Standard Requirements:

The rule defines "walking-working surfaces" as any surface on or through which an employee walks, works or gains access to a work area or workplace location (§ 1910.21(b)). Walking-working surfaces include, but are not limited to, floors, ladders, stairways, steps, roofs, ramps, runways, aisles, scaffolds, dockboards and step bolts. Walking-working surfaces include horizontal, vertical, and inclined or angled surfaces.

The inclusion of "work area" in the rule means that walking-working surfaces include those areas where employees perform their job duties, as well as other locations in the workplace, such as hallways and supply and change rooms. OSHA notes that, for some work and occupations, including equipment service and repair, delivery of materials and supplies, and landscaping, the "work area" may be at various locations.

Identifying walking-working surface hazards and deciding how best to protect employees is the first step in reducing or eliminating the hazards. A key requirement of the rule is that employers inspect walking-working surfaces regularly as needed, and correct, repair or guard against hazardous conditions.

The standard specifies that walking-working surfaces must be kept:

- clean
- dry (or have drainage and dry standing places when wet processes are used)
- free of hazards like sharp or protruding objects, loose boards, corrosion, leaks, spills, snow and ice.

Hazards that are identified should be abated immediately, which could involve cleaning spills; marking spills and wet areas; sweeping debris from floors; removing obstacles and tacking or taping down mats, rugs, and carpets that do not lay flat.

Increase Your Knowledge:

→ This regulation, along with information about the stakeholder comments that were evaluated during its development, is available on the Federal Register website at 81 FR 82494. ***WMHS***

Did You Know?

- One out of five falls causes a serious injury such as broken bones or a head injury.
- More than 800,000 patients per year are hospitalized because of a fall injury, most often because of a head injury or hip fracture.
- Falls are the most common cause of traumatic brain injuries (TBI).
- In 2015 alone, the medical costs for falls in the U.S. totaled more than $50 billion.[1]
- Certain health conditions and medications can increase the likelihood of a fall. These include vision problems, tranquilizers, sedatives and antidepressants, and over-the-counter medicines that can affect balance. Poor footwear can also add to the risk of falling.
- Anti-slip flooring and reflective floor marking materials that can help guide workers along a safe route can help reduce the risk of slip, trip and fall incidents in the workplace.

1 https://tinyurl.com/zlp4kxv

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Duty to Have Fall Protection: OSHA 1926.501

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Important to Know:

Falls are among the most common causes of serious work-related injuries and deaths. Falls that result in injuries or deaths occur in many industries, but they are the top cause of fatalities in the construction industry, which represents 51% of all workplace falls nationally. According to the Bureau of Labor Statistics (BLS), in 2018 there were 320 fall fatalities out of 1,008 total fatalities in construction.[1]

The highest counts of nonfatal fall injuries occur in the health services and the wholesale and retail industries. People who work in healthcare support, building cleaning and maintenance, transportation and material moving, and construction and extraction are at a higher risk of fall injuries.

Falls, slips and trips increased 11% in 2019 to 880. Of those, 146 were on the same level, 711 to a lower level, 95 through a surface or existing opening and 37 from collapsing structures or equipment.[2]

Employers can protect workers from falls through the use of personal fall arrest systems, guardrail systems and safety net systems; the adoption of safe work practices and providing appropriate training. If personal fall protection systems are used, it is important to identify attachment points and to ensure that employees know how to properly use and inspect the equipment.

Standard Requirements:

Employers must set up the workplace to prevent employees from falling off overhead platforms, elevated workstations or into holes in the floor and walls.

OSHA requires that fall protection be provided at elevations of four feet in general industry workplaces, five feet in shipyards, six feet in the construction industry and eight feet in longshoring operations. In addition, fall protection must be provided when someone is working over dangerous equipment and machinery, regardless of the fall distance.

1926.501 is a robust standard with many provisions and specifications. Among them:

Personal fall arrest systems, guardrail systems or safety net systems must be used to protect employees who are potentially exposed to falls of six feet or more while they are:

- on ramps, runways, walkways, the edge of excavations, wells, pits, shafts or above dangerous equipment
- performing overhand bricklaying and related work
- engaged in roofing activities on low-slope roofs, with unprotected sides and edges (warning line systems may also be used)
- engaged in residential construction activities
- on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge
- constructing a leading
- in a hoist area
- near holes, including skylights (covers may also be used)
- on the face of formwork or reinforcing steel

The employer shall determine if the walking/working surfaces on which its employees are to work have the strength and structural integrity to support employees safely.

When an employee is exposed to falling objects, the employer shall have each employee wear a hard hat and must implement one of the following measures:

- Erect toeboards, screens or guardrail systems to prevent objects from falling from higher levels.
- Erect a canopy structure and keep potential fall objects far enough from the edge of the higher level so that those objects would not go over the edge if they were accidentally displaced.
- Barricade the area to which objects could fall, prohibit employees from entering the barricaded area, and keep objects that may fall far enough away from the edge of a higher level so that those objects would not go over the edge if they were accidentally displaced.

Increase Your Knowledge:

→ The complete standard can be viewed on the OSHA website at: www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.501 ***WMHS***

Did You Know?

Since 2012, OSHA, the National Institute for Occupational Safety and Health (NIOSH) and CPWR – the Center for Construction Research and Training have partnered in a National Campaign to Prevent Falls in Construction. This nationwide initiative provides resources and guidance to companies in an effort to improve fall prevention efforts and outcomes.

The campaign's messaging focuses on three main points:

1. Before every job, plan how to work safely at heights
2. Provide workers with the right equipment
3. Train workers on how to use the equipment and work safely

1 www.cdc.gov/niosh/construction/stopfalls.html
2 www.bls.gov/news.release/pdf/cfoi.pdf

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Important to Know:

Two global standards are used to evaluate the protection levels of work gloves: the ANSI/ISEA 105 (U.S.) and EN 388 (EU). EN 388 is also commonly cited in other parts of the world (i.e., Canada, AUS/NZ and South America).

A cut is usually considered to be a wound caused by a sharp object (knife or glass shard). A laceration implies a torn or jagged wound. Lacerations tend to be caused by sharp objects. Cuts and lacerations are terms often used interchangeably for the same condition or wound.

ANSI/ISEA 105-2016 & EN 388 are voluntary standards where manufacturers can choose the attributes they would like to make claims, perform testing and label classifications accordingly. The standards address the classification and testing of hand protection for specific performance properties related to chemical and industrial applications. Within these standards, hand protection includes gloves, mittens, partial gloves or other items covering the hand or a portion of the hand that are intended to provide protection against, or resistance to, a specific hazard. Performance ranges are provided for:

- Mechanical protection (cut-resistance, puncture-resistance and abrasion-resistance)
- Chemical protection (permeation resistance, degradation)
- Other performance characteristics, such as ignition-resistance and vibration reductions, based on standardized test methods

Standard Requirements:

Gloves are classified to performance levels based upon their performance when evaluated against set industry test methods. The ratings can assist users in selecting appropriate hand protection for known specific hazards in the workplace. Performances are rated in Chemical and Mechanical Protection categories, as well as "Other" protections.

Chemical Protection

Permeation testing is done in accordance with ASTM Method F 739 standards. In this method, a specimen is cut from the glove and clamped into a test cell as a barrier membrane. The exterior side of the specimen is then exposed to a hazardous chemical. At timed intervals, the unexposed interior side of the test cell is checked for the presence of the permeated chemical and the extent to which it may have permeated the glove material.


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Mechanical Protection

- Cut-resistance—In an effort to reduce variation for purposes of classifying a glove to ANSI/ISEA 105, a single test method (ASTM F2992-15 for TDM) was selected to help provide consistent meaning of the ratings, from the end-user perspective. The number of classification levels has also been expanded in the latest standard update to address the gap among certain levels seen in earlier versions and to model the approach used in similar international standards. ISEA and EN cut levels will be determined with the same piece of test equipment.
- Puncture resistance—The standard puncture test remains the same, using the EN388 puncture probe. An additional update is the inclusion of a


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Did You Know?

New cut-resistance standards from the American National Standards Institute (ANSI) and International Safety Equipment Associations (ISEA) became effective in March 2016. The standards include changes to the ratings scale and the standardization on a testing methodology. The European Standard for Protective Gloves-EN 388 was updated in November 2016, shortly after the American standard.

EN 388 is similar to ANSI/ISEA 105 and is used to evaluate mechanical risks for hand protection. Gloves with a EN 388 rating are third-party tested and rated for abrasion-, cut-, tear- and puncture-resistance. Cut resistance is rated 1-5, while all other physical performance factors are rated 1-4. Up until this update, the EN 388 standard used only the Coup Test* to test for cut resistance.

The new EN 388 2016 standard uses both the Coup Test and the TDM-100 Test to measure cut resistance for a more accurate score. Also included in the updated standard is a new Impact Protection test. In North America, you can find the EN 388 marking on many cut-resistant gloves. ***WMHS***

**Coup Test: The cut protection is tested when a knife is passed over the glove material until it cuts through. Protection level is a number between 1-5, where 5 indicates the highest cut protection.*

needlestick puncture test, recognizing that this is a common potential exposure for the medical, sanitation and recycling industries. The standard EN388 probe is quite large. There is a segment of users who need protection from smaller hypodermic needles, requiring a significantly different puncture device—very thin and sharp—and calling for using a new testing method and rating scale. The new method uses a 25-gauge needle as a probe. The normal industrial puncture test is done in accordance with clause 6.4 of EN 388:2003 (updated in 2016). A circular test specimen, cut from the glove palm, is mounted in a holder and punctured with a stylus of specified sharpness attached to a tensile tester. The force required to puncture the specimen to failure is measured. Results are classified into five performance levels: The higher the result, the better the performance. The average of 12 specimens (minimum) are used to determine the classification level.

- Abrasion resistance—These ASTM test methods (D3389-10 and D3884-09) shall be followed using H-18 abrasion wheels with a 500g load for levels 0-3 and a 1,000g load for levels 4-6. The test method has a 4in circular test specimen mounted on a horizontal axis platform, while being abraded to failure under a specified vertical weight load (500 or 1,000g) by the sliding rotation of two vertically oriented abrading wheels. The abrading wheels are comprised of vitrified clay and silicon carbide abrasive particles.

Other Protection

- Ignition resistance–Testing in accordance with ASTM F1358-16, the glove material's ignition-resistance and burning behavior should be classified against the levels provided in the standard. In order to be classified at a specific level, the glove material needs to meet each of the criteria at that specific level.

- Vibration reductions–The glove's vibration-reduction is classified as "pass" or "fail," when testing in accordance with ANSI S2.73-2002 (ISO 10819). A glove can only be considered an anti-vibration glove, if it fulfills both of the following criteria: TRM < 1.0 and TRH < 0.6, according to this standard.

Increase Your Knowledge:

→ The ANSI/ISEA 105-2016 standard is available for purchase at: https://webstore.ansi.org/Standards/ISEA/ANSIISEA1052016. ***WMHS***

GLOVE MEETS

ANSI/ISEA 105: 2016 – CUT A7 |
PUNCTURE 5 | ABRASION 4
ANSI/ISEA 138: 2019 – IMPACT 1
EN388: 2016 – 3X43FP

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Respiratory Protection: OSHA 1910.134

"Depending on the application for employees with beards, a loose fitting PAPR may be a good choice to avoid the fit testing specified in 1910.134(f): Fit testing. This paragraph requires that, before an employee may be required to use any respirator with a negative or positive pressure tight-fitting facepiece, the employee must be fit tested with the same make, model, style and size of respirator that will be used." ILC Dover, 800.631.9567, www.ilcdover.com

Important to Know:

OSHA's Respiratory Protection Standard, 29 CFR 1910.134, applies to general industry, construction, shipyards, marine terminals and longshoring.

In keeping with many of OSHA's other standards, 1910.134 identifies engineering controls as the primary means of limiting employees' exposure to a workplace hazard - in this case, airborne contaminants. When engineering controls aren't feasible, respirators must be provided to employees, free of charge.

A respirator is a protective facepiece, hood or helmet that is designed to protect the wearer against a variety of harmful airborne agents. Respirator selection depends upon the hazards to which the worker is exposed (i.e., insufficient oxygen environments, harmful dusts, fogs, smokes, mists, gases, vapors and sprays.) These hazards may cause cancer, lung impairment, diseases or death.

Respirators protect the user in two basic ways: by removing contaminants from the air or by supplying clean respirable air from another source. The first category includes particulate respirators that filter out airborne particles and air-purifying respirators with cartridges/canisters which filter out chemicals and gases. In the second category are airline respirators, which use compressed air from a remote source, and self-contained breathing apparatus (SCBA), which include their own air supply.

OSHA estimates that compliance with its respiratory standard could avert hundreds of deaths and thousands of illnesses annually.

Standard Requirements:

OSHA requires employers to implement and maintain a respiratory protection program that will be overseen by a qualified program administrator. In addition to respirators, the program must also provide employees with training on how to use the respirators and medical evaluations.

Respirators used must be certified by the National Institute for Occupational Safety and Health (NIOSH). OSHA specifies the types of respirators approved for immediately dangerous to life or health (IDLH) atmospheres and for non-IDLH atmospheres.[1]

Employers must identify and evaluate the respiratory hazards in the workplace, including a reasonable estimate of employee exposures and identification of the contaminant's chemical state and physical form. Where exposure cannot be identified or reasonably estimated, the atmosphere shall be considered immediately dangerous to life or health (IDLH).

A medical evaluation must be conducted by a physician or other licensed health care professional (PLHCP) in order to determine an employee's ability to use a respirator. The employer must obtain a written recommendation regarding the employee's ability to use the respirator from the PLHCP. Additional medical evaluations are required under certain circumstances, such as if an employee reports medical signs or symptoms related to respirator use, or changes occur in workplace conditions that may substantially increase the physiological burden on an employee.

All employees using a tight-fitting facepiece respirator must pass a fit test prior to initial use and at least annually thereafter.

The employer must provide for the cleaning and disinfecting, storage, inspection and repair of respirators used by employees. The cleaning and disinfecting must be done before being worn by different individuals (if a respirator is issued to more than one employee) and after each use for emergency use respirators and those used in fit testing and training.

Did You Know?

Here are some of the frequently asked questions OSHA addresses on a document available on its website:[1]

Q: Why is a formal respirator program needed?
A: A respirator program increases the chances of using a respirator correctly. A respirator will only protect if it is used correctly.

Q: What can be done if an employee has a very small face and has trouble being fit tested for a respirator?
A: Manufacturers make several different sizes. Respirators may also vary in size from manufacturer to manufacturer. Users may be able to get a better fit by trying a respirator made by another manufacturer. In some cases, the use of powered air-purifying respirators may be appropriate. Employers must help employees find a suitable respirator.

Q: Can a respirator be used by more than one person? How often should it be cleaned and disinfected?
A: Disposable respirators cannot be disinfected, and are therefore assigned to only one person. Disposable respirators must be discarded if they are soiled, physically damaged or reach the end of their service life. Replaceable filter respirators may be shared, but must be thoroughly cleaned and disinfected after each use before being worn by a different person.

1 https://tinyurl.com/y9bn4zbc

Increase Your Knowledge:

→ To view the complete standard, go to www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.134 ***WMHS***

1 https://tinyurl.com/y4q7dphl

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Consult the checklist found at ***https://www.ilcdover.com/wp-content/uploads/2018/03/ILC-Dover-PAPRs-Spares-Maintenance-Checklist.pdf*** after each use to inspect your system for any signs of damage or wear that may affect performance of the respirator and reduce the degree of protection provided.

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NFPA 70E-2018-Standard for Electrical Safety in the Workplace®

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Important to Know:

Electricity has long been recognized as a serious workplace hazard, for both people who work directly with it – such as electricians and engineers – and others who may work with electricity indirectly. Potential sources of exposure are many: overhead lines, cable harnesses, circuit assemblies and more.

In a fraction of an instant, an electrical incident can kill, injure or disable a worker. Electrical injuries to workers can result from electrocution, shock, burns or from falls caused by the worker coming into contact with electrical energy. In 2018, 160 workers were killed and 1,560 injured in U.S. workplaces, according to the Electrical Safety Foundation International (ESFI).[1] More than half of the fatal electrical injuries that year occurred in the construction industry.

1 https://tinyurl.com/y5723f9f

NFPA 70E, which was originally developed at OSHA's request, is considered the definitive standard for electrical safety in the workplace. It includes information about arc flash incident energy, lockout-tagout procedures and personal protective equipment (PPE) that can mitigate the risk of an electrical injury.

Standard Requirements:

Whenever possible, turn off electrical power during the work being done and verify that it stays off until the task is completed. This can be done by: individual qualified employee control; simple lockout/tagout or complex lockout/tagout.

When it is necessary to work "live" near exposed energized parts, a live work permit that describes the work to be performed and why it must be performed should be signed by the customer, engineers or other person in charge.

For shock protection, three shock hazard boundaries should be determined: limited approach, restricted and prohibited. These boundaries help identify who should be allowed (i.e., only qualified persons can enter the restricted approach boundary) and when workers must use voltage-rated rubber gloves and fiberglass tools.

The flash protection boundary (FPB) must also be determined. Anyone working closer than 48in to live parts must wear PPE to protect against arc flash. This may include overalls, jackets and vests made of material that blocks heat energy and that has non-conducive hardware.

The Hazard/Risk Category (HRC) must be determined, based on tables provided by the standard. Determine Hazard/Risk Category (HRC). The HRC level helps electrical workers select the correct type of PPE to wear, based upon the task they are performing live.

Workers must wear appropriate PPE whenever they are performing tasks within the FPB, whether or not they are actually touching the live equipment.

Increase Your Knowledge:

- The complete standard is available online at: https://webstore.ansi.org

WMHS

Did You Know?

The National Fire Protection Association (NFPA) uses public input and public comment in the development of its standards, which are then considered at an NFPA Technical Meeting and are subject to appeals or issuance through Standards Council Action. All NFPA standards are revised and updated every three to five years, in revision cycles that begin twice each year.

The NFPA formed a new electrical standards development committee in order to develop an electrical safety standard in 1976, at the request of OSHA. NFPA 70E was first published in 1979. A noteworthy development occurred in 1995, when the arc flash hazard was mentioned in NFPA 70E. This was the first time arc flash was formally addressed in a safety standard. NFPA describes an arc flash hazard as a "source of possible injury or damage to health associated with the release of energy caused by an electric arc." Arc flash had been identified and named as an electrical hazard only 13 years prior to version of NFPA 70E.

The standard is important for electrical engineers, safety managers, electricians, electrical contractors, plant managers, facility maintenance personnel, electrical inspectors, risk managers, mechanical engineers, HVAC installers, designers and project managers.

NFPA 70E continues to evolve (an update will be released this year), to contain the latest information about the effects of arc flash, arc blast, and direct current (dc) hazards, and recent developments in electrical design and PPE. The standard now emphasizes using the hierarchy of risk controls to eliminate hazards.

Work practices including using boundaries, signs and barricades to designate a "safe work zone" can also help keep workers safe.


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NFPA 70E is a key tool in easing the burden on Safety Professionals when it comes to the selection of appropriate rainwear. By simply stating that to be compliant with the standard, rainwear must comply with ASTM F1891, decision-makers do not have to worry about different stated levels of performance, job function or a hazard risk assessment: They can just find a product they like from a reputable manufacturer that meets the ASTM F1891 standard.
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American National Standard for Industrial Head Protection: ANSI/ISEA Z89.1-2014

"Compliance with most ANSI standards is voluntary, however ANSI Z89.1 is one of the standards that OSHA actually cites in the PPE regulations, making it the law for workers exposed to hazards requiring head protection. That's why Petzl feels it is very important to design all our professional helmets to meet this standard. We want to help workers reduce their risk of head injuries and comply with workplace safety regulations." *-Jeremiah Wangsgard; Petzl America Technical Information Manager, www.petzl.com/US/en/Professional, 801-926-1500.*

Important to Know:

Although they may not occur as frequently as other work-related injuries, on-the-job head injuries merit special attention because of their potential severity and long-lasting effects. Years after a worker has suffered a traumatic brain injury (TBI), for instance, he or she may still be experiencing residual deficits in physical and mental impairment as well as difficulties with mood stabilization and frustration tolerance. A TBI can even cause epilepsy and increase the risk for conditions such as Alzheimer's disease, Parkinson's disease and other brain disorders.

The CDC defines a TBI as a disruption in the brain's normal function that is caused by a bump, blow or jolt to the head, or penetrating head injury. Not all blows or jolts to the head result in a TBI. The severity of a TBI may range from "mild" (i.e., a brief change in mental status or consciousness) to "severe" (i.e., an extended period of unconsciousness or memory loss after the injury).

A TBI can cause short- and long-term changes in:

- Thinking (i.e., memory and reasoning)
- Sensation (i.e., sight and balance)
- Language (i.e., communication, expression, and understanding)
- Emotion (i.e., depression, anxiety, personality changes, aggression, acting out and social inappropriateness)

Most TBIs that occur each year are classified as mild. Concussions fall into this category, yet they can cause complex effects and result in significant time lost from work. A concussion occurs when a jolt to the head or body causes the head and brain to move rapidly back and forth. This sudden movement makes the brain to bounce around or twist in the skull, creating chemical changes in the brain and sometimes stretching and damaging brain cells.

Did You Know?

This is the seventh revision of the American National Standard for Industrial Head Protection, ANSI/ISEA Z89.1-2014. The changes that were made represent an effort to accommodate characteristics of industrial head protection that end-users identified as being important as work environments change and emerging hazards are identified. This edition was prepared by the ISEA Head Protection Group as a revision to ANSI Z89.1-2009, and approved by a consensus review panel of users, government agencies and safety experts. The core performance requirements remain unchanged. However, this updated version incorporates optional preconditioning at higher temperatures than the standard test temperatures. Head protection devices that meet the applicable product performance criteria after having been exposed to these higher temperatures will bear a unique mark indicating such, to provide easy identification to the user.

Standard Requirements:

This standard establishes minimum performance and labeling requirements for protective helmets used in industrial and occupational settings that reduce the forces of impact and penetration and that may provide protection from electric shock (not arc flash).

It also includes requirements for high-visibility helmets and specifies test methods for evaluating all requirements.

Helmets conforming to the requirements of this standard are designated both by Type (based on location of impact force) and Class (based on electrical insulation), as well as any optional feature. Type I refers to top protection and Type II to lateral impact protection. Both types are tested for impact attenuation and penetration resistance. Type II helmet performance requirements include criteria for impact energy attenuation from impacts from the front, back and sides (as well as the top), off-center penetration resistance and chin strap retention. The three classes indicate the helmet's electrical insulation rating. Class G (general) helmets are tested at 2200 volts, Class E (electrical) are tested to withstand 20,000 volts and Class C (conductive) provide no electrical protection.

Limitations:

Helmets that meet this standard provide limited protection but should be effective against small tools, small pieces of wood, bolts, nuts, rivets, sparks and similar hazards. Protective helmets reduce the amount of force from an impact blow but cannot provide complete head protection from severe impact and penetration.

The use of protective helmets should never be viewed as a substitute for good safety practices and engineering controls.

Helmets are designed to provide protection above the test lines, which are clearly defined in the standard. Helmets may extend below the test lines for styling or practical purposes, but no protection is to be implied below the test lines.

Alterations, attachments or additions of accessories may affect the performance of the helmet.

What is not covered by the standard:

This standard does not cover bump caps, firefighting helmets or head protection devices used in recreational activities.

Increase Your Knowledge:

→ Copies of the standard can be purchased online at https://webstore.ansi.org/. ***WMHS***

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