

## 29 CFR 1910 – General Industry

**Note:** NC State-Specific Standards that are relevant to General Industry are included at the end.

### OSHA Standards With Special Requirements

These webpages are designed to assist employers in complying with standards that have "**special requirements**". For the purpose of this technical guidance, special requirements includes programs, plans, procedures, policies, inspections, certifications, competent persons, qualified persons, training, medical surveillance, exposure monitoring, signs, tags, markings, tests, records and recordkeeping requirements that are applicable in meeting the requirements of OSHA standards by industry. *If a standard or subpart are not listed, it did not have one of these types of special requirements.*

**Note:** While all attempts have been made to ensure the accuracy of the content and completeness in the information provided, it may not include all the specific standards that have special requirements that may be required by an OSHA standard. To ensure completeness in meeting each standard's requirement, the specific standard should be referenced.

To learn more about these special requirements, click on the tabs below.

### Special Requirements

This webpage is to be used in conjunction with the [Which OSHA Standards Apply](#) webpages for [General Industry Standards](#) (29 CFR Part 1910).

- Subpart D - [Walking-Working Surfaces](#)
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## **Subpart D - [Walking-Working Surfaces](#)**

[Subpart D](#) provides the requirements for ladders, step bolts, manhole steps, scaffolds, stairways, dockboards, rope descent systems, and other walking and working surfaces. It also includes requirements for fall protection, fall protection systems, and falling object protection.

[Walking-working surface](#) means any horizontal or vertical surface on or through which an employee walks, works, or gains access to a work area or workplace location.

To learn if subpart D applies to you, go to [Does "Subpart D - Walking-Working Surfaces" Apply to You?](#)

## **Special Requirements**

### **1910.22 - General Requirements**

**Scope:** This [standard](#) provides general requirements for walking and working surfaces including housekeeping, floor loading, and access and egress.

**Special Requirements:** Inspections, qualified person, maximum intended load, supervises, maintained, maintenance, repaired

[1910.22\(a\)\(3\)](#) - Walking-working surfaces are *maintained* free of hazards such as sharp or protruding objects, loose boards, corrosion, leaks, spills, snow, and ice.

[1910.22\(b\)](#) - *Loads*. The employer must ensure that each walking-working surface can support the *maximum intended load* for that surface.

[1910.22\(d\)](#) - *Inspection, maintenance, and repair*. The employer must ensure:

- [1910.22\(d\)\(1\)](#) - Walking-working surfaces are *inspected, regularly and as necessary*, and *maintained* in a safe condition.
- [1910.22\(d\)\(2\)](#) - Hazardous conditions on walking-working surfaces are *corrected or repaired* before an employee uses the walking-working surface again. If the *correction or repair* cannot be made immediately, the hazard must be *guarded* to prevent employees from using the walking-working surface until the hazard is corrected or *repaired*.
- [1910.22\(d\)\(3\)](#) - When any correction or repair involves the structural integrity of the walking-working surface, a *qualified person* performs or *supervises* the correction or repair.

*Qualified* describes a person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project.

## 1910.23 – Ladders

**Scope:** This [standard](#) provides general requirements for ladders including portable and fixed ladders, mobile ladder stands and platforms. This section covers all ladders, except when the ladder is: used in emergency operations such as firefighting, rescue, and tactical law enforcement operations, or training for these operations; or designed into or is an integral part of machines or equipment.

**Special Requirements:** Inspections, tagged, intended load, maintenance/repair, employer demonstrates, references other standards

[1910.23\(b\)\(9\)](#) - Ladders are *inspected before initial use* in each work shift, and *more frequently as necessary*, to identify any visible defects that could cause employee injury.

[1910.23\(b\)\(10\)](#) - Any ladder with structural or other defects is immediately *tagged "Dangerous: Do Not Use"* or with *similar language* in accordance with [1910.145](#) - *Specifications for accident prevention signs and tags*, and *removed from service until repaired* in accordance with [1910.22\(d\)](#) - *Inspection, maintenance and repair*, or replaced.

[1910.23\(c\)\(3\)](#) - Ladders are not loaded beyond the *maximum intended load*. Note to [paragraph \(c\)\(3\)](#): The *maximum intended load*, as defined in [1910.21\(b\)](#), includes the total load (weight and force) of the employee and all tools, equipment, and materials being carried.

[1910.23\(d\)\(1\)](#) - Fixed ladders are capable of supporting their *maximum intended load*. **Note:** [1910.28](#) - *Duty to have fall protection and falling object protection*, establishes the *employer's duty to provide fall protection* for employees on fixed ladders, and [1910.29](#) - *fall protection systems and falling object protection - criteria and practices*, specifies the criteria for fall protection systems for fixed ladders.

[1910.23\(e\)\(1\)\(iii\)](#) - Mobile ladder stands and platforms are capable of supporting at least four times their *maximum intended load*.

[1910.23\(e\)\(1\)\(iv\)](#) - Wheels or casters under load are capable of supporting their proportional share of four times the *maximum intended load*, plus their proportional share of the unit's weight.

[1910.23\(e\)\(3\)\(i\)](#) - Steps of mobile ladder stand platforms meet the requirements of [paragraph \(e\)\(2\)\(i\)](#) of this section. When the *employer demonstrates* that the requirement is not feasible, steeper slopes or vertical rung ladders may be used, provided the units are stabilized to prevent overturning.

## 1910.24 - Step Bolts and Manhole Steps

**Scope:** This [standard](#) provides requirements for step bolts and manhole steps.

[Manhole](#) steps means steps that are individually attached to, or set into, the wall of a manhole structure.

[Step bolt](#) (pole step) means a bolt or rung attached at intervals along a structural member used for foot placement and as a handhold when climbing or standing.

**Special Requirements:** Inspections, design, demonstrates, maintained, intended load, references other standards

[1910.24\(a\)\(2\)](#) - Each step bolt is *designed*, constructed, and *maintained* to prevent the employee's foot from slipping off the end of the step bolt.

[1910.24\(a\)\(5\)](#) - The minimum perpendicular distance between the centerline of each step bolt to the nearest permanent object in back of the step bolt is 7 inches (18 cm). When the *employer demonstrates* that an obstruction cannot be avoided, the distance must be at least 4.5 inches (11 cm);

[1910.24\(a\)\(6\)](#) - Each step bolt installed before January 17, 2017 is capable of supporting its *maximum intended load*.

[1910.24\(a\)\(8\)](#) - Each step bolt is *inspected at the start of the workshift* and maintained in accordance with [1910.22](#) - *General requirements*.

[1910.24\(b\)\(1\)](#) - The employer must ensure that each manhole step is capable of supporting its *maximum intended load*.

[1910.24\(b\)\(2\)\(vi\)](#) - Manhole steps. Is *designed*, constructed, and *maintained* to prevent the employee's foot from slipping or sliding off the end.

[1910.24\(b\)\(3\)](#) - The employer must ensure that each manhole step is *inspected at the start of the work shift* and *maintained* in accordance with [1910.22](#) - *General requirements*.

## **1910.25 – Stairways**

**Scope:** This [standard](#) covers all stairways (including standard, spiral, ship, and alternating tread-type stairs), except for articulated stairs (stairs that change pitch due to change in height at the point of attachment) such as those serving floating roof tanks, stairs on scaffolds, stairs designed into machines or equipment, and stairs on self-propelled motorized equipment.

**Special Requirements:** Manufacturer instructions, maintained, employer demonstrates, references other standards

[1910.25\(b\)\(1\)](#) - Handrails, stair rail systems, and guardrail systems are provided in accordance with [1910.28](#) - *duty to have fall protection and falling object protection*.

[1910.25\(b\)\(8\)](#) - Spiral, ship, or alternating tread-type stairs are used only when the *employer can demonstrate* that it is not feasible to provide standard stairs.

[1910.25\(b\)\(9\)](#) - When [paragraph \(b\)\(8\)](#) of this section allows the use of spiral, ship, or alternating tread-type stairs, they are installed, used, and *maintained* in accordance with *manufacturer's instructions*.

## **1910.26 – Dockboards**

**Scope:** This [standard](#) provides the requirements for dockboards.

[Dockboard](#) means a portable or fixed device that spans a gap or compensates for a difference in elevation between a loading platform and a transport vehicle. Dockboards include, but are not limited to, bridge plates, dock plates, and dock levelers.

**Special Requirements:** Employer demonstrates, measures, maximum intended load, designed, maintained, references other standards

1910.26(a) - Dockboards are capable of supporting the *maximum intended load* in accordance with 1910.22(b) - *general requirements, loads*.

1910.26(b)(1) - Dockboards put into initial service on or after January 17, 2017 are *designed*, constructed, and *maintained* to prevent transfer vehicles from running off the dockboard edge;

- 1910.26(b)(2) - *Exception to paragraph (b)(1) of this section*. When the *employer demonstrates* there is no hazard of transfer vehicles running off the dockboard edge, the employer may use dockboards that do not have run-off protection.

1910.26(c) - Portable dockboards are secured by anchoring them in place or using equipment or devices that prevent the dockboard from moving out of a safe position. When the *employer demonstrates* that securing the dockboard is not feasible, the employer must ensure there is sufficient contact between the dockboard and the surface to prevent the dockboard from moving out of a safe position.

1910.26(d) - *Measures*, such as wheel chocks or sand shoes, are used to prevent the transport vehicle (e.g., a truck, semi-trailer, trailer, or rail car) on which a dockboard is placed, from moving while employees are on the dockboard.

## **1910.27 - Scaffolds and Rope Descent Systems**

**Scope:** This standard provides requirements for scaffolds and rope descent systems.

Scaffold means any temporary elevated or suspended platform and its supporting structure, including anchorage points, used to support employees, equipment, materials, and other items. For purposes of this subpart, a scaffold does not include a crane-suspended or derrick-suspended personnel platform or a rope descent system.

Rope descent system means a suspension system that allows an employee to descend in a controlled manner and, as needed, stop at any point during the descent. A rope descent system usually consists of a roof anchorage, support rope, a descent device, carabiner(s) or shackle(s), and a chair (seatboard). A rope descent system also is called controlled descent equipment or apparatus. Rope descent systems do not include industrial rope access systems.

**Special Requirements:** Tested, certified, inform (written), information (written), inspections, demonstrates, instructions, warnings, qualified person, design, training, rated load, maintained, rescue, references other standards

[1910.27\(a\)](#) - Scaffolds. Scaffolds used in general industry must meet the requirements in 29 CFR part 1926 - construction, [subpart L](#) - Scaffolds.

[1910.27\(b\)\(1\)](#) - Rope descent system. Anchorages.

- [1910.27\(b\)\(1\)\(i\)](#) - Before any rope descent system is used, the building owner must *inform* the employer, in *writing* that the building owner has identified, *tested*, *certified*, and *maintained* each anchorage so it is capable of supporting at least 5,000 pounds (2,268 kg), in any direction, for each employee attached. The *information* must be based on an *annual inspection* by a *qualified person* and *certification* of each anchorage by a *qualified person*, as necessary, and at least every 10 years.
- [1910.27\(b\)\(1\)\(ii\)](#) - The employer must ensure that no employee uses any anchorage before the employer has *obtained written information* from the building owner that each anchorage meets the requirements of [paragraph \(b\)\(1\)\(i\)](#) of this section. The employer must keep the *information* for the *duration of the job*.

[1910.27\(b\)\(2\)](#) - Use of rope descent system.

- [1910.27\(b\)\(2\)\(i\)](#) - No rope descent system is used for heights greater than 300 feet (91 m) above grade unless the *employer demonstrates* that it is not feasible to access such heights by any other means or that those means pose a greater hazard than using a rope descent system.
- [1910.27\(b\)\(2\)\(ii\)](#) - The rope descent system is used in accordance with *instructions, warnings, and design* limitations set by the manufacturer or under the direction of a *qualified person*.
- [1910.27\(b\)\(2\)\(iii\)](#) - Each employee who uses the rope descent system is *trained* in accordance with [1910.30](#) - *training requirements*.
- [1910.27\(b\)\(2\)\(iv\)](#) - The rope descent system is *inspected at the start of each workshift* that it is to be used. The employer must ensure damaged or defective equipment is *removed from service* immediately and replaced.
- [1910.27\(b\)\(2\)\(vi\)](#) - Each employee uses a separate, independent personal fall arrest system that meets the requirements of [subpart I](#) - *personal protective equipment*, of this part (1910).
- [1910.27\(b\)\(2\)\(vii\)](#) - All components of each rope descent system, except seat boards, are capable of sustaining a minimum *rated load* of 5,000 pounds (22.2 kN). Seat boards must be capable of supporting a *live load* of 300 pounds (136 kg).
- [1910.27\(b\)\(2\)\(viii\)](#) - Prompt *rescue* of each employee is provided in the event of a fall.

[Anchorage](#) means a secure point of attachment for equipment such as lifelines, lanyards, deceleration devices, and rope descent systems.



Qualified describes a person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project.

## **1910.28 - Duty to Have Fall Protection and Falling Object Protection**

**Scope:** This standard provides the requirements for fall protection and falling object protection.

**Special Requirements:** Demonstrate, fall protection plan, personal fall protection systems, designated area, practices, inspections, authorized employees, markings, training, warning lines, signs, references other standards

1910.28(a)(1) - This section requires employers to *provide protection* for each employee exposed to fall and falling object hazards. Unless stated otherwise, the employer must ensure that all *fall protection and falling object protection* required by this section meet the criteria in 1910.29 - Fall protection systems and falling object protection - *criteria and practices*, except that *personal fall protection systems* required by this section meet the criteria of 1910.140 - Personal fall protection systems.

1910.28(a)(2) - This section **does not apply** to [Reference paragraph (a)(2)]:

- 1910.28(a)(2)(ii) - When employers are *inspecting, investigating, or assessing* workplace conditions or work to be performed prior to the *start of work or after all work* has been completed. This exemption does not apply when *fall protection systems* or equipment meeting the requirements of 1910.29 - Fall protection systems and falling object protection - *criteria and practices*, have been installed and are available for workers to use for *pre-work and post-work inspections, investigations, or assessments*.

1910.28(b)(1) - Protection from fall hazards - Unprotected sides and edges

- 1910.28(b)(1)(ii) - When the employer can *demonstrate* that it is not feasible or creates a greater hazard to use guardrail, safety net, or *personal fall protection systems* on residential roofs, the employer must *develop and implement a fall protection plan* that meets the requirements of 29 CFR 1926.502(k) and *training* that meets the requirements of 29 CFR 1926.503(a) and 29 CFR 1926.503(c).

**Note:** *There is a presumption that it is feasible and will not create a greater hazard to use at least one of the above-listed fall protection systems specified in paragraph (b)(1)(i) - Unprotected sides and edges, of this section. Accordingly, the employer has the burden of establishing that it is not feasible or creates a greater hazard to provide the fall protection systems specified in paragraph (b)(1)(i) and that it is necessary to implement a fall*



protection plan that complies with [1926.502\(k\)](#) in the particular work operation, in lieu of implementing any of those systems.

- [1910.28\(b\)\(1\)\(iii\)](#) - When the employer can *demonstrate* that the use of *fall protection systems* is not feasible on the working side of a platform used at a loading rack, loading dock, or teeming platform, the work may be done without a *fall protection system*, provided:
  - [1910.28\(b\)\(1\)\(iii\)\(B\)](#) - Access to the platform is limited to *authorized employees*; and
  - [1910.28\(b\)\(1\)\(iii\)\(C\)](#) - The *authorized employees* are *trained* in accordance with [1910.30](#) - *Training requirements*.

[1910.28\(b\)\(2\)\(iii\)](#) - If grab handles are installed at hoist areas, they meet the requirements of [1910.29\(l\)](#) - *grab handles*.

[1910.28\(b\)\(3\)\(iii\)](#) - Each employee is protected from falling into a stairway floor hole by a fixed guardrail system on all exposed sides, except at the stairway entrance. However, for any stairway used less than once per day where traffic across the stairway floor hole prevents the use of a fixed guardrail system (e.g., holes located in aisle spaces), the employer may protect employees from falling into the hole by using a hinged floor hole cover that meets the criteria in [1910.29](#) - *fall protection systems and falling object protection - criteria and practices* and a removable guardrail system on all exposed sides, except at the entrance to the stairway.

[1910.28\(b\)\(3\)\(v\)](#) - Each employee is protected from falling through a hatchway and chute-floor hole by:

- [1910.28\(b\)\(3\)\(v\)\(A\)](#) - A hinged floor-hole cover that meets the criteria in [1910.29](#) - *fall protection systems and falling object protection - criteria and practices*, and a fixed guardrail system that leaves only one exposed side. When the hole is not in use, the employer must ensure the cover is closed or a removable guardrail system is provided on the exposed sides;

[1910.28\(b\)\(4\)](#) - Protection from fall hazards - [Dockboards](#).

- [1910.28\(b\)\(4\)\(ii\)\(C\)](#) - Those employees have been *trained* in accordance with [1910.30](#) - *Training requirements*.

[1910.28\(b\)\(5\)](#) - Runways and similar walkways.

- [1910.28\(b\)\(5\)\(ii\)](#) - When the employer can *demonstrate* that it is not feasible to have guardrails on both sides of a runway used exclusively for a special purpose, the employer may omit the guardrail on one side of the runway, provided the employer ensures:

1910.28(b)(8) - Repair pits, service pits, and assembly pits less than 10 feet in depth.

- 1910.28(b)(8)(i) - Limits access within 6 feet (1.8 m) of the edge of the pit to *authorized employees trained* in accordance with 1910.30 - *training requirements*.
- 1910.28(b)(8)(ii) - Applies *floor markings at least 6 feet (1.8 m)* from the edge of the pit in colors that contrast with the surrounding area; or places a *warning line at least 6 feet (1.8 m)* from the edge of the pit as well as stanchions that are capable of resisting, without tipping over, a force of at least 16 pounds (71 N) applied horizontally against the stanchion at a height of 30 inches (76 cm); or places a combination of *floor markings and warning lines at least 6 feet (1.8 m)* from the edge of the pit. When two or more pits in a common area are not more than 15 feet (4.5m) apart, the employer may comply by placing contrasting *floor markings at least 6 feet (1.8 m)* from the pit edge around the entire area of the pits; and
- 1910.28(b)(8)(iii) - Posts readily visible *caution signs* that meet the requirements of 1910.145 - *Specifications for accident prevention signs and tags, and state "Caution - Open Pit."*

1910.28(b)(10) - Outdoor advertising (billboards).

- 1910.28(b)(10)(ii)(A) - Receives *training and demonstrates* the physical capability to perform the necessary climbs in accordance with 1910.29(h) - *outdoor advertising*.

1910.28(b)(12) - *Scaffolds and rope descent systems*. The employer must ensure:

- 1910.28(b)(12)(i) - Each employee on a scaffold is protected from falling in accordance 29 CFR part 1926, subpart L - *scaffolds*.

1910.28(b)(13)(ii) - When work is performed at least 6 feet (1.6 m) but less than 15 feet (4.6 m) from the roof edge, the employer must ensure each employee is protected from falling by using a guardrail system, safety net system, travel restraint system, or *personal fall arrest system*. The employer may use a *designated area* when performing work that is both infrequent and temporary.

1910.28(b)(13)(iii) - When work is performed 15 feet (4.6 m) or more from the roof edge, the employer must:

- 1910.28(b)(13)(iii)(A) - Protect each employee from falling by a guardrail system, safety net system, travel restraint system, or *personal fall arrest system* or a *designated area*. The employer is not required to provide any fall protection, provided the work is both infrequent and temporary.

1910.28(b)(14) - Slaughtering facility platforms

- [1910.28\(b\)\(14\)\(ii\)](#) - When the employer can *demonstrate* the use of a guardrail or *travel restraint system* is not feasible, the work may be done without those systems provided:
  - [1910.28\(b\)\(14\)\(ii\)\(B\)](#) - Access to the platform is limited to *authorized employees*; and
  - [1910.28\(b\)\(14\)\(ii\)\(C\)](#) - The *authorized employees* are *trained* in accordance with [1910.30](#) - *training requirements*.

[1910.28\(b\)\(15\)](#) - Walking-working surfaces not otherwise addressed. Except as provided elsewhere in this *section* or *by other subparts* of this part, the employer must ensure each employee on a walking-working surface 4 feet (1.2 m) or more above a lower level is protected from falling by: [Reference [paragraph \(b\)\(15\)\(i\) - \(iii\)](#)].

*Authorized* means an employee who the employer assigns to perform a specific type of duty, or allows in a specific location or area.

*Unprotected sides and edges* mean any side or edge of a walking-working surface (except at entrances and other points of access) where there is no wall, guardrail system, or stair rail system to protect an employee from falling to a lower level.

*Personal fall arrest system* means a system used to arrest an employee in a fall from a walking-working surface. It consists of a body harness, anchorage, and connector. The means of connection may include a lanyard, deceleration device, lifeline, or a suitable combination of these.

*Personal fall protection system* means a system (including all components) an employer uses to provide protection from falling or to safely arrest an employee's fall if one occurs. Examples of personal fall protection systems include personal fall arrest systems, positioning systems, and travel restraint systems.

## **1910.29 - Fall Protection Systems and Falling Object Protection - Criteria and Practices**

**Scope:** This [standard](#) provides the requirements for fall protection systems and falling object protection.

**Special Requirements:** Fall protection system, inspections, programs, training, designated areas, maximum intended loads, demonstrates, references other standards

[1910.29\(a\)\(1\)](#) - Ensure each *fall protection system* and falling object protection, other than personal fall protection systems, that this part requires meets the requirements in this section. The employer must ensure each *personal fall protection system* meets the requirements in [Subpart I - Personal Protective Equipment](#) of this part (29 CFR 1910).

1910.29(b) - Guardrail systems.

- 1910.29(b)(10) - When guardrail systems are used at hoist areas, a removable guardrail section, consisting of a top rail and midrail, are placed across the access opening between guardrail sections when employees are not performing hoisting operations. The employer may use chains or gates instead of a removable guardrail section at hoist areas if the *employer demonstrates* the chains or gates provide a level of safety equivalent to guardrails.
- 1910.29(b)(15) - Manila or synthetic rope used for *top rails or midrails are inspected as necessary* to ensure that the rope continues to meet the strength requirements in paragraph (b)(3) and paragraph (b)(5) of this section.

1910.29(c) - Safety net systems. The employer must ensure each safety net system meets the requirements in 29 CFR part 1926, subpart M - fall protection.

1910.29(d)(1) - When the employer uses a *designated area*, the employer must ensure: [Reference paragraphs (d)(1)(i)-(ii) and (d)(3)].

1910.29(e) - Covers. The employer must ensure each cover for a hole in a walking-working surface:

- 1910.29(e)(1) - Is capable of supporting without failure, at least twice the *maximum intended load* that may be imposed on the cover at any one time

1910.29(h) - Outdoor advertising. This paragraph (h) applies only to employers engaged in outdoor advertising operations [see 1910.28(b)(10) - Outdoor advertising (billboards)]. Employers must ensure that each employee who climbs a fixed ladder without fall protection:

- 1910.29(h)(2) - Has successfully completed a *training or apprenticeship program* that includes hands-on training on the safe climbing of ladders and is *retrained* as necessary to maintain the necessary skills;
- 1910.29(h)(3) - Has the skill to climb ladders safely, as demonstrated through formal *classroom training or on-the-job training*, and *performance observation*.

1910.29(j) - *Personal fall protection systems*. Body belts, harnesses, and other components used in personal fall arrest systems, work positioning systems, and travel restraint systems must *meet the requirements of 1910.140 - personal fall protection systems*.

1910.29(k)(1)(v) - protection from falling objects - Have a minimum height of 2.5 inches (6 cm) when used around vehicle repair, service, or assembly pits. Toeboards may be omitted around vehicle repair, service, or assembly pits when the employer can *demonstrate* that a toeboard would prevent access to a vehicle that is over the pit.

1910.29(l)(3) - Grab handles - Is capable of withstanding a maximum horizontal pull-out force equal to two times the *maximum intended load* or 200 pounds (890 N), whichever is greater.

Guardrail system means a barrier erected along an unprotected or exposed side, edge, or other area of a walking-working surface to prevent employees from falling to a lower level.

Personal fall arrest system means a system used to arrest an employee in a fall from a walking-working surface. It consists of a body harness, anchorage, and connector. The means of connection may include a lanyard, deceleration device, lifeline, or a suitable combination of these.

Personal fall protection system means a system (including all components) an employer uses to provide protection from falling or to safely arrest an employee's fall if one occurs. Examples of personal fall protection systems include personal fall arrest systems, positioning systems, and travel restraint systems.

## 1910.30 - Training Requirements

**Scope:** This standard provides the training requirements for subpart D - walking - working surfaces.

**Special Requirements:** Training, fall protection systems, qualified person, inspections, techniques, procedures, information, references other standards

1910.30(a) - Fall hazards.

- 1910.30(a)(1) - *Before any employee is exposed to a fall hazard*, the employer must provide *training* for each employee who uses *personal fall protection systems* or who is required to be *trained* as specified elsewhere in this subpart. Employers must ensure employees are *trained* in the requirements of this paragraph on or before May 17, 2017.
- 1910.30(a)(2) - The employer must ensure that each employee is *trained* by a *qualified person*.
- 1910.30(a)(3) - The employer must *train* each employee in at least the following topics:
  - 1910.30(a)(3)(ii) - The *procedures* to be followed to minimize those hazards.
  - 1910.30(a)(3)(iii) - The correct *procedures* for installing, *inspecting*, operating, maintaining, and disassembling the *personal fall protection systems* that the employee uses.
  - 1910.30(a)(3)(iv) - The correct use of *personal fall protection systems* and equipment specified in paragraph (a)(1) of this section, including, but not limited to, proper hook-up, anchoring, and *tie-off techniques*, and

*methods of equipment inspection and storage, as specified by the manufacturer.*

1910.30(b) - Equipment hazards.

- 1910.30(b)(1) - The employer must *train* each employee on or before May 17, 2017 in the proper care, *inspection*, storage, and use of equipment covered by this subpart (subpart D) before an employee uses the equipment.
- 1910.30(b)(2) - The employer must *train* each employee who uses a dockboard to properly place and secure it to prevent unintentional movement.
- 1910.30(b)(3) - The employer must *train* each employee who uses a rope descent system in proper rigging and use of the equipment in accordance with 1910.27 - Scaffolds and rope descent systems.
- 1910.30(b)(4) - The employer must *train* each employee who uses a designated area in the proper set-up and use of the area.
- 1910.30(c) - *Retraining*. The employer must *retrain* an employee when the employer has reason to believe the employee does not have the understanding and skill required by paragraph (a) and paragraph (b) of this section. Situations requiring retraining include, but are not limited to, the following: [Reference paragraph (c)(1) - (3)].
- 1910.30(d) - *Training* must be understandable. The employer must provide *information and training* to each employee in a manner that the employee understands.

Fall hazard means any condition on a walking-working surface that exposes an employee to a risk of harm from a fall on the same level or to a lower level.

## **Subpart E - Exit Routes and Emergency Planning**

Subpart E provides the requirements for exit routes and emergency planning provides the requirements for exit routes, emergency action plans and fire prevention plans.

Exit means that portion of an exit route that is generally separated from other areas to provide a protected way of travel to the exit discharge. An example of an exit is a two-hour fire resistance-rated enclosed stairway that leads from the fifth floor of an office building to the outside of the building.

Exit route means a continuous and unobstructed path of exit travel from any point within a workplace to a place of safety (including refuge areas). An exit route consists of three parts: The exit access; the exit; and, the exit discharge. (An exit route includes all vertical and horizontal areas along the route.)



To learn if subpart E applies to you, go to [Does "Subpart E - Exit Routes and Emergency Planning" Apply to You?](#)

## Special Requirements

### 1910.35 - Compliance with Alternate Exit-route Codes

**Scope:** This [standard](#) provides for the compliance with other exit-route codes.

**Special Requirements:** Demonstrates, references other standards

OSHA will deem an employer *demonstrating compliance* with the exit-route provisions of *NFPA 101, Life Safety Code, 2009 edition*, or the exit-route provisions of the International Fire Code, 2009 edition, to be in compliance with the corresponding requirements in [1910.34](#) - coverage and definitions, [1910.36](#) - design and construction requirements for exit routes, and [1910.37](#) - Maintenance, safeguards, and operational features for exit routes (incorporated by reference, see section [1910.6](#)).

### 1910.36 - Design and Construction Requirements for Exit Routes

**Scope:** This [standard](#) provides the requirements for exit design and construction.

**Special Requirements:** Emergency plan, occupant load, supervisory personnel, fire resistance rating, references other standards

[1910.36\(a\)\(2\)](#) - An exit must be separated by fire resistant materials. Construction materials used to separate an exit from other parts of the workplace must have a *one-hour fire resistance-rating* if the exit connects three or fewer stories and a two-hour fire resistance-rating if the exit connects four or more stories.

[1910.36\(a\)\(3\)](#) - Openings into an exit must be limited. An exit is permitted to have only those openings necessary to allow access to the exit from occupied areas of the workplace, or to the exit discharge. An opening into an exit must be protected by a self-closing fire door that remains closed or automatically closes in an emergency upon the sounding of a fire alarm or employee alarm system. Each fire door, including its frame and hardware, must be listed or approved by a nationally recognized testing laboratory. Section [1910.155\(c\)\(3\)\(iv\)\(A\)](#) - fire protection, of this part defines “listed” and [1910.7](#) of this part defines a “nationally recognized testing laboratory.”

[1910.36\(d\)\(3\)](#) - An exit route door may be locked from the inside only in mental, penal, or correctional facilities and then only if *supervisory personnel* are continuously *on duty* and the employer has a *plan* to remove occupants from the facility *during an emergency*.



[1910.36\(f\)\(1\)](#) - Exit routes must support the *maximum permitted occupant load* for each floor served. Note to [paragraph \(f\)](#) of this section: Information regarding the “Occupant load” is located in *NFPA 101-2009, Life Safety Code*, and in IFC-2009, International Fire Code (incorporated by reference, see [1910.6](#)).

[1910.36\(g\)\(3\)](#) - The width of an exit route must be sufficient to accommodate the *maximum permitted occupant load* of each floor served by the exit route.

[Exit route](#) means a continuous and unobstructed path of exit travel from any point within a workplace to a place of safety (including refuge areas). An exit route consists of three parts: The exit access; the exit; and, the exit discharge. (An exit route includes all vertical and horizontal areas along the route.)

[Exit access](#) means that portion of an exit route that leads to an exit. An example of an exit access is a corridor on the fifth floor of an office building that leads to a two-hour fire resistance-rated enclosed stairway (the Exit).

[Exit discharge](#) means the part of the exit route that leads directly outside or to a street, walkway, refuge area, public way, or open space with access to the outside. An example of an exit discharge is a door at the bottom of a two-hour fire resistance-rated enclosed stairway that discharges to a place of safety outside the building.

## **1910.37 - Maintenance, Safeguards, and Operational Features for Exit Routes**

**cope:** This [standard](#) provides the requirements for maintenance and operational features for exit routes.

**Special Requirements:** Markings, exit signs, employee alarm system, distinctive signals, references other standards

[1910.37\(b\)](#) - Lighting and *marking must be adequate* and appropriate.

- [1910.37\(b\)\(2\)](#) - Each exit must be clearly visible and *marked by a sign reading "Exit."*
- [1910.37\(b\)\(3\)](#) - Each exit route door must be free of decorations or *signs* that obscure the visibility of the exit route door.
- [1910.37\(b\)\(4\)](#) - If the direction of travel to the exit or exit discharge is not immediately apparent, *signs must be posted* along the exit access indicating the direction of travel to the nearest exit and exit discharge. Additionally, the line-of-sight to an *exit sign must clearly be visible* at all times.
- [1910.37\(b\)\(5\)](#) - Each doorway or passage along an exit access that could be mistaken for an exit must be *marked "Not an Exit"* or similar designation, or be *identified by a sign* indicating its actual use (e.g., closet).

- [1910.37\(b\)\(6\)](#) - Each *exit sign* must be illuminated to a surface value of at least five foot-candles (54 lux) by a reliable light source and be distinctive in color. Self-luminous or electroluminescent signs that have a minimum luminance surface value of at least .06 footlamberts (0.21 cd/m<sup>2</sup>) are permitted.
- [1910.37\(b\)\(7\)](#) - Each *exit sign* must have the word "*Exit*" in plainly legible letters not less than six inches (15.2 cm) high, with the principal strokes of the *letters in the word "Exit"* not less than three-fourths of an inch (1.9 cm) wide.

[1910.37\(e\)](#) - An *employee alarm system* must be operable. Employers must install and maintain an operable *employee alarm system* that has a *distinctive signal* to warn employees of fire or other emergencies, unless employees can promptly see or smell a fire or other hazard in time to provide *adequate warning* to them. The *employee alarm system* must comply with [1910.165](#) - *Employee alarm systems*.

## 1910.38 - Emergency Action Plans

**Scope:** This [standard](#) provides the requirements for an emergency action plan. An employer must have an emergency action plan whenever an OSHA standard in this part (1910) requires one. The requirements in this section apply to each such emergency action plan.

**Special Requirements:** Emergency action plan (written), procedures, training, employee alarm system, plan review, responsibilities, designated employees, distinctive signal, references other standards

[1910.38\(b\)](#) - *Written and oral emergency action plans*. An *emergency action plan* must be in *writing*, *kept in the workplace*, and available to employees *for review*. However, an employer with *10 or fewer employees* may *communicate the plan orally* to employees.

[1910.38\(c\)](#) - Minimum elements of an *emergency action plan*. An *emergency action plan* must include at a minimum:

- [1910.38\(c\)\(1\)](#) - *Procedures for reporting a fire or other emergency*;
- [1910.38\(c\)\(2\)](#) - *Procedures for emergency evacuation*, including type of evacuation and *exit route assignments*;
- [1910.38\(c\)\(3\)](#) - *Procedures to be followed by employees who remain to operate critical plant operations before they evacuate*;
- [1910.38\(c\)\(4\)](#) - *Procedures to account for all employees after evacuation*;
- [1910.38\(c\)\(5\)](#) - *Procedures to be followed by employees performing rescue or medical duties*; and
- [1910.38\(c\)\(6\)](#) - The *name or job title* of every employee who may be contacted by employees who need more *information* about the *plan* or an *explanation of their duties under the plan*.

[1910.38\(d\)](#) - *Employee alarm system.* An employer must have and maintain an *employee alarm system*. The *employee alarm system* must use a *distinctive signal* for each purpose and comply with the requirements in [1910.165](#) – *employee alarm systems*.

[1910.38\(e\)](#) - *Training.* An employer must *designate and train employees* to assist in a *safe and orderly evacuation* of other employees.

[1910.38\(f\)](#) - *Review of emergency action plan.* An employer must *review the emergency action plan* with each employee covered by the *plan*:

- [1910.38\(f\)\(1\)](#) - When the *plan* is *developed* or the employee is assigned *initially* to a *job*;
- [1910.38\(f\)\(2\)](#) - When the *employee's responsibilities* under the *plan* change; and
- [1910.38\(f\)\(3\)](#) - When the *plan* is changed.

## **1910.39 - Fire Prevention Plans**

**Scope:** This [standard](#) provides the requirements for a fire prevention plan. An employer must have a fire prevention plan when an OSHA standard in this part requires one. The requirements in this section apply to each such fire prevention plan.

**Special Requirements:** Fire prevention plans (written), communication, procedures, review, information, inform, responsibilities, list of hazards

[1910.39\(b\)](#) - *Written and oral fire prevention plans.* A *fire prevention plan* must be in *writing*, be *kept in the workplace*, and be made *available to employees for review*. However, an employer with *10 or fewer employees* may *communicate the plan orally* to employees.

[1910.39\(c\)](#) - *Minimum elements of a fire prevention plan.* A *fire prevention plan* must include:

- [1910.39\(c\)\(1\)](#) - A *list of all major fire hazards*, proper *handling and storage procedures* for hazardous materials, potential ignition sources and their control, and the type of fire protection equipment necessary to control each major hazard;
- [1910.39\(c\)\(2\)](#) - *Procedures to control accumulations* of flammable and combustible waste materials;
- [1910.39\(c\)\(3\)](#) - *Procedures for regular maintenance* of safeguards installed on heat-producing equipment to prevent the accidental ignition of combustible materials;
- [1910.39\(c\)\(4\)](#) - The *name or job title* of employees responsible for *maintaining equipment* to prevent or control sources of ignition or fires; and
- [1910.39\(c\)\(5\)](#) - The *name or job title* of employees responsible for the *control of fuel source hazards*.

[1910.39\(d\)](#) - *Employee information*. An employer must *inform employees upon initial assignment* to a job of the fire hazards to which they are exposed. An employer must also *review* with each employee those parts of the *fire prevention plan* necessary for self-protection.

## **Subpart F - [Powered Platforms, Manlifts and Vehicle Mounted Work Platforms](#)**

[Subpart F](#) provides the standards for powered platforms, manlifts and vehicle-mounted work platforms provides the requirements for powered platforms permanently dedicated for building maintenance of a structure, vehicle-mounted elevating and rotating work platforms and manlifts used for the transportation of personnel from floor to floor.

To learn if subpart F applies to you, go to [Does "Subpart F - Powered Platforms, Manlifts and Vehicle Mounted Work Platforms" Apply to You?](#)

### **Special Requirements**

#### **1910.66 - Powered Platforms for Building Maintenance**

**Scope:** This [standard](#) covers powered platform installations permanently dedicated to interior or exterior building maintenance of a specific structure or group of structures.

**Exceptions:** This standard does not apply to suspended scaffolds (swinging scaffolds) used to service buildings on a temporary basis and covered under [subpart D](#) – walking – working surfaces, nor to suspended scaffolds used for construction work and covered under [subpart L](#) – scaffolds of 29 CFR Part 1926 – Construction standards.

**Special Requirements:** Inform, installation requirements (written), design criteria, registered professional engineer, test data, field test, verification, assurance, inform (written), inspections, tests, certification record, emergency action plan, training, procedures, alarm systems, competent person, certify, work procedures (written), preventive measures, maintenance, information, operating manuals, personal fall arrest systems, references other standards

[1910.66\(c\)\(1\)](#) - Building owners of new installations shall *inform the employer before each use in writing* that the installation meets the requirements of [paragraph \(e\)\(1\)](#) and [paragraph \(f\)\(1\)](#) of this section and the additional *design criteria* contained in other provisions of [paragraph \(e\)](#) and [paragraph \(f\)](#) of this section relating to: required load sustaining capabilities of platforms, building components, hoisting and supporting equipment; stability factors for carriages, platforms and supporting equipment; maximum horizontal force for movement of carriages and davits; design of carriages, hoisting machines, wire rope and stabilization systems; and *design criteria* for electrical wiring and equipment.

[1910.66\(c\)\(2\)](#) - Building owners shall base the *information* required in [paragraph \(c\)\(1\)](#) of this section on the *results* of a *field test* of the installation *before being placed into service and following any major alteration* to an existing installation, as required in [paragraph \(g\)\(1\)](#) of this section. The assurance shall also be based on all other relevant available *information*, including, but not limited to, *test data, equipment specifications* and *verification by a registered professional engineer*.

[1910.66\(c\)\(3\)](#) - Building owners of all installations, new and existing, shall *inform the employer in writing* that the installation has been *inspected, tested*, and maintained in compliance with the requirements of [paragraph \(g\)](#) and [paragraph \(h\)](#) of this section and that all anchorages meet the requirements of [1910.140\(c\)\(13\)](#).

[1910.66\(c\)\(4\)](#) - The employer shall not permit employees to use the installation *prior to receiving assurance* from the building owner that the installation meets the requirements contained in [paragraph \(c\)\(1\)](#) and [paragraph \(c\)\(3\)](#) of this section.

[1910.66\(e\)\(1\)\(i\)](#) - Structural supports, tie-downs, tie-in guides, anchoring devices and any affected parts of the building included in the installation shall be *designed* by or under the direction of a *registered professional engineer* experienced in such *design*.

[1910.66\(e\)\(2\)\(iv\)](#) -Tie-in guides for building interiors (atriums) may be eliminated when a *registered professional engineer* determines that an alternative stabilization system, including systems in [paragraph \(e\)\(2\)\(iii\)\(A\)](#), [paragraph \(e\)\(2\)\(iii\)\(B\)](#) and [paragraph \(e\)\(2\)\(iii\)\(C\)](#), or a platform tie-off at each work station will provide equivalent safety.

[1910.66\(e\)\(9\)](#) - Emergency planning. A *written emergency action plan* shall be *developed* and implemented for each kind of working platform operation. This *plan* shall *explain the emergency procedures* which are to be followed in the event of a power failure, equipment failure or other emergencies which may be encountered. The *plan* shall also explain that employees *inform* themselves about the building emergency escape routes, *procedures* and *alarm systems* before operating a platform. Upon *initial assignment and whenever the plan is changed* the employer shall *review* with each employee those parts of the *plan* which the employee must know to protect himself or herself in the event of an emergency.

[1910.66\(f\)\(1\)\(i\)](#) - Equipment installations shall be *designed* by or under the direction of a *registered professional engineer* experienced in such *design*.

[1910.66\(f\)\(5\)\(ii\)\(I\)](#) - Portable fire extinguishers conforming to the provisions of [1910.155](#) - *scope, application and definitions applicable to this part*, and [1910.157](#) - *portable fire extinguishers, of this part* shall be provided and securely attached on all working platforms.

[1910.66\(f\)\(5\)\(ii\)\(L\)](#) - The platform shall be provided with a secondary wire rope suspension system if the platform contains overhead structures which restrict the emergency egress of

employees. A *horizontal lifeline* or a direct connection anchorage shall be provided as part of a *personal fall arrest system* that meets the requirements of [subpart I - personal protective equipment](#), of this part (1910) for each employee on such a platform.

[1910.66\(f\)\(5\)\(ii\)\(M\)](#) - A *vertical lifeline* shall be provided as part of a *personal fall arrest system* that meets the requirements of [subpart I - personal protective equipment](#), of this part for each employee on a working platform suspended by two or more wire ropes, if the failure of one wire rope or suspension attachment will cause the platform to upset. If a secondary wire rope suspension is used, vertical lifelines are not required for the *personal fall arrest system*, provided that each employee is attached to a *horizontal lifeline* anchored to the platform.

[1910.66\(g\)\(1\)](#) - Installations and alterations. All completed building maintenance equipment installations shall be *inspected and tested* in the field before being placed in initial service to determine that all parts of the installation conform to applicable requirements of this standard, and that all safety and operating equipment is functioning as required. A similar *inspection and test* shall be made following any major alteration to an existing installation. No hoist in an installation shall be subjected to a load in excess of 125 percent of its rated load.

[1910.66\(g\)\(2\)\(i\)](#) - *Periodic inspections and tests*. Related building supporting structures shall undergo *periodic inspection* by a *competent person* at intervals not exceeding 12 months.

[1910.66\(g\)\(2\)\(ii\)](#) - *Periodic inspections and tests*. All parts of the equipment including control systems shall be *inspected*, and, where necessary, *tested by a competent person* at intervals specified by the manufacturer/supplier, but *not to exceed 12 months*, to determine that they are in safe operating condition. Parts subject to wear, such as wire ropes, bearings, gears, and governors shall be *inspected and/or tested* to determine that they have not worn to such an extent as to affect the safe operation of the installation.

[1910.66\(g\)\(2\)\(iii\)](#) - *Periodic inspections and tests*. The building owner shall keep a *certification record* of each *inspection and test* required under [paragraph \(g\)\(2\)\(i\)](#) and [paragraph \(g\)\(2\)\(ii\)](#) of this section. The *certification record* shall include the date of the *inspection*, the *signature* of the person who performed the *inspection*, and the number, or other identifier, of the building support structure and equipment which was *inspected*. This *certification record* shall be kept readily *available* for review by the Assistant Secretary of Labor or the Assistant Secretary's representative and by the employer.

[1910.66\(g\)\(2\)\(iv\)](#) - *Periodic inspections and tests*. Working platforms and their components shall be *inspected* by the employer for visible defects before every use and after each occurrence which could affect the platform's structural integrity.



1910.66(g)(3)(i) - *Maintenance inspections and tests.* A maintenance inspection and, where necessary, a test shall be made of each platform installation every 30 days, or where the work cycle is less than 30 days such inspection and/or test shall be made prior to each work cycle. This inspection and test shall follow procedures recommended by the manufacturer, and shall be made by a competent person.

1910.66(g)(3)(ii) - *Maintenance inspections and tests.* The building owner shall keep a certification record of each inspection and test performed under paragraph (g)(3)(i) of this section. The certification record shall include the date of the inspection and test, the signature of the person who performed the inspection and/or test, and an identifier for the platform installation which was inspected. The certification record shall be kept readily available for review by the Assistant Secretary of Labor or the Assistant Secretary's representative and by the employer.

1910.66(g)(4)(i) - *Special inspection of governors and secondary brakes.* Governors and secondary brakes shall be inspected and tested at intervals specified by the manufacturer/supplier but not to exceed every 12 months.

1910.66(g)(4)(ii) - *Special inspection of governors and secondary brakes.* The results of the inspection and test shall confirm that the initiating device for the secondary braking system operates at the proper overspeed.

1910.66(g)(4)(iii) - *Special inspection of governors and secondary brakes.* The results of the inspection and test shall confirm that the secondary brake is functioning properly.

1910.66(g)(4)(iv) - *Special inspection of governors and secondary brakes.* If any hoisting machine or initiating device for the secondary brake system is removed from the equipment for testing, all reinstalled and directly related components shall be reinspected prior to returning the equipment installation to service.

1910.66(g)(4)(v) - *Special inspection of governors and secondary brakes.* Inspection of governors and secondary brakes shall be performed by a competent person.

1910.66(g)(4)(vi) - *Special inspection of governors and secondary brakes.* The secondary brake governor and actuation device shall be tested before each day's use. Where testing is not feasible, a visual inspection of the brake shall be made instead to ensure that it is free to operate.

1910.66(g)(5)(i) - *Suspension wire rope maintenance, inspection and replacement.* Suspension wire rope shall be maintained and used in accordance with procedures recommended by the wire rope manufacturer.

1910.66(g)(5)(ii) - *Suspension wire rope maintenance, inspection and replacement.* Suspension wire rope shall be inspected by a competent person for visible defects and



gross damage to the rope before every use and after each occurrence which might affect the wire rope's integrity.

1910.66(g)(5)(iii) - *Suspension wire rope maintenance, inspection and replacement.* A thorough *inspection* of suspension wire ropes in service shall be made *once a month*. Suspension wire ropes that have been inactive for 30 days or longer shall have a thorough *inspection before they are placed into service*. These thorough *inspections* of suspension wire ropes shall be performed by a *competent person*.

1910.66(g)(5)(iv) - *Suspension wire rope maintenance, inspection and replacement.* The need for replacement of a suspension wire rope shall be determined by *inspection* and shall be based on the condition of the wire rope. Any of the following conditions or combination of conditions will be cause for removal of the wire rope.

- 1910.66(g)(5)(iv)(J) - Any other condition which the *competent person* determines has significantly affected the integrity of the rope.

1910.66(g)(5)(v) - *Suspension wire rope maintenance, inspection and replacement.* The building owner shall keep a *certification record* of each monthly *inspection* of a suspension wire rope as required in paragraph (g)(5)(iii) of this section. The *record* shall include the date of the *inspection*, the *signature* of the person who performed the *inspection*, and a number, or other identifier, of the wire rope which was *inspected*. This *record of inspection* shall be made *available* for review by the Assistant Secretary of Labor or the Assistant Secretary's representative and by the employer.

1910.66(g)(6) - *Hoist inspection.* Before lowering personnel below the top elevation of the building, the hoist shall be *tested* each day in the lifting direction with the intended load to make certain it has sufficient capacity to raise the personnel back to the boarding level.

1910.66(h)(1) - *General maintenance.* All parts of the equipment affecting safe operation shall be *maintained* in proper working order so that they may perform the functions for which they were intended. The equipment shall be *taken out of service* when it is not in proper working order.

1910.66(h)(5) - *Roof systems.* Roof track systems, tie-downs, or similar equipment shall be *maintained* in proper working order so that they perform the function for which they were intended.

1910.66(h)(6) - *Building face guiding members.* T-rails, indented mullions, or equivalent guides located in the face of a building shall be *maintained* in proper working order so that they perform the functions for which they were intended. Brackets for cable stabilizers shall similarly be *maintained in proper working order*.

[1910.66\(h\)\(7\)](#) - *Inoperative safety devices*. No person shall render a required safety device or electrical protective device inoperative, except as necessary for *tests, inspections*, and maintenance. Immediately upon completion of such *tests, inspections* and maintenance, the device shall be restored to its normal operating condition.

[1910.66\(i\)\(1\)\(i\)](#) - *Training*. Working platforms shall be operated only by persons who are proficient in the operation, safe use and *inspection* of the particular working platform to be operated.

[1910.66\(i\)\(1\)\(ii\)](#) - *Training*. All employees who operate working platforms shall be *trained* in the following:

- [1910.66\(i\)\(1\)\(ii\)\(A\)](#) - Recognition of, and *preventive measures* for, the safety hazards associated with their individual work tasks.
- [1910.66\(i\)\(1\)\(ii\)\(C\)](#) - *Emergency action plan procedures* required in [paragraph \(e\)\(9\)](#) of this section.
- [1910.66\(i\)\(1\)\(ii\)\(D\)](#) - *Work procedures* required in [paragraph \(i\)\(1\)\(iv\)](#) of this section.
- [1910.66\(i\)\(1\)\(ii\)\(E\)](#) - *Personal fall arrest system inspection*, care, use and system performance.

[1910.66\(i\)\(1\)\(iii\)](#) - *Training* of employees in the operation and *inspection* of working platforms shall be done by a *competent person*.

[1910.66\(i\)\(1\)\(iv\)](#) - *Written work procedures* for the operation, safe use and *inspection* of working platforms shall be provided for employee *training*. *Pictorial methods* of instruction, may be used, in lieu of *written work procedures*, if employee *communication* is improved using this method. The *operating manuals* supplied by manufacturers for platform system components can serve as the basis for these *procedures*.

[1910.66\(i\)\(1\)\(v\)](#) - The employer shall *certify* that employees have been *trained* in operating and *inspecting* a working platform by preparing a *certification record* which includes the identity of the person *trained*, the *signature* of the employer or the person who conducted the *training* and the date that *training* was completed. The *certification record* shall be prepared at the completion of the *training* required in [paragraph \(i\)\(1\)\(ii\)](#) of this section, and shall be *maintained* in a file for the duration of the employee's employment. The *certification record* shall be kept readily *available* for review by the Assistant Secretary of Labor or the Assistant Secretary's representative.

[Building maintenance](#) means operations such as window cleaning, caulking, metal polishing, reglazing, and general maintenance on building surfaces.

[Competent person](#) means a person who, because of training and experience, is capable of identifying hazardous or dangerous conditions in powered platform installations and of training employees to identify such conditions.

*Registered professional engineer* means a person who has been duly and currently registered and licensed by an authority within the United States or its territories to practice the profession of engineering.

## 1910.67 - Vehicle-mounted Elevating and Rotating Work Platforms

**Scope:** This [standard](#) covers vehicle-mounted aerial devices used to elevate personnel to jobsites above ground.

**Exceptions:** This standard does not apply to firefighting equipment or to the vehicles upon which aerial devices are mounted.

**Special Requirements:** Tests, trained, inspections, personal fall arrest, travel restraint system, references other standards

[1910.67\(c\)\(2\)\(i\)](#) - Lift controls shall be *tested each day prior to use* to determine that such controls are in safe working condition.

[1910.67\(c\)\(2\)\(ii\)](#) - Only *trained* persons shall operate an aerial lift.

[1910.67\(c\)\(2\)\(v\)](#) - A *personal fall arrest or travel restraint system* that meets the requirements in [subpart I - personal protective equipment](#), of this part (1910) shall be worn and attached to the boom or basket when working from an aerial lift.

[1910.67\(c\)\(2\)\(xii\)](#) - Before moving an aerial lift for travel, the boom(s) shall be *inspected* to see that it is properly cradled and outriggers are in stowed position, except as provided in [paragraph \(c\)\(2\)\(viii\)](#) of this section.

[1910.67\(c\)\(3\)](#) - *Electrical tests.* *Electrical tests* shall be made in conformance with the requirements of [ANSI A92.2—1969](#), Section 5. However, equivalent DC voltage *tests* may be used in lieu of the AC voltage *test* specified in A92.2—1969. DC voltage *tests* which are approved by the equipment manufacturer or equivalent entity shall be considered an equivalent test for the purpose of this [paragraph \(c\)\(3\)](#).

[Aerial device.](#) Any vehicle—mounted device, telescoping or articulating, or both, which is used to position personnel.

[Articulating boom platform.](#) An aerial device with two or more hinged boom sections.

## 1910.68 – Manlifts

**Scope:** This [standard](#) applies to the construction, maintenance, inspection, and operation of manlifts in relation to accident hazards.

**Special Requirements:** Trained, authorized, instruction signs, maintenance, posted signs, warning light, operating rules, inspection record, certification record

1910.68(b)(1) - *Application*. This section applies to the construction, *maintenance, inspection*, and operation of manlifts in relation to accident hazards. Manlifts covered by this section consist of platforms or brackets and accompanying handholds mounted on, or attached to an endless belt, operating vertically in one direction only and being supported by, and driven through pulleys, at the top and bottom. These manlifts are intended for conveyance of persons only. It is not intended that this section cover moving stairways, elevators with enclosed platforms ("Paternoster" elevators), gravity lifts, nor conveyors used only for conveying material. This section applies to manlifts used to carry only personnel *trained and authorized* by the employer in their use.

1910.68(c)(7)(i) - *Instruction signs* at landings or belts. *Signs* of conspicuous and easily read style giving *instructions* for the use of the manlift shall be *posted* at each landing or stenciled on the belt.

1910.68(c)(7)(ii)(a) - At the top floor an *illuminated sign* shall be *displayed* bearing the following wording: "*TOP FLOOR—GET OFF*". *Signs* shall be in block letters not less than 2 inches in height. This *sign* shall be located within easy view of an ascending passenger and not more than 2 feet above the top terminal landing.

1910.68(c)(7)(ii)(b) - In addition to the *sign* required by paragraph (c)(7)(ii)(a) of this section, a *red warning light* of not less than 40- watt rating shall be provided immediately below the upper landing terminal and so located as to shine in the passenger's face.

1910.68(c)(7)(iii) - *Visitor warning*. A conspicuous *sign* having the following *legend*—*AUTHORIZED PERSONNEL ONLY*—shall be displayed at each landing.

1910.68(d)(1) - *Operating rules*. Proper use of manlifts. No freight, packaged goods, pipe, lumber, or construction materials of any kind shall be handled on any manlift.

1910.68(e)(1) - *Frequency*. All manlifts shall be *inspected* by a *competent designated person* at intervals of not more than 30 days. *Limit switches* shall be checked weekly. Manlifts found to be unsafe shall not be operated until properly repaired.

1910.68(e)(3) - *Inspection record*. A *certification record* shall be kept of each *inspection* which includes the date of the *inspection*, the *signature* of the person who performed the *inspection* and the serial number, or other identifier, of the manlift which was *inspected*. This *record of inspection* shall be made *available* to the Assistant Secretary of Labor or a duly authorized representative.

**Manlift.** A device consisting of a power-driven endless belt moving in one direction only, and provided with steps or platforms and handholds attached to it for the transportation of personnel from floor to floor.

## Subpart G - [Occupational Health and Environmental Control](#)

[Subpart G](#) provides the ventilation standard for operations involving abrasive blasting, grinding, polishing, buffing and spray finishing and also the standards for noise and non-ionizing radiation exposures in the workplace.

To learn if subpart G applies to you, go to [Does "Subpart G - Occupational Health and Environmental Control" Apply to You?](#)

### Special Requirements

#### 1910.94 – Ventilation

**Scope:** This [standard](#) covers three operations: [paragraph \(a\)](#) - abrasive blasting; [paragraph \(b\)](#) - grinding, polishing and buffing; and [paragraph \(c\)](#) - spray finishing.

**Special Requirements:** Inspections, respiratory protection program, NIOSH approved, respirators, operational procedures, safety shoes, eye and face protection, references other standards

[1910.94\(a\)\(3\)\(i\)\(e\)](#) - Slit abrasive-resistant baffles shall be installed in multiple sets at all small access openings where dust might escape, and shall be *inspected* regularly and replaced when needed.

[1910.94\(a\)\(4\)\(i\)](#) - The construction, installation, *inspection*, and *maintenance* of exhaust systems shall conform to the principles and requirements set forth in *American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, Z9.2-1960, and ANSI Z33.1-1961*, which is incorporated by reference as specified in [1910.6](#) - *incorporation by reference*.

[1910.94\(a\)\(5\)\(i\)](#) - Employers must use only *respirators approved* by the *National Institute for Occupational Safety and Health (NIOSH)* under 42 CFR part 84 to protect employees from dusts produced during abrasive-blasting operations.

[1910.94\(a\)\(5\)\(ii\)](#) - *Abrasive-blasting respirators* shall be worn by all abrasive-blasting operators: [Reference [paragraph \(a\)\(5\)\(ii\)\(A\) - \(C\)](#)].].

[1910.94\(a\)\(5\)\(iii\)](#) - Properly fitted particulate-filter *respirators*, commonly referred to as *dust-filter respirators*, may be used for short, intermittent, or occasional dust exposures such as cleanup, dumping of dust collectors, or unloading shipments of sand at a receiving point when it is not feasible to control the dust by enclosure, exhaust ventilation, or other means. The *respirators used must be approved by NIOSH* under 42 CFR part 84 for protection against the specific type of dust encountered. [Reference [paragraph \(a\)\(5\)\(iii\)\(A\) - \(B\)](#)].

[1910.94\(a\)\(5\)\(iv\)](#) - For employees who use *respirators* required by this section, the employer must implement a *respiratory protection program* in accordance with [1910.134](#).

[1910.94\(a\)\(5\)\(v\)](#) - Operators shall be equipped with heavy canvas or *leather gloves and aprons or equivalent protection* to protect them from the impact of abrasives. *Safety shoes* shall be worn to protect against foot injury where heavy pieces of work are handled.

- [1910.94\(a\)\(5\)\(v\)\(a\)](#) - *Protective footwear* must comply with the requirements specified by [29 CFR 1910.136\(b\)\(1\)](#).
- [1910.94\(a\)\(5\)\(v\)\(b\)](#) - *Equipment for protection of the eyes and face* shall be supplied to the operator when the *respirator* design does not provide such protection and to any other personnel working in the vicinity of abrasive blasting operations. This equipment shall conform to the requirements of [1910.133](#) - *eye and face protection*.

[1910.94\(a\)\(6\)](#) - Air supply and air compressors. Air for abrasive-blasting respirators must be free of harmful quantities of dusts, mists, or noxious gases, and must meet the requirements for supplied-air quality and use specified in [29 CFR 1910.134\(i\)](#) - *respiratory protection*.

[1910.94\(a\)\(7\)](#) - *Operational procedures* and general safety. Dust shall not be permitted to accumulate on the floor or on ledges outside of an abrasive-blasting enclosure, and dust spills shall be cleaned up promptly. Aisles and walkways shall be kept clear of steel shot or similar abrasive which may create a slipping hazard.

[1910.94\(b\)\(2\)](#) - Application. Wherever dry grinding, dry polishing or buffing is performed, and employee exposure, without regard to the use of *respirators*, exceeds the permissible exposure limits prescribed in [1910.1000 - air contaminants](#), or other sections of this part (1910), a local exhaust ventilation system shall be provided and used to maintain employee exposures within the prescribed limits.

[1910.94\(c\)\(3\)\(iii\)\(a\)](#) - Overspray filters shall be installed and *maintained* in accordance with the requirements of [1910.107\(b\)\(5\)](#) - *Spray finishing using flammable and combustible materials*, and shall only be in a location easily accessible for *inspection*, cleaning, or replacement.



[1910.94\(c\)\(5\)\(iii\)\(e\)](#) - *Inspection* or clean-out doors shall be provided for every 9 to 12 feet of running length for ducts up to 12 inches in diameter, but the distance between cleanout doors may be greater for larger pipes. A clean-out door or doors shall be provided for servicing the fan, and where necessary, a drain shall be provided.

[1910.94\(c\)\(6\)\(iii\)\(a\)](#) - When an operator is in a booth downstream from the object being sprayed, an air-supplied *respirator or other type of respirator* must be used by employees that has been *approved by NIOSH under 42 CFR part 84* for the material being sprayed.

*Abrasive*. A solid substance used in an abrasive blasting operation.

*Particulate-filter respirator*. An air purifying respirator, commonly referred to as a dust or a fume respirator, which removes most of the dust or fume from the air passing through the device.

## 1910.95 - Occupational Noise Exposure

**Scope:** This [standard](#) provides the requirements for protection against noise exposures.

**Special Requirements:** Controls, hearing conservation program, monitoring program, audiometric testing program, training program, notifications, strategies, results, testing, certified, audiograms, monitoring, competence, qualified persons (i.e., audiologist), information, records, procedures, training, materials, instructions, records, measurements, informed (written), calibration, checks, personal protective equipment

[1910.95\(a\)](#) - Protection against the effects of noise exposure shall be provided when the sound levels exceed those shown in [Table G-16 - Permissible Noise Exposures](#) when measured on the A scale of a standard sound level meter at slow response. When noise levels are determined by octave band analysis, the equivalent A-weighted sound level may be determined as follows: [Reference [paragraph \(a\)](#)].

[1910.95\(b\)\(1\)](#) - When employees are subjected to sound exceeding those listed in [Table G-16 - Permissible Noise Exposures](#), feasible *administrative or engineering controls* shall be utilized. If such *controls* fail to reduce sound levels within the levels of [Table G-16](#), *personal protective equipment* shall be provided and used to reduce sound levels within the levels of the table.

[1910.95\(c\)\(1\)](#) - The employer shall administer a continuing, effective *hearing conservation program*, as described in [paragraphs \(c\) - hearing conservation program](#), through (o) of this section, whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of 85 decibels measured on the A scale (slow response) or, equivalently, a dose of fifty percent. For purposes of the *hearing conservation program*, employee noise exposures shall be computed in accordance with [appendix A - Noise](#)



Exposure Computation, and [Table G-16a](#) - Permissible Noise Exposures, and without regard to any attenuation provided by the use of personal protective equipment.

[1910.95\(d\)\(1\)](#) - When *information* indicates that any employee's exposure may equal or exceed an 8-hour time-weighted average of 85 decibels, the employer shall *develop* and implement a *monitoring program*.

[1910.95\(d\)\(1\)\(i\)](#) - The *sampling strategy* shall be designed to identify employees for inclusion in the *hearing conservation program* and to enable the proper selection of hearing protectors.

[1910.95\(e\)](#) - *Employee notification*. The employer shall *notify* each employee exposed at or above an 8-hour time-weighted average of 85 decibels of the *results* of the *monitoring*.

[1910.95\(g\)\(1\)](#) - The employer shall *establish* and maintain an *audiometric testing program* as provided in this paragraph by making *audiometric testing* available to all employees whose exposures equal or exceed an 8-hour time-weighted average of 85 decibels.

[1910.95\(g\)\(2\)](#) - The *program* shall be provided at no cost to employees.

[1910.95\(g\)\(3\)](#) - *Audiometric tests* shall be performed by a *licensed or certified audiologist, otolaryngologist, or other physician, or by a technician* who is *certified* by the Council of Accreditation in Occupational Hearing Conservation, or who has satisfactorily *demonstrated competence* in administering audiometric examinations, obtaining valid *audiograms*, and properly using, maintaining and checking calibration and proper functioning of the audiometers being used. A technician who operates microprocessor audiometers does not need to be *certified*. A technician who performs *audiometric tests* must be responsible to an *audiologist, otolaryngologist or physician*.

[1910.95\(g\)\(5\)\(i\)](#) - Within 6 months of an employee's first exposure at or above the action level, the employer shall establish a valid baseline *audiogram* against which subsequent *audiograms* can be compared.

[1910.95\(g\)\(5\)\(iv\)](#) - The employer shall *notify employees* of the need to avoid high levels of non-occupational noise exposure during the 14-hour period immediately preceding the *audiometric* examination.

[1910.95\(g\)\(6\)](#) - *Annual audiogram*. At least *annually* after obtaining the baseline audiogram, the employer shall obtain a new *audiogram* for each employee exposed at or above an 8-hour time-weighted average of 85 decibels.

1910.95(g)(7)(iii) - The *audiologist, otolaryngologist, or physician* shall review problem *audiograms* and shall determine whether there is a need for further evaluation. The employer shall *provide* to the person performing this *evaluation* the following *information*:

- 1910.95(g)(7)(iii)(A) - A *copy* of the requirements for hearing conservation as set forth in paragraphs (c) through (n) of this section;
- 1910.95(g)(7)(iii)(B) - The *baseline audiogram* and most recent *audiogram* of the employee to be evaluated;
- 1910.95(g)(7)(iii)(C) - *Measurements* of background sound pressure levels in the *audiometric test room* as required in appendix D: Audiometric Test Rooms.
- 1910.95(g)(7)(iii)(D) - *Records* of *audiometer calibrations* required by paragraph (h)(5) - audiometer calibration, of this section.

1910.95(g)(8)(i) - *Follow-up procedures*. If a comparison of the *annual audiogram* to the *baseline audiogram* indicates a standard threshold shift as defined in paragraph (g)(10) - standard threshold shift, of this section has occurred, the employee shall be *informed* of this fact in *writing*, *within 21 days* of the determination.

1910.95(g)(8)(ii) - *Follow-up procedures*. Unless a physician determines that the standard threshold shift is not work related or aggravated by occupational noise exposure, the employer shall ensure that the following steps are taken when a standard threshold shift occurs:

- 1910.95(g)(8)(ii)(A) - Employees not using hearing protectors shall be fitted with hearing protectors, *trained* in their use and care, and required to use them.
- 1910.95(g)(8)(ii)(B) - Employees already using hearing protectors shall be *refitted* and *retrained* in the use of hearing protectors and provided with hearing protectors offering greater attenuation if necessary.
- 1910.95(g)(8)(ii)(D) - The employee is *informed* of the need for an otological examination if a medical pathology of the ear that is unrelated to the use of hearing protectors is suspected.

1910.95(g)(8)(iii)(A) - Shall *inform* the employee of the new audiometric interpretation (subsequent audiometric testing).

1910.95(h)(1) - *Audiometric tests* shall be pure tone, air conduction, hearing threshold examinations, with *test frequencies* including as a minimum 500, 1000, 2000, 3000, 4000, and 6000 Hz. *Tests* at each frequency shall be taken separately for each ear.

1910.95(h)(2) - *Audiometric tests* shall be conducted with audiometers (including microprocessor audiometers) that meet the specifications of, and are maintained and used

in accordance with, American National Standard Specification for Audiometers, S3.6-1969, which is incorporated by reference as specified in [1910.6](#) - incorporation by reference.

[1910.95\(h\)\(5\)\(i\)](#) - The functional operation of the audiometer shall be *checked* before each day's use by *testing* a person with known, stable hearing thresholds, and by listening to the audiometer's output to make sure that the output is free from distorted or unwanted sounds. Deviations of 10 decibels or greater require an acoustic calibration.

[1910.95\(h\)\(5\)\(ii\)](#) - *Audiometer calibration* shall be *checked* acoustically at least *annually* in accordance with [appendix E: Acoustic Calibration of Audiometers](#). Test frequencies below 500 Hz and above 6000 Hz may be omitted from this *check*. Deviations of 15 decibels or greater require an exhaustive *calibration*.

[1910.95\(i\)\(1\)](#) - Employers shall make *hearing protectors* available to all employees exposed to an 8-hour time-weighted average of 85 decibels or greater at no cost to the employees. *Hearing protectors* shall be replaced as necessary.

[1910.95\(i\)\(2\)](#) - Employers shall ensure that *hearing protectors* are worn:  
{Reference [paragraph \(i\)\(2\)\(i\) - \(ii\)](#)}.

[1910.95\(i\)\(3\)](#) - Employees shall be given the opportunity to select their hearing protectors from a variety of suitable *hearing protectors* provided by the employer.

[1910.95\(i\)\(4\)](#) - The employer shall provide *training* in the use and care of all hearing protectors provided to employees.

[1910.95\(j\)\(1\)](#) - The employer shall *evaluate* hearing protector attenuation for the specific noise environments in which the protector will be used. The employer shall use one of the *evaluation methods* described in [appendix B: Methods for Estimating the Adequacy of Hearing Protection Attenuation](#).

[1910.95\(k\)\(1\)](#) - The employer shall *train* each employee who is exposed to noise at or above an 8-hour time weighted average of 85 decibels in accordance with the requirements of this section. The employer shall institute a *training program* and ensure employee participation in the *program*.

[1910.95\(k\)\(2\)](#) - The *training program* shall be *repeated annually* for each employee included in the *hearing conservation program*. Information provided in the *training program* shall be updated to be consistent with changes in *protective equipment and work processes*.

[1910.95\(k\)\(3\)](#) - The employer shall ensure that each employee is *informed* of the following:

- [1910.95\(k\)\(3\)\(i\)](#) - The effects of noise on hearing;

- [1910.95\(k\)\(3\)\(ii\)](#) - The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and *instructions* on selection, *fitting*, use, and care; and
- [1910.95\(k\)\(3\)\(iii\)](#) - The purpose of *audiometric testing*, and an *explanation* of the *test procedures*.

[1910.95\(l\)](#) - Access to *information* and *training materials*.

- [1910.95\(l\)\(1\)](#) - The employer shall make available to affected employees or their representatives *copies* of this *standard* and shall also *post a copy* in the workplace.
- [1910.95\(l\)\(2\)](#) - The employer shall provide to affected employees any *informational materials* pertaining to the standard that are supplied to the employer by the Assistant Secretary.
- [1910.95\(l\)\(3\)](#) - The employer shall provide, upon request, all *materials* related to the employer's *training and education program* pertaining to this standard to the Assistant Secretary and the Director.

[1910.95\(m\)\(1\)](#) - *Exposure measurements*. The employer shall *maintain* an accurate *record* of all *employee exposure measurements* required by [paragraph \(d\)](#) - monitoring, of this section.

[1910.95\(m\)\(2\)\(i\)](#) - *Audiometric tests*. The employer shall *retain* all employee audiometric *test records* obtained pursuant to [paragraph \(g\)](#) - *audiometric testing program*, of this section:

[1910.95\(m\)\(2\)\(ii\)\(F\)](#) - The employer shall *maintain* accurate *records* of the measurements of the background sound pressure levels in *audiometric test rooms*.

[1910.95\(m\)\(3\)](#) - *Record retention*. The employer shall *retain records* required in this [paragraph \(m\)](#) - records retention, for at least the following periods.

- [1910.95\(m\)\(3\)\(i\)](#) - Noise *exposure measurement records* shall be *retained* for two years.
- [1910.95\(m\)\(3\)\(ii\)](#) - *Audiometric test records* shall be *retained* for the *duration of the affected employee's employment*.

[1910.95\(m\)\(4\)](#) - *Access to records*. All *records* required by this section shall be provided upon request to employees, former employees, representatives designated by the individual employee, and the Assistant Secretary. The provisions of [29 CFR 1910.1020](#) (a)-(e) and (g)-(i) apply to access to *records* under this section.

[1910.95\(m\)\(5\)](#) - *Transfer of records*. If the employer ceases to do business, the employer shall transfer to the successor employer all *records* required to be *maintained* by this

section, and the successor employer shall retain them for the remainder of the period prescribed in [paragraph \(m\)\(3\)](#) - record retention, of this section.

## 1910.97 - Nonionizing Radiation

**Scope:** This [standard](#) applies to all radiations originating from radio stations, radar equipment, and other possible sources of electromagnetic radiation such as used for communication, radio navigation, and industrial and scientific purposes. This standard does not apply to the deliberate exposure of patients by, or under the direction of, practitioners of the healing arts.

**Special Requirements:** Radiation protection guide, warning symbol, warning information, instructions

[1910.97\(a\)\(2\)\(i\)](#) - *Radiation protection guide.* For normal environmental conditions and for incident electromagnetic energy of frequencies from 10 MHz to 100 GHz, the *radiation protection guide* is 10 mW/cm.<sup>2</sup> (milliwatt per square centimeter) as averaged over any possible 0.1-hour period.

[1910.97\(a\)\(3\)\(i\)](#) - The *warning symbol* for radio frequency radiation hazards shall consist of a red isosceles triangle above an inverted black isosceles triangle, separated and outlined by an aluminum color border. The words “*Warning—Radio-Frequency Radiation Hazard*” shall appear in the upper triangle. See [figure G-11](#).

[1910.97\(a\)\(3\)\(iii\)](#) - The inclusion and choice of *warning information* or *precautionary instructions* is at the discretion of the user. If such *information* is included it shall appear in the lower triangle of the *warning symbol*.

The term [electromagnetic radiation](#) is restricted to that portion of the spectrum commonly defined as the radio frequency region, which for the purpose of this specification shall include the microwave frequency region.

[Radiation protection guide.](#) Radiation level which should not be exceeded without careful consideration of the reasons for doing so.

## Subpart H - [Hazardous Materials](#)

[Subpart H](#) provides requirements for compressed gases, flammable liquids, explosives and blasting agents, LP gases, anhydrous ammonia, process safety management of highly hazardous materials, HAZWOPER, and dipping and coating operations.

To learn if subpart H applies to you, go to [Does "Subpart H - Hazardous Materials" Apply to You?](#)

## Special Requirements

### 1910.101 - Compressed Gases (General Requirements)

**Scope:** This [standard](#) provides requirements pertaining to safety relief devices.

**Special Requirements:** Inspections, references other standards

[1910.101\(a\)](#) - *Inspection* of compressed gas cylinders. Each employer shall determine that compressed gas cylinders under his control are in a safe condition to the extent that this can be determined by *visual inspection*. *Visual and other inspections* shall be conducted as prescribed in the Hazardous Materials Regulations of the Department of Transportation (49 CFR parts 171-179 and 14 CFR part 103). Where those regulations are not applicable, *visual* and other *inspections* shall be conducted in accordance with Compressed Gas Association Pamphlets [C-6-1968](#) and [C-8-1962](#), which is incorporated by reference as specified in [1910.6](#) - incorporation by reference.

### 1910.102 – Acetylene

**Scope:** This [standard](#) provides the requirements pertaining to acetylene including use (i.e., cylinders, filling, piping).

**Special Requirements:** Demonstrate, references other standards

[1910.102\(b\)\(2\)](#) - When employers can *demonstrate* that the facilities, equipment, structures, or installations used to generate acetylene or to charge (fill) acetylene cylinders were installed prior to February 16, 2006, these employers may comply with the provisions of Chapter 7 (“Acetylene Piping”) of [NFPA 51A-2001](#) (“Standard for Acetylene Charging Plants”) (National Fire Protection Association, 2001 ed., 2001).

[1910.102\(c\)\(2\)](#) - When employers can *demonstrate* that the facilities, equipment, structures, or installations used to generate acetylene or to charge (fill) of acetylene cylinders were constructed or installed prior to February 16, 2006, these employers may comply with the provisions of [NFPA 51A-2001](#) (“Standard for Acetylene Charging Plants”) (National Fire Protection Association, 2001 ed., 2001).

### 1910.103 – Hydrogen

**Scope:** This [standard](#) provides the requirements pertaining to hydrogen systems.



**Special Requirements:** Design, tests, inspections, markings, placards, authorized personnel, qualified person, checked, determined, operating instructions (written), practices, supervision, references other standards

Gaseous hydrogen system is one in which the hydrogen is delivered, stored and discharged in the gaseous form to consumer's piping. The system includes stationary or movable containers, pressure regulators, safety relief devices, manifolds, interconnecting piping and controls. The system terminates at the point where hydrogen at service pressure first enters the consumer's distribution piping.

1910.103(b)(1)(i)(a)(1) - Containers. *Designed*, constructed, and *tested* in accordance with appropriate requirements of ASME Boiler and Pressure Vessel Code, section VIII - Unfired Pressure Vessels - 1968, which is incorporated by reference as specified in 1910.6 - incorporation by reference.

1910.103(b)(1)(i)(a)(2) - Containers. *Designed*, constructed, *tested* and maintained in accordance with U.S. Department of Transportation Specifications and Regulations.

1910.103(b)(1)(i)(c) - Each portable container shall be *legibly marked* with the name "*Hydrogen*" in accordance with the *marking* requirements set forth in 1910.253(b)(1)(ii). Each manifolded hydrogen supply unit shall be *legibly marked* with the name "*Hydrogen*" or a *legend* such as "This unit contains hydrogen."

1910.103(b)(1)(ii)(c) - Safety relief devices or vent piping shall be *designed* or located so that moisture cannot collect and freeze in a manner which would interfere with proper operation of the device.

1910.103(b)(1)(iv)(b) - Installation of hydrogen systems shall be *supervised by personnel familiar with proper practices* with reference to their construction and use.

1910.103(b)(1)(v) - *Marking*. The hydrogen storage location shall be *permanently placarded* as follows: "HYDROGEN - FLAMMABLE GAS - NO SMOKING - NO OPEN FLAMES," or equivalent.

1910.103(b)(1)(vi) - *Testing*. After installations, all piping, tubing, and fittings shall be *tested* and proved hydrogen gas tight at maximum operating pressure.

1910.103(b)(2)(i)(a) - Containers. The system shall be located so that it is readily accessible to delivery equipment and to *authorized personnel*.

1910.103(c)(1)(iii) - *Marking*. Each container shall be *legibly marked* to indicate "LIQUEFIED HYDROGEN - FLAMMABLE GAS."



[1910.103\(c\)\(1\)\(vii\)\(a\)](#) - After installation, all field-erected piping shall be *tested* and proved hydrogen gas-tight at operating pressure and temperature.

[1910.103\(c\)\(1\)\(vii\)\(b\)](#) - Containers if out of service in excess of 1 year shall be *inspected and tested* as outlined in [\(a\)](#) of this subdivision. The safety relief devices shall be *checked to determine* if they are operable and properly set.

[1910.103\(c\)\(1\)\(iv\)\(c\)](#) - Safety relief devices or vent piping shall be *designed* or located so that moisture cannot collect and freeze in a manner which would interfere with proper operation of the device.

[1910.103\(c\)\(2\)\(i\)\(a\)](#) - Location of liquefied hydrogen storage. The storage containers shall be located so that they are readily accessible to mobile supply equipment at ground level and to *authorized personnel*.

[1910.103\(c\)\(4\)\(i\)](#) - *Operating instructions. Written instructions.* For installation which require any operation of equipment by the user, legible *instructions* shall be maintained at operating locations.

[1910.103\(c\)\(4\)\(ii\)](#) - *Attendant.* A *qualified person* shall be in attendance at all times while the mobile hydrogen supply unit is being unloaded.

## **1910.104 – Oxygen**

**Scope:** This [standard](#) applies to the installation of bulk oxygen systems on industrial and institutional consumer premises. This section does not apply to oxygen manufacturing plants or other establishments operated by the oxygen supplier or his agent for the purpose of storing oxygen and refilling portable containers, trailers, mobile supply trucks, or tank cars, nor to systems having capacities less than those stated in [paragraph \(b\)\(1\)](#) of this section.

**Special Requirements:** Design, tests, references other standards

[1910.104\(b\)\(4\)\(ii\)](#) - Construction - liquid. Liquid oxygen storage containers shall be fabricated from materials meeting the impact *test* requirements of paragraph UG-84 of [ASME Boiler and Pressure Vessel Code](#), section VIII - Unfired Pressure Vessels - 1968, which is incorporated by reference as specified in [1910.6](#) - incorporation by reference. Containers operating at pressures above 15 pounds per square inch gage (p.s.i.g.) shall be *designed*, constructed, and *tested* in accordance with appropriate requirements of ASME Boiler and Pressure Vessel Code, section VII - Unfired Pressure Vessels - 1968. Insulation surrounding the liquid oxygen container shall be noncombustible.

A [bulk oxygen system](#) is an assembly of equipment, such as oxygen storage containers, pressure regulators, safety devices, vaporizers, manifolds, and interconnecting piping,

which has storage capacity of more than 13,000 cubic feet of oxygen, Normal Temperature and Pressure (NTP), connected in service or ready for service, or more than 25,000 cubic feet of oxygen (NTP) including unconnected reserves on hand at the site. The bulk oxygen system terminates at the point where oxygen at service pressure first enters the supply line. The oxygen containers may be stationary or movable, and the oxygen may be stored as gas or liquid.

## 1910.106 - Flammable Liquids

**Scope:** This [standard](#) applies to the handling, storage, and use of flammable liquids with a flashpoint at or below 199.4 °F (93 °C) unless otherwise noted.

**Special Requirements:** Certification, qualified observer, calculations, nameplates, printed instructions, safe procedures, operating practices, tests, inspections, responsible charge, notifications, references other standards

[1910.106\(b\)\(2\)\(v\)\(i\)](#) - The flow capacity of tank venting devices 12 inches and smaller in nominal pipe size shall be determined by actual *test* of each type and size of vent. These *flow tests* may be conducted by the manufacturer if *certified by a qualified impartial observer*, or may be conducted by an outside agency. The flow capacity of tank venting devices larger than 12 inches nominal pipe size, including manhole covers with long bolts or equivalent, may be *calculated* provided that the opening pressure is actually measured, the rating pressure and corresponding free orifice area are stated, the word "*calculated*" appears on the *nameplate*, and the computation is based on a flow coefficient of 0.5 applied to the rated orifice area.

[1910.106\(b\)\(5\)\(vi\)\(v\)](#) - *Inspections*. The Assistant Secretary or his designated representative shall make *periodic inspections* of all plants where the storage of flammable liquids is such as to require compliance with the foregoing requirements, in order to assure the following:

- [1910.106\(b\)\(5\)\(vi\)\(v\)\(1\)](#) - That all flammable liquid storage tanks are in compliance with these requirements and so maintained.
- [1910.106\(b\)\(5\)\(vi\)\(v\)\(2\)](#) - That detailed *printed instructions* of what to do in *flood emergencies* are properly *posted*.
- [1910.106\(b\)\(5\)\(vi\)\(v\)\(3\)](#) - That station operators and other employees depended upon to carry out such *instructions* are thoroughly *informed* as to the location and operation of such valves and other equipment necessary to effect these requirements.

[1910.106\(c\)\(1\)\(i\)](#) - *Design*. The *design* (including selection of materials) fabrication, assembly, *test*, and *inspection* of piping systems containing flammable liquids shall be suitable for the expected working pressures and structural stresses. Conformity with the applicable provisions of Pressure Piping, [ASME B31](#) series and the provisions of this

paragraph, shall be considered prima facie evidence of compliance with the foregoing provisions.

1910.106(c)(7) - *Testing*. All piping before being covered, enclosed, or placed in use shall be *hydrostatically tested* to 150 percent of the maximum anticipated pressure of the system, or pneumatically tested to 110 percent of the maximum anticipated pressure of the system, but not less than 5 pounds per square inch gage at the highest point of the system. This test shall be maintained for a sufficient time to complete *visual inspection* of all joints and connections, but for at least 10 minutes.

1910.106(e)(5)(v) - *Maintenance*. All plant fire protection facilities shall be adequately maintained and periodically *inspected and tested* to make sure they are always in satisfactory operating condition, and they will serve their purpose in time of emergency.

1910.106(e)(8) - *Repairs to equipment*. Hot work, such as welding or cutting operations, use of spark-producing power tools, and chipping operations shall be permitted only under supervision of an *individual in responsible charge*. The *individual in responsible charge* shall make an *inspection* of the area to be sure that it is safe for the work to be done and that *safe procedures* will be followed for the work specified.

1910.106(e)(9)(i) - *Housekeeping*. General. *Maintenance and operating practices* shall be in accordance with *established procedures* which will tend to control leakage and prevent the accidental escape of flammable liquids. Spills shall be cleaned up promptly.

1910.106(f)(4)(vii) - *Hoses and couplings*. All pressure hoses and couplings shall be *inspected* at *intervals appropriate* to the service. The hose and couplings shall be *tested* with the hose extended and using the "in-service maximum operating pressures." Any hose showing material deteriorations, signs of leakage, or weakness in its carcass or at the couplings shall be withdrawn from service and repaired or discarded.

1910.106(f)(4)(viii)(g) - *Pipelines on flammable liquids wharves* shall be adequately bonded and grounded. If excessive stray currents are encountered, insulating joints shall be installed. Bonding and grounding connections on all pipelines shall be located on wharfside of hose-riser insulating flanges, if used, and shall be accessible for *inspection*.

1910.106(g)(1)(ii)(b) - *Special enclosures*. The enclosure shall be substantially liquid and vaportight without backfill. Sides, top, and bottom of the enclosure shall be of reinforced concrete at least 6 inches thick, with openings for *inspection* through the top only. Tank connections shall be so piped or closed that neither vapors nor liquid can escape into the enclosed space. Means shall be provided whereby portable equipment may be employed to discharge to the outside any liquid or vapors which might accumulate should leakage occur.

1910.106(g)(3)(v)(c) - *Pits for subsurface pumps or piping manifolds of submersible pumps* shall withstand the external forces to which they may be subjected without damage to the

pump, tank, or piping. The pit shall be no larger than necessary for *inspection* and maintenance and shall be provided with a fitted cover.

1910.106(h)(6)(iii) - Fire control. *Alarm systems*. An approved means for prompt *notification* of fire to those within the plant and any public fire department available shall be provided. It may be advisable to connect the plant system with the public system where public *fire alarm system* is available.

1910.106(h)(6)(iv) - Fire control. Maintenance. All plant fire protection facilities shall be adequately maintained and *periodically inspected and tested* to make sure they are always in satisfactory operating condition and that they will serve their purpose in time of emergency.

1910.106(h)(7)(ii)(b) - Hot work, such as welding or cutting operations, use of spark-producing power tools, and chipping operations shall be permitted only under supervision of an individual in responsible charge who shall make an *inspection* of the area to be sure that it is safe for the work to be done and that *safe procedures* will be followed for the work specified.

*Flammable liquid* means any liquid having a flashpoint at or below 199.4 °F (93 °C). Flammable liquids are divided into four categories as follows:

- Category 1 shall include liquids having flashpoints below 73.4 °F (23 °C) and having a boiling point at or below 95 °F (35 °C).
- Category 2 shall include liquids having flashpoints below 73.4 °F (23 °C) and having a boiling point above 95 °F (35 °C).
- Category 3 shall include liquids having flashpoints at or above 73.4 °F (23 °C) and at or below 140 °F (60 °C). When a Category 3 liquid with a flashpoint at or above 100 °F (37.8 °C) is heated for use to within 30 °F (16.7 °C) of its flashpoint, it shall be handled in accordance with the requirements for a Category 3 liquid with a flashpoint below 100 °F (37.8 °C).
- Category 4 shall include liquids having flashpoints above 140 °F (60 °C) and at or below 199.4 °F (93 °C). When a Category 4 flammable liquid is heated for use to within 30 °F (16.7 °C) of its flashpoint, it shall be handled in accordance with the requirements for a Category 3 liquid with a flashpoint at or above 100 °F (37.8 °C). **Note:** *When liquid with a flashpoint greater than 199.4 °F (93 °C) is heated for use to within 30 °F (16.7 °C) of its flashpoint, it shall be handled in accordance with the requirements for a Category 4 flammable liquid.*

## 1910.107 - Spray Finishing Using Flammable and Combustible Materials

**Scope:** This standard provides the requirements for spray finishing operations using flammable and combustible materials.

**Special Requirements:** Designs, inspections, maintenance, approved cans, posted signs

1910.107(b)(5)(i) - The spraying operations except electrostatic spraying operations shall be so *designed*, installed and maintained that the average air velocity over the open face of the booth (or booth cross section during spraying operations) shall be not less than 100 linear feet per minute. Electrostatic spraying operations may be conducted with an air velocity over the open face of the booth of not less than 60 linear feet per minute, or more, depending on the volume of the finishing material being applied and its flammability and explosion characteristics. Visible gauges or audible alarm or pressure activated devices shall be installed to indicate or insure that the required air velocity is maintained. Filter rolls shall be *inspected* to insure proper replacement of filter media.

1910.107(e)(6)(iii) - All pressure hose and couplings shall be *inspected at regular intervals* appropriate to this service. The hose and couplings shall be *tested* with the hose extended, and using the "in-service maximum operating pressures." Any hose showing material deteriorations, signs of leakage, or weakness in its carcass or at the couplings, shall be withdrawn from service and repaired or discarded.

1910.107(g) - *Operations and maintenance*

- 1910.107(g)(3) - Residue disposal. Residue scrapings and debris contaminated with residue shall be immediately removed from the premises and properly disposed of. *Approved metal waste cans* shall be provided wherever rags or waste are impregnated with finishing material and all such rags or waste deposited therein immediately after use. The contents of waste cans shall be properly disposed of at least *once daily or at the end of each shift*.

1910.107(l)(4)(iii) - "*No Smoking*" signs in large letters on contrasting color background shall be conspicuously *posted* at all powder coating areas and powder storage rooms.

1910.107(l)(7)(i) - Electrostatic fluidized beds and associated equipment shall be of *approved types*. The maximum surface temperature of this equipment in the coating area shall not exceed 150 °F. The high voltage circuits shall be so designed as to not produce a spark of sufficient intensity to ignite any powder-air mixtures nor result in appreciable shock hazard upon coming in contact with a grounded object under normal operating conditions.

1910.107(m)(2) - Smoking. Smoking shall be prohibited and "*No Smoking*" signs shall be prominently displayed and only nonsparking tools shall be used in any area where organic peroxides are stored, mixed or applied.

*Spraying area* - Any area in which dangerous quantities of flammable vapors or mists, or combustible residues, dusts, or deposits are present due to the operation of spraying processes.

Spray booth - A power-ventilated structure provided to enclose or accommodate a spraying operation to confine and limit the escape of spray, vapor, and residue, and to safely conduct or direct them to an exhaust system.

## 1910.109 - Explosives and Blasting Agents

**Scope:** This standard provides the requirements for the use, transport, manufacture and storage of explosives and blasting agents.

**Special Requirements:** Posted signs, manufacturer instructions, markings, placards, instructions, measures, procedures, designated routes, authorized storage areas, warning signals, warning flags, training, maintenance program

1910.109(c)(2)(iii) - Property upon which Class I magazines are located and property where Class II magazines are located outside of buildings shall be *posted with signs reading "Explosives - Keep Off."*

1910.109(c)(5)(iv) - Magazine floors shall be regularly swept, kept clean, dry, free of grit, paper, empty used packages, and rubbish. Brooms and other cleaning utensils shall not have any spark-producing metal parts. Sweepings from floors of magazines shall be properly disposed of. Magazine floors stained with nitroglycerin shall be cleaned according to *instructions* by the *manufacturer*.

1910.109(c)(5)(v) - When any explosive has deteriorated to an extent that it is in an unstable or dangerous condition, or if nitroglycerin leaks from any explosives, then the person in possession of such explosive shall immediately proceed to destroy such explosive in accordance with the *instructions* of the *manufacturer*. Only *experienced persons* shall be allowed to do the work of destroying explosives.

1910.109(d)(2)(ii) - Every vehicle used for transporting explosives and oxidizing materials listed in paragraph (d)(2)(ii)(a) of this section shall be *marked* as follows:

- 1910.109(d)(2)(ii)(a) - Exterior *markings or placards* required on applicable vehicles shall be as follows for the various classes of commodities:
- 1910.109(d)(2)(ii)(c) - Such *markings or placards* shall be *displayed at the front, rear, and on each side* of the motor vehicle or trailer, or other cargo carrying body while it contains explosives or other dangerous articles of such type and in such quantity as specified in paragraph (d)(2)(ii)(a) of this subdivision. The *front marking or placard* may be *displayed on the front* of either the truck, truck body, truck tractor or the trailer.



- [1910.109\(d\)\(2\)\(ii\)\(d\)](#) - Any motor vehicle, trailer, or other cargo-carrying body containing more than one kind of explosive as well as an oxidizing material requiring a placard under the provisions of [paragraph \(d\)\(2\)\(ii\)\(a\)](#), the aggregate gross weight of which totals 1,000 pounds or more, shall be *marked or placarded "Dangerous" as well as "Explosive A" or "Explosive B"* as appropriate. If explosives Class A and explosives Class B are loaded on the same vehicle, the *"Explosives B" marking* need not be displayed.
- [1910.109\(d\)\(2\)\(ii\)\(e\)](#) - In any combination of two or more vehicles containing explosives or other dangerous articles each vehicle shall be *marked or placarded* as to its contents and in accordance with [paragraph \(d\)\(2\)\(ii\)\(a\)](#) and [paragraph \(d\)\(2\)\(ii\)\(c\)](#) of this subdivision.

[1910.109\(d\)\(3\)\(iii\)](#) - Every motor vehicle transporting any quantity of Class A or Class B explosives shall, at all times, be attended by a driver or other attendant of the motor carrier. This attendant shall have been made aware of the class of the explosive material in the vehicle and of its inherent dangers, and shall have been *instructed* in the *measures and procedures* to be followed in order to protect the public from those dangers. He shall have been *made familiar* with the vehicle he is assigned, and shall be *trained*, supplied with the necessary means, and *authorized* to move the vehicle when required.

[1910.109\(d\)\(3\)\(v\)](#) - Vehicles transporting explosives shall avoid congested areas and heavy traffic. Where *routes* through congested areas have been *designated* by *local authorities* such routes shall be followed.

[1910.109\(d\)\(3\)\(vi\)](#) - Delivery shall only be made to *authorized persons* and into authorized magazines or *authorized temporary storage* or handling areas.

[1910.109\(e\)\(1\)\(iv\)](#) - *Persons authorized* to prepare explosive charges or conduct blasting operations shall use every reasonable precaution, including but not limited to *warning signals, flags, barricades*, or woven wire mats to insure the safety of the general public and workmen.

[1910.109\(e\)\(1\)\(vii\)\(b\)](#) - The *posting of signs warning* against the use of mobile radio transmitters on all roads within 350 feet of the blasting operations.

[1910.109\(e\)\(5\)](#) - *Warning required*. Before a blast is fired, the employer shall require that a *loud warning signal* be given by the *person in charge*, who has made certain that all surplus explosives are in a safe place, all persons and vehicles are at a safe distance or under sufficient cover, and that an *adequate warning* has been given.

[1910.109\(f\)\(2\)](#) - Packing and *marking*. No person shall deliver any explosive to any carrier unless such explosive conforms in all respects, including *marking* and packing, to the U.S. Department of Transportation Regulations for the Transportation of Explosives.

[1910.109\(f\)\(3\)](#) - *Marking cars*. Every railway car containing explosives which has reached its designation, or is stopped in transit so as no longer to be in interstate commerce, shall have attached to both sides and ends of the car, *cards* with the words "*Explosives - Handle Carefully - Keep Fire Away*" in red letters at least 1½ inches high on a white background.

[1910.109\(g\)\(3\)\(iii\)\(a\)](#) - Bulk delivery and mixing vehicles. The operator shall be *trained in the safe operation* of the vehicle together with its mixing, conveying, and related equipment. The employer shall assure that the operator is *familiar* with the commodities being delivered and the *general procedure* for *handling emergency situations*.

[1910.109\(h\)\(3\)\(iv\)\(b\)](#) - Both *equipment and handling procedures* shall be designed to prevent the introduction of foreign objects or materials.

[1910.109\(h\)\(3\)\(v\)\(b\)](#) - A *daily visual inspection* shall be made of mixing, conveying, and electrical equipment to establish that such equipment is in good operating condition. A *program of systematic maintenance* shall be *conducted on regular schedule*.

[1910.109\(h\)\(4\)\(ii\)\(b\)](#) - Bulk delivery and mixing vehicles. The operator shall be *trained in the safe operation of the vehicle* together with its mixing, conveying, and related equipment. He shall be *familiar with the commodities* being delivered and the *general procedure for handling emergency situations*.

[1910.109\(i\)\(1\)\(i\)\(d\)](#) - The storage of ammonium nitrate and ammonium nitrate mixtures that are more sensitive than allowed by the "Definition of *Test Procedures* for Ammonium Nitrate Fertilizer" is prohibited.

[1910.109\(i\)\(4\)\(ii\)\(c\)](#) - The ammonium nitrate storage bins or piles shall be clearly identified by *signs reading "Ammonium Nitrate"* with letters at least 2 inches high.

*Explosive* is defined as any chemical compound, mixture, or device, the primary or common purpose of which is to function by explosion, i.e., with substantially instantaneous release of gas and heat, unless such compound, mixture, or device is otherwise specifically classified by the U.S. Department of Transportation; see 49 CFR chapter I. The term "explosives" shall include all material which is classified as Class A, Class B, and Class C explosives by the U.S. Department of Transportation, and includes, but is not limited to dynamite, black powder, pellet powders, initiating explosives, blasting caps, electric blasting caps, safety fuse, fuse lighters, fuse igniters, squibs, cordeau detonant fuse, instantaneous fuse, igniter cord, igniters, small arms ammunition, small arms ammunition

primers, smokeless propellant, cartridges for propellant-actuated power devices, and cartridges for industrial guns. Commercial explosives are those explosives which are intended to be used in commercial or industrial operations.

Blasting agent is defined as any material or mixture, consisting of a fuel and oxidizer, intended for blasting, not otherwise classified as an explosive and in which none of the ingredients are classified as an explosive, provided that the finished product, as mixed and packaged for use or shipment, cannot be detonated by means of a No. 8 test blasting cap when unconfined.

## **1910.110 - Storage and Handling of Liquefied Petroleum Gases**

**Scope:** This standard provides the requirements for the storage and handling of liquefied petroleum gases.

**Special Requirements:** Design, tests, stamped, markings, instructions, maintenance, training

1910.110(b)(3)(i) - Containers used with systems embodied in paragraphs (d), (e), (g), and (h) of this section, except as provided in paragraphs (e)(3)(iii) and (g)(2)(i) of this section, shall be *designed*, constructed, and *tested* in accordance with the Rules for Construction of Unfired Pressure Vessels, section VIII, Division 1, American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, 1968 edition, which is incorporated by reference as specified in 1910.6 - incorporation by reference.

1910.110(b)(3)(v) - Containers used with systems embodied in paragraphs (b), (d)(3)(iii), and (f) of this section, shall be constructed, *tested*, and *stamped* in accordance with *DOT specifications* effective at the date of their manufacture.

1910.110(b)(5)(i) - *Markings* on containers. Each container covered in paragraph (b)(3)(i) of this section, except as provided in paragraph (b)(3)(iv) of this section shall be *marked* [*Reference paragraphs (b)(5)(i)(a) - (i)*].

1910.110(b)(8)(ix) - All piping, tubing, or hose shall be *tested* after assembly and proved free from leaks at not less than normal operating pressures. After installation, piping and tubing of all domestic and commercial systems shall be *tested* and proved free of leaks using a manometer or equivalent device that will indicate a drop in pressure. *Test* shall not be made with a flame.

1910.110(b)(11)(ii)(c) - Vaporizers of less than 1 quart capacity heated by the ground or surrounding air, need not be equipped with safety relief valves provided that adequate *tests demonstrate* that the assembly is safe without safety relief valves.

[1910.110\(b\)\(11\)\(iii\)](#) - Direct gas-fired vaporizers shall be constructed, *marked*, and installed as follows. [Reference [paragraphs 1910.110\(b\)\(11\)\(iii\)\(a\)\(1\) - \(2\)](#)].

[1910.110\(b\)\(16\)](#) - *Instructions*. Personnel performing installation, removal, operation, and *maintenance work* shall be properly *trained* in such function.

[1910.110\(c\)\(5\)\(ix\)](#) - Containers are permitted to be used temporarily in buildings for *training* purposes related in installation and use of LP-Gas systems, as follows. [Reference [paragraphs \(c\)\(5\)\(ix\)\(a\) - \(b\)](#)].

[1910.110\(d\)\(4\)\(v\)\(a\)](#) - Vaporizers of less than 1 quart total capacity, heated by the ground or the surrounding air, need not be equipped with safety relief valves provided that adequate *tests certified* by any of the *authorities* referred to in [paragraph \(b\)\(2\)](#) of this section, *demonstrate* that the assembly is safe without safety relief valves.

[1910.110\(d\)\(12\)\(i\)](#) - When standard watch service is provided, it shall be extended to the LP-Gas installation and personnel properly *trained*.

[1910.110\(e\)\(5\)\(iv\)\(c\)](#) - In the case of containers used solely in farm tractor service, and charged at a point at least 50 feet from any important building, the fixed liquid-level gaging device may be so constructed that the outward flow of container content exceeds that passed by a No. 54 drill size opening, but in no case shall the flow exceed that passed by a No. 31 drill-size opening. An excess flow valve is not required. Fittings equipped with such restricted drill size opening and container on which they are used shall be *marked* to indicate the size of the opening.

[1910.110\(e\)\(8\)\(iv\)](#) - Each vaporizer shall be permanently *marked* at a visible point. [Reference [paragraphs \(e\)\(8\)\(iv\)\(a\) - \(b\)](#)].

[1910.110\(h\)\(9\)\(vii\)](#) - All piping shall be *tested* after assembly and proved free from leaks at not less than normal operating pressures.

## **1910.111 - Storage and Handling of Anhydrous Ammonia**

**Scope:** This [standard](#) provides the requirements for *the* storage and handling of anhydrous ammonia.

**Special Requirements:** Markings, inspections, nameplates, labels, etched, impressed

[1910.111\(b\)\(3\)\(i\)](#) - *Marking nonrefrigerated containers*. System nameplates, when required, shall be *permanently attached* to the system so as to be readily accessible for *inspection* and shall include *markings* as prescribed in subdivision [\(b\)\(3\)\(ii\)](#) of this subparagraph.

- [1910.111\(b\)\(3\)\(ii\)](#) - Each container or system covered in paragraphs [\(c\)](#), [\(f\)](#), [\(g\)](#), and [\(h\)](#) of this section shall be *marked* as specified in the following.  
[Reference [paragraphs \(b\)\(3\)\(ii\)\(a\) - \(j\)](#)].

[1910.111\(b\)\(4\)](#) - *Marking refrigerated containers*. Each refrigerated container shall be *marked* with *nameplate* on the outer covering in an accessible place as specified in the following. [Reference [paragraphs \(b\)\(4\)\(i\) - \(viii\)](#)].

[1910.111\(b\)\(6\)\(viii\)](#) - All excess flow valves shall be *plainly and permanently marked* with the name or trademark of the manufacturer, the catalog number, and the rated capacity.

[1910.111\(b\)\(8\)\(v\)](#) - On all hose one-half inch outside diameter and larger, used for the transfer of anhydrous ammonia liquid or vapor, there shall be *etched, cast, or impressed at 5-foot intervals* the following *information* [Reference paragraph [\(b\)\(8\)\(v\)](#)].

[1910.111\(b\)\(9\)\(vii\)](#) - Each container safety-relief valve used with systems covered by paragraphs [\(c\)](#), [\(f\)](#), [\(g\)](#), and [\(h\)](#) of this section shall be *plainly and permanently marked with the symbol “NH3” or “AA”*; with the pressure in pounds-per-square-inch gage at which the valve is set to start-to-discharge; with the actual rate of discharge of the valve at its full open position in cubic feet per minute of air at 60 °F. and atmospheric pressure; and with the manufacturer's name and catalog number. Example: “NH3 250-4050 Air” indicates that the valve is suitable for use on an anhydrous ammonia container, is set to start-to-discharge at a pressure of 250 p.s.i.g., and that its rate of discharge at full open position (subdivisions [\(ii\)](#) and [\(iii\)](#) of this subparagraph) is 4,050 cubic feet per minute of air.

[1910.111\(e\)\(1\)](#) - Systems utilizing portable DOT containers. Conformance. Cylinders shall comply with *DOT specifications* and shall be maintained, filled, packaged, *marked, labeled*, and shipped to comply with 49 CFR chapter I and the *marking* requirements set forth in [1910.253\(b\)\(1\)\(ii\)](#) - oxygen-fuel gas welding and cutting.

[1910.111\(g\)\(5\)](#) - *Marking the container*. There shall appear on *each side and on the rear end of the container in letters at least 4 inches high*, the words, “*Caution - Ammonia*” or the container shall be *marked* in accordance with *DOT regulations*.

## **1910.119 - Process Safety Management of Highly Hazardous Chemicals**

**Scope:** This [standard](#) provides the requirements for preventing or minimizing the consequences of catastrophic releases of toxic, reactive, flammable, or explosive chemicals. These releases may result in toxic, fire or explosion hazards.

**Special Requirements:** Information (written), safety performance and programs, team, recommendations, emergency action plan (written), training (document), evaluations, work

practices, documentation, safety rules, inform, explain, instructions, records, procedures (written), inspections (document), safe work practices, advise, reviews, process hazard analysis (written), information, methodologies, schedules, permits (document), updates, incident reports, reviews, audits, communicate, engineering controls, administrative controls, personal protective equipment, consultation, determine, operating procedures (written), agreements, evaluate, prepare, certify, references other standards

1910.119(c)(1) - Employers shall develop a *written plan of action* regarding the implementation of the employee participation required by this paragraph.

1910.119(c)(2) - Employers shall *consult with employees* and their representatives on the conduct and *development of process hazards analyses* and on the *development of the other elements of process safety management* in this standard.

1910.119(c)(3) - Employers shall provide to employees and their representatives access to *process hazard analyses* and to all other *information* required to be developed under this standard.

1910.119(d) - *Process safety information*. In accordance with the schedule set forth in paragraph (e)(1) of this section, the employer shall complete a compilation of *written process safety information* before conducting any process hazard analysis required by the standard. The compilation of *written process safety information* is to enable the employer and the employees involved in operating the process to identify and understand the hazards posed by those processes involving highly hazardous chemicals. This *process safety information* shall include information pertaining to the hazards of the highly hazardous chemicals used or produced by the process, information pertaining to the technology of the process, and information pertaining to the equipment in the process.

1910.119(d)(1) - *Information* pertaining to the hazards of the highly hazardous chemicals in the process. This *information* shall consist of at least the following: [Reference paragraph (d)(1)(i) - (vii)].

1910.119(d)(2) - *Information pertaining to the technology of the process*.  
[Reference paragraph (d)(2)(i) - (ii)].

1910.119(d)(3)(i) - *Information pertaining to the equipment* in the process shall include:  
[Reference paragraph (d)(3)(i)(A) - (H)].

1910.119(e)(1) - The employer shall *perform an initial process hazard analysis* (hazard evaluation) on processes covered by this standard. The *process hazard analysis* shall be appropriate to the complexity of the process and shall identify, evaluate, and control the hazards involved in the process. Employers shall *determine and document* the priority order



for conducting *process hazard analyses* based on a rationale which includes such considerations as extent of the process hazards, number of potentially affected employees, age of the process, and operating history of the process. The *process hazard analysis* shall be conducted as soon as possible, but not later than the following schedule:

[Reference [paragraph \(e\)\(1\)\(i\) - \(v\)](#)].

[1910.119\(e\)\(2\)](#) - The employer shall use one or more of the following *methodologies* that are appropriate to determine and *evaluate the hazards* of the process being analyzed.

[Reference [paragraph \(e\)\(2\)\(i\) - \(vii\)](#)].

[1910.119\(e\)\(3\)](#) - The *process hazard analysis* shall address: [Reference [paragraph \(e\)\(3\)\(i\) - \(vii\)](#)].

[1910.119\(e\)\(4\)](#) - The *process hazard analysis* shall be performed by a *team with expertise in engineering and process operations*, and the team shall include at least *one employee who has experience and knowledge specific to the process* being evaluated. Also, one member of the team must be *knowledgeable in the specific process hazard analysis methodology* being used.

[1910.119\(e\)\(5\)](#) - The employer shall establish a *system* to promptly address the *team's findings and recommendations*; assure that the recommendations are resolved in a timely manner and that the *resolution is documented*; *document* what actions are to be taken; complete actions as soon as possible; develop a written schedule of when these actions are to be *completed*; *communicate* the actions to operating, *maintenance* and other employees whose work assignments are in the process and who may be affected by the *recommendations or actions*.

[1910.119\(e\)\(6\)](#) - At least every *five (5) years* after the completion of the *initial process hazard analysis*, the *process hazard analysis* shall be *updated and revalidated by a team* meeting the requirements in [paragraph \(e\)\(4\)](#) of this section, to assure that the process hazard analysis is consistent with the current process.

[1910.119\(e\)\(7\)](#) - Employers shall *retain process hazards analyses and updates or revalidations* for each process covered by this section, as well as the *documented resolution of recommendations* described in [paragraph \(e\)\(5\)](#) of this section for the life of the process.

[1910.119\(f\)\(1\)](#) - The employer shall *develop and implement written operating procedures* that provide *clear instructions* for safely conducting activities involved in each covered process consistent with the *process safety information* and shall address at least the following elements. [Reference [paragraph \(f\)\(1\)\(i\) - \(iv\)](#)].

1910.119(f)(3) - The *operating procedures* shall be reviewed as often as necessary to assure that they reflect current *operating practice*, including changes that result from changes in process chemicals, technology, and equipment, and changes to facilities. The employer shall *certify annually* that these *operating procedures* are current and accurate.

1910.119(f)(4) - The employer shall *develop and implement safe work practices* to provide for the control of hazards during operations such as *lockout/tagout; confined space entry*; opening process equipment or piping; and control over entrance into a facility by maintenance, contractor, laboratory, or other support personnel. These *safe work practices* shall apply to employees and contractor employees.

1910.119(g)(1)(i) - Each employee presently involved in *operating a process*, and each employee before being involved in operating a newly assigned process, shall be *trained* in an overview of the process and in the *operating procedures* as specified in paragraph (f) of this section. The training shall include emphasis on the specific safety and health hazards, emergency operations including shutdown, and safe work practices applicable to the employee's job tasks.

1910.119(g)(1)(ii) - In lieu of *initial training* for those employees already involved in operating a process on May 26, 1992, an employer may *certify in writing* that the employee has the *required knowledge, skills, and abilities* to safely carry out the duties and responsibilities as specified in the *operating procedures*.

1910.119(g)(2) - *Refresher training*. *Refresher training* shall be provided at least every *three years*, and more often if necessary, to each employee involved in operating a process to assure that the employee understands and adheres to the *current operating procedures* of the process. The employer, in *consultation* with the employees involved in operating the process, shall *determine* the appropriate *frequency of refresher training*.

1910.119(g)(3) - *Training documentation*. The employer shall ascertain that each employee involved in operating a process has received and understood the *training* required by this paragraph. The employer shall prepare a *record* which contains the identity of the employee, the date of training, and the means used to *verify* that the employee *understood the training*.

1910.119(h)(2) - Employer responsibilities.

- 1910.119(h)(2)(i) - The employer, when selecting a contractor, shall *obtain and evaluate information* regarding the contract employer's *safety performance and programs*.

- [1910.119\(h\)\(2\)\(ii\)](#) - The employer shall *inform contract employers* of the known potential fire, explosion, or toxic release hazards related to the contractor's work and the process.
- [1910.119\(h\)\(2\)\(iii\)](#) - The employer shall *explain to contract employers* the applicable provisions of the *emergency action plan* required by [paragraph \(n\)](#) of this section.
- [1910.119\(h\)\(2\)\(iv\)](#) - The employer shall *develop and implement safe work practices* consistent with [paragraph \(f\)\(4\)](#) of this section, to control the entrance, presence and exit of contract employers and contract employees in covered process areas.
- [1910.119\(h\)\(2\)\(v\)](#) - The employer shall *periodically evaluate the performance* of contract employers in fulfilling their obligations as specified in [paragraph \(h\)\(3\)](#) of this section.
- [1910.119\(h\)\(2\)\(vi\)](#) - The employer shall *maintain a contract employee injury and illness log* related to the contractor's work in process areas.

[1910.119\(h\)\(3\)](#) - Contract employer responsibilities.

- [1910.119\(h\)\(3\)\(i\)](#) - The contract employer shall assure that each contract employee is *trained* in the *work practices* necessary to safely perform his/her job.
- [1910.119\(h\)\(3\)\(ii\)](#) - The contract employer shall assure that each contract employee is *instructed* in the known potential fire, explosion, or toxic release hazards related to his/her job and the process, and the applicable provisions of the *emergency action plan*.
- [1910.119\(h\)\(3\)\(iii\)](#) - The contract employer shall *document* that each contract employee *has received and understood the training* required by this paragraph. The contract employer shall *prepare a record* which contains the identity of the contract employee, the date of training, and the means used to *verify* that the *employee understood the training*.
- [1910.119\(h\)\(3\)\(iv\)](#) - The contract employer shall assure that each contract employee follows the *safety rules* of the facility including the *safe work practices* required by [paragraph \(f\)\(4\)](#) of this section.
- [1910.119\(h\)\(3\)\(v\)](#) - The contract employer shall *advise the employer* of any unique hazards presented by the contract employer's work, or of any hazards found by the contract employer's work.

1910.119(i)(1) - *Pre-startup safety review*. The employer shall perform a *pre-startup safety review* for new facilities and for modified facilities when the modification is significant enough to require a change in the process safety information.

1910.119(i)(2) - The *pre-startup safety review* shall confirm that prior to the introduction of highly hazardous chemicals to a process:

- 1910.119(i)(2)(i) - Construction and equipment is in accordance with *design specifications*;
- 1910.119(i)(2)(ii) - *Safety, operating, maintenance, and emergency procedures* are in place and are adequate;
- 1910.119(i)(2)(iii) - For new facilities, a *process hazard analysis* has been performed and recommendations have been resolved or implemented before startup; and modified facilities meet the requirements contained in management of change, paragraph (l).
- 1910.119(i)(2)(iv) - *Training* of each employee involved in operating a process has been completed.

1910.119(j)(2) - *Written procedures*. The employer shall establish and implement *written procedures* to maintain the on-going integrity of process equipment.

1910.119(j)(3) - *Training for process maintenance activities*. The employer shall *train* each employee involved in maintaining the on-going integrity of process equipment in an overview of that process and its hazards and in the procedures applicable to the employee's job tasks to assure that the employee can perform the job tasks in a safe manner.

1910.119(j)(4) - *Inspection and testing*.

- 1910.119(j)(4)(i) - *Inspections and tests* shall be performed on process equipment.
- 1910.119(j)(4)(ii) - *Inspection and testing procedures* shall follow recognized and generally accepted good *engineering practices*.
- 1910.119(j)(4)(iii) - The *frequency of inspections and tests* of process equipment shall be consistent with applicable *manufacturers' recommendations* and good *engineering practices*, and more frequently if determined to be necessary by prior operating experience.
- 1910.119(j)(4)(iv) - The employer shall *document* each *inspection* and *test* that has been performed on process equipment. The *documentation* shall identify the date of the *inspection or test*, the name of the person who performed the *inspection or*

test, the serial number or other identifier of the equipment on which the *inspection or test* was performed, a description of the *inspection or test* performed, and the results of the *inspection or test*.

1910.119(j)(6)(ii) - Appropriate *checks and inspections* shall be performed to assure that equipment is installed properly and consistent with *design specifications* and the *manufacturer's instructions*.

1910.119(k) - *Hot work permits*

- 1910.119(k)(1) - The employer shall issue a *hot work permit* for hot work operations conducted on or near a covered process.
- 1910.119(k)(2) - The *permit* shall *document* that the fire prevention and protection requirements in 29 CFR 1910.252(a) - welding, cutting and brazing, general requirements, have been implemented prior to beginning the *hot work operations*; it shall indicate the date(s) authorized for hot work; and identify the object on which hot work is to be performed. The *permit* shall be kept on *file* until completion of the *hot work operations*.

1910.119(l)(1) - The employer shall *establish* and implement *written procedures* to manage changes (except for "replacements in kind") to process chemicals, technology, equipment, and *procedures*; and, changes to facilities that affect a covered process.

1910.119(l)(2) - The *procedures* shall assure that the following considerations are addressed prior to any change.

- 1910.119(l)(2)(iii) - Modifications to *operating procedures*;

1910.119(l)(3) - Employees involved in operating a process and maintenance and contract employees whose job tasks will be affected by a change in the process shall be *informed* of, and *trained* in, the change prior to start-up of the process or affected part of the process.

1910.119(l)(4) - If a change covered by this paragraph results in a change in the *process safety information* required by paragraph (d) of this section, such *information* shall be *updated* accordingly.

1910.119(l)(5) - If a change covered by this paragraph results in a change in the *operating procedures or practices* required by paragraph (f) of this section, such *procedures or practices* shall be *updated* accordingly.

1910.119(m)(1) - The employer shall *investigate* each incident which resulted in, or could reasonably have resulted in a catastrophic release of highly hazardous chemical in the workplace.

1910.119(m)(2) - An *incident investigation* shall be initiated as promptly as possible, but not later than 48 hours following the incident.

1910.119(m)(3) - An *incident investigation team* shall be *established* and consist of at least one *person knowledgeable* in the process involved, including a contract employee if the incident involved work of the contractor, and other persons with *appropriate knowledge and experience* to thoroughly *investigate* and analyze the incident.

1910.119(m)(4) - A *report* shall be *prepared* at the *conclusion of the investigation* which includes at a minimum [Reference paragraphs (m)(4)(i) - (v)].

1910.119(m)(5) - The employer shall establish a *system* to promptly address and resolve the incident report *findings* and *recommendations*. Resolutions and corrective actions shall be *documented*.

1910.119(m)(6) - The *report* shall be *reviewed* with all affected personnel whose job tasks are relevant to the incident findings including contract employees where applicable.

1910.119(m)(7) - *Incident investigation reports* shall be *retained* for five years.

1910.119(n) - *Emergency planning and response*. The employer shall *establish* and implement an *emergency action plan* for the entire plant in accordance with the provisions of 29 CFR 1910.38 - emergency action plans. In addition, the *emergency action plan* shall include *procedures* for handling small releases. Employers covered under this standard may also be subject to the hazardous waste and emergency response provisions contained in 29 CFR 1910.120 - hazardous waste operations and emergency response, (a) - clean-up operations, (p) - treatment, storage and disposal (TSD), and (q) - emergency response operations.

1910.119(o) - *Compliance Audits*.

- 1910.119(o)(1) - Employers shall *certify* that they have *evaluated* compliance with the provisions of this section at least *every three years* to verify that the *procedures and practices developed* under the standard are adequate and are being followed.
- 1910.119(o)(2) - The compliance *audit* shall be *conducted* by at least one *person knowledgeable* in the process.
- 1910.119(o)(3) - A *report* of the findings of the *audit* shall be *developed*.
- 1910.119(o)(4) - The employer shall promptly determine and *document* an appropriate response to each of the findings of the compliance *audit*, and *document* that deficiencies have been corrected.



- [1910.119\(o\)\(5\)](#) - Employers shall *retain the two (2) most recent compliance audit reports*.

[1910.119\(p\)](#) - *Trade secrets*.

- [1910.119\(p\)\(1\)](#) - Employers shall make all *information* necessary to comply with the section available to those *persons responsible* for compiling the *process safety information* (required by [paragraph \(d\)](#) of this section), those assisting in the development of the *process hazard analysis* (required by [paragraph \(e\)](#) of this section), those responsible for developing the *operating procedures* (required by [paragraph \(f\)](#) of this section), and those involved in incident *investigations* (required by [paragraph \(m\)](#) of this section), emergency planning and response ([paragraph \(n\)](#) of this section) and compliance *audits* ([paragraph \(o\)](#) of this section) without regard to possible trade secret status of such *information*.
- [1910.119\(p\)\(2\)](#) - Nothing in this paragraph shall preclude the employer from requiring the persons to whom the *information* is made available under [paragraph \(p\)\(1\)](#) of this section to enter into *confidentiality agreements* not to disclose the *information* as set forth in [29 CFR 1910.1200](#) - hazard communication.
- [1910.119\(p\)\(3\)](#) - Subject to the *rules and procedures* set forth in [29 CFR 1910.1200\(i\)\(1\)](#) through 1910.1200(i)(12), employees and their designated representatives shall have access to *trade secret information* contained within the process hazard analysis and other *documents* required to be developed by this standard.

[Highly hazardous chemical](#) means a substance possessing toxic, reactive, flammable, or explosive properties.

[Normally unoccupied remote facility](#) means a facility which is operated, maintained or serviced by employees who visit the facility only periodically to check its operation and to perform necessary operating or maintenance tasks. No employees are permanently stationed at the facility. Facilities meeting this definition are not contiguous with, and must be geographically remote from all other buildings, processes or persons.

[Process](#) means any activity involving a highly hazardous chemical including any use, storage, manufacturing, handling, or the on-site movement of such chemicals, or combination of these activities. For purposes of this definition, any group of vessels which are interconnected and separate vessels which are located such that a highly hazardous chemical could be involved in a potential release shall be considered a single process.

## 1910.120 - Hazardous Waste Operations and Emergency Response

**Scope:** This [standard](#) provides the requirements for clean-up operations by an employer [[paragraph \(b\) - \(o\)](#)]; treatment, storage and disposal [[paragraph \(p\)](#)]; and emergency response when dealing with hazardous waste [[paragraph \(q\)](#)].

[Clean-up operation](#) means an operation where hazardous substances are removed, contained, incinerated, neutralized, stabilized, cleared-up, or in any other manner processed or handled with the ultimate goal of making the site safer for people or the environment.

[Emergency response or responding to emergencies](#) means a response effort by employees from outside the immediate release area or by other designated responders (i.e., mutual aid groups, local fire departments, etc.) to an occurrence which results, or is likely to result, in an uncontrolled release of a hazardous substance. **Note:** *Responses to incidental releases of hazardous substances where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area, or by maintenance personnel are not considered to be emergency responses within the scope of this standard. Responses to releases of hazardous substances where there is no potential safety or health hazard (i.e., fire, explosion, or chemical exposure) are not considered to be emergency responses.*

**Special Requirements:** Safety and health program (written), site safety and health plan, informational program, employee alarm system, spill containment program, personal protective equipment program (written, personal protective equipment, air monitoring program, site control program, emergency response plan (written), emergency incident procedures, medical surveillance program, training, inform, procedures, reviews, updates, workplan, organizational structure, engineering controls, plans, briefings, surveys, evaluations, air monitoring, information, certification, written certificates, qualifications, new technology programs, techniques, field experience, copies, instructors, alerting, practices, competent, doffing procedures, work history, physician, operations, credentials, techniques, published exposure levels, inspections, informational programs, respirators, decontamination procedures, training program, standard operating procedures, decontamination program, briefings, training course, new technology program, material handling program, hazard communication program, labels, competent skills, HazMat team, records, references other standards

### Clean-Up Operations

[1910.120\(b\)\(1\)\(i\)](#) - Employers shall *develop* and implement a *written safety and health program* for their employees involved in hazardous waste operations.

The *program* shall be designed to identify, *evaluate*, and control safety and health hazards, and provide for *emergency response for hazardous waste operations*.

1910.120(b)(1)(ii) - The *written safety and health program* shall incorporate the following. [Reference paragraphs (b)(1)(ii)(A) - (G)].

1910.120(b)(1)(iv) - Contractors and sub-contractors. An employer who retains contractor or sub-contractor services for work in hazardous waste *operations* shall *inform* those contractors, sub-contractors, or their representatives of the site emergency response *procedures* and any potential fire, explosion, health, safety or other hazards of the hazardous waste *operation* that have been identified by the employer, including those identified in the *employer's information program*.

1910.120(b)(1)(v) - *Program availability*. The *written safety and health program* shall be made *available* to any contractor or subcontractor or their representative who will be involved with the hazardous waste operation; to employees; to employee designated representatives; to OSHA personnel, and to personnel of other Federal, state, or local agencies with regulatory authority over the site.

1910.120(b)(2)(i) - The *organizational structure part of the program* shall establish the specific *chain of command* and specify the overall *responsibilities of supervisors and employees*. It shall include, at a minimum, the following *elements*. [Reference paragraphs (b)(2)(i)(A) - (D)].

1910.120(b)(2)(ii) - The *organizational structure* shall be *reviewed and updated* as necessary to reflect the current status of waste site operations.

1910.120(b)(3) - *Comprehensive workplan part of the site program (i.e.; informational programs; medical surveillance program)*. The *comprehensive workplan part of the program* shall address the tasks and objectives of the *site operations* and the logistics and *resources* required to reach those tasks and objectives. [Reference paragraphs (b)(3)(i) - (vi)].

1910.120(b)(4)(i) - General. The site safety and health *plan*, which must be *kept* on site, shall address the safety and health hazards of each phase of site operation and include the requirements and *procedures* for employee protection.

1910.120(b)(4)(ii) - Elements. The *site safety and health plan (i.e.; PPE program; site control program; spill containment program; emergency response plan)*, as a minimum, shall address the following. [Reference paragraphs (b)(4)(ii)(A) - (J)].

1910.120(b)(4)(iii) - *Pre-entry briefing*. The *site specific safety and health plan* shall provide for *pre-entry briefings* to be *held prior to initiating any site activity*, and at such other times

as necessary to ensure that employees are apprised of the *site safety and health plan* and that this *plan* is being followed. The *information* and *data* obtained from site characterization and analysis work required in [paragraph \(c\)](#) of this section shall be used to *prepare* and *update* the *site safety and health plan*.

[1910.120\(b\)\(4\)\(iv\)](#) - Effectiveness of *site safety and health plan*. *Inspections* shall be conducted by the *site safety and health supervisor* or, in the absence of that individual, another individual who is knowledgeable in occupational safety and health, acting on behalf of the employer as necessary to determine the effectiveness of the *site safety and health plan*. Any deficiencies in the effectiveness of the *site safety and health plan* shall be corrected by the employer.

[1910.120\(c\)\(1\)](#) - General. Hazardous waste sites shall be *evaluated* in accordance with this paragraph to identify specific site hazards and to determine the appropriate *safety and health control procedures* needed to protect employees from the identified hazards.

[1910.120\(c\)\(2\)](#) - Preliminary *evaluation*. A *preliminary evaluation* of a site's characteristics shall be *performed prior to site entry* by a *qualified person* in order to aid in the selection of appropriate employee *protection methods* prior to site entry. *Immediately after initial site entry*, a more *detailed evaluation* of the site's specific characteristics shall be *performed by a qualified person* in order to further identify existing site hazards and to further aid in the selection of the appropriate *engineering controls* and *personal protective equipment* for the tasks to be performed.

[1910.120\(c\)\(3\)](#) - *Hazard identification*. All suspected conditions that may pose inhalation or skin absorption hazards that are immediately dangerous to life or health (IDLH), or other conditions that may cause death or serious harm, shall be identified during the *preliminary survey* and *evaluated* during the *detailed survey*. Examples of such hazards include, but are not limited to, confined space entry, potentially explosive or flammable situations, visible vapor clouds, or areas where biological indicators such as dead animals or vegetation are located.

[1910.120\(c\)\(4\)](#) - Required *information*. The following *information* to the extent available shall be *obtained* by the employer *prior* to allowing employees to enter a site.

[Reference [paragraphs \(c\)\(4\)\(i\) - \(viii\)](#)].

[1910.120\(c\)\(5\)](#) - *Personal protective equipment*. *Personal protective equipment (PPE)* shall be provided and used during initial site entry in accordance with the following requirements:

- [1910.120\(c\)\(5\)\(i\)](#) - Based upon the *results* of the *preliminary site evaluation*, an ensemble of *PPE* shall be selected and used *during initial site entry* which will provide protection to a level of exposure below permissible exposure limits and

published exposure levels for known or suspected hazardous substances and health hazards, and which will provide protection against other known and suspected hazards identified during the *preliminary site evaluation*. If there is no permissible exposure limit or published exposure level, the employer may use other *published studies and information* as a guide to appropriate *personal protective equipment*.

- [1910.120\(c\)\(5\)\(ii\)](#) - If positive-pressure self-contained breathing apparatus is not used as part of the entry ensemble, and if *respiratory protection* is warranted by the potential hazards *identified* during the *preliminary site evaluation*, an escape self-contained breathing apparatus of at least five minute's duration shall be carried by employees *during initial site entry*.
- [1910.120\(c\)\(5\)\(iii\)](#) - If the *preliminary site evaluation* does not produce sufficient information to identify the hazards or suspected hazards of the site, an ensemble providing protection equivalent to Level B *PPE* shall be provided as minimum protection, and direct reading instruments shall be used as appropriate for identifying IDLH conditions. (See [appendix B](#) for a description of Level B hazards and the recommendations for Level B protective equipment.)

[1910.120\(c\)\(6\)](#) - *Monitoring*. The following *monitoring (air monitoring program)* shall be conducted *during initial site entry* when the *site evaluation* produces information that shows the potential for ionizing radiation or IDLH conditions, or when the *site information* is not sufficient reasonably to eliminate these possible conditions [Reference [paragraphs \(c\)\(6\)\(i\) - \(iv\)](#)].

[1910.120\(c\)\(7\)](#) - *Risk identification*. Once the presence and concentrations of specific hazardous substances and health hazards have been established, the risks associated with these substances shall be identified. Employees who will be working on the site shall be *informed* of any risks that have been identified. In situations covered by the *Hazard Communication Standard*, [29 CFR 1910.1200](#), *training* required by that standard need not be duplicated.

[1910.120\(c\)\(8\)](#) - *Employee notification*. Any *information* concerning the chemical, physical, and toxicologic properties of each substance known or expected to be present on site that is available to the employer and relevant to the duties an employee is expected to perform shall be made *available* to the *affected employees prior to the commencement* of their work activities. The employer may utilize *information* developed for the *Hazard Communication Standard*, [29 CFR 1910.1200](#) for this purpose.

1910.120(d)(1) - General. Appropriate *site control procedures* shall be implemented to control employee exposure to hazardous substances before clean-up work begins.

1910.120(d)(2) - *Site control program*. A *site control program* for protecting employees which is part of the employer's *site safety and health program* required in paragraph (b) of this section shall be *developed* during the planning stages of a *hazardous waste clean-up operation* and modified as necessary as new *information* becomes available.

1910.120(d)(3) - Elements of the *site control program*. The *site control program* shall, as a minimum, include: A *site map*; *site work zones*; the use of a "buddy system"; *site communications* including *alerting* means for emergencies; the *standard operating procedures* or *safe work practices*; and, identification of the nearest medical assistance. Where these requirements are covered elsewhere they need not be repeated.

1910.120(e)(1)(i) - All employees working on site (such as but not limited to equipment operators, general laborers and others) exposed to hazardous substances, health hazards, or safety hazards and their supervisors and management responsible for the site shall receive *training* meeting the requirements of this paragraph before they are permitted to engage in hazardous waste operations that could expose them to hazardous substances, safety, or health hazards, and they shall receive review *training* as specified in this paragraph.

1910.120(e)(1)(ii) - Employees shall not be permitted to participate in or supervise field activities until they have been *trained* to a *level* required by their job function and responsibility.

1910.120(e)(2) - Elements to be covered. The *training* shall thoroughly cover the following. [Reference paragraphs (e)(2)(i) - (vii)].

1910.120(e)(3)(i) - General site workers (such as equipment operators, general laborers and supervisory personnel) engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances and health hazards shall receive a minimum of *40 hours of instruction* off the site, and a *minimum of three days actual field experience* under the *direct supervision of a trained, experienced supervisor*.

1910.120(e)(3)(ii) - Workers on site only occasionally for a specific limited task (such as, but not limited to, ground water monitoring, land surveying, or geo-physical surveying) and who are unlikely to be exposed over permissible exposure limits and published exposure limits shall receive a *minimum of 24 hours of instruction* off the site, and the *minimum of one day actual field experience* under the *direct supervision of a trained, experienced supervisor*.



[1910.120\(e\)\(3\)\(iii\)](#) - Workers regularly on site who work in areas which have been monitored and fully characterized indicating that exposures are under permissible exposure limits and published exposure limits where respirators are not necessary, and the characterization indicates that there are no health hazards or the possibility of an emergency developing, shall receive a minimum of *24 hours of instruction* off the site and the *minimum of one day actual field experience* under the *direct supervision of a trained, experienced supervisor*.

[1910.120\(e\)\(3\)\(iv\)](#) - Workers with *24 hours of training* who are covered by [paragraphs \(e\)\(3\)\(ii\)](#) and [\(e\)\(3\)\(iii\)](#) of this section, and who become general site workers or who are required to wear respirators, shall have the *additional 16 hours and two days of training* necessary to total the *training* specified in [paragraph \(e\)\(3\)\(i\)](#).

[1910.120\(e\)\(4\)](#) - *Management and supervisor training*. On-site management and supervisors directly responsible for, or who supervise employees engaged in, hazardous waste operations shall receive *40 hours initial training*, and *three days of supervised field experience* (the *training may be reduced to 24 hours and one day* if the only area of their responsibility is employees covered by [paragraphs \(e\)\(3\)\(ii\)](#) and [\(e\)\(3\)\(iii\)](#) and at least *eight additional hours of specialized training* at the time of job assignment on such topics as, but not limited to, the employer's *safety and health program* and the associated *employee training program, personal protective equipment program, spill containment program, and health hazard monitoring procedure and techniques*.

[1910.120\(e\)\(5\)](#) - *Qualifications for trainers*. Trainers shall be *qualified to instruct* employees about the subject matter that is being presented in *training*. Such *trainers* shall have satisfactorily completed a *training program* for teaching the subjects they are expected to teach, or they shall have the *academic credentials and instructional experience* necessary for teaching the subjects. *Instructors* shall *demonstrate competent instructional skills and knowledge* of the applicable subject matter.

[1910.120\(e\)\(6\)](#) - *Training certification*. Employees and supervisors that have received and successfully completed the *training and field experience* specified in [paragraphs \(e\)\(1\) through \(e\)\(4\)](#) of this section shall be *certified* by their *instructor or the head instructor* and *trained supervisor* as having successfully completed the necessary *training*. A *written certificate* shall be given to each person so *certified*. Any person who has not been so *certified* or who does not meet the requirements of [paragraph \(e\)\(9\)](#) of this section shall be prohibited from engaging in hazardous waste *operations*.

[1910.120\(e\)\(7\)](#) - *Emergency response*. Employees who are engaged in responding to hazardous emergency situations at hazardous waste clean-up sites that may expose them to hazardous substances shall be *trained* in how to respond to such expected emergencies.

[1910.120\(e\)\(8\)](#) - *Refresher training*. Employees specified in [paragraph \(e\)\(1\)](#) of this section, and managers and supervisors specified in [paragraph \(e\)\(4\)](#) of this section, shall receive *eight hours of refresher training* annually on the items specified in [paragraph \(e\)\(2\)](#) and/or [\(e\)\(4\)](#) of this section, any critique of incidents that have occurred in the past year that can serve as *training* examples of related work, and other relevant topics.

[1910.120\(e\)\(9\)](#) - *Equivalent training*. Employers who can show by *documentation or certification* that an employee's work experience and/or *training* has resulted in *training* equivalent to that *training* required in [paragraphs \(e\)\(1\) through \(e\)\(4\)](#) of this section shall not be required to provide the *initial training* requirements of those paragraphs to such employees and shall provide a *copy of the certification or documentation* to the employee upon request. However, *certified employees* or employees with *equivalent training* new to a site shall receive appropriate, *site specific training* before site entry and have appropriate *supervised field experience* at the new site. Equivalent *training* includes any *academic training* or the *training* that existing employees might have already received from actual hazardous waste site work experience.

[1910.120\(f\)\(1\)](#) - Medical surveillance. General. Employers engaged in operations specified in [paragraphs \(a\)\(1\)\(i\) through \(a\)\(1\)\(iv\)](#) of this section and not covered by [\(a\)\(2\)\(iii\)](#) exceptions and employers of employees specified in [paragraph \(q\)\(9\)](#) shall institute a *medical surveillance program* in accordance with this paragraph.

[1910.120\(f\)\(2\)](#) - Employees covered. The *medical surveillance program* shall be instituted by the employer for the following employees [Reference [paragraphs \(f\)\(2\)\(i\) - \(iv\)](#)].

[1910.120\(f\)\(3\)\(i\)](#) - For employees covered under [paragraph \(f\)\(2\)\(iii\)](#) and for all employees including those of employers covered by [paragraph \(a\)\(1\)\(v\)](#) who may have been injured, received a health impairment, developed signs or symptoms which may have resulted from exposure to hazardous substances resulting from an emergency incident, or exposed during an emergency incident to hazardous substances at concentrations above the permissible exposure limits or the published exposure levels without the necessary *personal protective equipment* being used: {Reference [paragraph \(f\)\(3\)\(i\)\(A\) - \(D\)](#)}.

[1910.120\(f\)\(4\)\(i\)](#) - Medical examinations required by [paragraph \(f\)\(3\)](#) of this section shall include a medical and work history (or updated history if one is in the employee's file) with special emphasis on symptoms related to the handling of hazardous substances and health hazards, and to fitness for duty including the ability to wear any required *PPE* under conditions (i.e., temperature extremes) that may be expected at the work site.

[1910.120\(f\)\(4\)\(ii\)](#) - The content of medical examinations or consultations made available to employees pursuant to [paragraph \(f\)](#) shall be determined by the attending physician. The

guidelines in the *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* (See [appendix D](#), Reference #10) should be consulted.

[1910.120\(f\)\(5\)](#) - Examination by a *physician* and costs. All medical examinations and *procedures* shall be performed by or under the *supervision of a licensed physician*, preferably one knowledgeable in occupational medicine, and shall be provided without cost to the employee, without loss of pay, and at a reasonable time and place.

[1910.120\(f\)\(6\)](#) - *Information provided to the physician*. The employer shall provide one *copy of this standard and its appendices* to the attending physician, and in addition the following for each employee: [Reference [paragraph \(f\)\(6\)\(i\) - \(v\)](#)].

[1910.120\(f\)\(7\)](#) - *Physician's written opinion*. [Reference [paragraph \(f\)\(7\)\(i\) - \(ii\)](#)].

[1910.120\(f\)\(8\)\(i\)](#) - An accurate *record* of the medical surveillance required by [paragraph \(f\)](#) of this section shall be *retained*. This *record* shall be *retained* for the period specified and meet the criteria of [29 CFR 1910.1020](#) - *access to employee exposure and medical records*.

[1910.120\(f\)\(8\)\(ii\)](#) - The *record* required in [paragraph \(f\)\(8\)\(i\)](#) of this section shall include at least the following *information*: [Reference [paragraph \(f\)\(8\)\(ii\)\(A\) - \(D\)](#)].

[1910.120\(g\)](#) - *Engineering controls, work practices, and personal protective equipment for employee protection*. *Engineering controls, work practices, personal protective equipment*, or a combination of these shall be implemented in accordance with this paragraph to protect employees from exposure to hazardous substances and safety and health hazards.

- [1910.120\(g\)\(1\)](#) - *Engineering controls, work practices and PPE* for substances regulated in [subpart G](#) - *occupational health and environmental control* and [subpart Z](#) - *toxic and hazardous substances*. [Reference [paragraph \(g\)\(1\)\(i\) - \(iv\)](#)].

[1910.120\(g\)\(3\)](#) - *Personal protective equipment selection*. [Reference [paragraph \(g\)\(3\)\(i\) - \(vi\)](#)].

[1910.120\(g\)\(4\)](#) - *Totally-encapsulating chemical protective suits*.

[1910.120\(g\)\(5\)](#) - *Personal protective equipment (PPE) program*. A written *personal protective equipment program*, which is part of the employer's *safety and health program* required in [paragraph \(b\)](#) of this section or required in [paragraph \(p\)\(1\)](#) of this section and which is also a part of the *site-specific safety and health plan* shall be established. The *PPE program* shall address the elements listed below. When elements, such as *donning and doffing procedures*, are provided by the manufacturer of a piece of equipment and are attached to the *plan*, they need not be rewritten into the *plan* as long as they adequately address the procedure or element. [Reference [paragraph \(g\)\(5\)\(i\) - \(x\)](#)].

[1910.120\(h\)\(1\)\(i\)](#) - *Monitoring* shall be performed in accordance with this paragraph where there may be a question of employee exposure to hazardous concentrations of hazardous substances in order to assure proper selection of *engineering controls, work practices and personal protective equipment* so that employees are not exposed to levels which exceed permissible exposure limits, or *published exposure levels* if there are no permissible exposure limits, for hazardous substances.

[1910.120\(h\)\(1\)\(ii\)](#) - *Air monitoring* shall be used to identify and quantify airborne levels of hazardous substances and safety and health hazards in order to determine the appropriate level of *employee protection* needed on site.

[1910.120\(h\)\(2\)](#) - Initial entry. Upon initial entry, representative *air monitoring* shall be conducted to identify any IDLH condition, exposure over permissible exposure limits or published exposure levels, exposure over a radioactive material's dose limits or other dangerous condition such as the presence of flammable atmospheres or oxygen-deficient environments.

[1910.120\(h\)\(3\)](#) - *Periodic monitoring*. Periodic monitoring shall be conducted when the possibility of an IDLH condition or flammable atmosphere has developed or when there is indication that exposures may have risen over permissible exposure limits or *published exposure levels* since *prior monitoring*. Situations where it shall be considered whether the possibility that exposures have risen are as follows: [Reference [paragraph \(h\)\(3\)\(i\) - \(iv\)](#)].

[1910.120\(h\)\(4\)](#) - *Monitoring of high-risk employees*. After the actual clean-up phase of any hazardous waste operation commences; for example, when soil, surface water or containers are moved or disturbed; the employer shall *monitor* those employees likely to have the highest exposures to hazardous substances and health hazards likely to be present above permissible exposure limits or *published exposure levels* by using *personal sampling frequently* enough to characterize employee exposures. If the employees likely to have the highest exposure are over permissible exposure limits or *published exposure limits*, then *monitoring* shall continue to determine all employees likely to be above those limits. The employer may utilize a representative *sampling approach* by documenting that the employees and chemicals chosen for *monitoring* are based on the criteria stated above.

[1910.120\(i\)](#) - *Informational programs*. Employers shall develop and implement a *program*, which is part of the *employer's safety and health program* required in [paragraph \(b\)](#) of this section, to *inform employees, contractors, and subcontractors* (or their representative) actually engaged in hazardous waste operations of the nature, level and degree of exposure likely as a result of participation in such hazardous waste operations.

Employees, contractors and subcontractors working outside of the operations part of a site are not covered by this standard.

[1910.120\(j\)\(1\)\(ii\)](#) - Drums and containers used during the clean-up shall meet the appropriate *DOT, OSHA, and EPA regulations* for the wastes that they contain.

[1910.120\(j\)\(1\)\(iii\)](#) - When practical, drums and containers shall be *inspected* and their integrity shall be assured prior to being moved. Drums or containers that cannot be *inspected* before being moved because of storage conditions (i.e., buried beneath the earth, stacked behind other drums, stacked several tiers high in a pile, etc.) shall be moved to an accessible location and *inspected prior* to further handling.

[1910.120\(j\)\(1\)\(iv\)](#) - *Unlabeled* drums and containers shall be considered to contain hazardous substances and handled accordingly until the contents are positively identified and *labeled*.

[1910.120\(j\)\(1\)\(vi\)](#) - Prior to movement of drums or containers, all employees exposed to the transfer operation shall be *warned* of the potential hazards associated with the contents of the drums or containers.

[1910.120\(j\)\(1\)\(viii\)](#) - Where major spills may occur, a *spill containment program*, which is part of the employer's *safety and health program* required in [paragraph \(b\)](#) of this section, shall be implemented to contain and isolate the entire volume of the hazardous substance being transferred.

[1910.120\(j\)\(1\)\(xii\)](#) - Fire extinguishing equipment meeting the requirements of 29 *CFR part 1910, subpart L - fire protection*, shall be on hand and ready for use to control incipient fires.

[1910.120\(j\)\(2\)](#) - Opening drums and containers. The following *procedures* shall be followed in areas where drums or containers are being opened: [Reference [paragraph \(j\)\(2\)\(i\) - \(vii\)](#)].

[1910.120\(j\)\(5\)](#) - Shock sensitive wastes. As a minimum, the following *special precautions* shall be taken when drums and containers containing or suspected of containing shock-sensitive wastes are handled: [Reference [paragraph \(j\)\(5\)\(i\) - \(vi\)](#)].

[1910.120\(j\)\(6\)](#) - Laboratory waste packs. In addition to the requirements of [paragraph \(j\)\(5\)](#) of this section, the following *precautions* shall be taken, as a minimum, in handling laboratory waste packs (lab packs): [Reference [paragraph \(j\)\(6\)\(i\) - \(ii\)](#)].

[1910.120\(j\)\(7\)](#) - *Sampling* of drum and container contents. *Sampling* of containers and drums shall be done in accordance with a *sampling procedure* which is part of the site *safety and health plan* developed for and available to employees and others at the specific worksite.

[1910.120\(j\)\(8\)\(i\)](#) - Drums and containers shall be *identified and classified* prior to packaging for shipment.

[1910.120\(j\)\(9\)](#) - *Tank and vault procedures*. [Reference [paragraph \(j\)\(9\)\(i\) - \(ii\)](#)].

[1910.120\(k\)\(1\)](#) - General. *Procedures* for all phases of decontamination shall be developed and implemented in accordance with this paragraph.

[1910.120\(k\)\(2\)](#) - *Decontamination procedures*. [Reference [paragraph \(k\)\(2\)\(i\) - \(iv\)](#)].

[1910.120\(k\)\(5\)\(i\)](#) - *Protective clothing and equipment* shall be decontaminated, cleaned, laundered, maintained or replaced as needed to maintain their effectiveness.

[1910.120\(k\)\(7\)](#) - Commercial laundries or cleaning establishments. Commercial laundries or cleaning establishments that decontaminate protective clothing or equipment shall be *informed* of the potentially harmful effects of exposures to hazardous substances.

[1910.120\(k\)\(8\)](#) - Showers and change rooms. Where the *decontamination procedure* indicates a need for regular showers and change rooms outside of a contaminated area, they shall be provided and meet the requirements of [29 CFR 1910.141 - sanitation](#). If temperature conditions prevent the effective use of water, then other effective means for cleansing shall be provided and used.

[1910.120\(l\)\(1\)\(i\)](#) - An *emergency response plan* shall be developed and implemented by all employers within the scope of [paragraphs \(a\)\(1\)\(i\)-\(ii\)](#) of this section to handle anticipated emergencies prior to the commencement of hazardous waste operations. The *plan* shall be in *writing* and available for *inspection and copying* by employees, their representatives, OSHA personnel and other governmental agencies with relevant responsibilities.

[1910.120\(l\)\(1\)\(ii\)](#) - Employers who will evacuate their employees from the danger area when an emergency occurs, and who do not permit any of their employees to assist in handling the emergency, are exempt from the requirements of this paragraph if they provide an *emergency action plan* complying with [29 CFR 1910.38 - emergency action plan](#).

[1910.120\(l\)\(2\)](#) - *Elements of an emergency response plan*. The employer shall develop an *emergency response plan* for emergencies which shall address, as a minimum, the following: [Reference [paragraph \(l\)\(2\)\(i\) - \(xi\)](#)].

[1910.120\(l\)\(3\)](#) - *Procedures* for handling emergency incidents. [Reference [paragraph \(l\)\(3\)\(i\) - \(vii\)](#)].

[1910.120\(n\)\(7\)\(i\)](#) - Showers shall be provided and shall meet the requirements of [29 CFR 1910.141\(d\)\(3\) - sanitation](#).



[1910.120\(n\)\(7\)\(ii\)](#) - Change rooms shall be provided and shall meet the requirements of [29 CFR 1910.141\(e\)](#) - *sanitation*. Change rooms shall consist of two separate change areas separated by the shower area required in [paragraph \(n\)\(7\)\(i\)](#) of this section. One change area, with an exit leading off the worksite, shall provide employees with a clean area where they can remove, store, and put on street clothing. The second area, with an exit to the worksite, shall provide employees with an area where they can put on, remove and store work clothing and *personal protective equipment*.

[1910.120\(o\)](#) - *New technology programs*. [Reference [paragraph \(o\)\(1\) - \(2\)](#)].

## **Treatment, Storage and Disposal**

[1910.120\(p\)\(1\)](#) - *Safety and health program*. The employer shall develop and implement a *written safety and health program* for employees involved in hazardous waste operations that shall be available for *inspection* by employees, their representatives and OSHA personnel. The *program* shall be designed to identify, evaluate and control safety and health hazards in their facilities for the purpose of employee protection, to provide for emergency response meeting the requirements of [paragraph \(p\)\(8\)](#) of this section and to address as appropriate *site analysis, engineering controls, maximum exposure limits, hazardous waste handling procedures* and uses of new technologies.

[1910.120\(p\)\(2\)](#) - *Hazard communication program*. The employer shall implement a *hazard communication program* meeting the requirements of [29 CFR 1910.1200](#) as part of the *employer's safety and program*.

[1910.120\(p\)\(3\)](#) - *Medical surveillance program*. The employer shall develop and implement a *medical surveillance program* meeting the requirements of [paragraph \(f\)](#) of this section.

[1910.120\(p\)\(4\)](#) - *Decontamination program*. The employer shall develop and implement a *decontamination procedure* meeting the requirements of [paragraph \(k\)](#) of this section.

[1910.120\(p\)\(5\)](#) - *New technology program*. The employer shall develop and implement *procedures* meeting the requirements of [paragraph \(o\)](#) of this section for introducing new and innovative equipment into the workplace.

[1910.120\(p\)\(6\)](#) - *Material handling program*. Where employees will be handling drums or containers, the employer shall develop and implement *procedures* meeting the requirements of [paragraphs \(j\)\(1\)\(ii\) through \(viii\)](#) and [\(xi\)](#) of this section, as well as [\(j\)\(3\)](#) and [\(j\)\(8\)](#) of this section prior to starting such work.

[1910.120\(p\)\(7\)](#) - *Training program* [Reference [paragraph \(p\)\(7\)\(i\) - \(iii\)](#)].

[1910.120\(p\)\(8\)\(i\)](#) - *Emergency response plan*. An *emergency response plan* shall be developed and implemented by all employers. Such *plans* need not duplicate any of the subjects fully addressed in the employer's contingency planning required by permits, such as those issued by the U.S. Environmental Protection Agency, provided that the *contingency plan* is made part of the *emergency response plan*. The *emergency response plan* shall be a *written portion* of the employer's *safety and health program* required in [paragraph \(p\)\(1\)](#) of this section. Employers who will evacuate their employees from the worksite location when an emergency occurs and who do not permit any of their employees to assist in handling the emergency are exempt from the requirements of [paragraph \(p\)\(8\)](#) if they provide an emergency action plan complying with [29 CFR 1910.38](#) - *emergency action plan*.

[1910.120\(p\)\(8\)\(ii\)](#) - *Elements of an emergency response plan*. The employer shall develop an *emergency response plan* for emergencies which shall address, as a minimum, the following areas to the extent that they are not addressed in any specific *program* required in this paragraph: [Reference [paragraph \(p\)\(8\)\(ii\)\(A\) - \(K\)](#)].

[1910.120\(p\)\(8\)\(iii\)\(A\)](#) - *Training* for emergency response employees shall be completed before they are called upon to perform in real emergencies. Such *training* shall include the elements of the *emergency response plan*, *standard operating procedures* the employer has established for the job, the *personal protective equipment* to be worn and procedures for handling emergency incidents.

[1910.120\(p\)\(8\)\(iii\)\(B\)](#) - Employee members of TSD facility emergency response organizations shall be *trained* to a level of *competence* in the recognition of health and safety hazards to protect themselves and other employees. This would include *training* in the methods used to minimize the risk from safety and health hazards; in the safe use of control equipment; in the selection and use of appropriate *personal protective equipment*; *in the safe operating procedures* to be used at the incident scene; in the techniques of coordination with other employees to minimize risks; in the appropriate response to over exposure from health hazards or injury to themselves and other employees; and in the recognition of subsequent symptoms which may result from over exposures.

[1910.120\(p\)\(8\)\(iii\)\(C\)](#) - The employer shall *certify* that each covered employee has attended and successfully completed the *training* required in [paragraph \(p\)\(8\)\(iii\)](#) of this section, or shall *certify* the employee's *competency at least yearly*. The method used to demonstrate *competency for certification of training* shall be *recorded* and maintained by the employer.

[1910.120\(p\)\(8\)\(iv\)](#) - *Procedures for handling emergency incidents*. [Reference [paragraph \(p\)\(8\)\(iv\)\(A\) - \(F\)](#)].

## Emergency Response

1910.120(q) - Emergency response to hazardous substance releases. This paragraph covers employers whose employees are engaged in emergency response no matter where it occurs except that it does not cover employees engaged in operations specified in paragraphs (a)(1)(i) through (a)(1)(iv) of this section. Those emergency response organizations who have developed and implemented *programs* equivalent to this paragraph for handling releases of hazardous substances pursuant to *section 303 of the Superfund Amendments and Reauthorization Act of 1986 (Emergency Planning and Community Right-to-Know Act of 1986, 42 U.S.C. 11003)* shall be deemed to have met the requirements of this paragraph.

1910.120(q)(1) - *Emergency response plan*. An *emergency response plan* shall be developed and implemented to handle anticipated emergencies prior to the commencement of emergency response operations. The *plan* shall be in *writing and available for inspection and copying* by employees, their representatives and OSHA personnel. Employers who will evacuate their employees from the danger area when an emergency occurs, and who do not permit any of their employees to assist in handling the emergency, are exempt from the requirements of this paragraph if they provide an *emergency action plan* in accordance with 29 CFR 1910.38 - *emergency action plan*.

1910.120(q)(2) - Elements of an *emergency response plan*. The employer shall develop an *emergency response plan* for emergencies which shall address, as a minimum, the following to the extent that they are not addressed elsewhere: [Reference paragraph (q)(2)(i) - (xii)].

1910.120(q)(3) - *Procedures* for handling emergency response. [Reference paragraph (q)(3)(i) - (x)].

1910.120(q)(4) - *Skilled support personnel*. Personnel, not necessarily an employer's own employees, who are skilled in the operation of certain equipment, such as mechanized earth moving or digging equipment or crane and hoisting equipment, and who are needed temporarily to perform immediate emergency support work that cannot reasonably be performed in a timely fashion by an employer's own employees, and who will be or may be exposed to the hazards at an emergency response scene, are not required to meet the *training* required in this paragraph for the employer's regular employees. However, these personnel shall be given an initial briefing at the site prior to their participation in any emergency response. The initial *briefing* shall include instruction in the wearing of appropriate *personal protective equipment*, what chemical hazards are involved, and what duties are to be performed. All other appropriate safety and health precautions provided to

the employer's own employees shall be used to assure the safety and health of these personnel.

1910.120(q)(5) - *Specialist employees*. Employees who, in the course of their regular job duties, work with and are *trained* in the hazards of specific hazardous substances, and who will be called upon to provide technical advice or assistance at a hazardous substance release incident to the *individual in charge*, shall receive *training* or *demonstrate competency* in the area of their specialization *annually*.

1910.120(q)(6) - *Training*. *Training* shall be based on the duties and function to be performed by each responder of an emergency response organization. The skill and knowledge levels required for all new responders, those hired after the effective date of this standard, shall be conveyed to them through *training* before they are permitted to take part in actual emergency operations on an incident. Employees who participate, or are expected to participate, in emergency response, shall be given *training* in accordance with the following paragraphs:

- 1910.120(q)(6)(i) - *First responder awareness level*. *First responders* at the awareness level are individuals who are likely to witness or discover a hazardous substance release and who have been *trained* to initiate an emergency response sequence by notifying the proper authorities of the release. They would take no further action beyond notifying the authorities of the release. First responders at the awareness level shall have sufficient *training* or have had sufficient experience to objectively *demonstrate competency* in the following areas: [Reference paragraph (q)(6)(i)(A) - (F)].

1910.120(q)(6)(ii) - *First responder operations level*. *First responders* at the operations level are individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release. They are *trained* to respond in a defensive fashion without actually trying to stop the release. Their function is to contain the release from a safe distance, keep it from spreading, and prevent exposures. *First responders* at the operational level shall have received at least *eight hours of training* or have had sufficient experience to objectively *demonstrate competency* in the following areas in addition to those listed for the awareness level and the employer shall so certify. [Reference paragraph (q)(6)(ii)(A) - (F)].

- 1910.120(q)(6)(iii) - *Hazardous materials technician*. *Hazardous materials technicians* are individuals who respond to releases or potential releases for the purpose of stopping the release. They assume a more aggressive role than a first

responder at the operations level in that they will approach the point of release in order to plug, patch or otherwise stop the release of a hazardous substance. *Hazardous materials technicians* shall have received at least *24 hours of training* equal to the first responder operations level and in addition have *competency* in the following areas and the employer shall so certify: [Reference [paragraph \(q\)\(6\)\(iii\)\(A\) - \(I\)](#)].

- [1910.120\(q\)\(6\)\(iv\)](#) - *Hazardous materials specialist*. *Hazardous materials specialists* are individuals who respond with and provide support to hazardous materials technicians. Their duties parallel those of the hazardous materials technician, however, those duties require a more directed or specific knowledge of the various substances they may be called upon to contain. The hazardous materials specialist would also act as the site liaison with Federal, state, local and other government authorities in regards to site activities. Hazardous materials specialists shall have received at least *24 hours of training* equal to the technician level and in addition have *competency* in the following areas and the employer shall so certify: [Reference [paragraph \(q\)\(6\)\(iv\)\(A\) - \(I\)](#)].
- [1910.120\(q\)\(6\)\(v\)](#) - *On scene incident commander*. Incident commanders, who will assume control of the incident scene beyond the first responder awareness level, shall receive at least *24 hours of training* equal to the first responder operations level and in addition have *competency* in the following areas and the employer shall so certify: [Reference [paragraph \(q\)\(6\)\(v\)\(A\) - \(F\)](#)].

[1910.120\(q\)\(7\)](#) - *Trainers*. *Trainers* who teach any of the above *training subjects* shall have satisfactorily completed a *training course* for teaching the subjects they are expected to teach, such as the *courses offered by the U.S. National Fire Academy*, or they shall have the training and/or *academic credentials and instructional* experience necessary to *demonstrate competent instructional skills* and a good command of the subject matter of the courses they are to teach.

[1910.120\(q\)\(8\)\(i\)](#) - Those employees who are *trained* in accordance with [paragraph \(q\)\(6\)](#) of this section shall receive *annual refresher training* of sufficient content and duration to maintain their *competencies*, or shall *demonstrate competency* in those areas at least yearly.

[1910.120\(q\)\(8\)\(ii\)](#) - A *statement* shall be made of the *training or competency*, and if a *statement of competency* is made, the employer shall keep a *record* of the methodology used to *demonstrate competency*.

[1910.120\(q\)\(9\)\(i\)](#) - Members of an organized and designated *HAZMAT team and hazardous materials specialists* shall receive a baseline physical examination and be provided with medical surveillance as required in [paragraph \(f\)](#) of this section.

[1910.120\(q\)\(10\)](#) - *Chemical protective clothing. Chemical protective clothing and equipment* to be used by organized and *designated HAZMAT team members*, or to be used by hazardous materials specialists, shall meet the requirements of [paragraphs \(g\)\(3\) through \(5\)](#) of this section.

[1910.120\(q\)\(11\)\(ii\)](#) - Where the clean-up is done on plant property using plant or workplace employees, such employees shall have completed the *training requirements* of the following: [29 CFR 1910.38](#) - *emergency action plan*, [1910.134](#) - *respiratory protection*, [1910.1200](#) - *hazard communication*, and other appropriate *safety and health training* made necessary by the tasks they are expected to perform such as *personal protective equipment and decontamination procedures*. All equipment to be used in the performance of the clean-up work shall be in serviceable condition and shall have been *inspected prior to use*.

## **1910.124 - General Requirements for Dipping and Coating Operations**

**Scope:** This [standard](#) provides the requirements for dipping and coating operations.

**Special Requirements:** Alarm system, first aid procedures, physician's approval, inspections, references other standards

[1910.124\(c\)\(3\)](#) - You must have a *system that sounds an alarm* and automatically shuts down the operation when the vapor concentration for any substance in the exhaust airstream exceeds 25% of its LFL.

[1910.124\(e\)](#) - What requirements must I follow when an employee enters a dip tank? When an employee enters a dip tank, you must meet the entry requirements of [1910.146](#), OSHA's standard for Permit-Required Confined Spaces, as applicable.

[1910.124\(f\)](#) - What *first-aid procedures* must my employees know? Your employees must know the *first-aid procedures* that are appropriate to the dipping or coating hazards to which they are exposed.

[1910.124\(h\)\(1\)](#) - A *physician's approval* before an employee with a sore, burn, or other skin lesion that requires medical treatment works in a vapor area.

[1910.124\(j\)](#) - What must I do to *inspect and maintain my dipping or coating operation*? You must:



- [1910.124\(j\)\(1\)](#) - *Inspect the hoods and ductwork of the ventilation system for corrosion or damage:*
- [1910.124\(j\)\(1\)\(i\)](#) - *At least quarterly during operation; and*
- [1910.124\(j\)\(1\)\(ii\)](#) - *Prior to operation after a prolonged shutdown.*

[1910.124\(j\)\(3\)](#) - *Periodically inspect all dipping and coating equipment, including covers, drains, overflow piping, and electrical and fire-extinguishing systems, and promptly correct any deficiencies.*

[1910.124\(j\)\(4\)](#) - Provide mechanical ventilation or respirators (selected and used as specified in [1910.134](#), OSHA's Respiratory Protection standard) to protect employees in the vapor area from exposure to toxic substances released during welding, burning, or open-flame work.

## **1910.125 - Additional Requirements for Dipping and Coating Operations that use Flammable Liquids or Liquids with Flashpoints Greater than 199.4 °F (93 °C).**

**Scope:** This [standard](#) provides additional requirements for dipping and coating operations that use flammable liquids.

### **Special Requirements: Inspections**

[1910.125\(b\)\(2\)\(ii\)](#) - Piping connections on drains and overflow pipes allow ready access to the interior of the pipe for *inspection* and cleaning.

## **Subpart I - [Personal Protective Equipment](#)**

[Subpart I](#) provides the standards for personal protective equipment for eye and face protection, head protection, foot protection, hand protection, electrical protective devices, respiratory protection and personal fall protection devices.

To learn if subpart I applies to you, go to [Does "Subpart I - Personal Protective Equipment" Apply to You?](#)

## **Special Requirements**

### **1910.132 - General Requirements**

**Scope:** This [standard](#) provides the general requirements for the use and maintenance of personal protective equipment.

**Special Requirements:** Design, hazard assessment, personal protective equipment, affected employee, maintenance, sanitation, evaluate, document, communicate, certification (written), certify, training, references other standards

1910.132(a) - Application. *Protective equipment*, including *personal protective equipment* for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be provided, used, and *maintained* in a sanitary and reliable condition wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.

1910.132(b) - *Employee-owned equipment*. Where employees provide their own *protective equipment*, the employer shall be responsible to assure its adequacy, including proper *maintenance, and sanitation* of such equipment.

1910.132(c) - *Design*. All *personal protective equipment* shall be of *safe design* and construction for the work to be performed.

1910.132(d)(1) - The employer shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of *personal protective equipment (PPE)*. If such hazards are present, or likely to be present, the employer shall:

- 1910.132(d)(1)(i) - Select, and have each *affected employee* use, the *types of PPE* that will protect the affected employee from the hazards identified in the *hazard assessment*;
- 1910.132(d)(1)(ii) - *Communicate selection decisions* to each *affected employee*; and
- 1910.132(d)(1)(iii) - *Select PPE* that properly fits each *affected employee*.

1910.132(d)(2) - The employer shall *verify* that the required *workplace hazard assessment* has been performed through a *written certification* that identifies the workplace *evaluated*; the *person certifying* that the *evaluation* has been performed; the date(s) of the *hazard assessment*; and, which identifies the *document as a certification of hazard assessment*.

1910.132(e) - *Defective and damaged equipment*. Defective or damaged *personal protective equipment* shall not be used.

[1910.132\(f\)\(1\)](#) - The employer shall provide *training* to each employee who is required by this section to use *PPE*. Each such employee shall be *trained* to know at least the following [Reference [paragraph \(f\)\(1\)\(i\) - \(v\)](#)].

[1910.132\(f\)\(2\)](#) - Each *affected employee* shall *demonstrate* an understanding of the *training* specified in [paragraph \(f\)\(1\)](#) of this section, and the ability to use *PPE* properly, before being allowed to perform work requiring the use of *PPE*.

[1910.132\(f\)\(3\)](#) - When the employer has reason to believe that any *affected employee* who has already been *trained* does not have the understanding and skill required by [paragraph \(f\)\(2\)](#) of this section, the employer shall *retrain* each such employee. Circumstances where *retraining* is required include, but are not limited to, situations where:  
[Reference [paragraph \(f\)\(3\)\(i\) - \(iii\)](#)].

[1910.132\(g\)](#) - [Paragraph \(d\)](#) and [paragraph \(f\)](#) of this section apply only to [1910.133](#) - eye and face protection, [1910.135](#) - head protection, [1910.136](#) - foot protection, [1910.138](#) - hand protection, and [1910.140](#) - personal fall protection systems. [Paragraph \(d\)](#) and [paragraph \(f\)](#) of this section do not apply to [1910.134](#) - respiratory protection and [1910.137](#) - electrical protective devices.

[1910.132\(h\)](#) - Payment for *protective equipment*. [Reference [paragraph \(h\)\(1\) - \(6\)](#)].

## **1910.133 - Eye and Face Protection**

**Scope:** This [standard](#) provides the requirements for eye and face protection.

**Special Requirements:** Markings, prescription, eye protection, affected employee, manufacturer identification, listing of shade numbers, employer demonstrates, references other standards

[1910.133\(a\)\(3\)](#) - The employer shall ensure that each *affected employee* who wears prescription lenses while engaged in operations that involve eye hazards wears eye protection that *incorporates the prescription* in its design, or wears eye protection that can be worn over the *prescription lenses* without disturbing the proper position of the prescription lenses or the protective lenses.

[1910.133\(a\)\(4\)](#) - Eye and face *PPE* shall be distinctly *marked* to facilitate *identification of the manufacturer*.

[1910.133\(a\)\(5\)](#) - The employer shall ensure that each affected employee uses equipment with filter lenses that have a *shade number* appropriate for the work being performed for protection from injurious light radiation. The following is a *listing* of appropriate *shade numbers* for various operations.

[1910.133\(b\)\(1\)](#) - *Protective eye and face protection devices* must comply with any of the following *consensus standards* [Reference [paragraph \(b\)\(1\)\(i\) - \(iii\)](#)].

[1910.133\(b\)\(2\)](#) - *Protective eye and face protection devices* that the employer demonstrates are at least as effective as *protective eye and face protection devices* that are constructed in accordance with one of the above *consensus standards* will be deemed to be in compliance with the requirements of this section.

## 1910.134 - Respiratory Protection

**Scope:** This [standard](#) provides the requirements for respiratory protection to prevent exposure to air contaminants.

**Special Requirements:** Engineering control measures, respirator program (written), procedures, respirators, training, fit testing, medical evaluations, program administrator, hazard evaluations, inspections, NIOSH-certified respirators, affected employees, change schedules, employer demonstrates, medical questionnaire, tests, certification, records, recordkeeping, assigned protection factors, tags, recommendations (written), PLHCP, references other standards

[1910.134\(a\)\(1\)](#) - In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective shall be to prevent atmospheric contamination. This shall be accomplished as far as feasible by *accepted engineering control measures* (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When effective *engineering controls* are not feasible, or while they are being instituted, appropriate *respirators* shall be used pursuant to this section.

[1910.134\(a\)\(2\)](#) - A *respirator* shall be provided to each employee when such equipment is necessary to protect the health of such employee. The employer shall provide the *respirators* which are applicable and suitable for the purpose intended. The employer shall be responsible for the establishment and maintenance of a *respiratory protection program*, which shall include the requirements outlined in [paragraph \(c\)](#) of this section. The *program* shall cover each employee required by this section to use a *respirator*.

[1910.134\(c\)\(1\)](#) - In any workplace where *respirators* are necessary to protect the health of the employee or whenever *respirators* are required by the employer, the employer shall *establish* and implement a *written respiratory protection program* with *worksite-specific procedures*. The *program* shall be updated as necessary to reflect those changes in workplace conditions that affect *respirator use*. The employer shall include in the *program* the following provisions of this section, as applicable:

- [1910.134\(c\)\(1\)\(i\)](#) - *Procedures for selecting respirators for use in the workplace;*
- [1910.134\(c\)\(1\)\(ii\)](#) - *Medical evaluations of employees required to use respirators;*
- [1910.134\(c\)\(1\)\(iii\)](#) - *Fit testing procedures for tight-fitting respirators;*
- [1910.134\(c\)\(1\)\(iv\)](#) - *Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations;*
- [1910.134\(c\)\(1\)\(v\)](#) - *Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators;*
- [1910.134\(c\)\(1\)\(vi\)](#) - *Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators;*
- [1910.134\(c\)\(1\)\(vii\)](#) - *Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations;*
- [1910.134\(c\)\(1\)\(viii\)](#) - *Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance; and*
- [1910.134\(c\)\(1\)\(ix\)](#) - *Procedures for regularly evaluating the effectiveness of the program.*

[1910.134\(c\)\(2\)](#) - Where *respirator* use is not required:

- [1910.134\(c\)\(2\)\(i\)](#) - An employer may provide *respirators* at the request of employees or permit employees to use their own *respirators*, if the employer determines that such *respirator* use will not in itself create a hazard. If the employer determines that any *voluntary respirator* use is permissible, the employer shall provide the *respirator* users with the *information* contained in [appendix D](#) to this section ("Information for Employees Using Respirators When Not Required Under the Standard" - Mandatory); and
- [1910.134\(c\)\(2\)\(ii\)](#) - In addition, the employer must *establish* and implement those elements of a *written respiratory protection program* necessary to ensure that any employee using a *respirator* voluntarily is *medically able* to use that respirator, and that the respirator is cleaned, stored, and maintained so that its use does not present a health hazard to the user. *Exception:* Employers are not required to include in a *written respiratory protection program* those employees whose only use of *respirators* involves the voluntary use of *filtering facepieces (dust masks)*.

1910.134(c)(3) - The employer shall *designate a program administrator* who is *qualified* by appropriate *training or experience* that is commensurate with the complexity of the *program* to administer or oversee the *respiratory protection program* and conduct the *required evaluations of program effectiveness*.

1910.134(c)(4) - The employer shall provide *respirators, training, and medical evaluations* at no cost to the employee.

1910.134(d) - Selection of *respirators*. This paragraph requires the employer to *evaluate respiratory hazard(s)* in the workplace, identify relevant workplace and user factors, and base *respirator selection* on these factors. The paragraph also specifies appropriately protective *respirators* for use in IDLH atmospheres, and limits the selection and use of *air-purifying respirators*.

- 1910.134(d)(1)(ii) - The employer shall select a *NIOSH-certified respirator*. The respirator shall be used in compliance with the conditions of its *certification*.
- 1910.134(d)(1)(iii) - The employer shall *identify and evaluate* the *respiratory hazard(s)* in the workplace; this *evaluation* shall include a reasonable estimate of employee exposures to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form. Where the employer cannot identify or reasonably estimate the employee exposure, the employer shall consider the atmosphere to be IDLH.

1910.134(d)(2)(i) - The employer shall provide the following *respirators* for employee use in IDLH atmospheres:

- 1910.134(d)(2)(i)(A) - A full facepiece pressure demand SCBA *certified by NIOSH* for a minimum service life of thirty minutes, or

1910.134(d)(2)(ii) - *Respirators* provided only for escape from IDLH atmospheres shall be *NIOSH-certified* for escape from the atmosphere in which they will be used.

1910.134(d)(2)(iii) - All oxygen-deficient atmospheres shall be considered IDLH. *Exception:* If the employer *demonstrates* that, under all foreseeable conditions, the oxygen concentration can be maintained within the ranges specified in Table II of this section (i.e., for the altitudes set out in the table), then any *atmosphere-supplying respirator* may be used.

1910.134(d)(3)(i)(A) - *Assigned Protection Factors (APFs)*. Employers must use the *assigned protection factors* listed in Table 1 to select a respirator that meets or exceeds the required level of employee protection. When using a combination *respirator* (e.g., airline respirators



with an air-purifying filter), employers must ensure that the *assigned protection factor* is appropriate to the mode of operation in which the *respirator* is being used.

1910.134(d)(3)(iii)(B) - For protection against gases and vapors, the employer shall provide, an *air-purifying respirator*, provided that:

- 1910.134(d)(3)(iii)(B)(1) - The *respirator* is equipped with an *end-of-service-life indicator (ESLI)* certified by NIOSH for the contaminant; or
- 1910.134(d)(3)(iii)(B)(2) - If there is no ESLI appropriate for conditions in the employer's workplace, the employer implements a *change schedule* for canisters and cartridges that is based on *objective information or data* that will ensure that canisters and cartridges are changed before the end of their service life. The employer shall describe in the *respirator program* the *information and data* relied upon and the basis for the *canister and cartridge change schedule* and the basis for reliance on the *data*.

1910.134(e) - *Medical evaluation*. Using a respirator may place a physiological burden on employees that varies with the type of *respirator* worn, the job and workplace conditions in which the *respirator* is used, and the medical status of the employee. Accordingly, this paragraph specifies the minimum requirements for *medical evaluation* that employers must implement to determine the employee's ability to use a respirator.

1910.134(e)(1) - General. The employer shall provide a *medical evaluation* to determine the employee's ability to use a respirator, before the employee is *fit tested* or required to use the respirator in the workplace. The employer may discontinue an employee's *medical evaluations* when the employee is no longer required to use a *respirator*.

1910.134(e)(2)(i) - *Medical evaluation procedures*. The employer shall identify a *physician or other licensed health care professional (PLHCP)* to perform *medical evaluations* using a *medical questionnaire* or an initial medical examination that obtains the same information as the *medical questionnaire*.

1910.134(e)(2)(ii) - The *medical evaluation* shall obtain the *information requested* by the *questionnaire* in Sections 1 and 2, part A of [appendix C](#) (mandatory) of this section.

1910.134(e)(3)(i) - Follow-up medical examination. The employer shall ensure that a follow-up medical examination is provided for an employee who gives a *positive response to any question* among *questions 1 through 8* in Section 2, part A of [appendix C](#) (mandatory) or whose initial medical examination demonstrates the need for a follow-up medical examination.

1910.134(e)(4)(i) - Administration of the *medical questionnaire* and examinations.

The *medical questionnaire* and examinations shall be *administered confidentially* during the employee's normal working hours or at a time and place convenient to the employee.

The *medical questionnaire* shall be administered in a manner that ensures that the employee understands its content.

1910.134(e)(4)(ii) - The employer shall provide the employee with an opportunity to *discuss the questionnaire* and examination results with the *PLHCP*.

1910.134(e)(5)(i) - Supplemental *information* for the *PLHCP*. The following *information* must be provided to the *PLHCP* before the *PLHCP* makes a *recommendation* concerning an employee's ability to use a *respirator* [Reference paragraph (e)(5)(i)(A) - (E)].

1910.134(e)(5)(iii) - Supplemental *information* for the *PLHCP*. The employer shall provide the *PLHCP* with a *copy of the written respiratory protection program* and a *copy* of this section.

1910.134(e)(6) - Medical determination. In determining the employee's ability to use a *respirator*, the employer shall:

- 1910.134(e)(6)(i) - Obtain a written *recommendation* regarding the employee's ability to use the *respirator* from the *PLHCP*. The *recommendation* shall provide only the following *information* [Reference paragraph (e)(6)(i)(A) - (C)].

1910.134(e)(7) - Additional medical evaluations. At a minimum, the employer shall provide additional *medical evaluations* that comply with the requirements of this section if:

- 1910.134(e)(7)(i) - An *employee reports* medical signs or symptoms that are related to ability to use a *respirator*;
- 1910.134(e)(7)(ii) - A *PLHCP, supervisor, or the respirator program administrator informs* the employer that an employee needs to be reevaluated;
- 1910.134(e)(7)(iii) - *Information* from the *respiratory protection program*, including *observations* made during *fit testing* and *program evaluation*, indicates a need for employee reevaluation.

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. This paragraph specifies the kinds of *fit tests* allowed, the *procedures* for conducting them, and how the results of the *fit tests* must be used.

1910.134(f)(1) - The employer shall ensure that employees using a tight-fitting *facepiece respirator* pass an appropriate *qualitative fit test (QLFT)* or *quantitative fit test (QNFT)* as stated in this paragraph.

1910.134(f)(2) - The employer shall ensure that an employee using a tight-fitting *facepiece respirator* is *fit tested prior to initial use of the respirator*, whenever a different *respirator facepiece* (size, style, model or make) is used, and *at least annually* thereafter.

1910.134(f)(3) - The employer shall *conduct an additional fit test* whenever the *employee reports*, or the *employer, PLHCP, supervisor, or program administrator makes visual observations* of, changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.

1910.134(f)(4) - If after passing a QLFT or QNFT, the *employee subsequently notifies the employer, program administrator, supervisor, or PLHCP* that the fit of the respirator is unacceptable, the employee shall be given a reasonable opportunity to select a different *respirator facepiece* and to be retested.

1910.134(f)(5) - The *fit test* shall be administered using an *OSHA-accepted QLFT or QNFT protocol*. The *OSHA-accepted QLFT and QNFT protocols and procedures* are contained in [appendix A](#) - fit testing procedures (mandatory), of this section.

1910.134(f)(8) - *Fit testing* of tight-fitting atmosphere-supplying *respirators* and tight-fitting powered air-purifying *respirators* shall be accomplished by *performing quantitative or qualitative fit testing* in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.

- 1910.134(f)(8)(i) - *Qualitative fit testing* of these *respirators* shall be accomplished by temporarily converting the *respirator* user's actual facepiece into a negative pressure *respirator* with appropriate filters, or by using an identical negative pressure air-purifying *respirator* facepiece with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying *respirator facepiece*.
- 1910.134(f)(8)(ii) - *Quantitative fit testing* of these *respirators* shall be accomplished by modifying the facepiece to allow sampling inside the facepiece in the breathing zone of the user, midway between the nose and mouth. This requirement shall be accomplished by installing a permanent sampling probe onto a surrogate facepiece, or by using a sampling adapter *designed* to temporarily provide a means of sampling air from inside the facepiece.

1910.134(g) - Use of *respirators*. This paragraph requires employers to *establish and implement procedures* for the proper use of *respirators*. These requirements include prohibiting conditions that may result in facepiece seal leakage, preventing employees from removing respirators in hazardous environments, taking actions to ensure continued effective respirator operation throughout the work shift, and *establishing procedures* for the use of respirators in IDLH atmospheres or in interior structural firefighting situations.

- 1910.134(g)(1)(iii) - For all tight-fitting *respirators*, the employer shall ensure that employees *perform a user seal check each time* they put on the respirator using the *procedures* in appendix B-1 - user seal checks, or *procedures* recommended by the respirator manufacturer that the *employer demonstrates* are as effective as those in appendix B-1 of this section.
- 1910.134(g)(2)(i) - Continuing *respirator* effectiveness.  
Appropriate *surveillance* shall be maintained of work area conditions and degree of employee exposure or stress. When there is a change in work area conditions or degree of employee exposure or stress that may affect *respirator* effectiveness, the employer shall *reevaluate* the continued effectiveness of the *respirator*.

1910.134(g)(3) - *Procedures for IDLH atmospheres*. For all IDLH atmospheres, the employer shall ensure that [Reference paragraphs (g)(3)(i) - (g)(3)(vi)].

1910.134(g)(4) - *Procedures for interior structural firefighting*. In addition to the requirements set forth under paragraph (g)(3), in interior structural fires, the employer shall ensure that: [Reference paragraphs (g)(4)(i) - (g)(4)(iii)].

1910.134(h) - Maintenance and care of *respirators*. This paragraph requires the employer to provide for the cleaning and disinfecting, storage, *inspection*, and repair of *respirators* used by employees.

1910.134(h)(1) - Cleaning and disinfecting. The employer shall provide each *respirator* user with a *respirator* that is clean, sanitary, and in good working order. The employer shall ensure that *respirators* are cleaned and disinfected using the *procedures* in appendix B-2 - respirator cleaning procedures (mandatory), of this section, or *procedures* recommended by the *respirator manufacturer*, provided that such *procedures* are of equivalent effectiveness. The *respirators* shall be cleaned and disinfected at the following intervals: [Reference paragraphs (h)(1)(i) - (h)(1)(iv)].

1910.134(h)(2) - Storage. The employer shall ensure that *respirators* are stored as follows:

- [1910.134\(h\)\(2\)\(ii\)\(C\)](#) - *Stored in accordance with any applicable manufacturer instructions.*

[1910.134\(h\)\(3\)\(i\)](#) - The employer shall ensure that *respirators* are *inspected* as follows:

- [1910.134\(h\)\(3\)\(i\)\(A\)](#) - All *respirators* used in routine situations shall be *inspected before each use and during cleaning*;
- [1910.134\(h\)\(3\)\(i\)\(B\)](#) - All *respirators* maintained for use in *emergency situations* shall be *inspected at least monthly* and in accordance with the manufacturer's recommendations, and shall be *checked for proper function* before and after each use; and
- [1910.134\(h\)\(3\)\(i\)\(C\)](#) - Emergency escape-only *respirators* shall be *inspected before being carried into the workplace* for use.

[1910.134\(h\)\(3\)\(ii\)](#) - The employer shall ensure that *respirator inspections* include the following: [Reference [paragraph \(h\)\(3\)\(ii\)\(A\) - \(h\)\(3\)\(ii\)\(B\)](#)].

[1910.134\(h\)\(3\)\(iii\)](#) - In addition to the requirements of [paragraphs \(h\)\(3\)\(i\) and \(ii\)](#) of this section, self-contained breathing apparatus shall be *inspected monthly*. Air and oxygen cylinders shall be maintained in a fully charged state and shall be recharged when the pressure falls to 90% of the *manufacturer's recommended* pressure level. The employer shall determine that the regulator and warning devices function properly.

[1910.134\(h\)\(3\)\(iv\)](#) - For *respirators* maintained for *emergency use*, the employer shall:

- [1910.134\(h\)\(3\)\(iv\)\(A\)](#) - *Certify the respirator by documenting* the date the inspection was performed, the name (or signature) of the person who made the *inspection*, the findings, required remedial action, and a serial number or other means of identifying the *inspected respirator*; and
- [1910.134\(h\)\(3\)\(iv\)\(B\)](#) - Provide this *information on a tag or label* that is attached to the storage compartment for the respirator, is kept with the respirator, or is included in *inspection reports* stored as paper or electronic files. This *information shall be maintained* until replaced following a *subsequent certification*.

[1910.134\(h\)\(4\)](#) - Repairs. The employer shall ensure that *respirators* that fail an *inspection* or are otherwise found to be defective are removed from service, and are discarded or repaired or adjusted in accordance with the *following procedures*:

- [1910.134\(h\)\(4\)\(i\)](#) - Repairs or adjustments to *respirators* are to be made only by *persons appropriately trained* to perform such operations and shall use only the *respirator manufacturer's NIOSH-approved parts* designed for the *respirator*;

- [1910.134\(h\)\(4\)\(ii\)](#) - Repairs shall be made according to the *manufacturer's recommendations and specifications* for the type and extent of repairs to be performed; and
- [1910.134\(h\)\(4\)\(iii\)](#) - Reducing and admission valves, regulators, and alarms shall be adjusted or repaired only by the manufacturer or a *technician trained* by the manufacturer.

[1910.134\(i\)\(4\)](#) - The employer shall ensure that cylinders used to supply breathing air to *respirators* meet the following requirements:

- [1910.134\(i\)\(4\)\(i\)](#) - Cylinders are *tested and maintained* as prescribed in the *Shipping Container Specification Regulations of the Department of Transportation* ([49 CFR part 180](#));
- [1910.134\(i\)\(4\)\(ii\)](#) - Cylinders of purchased breathing air have a *certificate of analysis* from the supplier that the breathing air meets the requirements for Grade D breathing air.

[1910.134\(i\)\(5\)\(iv\)](#) - Have a *tag* containing the most recent *change date and the signature* of the *person authorized* by the employer to perform the change. The *tag* shall be *maintained* at the compressor.

[1910.134\(i\)\(9\)](#) - The employer shall use only the *respirator manufacturer's NIOSH-approved* breathing-gas containers, *marked and maintained* in accordance with the *Quality Assurance provisions of the NIOSH approval* for the SCBA as issued in accordance with the *NIOSH respirator-certification standard* at [42 CFR part 84](#).

[1910.134\(j\)](#) - *Identification of filters, cartridges, and canisters*. The employer shall ensure that all filters, cartridges and canisters used in the workplace are *labeled and color coded* with the *NIOSH approval label* and that the *label is not removed* and remains legible.

[1910.134\(k\)](#) - *Training and information*. This paragraph requires the employer to provide *effective training* to employees who are required to use *respirators*. The *training must be comprehensive*, understandable, and *recur annually*, and more often if necessary. This paragraph also requires the employer to provide the basic information on respirators in [appendix D](#) - (mandatory) Information for employees using respirators when not required under the standard, of this section to employees who wear *respirators* when not required by this section or by the employer to do so.

- [1910.134\(k\)\(1\)](#) - The employer shall ensure that each employee can *demonstrate knowledge* of at least the following: [Reference [paragraph \(k\)\(1\)\(i\) - \(k\)\(1\)\(vii\)](#)].



[1910.134\(k\)\(2\)](#) - The *training* shall be conducted in a manner that is understandable to the employee.

[1910.134\(k\)\(3\)](#) - The employer shall provide the *training prior to requiring* the employee to use a *respirator* in the workplace.

[1910.134\(k\)\(4\)](#) - An employer who is able to *demonstrate* that a new employee has received *training within the last 12 months* that addresses the elements specified in [paragraph \(k\)\(1\)\(i\)](#) through (vii) is not required to repeat such *training* provided that, as required by [paragraph \(k\)\(1\)](#), the employee can *demonstrate knowledge* of those element(s). *Previous training* not repeated initially by the employer must be provided *no later than 12 months* from the date of the *previous training*.

[1910.134\(k\)\(5\)](#) - *Retraining* shall be administered *annually*, and when the following situations occur: [Reference [paragraph \(k\)\(5\)\(i\) - \(k\)\(5\)\(iii\)](#)].

[1910.134\(k\)\(6\)](#) - The basic *advisory information* on respirators, as presented in [appendix D](#) of this section, shall be provided by the employer in any *written or oral format*, to employees who wear respirators when such use is not required by this section or by the employer.

[1910.134\(l\)](#) - *Program evaluation*. This section requires the employer to *conduct evaluations* of the workplace to ensure that the *written respiratory protection program* is being properly implemented, and to *consult employees* to ensure that they are using the *respirators* properly.

[1910.134\(l\)\(1\)](#) - The employer shall *conduct evaluations* of the workplace as necessary to ensure that the provisions of the current *written program* are being effectively implemented and that it continues to be effective.

[1910.134\(l\)\(2\)](#) - The employer shall regularly *consult employees* required to use *respirators* to assess the employees' views on *program effectiveness* and to identify any problems. Any problems that are identified during this *assessment* shall be corrected. Factors to be *assessed* include, but are not limited to: [Reference [paragraph \(l\)\(2\)\(i\) - \(l\)\(2\)\(iv\)](#)].

[1910.134\(m\)](#) - *Recordkeeping*. This section requires the employer to establish and *retain written information* regarding *medical evaluations, fit testing, and the respirator program*. This *information* will facilitate employee involvement in the *respirator program*, assist the employer in *auditing* the adequacy of the *program*, and provide a *record* for compliance determinations by OSHA.

[1910.134\(m\)\(1\)](#) - *Medical evaluation. Records of medical evaluations* required by this section must be *retained* and made available in accordance with [1910.1020](#) - access to employee exposure and medical records.

[1910.134\(m\)\(2\)\(i\)](#) - *Fit testing*. The employer shall establish a *record* of the *qualitative and quantitative fit tests* administered to an employee including [Reference [paragraph \(m\)\(2\)\(i\)\(A\) - \(E\)](#)]:

[1910.134\(m\)\(2\)\(ii\)](#) - *Fit test records* shall be *retained* for *respirator users* until the next *fit test* is administered.

[1910.134\(m\)\(3\)](#) - A *written copy* of the current *respirator program* shall be *retained* by the employer.

[1910.134\(m\)\(4\)](#) - *Written materials* required to be *retained* under this paragraph shall be made available upon request to *affected employees* and to the Assistant Secretary or designee for examination and *copying*.

*Air-purifying respirator* means a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

*Filtering facepiece* (dust mask) means a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.

## **1910.135 - Head Protection**

**Scope:** This [standard](#) provides the requirements for head protection.

**Special Requirements:** Employer demonstrates, design, head protection, affected employee, references other standards

[1910.135\(a\)\(1\)](#) - The employer shall ensure that each *affected employee* wears a *protective helmet* when working in areas where there is a potential for injury to the head from falling objects.

[1910.135\(a\)\(2\)](#) - The employer shall ensure that a *protective helmet designed* to reduce electrical shock hazard is worn by each such *affected employee* when near exposed electrical conductors which could contact the head.

[1910.135\(b\)\(1\)](#) - *Head protection* must comply with any of the following *consensus standards* [Reference [paragraphs \(b\)\(1\)\(i\) - \(iii\)](#)].

[1910.135\(b\)\(2\)](#) - *Head protection devices that the employer demonstrates* are at least as effective as *head protection devices* that are constructed in accordance with one of the above *consensus standards* will be deemed to be in compliance with the requirements of this section.

## **1910.136 - Foot Protection**

**Scope:** This [standard](#) provides the requirements for foot protection.

**Special Requirements:** Employer demonstrates, protective footwear, affected employee, protective measures, reference other standards

[1910.136\(a\)](#) - General requirements. The employer shall ensure that each *affected employee* uses *protective footwear* when working in areas where there is a danger of foot injuries due to falling or rolling objects, or objects piercing the sole, or when the use of *protective footwear* will protect the *affected employee* from an electrical hazard, such as a static-discharge or electric-shock hazard, that remains after the employer takes other necessary *protective measures*.

[1910.136\(b\)\(1\)](#) - *Protective footwear* must comply with any of the following *consensus standards* [References [paragraph \(b\)\(1\)\(i\) - \(iii\)](#)].

[1910.136\(b\)\(2\)](#) - *Protective footwear that the employer demonstrates* is at least as effective as protective footwear that is constructed in accordance with one of the above *consensus standards* will be deemed to be in compliance with the requirements of this section.

## **1910.137 - Electrical Protective Equipment**

**Scope:** This [standard](#) provides the requirements for electrical protective devices.

**Special Requirements:** Markings, design requirements, tests, inspections, certify, proof-test voltage, manufacturer's identification, electrical protective equipment, certifications

[1910.137\(a\)](#) - *Design requirements* for specific types of *electrical protective equipment*. Rubber insulating blankets, rubber insulating matting, rubber insulating covers, rubber insulating line hose, rubber insulating gloves, and rubber insulating sleeves shall meet the following requirements:

- [1910.137\(a\)\(1\)\(ii\)](#) - Each item shall be clearly *marked* as follows [Reference [paragraphs \(a\)\(1\)\(ii\)\(A\) - \(I\)](#)].
- [1910.137\(a\)\(1\)\(ii\)\(I\)](#) - Other relevant *markings*, such as the *manufacturer's identification* and the size of the equipment, may also be provided.

- [1910.137\(a\)\(1\)\(iii\)](#) - *Markings* shall be nonconducting and shall be applied in such a manner as not to impair the insulating qualities of the equipment.
- [1910.137\(a\)\(1\)\(iv\)](#) - *Markings* on gloves shall be confined to the cuff portion of the glove.

[1910.137\(a\)\(2\)\(i\)](#) - Equipment shall be capable of withstanding the *ac proof-test voltage* specified in [Table I-1](#) or the *dc proof-test voltage* specified in [Table I-2](#).  
[Reference [paragraph \(a\)\(2\)\(i\)\(A\) - \(C\)](#)].

[1910.137\(a\)\(2\)\(ii\)](#) - When the *ac proof test* is used on gloves, the 60-hertz *proof-test* current may not exceed the values specified in [Table I-1](#) at any time during the test period.  
[Reference [paragraph \(a\)\(2\)\(ii\)\(A\) - \(C\)](#)].

[1910.137\(a\)\(2\)\(iv\)](#) - Material used for Type II insulating equipment shall be capable of withstanding an *ozone test*, with no visible effects. The *ozone test* shall reliably indicate that the material will resist ozone exposure in actual use. Any visible signs of ozone deterioration of the material, such as checking, cracking, breaks, or pitting, is evidence of failure to meet the requirements for ozone-resistant material. (See the note following [paragraph \(a\)\(3\)\(ii\)\(B\)](#) of this section.)

[1910.137\(a\)\(3\)\(i\)](#) - *Equipment* shall be free of physical irregularities that can adversely affect the insulating properties of the *equipment* and that can be detected by the *tests or inspections* required under this section.

[1910.137\(b\)\(2\)\(i\)](#) - *Protective equipment* used for the primary insulation of employees from energized circuit parts shall be capable of passing a *current test* when subjected to the highest nominal voltage on which the equipment is to be used.

[1910.137\(b\)\(2\)\(ii\)](#) - When *insulating equipment* is tested in accordance with [paragraph \(b\)\(2\)\(i\)](#) of this section, the *equipment* current may not exceed 1 microampere per kilovolt of phase-to-phase applied voltage.

[1910.137\(c\)\(2\)\(ii\)](#) - *Insulating equipment* shall be *inspected* for damage *before each day's use* and immediately following any incident that can reasonably be suspected of causing damage. Insulating gloves shall be given an *air test*, along with the *inspection*.

[1910.137\(c\)\(2\)\(iv\)](#) - *Insulating equipment* found to have other defects that might affect its insulating properties shall be removed from service and *returned for testing* under [paragraphs \(c\)\(2\)\(viii\) and \(c\)\(2\)\(ix\)](#) of this section.

[1910.137\(c\)\(2\)\(viii\)](#) - *Electrical protective equipment* shall be subjected to *periodic electrical tests*. *Test voltages* and the maximum intervals between tests shall be in accordance with [Table I-4 and Table I-5](#).

[1910.137\(c\)\(2\)\(x\)](#) - *Insulating equipment* failing to pass *inspections or electrical tests* may not be used by employees, except as follows [Reference [paragraphs \(c\)\(2\)\(x\)\(A\) - \(D\)](#)].

[1910.137\(c\)\(2\)\(xi\)](#) - Repaired insulating equipment shall be *retested* before it may be used by employees.

[1910.137\(c\)\(2\)\(xii\)](#) - The employer shall *certify* that equipment has been *tested* in accordance with the requirements of paragraphs [\(c\)\(2\)\(iv\)](#), [\(c\)\(2\)\(vii\)\(D\)](#), [\(c\)\(2\)\(viii\)](#), [\(c\)\(2\)\(ix\)](#), and [\(c\)\(2\)\(xi\)](#) of this section. The *certification* shall *identify the equipment* that passed the *test* and the date it was *tested* and shall be made available upon request to the Assistant Secretary for Occupational Safety and Health and to employees or their *authorized* representatives.

## **1910.140 - Personal Fall Protection Systems**

**Scope:** This [standard](#) provides the requirements for personal fall protection systems.

**Special Requirements:** Competent person, qualified person, personal fall protection systems, inspections, tests, employer demonstrates, prompt rescue, protocols, procedures

[1910.140\(a\)](#) - Scope and application. This section establishes performance, care, and use criteria for all *personal fall protection systems*. The employer must ensure that each *personal fall protection system* used to comply with this part must meet the requirements of this section.

[1910.140\(c\)\(6\)](#) - A *competent person or qualified person* must *inspect* each knot in a *lanyard or vertical lifeline* to ensure that it meets the requirements of [paragraphs \(c\)\(4\)](#) and [\(5\)](#) of this section before any employee uses the *lanyard or lifeline*.

[1910.140\(c\)\(8\)](#) - D-rings, snaphooks, and carabiners must be *proof tested* to a minimum tensile load of 3,600 pounds (16 kN) without cracking, breaking, or incurring permanent deformation. The gate strength of snaphooks and carabiners must be capable of withstanding a minimum load of 3,600 pounds (16 kN) without the gate separating from the nose of the snaphook or carabiner body by more than 0.125 inches (3.175 mm).

[1910.140\(c\)\(11\)](#) - The employer must ensure that each horizontal *lifeline*:

- [1910.140\(c\)\(11\)\(i\)](#) - Is *designed*, installed, and used under the *supervision of a qualified person*.

1910.140(c)(13)(ii) - *Designed*, installed, and used, under the *supervision of qualified person*, as part of a complete *personal fall protection system* that maintains a safety factor of at least two.

1910.140(c)(17) - A *personal fall protection system* or its components subjected to impact loading must be removed from service immediately and not used again until a *competent person inspects* the system or components and determines that it is not damaged and safe for use for employee personal fall protection.

1910.140(c)(18) - *Personal fall protection systems* must be *inspected before initial use during each workshift* for mildew, wear, damage, and other deterioration, and defective components *must be removed from service*.

1910.140(c)(21) - The employer must provide for *prompt rescue* of each employee in the event of a fall.

1910.140(d)(1)(v) - If the *personal fall arrest system* meets the *criteria and protocols* in [appendix D](#) of this subpart, and is being used by an employee having a combined body and tool weight of less than 310 pounds (140 kg), the system is considered to be in compliance with the provisions of [paragraphs \(d\)\(1\)\(i\) through \(iii\)](#) of this section. If the system is used by an employee having a combined body and tool weight of 310 pounds (140kg) or more and the employer has appropriately modified the criteria and *protocols* in [appendix D](#) - test methods and procedures for *personal fall protection systems non-mandatory guidelines*, then the system will be deemed to be in compliance with the requirements of [paragraphs \(d\)\(1\)\(i\) through \(iii\)](#).

1910.140(d)(2)(ii) - *Personal fall arrest systems* are rigged in such a manner that the employee cannot free fall more than 6 feet (1.8 m) or contact a lower level. A free fall may be more than 6 feet (1.8 m) provided the employer can *demonstrate* the manufacturer *designed* the system to allow a free fall of more than 6 feet and *tested the system* to ensure a maximum arresting force of 1,800 pounds (8 kN) is not exceeded.

1910.140(e)(1) - System performance requirements. The employer must ensure that each *positioning system* meets the following requirements:

- 1910.140(e)(1)(i) - *General*. All *positioning systems*, except window cleaners' *positioning systems*, are capable of withstanding, without failure, a *drop test* consisting of a 4-foot (1.2-m) drop of a 250-pound (113-kg) weight.
- 1910.140(e)(1)(iii) - *Positioning systems*, including window cleaners' *positioning systems*, that meet the *test methods and procedures* in [appendix D](#) - test methods



and procedures for personal fall protection systems non-mandatory guidelines, of this subpart are considered to be in compliance with [paragraphs \(e\)\(1\)\(i\) and \(ii\)](#).

- [1910.140\(e\)\(1\)\(iv\)](#) - *Lineman's body belt and pole strap systems*. Lineman's body belt and pole strap systems must meet the following tests [Reference [paragraphs \(e\)\(1\)\(iv\)\(A\) - \(e\)\(1\)\(iv\)\(C\)](#)].

[1910.140\(e\)\(2\)](#) - *System use criteria for window cleaners' positioning systems*. The employer must ensure that *window cleaners' positioning systems* meet and are used in accordance with the following: [Reference [paragraph \(e\)\(2\)\(i\) - \(xii\)](#)].

[Competent person](#) means a person who is capable of identifying existing and predictable hazards in any personal fall protection system or any component of it, as well as in their application and uses with related equipment, and who has authorization to take prompt, corrective action to eliminate the identified hazards.

[Qualified](#) describes a person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project.

[Personal fall arrest system](#) means a system used to arrest an employee in a fall from a walking-working surface. It consists of a body harness, anchorage, and connector. The means of connection may include a lanyard, deceleration device, lifeline, or a suitable combination of these.

[Personal fall protection system](#) means a system (including all components) an employer uses to provide protection from falling or to safely arrest an employee's fall if one occurs. Examples of personal fall protection systems include personal fall arrest systems, positioning systems, and travel restraint systems.

## **Subpart J - [General Environmental Controls](#)**

[Subpart J](#) provides the standards for sanitation, marking physical hazards, specifications for signs and tags, temporary labor camps, permit-required confined spaces and the control of hazardous energy (lockout/tagout).

To learn if subpart J applies to you, go to [Does "Subpart J - General Environmental Controls" Apply to You?](#)

## **Special Requirements**

## 1910.141 – Sanitation

**Scope:** This [standard](#) provides the requirements for housekeeping, potable water, bathrooms, showers, vermin control, food handling, and waste disposal.

**Special Requirements:** Extermination program, design, markings, disposal method

[1910.141\(a\)\(5\)](#) - Vermin control. Every enclosed workplace shall be so constructed, equipped, and maintained, so far as reasonably practicable, as to prevent the entrance or harborage of rodents, insects, and other vermin. A *continuing and effective extermination program* shall be instituted where their presence is detected.

[1910.141\(b\)\(1\)\(iii\)](#) - Portable drinking water dispensers shall be *designed*, constructed, and serviced so that sanitary conditions are maintained, shall be capable of being closed, and shall be equipped with a tap.

[1910.141\(b\)\(2\)\(i\)](#) - *Outlets for nonpotable water*, such as water for industrial or firefighting purposes, shall be *posted* or otherwise *marked* in a manner that will indicate clearly that the water is unsafe and is not to be used for drinking, washing of the person, cooking, washing of food, washing of cooking or eating utensils, washing of food preparation or processing premises, or personal service rooms, or for washing clothes.

[1910.141\(c\)\(1\)\(iii\)](#) - The *sewage disposal method* shall not endanger the health of employees.

## 1910.142 - Temporary Labor Camps

**Scope:** This [standard](#) provides requirements for temporary labor camps.

**Special Requirements:** State and local regulations, markings, health authority approval, measures, approved by health authority, trained person, duty, reporting communicable disease, references other standards

[1910.242\(b\)\(11\)](#) - All heating, cooking, and water heating equipment shall be installed in *accordance with State and local ordinances, codes, and regulations* governing such installations. If a camp is used during cold weather, adequate heating equipment shall be provided.

[1910.242\(d\)\(4\)](#) - Where the toilet rooms are shared, such as in multifamily shelters and in barracks type facilities, separate toilet rooms shall be provided for each sex. These rooms shall be *distinctly marked "for men" and "for women" by signs printed* in English and in the native language of the persons occupying the camp, or *marked* with easily

understood *pictures or symbols*. If the facilities for each sex are in the same building, they shall be separated by solid walls or partitions extending from the floor to the roof or ceiling.

[1910.242\(h\)\(1\)](#) - Fly-tight, rodent-tight, impervious, cleanable or single service containers, *approved by the appropriate health authority* shall be provided for the storage of garbage. At least one such container shall be provided for each family shelter and shall be located within 100 feet of each shelter on a wooden, metal, or concrete stand.

[1910.142\(i\)\(1\)](#) - In all camps where central dining or multiple family feeding operations are permitted or provided, the food handling facilities shall comply with the requirements of the “*Food Service Sanitation Ordinance and Code*,” Part V of the “*Food Service Sanitation Manual*,” U.S. Public Health Service Publication 934 (1965), which is incorporated by reference as specified in [1910.6](#) - incorporation by reference.

[1910.142\(j\)](#) - Insect and rodent control. *Effective measures* shall be taken to prevent infestation by and harborage of animal or insect vectors or pests.

[1910.142\(k\)\(1\)](#) - Adequate *first aid facilities approved by a health authority* shall be maintained and made available in every labor camp for the emergency treatment of injured persons.

[1910.142\(k\)\(2\)](#) - Such facilities shall be in charge of a *person trained to administer first aid* and shall be readily accessible for use at all times.

[1910.142\(l\)\(1\)](#) - It shall be the *duty of the camp superintendent to report* immediately to the *local health officer* the name and address of any individual in the camp known to have or suspected of having a communicable disease.

[1910.142\(l\)\(2\)](#) - Whenever there shall occur in any camp a case of suspected food poisoning or an unusual prevalence of any illness in which fever, diarrhea, sore throat, vomiting, or jaundice is a prominent symptom, it shall be the *duty of the camp superintendent to report* immediately the existence of the outbreak to the *health authority* by telegram, telephone, electronic mail or any other method that is equally fast.

## **1910.144 - Safety Color Code for Marking Physical Hazards**

**Scope:** This [standard](#) provides the color codes for marking physical hazards.

**Special Requirements:** Markings, painted, identification, signs

[1910.144\(a\)\(1\)\(ii\)](#) - Danger. Safety cans or other portable containers of flammable liquids having a flash point at or below 80 °F, table containers of flammable liquids (open cup tester), excluding shipping containers, shall be *painted red* with some additional

clearly *visible identification* either in the form of a yellow band around the can or the *name of the contents* conspicuously *stenciled or painted* on the can in yellow. Red lights shall be provided at barricades and at temporary obstructions. *Danger signs* shall be *painted red*.

[1910.144\(a\)\(1\)\(iii\)](#) - Stop. Emergency stop bars on hazardous machines such as rubber mills, wire blocks, flat work ironers, etc., shall be *red*. Stop buttons or electrical switches which letters or other *markings* appear, used for emergency stopping of machinery shall be *red*.

[1910.144\(a\)\(3\)](#) - Yellow. Yellow shall be the basic color for designating caution and for *marking physical hazards* such as: Striking against, stumbling, falling, tripping, and "caught in between."

## **1910.145 - Specifications for Accident Prevention Signs and Tags**

**Scope:** This [standard](#) provides the specifications for accident prevention signs and tags.

**Special Requirements:** Specifications, design, signs, safety measures, posted signs, instruction, markings, tags, inform, references other standards

[1910.145\(a\)\(1\)](#) - These *specifications* apply to the *design*, application, and use of *signs or symbols* (as included in [paragraphs \(c\) through \(e\)](#) of this section) intended to indicate and, insofar as possible, to define specific hazards of a nature such that failure to designate them may lead to accidental injury to workers or the public, or both, or to property damage. These *specifications* are intended to cover all *safety signs* except those designed for streets, highways, and railroads. These *specifications* do not apply to plant bulletin boards or to *safety posters*.

[1910.145\(a\)\(2\)](#) - All *new signs* and replacements of old *signs* shall be in accordance with these *specifications*.

[1910.145\(c\)\(1\)](#) - *Danger signs*.

- [1910.145\(c\)\(1\)\(i\)](#) - There shall be no variation in the type of *design of signs posted* to warn of specific dangers and radiation hazards.
- [1910.145\(c\)\(1\)\(ii\)](#) - All employees shall be *instructed* that *danger signs* indicate immediate danger and that special precautions are necessary.

[1910.145\(c\)\(2\)](#) - *Caution signs*.

- [1910.145\(c\)\(2\)\(i\)](#) - *Caution signs* shall be used only to warn against potential hazards or to caution against *unsafe practices*.

- [1910.145\(c\)\(2\)\(ii\)](#) - All employees shall be *instructed* that *caution signs* indicate a possible hazard against which proper precaution should be taken.

[1910.145\(c\)\(3\)](#) - *Safety instruction signs*. *Safety instruction signs* shall be used where there is a need for *general instructions* and suggestions relative to *safety measures*.

[1910.145\(d\)\(1\)](#) - *Design features*. All *signs* shall be furnished with rounded or blunt corners and shall be free from sharp edges, burrs, splinters, or other sharp projections. The ends or heads of bolts or other fastening devices shall be located in such a way that they do not constitute a hazard.

[1910.145\(d\)\(2\)](#) - *Danger signs*. The colors red, black, and white shall be those of opaque glossy samples as specified in Table 1, "Fundamental Specification of Safety Colors for CIE Standard Source 'C,' " of [ANSI Z53.1-1967](#) or in Table 1, "Specification of the Safety Colors for CIE Illuminant C and the CIE 1931, 2 Standard Observer," of ANSI Z535.1-2006(R2011), incorporated by reference in [1910.6](#) - incorporation by reference.

[1910.145\(d\)\(4\)](#) - *Caution signs*. The standard color of the background shall be yellow; and the panel, black with *yellow letters*. Any *letters* used against the yellow background shall be black. The colors shall be those of opaque glossy samples as specified in Table 1 of ANSI Z53.1-1967 or Table 1 of [ANSI Z535.1-2006\(R2011\)](#), incorporated by reference in [1910.6](#) - incorporation by reference.

[1910.145\(d\)\(6\)](#) - *Safety instruction signs*. The standard color of the background shall be white; and the panel, green with white letters. Any *letters* used against the white background shall be black. The colors shall be those of opaque glossy samples as specified in Table 1 of ANSI Z53.1-1967 or in Table 1 of ANSI Z535.1-2006(R2011), incorporated by reference in [1910.6](#).

[1910.145\(d\)\(10\)](#) - *Slow-moving vehicle emblem*. This *emblem* (see fig. J-7) consists of a fluorescent yellow-orange triangle with a dark red reflective border. The yellow-orange fluorescent triangle is a highly visible color for daylight exposure. The reflective border defines the shape of the fluorescent color in daylight and creates a hollow red triangle in the path of motor vehicle headlights at night. The *emblem* is intended as a unique identification for, and it shall be used only on, vehicles which by *design* move slowly (25 m.p.h. or less) on the public roads. The emblem is not a *clearance marker* for wide machinery nor is it intended to replace required lighting or marking of slow-moving vehicles. Neither the color film pattern and its dimensions nor the backing shall be altered to permit use of advertising or other *markings*. The *material, location, mounting, etc., of the emblem* shall be in accordance with the *American Society of Agricultural Engineers Emblem* for Identifying

Slow-Moving Vehicles, ASAE R276, 1967, or ASAE S276.2 (ANSI B114.1-1971), which are incorporated by reference as specified in [1910.6](#).

[1910.145\(e\)\(2\)](#) - Nature of *wording*. The *wording* of any *sign* should be easily read and concise. The *sign* should contain sufficient *information* to be easily understood. The *wording* should make a positive, rather than negative suggestion and should be accurate in fact.

[1910.145\(e\)\(4\)](#) - *Biological hazard signs*. The *biological hazard warning* shall be used to signify the actual or potential presence of a biohazard and to identify equipment, containers, rooms, materials, experimental animals, or combinations thereof, which contain, or are contaminated with, viable hazardous agents. For the purpose of this subparagraph the term "*biological hazard*," or "*biohazard*," shall include only those infectious agents presenting a risk or potential risk to the well-being of man.

[1910.145\(f\)\(1\)\(i\)](#) - This [paragraph \(f\)](#) applies to all *accident prevention tags* used to identify hazardous conditions and provide a *message* to employees with respect to hazardous conditions as set forth in [paragraph \(f\)\(3\)](#) of this section, or to meet the specific *tagging* requirements of other OSHA standards.

[1910.145\(f\)\(3\)](#) - Use. *Tags* shall be used as a means to prevent accidental injury or illness to employees who are exposed to hazardous or potentially hazardous conditions, equipment or operations which are out of the ordinary, unexpected or not readily apparent. *Tags* shall be used until such time as the *identified hazard* is eliminated or the hazardous operation is completed. *Tags* need not be used where *signs*, guarding or other positive means of protection are being used.

[1910.145\(f\)\(4\)\(i\)](#) - *Tags* shall contain a *signal word* and a *major message*.

- [1910.145\(f\)\(4\)\(i\)\(A\)](#) - The *signal word* shall be either "*Danger*," "*Caution*," or "*Biological Hazard*," "*BIOHAZARD*," or the *biological hazard symbol*.
- [1910.145\(f\)\(4\)\(i\)\(B\)](#) - The *major message* shall indicate the specific hazardous condition or the instruction to be communicated to the employee.

[1910.145\(f\)\(4\)\(ii\)](#) - The *signal word* shall be readable at a minimum distance of five feet (1.52 m) or such greater distance as warranted by the hazard.

[1910.145\(f\)\(4\)\(iii\)](#) - The *tag's major message* shall be presented in either *pictographs*, *written text* or *both*.

[1910.145\(f\)\(4\)\(iv\)](#) - The *signal word* and the *major message* shall be *understandable* to all employees who may be exposed to the identified hazard.



[1910.145\(f\)\(4\)\(v\)](#) - All employees shall be *informed* as to the meaning of the various *tags* used throughout the workplace and what special precautions are necessary.

[1910.145\(f\)\(4\)\(vi\)](#) - *Tags* shall be *affixed* as close as safely possible to their respective hazards by a positive means such as string, wire, or adhesive that prevents their loss or unintentional removal.

[1910.145\(f\)\(5\)](#) - *Danger tags*. *Danger tags* shall be used in major hazard situations where an immediate hazard presents a threat of death or serious injury to employees. *Danger tags* shall be used only in these situations.

[1910.145\(f\)\(6\)](#) - *Caution tags*. *Caution tags* shall be used in minor hazard situations where a non-immediate or potential hazard or *unsafe practice* presents a lesser threat of employee injury. *Caution tags* shall be used only in these situations.

[1910.145\(f\)\(7\)](#) - *Warning tags*. *Warning tags* may be used to represent a hazard level between "*Caution*" and "*Danger*," instead of the required "*Caution*" *tag*, provided that they have a *signal word* of "*Warning*," an appropriate *major message*, and otherwise meet the general tag criteria of [paragraph \(f\)\(4\)](#) of this section.

[1910.145\(f\)\(8\)\(i\)](#) - *Biological hazard tags* shall be used to identify the actual or potential presence of a biological hazard and to identify equipment, containers, rooms, experimental animals, or combinations thereof, that contain or are contaminated with hazardous biological agents.

[1910.145\(f\)\(8\)\(ii\)](#) - The *symbol design* for *biological hazard tags* shall conform to the design shown below: [Reference [paragraph \(f\)\(8\)\(ii\)](#)].

[1910.145\(f\)\(9\)](#) - *Other tags*. *Other tags* may be used in addition to those required by this [paragraph \(f\)](#), or in other situations where this [paragraph \(f\)](#) does not require *tags*, provided that they do not detract from the impact or visibility of the *signal word* and *major message* of any required *tag*.

## **1910.146 - Permit-Required Confined Spaces**

**Scope:** This [standard](#) provides the requirements for practices and procedures to protect employees in general industry from the hazards of entry into permit-required confined spaces.

**Special Requirements:** Permit space program (written), measures, procedures, permits, permit systems, evaluates, demonstrates, posting signs, debrief, apprise, inform, training, testing, designated person (authorized entrants, attendants, entry supervisors, rescue

services), documentation, certify, certification, inspections, (M)SDS, information (written), consult

1910.146(c)(1) - The employer shall *evaluate* the workplace to determine if any spaces are *permit-required confined spaces*.

1910.146(c)(2) - If the workplace contains permit spaces, the employer shall *inform exposed employees*, by *posting danger signs* or by any other equally effective means, of the existence and location of and the danger posed by the *permit spaces*.

1910.146(c)(3) - If the employer decides that its employees will not enter permit spaces, the employer shall *take effective measures* to prevent its employees from entering the permit spaces and shall comply with paragraphs (c)(1), (c)(2), (c)(6), and (c)(8) of this section.

1910.146(c)(4) - If the employer decides that its employees will enter permit spaces, the employer shall *develop and implement a written permit space program* that complies with this section. The *written program* shall be *available for inspection* by employees and their *authorized* representatives.

1910.146(c)(5) - An employer may use the *alternate procedures* specified in paragraph (c)(5)(ii) [(c)(5)(ii)(A) - (ii)(H)] of this section for entering a permit space under the conditions set forth in paragraph (c)(5)(i) [(c)(5)(i)(A) - (i)(F)] of this section.

1910.146(c)(6) - When there are changes in the use or configuration of a non-permit confined space that might increase the hazards to entrants, the employer shall *reevaluate that space* and, if necessary, *reclassify* it as a *permit-required confined space*.

1910.146(c)(7) - A *space classified* by the employer as a *permit-required confined space* may be reclassified as a non-permit confined space under the following *procedures*: [Reference paragraph (c)(7)(i) - (iv)].

1910.146(c)(8) - When an employer (host employer) arranges to have employees of another employer (contractor) perform work that *involves permit space entry*, the host employer shall:

- 1910.146(c)(8)(i) - *Inform the contractor* that the workplace contains permit spaces and that permit space entry is allowed only through compliance with a *permit space program* meeting the requirements of this section;
- 1910.146(c)(8)(ii) - *Apprise the contractor* of the elements, including the hazards identified and the host employer's experience with the space, that make the space in question a permit space;

- [1910.146\(c\)\(8\)\(iii\)](#) - *Apprise the contractor of any precautions or procedures that the host employer has implemented for the protection of employees in or near permit spaces where contractor personnel will be working;*
- [1910.146\(c\)\(8\)\(iv\)](#) - *Coordinate entry operations with the contractor, when both host employer personnel and contractor personnel will be working in or near permit spaces, as required by [paragraph \(d\)\(11\)](#) of this section; and*
- [1910.146\(c\)\(8\)\(v\)](#) - *Debrief the contractor at the conclusion of the entry operations regarding the permit space program followed and regarding any hazards confronted or created in permit spaces during entry operations.*

[1910.146\(c\)\(9\)](#) - In addition to complying with the permit space requirements that apply to all employers, each contractor who is *retained to perform* permit space entry operations shall:

- [1910.146\(c\)\(9\)\(i\)](#) - *Obtain any available information regarding permit space hazards and entry operations from the host employer;*
- [1910.146\(c\)\(9\)\(ii\)](#) - *Coordinate entry operations with the host employer, when both host employer personnel and contractor personnel will be working in or near permit spaces, as required by [paragraph \(d\)\(11\)](#) of this section; and*
- [1910.146\(c\)\(9\)\(iii\)](#) - *Inform the host employer of the permit space program that the contractor will follow and of any hazards confronted or created in permit spaces, either through a debriefing or during the entry operation.*

[1910.146\(d\)](#) - *Permit-required confined space program* (permit space program). Under the *permit space program* required by [paragraph \(c\)\(4\)](#) of this section, the employer shall: [Reference [paragraph \(d\)\(1\) - \(d\)\(14\)](#)].

[1910.146\(e\)](#) - *Permit system.*

- [1910.146\(e\)\(1\)](#) - Before entry is authorized, the employer shall *document the completion of measures* required by [paragraph \(d\)\(3\)](#) of this section by preparing an *entry permit*.  
[1910.146\(e\)\(2\)](#) - Before entry begins, the entry supervisor identified on the *permit* shall *sign the entry permit* to authorize entry.
- [1910.146\(e\)\(3\)](#) - The *completed permit* shall be made available at the time of entry to all *authorized entrants or their authorized representatives*, by *posting* it at the entry portal or by any other equally effective means, so that the entrants can confirm that pre-entry preparations have been completed.

- [1910.146\(e\)\(4\)](#) - The duration of the *permit* may not exceed the time required to complete the assigned task or job identified on the *permit* in accordance with [paragraph \(f\)\(2\)](#) of this section.
- [1910.146\(e\)\(5\)](#) - The entry supervisor shall terminate entry and *cancel the entry permit* when: [Reference [paragraph \(e\)\(5\)\(i\) - \(ii\)](#)].
- [1910.146\(e\)\(6\)](#) - The employer shall *retain each canceled entry permit for at least 1 year* to facilitate the *review of the permit-required confined space program* required by [paragraph \(d\)\(14\)](#) of this section. Any problems encountered during an entry operation shall be noted on the pertinent *permit so that appropriate revisions* to the *permit space program* can be made.

[1910.146\(f\)](#) - *Entry permit*. The *entry permit that documents compliance* with this section and authorizes entry to a permit space shall identify: [Reference [paragraph \(f\)\(1\) - \(f\)\(15\)](#)].

[1910.146\(g\)](#) - *Training*.

- [1910.146\(g\)\(1\)](#) - The employer shall *provide training* so that all employees whose work is regulated by this section acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned under this section.
- [1910.146\(g\)\(2\)](#) - *Training shall be provided* to each affected employee: [Reference [paragraph \(g\)\(2\)\(i\) - \(iv\)](#)].
- [1910.146\(g\)\(3\)](#) - The *training shall establish employee proficiency* in the duties required by this section and shall introduce *new or revised procedures*, as necessary, for compliance with this section.
- [1910.146\(g\)\(4\)](#) - The employer shall *certify that the training* required by [paragraphs \(g\)\(1\) through \(g\)\(3\)](#) of this section has been accomplished. The *certification* shall contain each employee's name, the *signatures or initials of the trainers*, and the dates of training. The *certification* shall be *available for inspection* by employees and their authorized representatives.

[1910.146\(h\)](#) - *Duties of authorized entrants*. The employer shall ensure that all *authorized entrants*: [Reference [paragraphs \(h\)\(1\) - \(h\)\(5\)](#)].

[1910.146\(i\)](#) - *Duties of attendants*. The employer shall ensure that each *attendant*: [Reference [paragraphs \(i\)\(1\) - \(i\)\(10\)](#)].

[1910.146\(j\)](#) - *Duties of entry supervisors*. The employer shall ensure that each *entry supervisor*: [Reference [paragraphs \(j\)\(1\) - \(j\)\(6\)](#)].

1910.146(k) - *Rescue and emergency services.*

- 1910.146(k)(1) - An employer who *designates rescue and emergency services*, pursuant to paragraph (d)(9) of this section, shall: [Reference paragraphs (k)(1)(i) - (iv)].
- 1910.146(k)(2) - An employer whose employees have been designated to provide *permit space rescue and emergency services* shall take the following *measures*: [Reference paragraphs (k)(2)(i) - (iv)].
- 1910.146(k)(3) - To facilitate non-entry rescue, *retrieval systems or methods* shall be used whenever an *authorized entrant* enters a permit space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant. Retrieval systems shall meet the following requirements. [Reference paragraphs (k)(3)(i) - (iii)].
- 1910.146(k)(4) - If an injured entrant is exposed to a substance for which a *Material Safety Data Sheet (MSDS)* or other similar *written information* is required to be kept at the worksite, that *MSDS or written information* shall be made available to the medical facility treating the *exposed entrant*.

1910.146(l) - *Employee participation.*

- 1910.146(l)(1) - Employers shall *consult with affected employees* and their authorized representatives on the development and implementation of all aspects of the *permit space program* required by paragraph (c) of this section.
- 1910.146(l)(2) - Employers shall *make available* to affected employees and their authorized representatives all *information* required to be developed by this section.

Confined space means a space that:

- (1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and
- (2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); and
- (3) Is not designed for continuous employee occupancy.

Permit-required confined space (permit space) means a confined space that has one or more of the following characteristics

- (1) Contains or has a potential to contain a hazardous atmosphere;
- (2) Contains a material that has the potential for engulfing an entrant;

- (3) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
- (4) Contains any other recognized serious safety or health hazard.

## **1910.147 - The Control of Hazardous Energy (Lockout/Tagout)**

**Scope:** This [standard](#) covers the servicing and maintenance of machines and equipment in which the unexpected energization or start up of the machines or equipment, or release of stored energy could cause injury to employees.

**Special Requirements:** Program (energy control), procedures (documented), training/retraining, inspections (annual), demonstrate, tagout system, safety measures, documentation, tagout program, lockout program, rules, techniques, certify (inspections, training), authorized employees, inform

[1910.147\(a\)\(3\)\(i\)](#) - This section requires employers to *establish a program and utilize procedures* for affixing appropriate *lockout devices or tagout devices* to energy isolating devices, and to otherwise disable machines or equipment to prevent unexpected energization, start-up or release of stored energy in order to prevent injury to employees.

[1910.147\(a\)\(3\)\(ii\)](#) - When other *standards in this part (1910)* require the use of lockout or tagout, they shall be used and supplemented by the *procedural and training requirements* of this section.

[1910.147\(c\)\(1\)](#) - *Energy control program.* The employer shall *establish a program consisting of energy control procedures, employee training and periodic inspections* to ensure that before any employee performs any servicing or maintenance on a machine or equipment where the unexpected energizing, start up or release of stored energy could occur and cause injury, the machine or equipment shall be isolated from the energy source, and rendered inoperative.

[1910.147\(c\)\(2\)](#) - Lockout/tagout

- [1910.147\(c\)\(2\)\(i\)](#) - If an energy isolating device is not capable of being locked out, the *employer's energy control program* under [paragraph \(c\)\(1\)](#) of this section shall utilize a *tagout system*.
- [1910.147\(c\)\(2\)\(ii\)](#) - If an energy isolating device is capable of being locked out, the *employer's energy control program* under [paragraph \(c\)\(1\)](#) of this section shall utilize lockout, unless the employer can *demonstrate* that the utilization of a *tagout*



system will provide full employee protection as set forth in [paragraph \(c\)\(3\)](#) of this section.

[1910.147\(c\)\(3\)](#) - Full employee protection.

- [1910.147\(c\)\(3\)\(i\)](#) - When a tagout device is used on an energy isolating device which is capable of being locked out, the *tagout device shall be attached* at the same location that the lockout device would have been attached, and the *employer shall demonstrate* that the *tagout program* will provide a level of safety equivalent to that obtained by using a *lockout program*.
- [1910.147\(c\)\(3\)\(ii\)](#) - In *demonstrating* that a level of safety is achieved in the tagout program which is equivalent to the level of safety obtained by using a *lockout program*, the *employer shall demonstrate* full compliance with all *tagout-related provisions* of this standard together with such additional elements as are necessary to provide the equivalent safety available from the use of a lockout device. Additional means to be considered as part of the *demonstration* of full employee protection shall include the implementation of additional *safety measures* such as the removal of an isolating circuit element, blocking of a controlling switch, opening of an extra disconnecting device, or the removal of a valve handle to reduce the likelihood of inadvertent energization.

[1910.147\(c\)\(4\)](#) - Energy control procedure.

- [1910.147\(c\)\(4\)\(i\)](#) - *Procedures shall be developed, documented* and utilized for the control of potentially hazardous energy when employees are engaged in the activities covered by this section.
- [1910.147\(c\)\(4\)\(ii\)](#) - The *procedures* shall clearly and specifically outline the scope, purpose, *authorization, rules, and techniques* to be utilized for the control of hazardous energy, and the means to enforce compliance including, but not limited to, the following: [Reference [paragraphs \(c\)\(4\)\(ii\)\(A\) - \(D\)](#)].

[1910.147\(c\)\(5\)\(ii\)](#) - *Lockout devices and tagout devices* shall be *singularly identified*; shall be the only devices(s) used for controlling energy; shall not be used for other purposes; and shall meet the following requirements: {Reference [paragraphs \(c\)\(5\)\(ii\)\(A\) - \(D\)](#)}.

[1910.147\(c\)\(5\)\(iii\)](#) - *Tagout devices* shall *warn* against hazardous conditions if the machine or equipment is energized and shall *include a legend* such as the following: *Do Not Start, Do Not Open, Do Not Close, Do Not Energize, Do Not Operate*.

1910.147(c)(6)(i) - The employer shall *conduct a periodic inspection* of the *energy control procedure at least annually* to ensure that the *procedure* and the requirements of this standard are being followed. [Reference paragraphs (c)(6)(i)(A) - (D)].

1910.147(c)(6)(ii) - The employer shall *certify that the periodic inspections* have been performed. The *certification* shall identify the machine or equipment on which the *energy control procedure* was being utilized, the *date of the inspection*, the employees included in the *inspection*, and the *person performing the inspection*.

1910.147(c)(7)(i) - The employer shall *provide training* to ensure that the purpose and function of the *energy control program* are understood by employees and that the *knowledge and skills* required for the safe application, usage, and removal of the *energy controls* are acquired by employees. The *training shall include* the following:  
[Reference paragraphs (c)(7)(i)(A) - (C)].

1910.147(c)(7)(ii) - When *tagout systems* are used, employees shall also be *trained* in the following *limitations of tags*: [Reference paragraphs (c)(7)(ii)(A) - (F)].

1910.147(c)(7)(iii) - *Employee retraining*. [Reference paragraphs (c)(7)(ii)(A) - (C)].

1910.147(c)(7)(iv) - The employer shall *certify that employee training* has been accomplished and is being *kept up to date*. The *certification* shall contain each employee's *name and dates of training*.

1910.147(c)(8) - Energy isolation. Lockout or tagout shall be performed only by the *authorized employees* who are performing the servicing or maintenance.

1910.147(c)(9) - *Notification of employees*. Affected *employees shall be notified* by the employer or *authorized employee* of the application and removal of lockout devices or tagout devices. *Notification* shall be given before the controls are applied, and after they are removed from the machine or equipment.

1910.147(d) - Application of control. The *established procedures* for the application of energy control (*the lockout or tagout procedures*) shall cover the following elements and actions and shall be done in the following sequence:

- 1910.147(d)(1) - Preparation for shutdown. Before an *authorized or affected employee* turns off a machine or equipment, the *authorized employee shall have knowledge* of the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy.
- 1910.147(d)(2) - Machine or equipment shutdown. The machine or equipment shall be turned off or shut down using the *procedures established* for the machine or

equipment. An orderly shutdown must be utilized to avoid any additional or increased hazard(s) to employees as a result of the equipment stoppage.

1910.147(d)(4)(i) - Lockout or tagout devices shall be *affixed* to each energy isolating device *by authorized employees*.

1910.147(d)(4)(iii)(A) - Where tagout devices are used with energy isolating devices designed with the capability of being locked, the *tag attachment* shall be fastened at the same point at which the lock would have *been attached*.

1910.147(d)(4)(iii)(B) - Where a *tag cannot be affixed* directly to the energy isolating device, the *tag shall be located* as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.

1010.147(d)(6) - *Verification* of isolation. Prior to starting work on machines or equipment that have been locked out or *tagged out*, the *authorized employee shall verify* that isolation and deenergization of the machine or equipment have been accomplished.

1910.147(e) - Release from lockout or tagout. Before lockout or tagout devices are removed and energy is restored to the machine or equipment, *procedures shall be followed* and actions taken by the *authorized employee(s)* to ensure the following:

- 1910.147(e)(1) - The machine or equipment. The work area *shall be inspected* to ensure that nonessential items have been removed and to ensure that machine or equipment components are operationally intact.
- 1910.147(e)(2)(i) - The work area shall be *checked to ensure* that all employees have been safely positioned or removed.
- 1910.147(e)(2)(ii) - After *lockout or tagout devices* have been removed and before a machine or equipment is started, *affected employees shall be notified* that the lockout or tagout device(s) have been removed.

1910.147(e)(3) - Lockout or tagout devices removal. Each lockout or tagout device shall be removed from each energy isolating device by the employee who applied the device. *Exception to paragraph (e)(3)*: When the *authorized employee* who applied the lockout or tagout device is not available to remove it, that device may be removed *under the direction of the employer*, provided that *specific procedures and training* for such removal have been *developed, documented* and incorporated into the employer's *energy control program*. The employer *shall demonstrate that the specific procedure* provides equivalent safety to the removal of the device by the *authorized employee* who applied it. The *specific procedure* shall include at least the following elements: [Reference paragraphs (e)(3)(i) - (iii)].

[1910.147\(f\)\(1\)](#) - *Testing* or positioning of machines, equipment or components thereof. In situations in which *lockout or tagout devices* must be temporarily removed from the energy isolating device and the machine or equipment *energized to test* or position the machine, equipment or component thereof, the following sequence of actions shall be followed: [Reference [paragraphs \(f\)\(1\)\(i\) - \(v\)](#)].

[1910.147\(f\)\(2\)\(i\)](#) - Whenever outside servicing personnel are to be engaged in activities covered by the scope and application of this standard, the on-site employer and the *outside employer shall inform* each other of their respective *lockout or tagout procedures*.

[1910.147\(f\)\(2\)\(ii\)](#) - The on-site employer shall ensure that his/her *employees understand and comply* with the restrictions and prohibitions of the outside employer's *energy control program*.

[1910.147\(f\)\(3\)\(i\)](#) - When servicing and/or maintenance is performed by a crew, craft, department or other group, they shall utilize a *procedure* which affords the employees a level of protection equivalent to that provided by the implementation of a personal lockout or tagout device.

[1910.147\(f\)\(3\)\(ii\)](#) - Group lockout or tagout devices shall be used in accordance with the *procedures* required by [paragraph \(c\)\(4\)](#) of this section including, but not necessarily limited to, the following specific requirements: [Reference [paragraphs \(f\)\(3\)\(ii\)\(A\) - \(D\)](#)].

[1910.147\(f\)\(4\)](#) - Shift or personnel changes. *Specific procedures* shall be utilized *during shift or personnel changes* to ensure the continuity of lockout or tagout protection, including provision for the orderly transfer of *lockout or tagout device protection* between off-going and oncoming employees, to minimize exposure to hazards from the unexpected energization or start-up of the machine or equipment, or the release of stored energy.

[Affected employee](#). An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

[Authorized employee](#). A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this section.

[Lockout](#). The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Tagout. The placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

## Subpart K - Medical and First Aid

Subpart K provides the requirements on medical and first aid provides the requirements for medical services and first aid.

To learn if subpart K applies to you, go to [Does "Subpart K - Medical and First Aid" Apply to You?](#)

### Special Requirements

#### 1910.151 - Medical Services and First Aid

**Scope:** This standard provides the requirements for first aid and medical services.

**Special Requirements:** Advice/consultation, training, first aid supplies

1910.151(a) - The employer shall ensure the *ready availability* of medical personnel for *advice and consultation* on matters of plant health.

1910.151(b) - 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*.

Near proximity (interpretation) - "OSHA has long interpreted the term 'near proximity' to mean that emergency care must be available within no more than 3-4 minutes from the workplace. Medical literature establishes that, for serious injuries such as those involving stopped breathing, cardiac arrest, or uncontrolled bleeding, first aid treatment must be provided within the first few minutes to avoid permanent medical impairment or death. Accordingly, in workplaces where serious accidents such as those involving falls, suffocation, electrocution, or amputation are possible, emergency medical services must be available within 3-4 minutes, if there is no employee on the site who is trained to render first aid. OSHA does exercise discretion in enforcing the first aid requirements in particular cases. For example, OSHA recognizes that in workplaces, such as offices, where the possibility of such serious work-related injuries is less likely, a longer response time of up to 15 minutes may be reasonable."

## Subpart L - [Fire Protection](#)

[Subpart L](#) provides the standards for fire brigades, portable fire extinguishers, standpipe and hose systems, extinguishing systems, fire detection systems and employee alarm systems installed to meet the fire protection requirements and applies to all employments except for maritime, construction, and agriculture.

To learn if subpart L applies to you, go to [Does "Subpart L - Fire Protection" Apply to You?](#)

### Special Requirements

#### 1910.156 - Fire Brigades

**Scope:** This [standard](#) provides requirements for the organization, training, and personal protective equipment of fire brigades whenever they are established by an employer. The requirements of this section apply to fire brigades, industrial fire departments and private or contractual type fire departments. Personal protective equipment requirements apply only to members of fire brigades performing interior structural fire fighting. The requirements of this section do not apply to airport crash rescue or forest fire fighting operations.

[Fire brigade](#) is defined as an organized group of employees who are knowledgeable, trained, and skilled in at least basic firefighting operations.

**Special Requirements:** Statement/policy (written), training (frequency, quality), physician's certificate, training and education program, personal protective equipment, procedures (written), inform, advise, inspections, tests, respirators, fire brigade members, references other standards

[1910.156\(b\)\(1\)](#) - *Organizational statement*. The employer shall *prepare and maintain a statement or written policy* which establishes the existence of a fire brigade; the basic organizational structure; the type, amount, and *frequency of training* to be provided to fire brigade members; the expected number of members in the fire brigade; and the functions that the fire brigade is to perform at the workplace. The *organizational statement shall be available* for inspection by the Assistant Secretary and by employees or their designated representatives.

[1910.156\(b\)\(2\)](#) - *Personnel*. The employer shall assure that employees who are expected to do interior structural fire fighting are physically capable of performing duties which may be assigned to them during emergencies. The employer shall not permit employees with known heart disease, epilepsy, or emphysema, to participate in fire brigade emergency activities unless a *physician's certificate of the employees' fitness* to participate in such activities is provided. For employees assigned to *fire brigades* before September 15, 1980, this



paragraph is effective on September 15, 1990. For employees assigned to fire brigades on or after September 15, 1980, this paragraph is effective December 15, 1980.

1910.156(c)(1) - The employer shall *provide training and education* for all fire brigade members commensurate with those duties and functions that fire brigade members are expected to perform. Such *training and education* shall be provided to *fire brigade members* before they perform fire brigade emergency activities. *Fire brigade leaders and training instructors* shall be provided with *training and education* which is more comprehensive than that provided to the general membership of the *fire brigade*.

1910.156(c)(2) - The employer shall assure that *training and education is conducted frequently* enough to assure that each member of the *fire brigade* is able to perform the member's assigned duties and functions satisfactorily and in a safe manner so as not to endanger fire brigade members or other employees. All *fire brigade members* shall be provided with *training at least annually*. In addition, *fire brigade members* who are expected to perform interior structural fire fighting shall be provided with an *education session or training at least quarterly*.

1910.156(c)(3) - The *quality of the training and education program* for fire brigade members shall be similar to those conducted by such fire training schools as the Maryland Fire and Rescue Institute; Iowa Fire Service Extension; West Virginia Fire Service Extension; Georgia Fire Academy, New York State Department, Fire Prevention and Control; Louisiana State University Firemen Training Program, or Washington State's Fire Service Training Commission for Vocational Education. (For example, for the oil refinery industry, with its unique hazards, the training and education program for those fire brigade members shall be similar to those conducted by Texas A & M University, Lamar University, Reno Fire School, or the Delaware State Fire School.

1910.156(c)(4) - The employer shall *inform fire brigade members* about special hazards such as storage and use of flammable liquids and gases, toxic chemicals, radioactive sources, and water reactive substances, to which they may be exposed during fire and other emergencies. The fire brigade members shall also *be advised of any changes* that occur in relation to the special hazards. The employer shall develop and make *available for inspection* by *fire brigade members*, *written procedures* that describe the actions to be taken in situations involving the special hazards and shall include these in the *training and education program*.

1910.156(d) - Fire fighting equipment. The employer *shall maintain and inspect, at least annually*, fire fighting equipment to assure the safe operational condition of the *equipment*. *Portable fire extinguishers and respirators* shall be *inspected at least*

monthly. Fire fighting equipment that is in damaged or unserviceable condition shall be removed from service and replaced.

[1910.156\(e\)](#) - *Protective clothing*. The following requirements apply to those employees who perform interior structural fire fighting. The requirements do not apply to employees who use fire extinguishers or standpipe systems to control or extinguish fires only in the incipient stage.

- [1910.156\(e\)\(1\)\(i\)](#) - The employer shall provide at no cost to the employee and assure the use of *protective clothing* which complies with the requirements of this paragraph. The employer shall assure that *protective clothing* ordered or purchased after July 1, 1981, meets the requirements contained in this paragraph. As the new equipment is provided, the employer shall assure that all *fire brigade members* wear the equipment when performing interior structural fire fighting. After July 1, 1985, the employer shall assure that all *fire brigade members* wear *protective clothing* meeting the requirements of this paragraph when performing interior structural fire fighting.
- [1910.156\(e\)\(2\)\(ii\)](#) - *Protective footwear* shall meet the requirements of [1910.136](#) - *Foot protection*, for Class 75 footwear. In addition, *protective footwear* shall be water-resistant for at least 5 inches (12.7 cm) above the bottom of the heel and shall be equipped with slip-resistant outer soles.
- [1910.156\(e\)\(2\)\(iii\)](#) - *Protective footwear* shall be tested in accordance with paragraph (1) of [appendix E](#), and shall provide protection against penetration of the midsole by a size 8D common nail when at least 300 pounds (1330 N) of static force is applied to the nail.
- [1910.156\(e\)\(3\)\(ii\)](#) - The performance, construction, and testing of fire-resistive coats and protective trousers shall be at least equivalent to the *requirements of the National Fire Protection Association (NFPA) standard NFPA No. 1971-1975, "Protective Clothing for Structural Fire Fighting,"* which is incorporated by reference as specified in [1910.6](#), (See [appendix D](#) to [subpart L](#)) with the following permissible variations from those requirements: [Reference [paragraphs \(e\)\(3\)\(ii\)\(A\) - \(B\)](#)].
- [1910.156\(e\)\(4\)\(i\)](#) - *Hand protection* shall consist of protective gloves or glove system which will provide protection against cut, puncture, and heat penetration. Gloves or glove system shall be tested in accordance with the test methods contained in the *National Institute for Occupational Safety and Health (NIOSH) 1976 publication, "The Development of Criteria for Fire Fighter's Gloves; Vol. II, Part II: Test*

*Methods*," which is incorporated by reference as *specified in 1910.6*, (See [appendix D](#) to [subpart L](#)) and shall meet the following criteria for cut, puncture, and heat penetration: [Reference [paragraphs \(e\)\(4\)\(i\)\(A\) - \(C\)](#)].

- [1910.156\(e\)\(4\)\(ii\)](#) - Exterior materials of gloves shall be flame resistant and *shall be tested* in accordance with paragraph (3) of [appendix E](#). Maximum allowable after flame shall be 2.0 seconds, and the maximum char length shall be 4.0 inches (10.2 cm).
- [1910.156\(e\)\(5\)\(i\)](#) - *Head protection* shall consist of a protective head device with ear flaps and chin strap which meet the performance, construction, and *testing requirements* of the National Fire Safety and Research Office of the National Fire Prevention and Control Administration, U.S. Department of Commerce (now known as the U.S. Fire Administration), which are contained in "Model Performance Criteria for Structural Firefighters' Helmets" (August 1977) which is *incorporated by reference as specified in 1910.6*, (See [appendix D](#) to [subpart L](#)).
- [1910.156\(e\)\(5\)\(ii\)](#) - *Protective eye and face devices* which comply with [1910.133 - Eye and face protection](#), shall be used by fire brigade members when performing operations where the hazards of flying or falling materials which may cause eye and face injuries are present. *Protective eye and face devices* provided as accessories to protective head devices (face shields) are permitted when such devices meet the requirements of [1910.133](#).
- [1910.156\(e\)\(5\)\(iii\)](#) - *Full facepieces, helmets, or hoods* of breathing apparatus which meet the *requirements of 1910.134 - Respiratory protection*, and [paragraph \(f\)](#) of this section, shall be acceptable as meeting the *eye and face protection* requirements of [paragraph \(e\)\(5\)\(ii\)](#) of this section.

[1910.156\(f\)\(1\)\(i\)](#) - The employer must ensure that *respirators* are provided to, and used by, each *fire brigade member*, and that the *respirators* meet the requirements of [29 CFR 1910.134](#) for each employee required by this section to use a *respirator*.  
[Reference [paragraphs \(f\)\(1\)\(i\) - \(vi\)](#)].

[1910.156\(f\)\(2\)\(i\)](#) - The employer shall assure that *self-contained breathing apparatus* ordered or purchased after July 1, 1981, for use by *fire brigade members* performing interior structural fire fighting operations, are of the pressure-demand or other positive-pressure type. Effective July 1, 1983, only pressure-demand or other *positive-pressure self-contained breathing apparatus* shall be worn by *fire brigade members* performing interior structural fire fighting.

## 1910.157 - Portable Fire Extinguishers

**Scope:** This [standard](#) provides requirements for the placement, use, maintenance, and testing of portable fire extinguishers provided for the use of employees. [Paragraph \(d\)](#) - selection and distribution, of this section does not apply to extinguishers provided for employee use on the outside of workplace buildings or structures. Where extinguishers are provided but are not intended for employee use and the employer has an emergency action plan and a fire prevention plan that meet the requirements of [29 CFR 1910.38](#) - emergency action plan, and [29 CFR 1910.39](#) - fire prevention plan, respectively, then only the requirements of [paragraphs \(e\) and \(f\)](#) of this section apply.

**Special Requirements:** Emergency action plan, fire prevention plan, fire safety policy (written), authorized employees, fire alarm signal, identify (fire extinguishers), training (annually), record, hydrostatic test, maintenance check, maintenance procedures, educational program, training, references other standards

[1910.157\(b\)\(1\)](#) - Where the employer has established and implemented a *written fire safety policy* which requires the immediate and total evacuation of employees from the workplace upon the sounding of a *fire alarm signal* and which includes an *emergency action plan* and a *fire prevention plan* which meet the requirements of [29 CFR 1910.38](#) and [29 CFR 1910.39](#) respectively, and when extinguishers are not available in the workplace, the employer is exempt from all requirements of this section unless a specific standard in part 1910 requires that a portable fire extinguisher be provided.

[1910.157\(b\)\(2\)](#) - Where the employer has an *emergency action plan* meeting the requirements of [29 CFR 1910.38](#) which designates certain employees to be the only *employees authorized* to use the available portable fire extinguishers, and which requires all other employees in the fire area to immediately evacuate the affected work area upon the sounding of the fire alarm, the employer is exempt from the distribution requirements in [paragraph \(d\)](#) - selection and distribution of this section.

[1910.157\(c\)\(1\)](#) - The employer shall provide portable fire extinguishers and shall mount, locate and *identify them* so that they are readily accessible to employees without subjecting the employees to possible injury.

[1910.157\(d\)\(3\)](#) - The employer may use uniformly spaced standpipe systems or hose stations connected to a sprinkler system installed for emergency use by employees instead of Class A portable fire extinguishers, provided that such systems meet the respective requirements of [1910.158](#) - *standpipe and hose systems*, or [1910.159](#) - *automatic sprinkler systems*, that they provide total coverage of the area to be protected, and that employees are *trained at least annually* in their use.

[1910.157\(e\)\(1\)](#) - The employer shall be responsible for the *inspection, maintenance and testing* of all portable fire extinguishers in the workplace.

[1910.157\(e\)\(2\)](#) - Portable extinguishers or hose used in lieu thereof under [paragraph \(d\)\(3\)](#) of this section shall be *visually inspected monthly*.

[1910.157\(e\)\(3\)](#) - The employer shall assure that portable fire extinguishers are subjected to an *annual maintenance check*. Stored pressure extinguishers do not require an internal examination. The employer shall record the *annual maintenance date and retain this record* for one year after the last entry or the life of the shell, whichever is less. The *record* shall be available to the Assistant Secretary upon request.

[1910.157\(e\)\(4\)](#) - The employer shall assure that stored pressure dry chemical extinguishers that require a 12-year *hydrostatic test* are emptied and subjected to applicable *maintenance procedures every 6 years*. Dry chemical extinguishers having non-refillable disposable containers are exempt from this requirement. When *recharging or hydrostatic testing* is performed, the 6-year *requirement* begins from that date.

[1910.157\(f\)\(1\)](#) - The employer shall assure that *hydrostatic testing* is performed by *trained persons* with suitable testing equipment and facilities. [Reference [paragraphs \(f\)\(2\) - \(16\)](#)].

[1910.157\(g\)\(1\)](#) - Where the employer has provided portable fire extinguishers for employee use in the workplace, the employer shall also provide an *educational program* to familiarize employees with the general principles of fire extinguisher use and the hazards involved with incipient stage fire fighting.

[1910.157\(g\)\(2\)](#) - The employer shall provide the *education* required in [paragraph \(g\)\(1\)](#) of this section upon *initial employment* and at least *annually* thereafter.

[1910.157\(g\)\(3\)](#) - The employer shall provide employees who have been designated to use fire fighting equipment as part of an *emergency action plan with training* in the use of the appropriate equipment.

[1910.157\(g\)\(4\)](#) - The employer shall provide the *training* required in [paragraph \(g\)\(3\)](#) of this section upon *initial assignment* to the designated group of employees and at least *annually* thereafter.

## **1910.158 - Standpipe and Hose Systems**

**Scope:** This [standard](#) applies to all small hose, Class II, and Class III standpipe systems installed to meet the requirements of a particular OSHA standard.

Small hose system means a system of hose ranging in diameter from 5/8" (1.6 cm up to 1 1/2" (3.8 cm) which is for the use of employees and which provides a means for the control and extinguishment of incipient stage fires.

Standpipe systems - Class 1 - 3.

**Special Requirements:** Hydrostatic tests, inspections, fire watch, trained person

1910.158(e)(1)(i) - The employer shall assure that the piping of Class II and Class III systems installed after January 1, 1981, including yard piping, is *hydrostatically tested* for a period of at least 2 hours at not less than 200 psi (1380 kPa), or at least 50 psi (340 kPa) in excess of normal pressure when such pressure is greater than 150 psi (1030 kPa).

1910.158(e)(1)(ii) - The employer shall assure that hose on all standpipe systems installed after January 1, 1981, is *hydrostatically tested* with couplings in place, at a pressure of not less than 200 psi (1380 kPa), before it is placed in service. This pressure shall be maintained for at least 15 seconds and not more than one minute during which time the hose shall not leak nor shall any jacket thread break during the *test*.

1910.158(e)(2)(iii) - The employer shall assure that hose systems are *inspected at least annually and after each use* to assure that all of the equipment and hose are in place, available for use, and in serviceable condition.

1910.158(e)(2)(iv) - When the system or any portion thereof is found not to be serviceable, the employer shall remove it from service immediately and replace it with equivalent protection such as extinguishers and *fire watches*.

1910.158(e)(2)(v) - The employer shall assure that hemp or linen hose on existing systems is unracked, *physically inspected* for deterioration, and reracked using a different fold pattern *at least annually*. The employer shall assure that defective hose is replaced in accordance with paragraph (c)(3)(ii) of this section.

1910.158(e)(2)(vi) - The employer shall *designate trained persons* to conduct all *inspections* required under this section.

## **1910.159 - Automatic Sprinkler Systems**

**Scope:** This standard applies to all automatic sprinkler systems installed to meet a particular OSHA standard. Exemptions. Automatic sprinkler systems installed in workplaces, but not required by OSHA, are exempt from the requirements of this section.

Sprinkler system means a system of piping designed in accordance with fire protection engineering standards and installed to control or extinguish fires. The system includes an



adequate and reliable water supply, and a network of specially sized piping and sprinklers which are interconnected. The system also includes a control valve and a device for actuating an alarm when the system is in operation.

**Special Requirements:** Flow tests, engineering review, acceptance tests, designed, records

[1910.159\(c\)\(2\)](#) - Maintenance. The employer shall properly maintain an automatic sprinkler system installed to comply with this section. The employer shall assure that a main drain *flow test is performed on each system annually*. The inspector's test valve shall be opened at least every two years to assure that the sprinkler system operates properly.

[1910.159\(c\)\(3\)](#) - Acceptance tests. The employer shall conduct *proper acceptance tests* on sprinkler systems installed for employee protection after January 1, 1981, and *record* the dates of such tests. Proper *acceptance tests* include the following: [Reference [paragraphs \(c\)\(3\)\(i\) - \(v\)](#)].

[1910.159\(c\)\(8\)\(ii\)](#) - The employer may not use older style sprinklers to replace standard sprinklers without a *complete engineering review* of the altered part of the system.

[1910.159\(c\)\(11\)](#) - *Hydraulically designed systems*. The employer shall assure that *hydraulically designed* automatic sprinkler systems or portions thereof are identified and that the location, number of sprinklers in the hydraulically designed section, and the basis of the design is indicated. *Central records* may be used in lieu of signs at sprinkler valves provided the *records are available for inspection* and copying by the Assistant Secretary.

## **1910.160 - Fixed Extinguishing Systems, General**

**Scope:** This [standard](#) applies to all fixed extinguishing systems installed to meet a particular OSHA standard except for automatic sprinkler systems which are covered by [1910.159](#) - automatic sprinkler systems. This section also applies to fixed systems not installed to meet a particular OSHA standard, but which, by means of their operation, may expose employees to possible injury, death, or adverse health consequences caused by the extinguishing agent. Such systems are only subject to the requirements of [paragraphs \(b\)\(4\) through \(b\)\(7\)](#) and [\(c\)](#) of this section. Systems otherwise covered in [paragraph \(a\)\(2\)](#) of this section which are installed in areas with no employee exposure are exempted from the requirements of this section.

[Fixed extinguishing system](#) means a permanently installed system that either extinguishes or controls a fire at the location of the system.

**Special Requirements:** Notify employees, signaling system, employee alarm systems, posted signs, inspections (annually), knowledgeable person, trained personnel, checks, weights, records, training, references other standards

1910.160(b)(2) - If for any reason a fixed extinguishing system becomes inoperable, the employer shall *notify employees* and take the necessary temporary precautions to assure their safety until the system is restored to operating order. Any defects or impairments shall be properly corrected by *trained personnel*.

1910.160(b)(3) - The employer shall provide a *distinctive alarm or signaling system* which complies with 1910.165 - *employee alarm systems*, and is capable of being perceived above ambient noise or light levels, on all extinguishing systems in those portions of the workplace covered by the extinguishing system to indicate when the extinguishing system is discharging. *Discharge alarms* are not required on systems where discharge is immediately recognizable.

1910.160(b)(5) - The employer shall *post hazard warning or caution signs* at the entrance to, and inside of, areas protected by fixed extinguishing systems which use agents in concentrations known to be hazardous to employee safety and health.

1910.160(b)(6) - The employer shall assure that fixed systems are *inspected annually* by a *person knowledgeable* in the design and function of the system to assure that the system is maintained in good operating condition.

1910.160(b)(7) - The employer shall assure that the weight and pressure of refillable containers is *checked at least semi-annually*. If the container shows a loss in net content or weight of more than 5 percent, or a loss in pressure of more than 10 percent, it shall be subjected to maintenance.

1910.160(b)(8) - The employer shall assure that factory charged nonrefillable containers which have no means of pressure indication are *weighed at least semi-annually*. If a container shows a loss in net weight or more than 5 percent it shall be replaced.

1910.160(b)(9) - The employer shall assure that *inspection and maintenance dates are recorded* on the container, on a tag attached to the container, or in a central location. *A record of the last semi-annual check* shall be maintained until the container is checked again or for the life of the container, whichever is less.

1910.160(b)(10) - The employer shall *train employees* designated to *inspect*, maintain, operate, or repair fixed extinguishing systems and *annually review their training* to keep them up-to-date in the functions they are to perform.

## 1910.161 - Fixed Extinguishing Systems, Dry Chemical

**Scope:** This [standard](#) applies to all fixed extinguishing systems, using dry chemical as the extinguishing agent, installed to meet a particular OSHA standard. These systems shall also comply with [1910.160](#) - fixed extinguishing systems, general.

[Fixed extinguishing system](#) means a permanently installed system that either extinguishes or controls a fire at the location of the system.

**Special Requirements:** Name plate, employee alarm systems, sample (annually), references other standards

[1910.161\(b\)\(2\)](#) - The employer may not mix together dry chemical extinguishing agents of different compositions. The employer shall assure that dry chemical systems are refilled with the chemical stated on the *approval nameplate* or an equivalent compatible material.

[1910.161\(b\)\(3\)](#) - When dry chemical discharge may obscure vision, the employer shall provide a pre-discharge *employee alarm* which complies with [1910.165](#) - *employee alarm systems*, and which will give employees time to safely exit from the discharge area prior to system discharge.

[1910.161\(b\)\(4\)](#) - The employer *shall sample* the dry chemical supply of all but stored pressure systems *at least annually* to assure that the dry chemical supply is free of moisture which may cause the supply to cake or form lumps.

## 1910.162 - Fixed Extinguishing Systems, Gaseous Agent

**Scope:** This [standard](#) applies to all fixed extinguishing systems, using a gas as the extinguishing agent, installed to meet a particular OSHA standard. These systems shall also comply with [1910.160](#) - fixed extinguishing systems, general.

[Fixed extinguishing system](#) means a permanently installed system that either extinguishes or controls a fire at the location of the system.

**Special Requirements:** Employee alarm systems, references other standards

[1910.162\(b\)\(5\)](#) - The employer shall provide a distinctive *pre-discharge employee alarm* capable of being perceived above ambient light or noise levels when agent design concentrations exceed the maximum safe level for employee exposure. A *pre-discharge employee alarm for alerting employees* before system discharge shall be provided on Halon 1211 and carbon dioxide systems with a design concentration of 4 percent or greater and for Halon 1301 systems with a design concentration of 10 percent or greater. The *pre-discharge*

*employee alarm* shall provide employees time to safely exit the discharge area prior to system discharge.

## **1910.163 - Fixed Extinguishing Systems, Water Spray and Foam**

**Scope:** This [standard](#) applies to all fixed extinguishing systems, using water or foam solution as the extinguishing agent, installed to meet a particular OSHA standard. These systems shall also comply with [1910.160](#) - fixed extinguishing systems, general. This section does not apply to automatic sprinkler systems which are covered under [1910.159](#).

[Fixed extinguishing system](#) means a permanently installed system that either extinguishes or controls a fire at the location of the system.

**Special Requirements:** Design, references other standards

[1910.163\(b\)\(1\)](#) - The employer shall assure that foam and water spray systems are *designed* to be effective in at least controlling fire in the protected area or on protected equipment.

## **1910.164 - Fire Detection Systems**

**Scope:** This [standard](#) applies to all automatic fire detection systems installed to meet the requirements of a particular OSHA standard.

**Special Requirements:** Tests, servicing, designed, design data, maintenance, trained personnel, cleaned (periodic), emergency action plan, references other standards

[1910.164\(b\)\(2\)](#) - The employer shall restore all fire detection systems and components to normal operating condition as promptly as possible after each *test or alarm*. Spare detection devices and components which are normally destroyed in the process of detecting fires shall be available on the premises or from a local supplier in sufficient quantities and locations for prompt restoration of the system.

[1910.164\(c\)\(4\)](#) - The employer shall assure that the *servicing, maintenance and testing* of fire detection systems, including cleaning and necessary sensitivity adjustments are performed by a *trained person knowledgeable* in the operations and functions of the system.

[1910.164\(c\)\(5\)](#) - The employer shall also assure that fire detectors that need to be cleaned of dirt, dust, or other particulates in order to be fully operational are *cleaned at regular periodic intervals*.

[1910.164\(e\)\(1\)](#) - The employer shall assure that *fire detection systems* installed for the purpose of actuating fire extinguishment or suppression systems shall be *designed* to operate in time to control or extinguish a fire.

[1910.164\(e\)\(2\)](#) - The employer shall assure that *fire detection systems* installed for the purpose of employee alarm and evacuation be *designed* and installed to provide a warning for emergency action and safe escape of employees.

[1910.164\(e\)\(3\)](#) - The employer shall not delay alarms or devices initiated by fire detector actuation for more than 30 seconds unless such delay is necessary for the immediate safety of employees. When such delay is necessary, it shall be addressed in an *emergency action plan* meeting the requirements of [1910.38](#).

[1910.164\(f\)](#) - Number, location and spacing of detecting devices. The employer shall assure that the number, spacing and location of fire detectors is based upon *design data* obtained from field experience, or *tests, engineering surveys, the manufacturer's recommendations*, or a recognized *testing laboratory listing*.

## **1910.165 - Employee Alarm Systems**

**Scope:** This [standard](#) applies to all emergency employee alarms installed to meet a particular OSHA standard. This section does not apply to those discharge or supervisory alarms required on various fixed extinguishing systems or to supervisory alarms on fire suppression, alarm or detection systems unless they are intended to be employee alarm systems.

**Special Requirements:** Emergency action plan, testing, inspections, maintenance, alerting employees, trained personnel, procedures, posting emergency phone numbers, communication system, alerting employees, reporting emergencies

[1910.165\(a\)\(2\)](#) - The requirements in this section that pertain to *maintenance, testing and inspection* shall apply to all local *fire alarm signaling systems* used for *alerting employees* regardless of the other functions of the system.

[1910.165\(b\)\(1\)](#) - The *employee alarm system* shall provide *warning* for necessary *emergency action* as called for in the *emergency action plan*, or for reaction time for safe escape of employees from the workplace or the immediate work area, or both.

[1910.165\(b\)\(2\)](#) - The *employee alarm* shall be capable of being perceived above ambient noise or light levels by all employees in the affected portions of the workplace. Tactile devices may be used to *alert those employees* who would not otherwise be able to recognize the *audible or visual alarm*.

1910.165(b)(3) - The *employee alarm* shall be distinctive and recognizable as a signal to evacuate the work area or to perform actions designated under the *emergency action plan*.

1910.165(b)(4) - The employer shall *explain to each employee* the preferred means of reporting emergencies, such as manual pull box alarms, public address systems, radio or telephones. The employer shall *post emergency telephone numbers* near telephones, or employee notice boards, and other conspicuous locations when telephones serve as a means of *reporting emergencies*. Where a *communication system* also serves as the *employee alarm system*, all emergency messages shall have priority over all non-emergency messages.

1910.165(b)(5) - The employer shall *establish procedures for sounding emergency alarms* in the workplace. For those employers with *10 or fewer employees* in a particular workplace, *direct voice communication* is an acceptable *procedure for sounding the alarm* provided all employees can hear the alarm. Such workplaces need not have a back-up system.

1910.165(c)(2) - The employer shall assure that all *employee alarm systems* are restored to normal operating condition as promptly as possible after *each test or alarm*. Spare alarm devices and components subject to wear or destruction shall be available in sufficient quantities and locations for prompt restoration of the system.

1910.165(d)(2) - The employer shall assure that a *test of the reliability* and adequacy of non-supervised *employee alarm systems is made every two months*. A different actuation device shall be used in each *test* of a multi-actuation device system so that no individual device is used for two consecutive tests.

1910.165(d)(4) - The employer shall assure that employee alarm circuitry installed after January 1, 1981, which is capable of *being supervised is supervised* and that it will provide positive *notification to assigned personnel* whenever a deficiency exists in the system. The employer shall assure that all *supervised employee alarm systems are tested at least annually* for reliability and adequacy.

1910.165(d)(5) - The employer shall assure that the *servicing, maintenance and testing of employee alarms* are done by *persons trained* in the designed operation and functions necessary for reliable and safe operation of the system.

## **Subpart M - Compressed Gas and Compressed Air Equipment**



[Subpart M](#) applies to compressed air receivers, and other equipment used in providing and utilizing compressed air for performing operations such as cleaning, drilling, hoisting, and chipping.

To learn if subpart M applies to you, go to [Does "Subpart M - Compressed Gas and Compressed Air Equipment" Apply to You?](#)

## Special Requirements

### 1910.169 - Compressed Air Receivers

**Scope:** This [standard](#) provides requirements for compressed air receivers, and other equipment used in providing and utilizing compressed air for performing cleaning, drilling, hoisting, and chipping operations.

**Special Requirements:** Tests, references other standards

[1910.169\(a\)\(2\)\(i\)](#) - All new air receivers installed after the effective date of these regulations shall be constructed in accordance with the *1968 edition of the A.S.M.E. Boiler and Pressure Vessel Code Section VIII*, which is incorporated by reference as specified in [1910.6](#).

[1910.169\(b\)\(3\)\(iv\)](#) - All safety valves shall be *tested frequently and at regular intervals* to determine whether they are in good operating condition.

## Subpart N - [Materials Handling and Storage](#)

[Subpart N](#) provides the standards for handling materials and storage which includes powered industrial trucks (forklifts), overhead and gantry cranes, crawler locomotive and truck cranes, derricks, helicopters and slings. This subpart also provides the standards for servicing multi-piece and single piece rim wheels.

To learn if subpart N applies to you, go to [Does "Subpart N - Materials Handling and Storage" Apply to You?](#)

## Special Requirements

### 1910.176 - Handling Materials – General

**Scope:** This [standard](#) provides general requirements for mechanical handling equipment.

**Special Requirements:** Markings, signage

[1910.176\(a\)](#) - Use of mechanical equipment. Where mechanical handling equipment is used, sufficient safe clearances shall be allowed for aisles, at loading docks, through doorways and wherever turns or passage must be made. Aisles and passageways shall be kept clear and in good repair, with no obstruction across or in aisles that could create a hazard. Permanent aisles and passageways shall be appropriately *marked*.

[1910.176\(e\)](#) - Clearance limits. Clearance *signs to warn of clearance limits* shall be provided.

## **1910.177 - Servicing Multi-piece and Single Piece Rim Wheels**

**Scope:** This [standard](#) applies to the servicing of multi-piece and single piece rim wheels used on large vehicles such as trucks, tractors, trailers, buses and off-road machines. It does not apply to the servicing of rim wheels used on automobiles, or on pickup trucks and vans utilizing automobile tires or truck tires designated "LT". All provisions of this section apply to the servicing of both single piece rim wheels and multi-piece rim wheels unless designated otherwise.

**Special Requirements:** Training program, safe operating procedures, instruction, charts, rim manual, contents of standard, demonstrates (employee), evaluate, visually inspect, inspections, marked, tagged, checked, safety procedures

[Multi-piece rim wheel](#) means the assemblage of a multi-piece wheel with the tire tube and other components.

[Single piece rim wheel](#) means the assemblage of single piece rim wheel with the tire and other components.

[1910.177\(c\)\(1\)](#) - The employer shall provide a *program to train all employees* who service rim wheels in the hazards involved in servicing those rim wheels and the *safety procedures* to be followed.

[1910.177\(c\)\(1\)\(i\)](#) - The employer shall assure that no employee services any rim wheel unless the employee has been *trained and instructed in correct procedures* of servicing the type of wheel being serviced, and in the *safe operating procedures* described in [paragraphs \(f\)](#) and [\(g\)](#) of this section.

[1910.177\(c\)\(1\)\(ii\)](#) - Information to be used in the *training program* shall include, at a minimum, the applicable *data* contained in the *charts (rim manuals)* and the *contents of this standard*.

[1910.177\(c\)\(1\)\(iii\)](#) - Where an employer knows or has reason to believe that any of his employees is unable to read and understand the *charts or rim manual*, the employer shall

assure that the employee is *instructed* concerning the *contents of the charts and rim manual* in a manner which the employee is able to understand.

[1910.177\(c\)\(2\)](#) - The employer shall assure that each *employee demonstrates* and maintains the ability to service rim wheels safely, including performance of the following tasks: [Reference [paragraphs \(c\)\(2\)\(i\) - \(viii\)](#)].

[1910.177\(c\)\(3\)](#) - The employer shall *evaluate* each employee's ability to perform these tasks and to service rim wheels safely, and shall provide *additional training* as necessary to assure that each employee maintains his or her proficiency.

[1910.177\(d\)\(3\)\(iii\)](#) - Restraining devices and barriers shall be *visually inspected prior to each day's use* and after any separation of the rim wheel components or sudden release of contained air. Any restraining device or barrier exhibiting damage such as the following defects shall be immediately removed from service: [Reference [paragraphs \(d\)\(3\)\(iii\)\(A\) - \(E\)](#)].

[1910.177\(d\)\(5\)](#) - Current *charts or rim manuals* containing *instructions* for the type of wheels being serviced shall be available in the service area.

[1910.177\(d\)\(6\)](#) - The employer shall furnish and assure that only tools recommended in the *rim manual* for the type of wheel being serviced are used to service rim wheels.

[1910.177\(e\)\(1\)](#) - Multi-piece wheel components shall not be interchanged except as provided in the *charts or in the applicable rim manual*.

[1910.177\(e\)\(2\)](#) - Multi-piece wheel components and single piece wheels shall be *inspected prior to assembly*. Any wheel or wheel component which is bent out of shape, pitted from corrosion, broken, or cracked shall not be used and shall be *marked or tagged unserviceable* and removed from the service area. Damaged or leaky valves shall be replaced.

[1910.177\(e\)\(4\)](#) - The size (bead diameter and tire/wheel widths) and type of both the tire and the wheel shall be *checked* for compatibility prior to assembly of the rim wheel.

[1910.177\(f\)](#) - *Safe operating procedure - multi-piece rim wheels*. The employer shall *establish a safe operating procedure* for servicing multi-piece rim wheels and shall assure that employees are *instructed in and follow that procedure*. The *procedure* shall include at least the following elements: [Reference [paragraphs \(f\)\(\(1\) - \(11\)](#)].

[1910.177\(g\)](#) - *Safe operating procedure - single piece rim wheels*. The employer shall *establish a safe operating procedure* for servicing single piece rim wheels and shall assure

that employees are *instructed* in and *follow that procedure*. The procedure shall include at least the following elements: [Reference [paragraphs \(g\)\(\(1\) - \(12\)\)](#)].

## 1910.178 - Powered Industrial Trucks

**Scope:** This [standard](#) provides the safety requirements relating to fire protection, design, maintenance, and use of fork trucks, tractors, platform lift trucks, motorized hand trucks, and other specialized industrial trucks powered by electric motors or internal combustion engines. This section does not apply to compressed air or nonflammable compressed gas-operated industrial trucks, nor to farm vehicles, nor to vehicles intended primarily for earth moving or over-the-road hauling.

**Special Requirements:** Label, markings, testing laboratory, design, manufacturer written approval, nameplates, instruction plates, tags, designations, training (initial/refresher), authorized/unauthorized, evaluations, competent, training program, designated locations, certification, traffic regulations, authorized speed limit, rated capacity, examination, reporting, references other standards

[1910.178\(a\)\(2\)](#) - All new powered industrial trucks acquired and used by an employer shall meet the *design* and construction requirements for powered industrial trucks established in the “*American National Standard for Powered Industrial Trucks, Part II, ANSI B56.1-1969*”, which is incorporated by reference as specified in [1910.6](#) - *incorporation by reference*, except for vehicles intended primarily for earth moving or over-the-road hauling.

[1910.178\(a\)\(3\)](#) - Approved trucks shall bear a *label or some other identifying mark* indicating *approval by the testing laboratory*. See [paragraph \(a\)\(7\)](#) of this section and paragraph 405 of “*American National Standard for Powered Industrial Trucks, Part II, ANSI B56.1-1969*”, which is incorporated by reference in [paragraph \(a\)\(2\)](#) of this section and which provides that if the powered industrial truck is accepted by a nationally recognized *testing laboratory* it should be so *marked*.

[1910.178\(a\)\(4\)](#) - Modifications and additions which affect capacity and safe operation shall not be performed by the customer or user without *manufacturers prior written approval*. Capacity, operation, and maintenance *instruction plates, tags, or decals* shall be changed accordingly.

[1910.178\(a\)\(5\)](#) - If the truck is equipped with front-end attachments other than factory installed attachments, the user shall request that the truck be *marked to identify the attachments* and show the approximate weight of the truck and attachment combination at maximum elevation with load laterally centered.

[1910.178\(a\)\(6\)](#) - The user shall see that all *nameplates and markings* are in place and are maintained in a *legible condition*.

[1910.178\(a\)\(7\)](#) - As used in this section, the term, *approved truck or approved industrial truck* means a truck that is *listed* or approved for fire safety purposes for the intended use by a *nationally recognized testing laboratory*, using nationally recognized *testing standards*. Refer to [1910.155\(c\)\(3\)\(iv\)\(A\)](#) - *fire protection*, for definition of listed, and to [1910.7](#) for definition of *nationally recognized testing laboratory*.

[1910.178\(b\)](#) - *Designations*. For the purpose of this standard there are *eleven different designations* of industrial trucks or tractors as follows: D, DS, DY, E, ES, EE, EX, G, GS, LP, and LPS. [Reference [paragraphs \(b\)\(1\) - \(12\)](#)].

[1910.178\(c\)\(2\)](#) - For specific areas of use, see [Table N-1](#) which tabulates the information contained in this section. References are to the corresponding classification as used in [Subpart S](#) - electrical, of this part (1910).

[1910.178\(f\)\(1\)](#) - The storage and handling of liquid fuels such as gasoline and diesel fuel shall be in accordance with *NFPA Flammable and Combustible Liquids Code (NFPA No. 30-1969)*, which is incorporated by reference as specified in [1910.6](#) - *incorporation by reference*.

[1910.178\(f\)\(2\)](#) - The storage and handling of liquefied petroleum gas fuel shall be in accordance with *NFPA Storage and Handling of Liquefied Petroleum Gases (NFPA No. 58-1969)*, which is incorporated by reference as specified in [1910.6](#).

[1910.178\(i\)\(1\)](#) - Concentration levels of carbon monoxide gas created by powered industrial truck operations shall not exceed the levels specified in [1910.1000](#) - *air contaminants*.

[1910.178\(j\)](#) - Dockboards (bridge plates). See [subpart D](#) - *walking and working surfaces*, of this part (1910).

[1910.178\(l\)\(1\)\(i\)](#) - The employer shall ensure that each powered industrial *truck operator* is *competent* to operate a powered industrial truck safely, as *demonstrated by the successful completion of the training and evaluation* specified in this [paragraph \(l\)](#).

[1910.178\(l\)\(1\)\(ii\)](#) - Prior to permitting an employee to operate a powered industrial truck (except for training purposes), the employer shall ensure that each operator has successfully completed the *training* required by this [paragraph \(l\)](#), except as permitted by [paragraph \(l\)\(5\)](#).

[1910.178\(l\)\(2\)](#) - *Training program implementation*.

- [1910.178\(l\)\(2\)\(i\)](#) - Trainees may operate a powered industrial truck only: [Reference [paragraphs \(l\)\(2\)\(i\)\(A\) - \(B\)](#)].
- [1910.178\(l\)\(2\)\(ii\)](#) - *Training* shall consist of a combination of *formal instruction* (e.g., *lecture, discussion, interactive computer learning, video tape, written material*), *practical training* (*demonstrations performed by the trainer and practical exercises performed by the trainee*), and *evaluation of the operator's performance* in the workplace.

[1910.178\(l\)\(2\)\(iii\)](#) - All *operator training and evaluation* shall be conducted by persons who have the *knowledge, training, and experience to train* powered industrial truck operators and *evaluate their competence*.

[1910.178\(l\)\(3\)](#) - *Training program* content. Powered industrial truck operators shall receive *initial training* in the following topics, except in topics which the employer can *demonstrate* are not applicable to safe operation of the truck in the employer's workplace.

- [1910.178\(l\)\(3\)\(i\)](#) - *Truck-related topics*: [Reference [paragraphs \(l\)\(3\)\(i\)\(A\) - \(M\)](#)].
- [1910.178\(l\)\(3\)\(ii\)](#) - *Workplace-related topics*: [Reference [paragraphs \(l\)\(3\)\(ii\)\(A\) - \(L\)](#)].

[1910.178\(l\)\(4\)\(i\)](#) - *Refresher training*, including an *evaluation* of the effectiveness of that *training*, shall be conducted as required by [paragraph \(l\)\(4\)\(ii\)](#) to ensure that the operator has the *knowledge and skills* needed to operate the powered industrial truck safely.

[1910.178\(l\)\(4\)\(ii\)](#) - *Refresher training* in relevant topics shall be provided to the operator when: [Reference [paragraphs \(l\)\(4\)\(ii\)\(A\) - \(E\)](#)].

[1910.178\(l\)\(4\)\(iii\)](#) - An *evaluation* of each powered industrial truck operator's performance shall be *conducted at least once every three years*.

[1910.178\(l\)\(5\)](#) - *Avoidance of duplicative training*. If an operator has *previously received training* in a topic specified in paragraph (l)(3) of this section, and such *training* is appropriate to the truck and working conditions encountered, *additional training* in that topic is not required if the operator has been *evaluated* and found *competent* to operate the truck safely.

[1910.178\(l\)\(6\)](#) - *Certification*. The employer shall certify that each operator has been *trained and evaluated* as required by this [paragraph \(l\)](#). The *certification* shall include the name of the operator, the date of the *training*, the date of the *evaluation*, and the *identity of the person(s) performing the training or evaluation*.



[1910.178\(m\)\(3\)](#) - *Unauthorized personnel* shall not be permitted to ride on powered industrial trucks. A safe place to ride shall be provided where riding of trucks is *authorized*.

[1910.178\(n\)\(1\)](#) - All *traffic regulations* shall be observed, including *authorized plant speed limits*. A safe distance shall be maintained approximately three truck lengths from the truck ahead, and the truck shall be kept under control at all times.

[1910.178\(o\)\(2\)](#) - Only loads within the *rated capacity* of the truck shall be handled.

[1910.178\(q\)\(1\)](#) - Any power-operated industrial truck not in safe operating condition shall be removed from service. All repairs shall be made by *authorized personnel*.

[1910.178\(q\)\(3\)](#) - Those repairs to the fuel and ignition systems of industrial trucks which involve fire hazards shall be conducted only in *locations designated* for such repairs.

[1910.178\(q\)\(6\)](#) - Industrial trucks shall not be altered so that the relative positions of the various parts are different from what they were when originally received from the manufacturer, nor shall they be altered either by the addition of extra parts not provided by the manufacturer or by the elimination of any parts, except as provided in [paragraph \(q\)\(12\)](#) of this section. Additional counterweighting of fork trucks shall not be done unless *approved by the truck manufacturer*.

[1910.178\(q\)\(7\)](#) - Industrial trucks shall be *examined before being placed in service*, and shall not be placed in service if the examination shows any condition adversely affecting the safety of the vehicle. Such *examination shall be made at least daily*. Where industrial trucks are used on a round-the-clock basis, they shall be *examined after each shift*. Defects when found shall be immediately *reported* and corrected.

## **1910.179 - Overhead and Gantry Cranes**

**Scope:** This [standard](#) applies to overhead and gantry cranes, including semigantry, cantilever gantry, wall cranes, storage bridge cranes, and others having the same fundamental characteristics. These cranes are grouped because they all have trolleys and similar travel characteristics.

**Special Requirements:** Design specifications, rated load (displayed), markings, tested, qualified engineer, checked, designated personnel, manufacturer's recommendations, manufacturer approval, warning signals, inspections, tests, preventive maintenance program, labels, instruct, competent supervision, designated personnel, maintenance procedures, test reports, certification record, appointed person, responsible person, notification, familiar with fire extinguishers, references other standards

Gantry crane means a crane similar to an overhead crane except that the bridge for carrying the trolley or trolleys is rigidly supported on two or more legs running on fixed rails or other runway.

Overhead crane means a crane with a movable bridge carrying a movable or fixed hoisting mechanism and traveling on an overhead fixed runway structure.

1910.179(b)(2) - *New and existing equipment.* All new overhead and gantry cranes constructed and installed on or after August 31, 1971, shall meet the *design specifications* of the *American National Standard Safety Code for Overhead and Gantry Cranes, ANSI B30.2.0-1967*, which is incorporated by reference as specified in 1910.6 - *incorporation by reference*.

1910.179(b)(3) - *Modifications.* Cranes may be modified and rerated provided such modifications and the supporting structure are *checked thoroughly* for the *new rated load by a qualified engineer or the equipment manufacturer*. The crane shall be tested in accordance with paragraph (k)(2) of this section. *New rated load shall be displayed* in accordance with subparagraph (5) of this paragraph.

1910.179(b)(5) - *Rated load marking.* The *rated load* of the crane shall be *plainly marked on each side* of the crane, and if the crane has more than one hoisting unit, each hoist shall have its *rated load marked* on it or its load block and this *marking shall be clearly legible* from the ground or floor.

1910.179(b)(6)(i) - Minimum clearance of 3 inches overhead and 2 inches laterally shall be provided and maintained between crane and obstructions in conformity with *Crane Manufacturers Association of America, Inc., Specification No. 61*, which is incorporated by reference as specified in 1910.6 (*formerly the Electric Overhead Crane Institute, Inc.*).

1910.179(b)(8) - *Designated personnel* - Only *designated personnel* shall be permitted to operate a crane covered by this section.

1910.179(c)(2) - *Access to crane.* Access to the car and/or bridge walkway shall be by a conveniently placed fixed ladder, stairs, or platform requiring no step over any gap exceeding 12 inches (30 cm). Fixed ladders must comply with subpart D - walking-working surfaces, of this part (1910).

1910.179(d)(3) - *Toeboards and handrails for footwalks.* Toeboards and handrails must comply with subpart D - walking-working surfaces, of this part (1910).

1910.179(d)(4)(iii) - Ladders shall be permanently and securely fastened in place and constructed in compliance with subpart D - walking-working surfaces, of this part (1910).

[1910.179\(g\)\(1\)\(i\)](#) - Wiring and equipment shall comply with [subpart S](#) - *electrical, of this part (1910)*.

[1910.179\(g\)\(1\)\(v\)](#) - Pendant control boxes shall be constructed to prevent electrical shock and shall be *clearly marked* for identification of functions.

[1910.179\(h\)\(2\)\(i\)](#) - In using hoisting ropes, the *crane manufacturer's recommendation* shall be followed. The *rated load* divided by the number of parts of rope shall not exceed 20 percent of the nominal breaking strength of the rope.

[1910.179\(h\)\(2\)\(iii\)\(b\)](#) - Rope end shall be anchored by a clamp securely attached to the drum, or by a socket arrangement *approved by the crane or rope manufacturer*.

[1910.179\(h\)\(2\)\(v\)](#) - Rope clips attached with U-bolts shall have the U-bolts on the dead or short end of the rope. Spacing and number of all types of clips shall be in accordance with the clip *manufacturer's recommendation*. Clips shall be drop-forged steel in all sizes manufactured commercially. When a newly installed rope has been in operation for an hour, all nuts on the clip bolts shall be retightened.

[1910.179\(h\)\(2\)\(vi\)](#) - Swaged or compressed fittings shall be applied as *recommended by the rope or crane manufacturer*.

[1910.179\(h\)\(2\)\(viii\)](#) - Replacement rope shall be the same size, grade, and construction as the original rope furnished by the crane manufacturer, unless otherwise *recommended by a wire rope manufacturer* due to actual working condition requirements.

[1910.179\(h\)\(4\)](#) - *Hooks*. Hooks shall meet the *manufacturer's recommendations* and shall not be overloaded.

[1910.179\(i\)](#) - Warning device. Except for floor-operated cranes a gong or other effective *warning signal* shall be provided for each crane equipped with a power traveling mechanism.

[1910.179\(j\)\(1\)\(i\)](#) - *Initial inspection*. Prior to initial use, all new and altered cranes shall be *inspected to insure compliance* with the provisions of this section.

[1910.179\(j\)\(1\)\(ii\)](#) - *Inspection procedure* for cranes in regular service is divided into two general *classifications* based upon the intervals at which *inspection* should be performed. The intervals in turn are dependent upon the nature of the critical components of the crane and the degree of their exposure to wear, deterioration, or malfunction. The two general classifications are herein designated as "*frequent*" and "*periodic*" with respective intervals between inspections as defined below: [Reference [paragraphs \(j\)\(1\)\(ii\)\(a\) - \(b\)](#)].

1910.179(j)(2) - *Frequent inspection*. The following items shall be *inspected for defects at intervals* as defined in paragraph (j)(1)(ii) of this section or as specifically indicated, including observation during operation for any defects which might appear between *regular inspections*. All deficiencies such as listed shall be *carefully examined* and determination made as to whether they constitute a safety hazard: [Reference paragraphs (j)(2)(i) - (vii)].

1910.179(j)(3) - *Periodic inspection*. *Complete inspections* of the crane shall be performed *at intervals* as generally defined in paragraph (j)(1)(ii)(b) of this section, depending upon its activity, severity of service, and environment, or as specifically indicated below. These *inspections* shall include the requirements of paragraph (j)(2) of this section and in addition, the following items. Any deficiencies such as *listed* shall be *carefully examined* and determination made as to whether they constitute a safety hazard: [Reference paragraphs (j)(3)(i) - (x)].

1910.179(j)(4)(i) - A crane which has been idle for a period of 1 month or more, but less than 6 months, shall be given an *inspection* conforming with requirements of paragraph (j)(2) of this section and paragraph (m)(2) of this section *before placing in service*.

1910.179(j)(4)(ii) - A crane which has been idle for a period of over 6 months shall be given a *complete inspection* conforming with requirements of paragraphs (j)(2) and (3) of this section and paragraph (m)(2) of this section *before placing in service*.

1910.179(j)(4)(iii) - Standby cranes shall be *inspected at least semi-annually* in accordance with requirements of paragraph (j)(2) of this section and paragraph (m)(2) of this section.

1910.179(k)(1) - *Operational tests*.

- 1910.179(k)(1)(i) - *Prior to initial use*, all new and altered cranes shall be *tested* to insure compliance with this section including the following functions: [Reference paragraphs (k)(1)(i)(a) - (d)].

1910.179(k)(2) - *Rated load test*. *Test loads* shall not be more than 125 percent of the *rated load* unless otherwise recommended by the manufacturer. The *test reports* shall be placed on file where readily available to *appointed personnel*.

1910.179(l)(1) - *Preventive maintenance*. A *preventive maintenance program* based on the crane *manufacturer's recommendations* shall be established.

1910.179(l)(2) - *Maintenance procedure*.

- 1910.179(l)(2)(i) - Before adjustments and repairs are started on a crane the following *precautions* shall be taken: [Reference paragraphs (l)(2)(i)(a) - (e)].

[1910.179\(l\)\(3\)\(i\)](#) - Any unsafe conditions disclosed by the *inspection requirements* of [paragraph \(j\)](#) of this section shall be corrected before operation of the crane is resumed. Adjustments and repairs shall be done only by *designated personnel*.

[1910.179\(l\)\(3\)\(iii\)\(a\)](#) - Crane hooks showing defects described in [paragraph \(j\)\(2\)\(iii\)](#) of this section shall be discarded. Repairs by welding or reshaping are not generally recommended. If such repairs are attempted they shall only be done under *competent supervision* and the hook shall be tested to the load requirements of [paragraph \(k\)\(2\)](#) of this section before further use.

[1910.179\(l\)\(3\)\(iii\)\(d\)](#) - Pendant control stations shall be kept clean and function *labels kept legible*.

[1910.179\(m\)\(1\)](#) - Running ropes. A *thorough inspection* of all ropes shall be made *at least once a month and a certification record* which includes the *date of inspection*, the signature of the *person who performed the inspection* and an identifier for the ropes which were *inspected shall be kept on file* where readily available to *appointed personnel*. Any deterioration, resulting in appreciable loss of original strength, shall be carefully observed and determination made as to whether further use of the rope would constitute a safety hazard. Some of the conditions that could result in an appreciable loss of strength are the following: [Reference [paragraphs \(m\)\(1\)\(i\) - \(vi\)](#)].

[1910.179\(m\)\(2\)](#) - Other ropes. All rope which has been idle for a period of a month or more due to shutdown or storage of a crane on which it is installed shall be given a *thorough inspection before it is used*. This *inspection* shall be for all types of deterioration and shall be *performed by an appointed person* whose approval shall be required for further use of the rope. A *certification record* shall be *available for inspection* which includes the *date of inspection*, the *signature of the person* who performed the *inspection* and an identifier for the rope which was *inspected*.

[1910.179\(n\)\(3\)\(iv\)](#) - Cranes shall not be used for side pulls except when specifically *authorized by a responsible person* who has determined that the stability of the crane is not thereby endangered and that various parts of the crane will not be overstressed.

[1910.179\(n\)\(3\)\(vii\)](#) - The operator shall *test the brakes each time* a load approaching the *rated load* is handled. The brakes shall be *tested by raising the load* a few inches and applying the brakes.

[1910.179\(n\)\(3\)\(ix\)](#) - When two or more cranes are used to lift a load *one qualified responsible person* shall be in charge of the operation. He shall analyze the operation and *instruct all personnel* involved in the proper positioning, rigging of the load, and the movements to be made.

[1910.179\(n\)\(4\)\(i\)](#) - At the beginning of each operator's shift, the upper limit switch of each hoist shall be tried out under no load. Extreme care shall be exercised; the block shall be "inched" into the limit or run in at slow speed. If the switch does not operate properly, the *appointed person* shall be *immediately notified*.

[1910.179\(o\)\(3\)](#) - Fire extinguishers. The employer shall insure that *operators are familiar with the operation and care* of fire extinguishers provided.

## **1910.180 - Crawler Locomotive and Truck Cranes**

**Scope:** This [standard](#) applies to crawler cranes, locomotive cranes, wheel mounted cranes of both truck and self-propelled wheel type, and any variations thereof which retain the same fundamental characteristics. This section includes only cranes of the above types, which are basically powered by internal combustion engines or electric motors and which utilize drums and ropes. Cranes designed for railway and automobile wreck clearances are excepted. The requirements of this section are applicable only to machines when used as lifting cranes.

A [crawler crane](#) consists of a rotating superstructure with power plant, operating machinery, and boom, mounted on a base, equipped with crawler treads for travel. Its function is to hoist and swing loads at various radii.

A [locomotive crane](#) consists of a rotating superstructure with power-plant, operating machinery and boom, mounted on a base or car equipped for travel on railroad track. It may be self-propelled or propelled by an outside source. Its function is to hoist and swing loads at various radii.

A [truck crane](#) consists of a rotating superstructure with powerplant, operating machinery and boom, mounted on an automotive truck equipped with a powerplant for travel. Its function is to hoist and swing loads at various radii.

**Special Requirements:** Design specifications, designated personnel, inspections, inspection procedures, inspection records, load ratings, certification records, test procedures, operational tests, rated load tests, written reports, authorized person, quality control measures, instruction, designated person, certified test results, manufacturer approval, familiar with fire extinguishers, references other standards

[1910.180\(b\)\(2\)](#) - New and existing equipment. All new crawler, locomotive, and truck cranes constructed and utilized on or after August 31, 1971, shall meet the *design specifications* of the *American National Standard Safety Code for Crawler, Locomotive, and Truck Cranes, ANSI B30.5-1968*, which is incorporated by reference as specified in [1910.6](#) - *incorporation by reference*. Crawler, locomotive, and truck cranes constructed prior to August 31, 1971,



should be modified to conform to those *design specifications* by February 15, 1972, unless it can be shown that the crane cannot feasibly or economically be altered and that the crane substantially complies with the requirements of this section.

1910.180(b)(3) - *Designated personnel*. Only *designated personnel* shall be permitted to operate a crane covered by this section.

1910.180(c)(1) - *Load ratings* - where stability governs lifting performance.

1910.180(c)(1)(i) - The margin of stability for determination of *load ratings*, with booms of stipulated lengths at stipulated working radii for the various types of crane mountings, is established by taking a percentage of the loads which will produce a condition of tipping or balance with the boom in the least stable direction, relative to the mounting. The *load ratings* shall not exceed the following percentages for cranes, with the indicated types of mounting under conditions stipulated in paragraphs (c)(1)(ii) and (iii) of this section.

1910.180(c)(1)(iii) - Stipulations governing the application of the values in paragraph (c)(1)(i) of this section for crawler, truck, and wheel-mounted cranes shall be in accordance with *Crane Load-Stability Test Code, Society of Automotive Engineers (SAE) J765*, which is incorporated by reference as specified in 1910.6.

1910.180(c)(2) - *Load rating chart*. A substantial and durable rating chart with clearly *legible letters and figures* shall be provided with each crane and *securely fixed* to the crane cab in a location easily visible to the operator while seated at his control station.

1910.180(d)(1) - *Initial inspection*. Prior to initial use all new and altered cranes shall be *inspected* to insure compliance with provisions of this section.

1910.180(d)(2) - *Regular inspection*. *Inspection procedure* for cranes in regular service is divided into two general classifications based upon the intervals at which inspection should be performed. The intervals in turn are dependent upon the nature of the critical components of the crane and the degree of their exposure to wear, deterioration, or malfunction. The two general classifications are herein designated as "*frequent*" and "*periodic*", with respective intervals between *inspections* as defined below:  
[Reference paragraphs (d)(2)(i) - (ii)].

1910.180(d)(3) - *Frequent inspection*. Items such as the following shall be *inspected* for defects at intervals as defined in paragraph (d)(2)(i) of this section or as specifically indicated including observation during operation for any defects which might appear between *regular inspections*. Any deficiencies such as listed shall be carefully examined and determination made as to whether they constitute a safety hazard:  
[Reference paragraphs (d)(3)(i) - (vii)].

1910.180(d)(4) - *Periodic inspection*. Complete inspections of the crane shall be performed at intervals as generally defined in paragraph (d)(2)(ii) of this section depending upon its activity, severity of service, and environment, or as specifically indicated below. These inspections shall include the requirements of paragraph (d)(3) of this section and in addition, items such as the following. Any deficiencies such as listed shall be carefully examined and determination made as to whether they constitute a safety hazard: [Reference paragraphs (d)(4)(i) - (x)].

1910.180(d)(5)(i) - A crane which has been idle for a period of one month or more, but less than 6 months, shall be given an *inspection* conforming with requirements of paragraph (d)(3) of this section and paragraph (g)(2)(ii) of this section before placing in service.

1910.180(d)(5)(ii) - A crane which has been idle for a period of six months shall be given a *complete inspection* conforming with requirements of paragraphs (d)(3) and (4) of this section and paragraph (g)(2)(ii) of this section before placing in service.

1910.180(d)(5)(iii) - Standby cranes shall be *inspected at least semiannually* in accordance with requirements of paragraph (d)(3) of this section and paragraph (g)(2)(ii) of this section. Such cranes which are exposed to adverse environment should be *inspected more frequently*.

1910.180(d)(6) - *Inspection records*. Certification records which include the date of inspection, the *signature of the person who performed the inspection* and the serial number, or other identifier, of the crane which was *inspected* shall be made monthly on critical items in use such as brakes, crane hooks, and ropes. This *certification record* shall be kept

1910.180(e)(1) - *Operational tests*.

- 1910.180(e)(1)(i) - In addition to *prototype tests and quality-control measures*, each new production crane shall be tested by the manufacturer to the extent necessary to insure compliance with the operational requirements of this paragraph including functions such as the following: [Reference paragraphs (e)(1)(i)(a) - (e)].

1910.180(e)(1)(ii) - Where the complete production crane is not supplied by one manufacturer such *tests shall be conducted* at final assembly.

1910.180(e)(1)(iii) - *Certified production-crane test results* shall be made available.

1910.180(e)(2) - *Rated load test*.

- 1910.180(e)(2)(i) - *Written reports shall be available* showing *test procedures* and confirming the adequacy of repairs or alterations.

- [1910.180\(e\)\(2\)\(iii\)\(a\)](#) - Crawler, truck, and wheel-mounted cranes shall be tested in accordance with *SAE Recommended Practice, Crane Load Stability Test Code J765 (April 1961)*.
- [1910.180\(e\)\(2\)\(iii\)\(b\)](#) - Locomotive cranes shall be tested in accordance with [paragraph \(c\)\(1\)\(i\) and \(ii\)](#) of this section.
- [1910.180\(e\)\(2\)\(iii\)\(c\)](#) - Rerating test report shall be readily available.
- [1910.180\(e\)\(2\)\(iv\)](#) - No cranes shall be rerated in excess of the original load ratings unless such rating changes are approved by the crane manufacturer or final assembler.

[1910.180\(g\)\(1\)](#) - Running ropes. A *thorough inspection* of all ropes in use shall be made at least *once a month* and a *certification record* which includes the date of inspection, the *signature of the person who performed the inspection* and an identifier for the ropes shall be *prepared and kept on file* where readily available. All *inspections* shall be performed by an *appointed or authorized person*. Any deterioration, resulting in appreciable loss of original strength shall be carefully observed and determination made as to whether further use of the rope would constitute a safety hazard. Some of the conditions that could result in an appreciable loss of strength are the following: [Reference [paragraphs \(g\)\(1\)\(i\) - \(vi\)](#)].

[1910.180\(g\)\(2\)\(i\)](#) - Heavy wear and/or broken wires may occur in sections in contact with equalizer sheaves or other sheaves where rope travel is limited, or with saddles. Particular care shall be taken to *inspect ropes* at these locations.

[1910.180\(g\)\(2\)\(ii\)](#) - All rope which has been idle for a period of a month or more due to shutdown or storage of a crane on which it is installed shall be given a *thorough inspection* before it is used. This *inspection* shall be for all types of deterioration and shall be performed by an *appointed or authorized person* whose approval shall be required for further use of the rope. A *certification record* which includes the date of inspection, the *signature of the person who performed the inspection*, and an identifier for the rope which was *inspected shall be prepared* and kept readily available.

[1910.180\(g\)\(2\)\(iii\)](#) - Particular care shall be taken in the *inspection of nonrotating rope*.

[1910.180\(h\)\(1\)\(i\)](#) - No crane shall be loaded beyond the rated load, except for *test purposes* as provided in paragraph (e) of this section.

[1910.180\(h\)\(3\)\(vii\)](#) - On truck-mounted cranes, no loads shall be lifted over the front area except as *approved by the crane manufacturer*.

[1910.180\(h\)\(3\)\(viii\)](#) - The operator shall test *the brakes each time a load* approaching the *rated load* is handled by raising it a few inches and applying the brakes.

[1910.180\(h\)\(3\)\(ix\)](#) - Outriggers shall be used when the load to be handled at that particular radius exceeds the *rated load* without outriggers as given by the manufacturer for that crane. Where floats are used they shall be securely attached to the outriggers. Wood blocks used to support outriggers shall: [Reference [paragraphs \(h\)\(3\)\(ix\)\(a\) - \(c\)](#)].

[1910.180\(h\)\(3\)\(xii\)](#) - When two or more cranes are used to lift one load, *one designated person* shall be responsible for the operation. He shall be required to analyze the operation and *instruct all personnel* involved in the proper positioning, rigging of the load, and the movements to be made.

[1910.180\(h\)\(3\)\(xiv\)](#) - Before traveling a crane with load, a *designated person* shall be responsible for determining and controlling safety. Decisions such as position of load, boom location, ground support, travel route, and speed of movement shall be in accord with his determinations.

[1910.180\(i\)\(2\)](#) - Ballast or counterweight. Cranes shall not be operated without the full amount of any ballast or counterweight in place as *specified by the maker*, but truck cranes that have dropped the ballast or counterweight may be operated temporarily with special care and only for light loads without full ballast or counterweight in place. The ballast or counterweight in place *specified by the manufacturer* shall not be exceeded.

[1910.180\(i\)\(4\)\(i\)](#) - Refueling with small portable containers shall be done with an approved safety type can equipped with an automatic closing cap and flame arrester. Refer to [1910.155\(c\)\(3\)](#) - *fire protection*, for definition of approved.

[1910.180\(i\)\(5\)\(ii\)](#) - Operating and maintenance personnel shall be made *familiar with the use and care of the fire extinguishers* provided.

[1910.180\(j\)](#) - Operations near overhead lines. For operations near overhead electric lines, see [1910.333\(c\)\(3\)](#) - *electrical; selection and use of work practices*.

## **1910.181 – Derricks**

**Scope:** This [standard](#) provides requirements for guy, stiffleg, basket, breast, gin pole, Chicago boom and A-frame derricks of the stationary type, capable of handling loads at variable reaches and powered by hoists through systems of rope reeving, used to perform lifting hook work, single or multiple line bucket work, grab, grapple, and magnet work. Derricks may be permanently installed for temporary use as in construction work. The

requirements of this section also apply to any modification of these types which retain their fundamental features, except for floating derricks.

A *derrick* is an apparatus consisting of a mast or equivalent member held at the head by guys or braces, with or without a boom, for use with a hoisting mechanism and operating ropes.

**Special Requirements:** Designated personnel, load markings, rating chart, capacity charts, inspections, tests, appointed person, preventive maintenance program, maintenance procedures, designated individual, manufacturer recommendations, certification record, familiar with fire extinguisher, operator knowledge, references other standards

1910.181(b)(2) - New and existing equipment. All new derricks constructed and installed on or after August 31, 1971, shall meet the *design specifications of the American National Standard Safety Code for Derricks, ANSI B30.6-1969*, which is incorporated by reference as specified in 1910.6.

1910.181(b)(3) - *Designated personnel*. Only *designated personnel* shall be permitted to operate a derrick covered by this section.

1910.181(c)(1) - *Rated load marking*. For permanently installed derricks with fixed lengths of boom, guy, and mast, a substantial, durable, and clearly *legible rating chart* shall be provided with each derrick and *securely affixed* where it is visible to personnel responsible for the safe operation of the equipment. The *chart* shall include the following *data*: [Reference paragraphs (c)(1)(i) - (iii)].

1910.181(c)(2) - Nonpermanent installations. For nonpermanent installations, the *manufacturer shall provide sufficient information* from which *capacity charts* can be prepared for the particular installation. The *capacity charts* shall be *located at the derricks or the jobsite office*.

1910.181(d)(1)(i) - *Prior to initial use all new and altered derricks* shall be *inspected* to insure compliance with the provisions of this section.

1910.181(d)(1)(ii) - *Inspection procedure* for derricks in regular service is divided into two general classifications based upon the intervals at which *inspection* should be performed. The intervals in turn are dependent upon the nature of the critical components of the derrick and the degree of their exposure to wear, deterioration, or malfunction. The two general classifications are herein designated as *frequent and periodic* with respective *intervals between inspections* as defined below: [Reference paragraphs (d)(1)(ii)(a) - (b)].

1910.181(d)(2) - *Frequent inspection*. Items such as the following shall be *inspected* for defects at intervals as defined in paragraph (d)(1)(ii)(a) of this section or as specifically

indicated, including observation during operation for any defects which might appear between *regular inspections*. Deficiencies shall be carefully examined for any safety hazard: [Reference [paragraphs \(d\)\(2\)\(i\) - \(ix\)](#)].

[1910.181\(d\)\(3\)\(i\)](#) - Complete *inspections* of the derrick shall be performed at intervals as generally defined in [paragraph \(d\)\(1\)\(ii\)\(b\)](#) of this section depending upon its activity, severity of service, and environment, or as specifically indicated below. These *inspections* shall include the requirements of [paragraph \(d\)\(2\)](#) of this section and in addition, items such as the following. Deficiencies shall be carefully examined and a determination made as to whether they constitute a safety hazard: [Reference [paragraphs \(d\)\(3\)\(i\)\(a\) - \(f\)](#)].

[1910.181\(d\)\(3\)\(ii\)](#) - Foundation or supports shall be *inspected* for continued ability to sustain the imposed loads.

[1910.181\(d\)\(4\)\(i\)](#) - A derrick which has been idle for a period of *1 month or more, but less than 6 months*, shall be given an *inspection* conforming with requirements of [paragraph \(d\)\(2\)](#) of this section and [paragraph \(g\)\(3\)](#) of this section before placing in service.

[1910.181\(d\)\(4\)\(ii\)](#) - A derrick which has been idle for a period of *over 6 months* shall be given a complete *inspection* conforming with requirements of [paragraphs \(d\)\(2\)](#) and [\(3\)](#) of this section and [paragraph \(g\)\(3\)](#) of this section before placing in service.

[1910.181\(d\)\(4\)\(iii\)](#) - Standby derricks shall be *inspected at least semiannually* in accordance with requirements of [paragraph \(d\)\(2\)](#) of this section and [paragraph \(g\)\(3\)](#) of this section.

[1910.181\(e\)\(1\)](#) - *Operational tests*. Prior to initial use all new and altered derricks shall be *tested* to insure compliance with this section including the following functions: [Reference [paragraphs \(e\)\(1\)\(i\) - \(iv\)](#)].

[1910.181\(e\)\(2\)](#) - Anchorages. All anchorages shall be *approved by the appointed person*. Rock and hairpin anchorages may require special *testing*.

[1910.181\(f\)\(1\)](#) - Preventive maintenance. A *preventive maintenance program* based on the derrick *manufacturer's recommendations* shall be established.

[1910.181\(f\)\(2\)](#) - *Maintenance procedure*.

- [1910.181\(f\)\(2\)\(i\)](#) - Before adjustments and repairs are started on a derrick the following precautions shall be taken: [Reference [paragraphs \(f\)\(2\)\(i\)\(a\) - \(f\)](#)].

[1910.181\(f\)\(3\)\(i\)](#) - Any unsafe conditions disclosed by *inspection* shall be corrected before operation of the derrick is resumed.



[1910.181\(g\)\(1\)](#) - Running ropes. A thorough *inspection* of all ropes in use shall be made at least *once a month and a certification record* which includes the date of *inspection*, the *signature of the person* who performed the *inspection*, and an identifier for the ropes which were *inspected* shall be prepared and *kept on file* where readily available. Any deterioration, resulting in appreciable loss of original strength shall be carefully observed and determination made as to whether further use of the rope would constitute a safety hazard. Some of the conditions that could result in an appreciable loss of strength are the following: [Reference [paragraphs \(g\)\(1\)\(i\) - \(vi\)](#)].

[1910.181\(g\)\(2\)](#) - Limited travel ropes. Heavy wear and/or broken wires may occur in sections in contact with equalizer sheaves or other sheaves where rope travel is limited, or with saddles. Particular care shall be taken to *inspect ropes* at these locations.

[1910.181\(g\)\(3\)](#) - Idle ropes. All rope which has been idle for a period of a month or more due to shutdown or storage of a derrick on which it is installed shall be given a thorough *inspection before it is used*. This *inspection* shall be for all types of deterioration. A *certification record* shall be prepared and *kept readily available* which includes the date of *inspection*, the *signature of the person* who performed the *inspection*, and an identifier for the ropes which were *inspected*.

[1910.181\(g\)\(4\)](#) - Nonrotating ropes. Particular care shall be taken in the *inspection of nonrotating rope*.

[1910.181\(h\)](#) - Operations of derricks. Derrick operations shall be directed only by the *individual specifically designated* for that purpose.

[1910.181\(i\)\(1\)\(i\)](#) - No derrick shall be loaded beyond the *rated load*.

[1910.181\(i\)\(3\)\(iv\)](#) - A derrick shall not be used for side loading except when specifically *authorized by a responsible person* who has determined that the various structural components will not be overstressed.

[1910.181\(i\)\(3\)\(vii\)](#) - The operator shall *test the brakes* each time a load approaching the *rated load* is handled by raising it a few inches and applying the brakes.

[1910.181\(i\)\(5\)\(i\)](#) - Ropes shall not be handled on a winch head without the *knowledge of the operator*.

[1910.181\(j\)\(2\)\(i\)](#) - Hooks shall meet the *manufacturer's recommendations* and shall not be overloaded.

[1910.181\(j\)\(3\)\(ii\)](#) - Operating and maintenance personnel shall be *familiar with the use and care of the fire extinguishers* provided.

[1910.181\(j\)\(4\)\(i\)](#) - Refueling with portable containers shall be done with approved safety type containers equipped with automatic closing cap and flame arrester. Refer to [1910.155\(c\)\(3\)](#) - *fire protection*, for definition of Approved.

[1910.181\(j\)\(5\)](#) - Operations near overhead lines. For operations near overhead electric lines, see [1910.333\(c\)\(3\)](#) - *electrical; selection and use of work practices*.

## **1910.183 - Helicopters**

**Scope:** This [standard](#) provides requirements pertaining to the use of helicopters.

**Special Requirements:** Briefings, competent person, design, tests, manufacturer rating, instruction, hand signal systems, signalman, designated person, communication

[1910.183\(b\)](#) - *Briefing. Prior to each day's operation a briefing shall be conducted. This briefing shall set forth the plan of operation for the pilot and ground personnel.*

[1910.183\(d\)](#) - Cargo hooks. All electrically operated cargo hooks shall have the electrical activating device so *designed* and installed as to prevent inadvertent operation. In addition, these cargo hooks shall be equipped with an emergency mechanical control for releasing the load. The employer shall ensure that the hooks are *tested prior to each day's operation by a competent person* to determine that the release functions properly, both electrically and mechanically.

[1910.183\(k\)](#) - Weight limitation. The weight of an external load shall not exceed the helicopter *manufacturer's rating*.

[1910.183\(m\)](#) - Visibility. Ground personnel shall be *instructed* and the employer shall ensure that when visibility is reduced by dust or other conditions, they shall exercise special caution to keep clear of main and stabilizing rotors. Precautions shall also be taken by the employer to eliminate, as far as practical, the dust or other conditions reducing the visibility.

[1910.183\(n\)](#) - *Signal systems*. The employer shall *instruct* the aircrew and ground personnel on the *signal systems* to be used and shall review the *system* with the employees in advance of hoisting the load. This applies to both *radio and hand signal systems*. *Hand signals*, where used, shall be as shown in [Figure N-1](#).

[1910.183\(r\)](#) - *Communications*. There shall be constant *reliable communication* between the pilot and a *designated employee* of the ground crew who acts as a *signalman* during the period of loading and unloading. The *signalman* shall be clearly distinguishable from other ground personnel.

## **1910.184 – Slings**

**Scope:** This [standard](#) provides requirements pertaining to slings used in conjunction with other material handling equipment for the movement of material by hoisting, in employments covered by this part. The types of slings covered are those made from alloy steel chain, wire rope, metal mesh, natural or synthetic fiber rope (conventional three strand construction), and synthetic web (nylon, polyester, and polypropylene).

[Sling](#) is an assembly which connects the load to the material handling equipment.

**Special Requirements:** Safe operating practices, inspections, competent person, identification, rated capacity, record (written), proof test certificate, manufacturer recommendations, identification markings, marked, tagged, references other standards

[1910.184\(c\)](#) - *Safe operating practices.* Whenever any sling is used, the following *practices* shall be observed: [Reference [paragraphs \(c\)\(1\) - \(14\)](#)].

[1910.184\(d\)](#) - *Inspections.* Each day before being used, the sling and all fastenings and attachments shall be *inspected* for damage or defects by a *competent person* designated by the employer. Additional *inspections* shall be performed during sling use, where service conditions warrant. Damaged or defective slings shall be immediately removed from service.

[1910.184\(e\)\(1\)](#) - *Sling identification.* Alloy steel chain slings shall have *permanently affixed durable identification* stating size, grade, *rated capacity*, and reach.

[1910.184\(e\)\(2\)\(i\)](#) - Hooks, rings, oblong links, pear shaped links, welded or mechanical coupling links or other attachments shall have a *rated capacity* at least equal to that of the alloy steel chain with which they are used or the sling shall not be used in excess of the *rated capacity* of the weakest component.

[1910.184\(e\)\(3\)\(i\)](#) - In addition to the *inspection* required by [paragraph \(d\)](#) of this section, a thorough *periodic inspection* of alloy steel chain slings in use shall be made on a *regular basis*, to be determined on the basis of [Reference [paragraphs \(e\)\(3\)\(i\)\(A\) - \(D\)](#)].

[1910.184\(e\)\(3\)\(ii\)](#) - The employer shall make and maintain a *record of the most recent month* in which each alloy steel chain sling was thoroughly *inspected*, and shall make such *record* available for examination.

[1910.184\(e\)\(3\)\(iii\)](#) - The *thorough inspection* of alloy steel chain slings shall be performed by a *competent person* designated by the employer, and shall include a *thorough inspection* for wear, defective welds, deformation and increase in length. Where such defects or deterioration are present, the sling shall be immediately removed from service.

1910.184(e)(4) - *Proof testing*. The employer shall ensure that *before use*, each new, repaired, or reconditioned alloy steel chain sling, including all welded components in the sling assembly, shall be proof tested by the sling manufacturer or equivalent entity, in accordance with paragraph 5.2 of the *American Society of Testing and Materials Specification A391-65*, which is incorporated by reference as specified in 1910.6 (ANSI G61.1-1968). The employer shall retain a *certificate of the proof test* and shall make it available for examination.

1910.184(e)(6) - Safe operating temperatures. Employers must permanently remove an alloy steel-chain slings from service if it is heated above 1000 degrees F. When exposed to service temperatures in excess of 600 degrees F, employers must reduce the *maximum working-load limits* permitted by the chain manufacturer in accordance with the chain or sling *manufacturer's recommendations*.

1910.184(e)(7)(i) - Worn or damaged alloy steel chain slings or attachments shall not be used until repaired. When *welding or heat testing* is performed, slings shall not be used unless repaired, reconditioned and *proof tested by the sling manufacturer* or an equivalent entity.

1910.184(f)(1) - Sling use. Employers must use only wire-rope slings that have permanently affixed and legible *identification markings* as prescribed by the manufacturer, and that indicate the *recommended safe working load* for the type(s) of hitch(es) used, the angle upon which it is based, and the number of legs if more than one.

1910.184(f)(4)(ii) - All welded end attachments shall not be used unless *proof tested by the manufacturer* or equivalent entity at twice their *rated capacity prior to initial use*. The employer shall retain a *certificate of the proof test*, and make it available for examination.

1910.184(g)(1) - *Sling marking*. Each metal mesh sling shall have permanently affixed to it a durable *marking* that states the *rated capacity* for vertical basket hitch and choker hitch loadings.

1910.184(g)(2) - Handles. Handles shall have a *rated capacity* at least equal to the metal fabric and exhibit no deformation after *proof testing*.

1910.184(g)(4) - Sling coatings. Coatings which diminish the *rated capacity* of a sling shall not be applied.

1910.184(g)(5) - *Sling testing*. All new and repaired metal mesh slings, including handles, shall not be used unless *proof tested by the manufacturer* or equivalent entity at a minimum of 1½ times their *rated capacity*. Elastomer impregnated slings shall be *proof tested* before coating.

[1910.184\(g\)\(7\)](#) - Safe operating temperatures. Metal mesh slings which are not impregnated with elastomers may be used in a temperature range from minus 20 °F to plus 550 °F without decreasing the working load limit. Metal mesh slings impregnated with polyvinyl chloride or neoprene may be used only in a temperature range from zero degrees to plus 200 °F. For operations outside these temperature ranges or for metal mesh slings impregnated with other materials, the *sling manufacturer's recommendations* shall be followed.

[1910.184\(g\)\(8\)\(ii\)](#) - Once repaired, each sling shall be permanently *marked or tagged*, or a *written record* maintained, to indicate the date and nature of the repairs and the person or organization that performed the repairs. *Records* of repairs shall be made available for examination.

[1910.184\(h\)\(1\)](#) - Sling use. Employers must use natural and synthetic fiber-rope slings that have permanently affixed and legible identification *markings* stating the *rated capacity* for the type(s) of hitch(es) used and the angle upon which it is based, type of fiber material, and the number of legs if more than one.

[1910.184\(h\)\(2\)](#) - Safe operating temperatures. Natural and synthetic fiber rope slings, except for wet frozen slings, may be used in a temperature range from minus 20 °F to plus 180 °F without decreasing the working load limit. For operations outside this temperature range and for wet frozen slings, the *sling manufacturer's recommendations* shall be followed.

[1910.184\(h\)\(3\)](#) - Splicing. Spliced fiber rope slings shall not be used unless they have been spliced in accordance with the following minimum requirements and in accordance with any additional *recommendations of the manufacturer*.

[1910.184\(i\)\(1\)](#) - *Sling identification*. Each sling shall be *marked or coded* to show the rated capacities for each type of hitch and type of synthetic web material.

[1910.184\(i\)\(8\)\(ii\)](#) - Each repaired sling shall be *proof tested by the manufacturer* or equivalent entity to twice the *rated capacity* prior to its return to service. The employer shall retain a *certificate of the proof test* and make it available for examination.

## **Subpart O - [Machinery and Machine Guarding](#)**

[Subpart O](#) provides the requirements for machinery and machine guarding.

[Point of operations](#) means that point at which cutting, shaping, boring, or forming is accomplished upon the stock.

Guard means a barrier that prevents entry of the operator's hands or fingers into the point of operation.

Types of guarding - One or more methods of machine guarding shall be provided to protect the operator and other employees in the machine area from hazards such as those created by point of operation, ingoing nip points, rotating parts, flying chips and sparks. Examples of guarding methods are - barrier guards, two-hand tripping devices, electronic safety devices, etc.

To learn if subpart O applies to you, go to [Does "Subpart O - Machinery and Machine Guarding" Apply to You?](#)

## Special Requirements

### 1910.212 - General Requirements for All Machines

**Scope:** This [standard](#) provides the general requirements for all machines.

**Special Requirements:** Design, references other standards

[1910.212\(a\)\(3\)\(ii\)](#) - The point of operation of machines whose operation exposes an employee to injury, shall be guarded. The guarding device shall be in conformity with any *appropriate standards* therefor, or, in the absence of applicable *specific standards*, shall be so *designed* and constructed as to prevent the operator from having any part of his body in the danger zone during the operating cycle.

### 1910.213 - Woodworking Machinery Requirements

**Scope:** This [standard](#) provides the requirements for woodworking machinery.

**Special Requirements:** Marked, label, inspection, demonstrated skill, maintenance, references other standards

[1910.213\(a\)\(9\)](#) - All belts, pulleys, gears, shafts, and moving parts shall be guarded in accordance with the specific requirements of [1910.219](#) - *mechanical power-transmission apparatus*.

[1910.213\(h\)\(5\)](#) - Ripping and ploughing shall be against the direction in which the saw turns. The direction of the saw rotation shall be *conspicuously marked* on the hood. In addition, a *permanent label* not less than 1½ inches by ¾ inch shall be affixed to the rear of the guard at approximately the level of the arbor, *reading as follows: "Danger: Do Not Rip or Plough From This End"*.



[1910.213\(s\)](#) - *Inspection and maintenance of woodworking machinery.*

[Reference [paragraph \(s\)\(1\) - \(14\)](#)].

- [1910.213\(s\)\(5\)](#) - Sharpening or tensioning of saw blades or cutters shall be done only by *persons of demonstrated skill* in this kind of work.

## **1910.215 - Abrasive Wheel Machinery**

**Scope:** This [standard](#) provides the requirements for abrasive wheel machinery.

[Abrasive wheel](#) means a cutting tool consisting of abrasive grains held together by organic or inorganic bonds. Diamond and reinforced wheels are included.

**Special Requirements:** Inspections, ring test, checks, taps, references other standards

[1910.215\(b\)\(12\)](#) - *Guard design specifications.* Abrasive wheel machinery guards shall meet the *design specifications* of the *American National Standard Safety Code for the Use, Care, and Protection of Abrasive Wheels, ANSI B7.1-1970*, which is incorporated by reference as specified in [1910.6](#). This requirement shall not apply to natural sandstone wheels or metal, wooden, cloth, or paper discs, having a layer of abrasive on the surface.

[1910.215\(d\)\(1\)](#) - *Inspection.* Immediately before mounting, all wheels shall be closely *inspected* and sounded by the user (*ring test*) to make sure they have not been damaged in transit, storage, or otherwise. The spindle speed of the machine shall be *checked* before mounting of the wheel to be certain that it does not exceed the maximum operating speed marked on the wheel. Wheels should be *tapped gently* with a light nonmetallic implement, such as the handle of a screwdriver for light wheels, or a wooden mallet for heavier wheels. If they sound cracked (dead), they shall not be used. This is known as the “*Ring Test*”.

- [1910.215\(d\)\(1\)\(ii\)](#) - “*Tap*” wheels about 45° each side of the vertical centerline and about 1 or 2 inches from the periphery as indicated by the spots in [Figure O-25](#) and [Figure O-26](#). Then rotate the wheel 45° and repeat the test. A sound and undamaged wheel will give a clear metallic tone. If cracked, there will be a dead sound and not a clear “ring.”

## **1910.216 - Mills and Calenders in the Rubber and Plastics Industries**

**Scope:** This [standard](#) provides the requirements for mills and calendars used in the rubber and plastics industries.

Calender means a machine equipped with two or more metal rolls revolving in opposite directions and used for continuously sheeting or plying up rubber and plastics compounds and for frictioning or coating materials with rubber and plastics compounds.

Mill means a machine consisting of two adjacent metal rolls, set horizontally, which revolve in opposite directions (i.e., toward each other as viewed from above) used for the mechanical working of rubber and plastics compounds.

**Special Requirements:** References other standards

1910.216(a)(3) - Auxiliary equipment. Mechanical and electrical equipment and auxiliaries shall be installed in *accordance with this section and subpart S - electrical, of this part (1910)*.

## **1910.217 - Mechanical Power Presses**

**Scope:** This standard provides the requirements for mechanical power presses.

Press means a mechanically powered machine that shears, punches, forms or assembles metal or other material by means of cutting, shaping, or combination dies attached to slides. A press consists of a stationary bed or anvil, and a slide (or slides) having a controlled reciprocating motion toward and away from the bed surface, the slide being guided in a definite path by the frame of the press.

**Special Requirements:** Employer supervision, tests, design, inspections, checks, authorized personnel, maintenance, records (certification, maintenance, inspections), employer established limit, inspection program, stamped, employer responsibility, supervisor/safety engineer, diesetting procedures, instructions, training, operating procedures, injury reporting, certification, label, validation, manufacturer recommendations, references other standards

1910.217(b)(7)(xv) - Selection of bar operation shall be by means capable of being *supervised by the employer*. A separate pushbutton shall be employed to activate the clutch, and the clutch shall be activated only if the driver motor is deenergized.

1910.217(b)(12) - Pressure vessels. All pressure vessels used in conjunction with power presses shall conform to the *American Society of Mechanical Engineers Code for Pressure Vessels, 1968 Edition*, which is incorporated by reference as specified in 1910.6.

1910.217(b)(13) - Control reliability. When required by paragraph (c)(5) of this section, the control system shall be constructed so that a failure within the system does not prevent the normal stopping action from being applied to the press when required, but does prevent initiation of a successive stroke until the failure is corrected. The failure shall be detectable

by a *simple test*, or indicated by the control system. This requirement does not apply to those elements of the control system which have no effect on the protection against point of operation injuries.

[1910.217\(b\)\(14\)\(i\)](#) - Be so constructed as to automatically prevent the activation of a successive stroke if the stopping time or braking distance deteriorates to a point where the safety distance being utilized does not meet the requirements set forth in [paragraph \(c\)\(3\)\(iii\)\(e\)](#) or [\(c\)\(3\)\(vii\)\(c\)](#) of this section. The brake monitor used with the Type B gate or movable barrier device shall be installed in a manner to detect slide top-stop overrun beyond the *normal limit reasonably established by the employer*.

[1910.217\(c\)\(1\)\(i\)](#) - It shall be the *responsibility of the employer* to provide and insure the usage of "*point of operation guards*" or properly applied and adjusted point of operation devices on every operation performed on a mechanical power press. See [Table O-10](#).

[1910.217\(c\)\(2\)\(i\)](#) - Every point of operation guard shall meet the following *design*, construction, application, and adjustment requirements: [Reference [paragraph \(c\)\(2\)\(i\)\(a\) - \(f\)](#)].

[1910.217\(c\)\(2\)\(vi\)](#) - The adjustable barrier guard shall be securely attached to the press bed, bolster plate, or die shoe, and shall be adjusted and operated in conformity with [Table O-10](#) and the requirements of this subparagraph. Adjustments shall be made only by *authorized personnel* whose qualifications include a knowledge of the provisions of [Table O-10](#) and this subparagraph.

[1910.217\(c\)\(3\)\(iv\)\(d\)](#) - Each pull-out device in use shall be *visually inspected and checked* for proper adjustment at the start of each operator shift, following a new die set-up, and when operators are changed. Necessary maintenance or repair or both shall be performed and completed before the press is operated. *Records of inspections and maintenance shall be kept* in accordance with [paragraph \(e\)](#) of this section.

[1910.217\(c\)\(3\)\(viii\)\(d\)](#) - Two hand trips shall be fixed in position so that only a *supervisor or safety engineer* is capable of relocating the controls.

[1910.217\(d\)\(3\)](#) - Scrap handling. The employer shall provide means for handling scrap from roll feed or random length stock operations. Scrap cutters used in conjunction with scrap handling systems shall be safeguarded in accordance with [paragraph \(c\)](#) of this section and with [1910.219](#) - *mechanical power-transmission apparatus*.

[1910.217\(d\)\(6\)](#) - *Tonnage, stroke, and weight designation*. All dies shall be:

- [1910.217\(d\)\(6\)\(i\)](#) - *Stamped* with the tonnage and stroke requirements, or have these characteristics *recorded if these records* are readily available to the die setter;

- [1910.217\(d\)\(6\)\(ii\)](#) - *Stamped* to indicate upper die weight when necessary for air counterbalance pressure adjustment; and
- [1910.217\(d\)\(6\)\(iii\)](#) - *Stamped* to indicate complete die weight when handling equipment may become overloaded.

[1910.217\(d\)\(9\)\(i\)](#) - The employer shall establish a *diesetting procedure* that will insure compliance with [paragraph \(c\)](#) of this section.

[1910.217\(e\)\(1\)](#) - *Inspection and maintenance records*. The employer shall establish and follow an *inspection program* having a general component and a directed component. [Reference [paragraph \(e\)\(1\)\(i\) - \(iii\)](#)].

[1910.217\(e\)\(2\)](#) - *Modification*. It shall be the *responsibility of any person modifying* a power press to *furnish instructions* with the modification to establish new or *changed guidelines* for use and care of the power press so modified.

[1910.217\(e\)\(3\)](#) - *Training* of maintenance personnel. It shall be the responsibility of the employer to insure the original and continuing competence of personnel caring for, *inspecting, and maintaining* power presses.

[1910.217\(f\)\(2\)](#) - *Instruction to operators*. The employer shall *train and instruct* the operator in the *safe method* of work before starting work on any operation covered by this section. The employer shall insure by *adequate supervision* that correct *operating procedures* are being followed.

[1910.217\(g\)\(1\)](#) - The employer shall *report, within 30 days* of the occurrence, all point-of-operation injuries to operators or other employees to either the Director of the Directorate of Standards and Guidance at OSHA, U.S. Department of Labor, Washington, DC 20210 or electronically at <http://www.osha.gov/pls/oshaweb/mechanical.html>; or to the State Agency administering a plan approved by the Assistant Secretary of Labor for Occupational Safety and Health.

[1910.217\(g\)\(2\)](#) - The *report* shall include the following *information*: [Reference [paragraph \(g\)\(2\)\(i\) - \(viii\)](#)].

[1910.217\(h\)\(5\)\(i\)](#) - Presses operated in the PSDI mode shall be equipped with a brake monitor that meets the requirements of [paragraphs \(b\)\(13\)](#) and [\(b\)\(14\)](#) of this section. In addition, the brake monitor shall be adjusted during *installation certification* to prevent successive stroking of the press if increases in stopping time cause an increase in the safety distance above that required by [paragraph \(h\)\(9\)\(v\)](#) of this section.

[1910.217\(h\)\(5\)\(ii\)](#) - Once the PSDI safety system has been *certified/validated*, adjustment of the brake monitor shall not be done without prior approval of the *validation organization* for both the brake monitor adjustment and the corresponding adjustment of the safety distance. The *validation organization* shall in its installation validation, state that in what circumstances, if any, the employer has advance approval for adjustment, when prior oral approval is appropriate and when prior *approval must be in writing*. The adjustment shall be done under the supervision of an *authorized person* whose *qualifications* include knowledge of safety distance requirements and experience with the brake system and its adjustment. When brake wear or other factors extend press stopping time beyond the limit permitted by the brake monitor, adjustment, repair, or maintenance shall be performed on the brake or other press system element that extends the stopping time.

[1910.217\(h\)\(6\)\(vi\)](#) - The control system shall incorporate a timer to deactivate PSDI when the press does not stroke within the period of time set by the timer. The timer shall be manually adjustable, to a maximum time of 30 seconds. For any timer setting greater than 15 seconds, the adjustment shall be made by the use of a special tool available only to *authorized persons*. Following a deactivation of PSDI by the timer, the system shall make it necessary to reset the set-up/reset means in order to reactivate the PSDI mode.

[1910.217\(h\)\(9\)\(vii\)](#) - Where presence sensing device location is adjustable, adjustment shall require the use of a special tool available only to *authorized persons*.

[1910.217\(h\)\(10\)](#) - *Inspection and maintenance*.

- [1910.217\(h\)\(10\)\(i\)](#) - Any press equipped with presence sensing devices for use in PSDI, or for supplemental safeguarding on presses used in the PSDI mode, shall be equipped with a test rod of diameter specified by the presence sensing device manufacturer to represent the minimum object sensitivity of the sensing field. *Instructions for use of the test rod* shall be noted on a *label affixed* to the presence sensing device.
- [1910.217\(h\)\(10\)\(ii\)](#) - The following *checks* shall be made at the *beginning of each shift* and whenever a die change is made. [Reference [paragraph \(h\)\(10\)\(ii\)\(A\) - \(E\)](#)].

[1910.217\(h\)\(10\)\(iii\)](#) - When presses used in the PSDI mode have flywheel or bullgear running on crankshaft mounted journals and bearings, or a flywheel mounted on back shaft journals and bearings, periodic inspections following the press manufacturer's recommendations shall be made to ascertain that bearings are in good working order, and that automatic lubrication systems for these bearings (if automatic lubrication is provided) are supplying proper lubrication. On presses with provision for manual lubrication of flywheel or bullgear

bearings, lubrication shall be provided according to the press *manufacturer's recommendations*.

1910.217(h)(10)(iv) - *Periodic inspections* of clutch and brake mechanisms shall be performed to assure they are in proper operating condition. The press *manufacturer's recommendations* shall be followed.

1910.217(h)(10)(v) - When any *check of the press*, including those performed in accordance with the requirements of paragraphs (h)(10)(ii), (iii) or (iv) of this section, reveals a condition of noncompliance, improper adjustment, or failure, the press shall not be operated until the condition has been corrected by adjustment, replacement, or repair.

1910.217(h)(10)(vi) - It shall be the responsibility of the employer to ensure the competence of personnel caring for, *inspecting*, and maintaining power presses equipped for PSDI operation, *through initial and periodic training*.

1910.217(h)(11)(i) - Prior to the initial use of any mechanical press in the PSDI mode, two sets of *certification and validation* are required: [Reference paragraph (h)(11)(i)(A) - (B)].

1910.217(h)(11)(ii) - At least *annually* thereafter, the safety system on a mechanical power press used in the PSDI mode shall be *recertified by the employer and revalidated* by an OSHA-recognized *third-party validation organization* to meet all applicable requirements of paragraphs (a) through (h) and appendix A - trajectory, of this section. Any press whose safety system has not been *recertified and revalidated within the preceding 12 months* shall be removed from service in the PSDI mode until the safety system is *recertified and revalidated*.

1910.217(h)(11)(iii) - A *label* shall be affixed to the press as part of each *installation certification/validation* and the most recent *recertification/revalidation*. The *label* shall indicate the press serial number, the minimum safety distance ( $D_s$ ) required by paragraph (h)(9)(v) of this section, the fulfillment of *design certification/validation*, the employer's *signed certification*, the identification of the OSHA-recognized third-party validation organization, its signed validation, and the date the *certification/validation and recertification/revalidation* are issued.

1910.217(h)(11)(iv) - *Records of the installation certification and validation* and the most recent *recertification and revalidation* shall be maintained for each safety system equipped press by the employer as long as the press is in use. The *records* shall include the manufacture and model number of each component and subsystem, the calculations of the safety distance as required by paragraph (h)(9)(v) of this section, and the stopping time measurements required by paragraph (h)(2)(ii) of this section. The most recent *records* shall be made available to OSHA upon request.



[1910.217\(h\)\(11\)\(v\)](#) - The employer shall notify the *OSHA-recognized third-party validation organization within five days* whenever a component or a subsystem of the safety system fails or modifications are made which may affect the safety of the system. The failure of a critical component shall necessitate the removal of the safety system from service until it is *recertified and revalidated*, except *recertification* by the employer without *revalidation* is permitted when a non-critical component or subsystem is replaced by one of the same *manufacture and design* as the original, or determined by the *third-party validation organization* to be equivalent by similarity analysis, as set forth in [appendix A](#) - trajectory.

[1910.217\(h\)\(11\)\(vi\)](#) - The employer shall *notify the OSHA-recognized third-party validation organization within five days* of the occurrence of any point of operation injury while a press is used in the PSDI mode. This is in addition to the *report of injury* required by [paragraph \(g\)](#) of this section; however, a *copy of that report* may be used for this purpose.

[1910.217\(h\)\(12\)\(iii\)](#) - Following a die change, the safety distance, the proper application of supplemental safeguarding, and the slide counterbalance adjustment (if the press is equipped with a counterbalance) shall be *checked and maintained by authorized persons whose qualifications* include knowledge of the safety distance, supplemental safeguarding requirements, and the *manufacturer's specifications* for counterbalance adjustment. Adjustment of the location of the PSDI presence sensing device shall require use of a special tool available only to the *authorized persons*.

[1910.217\(h\)\(13\)\(i\)](#) - The *operator training* required by [paragraph \(f\)\(2\)](#) of this section shall be provided to the employee before the employee initially operates the press and as needed to *maintain competence*, but not less than *annually thereafter*. It shall include *instruction* relative to the following items for presses used in the PSDI mode. [Reference [paragraph \(h\)\(13\)\(i\)\(A\) - \(E\)](#)].

[1910.217\(h\)\(13\)\(ii\)](#) - The employer shall *certify* that employees have been *trained by preparing a certification record* which includes the identity of the *person trained*, the *signature of the employer* or the person who conducted the *training*, and the date the training was completed. The *certification record* shall be prepared at the *completion of training* and shall be maintained on file *for the duration of the employee's employment*. The *certification record* shall be made available upon request to the Assistant Secretary for Occupational Safety and Health.

## **1910.218 - Forging Machines**

**Scope:** This [standard](#) provides the requirements for forging machines.

*Forging* means the product of work on metal formed to a desired shape by impact or pressure in hammers, forging machines (upsetters), presses, rolls, and related forming equipment. Forging hammers, counterblow equipment and high-energy-rate forging machines impart impact to the workpiece, while most other types of forging equipment impart squeeze pressure in shaping the stock. Some metals can be forged at room temperature, but the majority of metals are made more plastic for forging by heating.

**Special Requirements:** Inspections, maintenance, signatures, records, scheduling, certification record, training, engineering standards, specifications, locking out, switches identifiable, references other standards

1910.218(a)(2) - *Inspection and maintenance*. It shall be the responsibility of the employer to maintain all forge shop equipment in a condition which will insure continued safe operation. This responsibility includes:

- 1910.218(a)(2)(i) - Establishing *periodic and regular maintenance safety checks* and keeping *certification records* of these *inspections* which include the date of inspection, the *signature of the person who performed the inspection* and the serial number, or other identifier, for the forging machine which was *inspected*.
- 1910.218(a)(2)(ii) - *Scheduling and recording the inspection* of guards and point of operation protection devices at frequent and regular intervals. *Recording of inspections* shall be in the form of a *certification record* which includes the date the inspection was performed, the *signature of the person who performed the inspection* and the serial number, or other identifier, of the *equipment inspected*.
- 1910.218(a)(2)(iii) - *Training personnel* for the proper *inspection and maintenance* of forging machinery and equipment.

1910.218(a)(3)(i) - All hammers shall be positioned or installed in such a manner that they remain on or are anchored to foundations sufficient to support them according to applicable *engineering standards*.

1910.218(a)(3)(ii) - All presses shall be installed in such a manner that they remain where they are positioned or they are anchored to foundations sufficient to support them according to applicable *engineering standards*.

1910.218(a)(3)(iii) - Means shall be provided for disconnecting the power to the machine and for *locking out* or rendering cycling controls inoperable.

1910.218(a)(3)(iv) - The ram shall be blocked when dies are being changed or other work is being done on the hammer. Blocks or wedges shall be made of material the strength and

construction of which should meet or exceed the *specifications* and dimensions shown in [Table O-11](#).

[1910.218\(d\)\(4\)](#) - Pressure pipes. Steam or air piping shall conform to the *specifications* of *American National Standard ANSI B31.1.0-1967, Power Piping with Addenda* issued before April 28, 1971, which is incorporated by reference as specified in [1910.6](#).

[1910.218\(e\)\(1\)\(iv\)](#) - Air piping shall conform to the *specifications* of the *ANSI B31.1.0-1967, Power Piping with Addenda* issued before April 28, 1971, which is incorporated by reference as specified in [1910.6](#).

[1910.218\(f\)\(1\)](#) - Mechanical forging presses. When dies are being changed or maintenance is being performed on the press, the following shall be accomplished:

- [1910.218\(f\)\(1\)\(i\)](#) - The power to the press shall be *locked out*.
- [1910.218\(f\)\(1\)\(iii\)](#) - The ram shall be blocked with a material the strength of which shall meet or exceed the *specifications or dimensions* shown in [Table O-11](#).

[1910.218\(f\)\(2\)](#) - Hydraulic forging presses. When dies are being changed or maintenance is being performed on the press, the following shall be accomplished:

- [1910.218\(f\)\(2\)\(i\)](#) - The hydraulic pumps and power apparatus shall be *locked out*.
- [1910.218\(f\)\(2\)\(ii\)](#) - The ram shall be blocked with a material the strength of which shall meet or exceed the *specifications or dimensions* shown in [Table O-11](#).

[1910.218\(g\)\(2\)](#) - Cold trimming presses. Cold trimming presses shall be safeguarded in accordance with [1910.217\(c\)](#) - mechanical power presses.

[1910.218\(h\)\(2\)](#) - *Lockouts*. Upsetters shall be provided with a means for *locking out* the power at its entry point to the machine and rendering its cycling controls inoperable.

[1910.218\(h\)\(3\)](#) - Manually operated controls. All manually operated valves and switches shall be *clearly identified* and readily accessible.

[1910.218\(h\)\(5\)](#) - *Changing dies*. When dies are being changed, maintenance performed, or any work done on the machine, the power to the upsetter shall be *locked out*, and the flywheel shall be at rest.

[1910.218\(j\)\(3\)](#) - Conveyors. Conveyor power transmission equipment shall be guarded in accordance with *ANSI B20.1-1957, Safety Code for Conveyors, Cableways, and Related Equipment*, which is incorporated by reference as specified in [1910.6](#).

[1910.218\(j\)\(5\)](#) - Grinding. Personal protective equipment shall be used in grinding operations, and equipment shall be used and maintained in accordance with *ANSI B7.1-1970, Safety Code for the Use, Care, and Protection of Abrasive Wheels*, which is incorporated by reference as specified in [1910.6](#), and with [1910.215](#) - abrasive wheel machinery.

## **1910.219 - Mechanical Power-Transmission Apparatus**

**Scope:** This [standard](#) provides the requirements for safeguards for all types and shapes of power-transmission belts, pulleys, ropes, gears, sprockets, chains, projections (keys, setscrews), clutches, collars, couplings, fasteners, and other similar moving parts.

**Special Requirements:** Manufacturer recommendations, designed, inspections, references other standards

[1910.219\(c\)\(5\)\(iii\)](#) - The intensity of illumination conforms to the requirements of *ANSI A11.1-1965 (R-1970)*, which is incorporated by reference as specified in [1910.6](#).

[1910.219\(d\)\(4\)](#) - Pulley speeds. Pulleys intended to operate at rim speed in excess of *manufacturers normal recommendations* shall be specially *designed* and carefully balanced for the speed at which they are to operate.

[1910.219\(p\)\(1\)](#) - General. All power-transmission equipment shall be *inspected* at intervals not exceeding 60 days and be kept in good working condition at all times.

[1910.219\(p\)\(4\)](#) - Hangers. Hangers shall be *inspected* to make certain that all supporting bolts and screws are tight and that supports of hanger boxes are adjusted properly.

[1910.219\(p\)\(6\)\(ii\)](#) - *Inspection* shall be made of belts, lacings, and fasteners and such equipment kept in good repair.

## **Subpart P - [Hand and Portable Powered Tools and Other Hand-held Equipment](#)**

[Subpart P](#) provides the requirements for hand and portable powered tools and other hand-held equipment and applies to many employers in general industry that have machine shops, garages or other work areas where hand and portable powered tools are used.

To learn if subpart P applies to you, go to [Does "Subpart P - Hand and Portable Powered Tools and Other Hand-held Equipment" Apply to You?](#)

## **Special Requirements**

## 1910.243 - Guarding of portable powered tools

**Scope:** This [standard](#) provides requirements for guarding portable powered tools.

**Special requirements:** Inspections, checks, design, marked, manufacturer specifications/recommendations, hand and face protection, identified (words) controls, references other standards

[1910.243\(a\)\(5\)](#) - Grounding. Portable electric powered tools shall meet the electrical requirements of [subpart S - electrical](#), of this part (1910).

[1910.243\(c\)\(5\)\(i\)](#) - Immediately before mounting, all wheels shall be *closely inspected* and sounded by the user [*ring test*, [subpart O](#), [1910.215\(d\)\(1\)](#)] to make sure they have not been damaged in transit, storage, or otherwise. The spindle speed of the machine shall be *checked before mounting* of the wheel to be certain that it does not exceed the maximum operating speed *marked* on the wheel.

[1910.243\(c\)\(5\)\(v\)](#) - Requirements for the use of flanges and blotters, see [subpart O](#), [1910.215\(c\)](#).

[1910.243\(d\)\(1\)\(ii\)](#) - Operators and assistants using tools shall be safeguarded by means of *eye protection*. *Head and face protection* shall be used, as required by working conditions, as set forth in [subpart I - personal protective equipment](#).

[1910.243\(d\)\(2\)](#) - *Inspection*, maintenance, and tool handling - high velocity tools. [Reference [paragraph \(d\)\(2\)\(i\) - \(iii\)](#)].

[1910.243\(d\)\(4\)\(i\)](#) - *Before using a tool*, the operator shall *inspect* it to determine to his satisfaction that it is clean, that all moving parts operate freely, and that the barrel is free from obstructions.

[1910.243\(d\)\(4\)\(xiii\)](#) - All tools shall be used with the correct shield, guard, or attachment *recommended by the manufacturer*.

[1910.243\(d\)\(4\)\(xiv\)](#) - Any tool found not in proper working order shall be immediately removed from service. The tool shall be *inspected* at *regular intervals* and shall be repaired in accordance with the *manufacturer's specifications*.

[1910.243\(e\)\(1\)\(i\)](#) - Power lawnmowers of the walk-behind, riding-rotary, and reel power lawnmowers shall be guarded in accordance with the machine guarding requirements in [29 CFR 1910.212](#) - *general requirements for all machines*.

[1910.243\(e\)\(1\)\(iv\)](#) - All positions of the operating controls shall be *clearly identified*.

[1910.243\(e\)\(1\)\(v\)](#) - The words, "*Caution. Be sure the operating control(s) is in neutral before starting the engine,*" or similar wording shall be clearly visible at an engine starting control point on self-propelled mowers.

[1910.243\(e\)\(2\)\(ii\)\(a\)](#) - Walk-behind and riding rotary mowers. *Warning instructions shall be affixed* to the mower near the opening stating that the mower shall not be used without either the catcher assembly or the guard in place.

[1910.243\(e\)\(2\)\(ii\)\(c\)](#) - Walk-behind and riding rotary mowers. The *instruction manual* shall state that the mower shall not be used without either the catcher assembly or the guard in place.

[1910.243\(e\)\(2\)\(v\)](#) - Walk-behind and riding rotary mowers. The word "*Caution.*" or stronger wording, shall be placed on the mower at or near each discharge opening.

## **1910.244 - Other Portable Tools and Equipment**

**Scope:** This [standard](#) provides the requirements for jacks and abrasive blast cleaning nozzles.

**Special Requirements:** Rated load, load marked, inspections, tagged

[1910.244\(a\)\(1\)\(i\)](#) - The operator shall make sure that the jack used has a *rating* sufficient to lift and sustain the load.

[1910.244\(a\)\(1\)\(ii\)](#) - The *rated load* shall be legibly and *permanently marked* in a prominent location on the jack by *casting, stamping*, or other suitable means.

[1910.244\(a\)\(2\)\(vi\)](#) - Each jack shall be thoroughly *inspected at times* which depend upon the service conditions. *Inspections* shall be not less frequent than the following:  
[Reference [paragraph \(a\)\(2\)\(vi\)\(a\) - \(c\)](#)].

[1910.244\(a\)\(2\)\(viii\)](#) - Jacks which are *out of order shall be tagged* accordingly, and shall not be used until repairs are made.

## **Subpart Q - [Welding, Cutting and Brazing](#)**

[Subpart Q](#) provides the requirements for welding, cutting and brazing operations.

[Welder and welding operator](#) mean any operator of electric or gas welding and cutting equipment.



To learn if subpart Q applies to you, go to [Does "Subpart Q - Welding, Cutting and Brazing" Apply to You?](#)

## Special Requirements

### 1910.252 - General Requirements

**Scope:** This [standard](#) provides the general requirements for welding, cutting and brazing operations including fire prevention, confined spaces, protection of personnel, ventilation and other requirements.

**Special Requirements:** Fire watchers, trained, fire watch, authorization, responsible individual, inspections, written permit, prohibited areas, procedures, supervisor, attendant, rescue procedure, determine, designate, advise contractors, test, markings, labels, safety data sheets, warning sign, tags, lifelines, reporting injuries, NIOSH approved, manufacturers instructions, personal protective equipment, references other standards

[1910.252\(a\)\(1\)](#) - Basic precautions. For elaboration of these basic precautions and of the special precautions of [paragraph \(a\)\(2\)](#) of this section as well as a delineation of the fire protection and prevention responsibilities of welders and cutters, their supervisors (including outside contractors) and those in management on whose property cutting and welding is to be performed, see *Standard for Fire Prevention in Use of Cutting and Welding Processes, NFPA Standard 51B*, 1962, which is incorporated by reference as specified in [1910.6](#). The basic precautions for fire prevention in welding or cutting work are: [Reference [paragraph \(a\)\(1\)\(i\) - \(iii\)](#)].

[1910.252\(a\)\(2\)\(iii\)\(A\)](#) - *Fire watchers* shall be required whenever welding or cutting is performed in locations where other than a minor fire might develop, or any of the following conditions exist: [Reference [paragraph \(a\)\(2\)\(iii\)\(A\)\(1\) - \(4\)](#)].

[1910.252\(a\)\(2\)\(iii\)\(B\)](#) - *Fire watchers* shall have fire extinguishing equipment readily available and be *trained* in its use. They shall be familiar with facilities for *sounding an alarm* in the event of a fire. They shall watch for fires in all exposed areas, try to extinguish them only when obviously within the capacity of the equipment available, or otherwise sound the alarm. *A fire watch shall be maintained for at least a half hour* after completion of welding or cutting operations to detect and extinguish possible smoldering fires.

[1910.252\(a\)\(2\)\(iv\)](#) - *Authorization*. Before cutting or welding is permitted, the area shall be *inspected* by the *individual responsible for authorizing* cutting and welding operations. He shall *designate precautions* to be followed in *granting authorization* to proceed preferably in the form of a *written permit*.

1910.252(a)(2)(vi) - *Prohibited areas*. Cutting or welding shall not be permitted in the following situations:

- 1910.252(a)(2)(vi)(A) - In *areas not authorized* by management.

1910.252(a)(2)(xiii) - Management. Management shall *recognize its responsibility* for the safe usage of cutting and welding equipment on its property and:

- 1910.252(a)(2)(xiii)(A) - Based on fire potentials of plant facilities, establish areas for cutting and welding, and *establish procedures* for cutting and welding, in other areas.
- 1910.252(a)(2)(xiii)(B) - *Designate an individual responsible for authorizing* cutting and welding operations in areas not specifically designed for such processes.
- 1910.252(a)(2)(xiii)(C) - Insist that cutters or welders and their supervisors are *suitably trained* in the safe operation of their equipment and the safe use of the process.
- 1910.252(a)(2)(xiii)(D) - *Advise all contractors* about flammable materials or hazardous conditions of which they may not be aware.

1910.252(a)(2)(xiv) - *Supervisor*. The Supervisor:

- 1910.252(a)(2)(xiv)(B) - Shall *determine* the combustible materials and hazardous areas present or likely to be present in the work location.
- 1910.252(a)(2)(xiv)(D) - Shall *secure authorization* for the cutting or welding operations from the designated management representative.
- 1910.252(a)(2)(xiv)(E) - Shall *determine* that the cutter or welder secures his approval that conditions are safe before going ahead.
- 1910.252(a)(2)(xiv)(F) - Shall *determine* that fire protection and extinguishing equipment are properly located at the site.
- 1910.252(a)(2)(xiv)(G) - Where *fire watches* are required, he shall see that they are available at the site.

1910.252(b)(2)(ii)(G) - Lenses shall bear some permanent distinctive *marking* by which the source and shade may be readily identified.

- 1910.252(b)(2)(ii)(I) - Filter lenses must meet the *test* for transmission of radiant energy prescribed by any of the consensus standards listed in 29 CFR 1910.133(b)(1) - *eye and face protection*.

[1910.252\(b\)\(3\)](#) - *Protective clothing* - General requirements. Employees exposed to the hazards created by welding, cutting, or brazing operations shall be protected by *personal protective equipment* in accordance with the requirements of [1910.132](#) - *personal protective equipment*, of this part (1910). Appropriate *protective clothing* required for any welding operation will vary with the size, nature and location of the work to be performed.

[1910.252\(b\)\(4\)\(iv\)](#) - *Lifelines*. Where a welder must enter a confined space through a manhole or other small opening, means shall be provided for quickly removing him in case of emergency. When *safety belts and lifelines* are used for this purpose they shall be so attached to the welder's body that his body cannot be jammed in a small exit opening. An *attendant with a preplanned rescue procedure* shall be stationed outside to observe the welder at all times and be capable of putting rescue operations into effect.

[1910.252\(b\)\(4\)\(vii\)](#) - *Warning sign*. After welding operations are completed, the welder shall *mark* the hot metal or provide some other means of warning other workers.

[1910.252\(c\)\(1\)\(iii\)](#) - Maximum allowable concentration. Local exhaust or general ventilating systems shall be provided and arranged to keep the amount of toxic fumes, gases, or dusts below the maximum allowable concentration as specified in [1910.1000](#) - *air contaminants*, of this part (1910).

[1910.252\(c\)\(1\)\(iv\)](#) - Hazard communication. The employer shall include the potentially hazardous materials employed in fluxes, coatings, coverings, and filler metals, all of which are potentially used in welding and cutting, or are released to the atmosphere during welding and cutting, in the program established to comply with the *Hazard Communication Standard (HCS)* ([1910.1200](#)). The employer shall ensure that each employee has *access to labels* on containers of such materials and *safety data sheets*, and *is trained* in accordance with the provisions of [1910.1200](#). Potentially hazardous materials shall include but not be limited to the materials itemized in [paragraphs \(c\)\(5\) through \(c\)\(12\)](#) of this section.

[Reference [paragraph \(c\)\(1\)\(iv\) - \(vi\)](#)].

[1910.252\(c\)\(4\)\(ii\)](#) - Airline respirators. In circumstances for which it is impossible to provide such ventilation, airline respirators or hose masks *approved for this purpose by the National Institute for Occupational Safety and Health (NIOSH)* under 42 CFR part 84 must be used.

[1910.252\(c\)\(4\)\(iii\)](#) - Self-contained units. In areas immediately hazardous to life, a full-facepiece, pressure-demand, self-contained breathing apparatus or a combination full-facepiece, pressure-demand supplied-air respirator with an auxiliary, self-contained air supply *approved by NIOSH* under 42 CFR part 84 must be used.

[1910.252\(c\)\(4\)\(iv\)](#) - Outside helper. Where welding operations are carried on in confined spaces and where welders and helpers are provided with hose masks, hose masks with

blowers or self-contained breathing equipment *approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health*, a worker shall be stationed on the outside of such confined spaces to insure the safety of those working within.

[1910.252\(c\)\(7\)\(iii\)](#) - Local ventilation. In confined spaces or indoors, welding or cutting operations involving metals containing lead, other than as an impurity, or metals coated with lead-bearing materials, including paint, must be done using local exhaust ventilation or airline respirators. Such operations, when done outdoors, must be done using respirators *approved for this purpose by NIOSH* under 42 CFR part 84. In all cases, workers in the immediate vicinity of the cutting operation must be protected by local exhaust ventilation or airline respirators.

[1910.252\(c\)\(8\)](#) - Beryllium. Welding or cutting indoors, outdoors, or in confined spaces involving beryllium-containing base or filler metals shall be done using local exhaust ventilation and airline respirators unless *atmospheric tests* under the most adverse conditions have established that the workers' exposure is within the acceptable concentrations defined by [1910.1000](#) - *air contaminants*, of this part (1910). In all cases, workers in the immediate vicinity of the welding or cutting operations shall be protected as necessary by local exhaust ventilation or airline respirators.

[1910.252\(c\)\(9\)\(i\)](#) - General. In confined spaces or indoors, welding or cutting operations involving cadmium-bearing or cadmium-coated base metals must be done using local exhaust ventilation or airline respirators unless *atmospheric tests* under the most adverse conditions show that employee exposure is within the acceptable concentrations specified by [1910.1000](#) - *air contaminants*. Such operations, when done outdoors, must be done using respirators, such as fume respirators, *approved for this purpose by NIOSH* under 42 CFR part 84.

[1910.252\(c\)\(10\)](#) - Mercury. In confined spaces or indoors, welding or cutting operations involving metals coated with mercury-bearing materials, including paint, must be done using local exhaust ventilation or airline respirators unless *atmospheric tests* under the most adverse conditions show that employee exposure is within the acceptable concentrations specified by [1910.1000](#) - *air contaminants*. Such operations, when done outdoors, must be done using *respirators approved for this purpose by NIOSH* under 42 CFR part 84.

[1910.252\(c\)\(11\)\(i\)](#) - *Manufacturer's instructions*. In the use of cleaning materials, because of their possible toxicity or flammability, appropriate precautions such as *manufacturers instructions* shall be followed.

[1910.252\(c\)\(13\)](#) - First-aid equipment. First-aid equipment shall be available at all times. All *injuries shall be reported* as soon as possible for medical attention. First aid shall be rendered until medical attention can be provided.

[1910.252\(d\)\(1\)\(i\)](#) - Transmission pipeline. General. The requirements of [paragraphs \(b\) and \(c\)](#) of this section and [1910.254](#) - *arc welding and cutting*, of this part (1910) shall be observed.

[1910.252\(d\)\(1\)\(ii\)](#) - Field shop operations. Where field shop operations are involved for fabrication of fittings, river crossings, road crossings, and pumping and compressor stations the requirements of [paragraphs \(a\), \(b\), and \(c\)](#) of this section and [1910.253](#) - *oxygen-fuel gas welding and cutting*, and [1910.254](#) - *arc welding and cutting*, of this part (1910) shall be observed.

[1910.252\(d\)\(1\)\(iv\)](#) - *Pressure testing*. In *pressure testing* of pipelines, the workers and the public shall be protected against injury by the blowing out of closures or other pressure restraining devices. Also, protection shall be provided against expulsion of loose dirt that may have become trapped in the pipe.

[1910.252\(d\)\(1\)\(v\)](#) - *Construction standards*. The welded construction of transmission pipelines shall be conducted in accordance with the *Standard for Welding Pipe Lines and Related Facilities, API Std. 1104 - 1968*, which is incorporated by reference as specified in [1910.6](#).

[1910.252\(d\)\(1\)\(vi\)](#) - Flammable substance lines. The connection, by welding, of branches to pipelines carrying flammable substances shall be performed in accordance with *Welding or Hot Tapping on Equipment Containing Flammables, API Std. PSD No. 2201 - 1963*, which is incorporated by reference as specified in [1910.6](#).

[1910.252\(d\)\(1\)\(vii\)](#) - *X-ray inspection*. The use of X-rays and radioactive isotopes for the *inspection* of welded pipeline joints shall be carried out in conformance with the *American National Standard Safety Standard for Non-Medical X-ray and Sealed Gamma-Ray Sources, ANSI Z54.1 - 1963*, which is incorporated by reference as specified in [1910.6](#).

[1910.252\(d\)\(2\)\(i\)](#) - Mechanical piping systems. General. The requirements of [paragraphs \(a\), \(b\), and \(c\)](#) of this section and [1910.253](#) - *oxygen-fuel gas welding and cutting*, and [1910.254](#) - *arc welding and cutting*, of this part (1910) shall be observed.

[1910.252\(d\)\(2\)\(ii\)](#) - X-ray inspection. The use of X-rays and radioactive isotopes for the *inspection* of welded piping joints shall be in conformance with the *American National Standard Safety Standard for Non-Medical X-ray and Sealed Gamma-Ray Sources, ANSI Z54.1 - 1963*.

## 1910.253 - Oxygen-fuel Gas Welding and Cutting

**Scope:** This [standard](#) provides the requirements for oxygen-fuel gas welding and cutting operations.

**Special Requirements:** Approved apparatus, instructed, competent, rules, instructions (posted), marked, marking, labeling, tests, posted sign, operating procedures, material and fabrication procedures, inspections, painted, instruction card, references other standards

[1910.253\(a\)\(1\)](#) - Flammable mixture. Mixtures of fuel gases and air or oxygen may be explosive and shall be guarded against. No device or attachment facilitating or permitting mixtures of air or oxygen with flammable gases prior to consumption, except at the burner or in a standard torch, shall be allowed unless *approved* for the purpose.

[1910.253\(a\)\(3\)](#) - Apparatus. Only *approved apparatus* such as torches, regulators or pressure-reducing valves, acetylene generators, and manifolds shall be used.

[1910.253\(a\)\(4\)](#) - Personnel. Workmen in charge of the oxygen or fuel-gas supply equipment, including generators, and oxygen or fuel-gas distribution piping systems shall be *instructed and judged competent* by their employers for this important work before being left in charge. *Rules and instructions* covering the operation and maintenance of oxygen or fuel-gas supply equipment including generators, and oxygen or fuel-gas distribution piping systems shall be readily available.

[1910.253\(b\)\(1\)\(ii\)](#) - Compressed gas cylinders shall be *legibly marked*, for the purpose of identifying the gas content, with either the chemical or the trade name of the gas. Such *marking* shall be by means of *stenciling, stamping, or labeling*, and shall not be readily removable. Whenever practical, the *marking* shall be located on the shoulder of the cylinder.

[1910.253\(b\)\(1\)\(iii\)](#) - Compressed gas cylinders shall be equipped with connections complying with the *American National Standard Compressed Gas Cylinder Valve Outlet and Inlet Connections, ANSI B57.1—1965*, which is incorporated by reference as specified in [1910.6](#).

[1910.253\(b\)\(4\)\(iv\)](#) - Where a liquid oxygen system is to be used to supply gaseous oxygen for welding or cutting and the system has a storage capacity of more than 13,000 cubic feet (364 m<sup>3</sup>) of oxygen [measured at 14.7 psia (101 kPa) and 70 °F (21.1 °C)], connected in service or ready for service, or more than 25,000 cubic feet (700 m<sup>3</sup>) of oxygen [measured at 14.7 psia (101 kPa) and 70 °F (21.1 °C)], including unconnected reserves on hand at the site, it shall comply with the provisions of the *Standard for Bulk Oxygen Systems at Consumer Sites, NFPA No. 566—1965*, which is incorporated by reference as specified in [1910.6](#).



[1910.253\(b\)\(5\)](#) - *Operating procedures*. [Reference [paragraph \(b\)\(5\)](#)].

[1910.253\(c\)\(2\)\(v\)](#) - An oxygen manifold or oxygen bulk supply system which has storage capacity of more than 13,000 cubic feet (364 m<sup>3</sup>) of oxygen [measured at 14.7 psia (101 kPa) and 70 °F (21.1 °C)], connected in service or ready for service, or more than 25,000 cubic feet (700 m<sup>3</sup>) of oxygen (measured at 14.7 psia [101 kPa) and 70 °F (21.1 °C)], including unconnected reserves on hand at the site, shall comply with the provisions of the *Standard for Bulk Oxygen Systems at Consumer Sites, NFPA No. 566-1965*.

[1910.253\(c\)\(3\)\(iii\)](#) - The assembled manifold including leads shall be *tested* and proven gas-tight at a pressure of 300 psig (2.04 MPa). The fluid used for testing oxygen manifolds shall be oil-free and not combustible.

[1910.253\(c\)\(3\)\(v\)](#) - The following *sign shall be conspicuously posted* at each manifold: [Reference [paragraph \(c\)\(3\)\(v\)](#)].

[1910.253\(c\)\(4\)\(vii\)](#) - *Materials and fabrication procedures* for portable outlet headers shall comply with [paragraphs \(d\)\(1\), \(d\)\(2\), and \(d\)\(5\)](#) of this section.

[1910.253\(c\)\(5\)](#) - *Manifold operation procedures*. [Reference [paragraph \(c\)\(5\)](#)].

[1910.253\(d\)\(1\)\(i\)\(A\)](#) - Service piping systems. Piping and fittings shall comply with section 2, Industrial Gas and Air Piping Systems, of the *American National Standard Code for Pressure Piping ANSI B31.1, 1967*, which is incorporated by reference as specified in [1910.6](#), insofar as it does not conflict with [paragraphs \(d\)\(1\)\(i\)\(A\)\(1\) and \(d\)\(1\)\(i\)\(A\)\(2\)](#) of this section: [Reference [paragraph \(d\)\(1\)\(i\)\(A\)\(1\) - \(2\)](#)].

[1910.253\(d\)\(4\)\(i\)](#) - Underground pipe and tubing and outdoor ferrous pipe and tubing shall be covered or *painted* with a suitable material for protection against corrosion.

[1910.253\(d\)\(4\)\(ii\)](#) - Aboveground piping systems shall be marked in accordance with the *American National Standard Scheme for the Identification of Piping Systems, ANSI A13.1-1956*, which is incorporated by reference as specified in [1910.6](#).

[1910.253\(d\)\(4\)\(iii\)](#) - Station outlets shall be *marked* to indicate the name of the gas.

[1910.253\(d\)\(5\)\(i\)](#) - Piping systems shall be *tested* and proved gastight at 1½ times the maximum operating pressure, and shall be thoroughly purged of air before being placed in service. The material used for *testing oxygen lines* shall be oil free and noncombustible. Flames shall not be used to detect leaks.

[1910.253\(e\)\(3\)\(ii\)](#) - *Approved protective equipment* (designated P<sub>F</sub> in Figures Q-1, Q-2, and Q-3) shall be installed in fuel-gas piping to prevent: [Reference [paragraph \(e\)\(3\)\(ii\)\(A\) - \(C\)](#)].

[1910.253\(e\)\(4\)\(iv\)](#) - If the station outlet is equipped with a detachable regulator, the outlet shall terminate in a union connection that complies with the *Regulator Connection Standards, 1958, Compressed Gas Association*, which is incorporated by reference as specified in [1910.6](#).

[1910.253\(e\)\(4\)\(v\)](#) - If the station outlet is connected directly to a hose, the outlet shall terminate in a union connection complying with the *Standard Hose Connection Specifications, 1957, Compressed Gas Association*, which is incorporated by reference as specified in [1910.6](#).

[1910.253\(e\)\(5\)\(i\)](#) - Hose for oxy-fuel gas service shall comply with the *Specification for Rubber Welding Hose, 1958, Compressed Gas Association and Rubber Manufacturers Association*, which is incorporated by reference as specified in [1910.6](#).

[1910.253\(e\)\(5\)\(iii\)](#) - Hose connections shall comply with the *Standard Hose Connection Specifications, 1957, Compressed Gas Association*.

[1910.253\(e\)\(6\)\(i\)](#) - Pressure-reducing regulators shall be used only for the gas and pressures for which they are intended. The regulator inlet connections shall comply with *Regulator Connection Standards, 1958, Compressed Gas Association*.

[1910.253\(e\)\(6\)\(iv\)](#) - Union nuts and connections on regulators shall be *inspected before* use to detect faulty seats which may cause leakage of gas when the regulators are attached to the cylinder valves.

[1910.253\(f\)\(1\)\(i\)](#) - Generators shall be of *approved construction* and shall be *plainly marked* with the maximum rate of acetylene in cubic feet per hour for which they are designed; the weight and size of carbide necessary for a single charge; the *manufacturer's name and address*; and the name or number of the type of generator.

[1910.253\(f\)\(1\)\(ii\)](#) - Carbide shall be of the *size marked* on the generator *nameplate*.

[1910.253\(f\)\(2\)\(i\)](#) - The total hourly output of a generator shall not exceed the rate for which it is *approved and marked*. Unless specifically *approved* for higher ratings, carbide-feed generators shall be rated at 1 cubic foot (0.028 m<sup>3</sup>) per hour per pound of carbide required for a single complete charge.

[1910.253\(f\)\(4\)\(iv\)\(A\)](#) - The compressor or booster system shall be of an *approved type*.

[1910.253\(f\)\(4\)\(iv\)\(B\)](#) - Wiring and electric equipment in compressor or booster pump rooms or enclosures shall conform to the provisions of [subpart S](#) of this part (1910) for Class I, Division 2 locations.

[1910.253\(f\)\(4\)\(iv\)\(E\)](#) - Compressor or booster pump discharge outlets shall be provided with *approved protective equipment*. (See [paragraph \(e\)](#) of this section.)

[1910.253\(f\)\(5\)\(i\)\(A\)](#) - All portable generators shall be of a type *approved for portable use*.

[1910.253\(f\)\(7\)\(i\)](#) - *Unauthorized persons* shall not be permitted in outside generator houses or inside generator rooms.

[1910.253\(f\)\(7\)\(i\)\(A\)](#) - *Operating instructions* shall be posted in a conspicuous place near the generator or kept in a suitable place available for ready reference.

[1910.253\(f\)\(7\)\(i\)\(B\)](#) - When recharging generators the order of operations specified in the *instructions* supplied by the manufacturer shall be followed.

[1910.253\(f\)\(7\)\(i\)\(C\)](#) - In the case of batch-type generators, when the charge of carbide is exhausted and before additional carbide is added, the generating chamber shall always be flushed out with water, renewing the water supply in accordance with the *instruction card* furnished by the manufacturer.

[1910.253\(g\)\(1\)\(ii\)](#) - Packages containing calcium carbide shall be conspicuously *marked* “Calcium Carbide—Dangerous If Not Kept Dry” or with equivalent warning.

[1910.253\(g\)\(3\)\(ii\)](#) - Carbide containers to be stored outdoors shall be *examined* to make sure that they are in good condition. *Periodic reexaminations* shall be made for rusting or other damage to a container that might affect its water or air tightness.

## **1910.254 - Arc Welding and Cutting**

**Scope:** This [standard](#) provides the requirements for arc welding and cutting.

**Special Requirements:** Instruction, qualified, design, rated load, checks, printed rules, manufacturer instructions, reporting, qualified personnel, tests, references other standards

[1910.254\(a\)\(3\)](#) - *Instruction*. Workmen designated to operate arc welding equipment shall have been properly *instructed and qualified to operate such equipment* as specified in paragraph (d) of this section.

[1910.254\(b\)\(1\)](#) - General. Assurance of consideration of *safety in design* is obtainable by choosing apparatus complying with the *Requirements for Electric Arc-Welding Apparatus, NEMA EW-1-1962, National Electrical Manufacturers Association or the Safety Standard for Transformer-Type Arc-Welding Machines, ANSI C33.2 - 1956, Underwriters' Laboratories*, both of which are incorporated by reference as specified in 1910.6.

[1910.254\(b\)\(2\)\(i\)](#) - Standard machines for arc welding service *shall be designed* and constructed to carry their *rated load* with rated temperature rises where the temperature of

the cooling air does not exceed 40 °C (104 °F) and where the altitude does not exceed 3,300 feet (1,005.8 m), and shall be suitable for operation in atmospheres containing gases, dust, and light rays produced by the welding arc.

1910.254(b)(4)(i) - A controller integrally mounted in an electric motor driven welder shall have capacity for carrying rated motor current, shall be capable of making and interrupting stalled rotor current of the motor, and may serve as the running overcurrent device if provided with the number of overcurrent units as specified by subpart S of this part (1910).

1910.254(c)(1) - Installation of arc welding equipment. General. Installation including power supply shall be in accordance with the requirements of subpart S of this part (1910).

1910.254(c)(2)(i) - The frame or case of the welding machine (except engine-driven machines) shall be grounded under the conditions and according to the methods prescribed in subpart S of this part (1910).

1910.254(c)(2)(v) - All ground connections shall be *checked* to determine that they are mechanically strong and electrically adequate for the required current.

1910.254(c)(3)(i) - A disconnecting switch or controller shall be provided at or near each welding machine which is not equipped with such a switch or controller mounted as an integral part of the machine. The switch shall be in accordance with subpart S of this part. Overcurrent protection shall be provided as specified in subpart S of this part (1910). A disconnect switch with overload protection or equivalent disconnect and protection means, permitted by subpart S of this part (1910), shall be provided for each outlet intended for connection to a portable welding machine.

1910.254(d)(1) - General. Workers assigned to operate or maintain arc welding equipment shall be acquainted with the requirements of this section and with 1910.252(a) (*welding and cutting, general requirements*) - *fire prevention and protection*, (b) - *protection of personnel*, and (c) - *health protection and ventilation*, of this part.

1910.254(d)(2) - Machine hook up. Before starting operations all connections to the machine shall be *checked* to make certain they are properly made. The work lead shall be firmly attached to the work; magnetic work clamps shall be freed from adherent metal particles of spatter on contact surfaces. Coiled welding cable shall be spread out before use to avoid serious overheating and damage to insulation.

1910.254(d)(3) - Grounding. Grounding of the welding machine frame shall be *checked*. Special attention shall be given to safety ground connections of portable machines.

[1910.254\(d\)\(6\)](#) - *Manufacturers' instructions. Printed rules and instructions* covering operation of equipment supplied by the manufacturers shall be strictly followed.

[1910.254\(d\)\(9\)\(i\)](#) - The *operator should report* any equipment defect or safety hazard to his supervisor and the use of the equipment shall be discontinued until its safety has been assured. Repairs shall be made only by *qualified personnel*.

[1910.254\(d\)\(9\)\(ii\)](#) - Machines which have become wet shall be thoroughly dried and *tested* before being used.

## **1910.255 - Resistance Welding**

**Scope:** This [standard](#) provides the requirements pertaining to resistance welding.

**Special Requirements:** Qualified electrician, qualified maintenance personnel, inspections, certification record, signatures, instructed, unauthorized persons, competent personnel, reporting, references other standards

[1910.255\(a\)\(1\)](#) - Installation. All equipment shall be *installed by a qualified electrician* in conformance with [subpart S](#) of this part (1910). There shall be a safety-type disconnecting switch or a circuit breaker or circuit interrupter to open each power circuit to the machine, conveniently located at or near the machine, so that the power can be shut off when the machine or its controls are to be serviced.

[1910.255\(a\)\(3\)](#) - Personnel. Workmen designated to operate resistance welding equipment shall have been *properly instructed and judged competent* to operate such equipment.

[1910.255\(b\)\(3\)](#) - Interlocks. All doors and access panels of all resistance welding machines and control panels shall be kept locked and interlocked to prevent access, by *unauthorized persons*, to live portions of the equipment.

[1910.255\(b\)\(4\)](#) - Guarding. All press welding machine operations, where there is a possibility of the operator's fingers being under the point of operation, shall be effectively guarded by the use of a device such as an electronic eye safety circuit, two hand controls or protection similar to that prescribed for punch press operation, [1910.217 - mechanical power press](#), of this part. All chains, gears, operating bus linkage, and belts shall be protected by adequate guards, in accordance with [1910.219 - mechanical power-transmission apparatus](#), of this part.

[1910.255\(b\)\(5\)](#) - Shields. The hazard of flying sparks shall be, wherever practical, eliminated by installing a shield guard of safety glass or suitable fire-resistant plastic at the point of operation. Additional shields or curtains shall be installed as necessary to protect passing

persons from flying sparks. (See [1910.252\(b\)\(2\)\(i\)\(C\)](#) - *welding and cutting, general requirements*).

[1910.255\(d\)\(1\)](#) - Ventilation and flash guard. Flash welding machines shall be equipped with a hood to control flying flash. In cases of high production, where materials may contain a film of oil and where toxic elements and metal fumes are given off, ventilation shall be provided in accordance with [1910.252\(c\)](#) - *welding and cutting, general requirements*, of this part.

[1910.255\(e\)](#) - Maintenance. *Periodic inspection* shall be made by *qualified maintenance personnel*, and a *certification record* maintained. The *certification record* shall include the *date of inspection*, the *signature of the person* who performed the *inspection* and the serial number, or other identifier, for the equipment inspected. The *operator shall be instructed to report* any equipment defects to his *supervisor* and the use of the equipment shall be discontinued until safety repairs have been completed.

## Subpart R - [Special Industries](#)

[Subpart R](#) provides standards for specific industries and are considered vertical standards as they apply to a particular industry. These standards apply to the following industries: manufacturing pulp, paper, and paperboard; manufacturing or processing textiles; bakery and equipment; laundry and laundry equipment; sawmills; logging operations; telecommunications; electric power generation, transmission and distribution; and grain handling.

To learn if subpart R applies to you, go to [Does "Subpart R - Special Industries" Apply to You?](#)

## Special Requirements

### 1910.261 - Pulp, Paper, and Paperboard Mills

**Scope:** This [standard](#) applies to establishments where pulp, paper, and paperboard are manufactured and converted. This section does not apply to logging and the transportation of logs to pulp, paper, and paperboard mills.

**Special Requirements:** Lockout, tagout, flagman, blue flag policy, warning flags/signs, painted boom (yellow), inspections, tests, manufacturer recommendations, signals, warning device, floor capacity (marked), markings, authorized personnel, crane operator,



approved safety fuse, alarm system, PPE, posted standards, hoisting engineer, person posted outside, references other standards

1910.261(a)(2) - *Standards incorporated by reference.* Standards covering issues of occupational safety and health which have general application without regard to any specific industry are incorporated by reference in paragraphs (b) through (m) of this section and in subparagraphs (3) and (4) of this paragraph and made applicable under this section. Such standards shall be construed according to the rules set forth in 1910.5 - applicability of standards.

1910.261(a)(3) - *General incorporation of standards.* Establishments subject to this section shall comply with the following standards of the American National Standards Institute, which are incorporated by reference as specified in 1910.6: [Reference paragraph (a)(3) - (4)].

1910.261(b)(1) - *Lockouts.* Devices such as padlocks shall be provided for *locking out* the source of power at the main disconnect switch. Before any *maintenance, inspection*, cleaning, adjusting, or servicing of equipment (electrical, mechanical, or other) that requires entrance into or close contact with the machinery or equipment, the main power disconnect switch or valve, or both, controlling its source of power or flow of material, shall be *locked out or blocked off* with padlock, blank flange, or similar device.

1910.261(c)(3)(ii) - The hatch tender shall be required to *signal the hoisting engineer* to move the load only after the men working in the hold are in the clear.

1910.261(c)(3)(iii) - The air in the ship's hold, tanks, or closed vessels shall be *tested for oxygen deficiency* and for both toxic and explosive gases and vapors.

1910.261(c)(5)(iii) - Where binder chains and crane slings are used, the crane slings shall be attached and taut before the binder chains are released. The hooker shall see that the helper is clear *before signaling* for the movement of the load.

1910.261(c)(8)(iii) - A crane shall not be operated where any part thereof may come within 10 feet of overhead powerlines (or other overhead obstructions) unless the powerlines have been deenergized. The *boom shall be painted bright yellow* from and including the head sheave to a point 6 feet down the boom towards the cab.

1910.261(c)(8)(iv) - *Standard signals* for the operation of cranes shall be established for all movements of the crane, in accordance with American National Standards B30.2 - 1943 (reaffirmed 1968) and B30.2.0 - 1967.

1910.261(c)(8)(v) - Only one member of the crew shall be *authorized to give signals* to the crane operator.

[1910.261\(c\)\(8\)\(vi\)](#) - All cranes shall be equipped with a *suitable warning device* such as a *horn or whistle*.

[1910.261\(c\)\(9\)\(i\)](#) - A *flagman* shall direct the movement of cranes or locomotives being moved across railroad tracks or roads, and at any points where the vision of the operator is restricted. The *flagman* must always remain in sight of the operator when the crane or locomotive is in motion. The *blue flag policy* shall be used to mark stationary cars day and night. This *policy* shall include *marking the track* in advance of the spotted cars (flag for daytime, light for darkness).

[1910.261\(c\)\(9\)\(ii\)](#) - After cars are spotted for loading or unloading, *warning flags or signs* shall be placed in the center of the track at least 50 feet away from the cars and a derail set to protect workmen in the car.

[1910.261\(c\)\(10\)](#) - *Illumination*. Artificial illumination shall be provided when loading or unloading is performed after dark, in accordance with *American National Standard [A11.1 - 1965](#) (R - 1970)*.

[1910.261\(c\)\(14\)\(ii\)](#) - If dynamite is used to loosen the pile, only *authorized personnel* shall be permitted to handle and discharge the explosive. An electric detonator is preferable for firing; if a fuse is used, it shall be an *approved safety fuse* with a burning rate of not less than 120 seconds per yard and a minimum length of 3 feet, in accordance with *Safety in the Handling and Use of Explosives, [IME Pamphlet No. 17](#), July 1960*.

[1910.261\(c\)\(15\)\(ii\)](#) - Where conveyors cross passageways or roadways, a horizontal platform shall be provided under the conveyor, extended out from the sides of the conveyor a distance equal to 1 ½ times the length of the wood handled. The platform shall extend the width of the road plus 2 feet (61 cm) on each side, and shall be kept free of wood and rubbish. The edges of the platform shall be provided with toeboards or other protection that meet the requirements of *subpart D - walking - working surfaces* (Reference [1910.28](#) - *duty to have fall protection and falling object protection* and [1910.29](#) - *fall protection systems and falling object protection - criteria and practices*), of *this part* to prevent wood from falling.

[1910.261\(c\)\(15\)\(iv\)](#) - Every belt conveyor shall have an emergency stop cable extending the length of the conveyor so that it may be stopped from any location along the line, or conveniently located stop buttons within 10 feet of each work station, in accordance with *American National Standard [B20.1 - 1957](#)*.

[1910.261\(c\)\(16\)](#) - *Signs*. When conveyors cross walkways or roadways in the yards, the employer must erect *signs reading "Danger—Overhead Conveyor" or an equivalent warning*, in accordance with *ANSI Z35.1-1968 or ANSI Z535.2-2011*, incorporated by reference in [1910.6](#).

1910.261(d)(1) - *Personal protective equipment*. Whenever possible, all dust, fumes, and gases incident to handling materials shall be controlled at the source, in accordance with *American National Standard Z9.2 - 1960*. Where control at the source is not possible, *respirators with goggles or protective masks* shall be provided, and employees shall wear them when handling alum, clay, soda ash, lime, bleach powder, sulfur, chlorine, and similar materials, and when opening rag bales.

1910.261(d)(3)(iii) - *Floor capacities shall be clearly marked* on all floors.

1910.261(e)(2) - *Slasher tables*. Saws shall be stopped and power switches shall be *locked out and tagged* whenever it is necessary for any person to be on the slasher table.

1910.261(e)(4) - Runway to the jack ladder. The runway from the pond or unloading dock to the table shall be protected with standard handrails and toeboards. Inclined portions shall have cleats or equivalent nonslip surfacing that complies with subpart D - walking - working surfaces, of this part. Protective equipment shall be provided for persons working over water.

1910.261(e)(10) - Stops. All control devices shall be *locked out and tagged* when knives are being changed.

1910.261(e)(12)(i) - When platforms or floors allow access to the sides of the drums, a standard railing shall be constructed around the drums. When two or more drums are arranged side by side, proper walkways with standard handrails shall be provided between each set, in accordance with the requirements of *29 CFR 1910.23, Guarding floor and wall openings and holes (These requirements are now located in 1910.28 - duty to have fall protection and falling object protection)*.

1910.261(e)(12)(ii) - Sprockets and chains, gears, and trunnions shall have standard guards, in accordance with the requirements of 29 CFR 1910.219 - mechanical power-transmission apparatus.

1910.261(e)(12)(iii) - Whenever it becomes necessary for a workman to go within a drum, the driving mechanism shall be *locked and tagged*, at the main disconnect switch, in accordance with paragraph (b)(1) of this section.

1910.261(e)(13) - Intermittent barking drums. In addition to motor switch, clutch, belt shifter, or other power disconnecting device, intermittent barking drums shall be equipped with a device which may be *locked* to prevent the drum from moving while it is being emptied or filled.

1910.261(e)(18) - *Chipper spout*. The feed system to the chipper spout shall be arranged in such a way that the operator does not stand in a direct line with the chipper spout. All

chipper spouts shall be enclosed to a height of at least 42 inches from the floor or operator's platform. When other protection is not sufficient, the operator shall wear a safety belt line. The safety belt line shall be fastened in such a manner as to make it impossible for the operator to fall into the throat of the chipper. Ear protection equipment shall be worn by the operator and others in the immediate area if there is any possibility that the noise level may be harmful (Reference [1910.95](#) - *occupational noise exposure*).

[1910.261\(f\)\(2\)\(iv\)](#) - Hoods of cutters, shredders, and dusters shall have exhaust ventilation, in accordance with *American National Standard Z9.2 - 1960*.

[1910.261\(f\)\(4\)](#) - *Conveyors*. Conveyors and conveyor drive belts and pulleys shall be fully enclosed or, if open and within 7 feet of the floor, shall be constructed and guarded in accordance with [paragraph \(c\)\(15\)](#) of this section and *American National Standards B15.1 - 1953 (Reaffirmed 1958)* and *B20.1 - 1957*.

[1910.261\(f\)\(5\)](#) - Dust. Measures for the control of dust shall be provided, in accordance with *American National Standards Z33.1 - 1961, Z87.1 - 1968, and Z88.2 - 1969*.

[1910.261\(f\)\(6\)\(i\)](#) - When cleaning, *inspection*, or other work requires that persons enter rag cookers, all steam and water valves, or other control devices, shall be *locked and tagged* in the closed or "off" position. Blank flanging of pipelines is acceptable in place of closed and locked valves.

[1910.261\(f\)\(6\)\(ii\)](#) - When cleaning, *inspection*, or other work requires that persons must enter the cooker, *one person shall be stationed outside* in a position to observe and assist in case of emergency, in accordance with [paragraph \(b\)\(5\)](#) of this section.

[1910.261\(f\)\(6\)\(iv\)](#) - Rag cookers shall be provided with safety valves in accordance with the *ASME Boiler and Pressure Vessel Code, Section VIII, Unfired Pressure Vessels—1968, with Addenda*.

[1910.261\(g\)\(1\)\(i\)](#) - Sulfur-burner houses shall be safely and adequately ventilated, and every precaution shall be taken to guard against dust explosion hazards and fires, in accordance with *American National Standards Z9.2 - 1960 and Z12.12 - 1968*.

[1910.261\(g\)\(1\)\(iii\)](#) - Sulfur storage bins shall be kept free of sulfur dust accumulation, in accordance with *American National Standard Z9.2 - 1960*.

[1910.261\(g\)\(2\)\(ii\)](#) - Acid plants. The worker shall be provided with *eye protection*, a supplied air respirator and a personal fall protection system that meets the requirements of [subpart I - personal protective equipment, of this part](#), during *inspection*, repairs or maintenance of acid towers. The line shall be extended to an *attendant stationed outside the tower opening*.

1910.261(g)(3) - Acid tower structure. Outside elevators shall be *inspected daily* during winter months when ice materially affects safety. Elevators, runways, stairs, etc., for the acid tower shall be *inspected monthly* for defects that may occur because of exposure to acid or corrosive gases.

1910.261(g)(4)(ii) - Acid tanks. A *man shall be stationed outside* to summon assistance if necessary. All intake valves to a tank shall be blanked off or disconnected.

1910.261(g)(11)(i) - Elevators shall be constructed in accordance with *American National Standard A17.1 - 1965*.

1910.261(g)(11)(iii) - Elevators shall be equipped with an *alarm system* to advise of failure.

1910.261(g)(13)(i) - Blow-pit openings preferably shall be on the side of the pit instead of on the top. Openings shall be as small as possible when located on top, and shall be protected in accordance with subpart D - walking - working surfaces, of this part (1910).

1910.261(g)(15)(i) - Valves controlling lines leading into a digester shall be *locked out and tagged*. The keys to the locks shall be in the possession of a person or persons doing the *inspecting* or making repairs.

1910.261(g)(15)(iii) - *No inspector* shall enter a digester unless a lifeline is securely fastened to his body by means of a safety belt and at least one other experienced employee is *stationed outside* the digester to handle the line and to summon assistance. All ladders and lifelines shall be *inspected before each use*.

1910.261(g)(15)(iv) - All employees entering digesters for *inspection or repair work* shall be provided with protective headgear. Eye protection and dust masks shall be provided to workmen while the old brick lining is being removed, in accordance with *American National Standards, Z87.1 - 1968, Z88.2 - 1969, and Z99.1 - 1969*.

1910.261(g)(16)(ii) - The pressure tanks-accumulators shall be *inspected twice annually*. (See the ASME Boiler and Pressure Vessel Code, Section VIII, Unfired Pressure Vessels - 1968, with Addenda.)

1910.261(g)(17)(i) - A safety valve shall be installed in a separate line from each pressure vessel; no hand valve shall be installed between this safety valve and the pressure vessel. Safety valves shall be *checked between each cook* to be sure they have not become plugged or corroded to the point of being inoperative. (See the ASME Boiler and Pressure Vessel Code, Section VIII, Unfired Pressure Vessels - 1968, with Addenda.)

1910.261(g)(17)(ii) - All safety devices shall conform to *Paragraph U-2 in the ASME Boiler and Pressure Vessel Code, Section VIII Unfired Pressure Vessels - 1968, with Addenda*.

[1910.261\(g\)\(18\)\(ii\)](#) - Rotary tenders, smelter operators, and those cleaning smelt spouts shall be provided with eye protection equipment (fitted with lenses that filter out the harmful rays emanating from the light source) when actively engaged in their duties, in accordance with *American National Standard* [Z87.1 - 1968](#).

[1910.261\(g\)\(18\)\(iii\)](#) - Heavy-duty pipe, valves, and fittings shall be used between digester and blow pit. These shall be *inspected at least semiannually* to determine the degree of deterioration and repaired or replaced when necessary, in accordance with *American National Standards* [B31.1 - 1955](#), [B31.1a - 1963](#), [B31.1.0 - 1967](#), and [B31.2 - 1968](#).

[1910.261\(g\)\(18\)\(v\)](#) - Smelt tanks shall be provided with vent stacks and explosion doors, in accordance with *American National Standard* [Z9.1 - 1951](#).

[1910.261\(g\)\(19\)\(iii\)](#) - When blow lines from more than one digester lead into one pipe, the cock or valve of the blow line from the tank being *inspected* or repaired shall be *locked or tagged out*, or the line shall be disconnected and blocked off.

[1910.261\(g\)\(20\)](#) - Furnace room. Exhaust ventilation shall be provided where niter cake is fed into a rotary furnace and shall be so designed and maintained as to keep the concentration of hydrogen sulfide gas below the parts per million listed in [1910.1000 - air contaminants](#)

[1910.261\(g\)\(21\)](#) - *Inspection and repair of tanks*. All piping leading to tanks shall be blanked off or valved and *locked or tagged*. Any lines to sewers shall be blanked off to protect workers from air contaminants.

[1910.261\(h\)\(1\)](#) - Bleaching engines. Bleaching engines, except the Bellmer type, shall be completely covered on the top, with the exception of one small opening large enough to allow filling, but too small to admit an employee. Platforms leading from one engine to another shall have standard guardrails that meet the requirements in [subpart D - walking - working surfaces](#) (Reference [1910.28](#) - *duty to have fall protection and falling object protection*), of this part.

[1910.261\(h\)\(2\)\(i\)](#) - The room in which the bleach powder is mixed shall be provided with adequate exhaust ventilation, located at the floor level, in accordance with *American National Standard* [Z9.1 - 1951](#).

[1910.261\(h\)\(2\)\(ii\)](#) - Chlorine gas shall be carried away from the work place and breathing area by an exhaust system. The gas shall be rendered neutral or harmless before being discharged into the atmosphere. The requirements of *American National Standard* [Z9.2 - 1960](#) shall apply to this subdivision.



[1910.261\(h\)\(2\)\(iii\)](#) - For emergency and rescue operations, the employer must provide employees with self-contained breathing apparatuses or supplied-air respirators, and ensure that employees use these respirators, in accordance with the requirements of [29 CFR 1910.134](#) - *respiratory protection*.

[1910.261\(h\)\(3\)\(vi\)](#) - All chlorine, caustic, and acid lines shall be marked for positive identification, in accordance with *American National Standard A13.1 - 1967*.

[1910.261\(i\)\(1\)\(i\)](#) - Water wheels directly connected to pulp grinders shall be provided with speed governors limiting the peripheral speed of the grinder to that *recommended by the manufacturer*.

[1910.261\(i\)\(2\)](#) - *Butting* saws. Hood guards shall be provided on butting saws, in accordance with *American National Standard O1.1 - 1954 (reaffirmed 1961)*.

[1910.261\(i\)\(4\)](#) - *Personal protection*. Persons exposed to falling material shall wear eye, head, foot, and shin protection equipment, in accordance with *American National Standards Z87.1 - 1968, Z88.2 - 1969, Z89.1 - 1969, and Z41.1 - 1967*.

[1910.261\(j\)\(1\)\(iii\)](#) - Repairs for cleaning of blockage shall be done only when the shredder is shutdown and control devices *locked*.

[1910.261\(j\)\(2\)](#) - Pulp conveyors. Pulp conveyors and conveyor drive belts and pulleys shall be fully enclosed, or if open and within 7 feet of the floor, shall be constructed and guarded in accordance with *American National Standard B20.1 - 1957*.

[1910.261\(j\)\(4\)\(ii\)](#) - When cleaning, *inspecting*, or other work requires that persons enter the beaters, all control devices shall be *locked or tagged out*, in accordance with [paragraph \(b\)\(4\)](#) of this section.

[1910.261\(j\)\(4\)\(iii\)](#) - When beaters are fed from the floor above, the chute opening, if less than 42 inches (1.06 m) from the floor, shall be provided with a guardrail system that meets the requirements in [subpart D - walking - working surfaces](#) of this part, or other equivalent enclosures. Openings for manual feeding shall be sufficient only for entry of stock, and shall be provided with at least two permanently secured crossrails or other fall protection system that meet the requirements in [subpart D - walking - working surfaces](#).

[1910.261\(j\)\(5\)\(i\)](#) - All pulpers having the top or any other opening of a vessel less than 42 inches (107 cm) from the floor or work platform shall have such openings guarded by guardrail systems that meet the requirements in [subpart D - walking - working surfaces](#), of this part, or other equivalent enclosures. For manual changing, openings shall be sufficient only to permit the entry of stock, and shall be provided with at least two permanently

secured crossrails, or other fall protection systems that meet the requirements in [subpart D - walking - working surfaces](#).

[1910.261\(j\)\(5\)\(ii\)](#) - When cleaning, *inspecting*, or other work requires that persons enter the pulpers, they shall be equipped with safety belt and lifeline, and *one person shall be stationed outside* at a position to observe and assist in case of emergency.

[1910.261\(j\)\(5\)\(iii\)](#) - When cleaning, *inspecting*, or other work requires that persons enter pulpers, all steam, water, or other control devices shall be *locked or tagged out*. Blank flanging and *tagging* of pipe lines is acceptable in place of closed and *locked or tagged* valves. Blank flanging of steam and water lines shall be acceptable in place of valve locks.

[1910.261\(j\)\(6\)\(i\)](#) - All control devices shall be *locked or tagged out* when persons enter stock chests, in accordance with [paragraph \(b\)\(4\)](#) of this section.

[1910.261\(j\)\(6\)\(ii\)](#) - When cleaning, *inspecting*, or other work requires that persons enter stock chests, they shall be provided with a low-voltage extension light.

[1910.261\(k\)\(1\)](#) - Emergency stops. Paper machines shall be equipped with devices that will stop the machine quickly in an emergency. The devices shall consist of push buttons for electric motive power (or electrically operated engine stops), pull cords connected directly to the prime mover, control clutches, or other devices, interlocked with adequate braking action. The devices shall be *tested periodically* by making use of them when stopping the machine and shall be so located that any person working on the machine can quickly disconnect the machine from the source of power in case of emergency.

[1910.261\(k\)\(6\)](#) - Steps. Steps of uniform rise and tread with nonslip surfaces that meet the requirements in [subpart D - walking - working surfaces](#) (reference [1910.25 - stairways](#)) of this part shall be provided at each press.

[1910.261\(k\)\(12\)](#) - *Dryer gears*. Dryer gears shall be guarded excepting where the oilers' walkway is removed out of reach of the gears' nips and spokes and hot pipes in accordance with American National Standard [B15.1 - 1953](#) (reaffirmed 1958).

[1910.261\(k\)\(12\)\(i\)](#) - A guardrail shall be provided at broke holes in accordance with 1910.23 (Reference [1910.28 - duty to have fall protection and falling object protection for guardrails](#)).

[1910.261\(k\)\(13\)\(i\)](#) - A guardrail that complies with [subpart D - walking - working surfaces](#), of this part shall be provided at broke holes. (Reference [1910.28 - duty to have fall protection and falling object protection for guardrails](#)).

[1910.261\(k\)\(15\)](#) - Steps. Steps ([1910.25](#) - stairways) or ladders ([1910.23](#) - ladders) that comply with [subpart D](#) - walking - working surfaces of this part, and tread with nonslip surfaces shall be provided at each calendar stack. Handrails and hand grips complying with [subpart D](#) - walking - working surfaces (Reference [1910.28](#) - duty to have fall protection and falling object protection and [1910.29](#) - fall protection systems and falling object protection - criteria and practices) shall be provided at each calendar stack.

[1910.261\(k\)\(21\)](#) - Illumination. Permanent lighting shall be installed in all areas where employees are required to make machine adjustments and sheet transfers in accordance with the *American National Standard* [A11.1 - 1965](#) (R 1970).

[1910.261\(k\)\(24\)\(ii\)](#) - All lifting equipment (clamps, cables, and slings) shall be maintained in a safe condition and *inspected regularly*.

[1910.261\(k\)\(32\)](#) - Radiation. *Special standards* regarding the use of radiation equipment shall be *posted* and followed as required by [1910.1096](#) - *ionizing radiation*.

[1910.261\(l\)\(2\)](#) - Emergency stops. Electrically or manually operated quick power disconnecting devices, interlocked with braking action, shall be provided on all operating sides of the machine within easy reach of all employees. These devices *shall be tested* by making use of them when stopping the machine.

[1910.261\(l\)\(3\)](#) - Core collars. The requirements of [paragraph \(k\)\(27\)](#) of this section and the *American National Standard* [B15.1 - 1953](#) (reaffirmed 1958) shall apply.

[1910.261\(l\)\(4\)](#) - Elevators. These shall be in accordance with *American National Standard* [A17.1 - 1965](#).

[1910.261\(m\)\(5\)](#) - Unloading cars. *Flag signals*, derails, or other protective devices shall be used to protect men during switching operations. The *blue flag policy* shall be invoked according to [paragraph \(c\)\(9\)\(i\)](#) of this section.

## **1910.262 – Textiles**

**Scope:** This [standard](#) applies to the design, installation, processes, operation, and maintenance of textile machinery, equipment, and other plant facilities in all plants engaged in the manufacture and processing of textiles, except those processes used exclusively in the manufacture of synthetic fibers.

**Special Requirements:** Inspections, marking physical hazards, references other standards

[1910.262\(a\)\(2\)](#) - *Standards incorporated by reference*. *Standards* covering issues of occupational safety and health which are of general application without regard to any

specific industry are incorporated by reference in paragraphs of this section and made applicable to textiles. All such *standards* shall be construed according to the rules of construction set out in [1910.5 - applicability of standards](#).

[1910.262\(c\)\(5\)](#) - *Inspection and maintenance*. All guards and other safety devices, including starting and stopping devices, shall be properly maintained.

[1910.262\(c\)\(6\)](#) - *Lighting*. Lighting shall conform to *American National Standard A11.1—1965*, which is incorporated by reference as specified in 1910.6.

[1910.262\(c\)\(7\)](#) - *Identification of piping systems*. Identification of piping systems shall conform to *American National Standard A13.1—1956*, which is incorporated by reference as specified in 1910.6.

[1910.262\(c\)\(8\)](#) - *Identification of physical hazards*. Identification of physical hazards shall be in accordance with the requirements of [1910.144](#) - safety color code for marking physical hazards.

[1910.262\(h\)\(1\)\(i\)](#) - Reducing valves, safety valves, and pressure gages. Reducing valves, safety valves, and pressure gages shall conform to the *ASME Pressure Vessel Code, Section VIII, Unfired Pressure Vessels, 1968*, which is incorporated by reference as specified in 1910.6.

[1910.262\(h\)\(1\)\(ii\)](#) - Vacuum relief valves. Vacuum relief valves shall conform to the *ASME Code for Pressure Vessels, Section VIII, Unfired Pressure Vessels, 1968*.

[1910.262\(q\)\(1\)](#) - Reducing valves, safety valves, and pressure gages. Reducing valves, safety valves, and pressure gages shall conform to the *ASME Code for Unfired Pressure Vessels, Section VIII, Unfired/Pressure Vessels, 1968*.

[1910.262\(r\)](#) - Gray and white bins. On new installations guardrails (Reference [1910.28](#) - duty to have fall protection and falling object protection and [1910.29](#) - fall protection systems and falling object protection - criteria and practices) that comply with [subpart D](#) of this part shall be provided where workers are required to plait by hand from the top of the bin so as to protect the worker from falling to a lower level.

[1910.262\(s\)\(3\)](#) - Mangle and washers. The nip at the in-running rolls shall conform to [1910.264](#) - *laundry machinery and operations*.

[1910.262\(w\)\(1\)](#) - Pressure reducing valves and pressure gages. Pressure reducing valves and pressure gages shall conform to the *ASME Code for Pressure Vessels, Section VIII, 1968, Unfired Pressure Vessels*.

[1910.262\(x\)\(1\)](#) - Feed rolls. The feed rolls shall be guarded to conform to [1910.264](#) - *laundry machinery and operations*.

[1910.262\(x\)\(2\)](#) - Pressure rolls. Pressure rolls shall be covered or guarded to conform to [1910.264](#) - *laundry machinery and operations*.

[1910.262\(l\)](#) - Open tanks and vats for mixing and storage of hot or corrosive liquids—Shutoff valves. Boiling tanks, caustic tanks, and hot liquid containers, so located that the operator cannot see the contents from the floor or working area, shall have emergency shutoff valves controlled from a point not subject to danger of splash. Valves shall conform to the ASME Pressure Vessel Code, [Section VIII](#), *Unfired Pressure Vessels*, 1968.

## **1910.263 - Bakery Equipment**

**Scope:** This [standard](#) provides the requirements of this section shall apply to the design, installation, operation and maintenance of machinery and equipment used within a bakery.

**Special Requirements:** Inspections, marked specifications, marked maximum load capacity, inspections, instructed, especially appointed bakery employee, oven manufacturer representative, tested, references other standards

[1910.263\(d\)\(8\)\(i\)](#) - Enclosures of all types of flour sifters shall be so constructed that they are dust-tight but readily accessible for *interior inspection*.

[1910.263\(i\)\(12\)\(i\)](#) - All chain tackle shall be *marked prominently, permanently, and legibly with maximum load capacity*.

[1910.263\(i\)\(12\)\(ii\)](#) - All chain tackle shall be *marked permanently and legibly with minimum support specification*.

[1910.263\(i\)\(13\)\(i\)](#) - All hoists shall be *marked prominently, permanently, and legibly with maximum load capacity*.

[1910.263\(i\)\(13\)\(ii\)](#) - All hoists shall be *marked permanently and legibly with minimum support specifications*.

[1910.263\(i\)\(24\)\(ii\)](#) - Kettles with steam jackets shall be provided with safety valves in accordance with the ASME Pressure Vessel Code, [section VIII](#), *Unfired Pressure Vessels*, 1968, which is incorporated by reference as specified in 1910.6.

[1910.263\(k\)\(2\)\(i\)](#) - All drive belts used in connection with sugar and spice pulverizers shall be grounded by means of metal combs or other effective means of removing static electricity. All pulverizing of sugar or spice grinding shall be done in accordance with [NFPA 62 - 1967](#) (*Standard for Dust Hazards of Sugar and Cocoa*) and [NFPA 656 - 1959](#) (*Standard*

for Dust Hazards in Spice Grinding Plants), which are incorporated by reference as specified in 1910.6.

1910.263(l)(9)(ii) - All safety devices on ovens shall be *inspected at intervals* of not less than *twice a month* by an *especially appointed, properly instructed* bakery employee, and not less than *once a year* by *representatives of the oven manufacturers*.

1910.263(l)(9)(v)(b) - The safety shutoff valve shall be positively tight and shall be *tested at least twice monthly*.

1910.263(l)(9)(viii)(c) - Specifically exempted from the provisions of paragraph (l)(8)(viii) of this section are heating systems on ovens in which the fuel is admitted only to enclosed spaces which shall have been *tested* to prove that their construction will resist repeated explosions without deformation are exempt from the requirements of paragraph (l)(8)(viii)(a) and (b) of this section.

1910.263(l)(15)(iii) - Duct systems (in ovens) operating under pressure shall be *tested* for tightness in the initial starting of the oven and also *at intervals not farther apart than 6 months*.

## **1910.264 - Laundry Machinery and Operations**

**Scope:** This standard applies to moving parts of equipment used in laundries and to conditions peculiar to this industry, with special reference to the point of operation of laundry machines. This section does not apply to dry-cleaning operations.

**Special Requirements:** Instructions, warnings/cautioned, printed rules, safe practices

1910.264(d)(1)(iii) - *Markers. Markers* and others handling soiled clothes shall be *warned* against touching the eyes, mouth, or any part of the body on which the skin has been broken by a scratch or abrasion; and they shall be *cautioned* not to touch or eat food until their hands have been thoroughly washed.

1910.264(d)(1)(v) - *Instruction of employees.* Employees shall be properly *instructed* as to the hazards of their work and be *instructed in safe practices*, by bulletins, *printed rules*, and *verbal instructions*.

## **1910.265 – Sawmills**

**Scope:** This standard provides safety requirements for sawmill operations including, but not limited to, log and lumber handling, sawing, trimming, and planing; waste disposal; operation of dry kilns; finishing; shipping; storage; yard and yard equipment; and for power



tools and affiliated equipment used in connection with such operations, but excluding the manufacture of plywood, cooperage, and veneer.

**Special Requirements:** Safety factor, design, engineering practices, markings, warning signs, judged (illumination), identified (exits), references other standards

[1910.265\(c\)\(1\)](#) - *Safety factor*. All buildings, docks, tramways, walkways, log dumps, and other structures shall be *designed*, constructed and maintained so as to support the imposed load in accordance with a *safety factor*.

[1910.265\(c\)\(2\)](#) - Work areas. Work areas under mills shall be as evenly surfaced as local conditions permit. They shall be free from unnecessary obstructions and provided with lighting facilities in accordance with *American National Standard for Industrial Lighting A11.1—1965*, which is incorporated by reference as specified in 1910.6.

[1910.265\(c\)\(3\)](#) - Floors. Flooring in buildings and on ramps and walkways shall be constructed and installed in accordance with established principles of mechanics and *sound engineering practices*. They shall be of adequate strength to support the estimated or actual dead and live loads acting on them with the resultant stress not exceeding the allowable stress for the material being used.

[1910.265\(c\)\(3\)\(ii\)](#) - Areas beneath floor openings. Areas under floor openings shall, where practical, be fenced off. When this is not practical, they shall be plainly *marked* and telltales shall be installed to hang over these areas.

[1910.265\(c\)\(4\)\(v\)](#) - Elevated platforms. Where elevated platforms are used routinely on a daily basis, they shall be equipped with stairways ([1910.25](#)) or fixed ladders ([1910.23](#)) that comply with [subpart D - walking - working surfaces](#) of this part (1910).

[1910.265\(c\)\(5\)\(i\)](#) - Construction. Stairways ([1910.25](#)) shall be constructed in accordance with [subpart D - walking - working surfaces](#) of this part (1910).

[1910.265\(c\)\(6\)\(ii\)](#) - *Identification*. Exits shall be located and *identified* in a manner that affords ready exit from all work areas.

[1910.265\(c\)\(6\)\(v\)](#) - *Barriers and warning signs*. Where a doorway opens upon a railroad track or upon a tramway or dock over which vehicles travel, a barrier or other *warning device* shall be placed to prevent workmen from stepping into moving traffic.

[1910.265\(c\)\(9\)\(ii\)](#) - Effectiveness. Factors upon which the adequacy and effectiveness of illumination will be *judged*, include the following: [Reference [paragraph \(c\)\(9\)\(ii\)\(a\) - \(c\)](#)].

[1910.265\(c\)\(11\)](#) - *Hazard marking*. Physical *hazard marking* shall be as specified in [1910.144 - safety color code for marking physical hazards of this part](#).

**Safety factor.** The term *safety factor* means a calculated reduction factor which may be applied to laboratory test values to obtain safe working stresses for wooden beams and other mechanical members; ratio of breaking load to safe load.

## **1910.266 - Logging Operations**

**Scope:** This standard establishes safety practices, means, methods and operations for all types of logging, regardless of the end use of the wood. These types of logging include, but are not limited to, pulpwood and timber harvesting and the logging of sawlogs, veneer bolts, poles, pilings and other forest products. This standard does not cover the construction or use of cable yarding systems.

**Logging operations.** Operations associated with felling and moving trees and logs from the stump to the point of delivery, such as, but not limited to, marking danger trees and trees/logs to be cut to length, felling, limbing, bucking, debarking, chipping, yarding, loading, unloading, storing, and transporting machines, equipment and personnel to, from and between logging sites.

**Special Requirements:** Inspections, demonstrates, employee accounting, visual/audible contact, voice communications, hand signals, first aid kits contents reviewed/approved, healthcare provider, inspections, manufacturer's specifications, manufacturer's instructions, power company (notify, advises), operating procedures, designated person, operating and maintenance instructions, supervisor approval, acknowledgement, PPE, tested, rated capacity, training, verification, checks, signatures, certification record (written), lockout/tagout, safety and health meetings, operator's license, references other standards

**1910.266(d)(1)(i)** - The employer shall assure that *personal protective equipment*, including any *personal protective equipment* provided by an employee, is maintained in a serviceable condition.

**1910.266(d)(1)(ii)** - The employer shall assure that *personal protective equipment*, including any *personal protective equipment* provided by an employee, is *inspected before initial use during each workshift*. Defects or damage shall be repaired or the unserviceable *personal protective equipment* shall be replaced before work is commenced.

**1910.266(d)(1)(iv)** - The employer shall provide, at no cost to the employee, and assure that each employee who operates a chain saw wears *leg protection* constructed with cut-resistant material, such as ballistic nylon. The leg protection shall cover the full length of the thigh to the top of the boot on each leg to protect against contact with a moving chain saw. *Exception:* This requirement does not apply when an employee is working as a climber

if the *employer demonstrates* that a greater hazard is posed by wearing *leg protection* in the particular situation, or when an employee is working from a vehicular mounted elevating and rotating work platform meeting the requirements of [29 CFR 1910.67](#) - *vehicle-mounted elevating and rotating work platforms*.

[1910.266\(d\)\(1\)\(v\)](#) - The employer shall assure that each employee wears *foot protection*, such as heavy-duty logging boots that are waterproof or water repellant, cover and provide support to the ankle. The employer shall assure that each employee who operates a chain saw wears *foot protection* that is constructed with cut-resistant material which will protect the employee against contact with a running chain saw. Sharp, calk-soled boots or other slip-resistant type boots may be worn where the *employer demonstrates* that they are necessary for the employee's job, the terrain, the timber type, and the weather conditions, provided that foot protection otherwise required by this paragraph is met.

[1910.266\(d\)\(1\)\(vi\)](#) - The employer shall provide, at no cost to the employee, and assure that each employee who works in an area where there is potential for head injury from falling or flying objects wears *head protection* meeting the requirements of [subpart I](#) of part 1910 - *personal protective equipment*.

[1910.266\(d\)\(1\)\(vii\)](#) - The employer shall provide, at no cost to the employee, and assure that each employee wears the following:

- [1910.266\(d\)\(1\)\(vii\)\(A\)](#) - *Eye protection* meeting the requirements of [subpart I](#) of part 1910 - *personal protective equipment* where there is potential for eye injury due to falling or flying objects; and
- [1910.266\(d\)\(1\)\(vii\)\(B\)](#) - *Face protection* meeting the requirements of [subpart I](#) of part 1910 - *personal protective equipment* where there is potential for facial injury such as, but not limited to, operating a chipper. Logger-type mesh screens may be worn by employees performing chain-saw operations and yarding.

[1910.266\(d\)\(2\)\(iii\)](#) - The employer also may have the number and *content of first-aid kits* reviewed and approved annually by a health care provider.

[1910.266\(d\)\(3\)\(iv\)](#) - That each machine seat belt meets the requirements of the Society of Automotive Engineers Standard [SAE J386](#), June 1985, "*Operator Restraint Systems for Off-Road Work Machines*", which is incorporated by reference as specified in 1910.6.

[1910.266\(d\)\(4\)](#) - Fire extinguishers. The employer shall provide and maintain portable fire extinguishers on each machine and vehicle in accordance with the requirements of [subpart L](#) - *fire protection*, of part 1910.

[1910.266\(d\)\(6\)\(iii\)](#) - Each employee performing a logging operation at a logging work site shall work in a position or location that is *within visual or audible contact* with another employee.

[1910.266\(d\)\(6\)\(iv\)](#) - The employer shall *account for each employee at the end* of each workshift.

[1910.266\(d\)\(7\)\(i\)](#) - *Hand signals or audible contact*, such as but not limited to, whistles, horns, or radios, shall be utilized whenever noise, distance, restricted visibility, or other factors prevent clear understanding of normal *voice communications* between employees.

[1910.266\(d\)\(7\)\(ii\)](#) - Engine noise, such as from a chain saw, is not an acceptable means of signaling. Other *locally and regionally recognized signals* may be used.

[1910.266\(d\)\(7\)\(iii\)](#) - Only a *designated person* shall give signals, except in an emergency.

[1910.266\(d\)\(8\)\(i\)](#) - Logging operations near overhead electric lines shall be done in accordance with the requirements of [29 CFR 1910.333\(c\)\(3\)](#) - *selection and use of work practices, overhead lines*.

[1910.266\(d\)\(8\)\(ii\)](#) - The employer shall *notify the power company* immediately if a felled tree makes contact with any power line. Each employee shall remain clear of the area until the *power company advises* that there are no electrical hazards.

[1910.266\(d\)\(9\)\(i\)](#) - Flammable and combustible liquids shall be stored, handled, transported, and used in accordance with the requirements of [subpart H](#) - *hazardous materials*, of part 1910.

[1910.266\(d\)\(9\)\(iii\)](#) - Each machine, vehicle, and portable powered tool shall be shut off during fueling. Diesel-powered machines and vehicles may be fueled while they are at idle, provided that continued operation is intended and that the employer follows *safe fueling and operating procedures*.

[1910.266\(d\)\(10\)\(i\)](#) - Explosives and blasting agents shall be stored, handled, transported, and used in accordance with the requirements of [subpart H](#) - *hazardous materials*, of part 1910.

[1910.266\(d\)\(10\)\(ii\)](#) - Only a *designated person* shall handle or use explosives and blasting agents.

[1910.266\(e\)\(1\)\(ii\)](#) - The employer shall assure that each tool, including any tool provided by an employee, is *inspected before initial use during each workshift*. At a minimum, the *inspection* shall include the following: [Reference [paragraph \(e\)\(1\)\(ii\)\(A\) - \(H\)](#)].

1910.266(e)(1)(v) - The cutting edge of each tool shall be sharpened in accordance with *manufacturer's specifications* whenever it becomes dull *during the workshift*.

1910.266(e)(2)(i) - Each chain saw placed into initial service after the effective date of this section shall be equipped with a chain brake and shall otherwise meet the requirements of the ANSI B175.1-1991 "*Safety Requirements for Gasoline-Powered Chain Saws*", which is incorporated by reference as specified in 1910.6. Each chain saw placed into service before the effective date of this section shall be equipped with a protective device that minimizes chain-saw kickback. No chain-saw kickback device shall be removed or otherwise disabled.

1910.266(e)(2)(iii) - The chain saw shall be operated and adjusted in accordance with the *manufacturer's instructions*.

1910.266(f)(1)(ii) - The employer shall assure that each machine, including any machine provided by an employee, is *inspected before initial use during each workshift*. Defects or damage shall be repaired or the unserviceable machine shall be replaced before work is commenced.

1910.266(f)(1)(iii) - The employer shall assure that *operating and maintenance instructions are available* on the machine or in the area where the machine is being operated. Each machine operator and maintenance employee shall comply with the *operating and maintenance instructions*.

1910.266(f)(2)(i) - The machine shall be started and operated only by a *designated person*.

1910.266(f)(2)(iii) - The *rated capacity* of any machine shall not be exceeded.

1910.266(f)(2)(iv) - To maintain stability, the machine must be operated within the limitations imposed by the manufacturer as described in the *operating and maintenance instructions* for that machine.

1910.266(f)(2)(vi) - The machine shall be operated only from the operator's station or as otherwise *recommended by the manufacturer*.

1910.266(f)(2)(xi) - If a hydraulic or pneumatic storage device can move the moving elements such as, but not limited to, blades, buckets, saws and shears, after the machine is shut down, the pressure or stored energy from the element shall be discharged as *specified by the manufacturer*.

1910.266(f)(2)(xii) - The *rated capacity* of any vehicle transporting a machine shall not be exceeded.

1910.266(f)(3)(ii)(A) - ROPS shall be *tested*, installed, and maintained in serviceable condition.

[1910.266\(f\)\(3\)\(ii\)\(B\)](#) - Each machine manufactured after August 1, 1996, shall have *ROPS* tested, installed, and maintained in accordance with the *Society of Automotive Engineers SAE J1040*, April 1988, "*Performance Criteria for Rollover Protective Structures (ROPS) for Construction, Earthmoving, Forestry, and Mining Machines*", which is incorporated by reference as specified in 1910.6.

[1910.266\(f\)\(3\)\(iii\)](#) - FOPS shall be installed, tested and maintained in accordance with the *Society of Automotive Engineers SAE J231*, January 1981, "*Minimum Performance Criteria for Falling Object Protective Structures (FOPS)*", which is incorporated by reference as specified in 1910.6.

[1910.266\(f\)\(3\)\(iv\)](#) - ROPS and FOPS shall meet the requirements of the *Society of Automotive Engineers SAE J397*, April 1988, "*Deflection Limiting Volume-ROPS/FOPS Laboratory Evaluation*", which is incorporated by reference as specified in 1910.6.

[1910.266\(f\)\(3\)\(vii\)](#) - Each machine manufactured after August 1, 1996, shall have a cab that is fully enclosed with mesh material with openings no greater than 2 inches (5.08 cm) at its least dimension. The cab may be enclosed with other material(s) where the *employer demonstrates* such material(s) provides equivalent protection and visibility. Exception: Equivalent visibility is not required for the lower portion of the cab where there are control panels or similar obstructions in the cab, or where visibility is not necessary for safe operation of the machine.

[1910.266\(f\)\(3\)\(x\)](#) - When transparent material is used to enclose the upper portion of the cab, it shall be made of safety glass or other material that the *employer demonstrates* provides equivalent protection and visibility.

[1910.266\(f\)\(4\)](#) - Overhead guards. Each forklift shall be equipped with an overhead guard meeting the requirements of the *American Society of Mechanical Engineers, ASME B56.6-1992 (with addenda)*, "*Safety Standard for Rough Terrain Forklift Trucks*", which is incorporated by reference as specified in 1910.6.

[1910.266\(f\)\(5\)\(i\)](#) - Machine access systems, meeting the specifications of the *Society of Automotive Engineers, SAE J185*, June 1988, "*Recommended Practice for Access Systems for Off-Road Machines*", which is incorporated by reference as specified in 1910.6, shall be provided for each machine where the operator or any other employee must climb onto the machine to enter the cab or to perform maintenance.

[1910.266\(f\)\(8\)\(i\)](#) - Each machine shall be equipped with guarding to protect employees from exposed moving elements, such as but not limited to, shafts, pulleys, belts on conveyors, and gears, in accordance with the requirements of [subpart O - machinery and machine guarding](#), of part 1910.



1910.266(f)(8)(ii) - Each machine used for debarking, limbing and chipping shall be equipped with guarding to protect employees from flying wood chunks, logs, chips, bark, limbs and other material in accordance with the requirements of subpart O - machinery and machine guarding, of part 1910.

1910.266(g)(3) - The employer shall assure that *operating and maintenance instructions* are available in each vehicle. Each vehicle operator and maintenance employee shall comply with the *operating and maintenance instructions*.

1910.266(g)(4) - The employer shall assure that each vehicle operator has a *valid operator's license* for the class of vehicle being operated.

1910.266(h)(1)(ii) - The immediate supervisor shall be *consulted* when unfamiliar or unusually hazardous conditions necessitate the *supervisor's approval* before cutting is commenced.

1910.266(h)(1)(iv) - No employee shall approach a feller closer than two tree lengths of trees being felled until the feller has acknowledged that it is safe to do so, unless the *employer demonstrates* that a team of employees is necessary to manually fell a particular tree.

1910.266(h)(1)(v) - No employee shall approach a mechanical felling operation closer than two tree lengths of the trees being felled until the *machine operator has acknowledged* that it is safe to do so.

1910.266(h)(1)(vii) - Each danger tree shall be carefully *checked* for signs of loose bark, broken branches and limbs or other damage before they are felled or removed. Accessible loose bark and other damage that may create a hazard for an employee shall be removed or held in place before felling or removing the tree.

1910.266(h)(2)(i) - Before felling is started, the feller shall plan and clear a retreat path. The retreat path shall extend diagonally away from the expected felling line unless the *employer demonstrates* that such a retreat path poses a greater hazard than an alternate path. Once the backcut has been made the feller shall immediately move a safe distance away from the tree on the retreat path.

1910.266(h)(2)(iii) - Each tree shall be *checked* for accumulations of snow and ice. Accumulations of snow and ice that may create a hazard for an employee shall be removed before felling is commenced in the area or the area shall be avoided.

1910.266(h)(2)(v) - An undercut shall be made in each tree being felled unless the *employer demonstrates* that felling the particular tree without an undercut will not create a hazard for an employee. The undercut shall be of a size so the tree will not split and will fall in the intended direction.

[1910.266\(h\)\(4\)\(iii\)](#) - The chipper shall be shut down and *locked out* in accordance with the requirements of [29 CFR 1910.147](#) - *the control of hazardous energy*, when an employee performs any servicing or maintenance.

[1910.266\(h\)\(5\)\(ii\)](#) - Each choker shall be hooked and unhooked from the uphill side or end of the log, unless the *employer demonstrates* that it is not feasible in the particular situation to hook or unhook the choker from the uphill side. Where the choker is hooked or unhooked from the downhill side or end of the log, the log shall be securely chocked to prevent rolling, sliding or swinging.

[1910.266\(h\)\(5\)\(v\)](#) - No yarding line shall be moved unless the yarding machine operator has *clearly received and understood the signal* to do so. When in doubt, the yarding machine operator shall repeat the signal and wait for a *confirming signal* before moving any line.

[1910.266\(h\)\(5\)\(vi\)](#) - No load shall exceed the *rated capacity* of the pallet, trailer, or other carrier.

[1910.266\(h\)\(6\)\(ii\)](#) - Only the loading or unloading machine operator and other personnel the *employer demonstrates* are essential shall be in the loading or unloading work area during this operation.

[1910.266\(h\)\(6\)\(iii\)](#) - No transport vehicle operator shall remain in the cab during loading and unloading if the logs are carried or moved over the truck cab, unless the *employer demonstrates* that it is necessary for the operator to do so. Where the transport vehicle operator remains in the cab, the employer shall provide operator protection, such as but not limited to, reinforcement of the cab.

[1910.266\(h\)\(6\)\(viii\)\(B\)](#) - When the employee making the release is protected by racks, stanchions or other protection the *employer demonstrates* is capable of withstanding the force of the logs.

[1910.266\(h\)\(7\)](#) - Transport. The transport vehicle operator shall assure that each tie down is tight before transporting the load. While enroute, the operator shall *check* and tighten the tie downs whenever there is reason to believe that the tie downs have loosened or the load has shifted.

[1910.266\(i\)\(1\)](#) - The employer shall provide *training* for each employee, including supervisors, at no cost to the employee.

[1910.266\(i\)\(2\)](#) - *Frequency. Training* shall be provided as follows: [Reference [paragraph \(i\)\(2\)\(i\) - \(iv\)](#)].

1910.266(i)(3) - *Content*. At a minimum, *training* shall consist of the following elements:  
[Reference paragraph (i)(3)(i) - (vi)].

1910.266(i)(4) - *Training* of an employee due to unsafe job performance, or assignment of new work tasks, tools, equipment, machines, or vehicles; may be limited to those elements in paragraph (i)(3) of this section which are relevant to the circumstances giving rise to the need for *training*.

1910.266(i)(5) - *Portability of training*. [Reference paragraph (i)(5)(i) - (iv)].

1910.266(i)(6) - Each new employee and each employee who is required to be *trained* as specified in paragraph (i)(2) of this section, shall work under the close supervision of a *designated person until the employee demonstrates* to the employer the ability to safely perform their new duties independently.

1910.266(i)(7)(i) - The employer shall assure that each employee, including supervisors, receives or has received *first-aid and CPR training* meeting at least the requirements specified in appendix B - First-aid and CPR Training (Mandatory).

1910.266(i)(7)(ii) - The employer shall assure that each employee's *first-aid and CPR training and/or certificate of training* remain current.

1910.266(i)(8) - All *training* shall be conducted by a *designated person*.

1910.266(i)(9) - The employer shall assure that all *training* required by this section is presented in a manner that the employee is able to understand. The employer shall assure that all *training materials* used are appropriate in content and vocabulary to the educational level, literacy, and language skills of the employees being *trained*.

1910.266(i)(10)(i) - The employer shall *verify compliance* with paragraph (i) of this section by preparing a *written certification record*. The *written certification record* shall contain the name or other identity of the employee trained, the date(s) of the training, and the *signature of the person* who conducted the *training* or the *signature* of the employer. If the employer relies on *training* conducted prior to the employee's hiring or completed prior to the effective date of this section, the *certification record* shall indicate the date the employer determined the *prior training* was adequate.

1910.266(i)(10)(ii) - The most recent *training certification* shall be *maintained*.

1910.266(i)(11) - *Safety and health meetings*. The employer shall hold *safety and health meetings* as necessary and *at least each month* for each employee. *Safety and health meetings* may be conducted individually, in *crew meetings*, in larger groups, or as part of other *staff meetings*.

## 1910.268 – Telecommunications

**Scope:** This [standard](#) sets forth safety and health standards that apply to the work conditions, practices, means, methods, operations, installations and processes performed at telecommunications centers and at telecommunications field installations, which are located outdoors or in building spaces used for such field installations.

**Telecommunications center.** An installation of communication equipment under the exclusive control of an organization providing telecommunications service, that is located outdoors or in a vault, chamber, or a building space used primarily for such installations.

*Center* work includes the installation, operation, maintenance, rearrangement, and removal of communications equipment and other associated equipment in telecommunications switching centers.

*Field* work includes the installation, operation, maintenance, rearrangement, and removal of conductors and other equipment used for signal or communication service, and of their supporting or containing structures, overhead or underground, on public or private rights of way, including buildings or other structures.

**Special Requirements:** Markings, retest schedule, instructions, inspections, competent person, training, signature of trainer, safe practices, procedures, certification record, retesting/tests, emergency procedures, written certification from manufacturer, (posted) instructions, posted load capacity, checks, briefings, tagging/tags, rigger in charge, examined, danger signs, flags, voltage tests, visually determine, signature on tag, requests/notification, qualified person, first aid training, work procedure, radiation protection guide, posted radiation symbol, measures, authorized representatives, owners, PPE, supervisor/foreman in charge, references other standards

[1910.268\(b\)\(1\)\(iii\)](#) - Working spaces. Maintenance aisles, or wiring aisles, between equipment frame lineups are working spaces and are not an exit route for purposes of [29 CFR 1910.34](#) - *exit routes and emergency planning, coverage and definitions*.

[1910.268\(b\)\(1\)\(v\)](#) - Equipment, machinery and machine guarding. When power plant machinery in telecommunications centers is operated with commutators and couplings uncovered, the adjacent housing shall be *clearly marked* to alert personnel to the rotating machinery.

[1910.268\(b\)\(2\)\(i\)](#) - Eye protection devices which provide side as well as frontal eye protection for employees shall be provided when measuring storage battery specific gravity or handling electrolyte, and the employer shall ensure that such devices are used by the employees. The employer shall also ensure that acid resistant gloves and aprons shall be

worn for protection against spattering. Facilities for quick drenching or flushing of the eyes and body shall be provided unless the storage batteries are of the enclosed type and equipped with explosion proof vents, in which case sealed water rinse or neutralizing packs may be substituted for the quick drenching or flushing facilities. Employees assigned to work with storage batteries *shall be instructed in emergency procedures* such as dealing with accidental acid spills.

[1910.268\(b\)\(3\)](#) - Employers must provide employees with readily accessible, adequate, and appropriate first aid supplies. A non-mandatory example of appropriate supplies is listed in [appendix A - first aid kits](#) to [29 CFR 1910.151 - medical services and first aid](#).

[1910.268\(b\)\(4\)](#) - Hazardous materials. Highway mobile vehicles and trailers stored in garages in accordance with [1910.110 - storage and handling of liquefied petroleum gases](#), may be equipped to carry more than one LP-gas container, but the total capacity of LP-gas containers per work vehicle stored in garages shall not exceed 100 pounds of LP-gas. All container valves shall be closed when not in use.

[1910.268\(b\)\(6\)](#) - Support structures. No employee, or any material or equipment, may be supported or permitted to be supported on any portion of a pole structure, platform, ladder, walkway or other elevated structure or aerial device unless the employer ensures that the support structure is *first inspected by a competent person* and it is determined to be adequately strong, in good working condition and properly secured in place.

[1910.268\(c\)](#) - *Training*. Employers shall *provide training* in the various precautions and *safe practices* described in this section and shall insure that employees do not engage in the activities to which this section applies until such employees have received *proper training* in the various *precautions and safe practices* required by this section. However, where the *employer can demonstrate* that an employee is already *trained in the precautions and safe practices* required by this section prior to his employment, *training* need not be provided to that employee in accordance with this section. Where *training* is required, it shall consist of *on-the-job training or classroom-type training* or a combination of both. The employer shall *certify* that employees have been *trained* by preparing a *certification record* which includes the identity of the *person trained*, the *signature of the employer* or the person who conducted the *training*, and the date the *training* was completed.

The *certification record* shall be prepared at the completion of *training and shall be maintained on file* for the duration of the employee's employment. The *certification record* shall be made available upon request to the Assistant Secretary for Occupational Safety and Health. Such *training* shall, where appropriate, include the following subjects: [Reference [paragraph \(c\)\(1\) - \(3\)](#)].

[1910.268\(d\)\(1\)](#) - Before work is begun in the vicinity of vehicular or pedestrian traffic which may endanger employees, warning *signs and/or flags* or other traffic control devices shall be placed conspicuously to alert and channel approaching traffic. Where further protection is needed, barriers shall be utilized. At night, *warning lights* shall be prominently displayed, and excavated areas shall be enclosed with protective barricades.

[1910.268\(d\)\(2\)](#) - If work exposes energized or moving parts that are normally protected, *danger signs* shall be displayed and barricades erected, as necessary, to warn other personnel in the area.

[1910.268\(d\)\(3\)](#) - The employer shall insure that an employee finding any crossed or fallen wires which create or may create a hazardous situation at the work area: (i) *Remains on guard* or adopts other adequate means to warn other employees of the danger and (ii) has the *proper authority notified* at the earliest practical moment.

[1910.268\(e\)](#) - Tools and *personal protective equipment* - Generally. *Personal protective equipment, protective devices* and special tools needed for the work of employees shall be provided and the employer shall ensure that they are used by employees. *Before each day's use*, the employer shall ensure that these personal protective devices, tools, and equipment are carefully *inspected by a competent person* to ascertain that they are in good condition.

[1910.268\(f\)\(1\)](#) - Rubber insulating equipment designed for the voltage levels to be encountered shall be provided and the employer shall ensure that they are used by employees as required by this section. The requirements of [1910.137](#) - *electrical protective equipment*, shall be followed except for Table I-6.

[1910.268\(f\)\(2\)](#) - The employer is responsible for the *periodic retesting* of all insulating gloves, blankets, and other rubber insulating equipment. This *retesting* shall be electrical, visual and mechanical. The following maximum retesting intervals shall apply:  
[Reference [paragraph \(f\)\(2\)](#)].

[1910.268\(f\)\(3\)](#) - Gloves and blankets shall be *marked* to indicate compliance with the *retest schedule*, and shall be *marked* with the date the next *test is due*. Gloves found to be defective in the field or by the tests set forth in [paragraph \(f\)\(2\)](#) of this section shall be destroyed by cutting them open from the finger to the gauntlet.

[1910.268\(g\)\(1\)](#) - General. A *positioning system or a personal fall arrest system* shall be provided and the employer shall ensure their use when work is performed at positions more than 4 feet (1.2 m) above the ground, on poles, and on towers, except as provided in [paragraphs \(n\)\(7\)](#) and [\(8\)](#) of this section. These systems shall meet the applicable requirements in [subpart I](#) - *personal protective equipment*, of this part. The employer shall



ensure that all *climbing equipment* is *inspected before each day's use* to determine that it is in safe working condition.

[1910.268\(g\)\(2\)\(ii\)](#) - The employer shall ensure that pole climbers are *inspected by a competent person* for the following conditions: Fractured or cracked gaffs or leg irons, loose or dull gaffs, broken straps or buckles. If any of these conditions exist, the defect shall be corrected before the climbers are used.

[1910.268\(g\)\(2\)\(iii\)](#) - Pole climbers shall be *inspected as required in this paragraph (g)(3) before each day's use* and a gaff cut-out test *performed at least weekly* when in use.

[1910.268\(h\)](#) - Ladders. Ladders, step bolts, and manhole steps shall meet the applicable requirements in [subpart D - walking - working surfaces](#), of this part (1910).

[1910.268\(i\)\(1\)](#) - *Head protection*. Head protection meeting the requirements of [ANSI Z89.2-1971](#), "Safety Requirements for Industrial Protective Helmets for Electrical Workers, Class B" shall be provided whenever there is exposure to possible high voltage electrical contact, and the employer shall ensure that the *head protection* is used by employees. [ANSI Z89.2-1971](#) is incorporated by reference as specified in 1910.6.

[1910.268\(i\)\(2\)](#) - *Eye protection*. Eye protection meeting the requirements of [1910.133\(a\)\(2\) thru \(a\)\(6\)](#) - eye and face protection, shall be provided and the employer shall ensure its use by employees where foreign objects may enter the eyes due to work operations such as but not limited to: [Reference [paragraph \(i\)\(2\)\(i\) - \(xi\)](#)].

[1910.268\(i\)\(7\)](#) - Portable lights, tools, and appliances. Portable lights, tools, and appliances having noncurrent-carrying external metal housing may be used with power equipment described in [paragraph \(i\)\(5\)](#) of this section without an equipment grounding conductor. When operated from commercial power such metal parts of these devices shall be grounded, unless these tools or appliances are protected by a system of double insulation, or its equivalent. Where such a system is employed, the equipment shall be *distinctively marked* to indicate double insulation.

[1910.268\(i\)\(9\)](#) - Lead work. The wiping of lead joints using melted solder, gas fueled torches, soldering irons or other appropriate heating devices, and the soldering of wires or other electrical connections do not constitute the welding, cutting and brazing described in [subpart Q - welding, cutting and brazing, of this part \(1910\)](#). When operated from commercial power the metal housing of electric solder pots shall be grounded. Electric solder pots may be used with the power equipment described in [paragraph \(i\)\(5\)](#) of this section without a grounding conductor. The employer shall ensure that wiping gloves or cloths and eye protection are used in lead wiping operations. A drip pan to catch hot lead drippings shall also be provided and used.

[1910.268\(j\)\(1\)\(i\)](#) - Vehicle-mounted material handling devices and other mechanical equipment. The employer shall ensure that *visual inspections* are made of the equipment by a *competent person* each day the equipment is to be used to ascertain that it is in good condition.

[1910.268\(j\)\(1\)\(ii\)](#) - Vehicle-mounted material handling devices and other mechanical equipment. The employer shall ensure that *tests* shall be made at the *beginning of each shift by a competent person* to insure the vehicle brakes and operating systems are in proper working condition.

[1910.268\(j\)\(2\)\(i\)](#) - All rubber-tired, self-propelled scrapers, rubber-tired front end loaders, rubber-tired dozers, agricultural and industrial tractors, crawler tractors, crawler-type loaders, and motor graders, with or without attachments, that are used in telecommunications work shall have rollover protective structures that meet the requirements of [subpart W](#) - *rollover protective structures; overhead protection*, of [part 1926](#) - *Construction standards*, of this Title.

[1910.268\(j\)\(4\)\(iv\)](#) - Derricks and the operation of derricks shall comply with the following requirements:

- [1910.268\(j\)\(4\)\(iv\)\(A\)](#) - *Manufacturer's specifications, load ratings and instructions* for derrick operation shall be strictly observed.
- [1910.268\(j\)\(4\)\(iv\)\(B\)](#) - *Rated load capacities and instructions* related to derrick operation shall be conspicuously *posted* on a permanent weather-resistant plate or decal in a location on the derrick that is plainly visible to the derrick operator.
- [1910.268\(j\)\(4\)\(iv\)\(D\)](#) - Only persons *trained* in the operation of the derrick shall be permitted to operate the derrick.
- [1910.268\(j\)\(4\)\(iv\)\(E\)](#) - *Hand signals* to derrick operators shall be those prescribed by ANSI [B30.6-1969](#), "*Safety Code for Derricks*", which is incorporated by reference as specified in 1910.6.
- [1910.268\(j\)\(4\)\(iv\)\(F\)](#) - The employer shall ensure that the derrick and its associated equipment are *inspected by a competent person at intervals set by the manufacturer* but in no case less than once per year. *Records* shall be maintained including the dates of inspections, and necessary repairs made, if corrective action was required.
- [1910.268\(j\)\(4\)\(iv\)\(G\)](#) - Modifications or additions to the derrick and its associated equipment that alter its capacity or affect its safe operation shall be made only with *written certification from the manufacturer*, or other equivalent entity, such as

a *nationally recognized testing laboratory*, that the modification results in the equipment being safe for its intended use. Such changes shall require the changing and *posting* of revised capacity and *instruction decals or plates*. These *new ratings* or limitations shall be as provided by the manufacturer or other equivalent entity.

- [1910.268\(j\)\(4\)\(iv\)\(H\)](#) - Wire rope used with derricks shall be of improved plow steel or equivalent. Wire rope *safety factors* shall be in accordance with *American National Standards Institute B30.6-1969*.

[1910.268\(k\)\(1\)](#) - Poles. When working with poles in piles or stacks, work shall be performed from the ends of the poles as much as possible, and precautions shall be taken for the safety of employees at the other end of the pole. During pole hauling operations, all loads shall be secured to prevent displacement. *Lights, reflectors and/or flags shall be displayed* on the end and sides of the load as necessary. The requirements for installation, removal, or other handling of poles in pole lines are prescribed in paragraph (n) of this section which pertains to overhead lines. In the case of hoisting machinery equipped with a positive stop loadholding device, it shall be permissible for the operator to leave his position at the controls (while a load is suspended) for the sole purpose of assisting in positioning the load prior to landing it. Prior to unloading steel, poles, crossarms, and similar material, the load shall be *thoroughly examined* to ascertain that the load has not shifted, that binders or stakes have not broken, and that the load is not otherwise hazardous to employees.

[1910.268\(k\)\(2\)](#) - Cable reels. Cable reels in storage shall be *checked* or otherwise restrained when there is a possibility that they might accidentally roll from position.

[1910.268\(l\)\(1\)](#) - Employees involved in using high voltages to locate trouble or test cables shall be *instructed in the precautions* necessary for their own safety and the safety of other employees.

[1910.268\(l\)\(2\)](#) - Before the voltage is applied, cable conductors shall be isolated to the extent practicable. Employees shall be *warned*, by such techniques as *briefing and tagging* at all affected locations, to stay clear while the voltage is applied.

[1910.268\(m\)\(1\)](#) - Power conductors. Electric power conductors and equipment shall be considered as energized unless the employee can *visually determine* that they are bonded to one of the grounds listed in [paragraph \(m\)\(4\)](#) of this section.

[1910.268\(m\)\(3\)\(i\)](#) - Metal power conduit on joint use poles, exposed vertical power ground wires, and street light fixtures which are below communications attachments or less than 20 inches above these attachments, shall be considered energized and shall be *tested for*

*voltage* unless the employee can *visually determine* that they are bonded to the communications suspension strand or cable sheath.

1910.268(m)(3)(ii) - If no hazardous voltage is shown by the *voltage test*, a temporary bond shall be placed between such street light fixture, exposed vertical power grounding conductor, or metallic power conduit and the communications cable strand. Temporary bonds used for this purpose shall have sufficient conductivity to carry at least 500 amperes for a period of one second without fusing.

1910.268(m)(4) - Suitable protective grounding. Acceptable grounds for protective grounding are as follows:

- 1910.268(m)(4)(i) - A vertical ground wire which has been *tested*, found safe, and is connected to a power system multigrounded neutral or the grounded neutral of a power secondary system where there are at least three services connected.

1910.268(m)(7)(i) - Antenna work-radio transmitting stations 3-30 MHZ. Prior to grounding a radio transmitting station antenna, the employer shall insure that the *rigger in charge*:

- 1910.268(m)(7)(i)(A) - Prepares a *danger tag signed with his signature*,
- 1910.268(m)(7)(i)(B) - *Requests the transmitting technician* to shutdown the transmitter and to ground the antenna with its grounding switch,
- 1910.268(m)(7)(i)(C) - *Is notified by the transmitting technician* that the transmitter has been shutdown, and
- 1910.268(m)(7)(i)(D) - *Tags* the antenna ground switch personally in the presence of the transmitting technician after the antenna has been grounded by the *transmitting technician*.

1910.268(m)(7)(ii) - Power shall not be applied to the antenna, nor shall the grounding switch be opened under any circumstances while the *tag is affixed*.

1910.268(m)(7)(iii)(A) - Where no grounding switches are provided, grounding sticks shall be used, one on each side of line, and *tags* shall be placed on the grounding sticks, antenna switch, or plate power switch in a conspicuous place.

1910.268(m)(7)(iv) - All radio frequency line wires shall be *tested* for pickup with an insulated probe before they are handled either with bare hands or with metal tools.

1910.268(m)(7)(v) - The employer shall insure that the *transmitting technician warn the riggers* about adjacent lines which are, or may become energized.

[1910.268\(m\)\(7\)\(vi\)](#) - The employer shall insure that when antenna work has been completed, the *rigger in charge* of the job returns to the transmitter, *notifies the transmitting technician in charge* that work has been completed, and personally removes the *tag* from the antenna ground switch.

[1910.268\(n\)\(2\)](#) - Need for *testing* wood poles. Unless temporary guys or braces are attached, the following poles shall be *tested* in accordance with [paragraph \(n\)\(3\)](#) of this section and determined to be safe before employees are permitted to climb them: [Reference [paragraph \(n\)\(2\)\(i\) - \(v\)](#)].

[1910.268\(n\)\(3\)](#) - *Methods for testing wood poles*. One of the following *methods* or an equivalent method shall be used for *testing* wood poles: [Reference [paragraph \(n\)\(3\)\(i\) - \(ii\)](#)].

[1910.268\(n\)\(4\)](#) - Unsafe poles or structures. Poles or structures determined to be *unsafe by test or observation* may not be climbed until made safe by guying, bracing or other adequate means. Poles determined to be unsafe to climb shall, until they are made safe, be *tagged* in a conspicuous place to *alert and warn* all employees of the unsafe condition.

[1910.268\(n\)\(5\)\(i\)](#) - Before attaching a splicing platform to a cable suspension strand, the strand shall be *tested* and determined to have strength sufficient to support the weight of the platform and the employee. Where the strand crosses above power wires or railroad tracks it may not be *tested* but shall be *inspected* in accordance with [paragraph \(n\)\(6\)](#) of this section.

[1910.268\(n\)\(5\)\(ii\)](#) - The following method or an equivalent method shall be used for *testing* the strength of the strand: A rope, at least three-eighths inch in diameter, shall be thrown over the strand. On joint lines, the rope shall be passed over the strand using tree pruner handles or a wire raising tool. If two employees are present, both shall grip the double rope and slowly transfer their entire weight to the rope and attempt to raise themselves off the ground. If only one employee is present, one end of the rope which has been passed over the strand shall be tied to the bumper of the truck, or other equally secure anchorage. The employee then shall grasp the other end of the rope and attempt to raise himself off the ground.

[1910.268\(n\)\(6\)](#) - *Inspection of strand*. Where strand passes over electric power wires or railroad tracks, it shall be *inspected* from an elevated working position at each pole supporting the span in question. The strand may not be used to support any splicing platform, scaffold or cable car, if any of the following conditions exist: [Reference [paragraph \(n\)\(6\)\(i\) - \(iv\)](#)].

[1910.268\(n\)\(11\)\(v\)](#) - The guard or insulating material used to protect the pole shall meet the appropriate *3 minute proof test* voltage requirements contained in the ANSI [J6.4-1971](#).

[1910.268\(o\)](#) - Underground lines. The provisions of this paragraph apply to the guarding of manholes and street openings, and to the ventilation and *testing* for gas in manholes and unvented vaults, where telecommunications field work is performed on or with underground lines.

[1910.268\(o\)\(1\)\(ii\)](#) - While work is being performed in the manhole, a person with *basic first aid training* shall be immediately available to render assistance if there is cause for believing that a safety hazard exists, and if the requirements contained in [paragraphs \(d\)\(1\)](#) and [\(o\)\(1\)\(i\)](#) of this section do not adequately protect the employee(s). Examples of manhole worksite hazards which shall be considered to constitute a safety hazard include, but are not limited to: [Reference [paragraph \(o\)\(1\)\(ii\)\(A\) - \(C\)](#)].

[1910.268\(o\)\(2\)\(i\)](#) - Before an employee enters a manhole, the following steps shall be taken:

- [1910.268\(o\)\(2\)\(i\)\(A\)](#) - The internal atmosphere shall be *tested* for combustible gas and, except when continuous forced ventilation is provided, the atmosphere shall also be *tested* for oxygen deficiency.
- [1910.268\(o\)\(2\)\(i\)\(B\)](#) - When unsafe conditions are detected by *testing* or other means, the work area shall be ventilated and otherwise made safe before entry.

[1910.268\(o\)\(2\)\(ii\)](#) - An adequate continuous supply of air shall be provided while work is performed in manholes under any of the following conditions:

- [1910.268\(o\)\(2\)\(ii\)\(A\)](#) - Where combustible or explosive gas vapors have been *initially detected* and subsequently reduced to a safe level by ventilation,
- [1910.268\(o\)\(2\)\(ii\)\(B\)](#) - Where organic solvents are used in the *work procedure*,
- [1910.268\(o\)\(2\)\(ii\)\(C\)](#) - Where open flame torches are used in the *work procedure*.

[1910.268\(o\)\(3\)](#) - Joint power and telecommunication manholes. While work is being performed in a manhole occupied jointly by an electric utility and a telecommunication utility, an employee with *basic first aid training shall be available* in the immediate vicinity to render emergency assistance as may be required. The employee whose presence is required in the immediate vicinity for the purposes of rendering emergency assistance is not to be precluded from occasionally entering a manhole to provide assistance other than in an emergency. The requirement of this [paragraph \(o\)\(3\)](#) does not preclude a *qualified employee*, working alone, from entering for brief periods of time, a manhole where energized cables or equipment are in service, for the purpose of *inspection*, housekeeping, taking readings, or similar work if such work can be performed safely.



[1910.268\(o\)\(5\)](#) - Flames. When open flames are used in manholes, the following precautions shall be taken to protect against the accumulation of combustible gas:

- [1910.268\(o\)\(5\)\(i\)](#) - A test for combustible gas shall be made immediately before using the open flame device, and at least once per hour while using the device.

[1910.268\(p\)\(2\)](#) - Hazardous area. Accessible areas associated with microwave communication systems where the electromagnetic radiation level exceeds the *radiation protection guide* given in [1910.97](#) - *nonionizing radiation*, shall be *posted* as described in that section. The lower half of the *warning symbol* shall include the following:

- Radiation in this area may exceed hazard limitations and special precautions are required. *Obtain specific instruction* before entering.

[1910.268\(p\)\(3\)](#) - *Protective measures*. When an employee works in an area where the electromagnetic radiation exceeds the *radiation protection guide*, the employer shall institute *measures* that insure that the employee's exposure is not greater than that permitted by the *radiation guide*. Such *measures* shall include, but not be limited to those of an *administrative or engineering* nature or those involving personal protective equipment.

[1910.268\(q\)\(1\)\(ii\)](#) - Employees engaged in line-clearing operations shall be *instructed* that: [Reference [paragraph \(q\)\(1\)\(ii\)\(A\) - \(D\)](#)].

[1910.268\(q\)\(1\)\(iii\)](#) - Before any work is performed in proximity to energized conductors, the *system operator/owner of the energized conductors shall be contacted* to ascertain if he knows of any hazards associated with the conductors which may not be readily apparent. This rule does not apply when operations are performed by or on behalf of, the *system operator/owner*.

[1910.268\(q\)\(2\)\(i\)](#) - Working in proximity to electrical hazards. Employers shall ensure that a *close inspection* is made by the employee and by the *foremen or supervisor in charge* before climbing, entering, or working around any tree, to determine whether an electrical power conductor passes through the tree, or passes within reaching distance of an employee working in the tree. If any of these conditions exist either directly or indirectly, an electrical hazard shall be considered to exist unless the *system operator/owner* has caused the hazard to be removed by deenergizing the lines, or installing protective equipment.

[1910.268\(q\)\(2\)\(ii\)](#) - Only *qualified employees or trainees*, familiar with the *special techniques* and hazards involved in line clearance, shall be permitted to perform the work if it is found that an electrical hazard exists.

[1910.268\(q\)\(2\)\(iii\)](#) - During all tree working operations aloft where an electrical hazard of more than 750V exists, there shall be a *second employee or trainee qualified* in line clearance tree trimming within *normal voice communication*.

[1910.268\(q\)\(2\)\(iv\)](#) - Where tree work is performed by *employees qualified in line-clearance tree trimming and trainees qualified in line-clearance tree trimming*, the clearances from energized conductors given in [Table R-3 - Minimum Working Distances From Energized Conductors for Line-Clearance Tree Trimmers and Line-Clearance Tree-Trimming Trainees](#), shall apply.

[1910.268\(q\)\(3\)\(i\)](#) - Since storm work and emergency conditions create special hazards, only *authorized representatives of the electric utility system operator/owner* and not telecommunication workers may perform tree work in these situations where energized electrical power conductors are involved.

[1910.268\(q\)\(3\)\(ii\)](#) - When an emergency condition develops due to tree operations, work shall be suspended and the system *operator/owner shall be notified* immediately.

## **1910.269 - Electric Power Generation, Transmission, and Distribution**

**Scope:** This [standard](#) covers the operation and maintenance of electric power generation, control, transformation, transmission, and distribution lines and equipment.

[Reference [paragraph \(a\)\(1\)\(i\)\(A\) - \(E\)](#) for application (who it applies to) of the standard and [paragraph \(a\)\(1\)\(ii\)\(A\) - \(B\)](#) for who it does not apply to.]

**Special Requirements:** Qualified employees, training, competent, safety-related work practices, work rules, safety procedures, emergency procedures, inspections, energy control procedures (documented), energy control program, first aid training, supervision, proficiency, inform contract employers, advise, locks and tags (identifiable), instruct, training/retraining, certify, certificate (training), job briefing, information, authorized employee, notification, testing, calibration, monitoring program, monitoring, designated employee, manufacturer specifications, attendants, safe grounding practices, employer demonstrates, PPE, enclosed space procedures, checks, evaluation, maximum load ratings, determination, references other standards

[1910.269\(a\)\(1\)\(i\)\(E\)\(1\)](#) - Entire 1910.269, except [paragraph \(r\)\(1\)](#) of this section, applies to line-clearance tree trimming covered by the introductory text to [paragraph \(a\)\(1\)\(i\)\(E\)](#) of the section when performed by *qualified employees* (those who are knowledgeable in the construction and operation of the electric power generation, transmission, or distribution equipment involved, along with the associated hazards).

[1910.269\(a\)\(1\)\(iii\)](#) - This section applies *in addition to all other applicable standards* contained in this part 1910. Employers covered under this section are not exempt from complying with other *applicable provisions in part 1910* by the operation of [1910.5\(c\)](#). Specific references in this section to other sections of part 1910 are for emphasis only.

[1910.269\(a\)\(2\)\(i\)](#) - All employees performing work covered by this section shall be *trained* as follows: [Reference [paragraph 1910.269\(a\)\(2\)\(i\)\(A\) - \(C\)](#)].

[1910.269\(a\)\(2\)\(ii\)](#) - Each qualified employee shall also be *trained and competent* in: [Reference [paragraph 1910.269\(a\)\(2\)\(ii\)\(A\) - \(E\)](#)].

[1910.269\(a\)\(2\)\(iii\)](#) - Each line-clearance tree trimmer who is *not a qualified employee* shall also be *trained and competent* in: [Reference [paragraph 1910.269\(a\)\(2\)\(iii\)\(A\) - \(C\)](#)].

[1910.269\(a\)\(2\)\(iv\)](#) - The employer shall determine, *through regular supervision and through inspections* conducted on at least an annual basis, that each employee is complying with the *safety-related work practices* required by this section.

[1910.269\(a\)\(2\)\(v\)](#) - An employee shall receive *additional training (or retraining)* under any of the following conditions: [Reference [paragraph 1910.269\(a\)\(2\)\(v\)\(A\) - \(C\)](#)].

[1910.269\(a\)\(2\)\(vi\)](#) - The *training* required by [paragraph \(a\)\(2\)](#) of this section shall be of the *classroom or on-the-job type*.

[1910.269\(a\)\(2\)\(vii\)](#) - The *training* shall establish *employee proficiency in the work practices* required by this section and shall introduce the *procedures* necessary for compliance with this section.

[1910.269\(a\)\(2\)\(viii\)](#) - The employer shall ensure that each employee has *demonstrated proficiency* in the *work practices* involved before that employee is considered as having *completed the training* required by [paragraph \(a\)\(2\)](#) of this section. [Reference [paragraph \(a\)\(2\)\(viii\)](#)].

[1910.269\(a\)\(3\)\(i\)](#) - Before work begins, the host employer shall *inform contract employers* of: [Reference [paragraph \(a\)\(3\)\(i\)\(A\) - \(D\)](#)].

[1910.269\(a\)\(3\)\(ii\)\(A\)](#) - The contract employer shall ensure that each of its employees is *instructed* in the hazardous conditions relevant to the employee's work that the contract employer is aware of as a result of *information communicated* to the contract employer by the host employer under [paragraph \(a\)\(3\)\(i\)](#) of this section.

[1910.269\(a\)\(3\)\(ii\)\(B\)](#) - Before work begins, the contract employer shall *advise the host employer* of any unique hazardous conditions presented by the contract employer's work.

1910.269(a)(3)(ii)(C) - The contract employer shall *advise the host employer* of any unanticipated hazardous conditions found during the contract employer's work that the host employer did not mention under paragraph (a)(3)(i) of this section. The contract employer shall provide this *information* to the host employer *within 2 working days* after discovering the hazardous condition.

1910.269(a)(3)(iii) - The contract employer and the host employer shall coordinate their *work rules and procedures* so that each employee of the contract employer and the host employer is protected as required by this section.

1910.269(b) - Medical services and first aid. The employer shall provide medical services and first aid as required in 1910.151 - *medical services and first aid*. In addition to the requirements of 1910.151, the following requirements also apply:

- 1910.269(b)(1) - *First-aid training*. When employees are performing work on, or associated with, exposed lines or equipment energized at 50 volts or more, persons with *first-aid training* shall be available as follows: [Reference paragraph (b)(1)(i) - (ii)].

1910.269(b)(2) - First-aid supplies. First-aid supplies required by 1910.151(b) - *medical services and first aid*, shall be placed in weatherproof containers if the supplies could be exposed to the weather.

1910.269(b)(3) - First-aid kits. The employer shall maintain each first-aid kit, shall ensure that it is readily available for use, and shall *inspect it frequently* enough to ensure that expended items are replaced. The employer also shall *inspect* each first aid kit at least *once per year*.

1910.269(c)(1) - *Job briefing. Before each job.*

- 1910.269(c)(1)(i) - In assigning an employee or a group of employees to perform a job, the employer shall provide the *employee in charge of the job* with all available *information* that relates to the determination of existing characteristics and conditions required by paragraph (a)(4) of this section.
- 1910.269(c)(1)(ii) - The employer shall ensure that the employee in charge *conducts a job briefing* that meets paragraphs (c)(2), (c)(3), and (c)(4) of this section with the employees involved *before they start each job*.

1910.269(c)(2) - Subjects to be covered. The *briefing* shall cover at least the following subjects: hazards associated with the job, *work procedures involved*, special precautions, energy-source controls, and *personal protective equipment* requirements.

[1910.269\(c\)\(3\)\(i\)](#) - If the work or operations to be performed during the work day or shift are repetitive and similar, *at least one job briefing* shall be conducted *before the start of the first job of each day or shift*.

[1910.269\(c\)\(3\)\(ii\)](#) - Additional *job briefings* shall be held if significant changes, which might affect the safety of the employees, occur during the course of the work.

[1910.269\(c\)\(4\)\(i\)](#) - A *brief discussion* is satisfactory if the work involved is routine and if the employees, by virtue of *training and experience*, can reasonably be expected to recognize and avoid the hazards involved in the job.

[1910.269\(c\)\(4\)\(ii\)](#) - A more *extensive discussion* shall be conducted: [Reference [paragraph \(c\)\(4\)\(ii\)\(A\) - \(B\)](#)].

[1910.269\(c\)\(5\)](#) - Working alone. An employee working alone need not conduct a *job briefing*. However, the employer shall ensure that the tasks to be performed are planned as if a *briefing* were required.

[1910.269\(d\)\(1\)](#) - Application. The provisions of [paragraph \(d\)](#) of this section apply to the use of *lockout/tagout procedures* for the control of energy sources in installations for the purpose of electric power generation, including related equipment for communication or metering. *Locking and tagging procedures* for the deenergizing of electric energy sources which are used exclusively for purposes of transmission and distribution are addressed by [paragraph \(m\)](#) of this section.

- Note to [paragraph \(d\)\(1\)](#): Installations in electric power generation facilities that are not an integral part of, or inextricably commingled with, power generation processes or equipment are covered under [1910.147 - the control of hazardous energy](#), and [subpart S - electrical](#), of this part.

[1910.269\(d\)\(2\)\(i\)](#) - The employer shall establish a *program* consisting of *energy control procedures, employee training, and periodic inspections* to ensure that, before any employee performs any servicing or maintenance on a machine or equipment where the unexpected energizing, start up, or release of stored energy could occur and cause injury, the machine or equipment is isolated from the energy source and rendered inoperative.

[1910.269\(d\)\(2\)\(ii\)](#) - The employer's *energy control program* under [paragraph \(d\)\(2\)](#) of this section shall meet the following requirements: [Reference [paragraph \(c\)\(2\)\(ii\)\(A\) - \(C\)](#)].

[1910.269\(d\)\(2\)\(iii\)](#) - *Procedures* shall be developed, *documented*, and used for the control of potentially hazardous energy covered by [paragraph \(d\)](#) of this section.

1910.269(d)(2)(iv) - The *procedure* shall clearly and specifically outline the scope, purpose, *responsibility, authorization, rules*, and techniques to be applied to the control of hazardous energy, and the measures to enforce compliance including, but not limited to, the following: [Reference paragraph (d)(2)(iv)(A) - (D)].

1910.269(d)(2)(v) - The employer shall conduct a *periodic inspection of the energy control procedure at least annually* to ensure that the *procedure* and the provisions of paragraph (d) of this section are being followed. [Reference paragraph (d)(2)(v)(A) - (E)].

1910.269(d)(2)(vi) - The employer shall provide *training* to ensure that the purpose and function of the *energy control program* are understood by employees and that the knowledge and skills required for the safe application, usage, and removal of energy controls are acquired by employees. The *training* shall include the following: [Reference paragraph (d)(2)(vi)(A) - (C)].

1910.269(d)(2)(vii) - When tagout systems are used, employees shall also be *trained* in the following limitations of *tags*: [Reference paragraph (d)(2)(vii)(A) - (F)].

1910.269(d)(2)(viii) - *Retraining* shall be provided by the employer as follows: [Reference paragraph (d)(2)(viii)(A) - (C)].

1910.269(d)(2)(ix) - The employer shall *certify* that *employee training* has been accomplished and is being kept up to date. The *certification* shall contain each employee's name and dates of *training*.

1910.269(d)(3)(i) - *Locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware* shall be provided by the employer for isolating, securing, or blocking of machines or equipment from energy sources.

1910.269(d)(3)(ii) - *Lockout devices and tagout devices* shall be *singularly identified*; shall be the only devices used for controlling energy; may not be used for other purposes; and shall meet the following requirements: [Reference paragraph (d)(3)(ii)(A) - (F)].

1910.269(d)(4) - Energy isolation. *Lockout and tagout device application* and removal may only be performed by the *authorized employees* who are performing the servicing or maintenance.

1910.269(d)(5) - *Notification*. Affected employees shall be *notified by the employer or authorized employee* of the application and removal of *lockout or tagout devices*. *Notification* shall be given before the controls are applied and after they are removed from the machine or equipment.



[1910.269\(d\)\(6\)](#) - Lockout/tagout application. The established *procedures* for the application of energy control (the *lockout or tagout procedures*) shall include the following elements and actions, and these *procedures* shall be performed in the following sequence:

[Reference [paragraph \(d\)\(6\)\(i\) - \(vii\)](#)].

[1910.269\(d\)\(7\)](#) - Release from *lockout/tagout*. Before *lockout or tagout devices* are removed and energy is restored to the machine or equipment, *procedures* shall be followed and actions taken by the *authorized employees* to ensure the following: [Reference [paragraph \(d\)\(7\)\(i\) - \(iv\)](#)].

[1910.269\(d\)\(8\)\(i\)](#) - If the *lockout or tagout devices* must be temporarily removed from energy isolating devices and the machine or equipment must be energized to *test* or position the machine, equipment, or component thereof, the following sequence of actions shall be followed: [Reference [paragraph \(d\)\(8\)\(i\)\(A\) - \(E\)](#)].

[1910.269\(d\)\(8\)\(ii\)](#) - When servicing or maintenance is performed by a crew, craft, department, or other group, they shall use a *procedure* which affords the employees a level of protection equivalent to that provided by the implementation of a personal *lockout or tagout device*. *Group lockout or tagout devices* shall be used in accordance with the *procedures* required by [paragraphs \(d\)\(2\)\(iii\)](#) and [\(d\)\(2\)\(iv\)](#) of this section including, but not limited to, the following specific requirements: [Reference [paragraph \(d\)\(8\)\(ii\)\(A\) - \(D\)](#)].

[1910.269\(d\)\(8\)\(iii\)](#) - *Procedures* shall be used during shift or personnel changes to ensure the continuity of lockout or tagout protection, including provision for the orderly transfer of lockout or tagout device protection between off-going and on-coming employees, to minimize their exposure to hazards from the unexpected energizing or start-up of the machine or equipment or from the release of stored energy.

[1910.269\(d\)\(8\)\(iv\)](#) - Whenever outside servicing personnel are to be engaged in activities covered by [paragraph \(d\)](#) of this section, the on-site employer and the outside employer shall *inform each other* of their respective *lockout or tagout procedures*, and each employer shall ensure that his or her *personnel understand* and comply with restrictions and prohibitions of the *energy control procedures* being used.

[1910.269\(d\)\(8\)\(v\)](#) - If energy isolating devices are installed in a central location and are under the exclusive control of a system operator, the following requirements apply:

- [1910.269\(d\)\(8\)\(v\)\(A\)](#) - The employer shall use a *procedure* that affords employees a level of protection equivalent to that provided by the implementation of a personal *lockout or tagout device*.

- [1910.269\(d\)\(8\)\(v\)\(B\)](#) - The system operator shall place and remove *lockout and tagout devices* in place of the *authorized employee* under [paragraphs \(d\)\(4\), \(d\)\(6\)\(iv\), and \(d\)\(7\)\(iv\)](#) of this section.
- [1910.269\(d\)\(8\)\(v\)\(C\)](#) - Provisions shall be made to identify the *authorized employee* who is responsible for (that is, being protected by) the *lockout or tagout device*, to transfer responsibility for *lockout and tagout devices*, and to ensure that an *authorized employee* requesting removal or transfer of a *lockout or tagout device* is the one responsible for it before the device is removed or transferred.

[1910.269 \(e\)](#) - Enclosed spaces. [Paragraph \(e\)](#) covers enclosed spaces that may be entered by employees. It does not apply to vented vaults if the employer makes a *determination* that the ventilation system is operating to protect employees before they enter the space. This paragraph applies to routine entry into enclosed spaces in lieu of the permit-space entry requirements contained in [paragraphs \(d\) through \(k\)](#) of [1910.146 - permit-required confined spaces](#). If, after the employer takes the *precautions* given in [paragraphs \(e\)](#) and [\(t\)](#) of this section, the hazards remaining in the enclosed space endanger the life of an entrant or could interfere with an entrant's escape from the space, then entry into the enclosed space shall meet the permit-space entry requirements of [paragraphs \(d\) through \(k\)](#) of [1910.146 - permit-required confined spaces](#).

[1910.269\(e\)\(1\)](#) - *Safe work practices*. The employer shall ensure the use of *safe work practices* for entry into, and work in, enclosed spaces and for rescue of employees from such spaces.

[1910.269\(e\)\(2\)](#) - *Training*. Each employee who enters an enclosed space or who serves as an attendant shall be *trained* in the hazards of enclosed-space entry, in *enclosed-space entry procedures*, and in *enclosed-space rescue procedures*.

[1910.269\(e\)\(4\)](#) - *Evaluating potential hazards*. Before any entrance cover to an enclosed space is removed, the employer shall *determine* whether it is safe to do so by *checking* for the presence of any atmospheric pressure or temperature differences and by *evaluating* whether there might be a hazardous atmosphere in the space. Any conditions making it unsafe to remove the cover shall be eliminated before the cover is removed.

[1910.269\(e\)\(6\)](#) - Hazardous atmosphere. Employees may not enter any enclosed space while it contains a hazardous atmosphere, unless the entry conforms to the *permit-required confined spaces* standard in [1910.146 - permit-required confined spaces](#).

[1910.269\(e\)\(7\)](#) - *Attendants*. While work is being performed in the enclosed space, an attendant with *first-aid training* shall be immediately available outside the enclosed space to provide assistance if a hazard exists because of traffic patterns in the area of the opening

used for entry. The *attendant* is not precluded from performing other duties outside the enclosed space if these duties do not distract the *attendant from: monitoring employees* within the space or ensuring that it is safe for employees to enter and exit the space.

1910.269(e)(8) - *Calibration of test instruments.* Test instruments used to monitor atmospheres in enclosed spaces shall be kept in *calibration* and shall have a minimum accuracy of  $\pm 10$  percent.

1910.269(e)(9) - *Testing for oxygen deficiency.* Before an employee enters an enclosed space, the atmosphere in the enclosed space shall be *tested* for oxygen deficiency with a direct-reading meter or similar instrument, capable of collection and immediate analysis of *data samples* without the need for *off-site evaluation*. If continuous forced-air ventilation is provided, *testing* is not required provided that the *procedures* used ensure that employees are not exposed to the hazards posed by oxygen deficiency.

1910.269(e)(10) - *Testing for flammable gases and vapors.* Before an employee enters an enclosed space, the internal atmosphere shall be *tested* for flammable gases and vapors with a direct-reading meter or similar instrument capable of collection and immediate analysis of *data samples* without the need for off-site evaluation. This *test* shall be performed after the *oxygen testing* and ventilation required by paragraph (e)(9) of this section demonstrate that there is sufficient oxygen to ensure the accuracy of the test for flammability.

1910.269(e)(14) - *Open flames.* If open flames are used in enclosed spaces, a *test* for flammable gases and vapors shall be *made immediately* before the open flame device is used and at least once per hour while the device is used in the space. *Testing shall be conducted more frequently* if conditions present in the enclosed space indicate that once per hour is insufficient to detect hazardous accumulations of flammable gases or vapors.

1910.269(f) - *Excavations.* Excavation operations shall comply with subpart P - excavations, of part 1926 (construction) of this chapter.

1910.269(g)(1) - *General.* Personal protective equipment shall meet the requirements of subpart I - personal protective equipment, of this part (1910).

1910.269(g)(2)(i) - *Fall protection.* Personal fall arrest systems shall meet the requirements of subpart I - personal protective equipment, of this part (1910).

1910.269(g)(2)(ii) - *Personal fall arrest equipment* used by employees who are exposed to hazards from flames or electric arcs, as determined by the employer under paragraph (l)(8)(i) of this section, shall be capable of passing a *drop test* equivalent to that required

by [paragraph \(g\)\(2\)\(iii\)\(L\)](#) of this section after exposure to an electric arc with a heat energy of  $40\pm 5$  cal/cm<sup>2</sup>. [Reference [paragraph \(g\)\(2\)\(ii\) - \(iii\)](#)].

[1910.269\(g\)\(2\)\(iv\)\(A\)](#) - *Work-positioning equipment shall be inspected before use each day to determine that the equipment is in safe working condition. Work-positioning equipment that is not in safe working condition may not be used.*

[1910.269\(g\)\(2\)\(iv\)\(B\)](#) - *Personal fall arrest systems shall be used in accordance with [subpart I - personal protective equipment](#), of this part ([1910](#)).*

[1910.269\(g\)\(2\)\(iv\)\(C\)\(2\)](#) - Except as provided in [paragraph \(g\)\(2\)\(iv\)\(C\)\(3\)](#) of this section, each employee in elevated locations more than 1.2 meters (4 feet) above the ground on poles, towers, or similar structures shall use a *personal fall arrest system, work-positioning equipment, or fall restraint system*, as appropriate, if the employer has not provided other fall protection meeting [subpart D - walking - working surfaces](#), of this part ([1910](#)).

[1910.269\(g\)\(2\)\(iv\)\(C\)\(3\)](#) - Until March 31, 2015, a *qualified employee* climbing or changing location on poles, towers, or similar structures need not use *fall protection equipment*, unless conditions, such as, but not limited to, ice, high winds, the design of the structure (for example, no provision for holding on with hands), or the presence of contaminants on the structure, could cause the employee to lose his or her grip or footing. On and after April 1, 2015, each *qualified employee* climbing or changing location on poles, towers, or similar structures must use *fall protection equipment* unless the employer can *demonstrate* that climbing or changing location with *fall protection* is infeasible or creates a greater hazard than climbing or changing location without it.

[1910.269\(h\)\(1\)](#) - General. Requirements for portable ladders contained in [subpart D - walking - working surfaces](#), of this part ([1910](#)). of this part apply in addition to the requirements of [paragraph \(h\)](#) of this section, except as specifically noted in [paragraph \(h\)\(2\)](#) of this section.

[1910.269\(h\)\(2\)](#) - Special ladders and platforms. Portable ladders used on structures or conductors in conjunction with overhead line work need not meet [1910.23\(c\)\(4\)](#) and [\(9\)](#). Portable ladders and platforms used on structures or conductors in conjunction with overhead line work shall meet the following requirements: [Reference [paragraph \(h\)\(2\)\(i\) - \(iv\)](#)].

[1910.269\(h\)\(3\)](#) - Conductive ladders. Portable metal ladders and other portable conductive ladders may not be used near exposed energized lines or equipment. However, in specialized high-voltage work, conductive ladders shall be used when the *employer demonstrates* that nonconductive ladders would present a greater hazard to employees than conductive ladders.

1910.269(i)(2) - Cord- and plug-connected equipment. Cord- and plug-connected equipment not covered by subpart S - electrical, of this part shall comply with one of the following instead of 1910.243(a)(5) - guarding of portable powered tools:

[Reference paragraph (i)(2)(i) - (iii)].

1910.269(j)(1) - Design of tools. Live-line tool rods, tubes, and poles shall be *designed* and constructed to withstand the following *minimum tests*: [Reference paragraph (j)(1)(i) - (iii)].

1910.269(j)(2)(i) - Each live-line tool shall be wiped clean and *visually inspected* for defects *before use each day*.

1910.269(j)(2)(ii) - If any defect or contamination that could adversely affect the insulating qualities or mechanical integrity of the live-line tool is present after wiping, the tool shall be removed from service and examined and *tested* according to paragraph (j)(2)(iii) of this section before being returned to service.

1910.269(j)(2)(iii) - Live-line tools used for primary employee protection shall be removed from service *every 2 years*, and whenever required under paragraph (j)(2)(ii) of this section, for examination, cleaning, repair, and *testing* as follows: [Reference paragraph (j)(2)(iii)(A) - (E)].

1910.269(k)(1) - General. Materials handling and storage shall comply with applicable material-handling and material-storage requirements in this part, including those in subpart N of this part (1910).

1910.269(k)(2)(i) - In areas to which access is not restricted to *qualified persons* only, materials or equipment may not be stored closer to energized lines or exposed energized parts of equipment than the following distances, plus a distance that provides for the maximum sag and side swing of all conductors and for the height and movement of material-handling equipment: [Reference paragraph (k)(2)(i)(A) - (B)].

1910.269(k)(2)(ii) - In areas restricted to *qualified employees*, materials may not be stored within the working space about energized lines or equipment.

1910.269(l)(1)(i) - Only *qualified employees* may work on or with exposed energized lines or parts of equipment.

1910.269(l)(1)(ii) - Only *qualified employees* may work in areas containing unguarded, uninsulated energized lines or parts of equipment operating at 50 volts or more.

1910.269(l)(8)(v)(C) - Arc-rated protection is not necessary for the employee's head when the employee is wearing head protection meeting 1910.135 - head protection, if the

estimated incident energy is less than 9 cal/cm<sup>2</sup> for exposures involving single-phase arcs in open air or 5 cal/cm<sup>2</sup> for other exposures,

[1910.269\(l\)\(8\)\(v\)\(D\)](#) - The protection for the employee's head may consist of head protection meeting [1910.135](#) - *head protection*, and a faceshield with a minimum arc rating of 8 cal/cm<sup>2</sup> if the estimated incident-energy exposure is less than 13 cal/cm<sup>2</sup> for exposures involving single-phase arcs in open air or 9 cal/cm<sup>2</sup> for other exposures.

[1910.269\(l\)\(9\)](#) - Fuse handling. When an employee must install or remove fuses with one or both terminals energized at more than 300 volts, or with exposed parts energized at more than 50 volts, the employer shall ensure that the employee uses tools or gloves rated for the voltage. When an employee installs or removes expulsion-type fuses with one or both terminals energized at more than 300 volts, the employer shall ensure that the employee wears eye protection meeting the requirements of [subpart I](#) - *personal protective equipment*, of this part, uses a tool rated for the voltage, and is clear of the exhaust path of the fuse barrel.

[1910.269\(l\)\(11\)](#) - Non-current-carrying metal parts. Non-current-carrying metal parts of equipment or devices, such as transformer cases and circuit-breaker housings, shall be treated as energized at the highest voltage to which these parts are exposed, unless the employer *inspects* the installation and determines that these parts are grounded before employees begin performing the work.

[1910.269\(m\)\(1\)](#) - Application. [Paragraph \(m\)](#) of this section applies to the deenergizing of transmission and distribution lines and equipment for the purpose of protecting employees. See [paragraph \(d\)](#) of this section for requirements on the control of hazardous energy sources used in the generation of electric energy. Conductors and parts of electric equipment that have been deenergized under *procedures* other than those required by [paragraph \(d\)](#) or [\(m\)](#) of this section, as applicable, shall be treated as energized.

[1910.269\(m\)\(2\)\(i\)](#) - Deenergizing lines and equipment for employee protection - If a system operator is in charge of the lines or equipment and their means of disconnection, the employer shall *designate one employee* in the crew to be *in charge* of the clearance and shall comply with all of the requirements of [paragraph \(m\)\(3\)](#) of this section in the order specified.

[1910.269\(m\)\(2\)\(ii\)](#) - If no system operator is in charge of the lines or equipment and their means of disconnection, the employer shall *designate one employee* in the crew to be in charge of the clearance and to perform the functions that the system operator would otherwise perform under [paragraph \(m\)](#) of this section. All of the requirements of [paragraph](#)



(m)(3) of this section apply, in the order specified, except as provided in [paragraph \(m\)\(2\)\(iii\)](#) of this section.

[1910.269\(m\)\(2\)\(iv\)\(B\)](#) - Each crew shall independently comply with [paragraph \(m\)](#) of this section and, if there is no system operator in charge of the lines or equipment, shall have separate *tags* and coordinate deenergizing and reenergizing the lines and equipment with the other crews.

[1910.269\(m\)\(3\)\(i\)](#) - Deenergizing lines and equipment. The employee that the *employer designates* pursuant to [paragraph \(m\)\(2\)](#) of this section as being *in charge* of the clearance shall make a request of the system operator to deenergize the particular section of line or equipment. The *designated employee* becomes the *employee in charge* (as this term is used in [paragraph \(m\)\(3\)](#) of this section) and is responsible for the clearance.

[1910.269\(m\)\(3\)\(ii\)](#) - The employer shall ensure that all switches, disconnectors, jumpers, taps, and other means through which known sources of electric energy may be supplied to the particular lines and equipment to be deenergized are open. The employer shall render such means inoperable, unless its design does not so permit, and then ensure that such means are *tagged* to indicate that employees are at work.

[1910.269\(m\)\(3\)\(iii\)](#) - The employer shall ensure that automatically and remotely controlled switches that could cause the opened disconnecting means to close are also *tagged* at the points of control. The employer shall render the automatic or remote control feature inoperable, unless its design does not so permit.

[1910.269\(m\)\(3\)\(iv\)](#) - The employer need not use the *tags* mentioned in [paragraphs \(m\)\(3\)\(ii\)](#) and [\(m\)\(3\)\(iii\)](#) of this section on a network protector for work on the primary feeder for the network protector's associated network transformer when the employer can *demonstrate* all of the following conditions:

- [1910.269\(m\)\(3\)\(iv\)\(C\)](#) - The employer has *procedures* for manually overriding any network protector that incorporate provisions for determining, before anyone places a network protector in a closed position, that: The line connected to the network protector is not deenergized for the protection of any employee working on the line; and (if the line connected to the network protector is not deenergized for the protection of any employee working on the line) the primary conductors for the network protector are energized.

[1910.269\(m\)\(3\)\(v\)](#) - *Tags* shall prohibit operation of the disconnecting means and shall indicate that employees are at work.

[1910.269\(m\)\(3\)\(vi\)](#) - After the applicable requirements in [paragraphs \(m\)\(3\)\(i\) through \(m\)\(3\)\(v\)](#) of this section have been followed and the system operator gives a clearance to the *employee in charge*, the employer shall ensure that the lines and equipment are deenergized by *testing* the lines and equipment to be worked with a device designed to detect voltage.

[1910.269\(m\)\(3\)\(ix\)](#) -To transfer the clearance, the *employee in charge* (or the employee's supervisor if the *employee in charge* must leave the worksite due to illness or other emergency) shall *inform* the system operator and employees in the crew; and the new *employee in charge* shall be responsible for the clearance.

[1910.269\(m\)\(3\)\(x\)](#) - To *release a clearance*, the *employee in charge* shall:  
[Reference [paragraph \(m\)\(3\)\(x\)\(A\) - \(D\)](#)].

[1910.269\(m\)\(3\)\(xi\)](#) - Only the *employee in charge* who requested the clearance may *release the clearance*, unless the employer transfers responsibility under [paragraph \(m\)\(3\)\(ix\)](#) of this section.

[1910.269\(m\)\(3\)\(xii\)](#) - No one may remove *tags* without the *release of the associated clearance* as specified under [paragraphs \(m\)\(3\)\(x\)](#) and [\(m\)\(3\)\(xi\)](#) of this section.

[1910.269\(m\)\(3\)\(xiii\)](#) - The employer shall ensure that no one initiates action to reenergize the lines or equipment at a point of disconnection until all protective grounds have been removed, all crews working on the lines or equipment release their clearances, all employees are clear of the lines and equipment, and all protective *tags* are removed from that point of disconnection.

[1910.269\(n\)\(2\)](#) - [Paragraph \(n\)](#) of this section applies to grounding of generation, transmission, and distribution lines and equipment for the purpose of protecting employees. General. For any employee to work transmission and distribution lines or equipment as deenergized, the employer shall ensure that the lines or equipment are deenergized under the provisions of [paragraph \(m\)](#) of this section and shall ensure proper grounding of the lines or equipment as specified in [paragraphs \(n\)\(3\) through \(n\)\(8\)](#) of this section. However, if the *employer can demonstrate* that installation of a ground is impracticable or that the conditions resulting from the installation of a ground would present greater hazards to employees than working without grounds, the lines and equipment may be treated as deenergized provided that the employer establishes that all of the following conditions apply: [Reference [paragraph \(n\)\(2\)\(i\) - \(iii\)](#)].

[1910.269\(n\)\(3\)](#) - Equipotential zone. Temporary protective grounds shall be placed at such locations and arranged in such a manner that the *employer can demonstrate* will prevent each employee from being exposed to hazardous differences in electric potential.

1910.269(n)(5) - *Testing*. The employer shall ensure that, unless a previously installed ground is present, employees *test lines* and equipment and verify the absence of nominal voltage before employees install any ground on those lines or that equipment.

1910.269(n)(6)(i) - The employer shall ensure that, when an employee attaches a ground to a line or to equipment, the employee attaches the ground-end connection first and then attaches the other end by means of a live-line tool. For lines or equipment operating at 600 volts or less, the employer may permit the employee to use insulating equipment other than a live-line tool if the employer ensures that the line or equipment is not energized at the time the ground is connected or if the *employer can demonstrate* that each employee is protected from hazards that may develop if the line or equipment is energized.

1910.269(n)(6)(ii) - The employer shall ensure that, when an employee removes a ground, the employee removes the grounding device from the line or equipment using a live-line tool before he or she removes the ground-end connection. For lines or equipment operating at 600 volts or less, the employer may permit the employee to use insulating equipment other than a live-line tool if the employer ensures that the line or equipment is not energized at the time the ground is disconnected or if the *employer can demonstrate* that each employee is protected from hazards that may develop if the line or equipment is energized.

1910.269(n)(8) - Removal of grounds for *test*. The employer may permit employees to remove grounds temporarily during *tests*. During the *test procedure*, the employer shall ensure that each employee uses insulating equipment, shall isolate each employee from any hazards involved, and shall implement any additional measures necessary to protect each exposed employee in case the previously grounded lines and equipment become energized.

1910.269(o)(1) - Application. Paragraph (o) of this section provides for *safe work practices* for high-voltage and *high-power testing* performed in laboratories, shops, and substations, and in the field and on electric transmission and distribution lines and equipment. It applies only to *testing* involving interim measurements using high voltage, high power, or combinations of high voltage and high power, and not to testing involving continuous measurements as in routine metering, relaying, and normal line work.

1910.269(o)(2)(i) - The employer shall establish and enforce *work practices* for the protection of each worker from the hazards of high-voltage or high-power testing at all test areas, temporary and permanent. Such *work practices* shall include, as a minimum, *test area* safeguarding, grounding, the safe use of measuring and control circuits, and a means providing for *periodic safety checks* of field *test areas*.

1910.269(o)(2)(ii) - The employer shall ensure that each employee, upon *initial assignment to the test area, receives training in safe work practices*, with *retraining* provided as required by paragraph (a)(2) of this section.

1910.269(o)(3)(i) - The employer shall provide safeguarding within *test areas* to control access to *test equipment* or to apparatus under *test* that could become energized as part of the *testing* by either direct or inductive coupling and to prevent accidental employee contact with energized parts.

1910.269(o)(3)(iii) - In *field testing*, or at a temporary *test site* not guarded by permanent fences and gates, the employer shall ensure the use of one of the following means to prevent employees without *authorization* from entering: [Reference paragraph (o)(3)(iii)(A) - (C)].

1910.269(o)(4)(i) - The employer shall establish and implement *safe grounding practices* for the *test facility*. [Reference paragraph (o)(4)(i) - (vi)].

1910.269(o)(5)(i) - The employer may not run control wiring, meter connections, test leads, or cables from a *test area* unless contained in a grounded metallic sheath and terminated in a grounded metallic enclosure or unless the *employer takes other precautions that it can demonstrate* will provide employees with equivalent safety.

1910.269(o)(5)(iv) - If any employee will be present in the *test area* during *testing*, a *test observer* shall be present. The *test observer* shall be capable of implementing the immediate deenergizing of *test circuits* for safety purposes.

1910.269(o)(6)(i) - *Safety practices* governing employee work at temporary or *field test areas* shall provide, at the *beginning of each series of tests*, for a routine *safety check* of such *test areas*.

1910.269(o)(6)(ii) - The *test operator in charge* shall conduct these *routine safety checks* before each *series of tests* and shall verify at least the following conditions: [Reference paragraph (o)(6)(ii)(A) - (F)].

1910.269(p)(1)(i) - The critical safety components of mechanical elevating and rotating equipment shall receive a thorough *visual inspection* before use on *each shift*.

1910.269(p)(1)(ii)(B) - The vehicle is backed up only when a *designated employee signals* that it is safe to do so.

1910.269(p)(1)(iii) - Rubber-tired self-propelled scrapers, rubber-tired front-end loaders, rubber-tired dozers, wheel-type agricultural and industrial tractors, crawler-type tractors, crawler-type loaders, and motor graders, with or without attachments, shall have rollover

protective structures that meet the requirements of [subpart W](#) - rollover protective structures, of [part 1926](#) (construction) of this chapter.

[1910.269\(p\)\(1\)\(iv\)](#) - The operator of an electric line truck may not leave his or her position at the controls while a load is suspended, unless the *employer can demonstrate* that no employee (including the operator) is endangered.

[1910.269\(p\)\(2\)\(iii\)](#) - If the work area or the terrain precludes the use of outriggers, the equipment may be operated only within its *maximum load ratings specified by the equipment manufacturer* for the particular configuration of the equipment without outriggers.

[1910.269\(p\)\(3\)](#) - Applied loads. Mechanical equipment used to lift or move lines or other material shall be used within its *maximum load rating* and other design limitations for the conditions under which the mechanical equipment is being used.

[1910.269\(p\)\(4\)\(i\)](#) - Mechanical equipment shall be operated so that the *minimum approach distances, established by the employer* under [paragraph \(l\)\(3\)\(i\)](#) of this section, are maintained from exposed energized lines and equipment. However, the insulated portion of an aerial lift operated by a *qualified employee* in the lift is exempt from this requirement if the applicable minimum approach distance is maintained between the uninsulated portions of the aerial lift and exposed objects having a different electrical potential.

[1910.269\(p\)\(4\)\(ii\)](#) - A *designated employee* other than the equipment operator shall observe the approach distance to exposed lines and equipment and provide timely warnings before the minimum approach distance required by [paragraph \(p\)\(4\)\(i\)](#) of this section is reached, unless the *employer can demonstrate* that the operator can accurately determine that the minimum approach distance is being maintained.

[1910.269\(p\)\(4\)\(iii\)\(B\)](#) - The mechanical equipment shall be insulated for the voltage involved. The mechanical equipment shall be positioned so that its uninsulated portions cannot approach the energized lines or equipment any closer than the *minimum approach distances, established by the employer* under [paragraph \(l\)\(3\)\(i\)](#) of this section.

[1910.269\(p\)\(4\)\(iii\)\(C\)](#) - Each employee shall be protected from hazards that could arise from mechanical equipment contact with energized lines or equipment. The *measures* used shall ensure that employees will not be exposed to hazardous differences in electric potential. Unless the *employer can demonstrate* that the methods in use protect each employee from the hazards that could arise if the mechanical equipment contacts the energized line or equipment, the *measures* used shall include all of the following techniques:

[Reference [paragraph \(p\)\(4\)\(iii\)\(C\)\(1\) - \(4\)](#)].

[1910.269\(q\)\(2\)\(iv\)](#) - Before employees install lines parallel to existing energized lines, the employer shall make a *determination* of the approximate voltage to be induced in the new lines, or work shall proceed on the assumption that the induced voltage is hazardous. Unless the *employer can demonstrate* that the lines that employees are installing are not subject to the induction of a hazardous voltage or unless the lines are treated as energized, temporary protective grounds shall be placed at such locations and arranged in such a manner that the *employer can demonstrate* will prevent exposure of each employee to hazardous differences in electric potential.

[1910.269\(q\)\(2\)\(vi\)](#) - The employer shall ensure that employees do not exceed *load ratings* of stringing lines, pulling lines, conductor grips, load-bearing hardware and accessories, rigging, and hoists.

[1910.269\(q\)\(2\)\(ix\)](#) - The employer shall ensure that employees maintain reliable *communications*, through two-way radios or other equivalent means, between the reel tender and the pulling-rig operator.

[1910.269\(q\)\(3\)\(i\)](#) - Before an employee uses or supervises the use of the live-line barehand technique on energized circuits, the employer shall ensure that the employee *completes training* conforming to [paragraph \(a\)\(2\)](#) of this section in the technique and in the safety requirements of [paragraph \(q\)\(3\)](#) of this section.

[1910.269\(q\)\(3\)\(ii\)](#) - Before any employee uses the live-line barehand technique on energized high-voltage conductors or parts, the employer shall ascertain the following *information* in addition to *information* about other existing conditions required by [paragraph \(a\)\(4\)](#) of this section: [Reference [paragraph \(q\)\(3\)\(ii\)\(A\) - \(C\)](#)].

[1910.269\(q\)\(3\)\(iii\)](#) - The employer shall ensure that the insulated equipment, insulated tools, and aerial devices and platforms used by employees are *designed, tested*, and made for live-line barehand work.

[1910.269\(q\)\(3\)\(vi\)](#) - The employer shall ensure that employees do not perform work when adverse weather conditions would make the work hazardous even after the employer implements the *work practices* required by this section. Additionally, employees may not perform work when winds reduce the phase-to-phase or phase-to-ground clearances at the work location below the minimum approach distances specified in [paragraph \(q\)\(3\)\(xiv\)](#) of this section, unless insulating guards cover the grounded objects and other lines and equipment.

[1910.269\(q\)\(3\)\(xiii\)](#) - The employer shall ensure that employees perform a boom-current test *before starting work each day*, each time during the day when they encounter a higher



voltage, and when changed conditions indicate a need for an *additional* test. [Reference [paragraph \(q\)\(3\)\(xiii\)\(A\) - \(C\)](#)].

[1910.269\(q\)\(3\)\(xiv\)](#) - The employer shall ensure that employees maintain the *minimum approach distances*, established by the employer under [paragraph \(l\)\(3\)\(i\)](#) of this section, from all grounded objects and from lines and equipment at a potential different from that to which the live-line barehand equipment is bonded, unless insulating guards cover such grounded objects and other lines and equipment.

## **1910.272 - Grain Handling Facilities**

**Scope:** This [standard](#) contains requirements for the control of grain dust fires and explosions, and certain other safety hazards associated with grain handling facilities. It applies in addition to all other relevant provisions of part 1910 (or part 1917 at marine terminals).

**Note:** [Paragraphs \(a\)](#) through [\(n\)](#) of this section apply to grain elevators, feed mills, flour mills, rice mills, dust pelletizing plants, dry corn mills, soybean flaking operations, and the dry grinding operations of soycake. [Paragraphs \(o\)](#), [\(p\)](#), and [\(q\)](#) of this section apply only to grain elevators.

[Grain elevator](#) means a facility engaged in the receipt, handling, storage, and shipment of bulk raw agricultural commodities such as corn, wheat, oats, barley, sunflower seeds, and soybeans.

**Special Requirements:** Emergency action plan, training, procedures, measures, precautions, safety practices, authorized, hot work permits, certify permits, training, safety rules, explain, inspections, records, manufacturers' recommendations, inform, communications, observer stationed outside, locks/tags, certification records, employer demonstrates, (written) housekeeping program, references other standards

[1910.272\(d\)](#) - *Emergency action plan*. The employer shall develop and implement an *emergency action plan* meeting the requirements contained in [29 CFR](#)

[1910.38](#) - *emergency action plan*.

[1910.272\(e\)\(1\)](#) - The employer shall provide *training* to employees *at least annually* and when changes in job assignment will expose them to new hazards. Current employees, and new employees prior to starting work, *shall be trained* in at least the following:

- [1910.272\(e\)\(1\)\(i\)](#) - General *safety precautions* associated with the facility, including *recognition and preventive measures* for the hazards related to dust accumulations and common ignition sources such as smoking; and,

- [1910.272\(e\)\(1\)\(ii\)](#) - *Specific procedures and safety practices* applicable to their job tasks including but not limited to, *cleaning procedures for grinding equipment, clearing procedures for choked legs, housekeeping procedures, hot work procedures, preventive maintenance procedures and lock-out/tag-out procedures.*

[1910.272\(e\)\(2\)](#) - Employees assigned *special tasks*, such as bin entry and handling of flammable or toxic substances, shall be provided *training* to perform these tasks safely.

[1910.272\(f\)\(1\)](#) - The employer shall *issue a permit* for all hot work, with the following exceptions:

- [1910.272\(f\)\(1\)\(i\)](#) - Where the employer or the *employer's representative* (who would otherwise *authorize the permit*) is present while the hot work is being performed;
- [1910.272\(f\)\(1\)\(ii\)](#) - In welding shops *authorized by the employer*;
- [1910.272\(f\)\(1\)\(iii\)](#) - In hot work areas *authorized by the employer* which are located outside of the grain handling structure.
- [1910.272\(f\)\(2\)](#) - The *permit shall certify* that the requirements contained in [1910.252\(a\)](#) - *welding, cutting and brazing, general requirements*, have been implemented *prior to beginning the hot work operations*. The *permit shall be kept on file* until completion of the hot work operations.

[1910.272\(g\)\(1\)](#) - The following actions shall be taken before employees enter bins, silos, or tanks:

- [1910.272\(g\)\(1\)\(i\)](#) - The employer shall issue a *permit* for entering bins, silos, or tanks unless the employer or the *employer's representative* (who would otherwise *authorize the permit*) is present during the entire operation. The *permit shall certify* that the precautions contained in this paragraph [[1910.272\(g\)](#)] have been implemented prior to employees entering bins, silos or tanks. The *permit shall be kept on file* until completion of the entry operations.
- [1910.272\(g\)\(1\)\(ii\)](#) - All mechanical, electrical, hydraulic, and pneumatic equipment which presents a danger to employees inside grain storage structures shall be deenergized and shall be disconnected, *locked-out and tagged*, blocked-off, or otherwise prevented from operating by other equally effective means or methods.

[1910.272\(g\)\(1\)\(iii\)](#) - The atmosphere within a bin, silo, or tank shall be *tested* for the presence of combustible gases, vapors, and toxic agents when the employer has reason to believe they may be present. Additionally, the atmosphere within a bin, silo, or tank shall be *tested* for oxygen content unless there is continuous natural air movement or continuous

forced-air ventilation before and during the period employees are inside. If the oxygen level is less than 19.5%, or if combustible gas or vapor is detected in excess of 10% of the lower flammable limit, or if toxic agents are present in excess of the ceiling values listed in [subpart Z of 29 CFR part 1910](#), or if toxic agents are present in concentrations that will cause health effects which prevent employees from effecting self-rescue or *communication* to obtain assistance, the following provisions apply.

- [1910.272\(g\)\(1\)\(iii\)\(B\)](#) - If toxicity or oxygen deficiency cannot be eliminated by ventilation, employees entering the bin, silo, or tank shall wear an appropriate respirator. Respirator use shall be in accordance with the requirements of [1910.134](#) - *respiratory protection*.

[1910.272\(g\)\(2\)](#) - Whenever an employee enters a grain storage structure from a level at or above the level of the stored grain or grain products, or whenever an employee walks or stands on or in stored grain of a depth which poses an engulfment hazard, the employer shall equip the employee with a body harness with lifeline, or a boatswain's chair that meets the requirements of [subpart D - walking - working surfaces of this part](#). The lifeline shall be so positioned, and of sufficient length, to prevent the employee from sinking further than waist-deep in the grain. **Exception:** Where the employer can *demonstrate* that the protection required by this paragraph is not feasible or creates a greater hazard, the employer shall provide an alternative means of protection which is *demonstrated* to prevent the employee from sinking further than waist-deep in the grain.

[1910.272\(g\)\(3\)](#) - An observer, equipped to provide assistance, shall be *stationed outside* the bin, silo, or tank being entered by an employee. *Communications (visual, voice, or signal line)* shall be maintained between the observer and employee entering the bin, silo, or tank.

[1910.272\(g\)\(5\)](#) - The employee acting as *observer shall be trained in rescue procedures*, including *notification methods* for obtaining additional assistance.

[1910.272\(h\)\(1\)](#) - Each employee who walks or stands on or in stored grain, where the depth of the grain poses an engulfment hazard, shall be equipped with a lifeline or alternative means which the *employer demonstrates* will prevent the employee from sinking further than waist-deep into the grain.

[1910.272\(h\)\(2\)\(i\)](#) - Whenever an employee walks or stands on or in stored grain or grain products of a depth which poses an engulfment hazard, all equipment which presents a danger to that employee (such as an auger or other grain transport equipment) shall be deenergized, and shall be disconnected, *locked-out and tagged*, blocked-off, or otherwise prevented from operating by other equally effective means or methods.

1910.272(i)(1) - The employer shall *inform contractors* performing work at the grain handling facility of known potential fire and explosion hazards related to the contractor's work and work area. The employer shall also *inform contractors* of the applicable *safety rules* of the facility.

1910.272(i)(2) - The employer shall *explain the applicable provisions* of the *emergency action plan* to contractors.

1910.272(j)(1) - The employer shall develop and implement a *written housekeeping program* that establishes the frequency and method(s) determined best to reduce accumulations of fugitive grain dust on ledges, floors, equipment, and other exposed surfaces.

1910.272(j)(2) - In addition, the *housekeeping program* for grain elevators shall address fugitive grain dust accumulations at priority housekeeping areas.

1910.272(j)(2)(ii) - The employer shall immediately remove any fugitive grain dust accumulations whenever they exceed  $\frac{1}{8}$  inch (.32 cm) at priority housekeeping areas, pursuant to the *housekeeping program*, or shall *demonstrate* and assure, through the development and implementation of the *housekeeping program*, that equivalent protection is provided.

1910.272(j)(4) - Grain and product spills shall not be considered fugitive grain dust accumulations. However, the *housekeeping program* shall address the *procedures* for removing such spills from the work area.

1910.272(m)(1) - The employer shall implement *preventive maintenance procedures* consisting of:

- 1910.272(m)(1)(i) - Regularly *scheduled inspections* of at least the mechanical and safety control equipment associated with dryers, grain stream processing equipment, dust collection equipment including filter collectors, and bucket elevators;
- 1910.272(m)(1)(ii) - Lubrication and other appropriate maintenance in accordance with *manufacturers' recommendations*, or as determined necessary by *prior operating records*.

1910.272(m)(3) - A *certification record* shall be maintained of each *inspection*, performed in accordance with this paragraph (m), containing the date of the *inspection*, the name of the person who *performed the inspection* and the serial number, or other identifier, of the equipment specified in paragraph (m)(1)(i) of this section that was inspected.

[1910.272\(m\)\(4\)](#) - The employer shall *implement procedures* for the use of *tags and locks* which will prevent the inadvertent application of energy or motion to equipment being repaired, serviced, or adjusted, which could result in employee injury. Such *locks and tags* shall be removed in accordance with *established procedures* only by the employee installing them or, if unavailable, by his or her supervisor.

[1910.272\(q\)\(3\)](#) - All bucket elevators shall be equipped with a means of access to the head pulley section to allow *inspection* of the head pulley, lagging, belt, and discharge throat of the elevator head. The boot section shall also be provided with a means of access for clean-out of the boot and for *inspection* of the boot, pulley, and belt.

[1910.272\(q\)\(7\)](#) - [Paragraphs \(q\)\(5\)](#) and [\(q\)\(6\)](#) of this section do not apply to grain elevators having a permanent storage capacity of less than one million bushels, provided that *daily visual inspection* is made of bucket movement and tracking of the belt.

## **Subpart S - [Electrical](#)**

[Subpart S](#) provides the electrical standards that address the practical safeguarding of employees in the workplace. According to the standard on [introduction](#), this subpart has two distinct sections:

- Section One - Design safety standards for electrical systems
  - Design safety standards for electric utilization systems (Includes all electric equipment and installations used to provide electric power and light for employee workplaces)
  - Specific purpose equipment and installations
  - Hazardous (classified) locations
  - Special systems (over 600 volts)
- Section Two - Safety-related work practices

To learn if subpart S applies to you, go to [Does "Subpart S - Electrical" Apply to You?](#)

## **Special Requirements**

### **1910.303 – General**

**Scope:** This [standard](#) provides general electrical requirements for electrical installations and utilization equipment installed or used within or on buildings, structures, and other premises.

[Qualified person](#) - One who has received training in and has demonstrated skills and knowledge in the construction and operation of electric equipment and installations and the hazards involved.

**Special Requirements:** Labels, instructions, identified, listed, markings, inspection, approved, qualified person, warning signs, caution signs

[1910.303\(b\)\(2\)](#) - Installation and use. *Listed or labeled equipment* shall be installed and used in accordance with any *instructions* included in the *listing or labeling*.

[1910.303\(b\)\(6\)](#) - Deteriorating agents. Unless *identified for use* in the operating environment, no conductors or equipment shall be located in damp or wet locations; where exposed to gases, fumes, vapors, liquids, or other agents that have a deteriorating effect on the conductors or equipment; or where exposed to excessive temperatures.

[1910.303\(c\)\(1\)\(i\)](#) - Devices such as pressure terminal or pressure splicing connectors and soldering lugs shall be *identified* for the material of the conductor and shall be properly installed and used.

[1910.303\(c\)\(1\)\(ii\)](#) - Conductors of dissimilar metals may not be intermixed in a terminal or splicing connector where physical contact occurs between dissimilar conductors (such as copper and aluminum, copper and copper-clad aluminum, or aluminum and copper-clad aluminum) unless the device is *identified* for the purpose and conditions of use.

[1910.303\(c\)\(2\)\(ii\)](#) - Terminals for more than one conductor and terminals used to connect aluminum shall be so *identified*.

[1910.303\(c\)\(3\)\(ii\)](#) - Wire connectors or splicing means installed on conductors for direct burial shall be *listed* for such use.

[1910.303\(e\)\(1\)](#) - *Identification of manufacturer and ratings*. Electric equipment may not be used unless the following *markings* have been placed on the equipment:

- [1910.303\(e\)\(1\)\(i\)](#) - The *manufacturer's name, trademark, or other descriptive marking* by which the organization responsible for the product may be identified; and
- [1910.303\(e\)\(1\)\(ii\)](#) - Other *markings* giving voltage, current, wattage, or other ratings as necessary.



1910.303(e)(2) - Durability. The *marking* shall be of sufficient durability to withstand the environment involved.

1910.303(f)(1) - Motors and appliances. Each disconnecting means required by this subpart for motors and appliances shall be *legibly marked* to indicate its purpose, unless located and arranged so the purpose is evident.

1910.303(f)(2) - *Services, feeders, and branch circuits*. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be *legibly marked* to indicate its purpose, unless located and arranged so the purpose is evident.

1910.303(f)(3) - *Durability of markings*. The *markings* required by paragraphs (f)(1) and (f)(2) of this section shall be of sufficient durability to withstand the environment involved.

1910.303(f)(5) - *Marking for series combination ratings*. [Reference paragraph (f)(5)(i) - (ii)].

1910.303(g)(1)(ii) - Working space required by this standard may not be used for storage. When normally enclosed live parts are exposed for *inspection* or servicing, the working space, if in a passageway or general open space, shall be suitably guarded.

1910.303(g)(2)(i) - Except as elsewhere required or permitted by this standard, live parts of electric equipment operating at 50 volts or more shall be guarded against accidental contact by use of *approved* cabinets or other forms of *approved* enclosures or by any of the following means:

- 1910.303(g)(2)(i)(A) - By location in a room, vault, or similar enclosure that is accessible only to *qualified persons*;
- 1910.303(g)(2)(i)(B) - By suitable permanent, substantial partitions or screens so arranged so that only *qualified persons* will have access to the space within reach of the live parts. Any openings in such partitions or screens shall be so sized and located that persons are not likely to come into accidental contact with the live parts or to bring conducting objects into contact with them.

1910.303(g)(2)(iii) - Entrances to rooms and other guarded locations containing exposed live parts shall be *marked* with *conspicuous warning signs* forbidding unqualified persons to enter.

1910.303(h)(2)(i) - Electrical installations in a vault, room, or closet or in an area surrounded by a wall, screen, or fence, access to which is controlled by lock and key or other *approved means*, are considered to be accessible to *qualified persons* only. The type of enclosure

used in a given case shall be *designed* and constructed according to the hazards associated with the installation.

[1910.303\(h\)\(2\)\(iii\)](#) - The following requirements apply to indoor installations that are accessible to other than qualified persons: [Reference [paragraph \(h\)\(2\)\(iii\)\(A\) - \(C\)](#)].

- [1910.303\(h\)\(2\)\(iii\)\(B\)](#) - Metal-enclosed switchgear, unit substations, transformers, pull boxes, connection boxes, and other similar associated equipment shall be marked with appropriate *caution signs*;

[1910.303\(h\)\(2\)\(iv\)](#) - Outdoor electrical installations having exposed live parts shall be accessible to *qualified persons* only.

[1910.303\(h\)\(5\)\(ii\)](#) - If switches, cutouts, or other equipment operating at 600 volts, nominal, or less, are installed in a room or enclosure where there are exposed live parts or exposed wiring operating at over 600 volts, nominal, the high-voltage equipment shall be effectively separated from the space occupied by the low-voltage equipment by a suitable partition, fence, or screen. However, switches or other equipment operating at 600 volts, nominal, or less, and serving only equipment within the high-voltage vault, room, or enclosure may be installed in the high-voltage enclosure, room, or vault if accessible to *qualified persons* only.

[1910.303\(h\)\(5\)\(iii\)](#) - The following requirements apply to the entrances to all buildings, rooms, or enclosures containing exposed live parts or exposed conductors operating at over 600 volts, nominal:

- [1910.303\(h\)\(5\)\(iii\)\(A\)](#) - The entrances shall be kept locked unless they are under the observation of a *qualified person* at all times; and
- [1910.303\(h\)\(5\)\(iii\)\(B\)](#) - Permanent and conspicuous *warning signs* shall be provided, reading substantially as follows: “*DANGER - HIGH VOLTAGE - KEEP OUT.*”

## **1910.304 - Wiring Design and Protection**

**Scope:** This [standard](#) provides electrical requirements for electrical installations and utilization equipment installed or used within or on buildings, structures, and other premises.

[Competent person](#) - One who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees and who has authorization to take prompt corrective measures to eliminate them.

Qualified person - One who has received training in and has demonstrated skills and knowledge in the construction and operation of electric equipment and installations and the hazards involved.

**Special Requirements:** Identifiable (posted), markings/marked, listing, assured equipment grounding conductor program (written), inspections, tests, competent person, procedures, records, qualified person, warning signs, authorized personnel, references other standards

1910.304(a)(1)(i) - A conductor used as a grounded conductor shall be *identifiable* and distinguishable from all other conductors.

1910.304(a)(1)(ii) - A conductor used as an equipment grounding conductor shall be *identifiable* and distinguishable from all other conductors.

1910.304(b)(1) - *Identification* of multiwire branch circuits. Where more than one nominal voltage system exists in a building containing multiwire branch circuits, each ungrounded conductor of a multiwire branch circuit, where accessible, shall be identified by phase and system. The means of *identification* shall be *permanently posted* at each branch-circuit panelboard.

1910.304(b)(2)(iv)(C)(3) - A nongrounding-type receptacle may be replaced with a grounding-type receptacle where supplied through a ground-fault circuit-interrupter; the replacement receptacle shall be *marked "GFCI Protected" and "No Equipment Ground;"* an equipment grounding conductor may not be connected to such grounding-type receptacles.

1910.304(b)(3)(ii)(C) - Where the ground-fault circuit-interrupter protection required by paragraph (b)(3)(ii)(B) of this section is not available for receptacles other than 125-volt, single-phase, 15-, 20-, and 30-ampere, the employer shall establish and implement an *assured equipment grounding conductor program* covering cord sets, receptacles that are not a part of the building or structure, and equipment connected by cord and plug that are available for use or used by employees on those receptacles. This *program* shall comply with the following requirements:

- 1910.304(b)(3)(ii)(C)(1) - A *written description of the program*, including the *specific procedures* adopted by the employer, shall be available at the jobsite for *inspection and copying* by the Assistant Secretary of Labor and any affected employee;
- 1910.304(b)(3)(ii)(C)(2) - The employer shall designate one or more *competent persons* to implement the *program*;
- 1910.304(b)(3)(ii)(C)(3) - Each cord set, attachment cap, plug, and receptacle of cord sets, and any equipment connected by cord and plug, except cord sets and receptacles which are fixed and not exposed to damage, shall be *visually inspected*

*before each day's use* for external defects, such as deformed or missing pins or insulation damage, and for indications of possible internal damage. Equipment found damaged or defective shall not be used until repaired;

- [1910.304\(b\)\(3\)\(ii\)\(C\)\(4\)](#) - The following tests shall be performed on all cord sets and receptacles which are not a part of the permanent wiring of the building or structure, and cord- and plug-connected equipment required to be grounded:  
[Reference [paragraph \(b\)\(3\)\(ii\)\(C\)\(4\)\(i\) - \(iii\)](#)].
- [1910.304\(b\)\(3\)\(ii\)\(C\)\(6\)](#) - Tests performed as required in [paragraph \(b\)\(3\)\(ii\)\(C\)](#) of this section shall be *recorded*. This *test record* shall identify each receptacle, cord set, and cord- and plug-connected equipment that passed the *test* and shall indicate the last date it was *tested* or the interval for which it was *tested*. This *record* shall be kept by means of logs, color coding, or other effective means and shall be maintained until replaced by a more *current record*. The *record* shall be made *available on the jobsite for inspection* by the Assistant Secretary and any *affected employee*.

[1910.304\(e\)\(2\)\(i\)](#) - Services over 600 volts, nominal. Service-entrance conductors installed as open wires shall be guarded to make them accessible only to *qualified persons*.

[1910.304\(e\)\(2\)\(ii\)](#) - Services over 600 volts, nominal. *Signs warning* of high voltage shall be posted where unqualified employees might come in contact with live parts.

[1910.304\(f\)\(1\)\(iii\)](#) - A disconnecting means shall be provided on the supply side of all fuses in circuits over 150 volts to ground and cartridge fuses in circuits of any voltage where accessible to other than *qualified persons* so that each individual circuit containing fuses can be independently disconnected from the source of power. However, a current-limiting device without a disconnecting means is permitted on the supply side of the service disconnecting means. In addition, a single disconnecting means is permitted on the supply side of more than one set of fuses as permitted by the exception in [1910.305\(j\)\(4\)\(vi\)](#) - *wiring methods, components, and equipment for general use*, for group operation of motors, and a single disconnecting means is permitted for fixed electric space-heating equipment.

[1910.304\(f\)\(1\)\(iv\)](#) - Overcurrent devices shall be readily accessible to each *employee or authorized building management personnel*. These overcurrent devices may not be located where they will be exposed to physical damage or in the vicinity of easily ignitable material.

[1910.304\(f\)\(1\)\(viii\)](#) - Circuit breakers used as switches in 120-volt and 277-volt, fluorescent lighting circuits shall be *listed and marked "SWD."*

1910.304(g)(1)(v)(C) - Systems to be grounded. If the system is separately derived and is supplied by a transformer that has a primary voltage rating less than 1000 volts, provided all of the following conditions are met:

- 1910.304(g)(1)(v)(C)(2) - The conditions of *maintenance and supervision* ensure that only *qualified persons* will service the installation.

1910.304(g)(1)(v)(E) - If the system is a high-impedance grounded neutral system in which a grounding impedance, usually a resistor, limits the ground-fault current to a low value for 3-phase ac systems of 480 volts to 1000 volts provided all of the following conditions are met:

- 1910.304(g)(1)(v)(E)(1) - The conditions of *maintenance and supervision* ensure that only *qualified persons* will service the installation.

1910.304(g)(6)(vii)(B) - *Listed or labeled* portable tools and appliances if protected by an *approved system* of double insulation, or its equivalent, and *distinctively marked*.

## **1910.305 - Wiring Methods, Components, and Equipment for General Use**

**Scope:** This standard provides electrical requirements for electrical installations and utilization equipment installed or used within or on buildings, structures, and other premises.

Qualified person - One who has received training in and has demonstrated skills and knowledge in the construction and operation of electric equipment and installations and the hazards involved.

**Special Requirements:** Markings/marked, signs, qualified person, approved, authorized, identified, nameplate, warning label, switching procedure (displayed)

1910.305(b)(3)(iii) - Covers for boxes shall be permanently *marked "HIGH VOLTAGE."* The *marking* shall be on the outside of the box cover and shall be readily *visible and legible*.

1910.305(c)(3)(ii) - Single-throw knife switches, molded-case switches, switches with butt contacts, and circuit breakers used as switches shall be connected so that the terminals supplying the load are deenergized when the switch is in the open position. However, blades and terminals supplying the load of a switch may be energized when the switch is in the open position where the switch is connected to circuits or equipment inherently capable of providing a backfeed source of power. For such installations, a *permanent sign* shall be installed on the switch enclosure or immediately adjacent to open switches that read, *"WARNING -- LOAD SIDE TERMINALS MAY BE ENERGIZED BY BACKFEED."*

1910.305(d)(1) - Switchboards with exposed live parts. Switchboards that have any exposed live parts shall be located in permanently dry locations and shall be accessible only to *qualified persons*.

1910.305(d)(2) - Panelboard enclosures. Panelboards shall be mounted in cabinets, cutout boxes, or enclosures designed for the purpose and shall be dead front. However, panelboards other than the dead front externally-operable type are permitted where accessible only to *qualified persons*.

1910.305(g)(1)(i) - Flexible cords and cables shall be *approved* for conditions of use and location.

1910.305(g)(1)(iii) - If used as permitted in paragraphs (g)(1)(ii)(C), (g)(1)(ii)(G), or (g)(1)(ii)(I) of this section, the flexible cord shall be equipped with an attachment plug and shall be energized from an *approved* receptacle outlet.

1910.305(h)(7) - *Splices*. Portable cables may not be operated with splices unless the splices are of the permanent molded, vulcanized, or other *approved* type.

1910.305(h)(8) - *Terminations*. Termination enclosures shall be suitably *marked* with a high voltage *hazard warning*, and terminations shall be accessible only to *authorized and qualified employees*.

1910.305(i)(1) - General. Fixture wires shall be *approved* for the voltage, temperature, and location of use. A fixture wire which is used as a grounded conductor shall be *identified*.

1910.305(j)(1)(iv) - Fixtures installed in wet or damp locations shall be *identified* for the purpose and shall be so constructed or installed that water cannot enter or accumulate in wireways, lampholders, or other electrical parts.

1910.305(j)(3)(iii) - Each electric appliance shall be provided with a *nameplate* giving the identifying *name and the rating* in volts and amperes, or in volts and watts. If the appliance is to be used on a specific frequency or frequencies, it shall be so *marked*. Where motor overload protection external to the appliance is required, the appliance shall be so *marked*.

1910.305(j)(3)(iv) - *Marking* shall be located so as to be *visible* or easily accessible after installation.

1910.305(j)(4)(ii) - An individual disconnecting means shall be provided for each controller. A disconnecting means shall be located within sight of the controller location. However, a single disconnecting means may be located adjacent to a group of coordinated controllers mounted adjacent to each other on a multi-motor continuous process machine. The controller disconnecting means for motor branch circuits over 600 volts, nominal, may be



out of sight of the controller, if the controller is *marked* with a *warning label* giving the location and identification of the disconnecting means that is to be locked in the open position.

1910.305(j)(6)(ii)(D)(3) - *Switching procedure* prominently *displayed* at the switching location.

## **1910.306 - Specific Purpose Equipment and Installations**

**Scope:** This standard provides electrical requirements for electrical installations and utilization equipment installed or used within or on buildings, structures, and other premises, primarily for specific purpose equipment (i.e., outside lights, circuses, cranes, hoists, elevators, welders) and installations.

Qualified person - One who has received training in and has demonstrated skills and knowledge in the construction and operation of electric equipment and installations and the hazards involved.

**Special Requirements:** Qualified person, signs, labels, listed, identified, references other standards

1910.306(a)(2)(iii) - Doors or covers giving access to uninsulated parts of indoor signs or outline lighting exceeding 600 volts and accessible to other than *qualified persons* shall either be provided with interlock switches to disconnect the primary circuit or shall be so fastened that the use of other than ordinary tools will be necessary to open them.

1910.306(c)(5) - Elevators, dumbwaiters, escalators, moving walks, wheelchair lifts, and stairway chair lifts. Location. The disconnecting means shall be located where it is readily accessible to *qualified persons*.

1910.306(c)(6)(ii) - Elevators, dumbwaiters, escalators, moving walks, wheelchair lifts, and stairway chair lifts. The disconnecting means shall be provided with a *sign* to identify the location of the supply-side overcurrent protective device.

1910.306(c)(8) - Elevators, dumbwaiters, escalators, moving walks, wheelchair lifts, and stairway chair lifts. *Warning sign* for multiple disconnecting means. A *warning sign* shall be mounted on or next to the disconnecting means where multiple disconnecting means are used and parts of the controllers remain energized from a source other than the one disconnected. The *sign* shall be clearly *legible* and shall read “*WARNING - PARTS OF THE CONTROLLER ARE NOT DEENERGIZED BY THIS SWITCH.*”

1910.306(g)(1)(iv) - Induction and dielectric heating equipment. *Warning labels or signs* that read “*DANGER - HIGH VOLTAGE - KEEP OUT*” shall be attached to the equipment and shall

be plainly visible where persons might contact energized parts when doors are opened or closed or when panels are removed from compartments containing over 250 volts ac or dc.

[1910.306\(h\)\(4\)\(iii\)](#) - Power supply circuits and receptacles for portable electric equipment. Receptacles on circuits supplied by an isolating transformer with an ungrounded secondary:

- [1910.306\(h\)\(4\)\(iii\)\(B\)](#) - Shall be distinctively *marked*.

[1910.306\(k\)\(2\)\(iii\)](#) - Carnivals, circuses, fairs, and similar events. Flexible cords and cables shall be listed for extra-hard usage. When used outdoors, flexible cords and cables shall also be *listed* for wet locations and shall be sunlight resistant.

[1910.306\(k\)\(2\)\(v\)](#) - Carnivals, circuses, fairs, and similar events. Open conductors are prohibited except as part of a *listed* assembly or festoon lighting installed in accordance with [1910.304\(c\)](#) - *wiring design and protection*.

[1910.306\(k\)\(2\)\(vi\)](#) - Carnivals, circuses, fairs, and similar events. Flexible cords and cables shall be continuous without splice or tap between boxes or fittings. Cord connectors may not be laid on the ground unless *listed* for wet locations. Connectors and cable connections may not be placed in audience traffic paths or within areas accessible to the public unless guarded.

[1910.306\(k\)\(2\)\(vii\)](#) - Carnivals, circuses, fairs, and similar events. Wiring for an amusement ride, attraction, tent, or similar structure may not be supported by another ride or structure unless specifically *identified* for the purpose.

[1910.306\(k\)\(4\)\(iii\)](#) - Carnivals, circuses, fairs, and similar events. Portable distribution and termination boxes. Receptacles shall have overcurrent protection installed within the box. The overcurrent protection may not exceed the ampere rating of the receptacle, except as permitted in [1910.305\(j\)\(4\)](#) - *wiring methods, components, and equipment for general use*, for motor loads.

[1910.306\(k\)\(4\)\(iv\)\(A\)](#) - Carnivals, circuses, fairs, and similar events. Where ac single-pole portable cable connectors are used, they shall be *listed* and of the locking type. Where paralleled sets of current-carrying single-pole separable connectors are provided as input devices, they shall be prominently *labeled with a warning* indicating the presence of internal parallel connections. The use of single-pole separable connectors shall comply with at least one of the following conditions: [Reference [paragraph \(k\)\(4\)\(iv\)\(A\)\(1\) - \(3\)](#)].

[1910.306\(k\)\(4\)\(iv\)\(B\)](#) - Carnivals, circuses, fairs, and similar events. Single-pole separable connectors used in portable professional motion picture and television equipment may be

interchangeable for ac or dc use or for different current ratings on the same premises only if they are *listed* for ac/dc use and *marked* to identify the system to which they are connected.

## 1910.307 - Hazardous Locations

**Scope:** This [standard](#) provides the requirements for electric equipment and wiring in locations that are classified depending on the properties of the flammable vapors, liquids or gases, or combustible dusts or fibers that may be present therein and the likelihood that a flammable or combustible concentration or quantity is present.

**Special Requirements:** Authorized, documented, approved, employer demonstrates, protection techniques, zone classification system, division classification system, protection techniques, registered professional engineer, classified areas, listed, marked

[1910.307\(a\)\(4\)](#) - *Division and zone classification*. In Class I locations, an installation must be classified as using the *division classification system* meeting [paragraphs \(c\)](#), [\(d\)](#), [\(e\)](#), and [\(f\)](#) of this section or using the *zone classification system* meeting [paragraph \(g\)](#) of this section. In Class II and Class III locations, an installation must be classified using the *division classification system* meeting [paragraphs \(c\)](#), [\(d\)](#), [\(e\)](#), and [\(f\)](#) of this section.

[1910.307\(b\)](#) - *Documentation*. All areas designated as *hazardous (classified) locations* under the Class and Zone system and areas designated under the Class and Division system established after August 13, 2007 shall be properly *documented*. This *documentation* shall be available to those *authorized* to design, install, *inspect*, *maintain*, or operate electric equipment at the location.

[1910.307\(c\)](#) - Electrical installations. Equipment, wiring methods, and installations of equipment in hazardous (classified) locations shall be intrinsically safe, *approved* for the hazardous (classified) location, or safe for the hazardous (classified) location. Requirements for each of these options are as follows: [Reference [paragraph \(c\)\(1\) - \(3\)](#)].

[1910.307\(e\)](#) - Equipment in Division 2 locations. Equipment that has been *approved* for a Division 1 location may be installed in a Division 2 location of the same class and group. General-purpose equipment or equipment in general-purpose enclosures may be installed in Division 2 locations if the *employer can demonstrate* that the equipment does not constitute a source of ignition under normal operating conditions.

[1910.307\(f\)](#) - *Protection techniques*. The following are acceptable *protection techniques* for electric and electronic equipment in hazardous (classified) locations. [Reference [paragraph \(f\)\(1\) - \(10\)](#)].

1910.307(g)(1) - *Scope*. Employers may use the *zone classification system* as an alternative to the *division classification system* for electric and electronic equipment and wiring for all voltage in Class I, Zone 0, Zone 1, and Zone 2 hazardous (classified) locations where fire or explosion hazards may exist due to flammable gases, vapors, or liquids.

1910.307(g)(3) - *Protection techniques*. One or more of the following *protection techniques* shall be used for electric and electronic equipment in *hazardous (classified) locations* classified under the *zone classification system*. [Reference paragraph (g)(3)(i) - (viii)].

1910.307(g)(4)(i) - *Classification of areas* and selection of equipment and wiring methods shall be under the supervision of a *qualified registered professional engineer*.

1910.307(g)(5)(i) - Equipment that is *listed* for a Zone 0 location may be installed in a Zone 1 or Zone 2 location of the same gas or vapor. Equipment that is *listed* for a Zone 1 location may be installed in a Zone 2 location of the same gas or vapor.

1910.307(g)(5)(ii) - Equipment shall be *marked* in accordance with paragraph (g)(5)(ii)(A) and (g)(5)(ii)(B) of this section, except as provided in (g)(5)(ii)(C).

1910.307(g)(5)(ii)(A) - Equipment approved for Class I, Division 1 or Class 1, Division 2 shall, in addition to being *marked* in accordance with (c)(2)(ii), be *marked* with the following: [Reference paragraph (g)(5)(ii)(A)(1) - (3)].

1910.307(g)(5)(ii)(C) - Equipment that the *employer demonstrates* will provide protection from the hazards arising from the flammability of the gas or vapor and the zone of location involved and will be recognized as providing such protection by employees need not be *marked*.

## **1910.308 - Special Systems**

**Scope:** This standard provides the general requirements for all circuits and equipment operated at over 600 volts.

**Special Requirements:** Signs, authorized qualified person, supervision, classification, listed, markings, references other standards

1910.308(a)(5)(iv) - Where fused cutouts are not suitable to interrupt the circuit manually while carrying full load, an approved means shall be installed to interrupt the entire load. Unless the fused cutouts are interlocked with the switch to prevent opening of the cutouts under load, a *conspicuous sign* shall be placed at such cutouts *reading*: "WARNING – DO NOT OPERATE UNDER LOAD."

[1910.308\(a\)\(5\)\(vi\)\(B\)](#) - Where more than one switch is installed with interconnected load terminals to provide for alternate connection to different supply conductors, each switch shall be provided with a *conspicuous sign* reading: "*WARNING – SWITCH MAY BE ENERGIZED BY BACKFEED.*"

[1910.308\(a\)\(6\)\(i\)](#) - A metallic enclosure shall be provided on the mobile machine for enclosing the terminals of the power cable. The enclosure shall include provisions for a solid connection for the grounding terminal to effectively ground the machine frame. The method of cable termination used shall prevent any strain or pull on the cable from stressing the electrical connections. The enclosure shall have provision for locking so only *authorized qualified persons* may open it and shall be *marked* with a *sign warning* of the presence of energized parts.

[1910.308\(a\)\(6\)\(ii\)](#) - All energized switching and control parts shall be enclosed in effectively grounded metal cabinets or enclosures. Circuit breakers and protective equipment shall have the operating means projecting through the metal cabinet or enclosure so these units can be reset without locked doors being opened. Enclosures and metal cabinets shall be locked so that only *authorized qualified persons* have access and shall be *marked* with a *sign warning* of the presence of energized parts. Collector ring assemblies on revolving-type machines (shovels, draglines, etc.) shall be guarded.

[1910.308\(b\)\(2\)](#) - *Emergency illumination.* Emergency illumination shall include all required means of egress lighting, *illuminated exit signs*, and all other lights necessary to provide illumination. Where emergency lighting is necessary, the system shall be so arranged that the failure of any individual lighting element, such as the burning out of a light bulb, cannot leave any space in total darkness.

[1910.308\(b\)\(3\)\(i\)](#) - A *sign* shall be placed at the service entrance equipment indicating the type and location of on-site emergency power sources. However, a *sign* is not required for individual unit equipment.

[1910.308\(b\)\(3\)\(ii\)](#) - Where the grounded circuit conductor connected to the emergency source is connected to a grounding electrode conductor at a location remote from the emergency source, there shall be a *sign* at the grounding location that shall identify all emergency and normal sources connected at that location.

[1910.308\(c\)\(1\)](#) - *Classification.* Class 1, Class 2, and Class 3 remote control, signaling, or power-limited circuits are characterized by their usage and electrical power limitation that differentiates them from light and power circuits. These circuits are *classified* in accordance with their respective voltage and power limitations as summarized in [paragraphs \(c\)\(1\)\(i\) through \(c\)\(1\)\(iii\)](#) of this section.

[1910.308\(c\)\(2\)](#) - *Marking*. A Class 2 or Class 3 power supply unit shall be durably *marked* where plainly visible to indicate the class of supply and its electrical rating.

[1910.308\(d\)\(1\)](#) - *Classifications*. Fire alarm circuits shall be *classified* either as nonpower limited or power limited.

[1910.308\(d\)\(4\)](#) - *Identification*. Fire alarm circuits shall be identified at terminal and junction locations in a manner that will prevent unintentional interference with the signaling circuit during *testing and servicing*. Power-limited fire alarm circuits shall be durably *marked* as such where plainly visible at terminations.

[1910.308\(e\)](#) - *Communications systems*. This paragraph applies to central-station-connected and non-central-station-connected telephone circuits, radio and television receiving and transmitting equipment, including community antenna television and radio distribution systems, telegraph, district messenger, and outside wiring for fire and burglar alarm, and similar central station systems. These installations need not comply with the provisions of [1910.303 - general, through 1910.308\(d\)](#) - *special systems, except for 1910.304(c)(1) - wiring design and protection, and 1910.307 - hazardous locations*

[1910.308\(e\)\(1\)\(i\)](#) - A *listed* primary protector shall be provided on each circuit run partly or entirely in aerial wire or aerial cable not confined within a block.

[1910.308\(e\)\(1\)\(ii\)](#) - A *listed* primary protector shall be also provided on each aerial or underground circuit when the location of the circuit within the block containing the building served allows the circuit to be exposed to accidental contact with electric light or power conductors operating at over 300 volts to ground.

[1910.308\(e\)\(1\)\(iii\)](#) - In addition, where there exists a lightning exposure, each interbuilding circuit on premises shall be protected by a *listed* primary protector at each end of the interbuilding circuit.

[1910.308\(g\)\(1\)](#) - *Scope*. [Paragraph \(g\)](#) of this section covers integrated electrical systems, other than unit equipment, in which orderly shutdown is necessary to ensure safe operation. An integrated electrical system as used in this section shall be a unitized segment of an industrial wiring system where all of the following conditions are met:

- [1910.308\(g\)\(1\)\(ii\)](#) - The conditions of *maintenance and supervision* ensure that only *qualified persons* will service the system.

[1910.308\(g\)\(2\)](#) - Location of overcurrent devices in or on premises. Overcurrent devices that are critical to integrated electrical systems need not be readily accessible to employees as required by [1910.304\(f\)\(1\)\(iv\)](#) - *wiring design and protection*, if they are located with mounting heights to ensure security from operation by *nonqualified persons*.



## 1910.332 – Training

**Scope:** This [standard](#) provides the training requirements for employees who face a risk of electric shock that is not reduced to a safe level by the electrical installation requirements of [1910.303 through 1910.308](#).

**Note:** Employees in occupations listed in [Table S-4](#) face such a risk and are required to be trained. Other employees who also may reasonably be expected to face a comparable risk of injury due to electric shock or other electrical hazards must also be trained.

**Special Requirements:** Training, qualified person, unqualified person, safety related work practices, determined, references other standards

[1910.332\(b\)\(1\)](#) - *Practices* addressed in this standard. Employees shall be *trained* in and familiar with the *safety-related work practices* required by [1910.331 through 1910.335](#) that pertain to their respective job assignments.

[1910.332\(b\)\(2\)](#) - Additional requirements for unqualified persons. Employees who are covered by [paragraph \(a\)](#) of this section but who are *not qualified persons* shall also be *trained* in and familiar with any *electrically related safety practices* not specifically addressed by [1910.331 through 1910.335](#) but which are necessary for their safety.

[1910.332\(b\)\(3\)](#) - Additional requirements for *qualified persons*. *Qualified persons* (i.e., those permitted to work on or near exposed energized parts) shall, at a minimum, be *trained* in and familiar with the following: [Reference [paragraph \(b\)\(3\)\(i\) - \(iii\)](#)].

[1910.332\(c\)](#) - *Type of training*. The *training* required by this section shall be of the classroom or on-the-job type. The degree of *training* provided shall be *determined* by the risk to the employee.

## 1910.333 - Selection and Use of Work Practices

**Scope:** This [standard](#) provides the requirements pertaining to safe work practices.

**Special Requirements:** Safety-related work practices, employer demonstrates, locked/tagged, tagging, procedures (written), qualified person, inspections, tests, visual determination, precautionary techniques, approved, protective measures, housekeeping duties, PPE, references other standards

[1910.333\(a\)](#) - General. *Safety-related work practices* shall be employed to prevent electric shock or other injuries resulting from either direct or indirect electrical contacts, when work is performed near or on equipment or circuits which are or may be energized. The

specific *safety-related work practices* shall be consistent with the nature and extent of the associated electrical hazards.

[1910.333\(a\)\(1\)](#) - Deenergized parts. Live parts to which an employee may be exposed shall be deenergized before the employee works on or near them, unless the *employer can demonstrate* that deenergizing introduces additional or increased hazards or is infeasible due to equipment design or operational limitations. Live parts that operate at less than 50 volts to ground need not be deenergized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.

[1910.333\(a\)\(2\)](#) - Energized parts. If the exposed live parts are not deenergized (i.e., for reasons of increased or additional hazards or infeasibility), other *safety-related work practices* shall be used to protect employees who may be exposed to the electrical hazards involved. Such *work practices* shall protect employees against contact with energized circuit parts directly with any part of their body or indirectly through some other conductive object. The *work practices* that are used shall be suitable for the conditions under which the work is to be performed and for the voltage level of the exposed electric conductors or circuit parts. Specific *work practice* requirements are detailed in [paragraph \(c\)](#) of this section.

[1910.333\(b\)\(1\)](#) - Application. This paragraph applies to work on exposed deenergized parts or near enough to them to expose the employee to any electrical hazard they present. Conductors and parts of electric equipment that have been deenergized but have not been *locked out or tagged* in accordance with [paragraph \(b\)](#) of this section shall be treated as energized parts, and [paragraph \(c\)](#) of this section applies to work on or near them.

[1910.333\(b\)\(2\)](#) - *Lockout and tagging*. While any employee is exposed to contact with parts of fixed electric equipment or circuits which have been deenergized, the circuits energizing the parts shall be *locked out or tagged* or both in accordance with the requirements of this paragraph. The requirements shall be followed in the order in which they are presented (i.e., [paragraph \(b\)\(2\)\(i\)](#) first, then [paragraph \(b\)\(2\)\(ii\)](#), etc.).

- [1910.333\(b\)\(2\)\(i\)](#) - *Procedures*. The employer shall maintain a *written copy* of the *procedures* outlined in [paragraph \(b\)\(2\)](#) and shall make it available for *inspection* by employees and by the Assistant Secretary of Labor and his or her authorized representatives. **Note:** The *written procedures* may be in the form of a copy of [paragraph \(b\)](#) of this section.
- [1910.333\(b\)\(2\)\(ii\)](#) - *Deenergizing equipment procedures* [Reference [paragraph \(b\)\(2\)\(ii\)\(A\) - \(D\)](#)].

- [1910.333\(b\)\(2\)\(iii\)](#) - Application of *lock and tags*. [Reference [paragraph \(b\)\(2\)\(iii\)\(A\) - \(E\)](#)]
- [1910.333\(b\)\(2\)\(iv\)](#) - Verification of deenergized condition *procedures* [Reference [paragraph \(b\)\(2\)\(iv\)](#)].
- [1910.333\(b\)\(2\)\(v\)](#) - *Reenergizing equipment procedures* [Reference [paragraph \(b\)\(2\)\(v\)\(A\) - \(D\)](#)].

[1910.333\(c\)\(2\)](#) - Work on energized equipment. Only *qualified persons* may work on electric circuit parts or equipment that have not been deenergized under the procedures of [paragraph \(b\)](#) of this section. Such persons shall be capable of working safely on energized circuits and shall be *familiar* with the proper use of *special precautionary techniques, personal protective equipment*, insulating and shielding materials, and insulated tools.

[1910.333\(c\)\(3\)](#) - Overhead lines. If work is to be performed near overhead lines, the lines shall be deenergized and grounded, or other *protective measures* shall be provided before work is started. If the lines are to be deenergized, arrangements shall be made with the person or organization that operates or controls the electric circuits involved to deenergize and ground them. If *protective measures*, such as guarding, isolating, or insulating are provided, these *precautions* shall prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.

**Note:** The *work practices* used by *qualified persons* installing insulating devices on overhead power transmission or distribution lines are covered by [1910.269](#) - *electric power generation, transmission, and distribution*, of this part, not by [1910.332 through 1910.335](#) of this part. Under [paragraph \(c\)\(2\)](#) of this section, unqualified persons are prohibited from performing this type of work.

[1910.333\(c\)\(3\)\(i\)\(A\)](#) - When an *unqualified person* is working in an elevated position near overhead lines, the location shall be such that the person and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead line than the following distances: [Reference [paragraph \(c\)\(3\)\(i\)\(A\) - \(B\)](#)].

[1910.333\(c\)\(3\)\(ii\)](#) - *Qualified persons*. When a *qualified person* is working in the vicinity of overhead lines, whether in an elevated position or on the ground, the person may not approach or take any conductive object without an *approved* insulating handle closer to exposed energized parts than shown in [Table S-5](#) unless: [Reference [paragraph \(c\)\(3\)\(ii\)\(A\) - \(C\)](#)].

[1910.333\(c\)\(3\)\(iii\)\(A\)\(3\)](#) - If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a *qualified person*, the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance given in [Table S-5](#).

[1910.333\(c\)\(6\)](#) - Conductive materials and equipment. Conductive materials and equipment that are in contact with any part of an employee's body shall be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts. If an employee must handle long dimensional conductive objects (such as ducts and pipes) in areas with exposed live parts, the employer shall institute *work practices* (such as the use of insulation, guarding, and *material handling techniques*) which will minimize the hazard.

[1910.333\(c\)\(9\)](#) - *Housekeeping duties*. Where live parts present an electrical contact hazard, employees may not perform *housekeeping duties* at such close distances to the parts that there is a possibility of contact, unless adequate safeguards (such as insulating equipment or barriers) are provided. Electrically conductive cleaning materials (including conductive solids such as steel wool, metalized cloth, and silicon carbide, as well as conductive liquid solutions) may not be used in proximity to energized parts unless *procedures* are followed which will prevent electrical contact.

## **1910.334 - Use of Equipment**

**Scope:** This [standard](#) provides requirements for use of equipment.

**Special Requirements:** Inspections, tests, qualified person, equipment rating, checks, approved, references other standards

[1910.334\(a\)\(2\)\(i\)](#) - Portable cord- and plug-connected equipment and flexible cord sets (extension cords) shall be *visually inspected before use* on any shift for external defects (such as loose parts, deformed and missing pins, or damage to outer jacket or insulation) and for evidence of possible internal damage (such as pinched or crushed outer jacket). Cord- and plug-connected equipment and flexible cord sets (extension cords) which remain connected once they are put in place and are not exposed to damage need not be *visually inspected* until they are relocated.

[1910.334\(a\)\(2\)\(ii\)](#) - If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item shall be removed from service, and no employee may use it until repairs and *tests* necessary to render the equipment safe have been made.

[1910.334\(a\)\(2\)\(iii\)](#) - When an attachment plug is to be connected to a receptacle (including any on a cord set), the relationship of the plug and receptacle contacts shall first be *checked* to ensure that they are of proper mating configurations.

[1910.334\(a\)\(4\)](#) - *Conductive work locations*. Portable electric equipment and flexible cords used in highly conductive work locations (such as those inundated with water or other conductive liquids), or in job locations where employees are likely to contact water or conductive liquids, shall be approved for those locations.

[1910.334\(b\)\(3\)](#) - *Overcurrent protection modification*. Overcurrent protection of circuits and conductors may not be modified, even on a temporary basis, beyond that allowed by [1910.304\(e\)](#) - *wiring design and protection*, the installation safety requirements for overcurrent protection.

[1910.334\(c\)\(1\)](#) - Use. Only *qualified persons* may perform *testing* work on electric circuits or equipment.

[1910.334\(c\)\(2\)](#) - *Visual inspection*. *Test instruments* and equipment and all associated test leads, cables, power cords, probes, and connectors shall be *visually inspected* for external defects and damage before the equipment is used. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item shall be removed from service, and no employee may use it until repairs and *tests* necessary to render the equipment safe have been made.

[1910.334\(c\)\(3\)](#) - *Rating of equipment*. *Test instruments* and equipment and their accessories shall be *rated* for the circuits and equipment to which they will be connected and shall be designed for the environment in which they will be used.

[1910.334\(d\)](#) - Occasional use of flammable or ignitable materials. Where flammable materials are present only occasionally, electric equipment capable of igniting them shall not be used, unless *measures* are taken to prevent hazardous conditions from developing. Such materials include, but are not limited to: flammable gases, vapors, or liquids; combustible dust; and ignitable fibers or flyings. **Note:** Electrical installation requirements for locations where flammable materials are present on a regular basis are contained in [1910.307](#) - *hazardous locations*.

## **1910.335 - Safeguards for Personnel Protection**

**Scope:** This [standard](#) provides requirements pertaining to safeguards used for personnel protection.

**Special Requirements:** Inspected, tests, unqualified person, warning signs, tags, PPE, attendants, alerting techniques, references other standards

[1910.335\(a\)\(1\)\(i\)](#) - Employees working in areas where there are potential electrical hazards shall be provided with, and shall use, *electrical protective equipment* that is appropriate for the specific parts of the body to be protected and for the work to be performed. **Note:** Personal protective equipment requirements are contained in [subpart I](#) - *personal protective equipment* of this part (1910).

[1910.335\(a\)\(1\)\(ii\)](#) - *Protective equipment* shall be maintained in a safe, reliable condition and shall be *periodically inspected or tested*, as required by [1910.137](#) - *electrical protective devices*.

[1910.335\(a\)\(1\)\(iii\)](#) - If the insulating capability of *protective equipment* may be subject to damage during use, the insulating material shall be protected. (For example, an outer covering of leather is sometimes used for the protection of rubber insulating material.)

[1910.335\(a\)\(1\)\(iv\)](#) - Employees shall wear nonconductive *head protection* wherever there is a danger of head injury from electric shock or burns due to contact with exposed energized parts.

[1910.335\(a\)\(1\)\(v\)](#) - Employees shall wear *protective equipment* for the eyes or face wherever there is danger of injury to the eyes or face from electric arcs or flashes or from flying objects resulting from electrical explosion.

[1910.335\(a\)\(2\)\(ii\)](#) - *Protective shields*, protective barriers, or insulating materials shall be used to protect each employee from shock, burns, or other electrically related injuries while that employee is working near exposed energized parts which might be accidentally contacted or where dangerous electric heating or arcing might occur. When normally enclosed live parts are exposed for maintenance or repair, they shall be guarded to protect *unqualified persons* from contact with the live parts.

[1910.335\(b\)](#) - *Alerting techniques*. The following *alerting techniques* shall be used to warn and protect employees from hazards which could cause injury due to electric shock, burns, or failure of electric equipment parts:

- [1910.335\(b\)\(1\)](#) - *Safety signs and tags*. *Safety signs, safety symbols, or accident prevention tags* shall be used where necessary to warn employees about electrical hazards which may endanger them, as required by [1910.145](#) - *specifications for accident prevention signs and tags*.
- [1910.335\(b\)\(2\)](#) - *Barricades*. Barricades shall be used in conjunction with *safety signs* where it is necessary to prevent or limit employee access to work areas



exposing employees to uninsulated energized conductors or circuit parts. Conductive barricades may not be used where they might cause an electrical contact hazard.

- [1910.335\(b\)\(3\)](#) - *Attendants*. If *signs* and barricades do not provide sufficient warning and protection from electrical hazards, an *attendant* shall be stationed to warn and protect employees.

## Subpart T - [Commercial Diving Operations](#)

[Subpart T](#) provides the requirements for commercial diving operations. It applies to diving and related support operations that are conducted in connection with all types of work and employments, including general industry, construction, ship repairing, shipbuilding, shipbreaking and longshoring.

[Scientific diving](#) means diving performed solely as a necessary part of a scientific, research, or educational activity by employees whose sole purpose for diving is to perform scientific research tasks. Scientific diving does not include performing any tasks usually associated with commercial diving such as: Placing or removing heavy objects underwater; inspection of pipelines and similar objects; construction; demolition; cutting or welding; or the use of explosives.

[Recreational diving instruction](#) means training diving students in the use of recreational diving procedures and the safe operation of diving equipment, including an open-circuit, semi-closed-circuit, or closed-circuit self-contained underwater breathing apparatus, during dives.

To learn if subpart T applies to you, go to [Does "Subpart T - Commercial Diving Operations" Apply to You?](#)

## Special Requirements

### 1910.410 - Qualifications of Dive Team

**Scope:** This [standard](#) provides the qualification requirements for the dive team.

**Special Requirements:** Training, decompression/treatment procedures, supervision, dive team members, designated person in charge

[1910.410\(a\)\(1\)](#) - Each dive team member shall have the *experience or training* necessary to perform assigned tasks in a safe and healthful manner.

1910.410(a)(2) - Each dive team member shall have *experience or training* in the following: [Reference paragraph (a)(2)(i) - (iii)].

1910.410(a)(3) - All dive team members shall be *trained in cardiopulmonary resuscitation and first aid* (American Red Cross standard course or equivalent).

1910.410(a)(4) - Dive team members who are exposed to or control the exposure of others to hyperbaric conditions shall be *trained in diving-related physics and physiology*.

1910.410(b)(1) - Each dive team member shall be *assigned tasks* in accordance with the *employee's experience or training*, except that limited additional tasks may be assigned to an employee undergoing *training* provided that these tasks are performed under the *direct supervision* of an experienced dive team member.

1910.410(b)(2) - The employer shall not require a dive team member to be exposed to hyperbaric conditions against the employee's will, except when necessary to complete *decompression or treatment procedures*.

1910.410(c)(1) - The employer or an *employee designated* by the employer shall be at the dive location *in charge* of all aspects of the diving operation affecting the safety and health of *dive team members*.

1910.410(c)(2) - The *designated person-in-charge* shall have *experience and training* in the conduct of the assigned diving operation.

## **1910.420 - Safe Practices Manual**

**Scope:** This standard provides the requirements pertaining to a safe practices manual.

**Special Requirements:** Safe practices manual (written), policies, copy of standard, procedures, checklists, assignments

1910.420(a) - General. The employer shall *develop* and maintain a *safe practices manual* which shall be made available at the dive location to each dive team member.

1910.420(b)(1) - The *safe practices manual* shall contain a *copy of this standard* and the *employer's policies* for implementing the requirements of this standard.

1910.420(b)(2) - For each diving mode engaged in, the *safe practices manual* shall include:

- 1910.420(b)(2)(i) - *Safety procedures and checklists* for diving operations;
- 1910.420(b)(2)(ii) - *Assignments and responsibilities* of the dive team members;

- [1910.420\(b\)\(2\)\(iii\)](#) - *Equipment procedures and checklists*; and
- [1910.420\(b\)\(2\)\(iv\)](#) - *Emergency procedures for fire, equipment failure, adverse environmental conditions, and medical illness and injury.*

## 1910.421 - Pre-Dive Procedures

**Scope:** This [standard](#) provides the requirements for pre-dive procedures.

**Special Requirements:** List, physician approved first aid kit, first aid handbook, assessment, employee briefing, procedures, inspections, flag, warning signal, employer inquire (physical fitness)

[1910.421\(b\)](#) - Emergency aid. A *list* shall be kept at the dive location of the telephone or call numbers of the following: [Reference [paragraph \(b\)\(1\) - \(5\)](#)].

[1910.421\(c\)\(1\)](#) - A first aid kit appropriate for the diving operation and *approved by a physician* shall be available at the dive location.

[1910.421\(c\)\(3\)](#) - In addition to any other first aid supplies, an *American Red Cross standard first aid handbook or equivalent*, and a bag-type manual resuscitator with transparent mask and tubing shall be *available* at the dive location.

[1910.421\(d\)](#) - *Planning and assessment*. Planning of a diving operation shall include an *assessment* of the safety and health aspects of the following: [Reference [paragraph \(d\)\(1\) - \(9\)](#)].

[1910.421\(f\)\(1\)](#) - Dive team members shall be *briefed* on: [Reference [paragraph \(f\)\(1\)\(i\) - \(iv\)](#)].

[1910.421\(f\)\(2\)](#) - Prior to making individual dive team member assignments, the employer shall *inquire* into the dive team member's current state of *physical fitness*, and indicate to the dive team member the *procedure* for reporting physical problems or adverse physiological effects during and after the dive.

[1910.421\(g\)](#) - *Equipment inspection*. The breathing gas supply system including reserve breathing gas supplies, masks, helmets, thermal protection, and bell handling mechanism (when appropriate) shall be *inspected prior to each dive*.

[1910.421\(h\)](#) - *Warning signal*. When diving from surfaces other than vessels in areas capable of supporting marine traffic, a rigid replica of the *international code flag "A"* at least one meter in height shall be *displayed* at the dive location in a manner which allows all-round visibility, and shall be *illuminated* during night diving operations.

## 1910.422 - Procedures During Dive

**Scope:** This [standard](#) provides the requirements pertaining to procedures during the dive.

**Liveboating:** The practice of supporting a surfaced-supplied air or mixed gas diver from a vessel which is underway.

**Special Requirements:** Procedures, communication system/communications, decompression tables, dive profiles, tests, designated person-in-charge, dive team member, references other standards

[1910.422\(b\)](#) - Water entry and exit (Procedures). [Reference [paragraph \(b\)\(1\) - \(3\)](#)].

[1910.422\(c\)\(1\)](#) - An operational two-way voice *communication system* shall be used between: [Reference [paragraph \(c\)\(1\)\(i\) - \(ii\)](#)].

[1910.422\(c\)\(2\)](#) - An operational, two-way *communication system* shall be available at the dive location to obtain emergency assistance.

[1910.422\(d\)](#) - *Decompression tables*. Decompression, repetitive, and no-decompression tables (as appropriate) shall be at the dive location.

[1910.422\(e\)](#) - *Dive profiles*. A *depth-time profile*, including when appropriate any breathing gas changes, shall be maintained for *each diver during the dive* including decompression.

[1910.422\(g\)\(1\)](#) - A current supply switch to interrupt the current flow to the welding or burning electrode shall be:

- [1910.422\(g\)\(1\)\(i\)](#) - Tended by a dive team member in *voice communication* with the diver performing the welding or burning.

[1910.422\(h\)\(1\)](#) - Employers shall transport, store, and use explosives in accordance with this section and the applicable provisions of [1910.109](#) - *explosives and blasting agents*, and [1926.912](#) - underwater blasting, of Title 29 of the Code of Federal Regulations.

[1910.422\(h\)\(2\)](#) - Electrical continuity of explosive circuits shall not be *tested* until the diver is out of the water.

[1910.422\(i\)](#) - Termination of dive. The working interval of a dive shall be terminated when:

- [1910.422\(i\)\(1\)](#) - A diver *requests* termination;
- [1910.422\(i\)\(2\)](#) - A diver fails to respond correctly to *communications or signals* from a *dive team member*;

- [1910.422\(i\)\(3\)](#) - *Communications* are lost and can not be quickly re-established between the diver and a *dive team member* at the dive location, and between the *designated person-in-charge* and the person controlling the vessel in liveboating operations.

## 1910.423 - Post-Dive Procedures

**Scope:** This [standard](#) provides the procedures to be followed after diving.

**Special Requirements:** Procedures, checks, instruct, alert, advise, records, evaluation (written, procedure assessment, communication system, dive team member, designated person-in-charge, information, records, investigation, corrective action

[1910.423\(b\)\(1\)](#) - Precautions. After the completion of any dive, the employer shall (*procedures*):

- [1910.423\(b\)\(1\)\(i\)](#) - *Check* the physical condition of the diver;
- [1910.423\(b\)\(1\)\(ii\)](#) - *Instruct* the diver to report any physical problems or adverse physiological effects including symptoms of decompression sickness;
- [1910.423\(b\)\(1\)\(iii\)](#) - *Advise* the diver of the location of a decompression chamber which is ready for use; and
- [1910.423\(b\)\(1\)\(iv\)](#) - *Alert* the diver to the potential hazards of flying after diving.

[1910.423\(b\)\(2\)](#) - For any dive outside the no-decompression limits, deeper than 100 fsw or using mixed gas as a breathing mixture, the employer shall *instruct* the diver to remain awake and in the vicinity of the decompression chamber which is at the dive location for at least one hour after the dive (including decompression or treatment as appropriate).

[1910.423\(c\)\(4\)\(iii\)](#) - Decompression chamber. A two-way voice *communication system* between occupants and a dive team member at the dive location.

[1910.423\(c\)\(6\)](#) - A *dive team member* shall be available at the dive location *during and for at least one hour after* the dive to operate the decompression chamber (when required or provided).

[1910.423\(d\)\(1\)](#) - The following *information* shall be *recorded* and *maintained* for each diving operation: [Reference [paragraph \(d\)\(1\)\(i\) - \(vi\)](#)].

[1910.423\(d\)\(2\)](#) - For each dive outside the no-decompression limits, deeper than 100 fsw or using mixed gas, the following additional *information* shall be *recorded and maintained*: [Reference [paragraph \(d\)\(2\)\(i\) - \(iii\)](#)].

[1910.423\(d\)\(3\)](#) - For each dive in which decompression sickness is suspected or symptoms are evident, the following additional information shall be *recorded and maintained*: [Reference [paragraph \(d\)\(3\)\(i\) - \(ii\)](#)].

[1910.423\(e\)](#) - *Decompression procedure assessment*. The employer shall:

- [1910.423\(e\)\(1\)](#) - *Investigate and evaluate* each incident of decompression sickness based on the *recorded information*, consideration of the past performance of decompression table used, and individual susceptibility;
- [1910.423\(e\)\(2\)](#) - Take appropriate *corrective action* to reduce the probability of recurrence of decompression sickness; and
- [1910.423\(e\)\(3\)](#) - Prepare a *written evaluation* of the decompression *procedure assessment*, including any corrective action taken, within 45 days of the incident of decompression sickness.

## **1910.424 - SCUBA Diving**

**Scope:** This [standard](#) provides the requirements for SCUBA diving.

[SCUBA diving](#): A diving mode independent of surface supply in which the diver uses open circuit self-contained underwater breathing apparatus.

**Special Requirements:** Procedures, standby diver

[1910.424\(c\)](#) - *Procedures*. [Reference [paragraph \(c\)\(\(1\) - \(5\)](#)].

## **1910.425 - Surface-Supplied Air Diving**

**Scope:** This [standard](#) provides the requirements for surface-supplied air diving.

[Surface-supplied air diving](#): A diving mode in which the diver in the water is supplied from the dive location with compressed air for breathing.

**Special Requirements:** Procedures, dive team members

[1910.425\(c\)](#) - *Procedures*. [Reference [paragraph \(c\)\(1\) - \(6\)](#)].

## **1910.426 - Mixed-Gas Diving**

**Scope:** This [standard](#) provides requirements for mixed-gas diving.

[Mixed-gas diving](#): A diving mode in which the diver is supplied in the water with a breathing gas other than air.



**Special Requirements:** Procedures, dive team member, standby diver

[1910.426\(c\)](#) - *Procedures*. [Reference [paragraph \(c\)\(1\) - \(9\)](#)].

## 1910.427 – Liveboating

**Scope:** This [standard](#) provides the requirements pertaining to liveboating.

*Liveboating:* The practice of supporting a surfaced-supplied air or mixed gas diver from a vessel which is underway.

**Special Requirements:** Procedures, standby diver, designated person-in-charge, communication

[1910.427\(c\)](#) - *Procedures*. [Reference [paragraph \(c\)\(1\) - \(5\)](#)].

## 1910.430 – Equipment

**Scope:** This [standard](#) provides the requirements for diving equipment.

**Special Requirements:** Tests, maintenance, calibration, records, tagging and logging system, person's initials, marked, designed, maintenance, references other standards

[1910.430\(a\)\(2\)](#) - Each equipment modification, repair, *test, calibration or maintenance* service shall be *recorded* by means of a *tagging or logging system*, and include the date and nature of work performed, and the *name or initials of the person* performing the work.

[1910.430\(b\)\(4\)](#) - The output of air compressor systems shall be *tested for air purity every 6 months* by means of samples taken at the connection to the distribution system, except that non-oil lubricated compressors need not be tested for oil mist.

[1910.430\(c\)\(1\)](#) - Breathing gas supply hoses shall:

- [1910.430\(c\)\(1\)\(iii\)](#) - Be *tested at least annually* to 1.5 times their working pressure;
- [1910.430\(c\)\(3\)\(i\)](#) - Be *marked* in 10-ft. increments to 100 feet beginning at the diver's end, and in 50 ft. increments thereafter

[1910.430\(e\)](#) - Compressed gas cylinders. Compressed gas cylinders shall:

- [1910.430\(e\)\(1\)](#) - Be *designed, constructed and maintained* in accordance with the applicable provisions of [29 CFR 1910.101](#) - *compressed gases (general requirements)* and [1910.169](#) - *air receivers, through 1910.171 (does not exist)*.

### 1910.430(f) - Decompression chambers.

- 1910.430(f)(1) - Each decompression chamber manufactured after the effective date of this standard, shall be built and maintained in accordance with the *ASME Code* or equivalent.
- 1910.430(f)(2) - Each decompression chamber manufactured prior to the effective date of this standard shall be *maintained in conformity with the code* requirements to which it was built, or equivalent.

## **1910.440 - Recordkeeping Requirements**

**Scope:** This standard provides the recordkeeping requirements for commercial diving operations.

**Special Requirements:** Records, dive team members, inspection, document, safe practices manual, medical records, exposure records, depth-time profiles, dive recordings, hospital records, procedure assessment evaluations, equipment inspections, testing records, references other standards

1910.440(a)(2) - The employer shall *record* the occurrence of any diving-related injury or illness which requires any *dive team member* to be hospitalized for 24 hours or more, specifying the circumstances of the incident and the extent of any injuries or illnesses.

1910.440(b)(1) - Upon the request of the Assistant Secretary of Labor for Occupational Safety and Health, or the Director, National Institute for Occupational Safety and Health, Department of Health and Human Services of their designees, the employer shall make available for *inspection and copying any record or document* required by this standard.

1910.440(b)(2) - *Records and documents* required by this standard shall be provided upon request to employees, designated representatives, and the Assistant Secretary in accordance with 29 CFR 1910.1020 - *access to employee exposure and medical records, (a)-(e) and (g)-(i)*. *Safe practices manuals* (1910.420 - *safe practices manual*), *depth-time profiles* (1910.422 - *procedures during dive*), *recordings of dives* (1910.423 - *post-dive procedures*), *decompression procedure assessment evaluations* (1910.423 - *post-dive procedures*), and *records of hospitalizations* (1910.440 - *recordkeeping requirements*) shall be provided in the same manner as *employee exposure records* or analyses using *exposure or medical records*. *Equipment inspections and testing records* which pertain to employees (1910.430 - *equipment*) shall also be provided upon request to employees and their designated representatives.

1910.440(b)(3) - *Records and documents* required by this standard shall be retained by the employer for the following period: [Reference paragraph (b)(3)(i) - (vii)].

[1910.440\(b\)\(4\)](#) - The employer shall comply with any additional requirements set forth at [29 CFR 1910.1020](#) - *access to employee exposure and medical records*.

## Subpart Z - [Toxic and Hazardous Substances](#)

[Subpart Z](#) provides requirements relating to employee exposures to air contaminants and the following health hazards: asbestos, coal tar pitch volatiles, 13 carcinogens (e.g., 4-Nitrobiphenyl, alpha-Naphthylamine, chloromethyl ether, 3,3'-Dichlorobenzidine (and its salts), bis-Chloromethyl ether, beta-Naphthylamine, Benzidine, 4-Aminodiphenyl, Ethyleneimine, beta-Propiolactone, 2-Acetylaminofluorene, 4-Dimethylaminoazo-benzene, and N-Nitrosodimethylamine), vinyl chloride, inorganic arsenic, beryllium, lead, chromium (VI), cadmium, benzene, coke oven emissions, cotton dust, 1,2-dibromo-3-chloropropane, methylnedianiline, respirable crystalline silica, ionizing radiation, ethylene oxide, 1,3-butadiene, ethylene chloride, formaldehyde, bloodborne pathogens, acrylonitrile, hazard communication, and chemical hazards in laboratories. It also provides requirements pertaining to employee medical and exposure records and DOT markings, placards, and labels.

To learn if subpart Z applies to you, go to [Does "Subpart Z - Toxic and Hazardous Substances" Apply to You?](#)

## Special Requirements

### 1910.1000 - Air Contaminants

**Scope:** This [standard](#) provides the requirements for exposure to air contaminants.

**Special Requirements:** Exposure monitoring, ceiling values, PPE, protective measures, administrative controls, approved, competent industrial hygienist, qualified person, engineering controls, exposures, exposure limit, time weighted average, computation formula, determine, references other standards

An employee's exposure to any substance listed in [Tables Z-1](#) - limits for air contaminants, [Z-2](#), or [Z-3](#) - mineral dusts, of this section shall be limited in accordance with the requirements of the following paragraphs of this section.

[1910.1000\(a\)\(1\)](#) - Substances with limits preceded by "C"—*Ceiling Values*. An employee's exposure to any substance in [Table Z-1](#), the exposure limit of which is preceded by a "C", shall at no time exceed the *exposure limit* given for that substance. If instantaneous *monitoring* is not feasible, then the *ceiling* shall be assessed as a 15-minute *time weighted average* exposure which shall not be exceeded at any time during the working day.

[1910.1000\(a\)\(2\)](#) - Other substances—*8-hour Time Weighted Averages*. An employee's *exposure* to any substance in [Table Z-1](#), the *exposure limit* of which is not preceded by a "C", shall not exceed the 8-hour *Time Weighted Average* given for that substance in any 8-hour work shift of a 40-hour work week.

[1910.1000\(b\)](#) - [Table Z-2](#). An employee's *exposure* to any substance listed in [Table Z-2](#) shall not exceed the *exposure limits* specified as follows: [Reference [paragraph \(b\)\(1\) - \(3\)](#)].

[1910.1000\(c\)](#) - [Table Z-3](#). An employee's *exposure* to any substance listed in [Table Z-3](#), in any 8-hour work shift of a 40-hour work week, shall not exceed the 8-hour *time weighted average* limit given for that substance in the table.

[1910.1000\(d\)](#) - *Computation formulae*. The *computation formula* which shall apply to employee *exposure* to more than one substance for which 8-hour *time weighted averages* are listed in [subpart Z](#) of 29 CFR [part 1910](#) in order to *determine* whether an employee is *exposed* over the regulatory limit is as follows: [Reference [paragraph \(d\)\(1\) - \(2\)](#)].

[1910.1000\(e\)](#) - To achieve *compliance* with [paragraphs \(a\) through \(d\)](#) of this section, *administrative or engineering controls* must first be *determined* and implemented whenever feasible. When such *controls* are not feasible to achieve full compliance, *protective equipment or any other protective measures* shall be used to keep the *exposure* of employees to air contaminants within the *limits* prescribed in this section. Any equipment and/or *technical measures* used for this purpose must be *approved* for each particular use by a *competent industrial hygienist or other technically qualified person*. Whenever respirators are used, their use shall comply with [1910.134](#) - *respiratory protection*.

## 1910.1001 – Asbestos

**Scope:** This [standard](#) provides the requirements pertaining to asbestos.

**Special Requirements:** Permissible exposure levels, written notification, data, results, method, work practices, objective data, time-weighted average, determination, notify, affected employees, corrective action, exposure monitoring, excursion limit, regulated areas, demarcation, compliance program (written), engineering controls, respiratory protection program, self-help smoking cessation program material, asbestos awareness training course, work practice controls, review, update, employee rotation, authorized persons, PPE (i.e., respirators), cleaning, labels, laundry, showers, communication, training, chemical manufacturers, importers, distributors, hazard communication program, safety data sheets, change rooms, demonstrate, designate, inform, records, due diligence, posting, signs, treat, classifying hazards, duties, determine, employee participation, sign/label specifications, training program, building and facility owners, medical surveillance program, housekeeping, medical surveillance, analytical techniques,

industrial hygienist, physician, examinations, objective data, results, exposure measurements, recordkeeping, inform, statement, instruct, physician's written opinion, employee observation, written request, safety and health procedures, observation procedures, references other standards

1910.1001(a)(2) - This section does not apply to construction work as defined in 29 CFR 1910.12(b) - *construction work*. (Exposure to asbestos in construction work is covered by 29 CFR 1926.1101 - *asbestos*).

1910.1001(a)(3) - This section does not apply to ship repairing, shipbuilding and shipbreaking employments and related employments as defined in 29 CFR 1915.4 - *definitions*. (Exposure to asbestos in these employments is covered by 29 CFR 1915.1001 - *asbestos*).

1910.1001(c)(1) - *Time-weighted average limit (TWA)*. The employer shall ensure that no employee is exposed to an airborne concentration of asbestos in excess of 0.1 fiber per cubic centimeter of air as an *eight (8)-hour time-weighted average (TWA)* as determined by the *method* prescribed in Appendix A - *OSHA reference method - mandatory*, to this section, or by an equivalent *method*.

1910.1001(c)(2) - *Excursion limit*. The employer shall ensure that no employee is exposed to an airborne concentration of asbestos in excess of 1.0 fiber per cubic centimeter of air (1 f/cc) as averaged over a *sampling period* of *thirty (30) minutes* as determined by the *method* prescribed in Appendix A - *OSHA reference method - mandatory*, to this section, or by an equivalent *method*.

1910.1001(d) - *Exposure monitoring*. [Reference paragraph (d)(1) - (7)].

- 1910.1001(d)(1) - General. [Reference paragraph (d)(1)(i) - (ii)].
- 1910.1001(d)(2) - *Initial monitoring*. [Reference paragraph (d)(2)(i) - (iii)].
- 1910.1001(d)(3) - *Monitoring frequency (periodic monitoring) and patterns*. After the *initial determinations* required by paragraph (d)(2)(i) of this section, samples shall be of such frequency and pattern as to represent with reasonable accuracy the levels of exposure of the employees. In no case shall *sampling* be at intervals greater than *six months* for employees whose exposures may reasonably be foreseen to exceed the *TWA permissible exposure limit and/or excursion limit*.
- 1910.1001(d)(4) - *Changes in monitoring frequency*. If either the *initial or the periodic monitoring* required by paragraphs (d)(2) and (d)(3) of this section statistically indicates that employee exposures are below the *TWA permissible exposure limit and/or excursion limit*, the employer may discontinue the *monitoring* for those employees whose exposures are represented by such *monitoring*.
- 1910.1001(d)(5) - *Additional monitoring*. Notwithstanding the provisions of paragraphs (d)(2)(ii) and (d)(4) of this section, the employer shall institute the *exposure monitoring* required under paragraphs (d)(2)(i) and (d)(3) of this section

whenever there has been a change in the production, process, control equipment, personnel or *work practices* that may result in new or additional exposures above the *TWA permissible exposure limit and/or excursion limit* or when the employer has any reason to suspect that a change may result in new or additional exposures above the *PEL and/or excursion limit*.

- [1910.1001\(d\)\(6\)](#) - *Method of monitoring*. [Reference [paragraph \(d\)\(6\)\(i\) - \(iv\)](#)].
- [1910.1001\(d\)\(7\)](#) - *Employee notification of monitoring results*.
  - [1910.1001\(d\)\(7\)\(i\)](#) - The employer must, within *15 working days after the receipt of the results* of any *monitoring* performed under this sections, *notify each affected employee* of these *results* either individually in *writing or by posting the results* in an appropriate location that is accessible to *affected employees*.
  - [1910.1001\(d\)\(7\)\(ii\)](#) - The *written notification* required by [paragraph \(d\)\(7\)\(i\)](#) of this section shall contain the *corrective action* being taken by the employer to reduce employee exposure to or below the *TWA and/or excursion limit*, wherever *monitoring results* indicated that the *TWA and/or excursion limit* had been exceeded.

#### [1910.1001\(e\)](#) - *Regulated Areas*.

- [1910.1001\(e\)\(1\)](#) - *Establishment*. The employer shall establish *regulated areas* wherever airborne concentrations of asbestos and/or PACM are in excess of the *TWA and/or excursion limit* prescribed in [paragraph \(c\)](#) of this section.
- [1910.1001\(e\)\(2\)](#) - *Demarcation*. *Regulated areas* shall be *demarcated* from the rest of the workplace in any manner that minimizes the number of persons who will be exposed to asbestos.
- [1910.1001\(e\)\(3\)](#) - *Access*. Access to *regulated areas* shall be limited to *authorized persons or to persons authorized* by the Act or regulations issued pursuant thereto.
- [1910.1001\(e\)\(4\)](#) - *Provision of respirators*. Each person entering a *regulated area* shall be supplied with and required to use a *respirator*, selected in accordance with [paragraph \(g\)\(2\)](#) of this section.
- [1910.1001\(e\)\(5\)](#) - *Prohibited activities*. The employer shall ensure that employees do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the *regulated areas*.

#### [1910.1001\(f\)](#) - *Methods of compliance*.

- [1910.1001\(f\)\(1\)](#) - *Engineering controls and work practices*. [Reference [paragraph \(f\)\(1\)\(i\) - \(x\)](#)].
- [1910.1001\(f\)\(2\)](#) - *Compliance program*.
  - [1910.1001\(f\)\(2\)\(i\)](#) - Where the *TWA and/or excursion limit* is exceeded, the employer shall establish and implement a *written program* to reduce employee exposure to or below the *TWA* and to or below the *excursion limit* by means of *engineering and work practice controls* as required by [paragraph](#)



(f)(1) of this section, and by the use of *respiratory protection* where required or permitted under this section.

- [1910.1001\(f\)\(2\)\(ii\)](#) - Such *programs shall be reviewed and updated* as necessary to reflect significant changes in the status of the employer's *compliance program*.
- [1910.1001\(f\)\(2\)\(iii\)](#) - *Written programs* shall be submitted upon request for *examination and copying* to the Assistant Secretary, the Director, affected employees and designated employee representatives.
- [1910.1001\(f\)\(2\)\(iv\)](#) - The employer shall not use *employee rotation* as a means of compliance with the *TWA and/or excursion limit*.
- [1910.1001\(f\)\(3\)](#) - Specific *compliance methods* for brake and clutch repair: [Reference [paragraph \(f\)\(3\)\(i\) - \(ii\)](#)].

[1910.1001\(g\)\(1\)](#) - General. For employees who use *respirators* required by this section, the employer must provide each employee an appropriate *respirator* that complies with the requirements of this paragraph. *Respirators* must be used during: [Reference [paragraph \(g\)\(1\)\(i\) - \(iv\)](#)].

[1910.1001\(g\)\(2\)](#) - *Respirator program*. [Reference [paragraph \(g\)\(2\)\(i\) - \(iii\)](#)].

- [1910.1001\(g\)\(2\)\(i\)](#) - The employer must implement a *respiratory protection program* in accordance with [29 CFR 134\(b\) through \(d\)](#) [except [\(d\)\(1\)\(iii\)](#)], and [\(f\) through \(m\)](#), which covers each employee required by this section to use a *respirator*.

[1910.1001\(g\)\(3\)](#) - *Respirator selection*. Employers must: [Reference [paragraph \(g\)\(3\)\(i\) - \(ii\)](#)].

[1910.1001\(h\)](#) - *Protective work clothing and equipment*.

- [1910.1001\(h\)\(1\)](#) - Provision and use. If an employee is exposed to asbestos above the *TWA and/or excursion limit*, or where the possibility of eye irritation exists, the employer shall provide at no cost to the employee and ensure that the employee uses appropriate *protective work clothing and equipment* such as, but not limited to: [Reference [paragraph \(h\)\(1\)\(i\) - \(iii\)](#)].
- [1910.1001\(h\)\(2\)](#) - *Removal and storage*. [Reference [paragraph \(h\)\(2\)\(i\) - \(iv\)](#)].
- [1910.1001\(h\)\(3\)](#) - *Cleaning and replacement*. [Reference [paragraph \(h\)\(3\)\(i\) - \(vi\)](#)].

[1910.1001\(i\)](#) - *Hygiene facilities and practices*.

- [1910.1001\(i\)\(1\)](#) - *Change rooms*. [Reference [paragraph \(i\)\(1\)\(i\) - \(ii\)](#)].
  - [1910.1001\(i\)\(1\)\(ii\)](#) - The employer shall ensure that change rooms are in accordance with [1910.141\(e\) - sanitation](#), of this part, and are equipped with two separate lockers or storage facilities, so separated as to prevent

contamination of the employee's street clothes from his *protective work clothing and equipment*.

- [1910.1001\(i\)\(2\)](#) - Showers. [Reference [paragraph \(i\)\(2\)\(i\) - \(iii\)](#)].
  - [1910.1001\(i\)\(2\)\(ii\)](#) - The employer shall provide shower facilities which comply with [1910.141\(d\)\(3\)](#) - *sanitation*, of this part.
- [1910.1001\(i\)\(3\)](#) - Lunchrooms. [Reference [paragraph \(i\)\(3\)\(i\) - \(iv\)](#)].
- [1910.1001\(i\)\(4\)](#) - Smoking in work areas. The employer shall ensure that employees do not *smoke in work areas* where they are occupationally exposed to asbestos because of activities in that work area.

[1910.1001\(j\)](#) - *Communication of hazards* to employees - Introduction. This section applies to the communication of information concerning asbestos hazards in general industry to facilitate compliance with this standard. *Asbestos exposure* in general industry occurs in a wide variety of industrial and commercial settings. Employees who manufacture asbestos-containing products may be exposed to asbestos fibers. Employees who repair and replace automotive brakes and clutches may be exposed to asbestos fibers. In addition, employees engaged in housekeeping activities in industrial facilities with asbestos product manufacturing operations, and in public and commercial buildings with installed asbestos containing materials may be exposed to asbestos fibers. Most of these workers are covered by this general industry standard, with the exception of state or local governmental employees in non-state plan states. It should be noted that employees who perform housekeeping activities during and after *construction activities* are covered by the asbestos construction standard, [29 CFR 1926.1101](#) - *asbestos, formerly 1926.58*. However, housekeeping employees, regardless of industry designation, should know whether building components they maintain may expose them to asbestos. The same *hazard communication* provisions will protect employees who perform housekeeping operations in all three asbestos standards; general industry, construction, and shipyard employment. As noted in the construction standard, building owners are often the only and/or best source of *information* concerning the presence of previously installed asbestos containing building materials. Therefore they, along with employers of potentially exposed employees, are assigned specific *information* conveying and *retention duties* under this section.

[1910.1001\(j\)\(1\)](#) - *Hazard communication* - general.

- [1910.1001\(j\)\(1\)\(i\)](#) - Chemical manufacturers, importers, distributors and employers shall comply with all requirements of the *Hazard Communication Standard (HCS)* ([§1910.1200](#)) for asbestos.
- [1910.1001\(j\)\(1\)\(ii\)](#) - In *classifying the hazards* of asbestos at least the following hazards are to be addressed: Cancer and lung effects.
- [1910.1001\(j\)\(1\)\(iii\)](#) - Employers shall include asbestos in the *hazard communication program* established to comply with the HCS ([§1910.1200](#)). Employers shall ensure that each employee has access to *labels* on containers of asbestos and to *safety data sheets*, and is *trained* in accordance with the requirements of HCS and [paragraph \(j\)\(7\)](#) of this section.

1910.1001(j)(2) - Installed Asbestos Containing Material. Employers and building owners are required to treat installed TSI and sprayed on and troweled-on surfacing materials as ACM in buildings constructed no later than 1980 for purposes of this standard. These materials are designated "*presumed ACM or PACM*", and are defined in paragraph (b) of this section. Asphalt and vinyl flooring material installed no later than 1980 also must be treated as asbestos-containing. The employer or building owner may demonstrate that PACM and flooring material do not contain asbestos by complying with paragraph (j)(8)(iii) of this section.

1910.1001(j)(3) - Duties of employers and building and facility owners.

- 1910.1001(j)(3)(i) - Building and facility owners shall determine the presence, location, and quantity of ACM and/or PACM at the work site. Employers and building and facility owners shall exercise *due diligence* in complying with these requirements to inform employers and employees about the presence and location of ACM and PACM.
- 1910.1001(j)(3)(ii) - Building and facility owners shall maintain records of all information required to be provided pursuant to this section and/or otherwise known to the building owner concerning the presence, location and quantity of ACM and PACM in the building/facility. Such records shall be kept for the duration of ownership and shall be transferred to successive owners.
- 1910.1001(j)(3)(iii) - Building and facility owners shall inform employers of employees, and employers shall inform employees who will perform housekeeping activities in areas which contain ACM and/or PACM of the presence and location of ACM and/or PACM in such areas which may be contacted during such activities.

1910.1001(j)(4) - Warning signs.

- 1910.1001(j)(4)(i) - Posting. Warning signs shall be provided and displayed at each regulated area. In addition, warning signs shall be posted at all approaches to regulated areas so that an employee may read the signs and take necessary protective steps before entering the area.
- 1910.1001(j)(4)(ii) - Sign specifications.
  - 1910.1001(j)(4)(ii)(A) - The warning signs required by paragraph (j)(4)(i) of this section shall bear the following legend: [Reference paragraph (j)(4)(ii)(A) - (D)].
- 1910.1001(j)(4)(iii) - The employer shall ensure that employees working in and contiguous to regulated areas comprehend the warning signs required to be posted by paragraph (j)(4)(i) of this section. Means to ensure employee comprehension may include the use of foreign languages, pictographs and graphics.
- 1910.1001(j)(4)(iv) - At the entrance to mechanical rooms/areas in which employees reasonably can be expected to enter and which contain ACM and/or PACM, the building owner shall post signs which identify the material which is present, its location, and appropriate work practices which, if followed, will ensure that ACM

and/or PACM will not be disturbed. The employer shall ensure, to the extent feasible, that employees who come in contact with these *signs* can comprehend them. Means to ensure employee comprehension may include the use of *foreign languages, pictographs, graphics, and awareness training*.

1910.1001(j)(5) - Warning labels.

- 1910.1001(j)(5)(i) - Labeling. Labels shall be affixed to all raw materials, mixtures, scrap, waste, debris, and other products containing asbestos fibers, or to their containers. When a building owner or employer *identifies* previously installed ACM and/or PACM, *labels or signs* shall be *affixed or posted* so that employees will be *notified* of what materials contain ACM and/or PACM. The employer shall attach such *labels* in areas where they will clearly be noticed by employees who are likely to be exposed, such as at the entrance to mechanical room/areas. *Signs* required by paragraph (j) of this section may be *posted in lieu of labels* so long as they contain the *information* required for *labeling*.
- 1910.1001(j)(5)(ii) - Label specifications. In addition to the requirements of paragraph (j)(1), the employer shall ensure that *labels* of bags or containers of protective clothing and equipment, scrap, waste, and debris containing asbestos fibers include the following *information*: [Reference paragraph (j)(5)(ii) - (iii)].

1910.1001(j)(6) - The provisions for labels and for safety data sheets required by paragraph (j) of this section do not apply where: [Reference paragraph (j)(6)(i) - (ii)].

1910.1001(j)(7) - Employee information and training.

- 1910.1001(j)(7)(i) - The employer shall train each employee who is exposed to airborne concentrations of asbestos at or above the PEL and/or excursion limit in accordance with the requirements of this section. The employer shall institute a training program and ensure employee participation in the program.
- 1910.1001(j)(7)(ii) - Training shall be provided prior to or at the time of initial assignment and at least annually thereafter.
- 1910.1001(j)(7)(iii) - The training program shall be conducted in a manner which the employee is able to understand. The employer shall ensure that each employee is informed of the following: [Reference paragraph (j)(7)(iii)(A) - (J)].
- 1910.1001(j)(7)(iv) - The employer shall also provide, at no cost to employees who perform housekeeping operations in an area which contains ACM or PACM, an asbestos awareness training course, which shall at a minimum contain the following elements: health effects of asbestos, locations of ACM and PACM in the building/facility, recognition of ACM and PACM damage and deterioration, requirements in this standard relating to housekeeping, and proper response to fiber release episodes, to all employees who perform housekeeping work in areas where ACM and/or PACM is present. Each such employee shall be so trained at least once a year.

- [1910.1001\(j\)\(7\)\(v\)](#) - Access to *information and training materials*. [Reference [paragraph \(j\)\(7\)\(v\)\(A\) - \(C\)](#)].

[1910.1001\(j\)\(8\)\(i\)](#) - At any time, an employer and/or *building owner* may *demonstrate*, for purposes of this standard, that PACM does not contain asbestos. *Building owners* and/or employers are not required to *communicate information* about the presence of building material for which such a demonstration pursuant to the requirements of [paragraph \(j\)\(8\)\(ii\)](#) of this section has been made. However, in all such cases, the *information, data and analysis* supporting the *determination* that PACM does not contain asbestos, shall be *retained* pursuant to [paragraph \(m\) - recordkeeping](#), of this section.

[1910.1001\(j\)\(8\)\(ii\)](#) - An employer or owner may *demonstrate* that PACM does not contain asbestos by the following: [Reference [paragraph \(j\)\(8\)\(ii\)\(A\) - \(B\)](#)].

[1910.1001\(j\)\(8\)\(iii\)](#) - The employer and/or *building owner* may *demonstrate* that flooring material including associated mastic and backing does not contain asbestos, by a *determination* of an *industrial hygienist* based upon recognized *analytical techniques* showing that the material is not ACM.

[1910.1001\(k\)](#) - *Housekeeping*. [Reference [paragraph \(k\)\(1\) - \(8\)](#)].

[1910.1001\(l\)](#) - *Medical surveillance*. [Reference [paragraph \(l\)\(1\) - \(8\)](#)].

- [1910.1001\(l\)\(1\)\(i\)](#) - Employees covered. The employer shall institute a *medical surveillance program* for all employees who are or will be exposed to airborne concentrations of fibers of asbestos at or above the *TWA and/or excursion limit*.
- [1910.1001\(l\)\(1\)\(ii\)](#) - *Examination by a physician*. [Reference [paragraph \(l\)\(1\)\(ii\)\(A\) - \(B\)](#)].
- [1910.1001\(l\)\(2\)](#) - *Pre-placement examinations*. [Reference [paragraph \(l\)\(2\)\(i\) - \(ii\)](#)].
- [1910.1001\(l\)\(3\)](#) - *Periodic examinations*. [Reference [paragraph \(l\)\(3\)\(i\) - \(ii\)](#)].
- [1910.1001\(l\)\(4\)](#) - *Termination of employment examinations*. [Reference [paragraph \(l\)\(4\)\(i\) - \(ii\)](#)].
- [1910.1001\(l\)\(5\)](#) - *Recent examinations*. No medical examination is required of any employee, if adequate *records* show that the employee has been examined in accordance with any of [paragraphs \(l\)\(2\) through \(l\)\(4\)](#) of this section within the past 1 year period. A pre- employment medical examination which was required as a condition of employment by the employer, may not be used by that employer to meet the requirements of this paragraph, unless the cost of such *examination* is borne by the employer.
- [1910.1001\(l\)\(6\)](#) - *Information provided to the physician*. The employer shall provide the following *information* to the examining *physician*: [Reference [paragraph \(l\)\(6\)\(i\) - \(v\)](#)].
- [1910.1001\(l\)\(7\)](#) - *Physician's written opinion*. [Reference [paragraph \(l\)\(7\)\(i\) - \(iii\)](#)].



### 1910.1001(m) - Recordkeeping.

- 1910.1001(m)(1) - *Exposure measurements*. [Reference paragraph (m)(1)(i) - (iii)].
- 1910.1001(m)(2) - *Objective data* for exempted operations. [Reference paragraph (m)(2)(i) - (iii)].
- 1910.1001(m)(3) - *Medical surveillance*. [Reference paragraph (m)(3)(i) - (iii)].
- 1910.1001(m)(4) - *Training*. The employer shall maintain all employee *training records for one (1) year* beyond the last date of employment of that employee.
- 1910.1001(m)(5)(i) - The employer, upon *written request*, shall make all *records* required to be maintained by this section available to the Assistant Secretary and the Director for examination and *copying*.
- 1910.1001(m)(5)(ii) - The employer, upon request shall make any *exposure records* required by paragraph (m)(1) of this section available for examination and copying to affected employees, former employees, designated representatives and the Assistant Secretary, in accordance with 29 CFR 1910.1020 - access to employee exposure and medical records, paragraph (a) through (e) and (g) through (i).
- 1910.1001(m)(5)(iii) - The employer, upon request, shall make employee *medical records* required by paragraph (m)(3) of this section available for *examination and copying* to the subject employee, to anyone having the *specific written consent* of the subject employee, and the Assistant Secretary, in accordance with 29 CFR 1910.1020 - access to employee exposure and medical records.
- 1910.1001(m)(6) - *Transfer of records*. The employer shall comply with the requirements concerning transfer of *records* set forth in 29 CFR 1910.1020(h), paragraph - access to employee exposure and medical records

1910.1001(n)(1) - *Employee observation*. The employer shall provide *affected employees* or their designated representatives an opportunity to *observe* any *monitoring* of *employee exposure* to asbestos conducted in accordance with paragraph (d) of this section.

1910.1001(n)(2) - *Observation procedures*. When *observation of the monitoring* of employee exposure to asbestos requires entry into an area where the use of *protective clothing or equipment* is required, the observer shall be provided with and be required to use such *clothing and equipment* and shall comply with all other applicable *safety and health procedures*.

1910.1001(o)(1) - *Appendices A, D, E, and F* to this section are incorporated as part of this section and the contents of these *Appendices* are *mandatory*.

1910.1001(o)(2) - *Appendices B, G, H, I, and J* to this section are *informational* and are not intended to create any additional obligations not otherwise imposed or to detract from any existing obligations.

## **1910.1002 - Coal Tar Pitch Volatiles; Interpretation of Term**



**Scope:** This [standard](#) provides the interpretation of term coal tar pitch volatiles.

**Special Requirements:** References other standards

As used in [§ 1910.1000 \(Table Z-1\)](#), coal tar pitch volatiles include the fused polycyclic hydrocarbons which volatilize from the distillation residues of coal, petroleum (excluding asphalt), wood, and other organic matter. Asphalt (CAS 8052-42-4, and CAS 64742-93-4) is not covered under the "coal tar pitch volatiles" standard.

## 1910.1003 - 13 Carcinogens

**Scope:** This [standard](#) provides the requirements for 13 carcinogens.

**Special Requirements:** Labeling requirements, protective clothing and equipment, regulated areas, respirator program (i.e., written program fit-testing, training), shower facilities, measures, post, signs, training, washing facilities, authorized employees, hazard communication program, decontamination procedures, medical surveillance (program), records, maintenance, labels, safety data sheets, classifying, listed hazards, training and indoctrination program, instructions, procedures (i.e., first aid, emergency), inform, statement (furnish), listed carcinogens, chemical manufacturers, importers, distributors, materials, references other standards

[1910.1003\(a\)\(1\)](#) - This section applies to any area in which the 13 carcinogens addressed by this section are manufactured, processed, repackaged, released, handled, or stored, but shall not apply to transshipment in sealed containers, except for the *labeling requirements* under [paragraphs \(e\)\(2\), \(3\) and \(4\)](#) of this section. The 13 carcinogens are the following:

4-Nitrobiphenyl, Chemical Abstracts Service Register Number (CAS No.) 92933;  
alpha-Naphthylamine, CAS No. 134327;  
methyl chloromethyl ether, CAS No. 107302;  
3,5-Dichlorobenzidine (and its salts) CAS No. 91941;  
bis-Chloromethyl ether, CAS No. 542881;  
beta-Naphthylamine, CAS No. 91598;  
Benzidine, CAS No. 92875;  
4-Aminodiphenyl, CAS No. 92671;  
Ethyleneimine, CAS No. 151564;  
beta-Propiolactone, CAS No. 57578;  
2-Acetylaminofluorene, CAS No. 53963;  
4-Dimethylaminoazo-benzene, CAS No. 60117; and  
N-Nitrosodimethylamine, CAS No. 62759.

[1910.1003\(c\)](#) - Requirements for areas containing a carcinogen addressed by this section. A *regulated area* shall be established by an employer where a carcinogen addressed by this

section is manufactured, processed, used, repackaged, released, handled or stored. All such areas shall be controlled in accordance with the requirements for the following category or categories describing the operation involved: [Reference [paragraph \(c\)\(1\) - \(5\)](#)].

[1910.1003\(d\)\(1\)](#) - *Respiratory program*. The employer must implement a *respiratory protection program* in accordance with [§ 1910.134\(b\)](#) - *respiratory protection, definitions, (c)* - *respiratory protection program, (d)* - *selection of respirators, [except (d)(1)(iii) and (iv)* - *general requirements, and (d)(3)]* - *respirators for atmospheres that are not IDLH, and (e) through (m)*, which covers each employee required by this section to use a respirator.

[1910.1003\(d\)\(2\)](#) - *Emergencies*. In an emergency, immediate *measures* including, but not limited to, the requirements of [paragraphs \(d\)\(2\)\(i\) through \(v\)](#) of this section shall be implemented. [Reference [paragraph \(d\)\(2\)\(i\) - \(v\)](#)].

[1910.1003\(d\)\(3\)](#) - *Hygiene facilities and practices*.

- [1910.1003\(d\)\(3\)\(i\)](#) - Storage or consumption of food, storage or use of containers of beverages, storage or application of cosmetics, smoking, storage of smoking materials, tobacco products or other products for chewing, or the chewing of such products are prohibited in *regulated areas*.
- [1910.1003\(d\)\(3\)\(ii\)](#) - Where employees are required by this section to wash, *washing facilities* shall be provided in accordance with [§ 1910.141\(d\) \(1\) and \(2\)\(ii\) through \(vii\)](#).
- [1910.1003\(d\)\(3\)\(iii\)](#) - Where employees are required by this section to shower, *shower facilities* shall be provided in accordance with [§ 1910.141\(d\)\(3\) - sanitation](#).
- [1910.1003\(d\)\(3\)\(iv\)](#) - Where employees wear *protective clothing and equipment*, clean change rooms shall be provided for the number of such employees required to change clothes, in accordance with [§ 1910.141\(e\)](#) - *sanitation*.
- [1910.1003\(d\)\(3\)\(v\)](#) - Where toilets are in *regulated areas*, such toilets shall be in a separate room.

[1910.1003\(d\)\(4\)](#) - *Contamination control*.

- [1910.1003\(d\)\(4\)\(i\)](#) - Except for outdoor systems, *regulated areas* shall be maintained under pressure negative with respect to nonregulated areas. Local exhaust ventilation may be used to satisfy this requirement. Clean makeup air in equal volume shall replace air removed.
- [1910.1003\(d\)\(4\)\(ii\)](#) - Any equipment, material, or other item taken into or removed from a *regulated area* shall be done so in a manner that does not cause contamination in nonregulated areas or the external environment.

- [1910.1003\(d\)\(4\)\(iii\)](#) - *Decontamination procedures* shall be established and implemented to remove carcinogens addressed by this section from the surfaces of materials, equipment, and the decontamination facility.

[1910.1003\(e\)](#) - *Communication of hazards.*

- [1910.1003\(e\)\(1\)\(i\)](#) - *Chemical manufacturers, importers, distributors* and employers shall comply with all requirements of the *Hazard Communication Standard (HCS) (§ 1910.1200)* for each carcinogen listed in [paragraph \(e\)\(1\)\(iv\)](#) of this section.
- [1910.1003\(e\)\(1\)\(ii\)](#) - In *classifying* the hazards of carcinogens listed in [paragraph \(e\)\(1\)\(iv\)](#) of this section, at least the *hazards listed* in [paragraph \(e\)\(1\)\(iv\)](#) are to be addressed.
- [1910.1003\(e\)\(1\)\(iii\)](#) - Employers shall include the carcinogens listed in [paragraph \(e\)\(1\)\(iv\)](#) of this section in the *hazard communication program* established to comply with the *HCS (§ 1910.1200)*. Employers shall ensure that each employee has access to *labels* on containers of the carcinogens listed in [paragraph \(e\)\(1\)\(iv\)](#) and to *safety data sheets*, and is *trained* in accordance with the requirements of HCS and [paragraph \(e\)\(4\)](#) of this section.
- [1910.1003\(e\)\(1\)\(iv\)](#) - *List of Carcinogens*: [Reference [paragraph \(e\)\(1\)\(iv\)\(A\) - \(m\)](#)].
- [1910.1003\(e\)\(2\)\(i\)](#) - The employer shall *post* entrances to *regulated areas* with *signs* bearing the legend: [Reference [paragraph \(e\)\(2\)\(i\) - \(iv\)](#)].
- [1910.1003\(e\)\(2\)\(v\)](#) - Appropriate *signs and instructions* shall be *posted* at the entrance to, and exit from, *regulated areas*, *informing employees of the procedures* that must be followed in entering and leaving a *regulated area*.
- [1910.1003\(e\)\(3\)](#) - *Prohibited statements*. No *statement* shall appear on or near any required *sign, label, or instruction* that contradicts or detracts from the effect of any required *warning, information, or instruction*.
- [1910.1003\(e\)\(4\)\(i\)](#) - Each employee prior to being *authorized to enter a regulated area*, shall receive a *training and indoctrination program* including, but not necessarily limited to: [Reference [paragraph \(e\)\(4\)\(i\) - \(iii\)](#)].

[1910.1003\(g\)](#) - *Medical surveillance*. At no cost to the employee, a *program of medical surveillance* shall be established and implemented for employees considered for assignment to enter *regulated areas*, and for *authorized employees*. [Reference [paragraph \(g\)\(1\)\(i\) - \(iii\)](#)].

[1910.1003\(g\)\(2\)\(i\)](#) - Employers of employees examined pursuant to this paragraph shall cause to be maintained complete and accurate *records* of all such medical examinations. *Records* shall be *maintained for the duration of the employee's employment*.

[1910.1003\(g\)\(2\)\(ii\)](#) - *Records* required by this paragraph shall be provided upon request to employees, designated representatives, and the Assistant Secretary in accordance with [29 CFR 1910.1020 \(a\) through \(e\) and \(g\) through \(i\)](#) - *access to employee exposure and medical records*. These *records* shall also be provided upon request to the Director.

[1910.1003\(g\)\(2\)\(iii\)](#) - Any physician who conducts a medical examination required by this paragraph shall *furnish* to the employer a *statement* of the employee's suitability for employment in the specific exposure.

## **1910.1004 - Alpha-Naphthylamine**

**Scope:** This [standard](#) provides the requirements for alpha-Naphthylamine.

**Special Requirements:** References other standards (Refer to [13 Carcinogens](#))

See [§ 1910.1003](#), 13 carcinogens.

## **1910.1006 - Methyl Chloromethyl Ether**

**Scope:** This [standard](#) provides the requirements for methyl chloromethyl ether.

**Special Requirements:** References other standards (Refer to [13 Carcinogens](#))

See [§ 1910.1003](#), 13 carcinogens.

## **1910.1007 - 3,'-Dichlorobenzidine (and its salts)**

**Scope:** This [standard](#) provides the requirements for 3,'-Dichlorobenzidine (and its salts).

**Special Requirements:** References other standards (Refer to [13 Carcinogens](#))

See [§ 1910.1003](#), 13 carcinogens.

## **1910.1008 - Bis-Chloromethyl Ether**

**Scope:** This [standard](#) provides the requirements for bis-chloromethyl ether.

**Special Requirements:** References other standards (Refer to [13 Carcinogens](#))

See [§ 1910.1003](#), 13 carcinogens.

## **1910.1009 - Beta-Naphthylamine**

**Scope:** This [standard](#) provides the requirements for beta-Naphthylamine.

**Special Requirements:** References other standards (Refer to [13 Carcinogens](#))

See [§ 1910.1003](#), 13 carcinogens.

## **1910.1010 – Benzidine**

**Scope:** This [standard](#) provides the requirements for benzidine.

**Special Requirements:** References other standards (Refer to [13 Carcinogens](#))

See [§ 1910.1003](#), 13 carcinogens.

## **1910.1011 - 4-Aminodiphenyl**

**Scope:** This [standard](#) provides the requirements for 4-aminodiphenyl.

**Special Requirements:** References other standards (Refer to [13 Carcinogens](#))

See [§ 1910.1003](#), 13 carcinogens.

## **1910.1012 – Ethyleneimine**

**Scope:** This [standard](#) provides the requirements for ethyleneimine.

**Special Requirements:** References other standards (Refer to [13 Carcinogens](#))

See [§ 1910.1003](#), 13 carcinogens.

## **1910.1013 - Beta-Propiolactone**

**Scope:** This [standard](#) provides the requirements for beta-propiolactone.

**Special Requirements:** References other standards (Refer to [13 Carcinogens](#))

See [§ 1910.1003](#), 13 carcinogens.

## **1910.1014 - 2-Acetylaminofluorene**

**Scope:** This [standard](#) provides the requirements for 2-acetylaminofluorene.

**Special Requirements:** References other standards (Refer to [13 Carcinogens](#))

See [§ 1910.1003](#), 13 carcinogens.

## **1910.1015 - 4-dimethylaminoazobenzene**

**Scope:** This [standard](#) provides the requirements for 4-dimethylaminoazobenzene.

**Special Requirements:** References other standards (Refer to [13 Carcinogens](#))

See [§ 1910.1003](#), 13 carcinogens.

## 1910.1016 - N-Nitrosodimethylamine

**Scope:** This [standard](#) provides the requirements for n-nitrosodimethylamine.

**Special Requirements:** References other standards (Refer to [13 Carcinogens](#))

See [§ 1910.1003](#), 13 carcinogens.

## 1910.1017 - Vinyl Chloride

**Scope:** This [standard](#) provides the requirements pertaining to vinyl chloride.

**Special Requirements:** Permissible exposure limit (PEL), methods of compliance (written programs), monitoring, program, authorized, regulated area, engineering controls, work practice controls, personal protective controls, determination, PPE (i.e., respirator), action level, exposures, training, medical surveillance, medical surveillance program, training program, respiratory protection program, written operational plan (emergency situations), respirator selection, licensed physician, statement, results, classifying, writing, notify, records, warning, information, instruction, procedures, tests, hazard communication program, safety data sheets, signs, labels, post, examinations, chemical manufacturers, importers, distributors, references other standards

[1910.1017\(a\)\(3\)](#) - This section applies to the transportation of vinyl chloride or polyvinyl chloride except to the extent that the *Department of Transportation* may regulate the hazards covered by this section.

[1910.1017\(c\)](#) - *Permissible exposure limit*. [Reference [paragraph \(c\)\(1\) - \(3\)](#)].

[1910.1017\(d\)](#) - *Monitoring*.

- [1910.1017\(d\)\(1\)](#) - A *program of initial monitoring and measurement* shall be undertaken in each establishment to *determine* if there is any employee exposed, without regard to the use of *respirators*, in excess of the *action level*. [Reference [paragraph \(d\)\(1\) - \(5\)](#)].
- [1910.1017\(d\)\(2\)](#) - Where a *determination* conducted under [paragraph \(d\)\(1\)](#) of this section shows any employee exposures, without regard to the use of *respirators*, in excess of the *action level*, a *program* for determining exposures for each such employee shall be established. Such a *program*: [Reference [paragraph \(d\)\(2\)\(i\) - \(iii\)](#)].



1910.1017(e)(1) - A *regulated area* shall be established where: [Reference paragraph (e)(1) - (2)].

1910.1017(f) - *Methods of compliance*. Employee exposures to vinyl chloride shall be controlled to at or below the *permissible exposure limit* provided in paragraph (c) of this section by *engineering, work practice, and personal protective controls* as follows: [Reference paragraph (f)(1) - (3)].

1910.1017(g) - *Respiratory protection*.

- 1910.1017(g)(2) - *Respirator program*. The employer must implement a *respiratory protection program* in accordance § 1910.134 (b) through (d) [except (d)(1)(iii), and (d)(3)(iii)(B)(1) and (2)], and (f) through (m) which covers each employee required by this section to use a respirator.
- 1910.1017(g)(3) - *Respirator selection*. [Reference paragraph (g)(3)(i) - (ii)].

1910.1017(i) - *Emergency situations*. A *written operational plan for emergency situations* shall be developed for each facility storing, handling, or otherwise using vinyl chloride as a liquid or compressed gas. Appropriate portions of the *plan* shall be implemented in the event of an emergency. The *plan* shall specifically provide that: [Reference paragraph (i)(1) - (2)].

1910.1017(j) - *Training*. Each employee engaged in vinyl chloride or polyvinyl chloride operations shall be provided *training in a program* relating to the hazards of vinyl chloride and precautions for its safe use.

- 1910.1017(j)(1) - The *program* shall include: [Reference paragraph (j)(1) - (2)].

1910.1017(k) - *Medical surveillance*. A *program of medical surveillance* shall be instituted for each employee exposed, without regard to the use of respirators, to vinyl chloride in excess of the *action level*. The *program* shall provide each such employee with an opportunity for *examinations and tests* in accordance with this paragraph. All *medical examinations and procedures* shall be performed by or under the supervision of a *licensed physician*, and shall be provided without cost to the employee. [Reference paragraph (k)(1) - (6)].

1910.1017(l) - *Communication of hazards*.

- 1910.1017(l)(1)(i) - *Chemical manufacturers, importers, distributors* and employers shall comply with all requirements of the *Hazard Communication Standard (HCS) (§ 1910.1200)* for vinyl chloride and polyvinyl chloride.
- 1910.1017(l)(1)(ii) - In *classifying* the hazards of vinyl chloride at least the following hazards are to be addressed: Cancer; central nervous system effects; liver effects; blood effects; and flammability.

- [1910.1017\(l\)\(1\)\(iii\)](#) - Employers shall include vinyl chloride in the *hazard communication program* established to comply with the HCS ([§ 1910.1200](#)). Employers shall ensure that each employee has access to *labels* on containers of vinyl chloride and to *safety data sheets*, and is *trained* in accordance with the requirements of HCS and [paragraph \(j\) - training](#), of this section.
- [1910.1017\(l\)\(2\)](#) - *Signs*. [Reference [paragraph \(l\)\(2\)\(i\) - \(iii\)](#)].
- [1910.1017\(l\)\(3\)](#) - *Labels*. [Reference [paragraph \(l\)\(3\)\(i\) - \(ii\)](#)].
- [1910.1017\(l\)\(6\)](#) - No *statement* shall appear on or near any required *sign, label, or instruction* which contradicts or detracts from the effect of any required *warning, information, or instruction*.

[1910.1017\(m\)](#) - *Records*. [Reference [paragraph \(m\)\(1\) - \(2\)](#)].

- [1910.1017\(m\)\(2\)](#) - *Records* of required *monitoring and measuring and medical records* shall be provided upon request to employees, designated representatives, and the Assistant Secretary in accordance with [29 CFR 1910.1020](#) - *Access to employee exposure and medical records, paragraph (a) through (e) and (g) through (i)*. These *records* shall be provided upon request to the Director. Authorized personnel rosters shall also be provided upon request to the Assistant Secretary and the Director.

[1910.1017\(n\)](#) - The employer must, within *15 working days after the receipt of the results* of any *monitoring* performed under this section, *notify* each affected employee of these *results* and the steps being taken to reduce exposures within the *permissible exposure limit* either individually in *writing or by posting the results* in an appropriate location that is accessible to *affected employees*.

## 1910.1018 - Inorganic Arsenic

**Scope:** This [standard](#) provides the requirements pertaining to inorganic arsenic.

**Special Requirements:** Exposure monitoring, employee notification, notify, results, regulated areas, demarcation, authorized, PPE (i.e., respirators), posting, written notice (statement), affected employee, permissible exposure limit, corrective action, measurement, prohibited activities, methods of compliance, engineering controls, work practice controls, compliance program (written), written plans, operating procedures and maintenance practices, description, report, records, engineering plans, studies, schedule of implementation, monitoring data, written opinion, physician, medical surveillance, medical surveillance program, instruct, employee information and training, written housekeeping and maintenance plan, training program, checks, change rooms, lunchrooms, hazard communication program, labels, safety data sheets, signs, classifying hazards, chemical manufacturers, importers, distributors, observation procedures, records, recordkeeping, employee participation, references other standards

1910.1018(e) - *Exposure monitoring*. [Reference paragraph (e)(1) - (4)].

- 1910.1018(e)(5)(i) - The employer must, within *15 working days after the receipt of the results* of any *monitoring* performed under this section, *notify each affected employee* of these results either *individually in writing or by posting the results* in an appropriate location that is accessible to *affected employees*.
- 1910.1018(e)(5)(ii) - Whenever the *results* indicate that the representative employee exposure exceeds the *permissible exposure limit*, the employer shall include in the *written notice a statement* that the permissible exposure limit was exceeded and a *description* of the *corrective action* taken to reduce exposure to or below the *permissible exposure limit*.
- 1910.1018(e)(6) - *Accuracy of measurement*. [Reference paragraph (e)(6)(i) - (ii)].

1910.1018(f) - *Regulated area*. [Reference paragraph (f)(1) - (5)].

1910.1018(g)(1)(ii) - Where *engineering and work practice controls* are not sufficient to reduce exposures to or below the *permissible exposure limit*, they shall nonetheless be used to reduce exposures to the lowest levels achievable by these *controls* and shall be supplemented by the use of *respirators* in accordance with paragraph (h) of this section and other necessary *personal protective equipment*. *Employee rotation* is not required as a control strategy before *respiratory protection* is instituted.

1910.1018(g)(2)(i) - The employer shall establish and implement a *written program (compliance program)* to reduce exposures to or below the *permissible exposure limit* by means of *engineering and work practice controls*.

1910.1018(g)(2)(ii) - *Written plans* for these *compliance programs* shall include at least the following: [Reference paragraph (g)(2)(ii) - (iv)].

1910.1018(h) - *Respiratory protection*.

- 1910.1018(h)(1) - *General*. For employees who use *respirators* required by this section, the employer must provide each employee an appropriate *respirator* that complies with the requirements of this paragraph. *Respirators* must be used during: [Reference paragraph (h)(1)(i) - (iv)].
- 1910.1018(h)(2)(i) - The employer must implement a *respiratory protection program* in accordance with § 1910.134 (b) through (d) [except (d)(1)(iii), and (d)(3)(iii)(B)(1) and (2)], and (f) through (m), which covers each employee required by this section to use a respirator.
- 1910.1018(h)(2)(ii) - If an employee exhibits breathing difficulty during *fit testing* or *respirator* use, they must be examined by a *physician trained* in pulmonary medicine to determine whether they can use a *respirator* while performing the required duty.
- 1910.1018(h)(3) - *Respirator selection*. [Reference paragraph (h)(3)(i) - (ii)].

1910.1018(j) - *Protective work clothing and equipment.*

- 1910.1018(j)(1) - Provision and use. Where the possibility of skin or eye irritation from inorganic arsenic exists, and for all workers working in regulated areas, the employer shall provide at no cost to the employee and assure that employees use appropriate and *clean protective work clothing and equipment* such as, but not limited to: [Reference paragraph (j)(1)(i) - (iv)].
- 1910.1018(j)(2) - *Cleaning and replacement.* [Reference paragraph (j)(2)(i) - (viii)].

1910.1018(k) - *Housekeeping.* [Reference paragraph (k)(1) - (5)].

- 1910.1018(k)(4) - *Housekeeping plan.* A written housekeeping and maintenance *plan* shall be kept which shall list appropriate frequencies for carrying out housekeeping operations, and for cleaning and maintaining dust collection equipment. The *plan* shall be available for inspection by the Assistant Secretary.

1910.1018(m) - *Hygiene facilities and practices.* [Reference paragraph (m)(1) - (6)].

- 1910.1018(m)(1) - *Change rooms.* The employer shall provide for employees working in *regulated areas* or subject to the possibility of skin or eye irritation from inorganic arsenic, clean change rooms equipped with storage facilities for street clothes and separate storage facilities for protective clothing and equipment in accordance with 29 CFR 1910.141(e) - *sanitation, change rooms.*
- 1910.1018(m)(2)(ii) - The employer shall provide shower facilities in accordance with §1910.141(d)(3) - *sanitation, showers.*

1910.1018(n) - *Medical surveillance.* [Reference paragraph (n)(1) - (6)].

- 1910.1018(n)(1)(i) - *Employees covered.* The employer shall institute a *medical surveillance program* for the following employees: [Reference paragraph (n)(1)(i) - (ii)].

1910.1018(o)(1)(i) - The employer shall *train* each employee who is subject to exposure to inorganic arsenic above the *action level* without regard to *respirator* use, or for whom there is the possibility of skin or eye irritation from inorganic arsenic, in accordance with the requirements of this section. The employer shall institute a *training program* and ensure *employee participation in the program*.

1910.1018(o)(1)(ii) - The *training program* shall be provided by October 1, 1978, for employees covered by this provision, at the time of initial assignment for those subsequently covered by this provision, and at least *annually* for other covered employees thereafter; and the employer shall assure that each employee is *informed* of the following: [Reference paragraph (o)(1)(ii)(A) - (F)].

[1910.1018\(o\)\(2\)](#) - *Access to training materials.* [Reference [paragraph \(o\)\(2\)\(i\) - \(ii\)](#)].

[1910.1018\(p\)\(1\)\(i\)](#) - *Chemical manufacturers, importers, distributors and employers shall comply with all requirements of the Hazard Communication Standard (HCS) ([§1910.1200](#)) for inorganic arsenic.*

[1910.1018\(p\)\(1\)\(ii\)](#) - *In classifying the hazards of inorganic arsenic at least the following hazards are to be addressed: Cancer; liver effects; skin effects; respiratory irritation; nervous system effects; and acute toxicity effects.*

[1910.1018\(p\)\(1\)\(iii\)](#) - *Employers shall include inorganic arsenic in the hazard communication program established to comply with the HCS ([§1910.1200](#)). Employers shall ensure that each employee has access to labels on containers of inorganic arsenic and to safety data sheets, and is trained in accordance with the requirements of HCS and [paragraph \(o\)](#) of this section.*

[1910.1018\(p\)\(1\)\(iv\)](#) - *The employer shall ensure that no statement appears on or near any sign or label required by this [paragraph \(p\)](#) which contradicts or detracts from the meaning of the required sign or label.*

[1910.1018\(p\)\(2\)](#) - *Signs.* [Reference [paragraph \(p\)\(2\)\(i\) - \(iii\)](#)].

[1910.1018\(q\)](#) - *Recordkeeping.* [Reference [paragraph \(q\)\(1\) - \(2\)](#)].

- [1910.1018\(q\)\(1\)](#) - *Exposure monitoring.* [Reference [paragraph \(q\)\(1\)\(i\) - \(iii\)](#)].
- [1910.1018\(q\)\(2\)](#) - *Medical surveillance.* [Reference [paragraph \(q\)\(2\)\(i\) - \(iv\)](#)].
- [1910.1018\(q\)\(3\)\(ii\)](#) - *Records required by this paragraph shall be provided upon request to employees, designated representatives, and the Assistant Secretary in accordance with [29 CFR 1910.1020](#) - Access to employee exposure and medical records, [paragraph \(a\) through \(e\)](#) and [\(g\) through \(i\)](#).*

[1910.1018\(r\)\(1\)](#) - *Employee observation.* The employer shall provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to inorganic arsenic conducted pursuant to [paragraph \(e\)](#) of this section.

[1910.1018\(r\)\(2\)](#) - *Observation procedures.* [Reference [paragraph \(r\)\(2\)\(i\) - \(ii\)](#)].

## **1910.1020 - Access to Employee Exposure and Medical Records**

**Scope:** This [standard](#) provides the requirements pertaining to the access to employee exposure and medical records.

### [Exposure Record](#)

## Medical Record

**Special Requirements:** Records, exposure records, medical records, information, analyses, record retention, results, data, transfer of records, monitoring, inform, measures, reports, worksheets, safety data sheets, trade secrets, access to records, references other standards

1910.1020(b)(1) - This section applies to each general industry, maritime, and construction employer who makes, maintains, contracts for, or has access to employee *exposure or medical records, or analyses* thereof, pertaining to employees exposed to toxic substances or harmful physical agents.

1910.1020(b)(2) - This section applies to all employee *exposure and medical records, and analyses* thereof, of such employees, whether or not the *records* are mandated by specific *occupational safety and health standards*.

1910.1020(b)(3) - This section applies to all employee *exposure and medical records, and analyses* thereof, made or maintained in any manner, including on an in-house or contractual (e.g., fee-for-service) basis. Each employer shall assure that the preservation and access requirements of this section are complied with regardless of the manner in which the *records* are made or maintained.

1910.1020(d)(1) - Unless a specific *occupational safety and health standard* provides a different period of time, each employer shall assure the preservation and *retention of records* as follows:

- 1910.1020(d)(1)(i) - *Employee medical records*. The *medical record* for each employee shall be preserved and maintained for at least the *duration of employment plus thirty (30) years*, except that the following types of *records* need not be retained for any specified period: [Reference paragraph (d)(1)(i)(A) - (C)].
- 1910.1020(d)(1)(ii) - *Employee exposure records*. Each employee *exposure record* shall be preserved and maintained for at least *thirty (30) years*, except that: [Reference paragraph (d)(1)(ii)(A) - (C)].
- 1910.1020(d)(1)(iii) - *Analyses using exposure or medical records*. Each *analysis using exposure or medical records* shall be preserved and maintained for at least *thirty (30) years*.

1910.1020(d)(2) - Nothing in this section is intended to mandate the form, manner, or process by which an employer preserves a *record* as long as the *information* contained in the *record* is preserved and retrievable, except that chest X-ray films shall be preserved in their original state.

1910.1020(e) - *Access to records*. [Reference paragraph (e)(1) - (3)].



- [1910.1020\(e\)\(1\)](#) - General. [Reference [paragraph \(e\)\(1\)\(i\) - \(vi\)](#)].
- [1910.1020\(e\)\(2\)](#) - *Employee and designated representative access*. [Reference [paragraph \(e\)\(2\)\(i\) - \(vi\)](#)].
  - [1910.1020\(e\)\(2\)\(i\)](#) - *Employee exposure records*. [Reference [paragraph \(e\)\(2\)\(i\)\(A\) - \(B\)](#)].
  - [1910.1020\(e\)\(2\)\(ii\)](#) - *Employee medical records*. [Reference [paragraph \(e\)\(2\)\(ii\)\(A\) - \(E\)](#)].
  - [1910.1020\(e\)\(2\)\(iii\)](#) - *Analyses using exposure and medical records*. [Reference [paragraph \(e\)\(2\)\(iii\)\(A\) - \(B\)](#)].
- [1910.1020\(e\)\(3\)](#) - OSHA access. [Reference [paragraph \(e\)\(3\)\(i\) - \(ii\)](#)].

[1910.1020\(f\)](#) - *Trade secrets*. [Reference [paragraph \(f\)\(1\) - \(13\)](#)].

[1910.1020\(g\)](#) - *Employee information*.

- [1910.1020\(g\)\(1\)](#) - Upon an employee's first entering into employment, and at least *annually* thereafter, each employer shall *inform* current employees covered by this section of the following: [Reference [paragraph \(g\)\(1\) - \(2\)](#)].

[1910.1020\(h\)](#) - *Transfer of records*. [Reference [paragraph \(h\)\(1\) - \(2\)](#)].

## 1910.1024 – Beryllium

**Scope:** This [standard](#) provides the requirements pertaining to beryllium.

**Special Requirements:** Permissible exposure limit, time-weighted average, regulated area, demarcation, inform, signs, authorizes, exposure assessment, notification, results, observation, exposure monitoring, short-term exposure limit, PPE (i.e., respirators, protective clothing), review plan, evaluate plan, demonstrate, methods of compliance, written exposure control plan, lists, procedures, notified, update, engineering controls, work practices, respirator program, hazard communication program, training, prohibited activities, physician, written medical opinion, medical examinations, medical report, information, description, PLHCP, written medical report, chemical manufacturers, importers, distributors, medical surveillance, safety data sheets, hygiene areas and practices, housekeeping methods, records, recordkeeping, label, demonstrate, warning signs, sign specification, posting, medical removal, information, copy of standard, references other standards

[1910.1024\(c\)](#) - *Permissible Exposure Limits (PELs)*. [Reference [paragraph \(c\)\(1\) - \(2\)](#)].

[1910.1024\(d\)](#) - *Exposure assessment*. [Reference [paragraph \(d\)\(1\) - \(7\)](#)].

- [1910.1024\(d\)\(6\)](#) - *Employee notification of assessment results*. [Reference [paragraph \(d\)\(6\)\(i\) - \(ii\)](#)].

- [1910.1024\(d\)\(7\)](#) - *Observation of monitoring*. [Reference [paragraph \(d\)\(7\)\(i\) - \(iii\)](#)].

[1910.1024\(e\)](#) - *Beryllium work areas and regulated areas*.

- [1910.1024\(e\)\(1\)\(ii\)](#) - The employer must establish and maintain a *regulated area* wherever employees are, or can reasonably be expected to be, exposed to airborne beryllium at levels above the *TWA PEL* or *STEL*.
- [1910.1024\(e\)\(2\)](#) - *Demarcation*. [Reference [paragraph \(e\)\(2\)\(i\) - \(ii\)](#)].
- [1910.1024\(e\)\(3\)](#) - *Access*. The employer must limit access to *regulated areas* to: [Reference [paragraph \(e\)\(3\)\(i\) - \(iii\)](#)].
- [1910.1024\(e\)\(4\)](#) - *Provision of personal protective clothing and equipment, including respirators*. The employer must provide and ensure that each employee entering a *regulated area* uses: [Reference [paragraph \(e\)\(4\)\(i\) - \(ii\)](#)].

[1910.1024\(f\)\(1\)](#) - *Written exposure control plan*.

- [1910.1024\(f\)\(1\)\(i\)](#) - The employer must establish, implement, and maintain a *written exposure control plan*, which must contain: [Reference [paragraph \(f\)\(1\)\(i\)\(A\) - \(I\)](#)].
- [1910.1024\(f\)\(1\)\(ii\)](#) - The employer must *review and evaluate* the effectiveness of each *written exposure control plan* at least *annually* and *update* it, as necessary, when: [Reference [paragraph \(f\)\(1\)\(ii\)\(A\) - \(C\)](#)].
- [1910.1024\(f\)\(1\)\(iii\)](#) - The employer must make a *copy of the written exposure control plan* accessible to each employee who is, or can reasonably be expected to be, exposed to airborne beryllium in accordance with OSHA's *Access to Employee Exposure and Medical Records (Records Access)* standard [[§1910.1020\(e\)](#)].

[1910.1024\(f\)\(2\)\(i\)](#) - The employer must use *engineering and work practice controls* to reduce and maintain employee airborne exposure to beryllium to or below the *PEL* and *STEL*, unless the employer can *demonstrate* that such *controls* are not feasible. Wherever the employer demonstrates that it is not feasible to reduce airborne exposure to or below the *PELs* with *engineering and work practice controls*, the employer must implement and maintain *engineering and work practice controls* to reduce airborne exposure to the lowest levels feasible and supplement these *controls* using *respiratory protection* in accordance with [paragraph \(g\)](#) of this standard. [Reference [paragraph \(f\)\(2\)\(i\) - \(iii\)](#)].

[1910.1024\(g\)\(1\)](#) - *General*. The employer must provide *respiratory protection* at no cost to the employee and ensure that each employee uses *respiratory protection*: [Reference [paragraph \(g\)\(1\)\(i\) - \(v\)](#)].

[1910.1024\(g\)\(2\)](#) - *Respiratory protection program*. Where this standard requires an employer to provide *respiratory protection*, the selection and use of such *respiratory protection* must be in accordance with the *Respiratory Protection* standard ([§1910.134](#)).

[1910.1024\(h\)](#) - *Personal protective clothing and equipment*.

- [1910.1024\(h\)\(1\)](#) - Provision and use. The employer must provide at no cost, and ensure that each employee uses, appropriate *personal protective clothing and equipment* in accordance with the *written exposure control plan* required under [paragraph \(f\)\(1\)](#) of this standard and OSHA's *Personal Protective Equipment standards (subpart I of this part)*: [Reference [paragraph \(h\)\(1\)\(i\) - \(ii\)](#)].
- [1910.1024\(h\)\(2\)](#) - Removal and storage of *PPE*. [Reference [paragraph \(h\)\(2\)\(i\) - \(v\)](#)].
- [1910.1024\(h\)\(3\)](#) - Cleaning and replacement of *PPE*. [Reference [paragraph \(h\)\(3\)\(i\) - \(iii\)](#)].

#### [1910.1024\(i\)](#) - *Hygiene areas and practices*.

- [1910.1024\(i\)\(1\)\(i\)](#) - Provide readily accessible washing facilities in accordance with this standard and the *Sanitation standard (§1910.141)* to remove beryllium from the hands, face, and neck;
- [1910.1024\(i\)\(2\)](#) - *Change rooms*. In addition to the requirements of [paragraph \(i\)\(1\)\(i\)](#) of this standard, the employer must provide employees who are required to use *personal protective clothing or equipment* under [paragraph \(h\)\(1\)\(ii\)](#) of this standard with a designated *change room* in accordance with this standard and the *Sanitation standard (§1910.141)* where employees are required to remove their personal clothing.
- [1910.1024\(i\)\(3\)\(i\)](#) - The employer must provide showers in accordance with the *Sanitation standard (§1910.141)* where: [Reference [paragraph \(i\)\(3\)\(i\) - \(ii\)](#)].
- [1910.1024\(i\)\(4\)\(iii\)](#) - Eating and drinking facilities provided by the employer are in accordance with the *Sanitation standard (§1910.141)*. [Reference [paragraph \(i\)\(4\)\(i\) - \(iii\)](#)].
- [1910.1024\(i\)\(5\)](#) - *Prohibited activities*. The employer must ensure that no employees eat, drink, smoke, chew tobacco or gum, or apply cosmetics in *regulated areas*.

#### [1910.1024\(j\)](#) - *Housekeeping*.

- [1910.1024\(j\)\(1\)\(i\)](#) - The employer must maintain all surfaces in beryllium work areas and *regulated areas* as free as practicable of beryllium and in accordance with the *written exposure control plan* required under [paragraph \(f\)\(1\)](#) and the *cleaning methods* required under [paragraph \(j\)\(2\)](#) of this standard;
- [1910.1024\(j\)\(2\)](#) - *Cleaning methods*. [Reference [paragraph \(j\)\(2\)\(i\) - \(v\)](#)].

[1910.1024\(j\)\(3\)\(i\)](#) - Except for intra-plant transfers, when the employer transfers materials that contain at least 0.1 percent beryllium by weight or are contaminated with beryllium for disposal, recycling, or reuse, the employer must *label* the materials in accordance with [paragraph \(m\)\(3\)](#) of this standard.

#### [1910.1024\(k\)](#) - *Medical surveillance*.

- [1910.1024\(k\)\(1\)\(i\)](#) - The employer must make *medical surveillance* required by this paragraph available at no cost to the employee, and at a reasonable time and place, to each employee: [Reference [paragraph \(k\)\(1\)\(i\)\(A\) - \(D\)](#)].
- [1910.1024\(k\)\(1\)\(ii\)](#) - The employer must ensure that all medical examinations and *procedures* required by this standard are performed by, or under the direction of, a *licensed physician*.
- [1910.1024\(k\)\(4\)](#) - *Information* provided to the *PLHCP*. The employer must ensure that the examining *PLHCP* (and the agreed-upon CBD diagnostic center, if an *evaluation* is required under [paragraph \(k\)\(7\)](#) of this standard) has a *copy of this standard* and must provide the following *information*, if known: [Reference [paragraph \(k\)\(4\)\(i\) - \(iv\)](#)].
- [1910.1024\(k\)\(5\)](#) - *Licensed physician's written medical report* for the employee. The employer must ensure that the employee receives a *written medical report* from the *licensed physician* *within 45 days* of the examination (including any follow-up BeLPT required under [paragraph \(k\)\(3\)\(ii\)\(E\)](#) of this standard) and that the *PLHCP* explains the *results* of the examination to the employee. The *written medical report* must contain: [Reference [paragraph \(k\)\(5\)\(i\) - \(v\)](#)].
- [1910.1024\(k\)\(6\)](#) - *Licensed physician's written medical opinion* for the employer. [Reference [paragraph \(k\)\(6\)\(i\) - \(vi\)](#)].
- [1910.1024\(k\)\(7\)](#) - *CBD diagnostic center*. [Reference [paragraph \(k\)\(7\)\(i\) - \(vi\)](#)].

[1910.1024\(l\)](#) - *Medical removal*. [Reference [paragraph \(l\)\(1\) - \(4\)](#)].

[1910.1024\(m\)\(1\)\(i\)](#) - *Chemical manufacturers, importers, distributors*, and employers must comply with all requirements of the *HCS* ([§1910.1200](#)) for beryllium.

[1910.1024\(m\)\(1\)\(ii\)](#) - In *classifying the hazards* of beryllium, at least the following hazards must be addressed: Cancer; lung effects (CBD and acute beryllium disease); beryllium sensitization; skin sensitization; and skin, eye, and respiratory tract irritation.

[1910.1024\(m\)\(1\)\(iii\)](#) - Employers must include beryllium in the *hazard communication program* established to comply with the HCS. Employers must ensure that each employee has access to *labels* on containers of beryllium and to *safety data sheets*, and is *trained* in accordance with the requirements of the *HCS* ([§1910.1200](#)) and [paragraph \(m\)\(4\)](#) of this standard.

[1910.1024\(m\)\(2\)](#) - *Warning signs*.

- [1910.1024\(m\)\(2\)\(i\)](#) - *Posting*. The employer must provide and display *warning signs* at each approach to a *regulated area* so that each employee is able to read and understand the *signs* and take necessary protective steps before entering the area.
- [1910.1024\(m\)\(2\)\(ii\)](#) - *Sign specification*. [Reference [paragraph \(m\)\(2\)\(ii\)\(A\) - \(B\)](#)].

1910.1024(m)(3) - *Warning labels*. Consistent with the HCS ([§1910.1200](#)), the employer must *label* each immediate container of clothing, equipment, and materials contaminated with beryllium, and must, at a minimum, include the following on the *label*: [Reference [paragraph \(m\)\(3\)](#)].

1910.1024(m)(4) - *Employee information and training*.

- 1910.1024(m)(4)(i) - For each employee who has, or can reasonably be expected to have, airborne exposure to or dermal contact with beryllium: [Reference [paragraph \(m\)\(4\)\(i\)\(A\) - \(C\)](#)].
- 1910.1024(m)(4)(ii) - The employer must ensure that each employee who is, or can reasonably be expected to be, exposed to airborne beryllium can *demonstrate knowledge and understanding* of the following: [Reference [paragraph \(m\)\(4\)\(ii\)\(A\) - \(I\)](#)].
- 1910.1024(m)(4)(iii) - When a workplace change (such as modification of equipment, tasks, or procedures) results in new or increased airborne exposure that exceeds, or can reasonably be expected to exceed, either the *TWA PEL* or the *STEL*, the employer must provide additional *training* to those employees affected by the change in airborne exposure.
- 1910.1024(m)(4)(iv) - *Employee information*. The employer must make a *copy of this standard* and its *appendices* readily available at no cost to each employee and *designated* employee representative(s).

1910.1024(n) - *Recordkeeping*.

- 1910.1024(n)(1) - *Air monitoring data*. [Reference [paragraph \(n\)\(1\)\(i\) - \(iii\)](#)].
- 1910.1024(n)(2) - *Objective data*. [Reference [paragraph \(n\)\(2\)\(i\) - \(iii\)](#)].
- 1910.1024(n)(3) - *Medical surveillance*. [Reference [paragraph \(n\)\(3\)\(i\) - \(iii\)](#)].
- 1910.1024(n)(4) - *Training*. [Reference [paragraph \(n\)\(4\)\(i\) - \(ii\)](#)].
- 1910.1024(n)(5) - *Access to records*. Upon request, the employer must make all *records* maintained as a requirement of this standard available for examination and *copying* to the Assistant Secretary, the Director, each employee, and each employee's designated representative(s) in accordance the *Records Access standard* ([§1910.1020](#)) - *access to employee exposure and medical records*.
- 1910.1024(n)(6) - *Transfer of records*. The employer must comply with the requirements involving transfer of records set forth in the *Records Access standard* ([§1910.1020](#)) - *access to employee exposure and medical records*.

1910.1024(p) - *Appendix*. [Table A.1](#) in this appendix sets forth the operations that, where performed under the circumstances described in the column heading above the particular operations, *trigger* the requirement for a beryllium work area.

## 1910.1025 – Lead



**Scope:** This [standard](#) provides the requirements pertaining to lead.

**Special Requirements:** Permissible exposure limit, measurements, PPE (i.e., respirators, protective clothing), engineering controls, work practice controls, administrative controls, time-weighted average, exposure monitoring, employee notification, results, written notice (statement), job classification, record (written), determination, notify (writing), engineering and work practice controls, affected employees, writing results, posting the results, respiratory protection program, action level, sampling and analysis, tests, written compliance program, implementation schedule, housekeeping, corrective action, method, descriptions, written plans, written programs, revised, reviewed, data, administrative control schedule, work practice program, job rotation schedule, biological monitoring, notification, schedule, demonstrate, medical surveillance program, medical surveillance, medical removal protection, medical removal protection benefits, physician, medical removal, examinations, hygiene facilities and practices, inform (writing), training program, training, information, labeling, hazard communication program, medical written opinion, informed, instructions, classifying, classify, safety data sheets, labels, employee participation, signs, post, observation procedures, records, references other standards

[1910.1025\(c\)](#) - *Permissible exposure limit (PEL)*. [Reference [paragraph \(c\)\(1\) - \(3\)](#)].

[1910.1025\(d\)](#) - *Exposure monitoring*. [Reference [paragraph \(d\)\(1\) - \(7\)](#)].

- [1910.1025\(d\)\(1\)](#) - General. [Reference [paragraph \(d\)\(1\)\(i\) - \(iii\)](#)].
- [1910.1025\(d\)\(2\)](#) - *Initial determination*. Each employer who has a workplace or work operation covered by this standard shall *determine* if any employee may be exposed to lead at or above the *action level*.
- [1910.1025\(d\)\(3\)\(i\)](#) - The employer shall *monitor employee exposures* and shall base *initial determinations* on the *employee exposure monitoring results* and any of the following, relevant considerations: [Reference [paragraph \(d\)\(3\)\(i\) - \(iii\)](#)].
- [1910.1025\(d\)\(4\)](#) - *Positive initial determination and initial monitoring*. [Reference [paragraph \(d\)\(4\)\(i\) - \(ii\)](#)].
- [1910.1025\(d\)\(5\)](#) - *Negative initial determination*. Where a *determination*, conducted under [paragraphs \(d\)\(2\)](#) and [\(3\)](#) of this section is made that no employee is exposed to airborne concentrations of lead at or above the *action level*, the employer shall make a *written record* of such *determination*. The *record* shall include at least the *information* specified in [paragraph \(d\)\(3\)](#) of this section and shall also include the *date of determination*, location within the worksite, and the name number of each employee *monitored*.
- [1910.1025\(d\)\(6\)](#) - Frequency. [Reference [paragraph \(d\)\(6\)\(i\) - \(iii\)](#)].
- [1910.1025\(d\)\(7\)](#) - *Additional monitoring*. Whenever there has been a production, process, control or personnel change which may result in new or additional exposure to lead, or whenever the employer has any other reason to suspect a change which may result in new or additional exposures to lead, *additional monitoring* in accordance with this paragraph shall be conducted.



- [1910.1025\(d\)\(8\)\(i\)](#) - The employer must, within *15 working days after the receipt of the results* of any monitoring performed under this section, *notify* each *affected employee* of these *results* either individually in *writing* or by *posting the results* in an appropriate location that is accessible to *affected employees*.
- [1910.1025\(d\)\(8\)\(ii\)](#) - Whenever the *results* indicate that the representative employee exposure, without regard to respirators, exceeds the *permissible exposure limit*, the employer shall include in the *written notice* a *statement* that the *permissible exposure limit* was exceeded and a *description* of the *corrective action* taken or to be taken to reduce exposure to or below the *permissible exposure limit*.
- [1910.1025\(d\)\(9\)](#) - *Accuracy of measurement*. The employer shall use a *method of monitoring and analysis* which has an accuracy (to a confidence level of 95%) of not less than plus or minus 20 percent for airborne concentrations of lead equal to or greater than 30 µg/m<sup>3</sup>.

[1910.1025\(e\)](#) - *Methods of compliance*.

- [1910.1025\(e\)\(1\)](#) - *Engineering and work practice controls*. [Reference [paragraph \(e\)\(1\)\(i\) - \(ii\)](#)].
- [1910.1025\(e\)\(2\)](#) - *Respiratory protection*. Where *engineering and work practice controls* do not reduce employee exposure to or below the 50 µg/m<sup>3</sup> *permissible exposure limit*, the employer shall supplement these controls with *respirators* in accordance with [paragraph \(f\)](#).
- [1910.1025\(e\)\(3\)](#) - *Compliance program*.
  - [1910.1025\(e\)\(3\)\(i\)](#) - Each employer shall establish and implement a *written compliance program* to reduce exposures to or below the *permissible exposure limit*, and interim levels if applicable, solely by means of *engineering and work practice controls* in accordance with the *implementation schedule* in [paragraph \(e\)\(1\)](#).
  - [1910.1025\(e\)\(3\)\(ii\)](#) - *Written plans* for these *compliance programs* shall include at least the following: [Reference [paragraph \(e\)\(3\)\(ii\)\(A\) - \(H\)](#)].
  - [1910.1025\(e\)\(3\)\(iii\)](#) - *Written programs* shall be submitted upon request to the Assistant Secretary and the Director, and shall be *available* at the worksite for examination and *copying* by the Assistant Secretary, Director, any affected employee or authorized employee representatives.
  - [1910.1025\(e\)\(3\)\(iv\)](#) - *Written programs* must be *revised and updated* at least *annually* to reflect the current status of the *program*.
  - [1910.1025\(e\)\(4\)\(i\)](#) - When ventilation is used to control exposure, *measurements* which *demonstrate* the effectiveness of the system in controlling exposure, such as capture velocity, duct velocity, or static pressure shall be made at least every *3 months*. *Measurements* of the system's effectiveness in controlling exposure shall be made within *5 days* of any change in production, process, or control which might result in a change in employee exposure to lead.

- [1910.1025\(e\)\(5\)](#) - *Administrative controls*. If *administrative controls* are used as a means of reducing employees *TWA* exposure to lead, the employer shall establish and implement a *job rotation schedule* which includes:  
[Reference [paragraph \(e\)\(5\)\(i\) - \(iii\)](#)].

#### [1910.1025\(f\)](#) - *Respiratory protection*.

- [1910.1025\(f\)\(1\)](#) - General. For employees who use *respirators* required by this section, the employer must provide each employee an appropriate *respirator* that complies with the requirements of this paragraph. *Respirators* must be used during:  
[Reference [paragraph \(f\)\(1\)\(i\) - \(iii\)](#)].
- [1910.1025\(f\)\(2\)\(i\)](#) - The employer must implement a *respiratory protection program* in accordance with [§ 1910.134\(b\)](#) - *respiratory protection, definitions, (c) - respiratory protection program, (d) - selection of respirators, [except (d)(1)(iii) and (iv) - general requirements, and (d)(3)] - respirators for atmospheres that are not IDLH, and (e) through (m), which covers each employee required by this section to use a *respirator*. [Reference [paragraph \(f\)\(2\)\(i\) - \(iii\)](#)].*
- [1910.1025\(f\)\(3\)](#) - *Respirator selection*. [Reference [paragraph \(f\)\(3\)\(i\) - \(ii\)](#)].

#### [1910.1025\(g\)](#) - *Protective work clothing and equipment*.

- [1910.1025\(g\)\(1\)](#) - Provision and use. If an employee is exposed to lead above the *PEL*, without regard to the use of respirators or where the possibility of skin or eye irritation exists, the employer shall provide at no cost to the employee and assure that the employee uses appropriate *protective work clothing and equipment* such as, but not limited to: [Reference [paragraph \(g\)\(1\)\(i\) - \(iii\)](#)].
- [1910.1025\(g\)\(2\)](#) - *Cleaning and replacement*. [Reference [paragraph \(g\)\(2\)\(i\) - \(viii\)](#)].

#### [1910.1025\(h\)](#) - *Housekeeping*. [Reference [paragraph \(h\)\(1\) - \(3\)](#)].

#### [1910.1025\(i\)](#) - *Hygiene facilities and practices*. [Reference [paragraph \(i\)\(1\) - \(5\)](#)].

- [1910.1025\(i\)\(3\)\(ii\)](#) - The employer shall provide shower facilities in accordance with [§ 1910.141\(d\)\(3\)](#) - *sanitation*, of this part.
- [1910.1025\(i\)\(5\)](#) - Lavatories. The employer shall provide an adequate number of lavatory facilities which comply with [§ 1910.141\(d\)\(1\) and \(2\)](#) - *sanitation*, of this part.

#### [1910.1025\(j\)](#) - *Medical surveillance*. [Reference [paragraph \(j\)\(1\) - \(4\)](#)].

- [1910.1025\(j\)\(1\)\(i\)](#) - The employer shall institute a *medical surveillance program* for all employees who are or may be exposed at or above the *action level* for more than 30 days per year.

- [1910.1025\(j\)\(1\)\(ii\)](#) - The employer shall assure that all *medical examinations* and *procedures* are performed by or under the supervision of a *licensed physician*.
- [1910.1025\(j\)\(2\)\(i\)](#) - Blood lead and ZPP level *sampling and analysis*. The employer shall make available *biological monitoring* in the form of blood *sampling and analysis* for lead and zinc protoporphyrin levels to each employee covered under [paragraph \(j\)\(1\)\(i\)](#) of this section on the following *schedule*: [Reference [paragraph \(j\)\(2\)\(i\)\(A\) - \(C\)](#)].
- [1910.1025\(j\)\(2\)\(ii\)](#) - Follow-up blood *sampling tests*. Whenever the *results* of a blood lead level test indicate that an employee's blood lead level is at or above the numerical criterion for *medical removal* under [paragraph \(k\)\(1\)\(i\)\(A\)](#) of this section, the employer shall provide a second (follow-up) blood sampling test within two weeks after the employer receives the *results* of the first blood *sampling test*.
- [1910.1025\(j\)\(2\)\(iii\)](#) - Accuracy of blood lead level *sampling and analysis*. Blood lead level *sampling and analysis* provided pursuant to this section shall have an accuracy (to a confidence level of 95 percent) within plus or minus 15 percent or 6 µg/100ml, whichever is greater, and shall be conducted by a *laboratory licensed* by the Center for Disease Control, United States Department of Health, Education and Welfare (CDC) or which has received a satisfactory grade in blood lead proficiency testing from CDC in the prior twelve months.
- [1910.1025\(j\)\(2\)\(iv\)](#) - *Employee notification*. Within *five working days* after the receipt of *biological monitoring results*, the employer shall *notify in writing* each employee whose blood lead level is at or above 40 µg/100 g: [Reference [paragraph \(j\)\(2\)\(iv\)\(A\) - \(B\)](#)].
- [1910.1025\(j\)\(3\)](#) - *Medical examinations and consultations*. [Reference [paragraph \(j\)\(3\)\(i\) - \(iii\)](#)].
  - [1910.1025\(j\)\(3\)\(iv\)](#) - *Information* provided to examining and consulting *physicians*. [Reference [paragraph \(j\)\(3\)\(iv\)\(A\) - \(B\)](#)].
  - [1910.1025\(j\)\(3\)\(v\)](#) - *Written medical opinions*. [Reference [paragraph \(j\)\(3\)\(v\)\(A\) - \(B\)](#)].

[1910.1025\(k\)](#) - *Medical Removal Protection*. [Reference [paragraph \(k\)\(1\)\(i\) - \(v\)](#)].

- [1910.1025\(k\)\(2\)](#) - *Medical removal protection benefits*. [Reference [paragraph \(k\)\(2\)\(i\) - \(vii\)](#)].

[1910.1025\(l\)](#) - *Employee information and training*.

- [1910.1025\(l\)\(1\)](#) - *Training program*.
  - [1910.1025\(l\)\(1\)\(i\)](#) - Each employer who has a workplace in which there is a potential exposure to airborne lead at any level shall *inform* employees of the content of [Appendices A - Substance Data Sheet for Occupational Exposure to Lead](#), and [B - Employee Standard Summary](#), of this regulation.

- [1910.1025\(l\)\(1\)\(ii\)](#) - The employer shall *train* each employee who is subject to exposure to lead at or above the action level, or for whom the possibility of skin or eye irritation exists, in accordance with the requirements of this section. The employer shall institute a *training program* and ensure *employee participation* in the *program*.
- [1910.1025\(l\)\(1\)\(iii\)](#) - The employer shall provide initial *training* by 180 days from the effective date for those employees covered by [paragraph \(l\)\(1\)\(ii\)](#) on the standard's effective date and prior to the time of initial job assignment for those employees subsequently covered by this paragraph.
- [1910.1025\(l\)\(1\)\(iv\)](#) - The *training program* shall be repeated at least *annually* for each employee.
- [1910.1025\(l\)\(1\)\(v\)](#) - The employer shall assure that each employee is *informed* of the following: [Reference [paragraph \(l\)\(1\)\(v\)\(A\) - \(G\)](#)].
- [1910.1025\(l\)\(2\)](#) - Access to *information and training materials*. [Reference [paragraph \(l\)\(2\)\(i\) - \(iii\)](#)].

[1910.1025\(m\)\(1\)\(i\)](#) - Chemical manufacturers, importers, distributors and employers shall comply with all requirements of the *Hazard Communication Standard (HCS)* ([§ 1910.1200](#)) for lead.

[1910.1025\(m\)\(1\)\(ii\)](#) - In *classifying* the hazards of lead at least the following hazards are to be addressed: Reproductive/developmental toxicity; central nervous system effects; kidney effects; blood effects; and acute toxicity effects.

[1910.1025\(m\)\(1\)\(iii\)](#) - Employers shall include lead in the *hazard communication program* established to comply with the *HCS* ([§ 1910.1200](#)). Employers shall ensure that each employee has access to *labels* on containers of lead and to *safety data sheets*, and is *trained* in accordance with the requirements of HCS and [paragraph \(l\)](#) of this section.

[1910.1025\(m\)\(2\)](#) - *Signs*. [Reference [paragraph \(m\)\(2\)\(i\) - \(v\)](#)].

[1910.1025\(n\)](#) - *Recordkeeping*.

- [1910.1025\(n\)\(1\)](#) - *Exposure monitoring*. [Reference [paragraph \(n\)\(1\)\(i\) - \(iii\)](#)].
- [1910.1025\(n\)\(2\)](#) - *Medical surveillance*. [Reference [paragraph \(n\)\(2\)\(i\) - \(iv\)](#)].
- [1910.1025\(n\)\(3\)](#) - *Medical removals*. [Reference [paragraph \(n\)\(3\)\(i\) - \(iii\)](#)].

[1910.1025\(n\)\(4\)\(ii\)](#) - *Environmental monitoring, medical removal, and medical records* required by this paragraph shall be provided upon request to employees, *designated* representatives, and the Assistant Secretary in accordance with [29 CFR 1910.1020\(a\)-\(e\)](#) and [\(g\) - \(i\)](#) - *access to employee exposure and medical records*. *Medical removal records* shall be provided in the same manner as *environmental monitoring records*.

[1910.1025\(n\)\(5\)\(ii\)](#) - The employer shall also comply with any additional requirements involving *transfer of records* set forth in [29 CFR 1910.1020\(h\)](#).

[1910.1025\(o\)\(1\)](#) - *Employee observation*. The employer shall provide *affected employees* or their *designated* representatives an opportunity to observe any *monitoring* of employee exposure to lead conducted pursuant to [paragraph \(d\)](#) of this section.

[1910.1025\(o\)\(2\)](#) - *Observation procedures*. [Reference [paragraph \(o\)\(2\)\(i\) - \(ii\)](#)].

## 1910.1026 - Chromium (VI)

**Scope:** This [standard](#) provides the requirements pertaining to chromium (VI) exposures.

**Special Requirements:** Objective data, monitoring data, exposures, exposure determination, monitoring, employee notification, results (post), determine, written notification, corrective action, method, measurements, action level, regulated areas, authorized, procedures, PEL, demarcation, alerts, engineering controls, work practice controls, demonstrate, respiratory protection, respiratory protection program, personal protective equipment, labeled, hazard communication program, hygiene areas and practices (i.e., change rooms, washing facilities), medical surveillance, records, recordkeeping, housekeeping, medical examinations, information, physician, copy of standard, written opinion, statement, recommendations, communication, demonstrate, medical surveillance program, training, safety data sheets, prohibited activities, reference other standards

[1910.1026\(d\)](#) - *Exposure determination*

- [1910.1026\(d\)\(1\)](#) - General. Each employer who has a workplace or work operation covered by this section shall *determine* the *8-hour TWA exposure* for each employee exposed to chromium (VI). This *determination* shall be made in accordance with either [paragraph \(d\)\(2\)](#) or [paragraph \(d\)\(3\)](#) of this section.
- [1910.1026\(d\)\(2\)](#) - *Scheduled monitoring option*. [Reference [paragraph \(d\)\(2\)\(i\) - \(vi\)](#)].
- [1910.1026\(d\)\(3\)](#) - *Performance-oriented option*. The employer shall *determine* the *8-hour TWA exposure* for each employee on the basis of any combination of *air monitoring data, historical monitoring data, or objective data* sufficient to accurately characterize employee exposure to chromium (VI).
- [1910.1026\(d\)\(4\)](#) - *Employee notification of determination results*. [Reference [paragraph \(d\)\(4\)\(i\) - \(ii\)](#)].
- [1910.1026\(d\)\(5\)](#) - *Accuracy of measurement*. Where *air monitoring* is performed to comply with the requirements of this section, the employer shall use *a method of monitoring and analysis* that can *measure* chromium (VI) to within an accuracy of plus or minus 25 percent ( $\pm 25\%$ ) and can produce *accurate measurements* to within a statistical confidence level of 95 percent for airborne concentrations at or above the *action level*.



- [1910.1026\(d\)\(6\)](#) - *Observation of monitoring*. [Reference [paragraph \(d\)\(6\)\(i\) - \(ii\)](#)].

[1910.1026\(e\)](#) - *Regulated areas*.

- [1910.1026\(e\)\(1\)](#) - *Establishment*. The employer shall *establish a regulated area* wherever an employee's *exposure* to airborne concentrations of chromium (VI) is, or can reasonably be expected to be, in excess of the *PEL*.
- [1910.1026\(e\)\(2\)](#) - *Demarcation*. The employer shall ensure that *regulated areas* are *demarcated* from the rest of the workplace in a manner that adequately establishes and *alerts* employees of the boundaries of the *regulated area*.
- [1910.1026\(e\)\(3\)](#) - *Access*. The employer shall limit access to *regulated areas* to: [Reference [paragraph \(e\)\(3\)\(i\) - \(iii\)](#)].

[1910.1026\(f\)\(1\)](#) - *Engineering and work practice controls*.

- [1910.1026\(f\)\(1\)\(i\)](#) - Except as permitted in [paragraph \(f\)\(1\)\(ii\)](#) and [paragraph \(f\)\(1\)\(iii\)](#) of this section, the employer shall use *engineering and work practice controls* to reduce and maintain *employee exposure* to chromium (VI) to or below the *PEL* unless the employer can *demonstrate* that such *controls* are not feasible. Wherever feasible *engineering and work practice controls* are not sufficient to reduce *employee exposure* to or below the *PEL*, the employer shall use them to reduce *employee exposure* to the lowest levels achievable, and shall supplement them by the use of *respiratory protection* that complies with the requirements of [paragraph \(g\)](#) of this section.
- [1910.1026\(f\)\(1\)\(ii\)](#) - Where painting of aircraft or large aircraft parts is performed in the aerospace industry, the employer shall use *engineering and work practice controls* to reduce and maintain employee exposure to chromium (VI) to or below 25 µgm/m<sup>3</sup> unless the employer can *demonstrate* that such *controls* are not feasible. The employer shall supplement such *engineering and work practice controls* with the use of *respiratory protection* that complies with the requirements of [paragraph \(g\)](#) of this section to achieve the *PEL*.
- [1910.1026\(f\)\(1\)\(iii\)](#) - Where the employer can *demonstrate* that a process or task does not result in any employee exposure to chromium (VI) above the *PEL* for 30 or more days per year (12 consecutive months), the requirement to implement *engineering and work practice controls* to achieve the *PEL* does not apply to that process or task.

[1910.1026\(g\)\(1\)](#) - *General*. Where *respiratory protection* is required by this section, the employer must provide each employee an appropriate *respirator* that complies with the requirements of this paragraph. *Respiratory protection* is required during: [Reference [paragraph \(g\)\(1\)\(i\) - \(v\)](#)].



1910.1026(g)(2) - *Respiratory protection program*. Where *respirator* use is required by this section, the employer shall institute a *respiratory protection program* in accordance with § 1910.134, which covers each employee required to use a *respirator*.

1910.1026(h) - *Protective work clothing and equipment*.

- 1910.1026(h)(1) - Provision and use. Where a hazard is present or is likely to be present from skin or eye contact with chromium (VI), the employer shall provide appropriate *personal protective clothing and equipment* at no cost to employees, and shall ensure that employees use such *clothing and equipment*.
- 1910.1026(h)(2) - *Removal and storage*. [Reference paragraph (h)(2)(i) - (iv)].
  - 1910.1026(h)(2)(iv) - The employer shall ensure that bags or containers of contaminated *protective clothing or equipment* that are removed from change rooms for laundering, cleaning, maintenance, or disposal are *labeled* in accordance with the requirements of the *Hazard Communication Standard*, § 1910.1200.
- 1910.1026(h)(3) - *Cleaning and replacement*. [Reference paragraph (h)(3)(i) - (iii)].

1910.1026(i) - *Hygiene areas and practices*. [Reference paragraph (i)(1) - (5)].

- 1910.1026(i)(1) - *General*. Where *protective clothing and equipment* is required, the employer shall provide *change rooms* in conformance with 29 CFR 1910.141 - sanitation. Where skin contact with chromium (VI) occurs, the employer shall provide washing facilities in conformance with 29 CFR 1910.141. Eating and drinking areas provided by the employer shall also be in conformance with § 1910.141.

1910.1026(j) - *Housekeeping*. [Reference paragraph (j)(1) - (3)].

- 1910.1026(j)(3)(ii) - Bags or containers of waste, scrap, debris, and any other materials contaminated with chromium (VI) that are consigned for disposal are *labeled* in accordance with the requirements of the *Hazard Communication Standard*, § 1910.1200.

1910.1026(k) - *Medical surveillance*.

- 1910.1026(k)(1)(i) - The employer shall make *medical surveillance* available at no cost to the employee, and at a reasonable time and place, for all employees: [Reference paragraph (k)(1)(i) - (ii)].
- 1910.1026(k)(2) - *Frequency*. The employer shall provide a *medical examination*: [Reference paragraph (k)(2)(i) - (vi)].
- 1910.1026(k)(3) - *Contents of examination*. A *medical examination* consists of: [Reference paragraph (k)(3)(i) - (iii)].

- [1910.1026\(k\)\(4\)](#) - *Information provided to the PLHCP*. The employer shall ensure that the examining *PLHCP* has a copy of this standard, and shall provide the following *information*: [Reference [paragraph \(k\)\(4\)\(i\) - \(iv\)](#)].
- [1910.1026\(k\)\(5\)](#) - *PLHCP's written medical opinion*. [Reference [paragraph \(k\)\(5\)\(i\) - \(iii\)](#)].

[1910.1026\(l\)](#) - *Communication of chromium (VI) hazards to employees*.

- [1910.1026\(l\)\(1\)\(i\)](#) - Chemical manufacturers, importers, distributors and employers shall comply with all requirements of the *Hazard Communication Standard (HCS) (§ 1910.1200)* for chromium (VI).
- [1910.1026\(l\)\(1\)\(ii\)](#) - In *classifying* the hazards of chromium (VI) at least the following hazards are to be addressed: Cancer, eye irritation, and skin sensitization.
- [1910.1026\(l\)\(1\)\(iii\)](#) - Employers shall include chromium (VI) in the *hazard communication program* established to comply with the *HCS (§ 1910.1200)*. Employers shall ensure that each employee has access to *labels* on containers of chromium (VI) and to *safety data sheets*, and is *trained* in accordance with the requirements of *HCS* and [paragraph \(l\)\(2\)](#) of this section.
- [1910.1026\(l\)\(2\)](#) - *Employee information and training*.
  - [1910.1026\(l\)\(2\)\(i\)](#) - The employer shall ensure that each employee can *demonstrate knowledge* of at least the following: [Reference [paragraph \(l\)\(2\)\(i\) - \(ii\)](#)].

[1910.1026\(m\)](#) - *Recordkeeping*.

- [1910.1026\(m\)\(1\)](#) - *Air monitoring data*. [Reference [paragraph \(m\)\(1\)\(i\) - \(iii\)](#)].
  - [1910.1026\(m\)\(1\)\(iii\)](#) - The employer shall ensure that *exposure records* are maintained and made available in accordance with [29 CFR 1910.1020 - access to employee exposure and medical records](#).
- [1910.1026\(m\)\(2\)](#) - *Historical monitoring data*. [Reference [paragraph \(m\)\(2\)\(i\) - \(iii\)](#)].
  - [1910.1026\(m\)\(2\)\(iii\)](#) - The employer shall ensure that *historical exposure records* are maintained and made available in accordance with [29 CFR 1910.1020 - access to employee exposure and medical records](#).
- [1910.1026\(m\)\(3\)](#) - *Objective data*. [Reference [paragraph \(m\)\(3\)\(i\) - \(iii\)](#)].
  - [1910.1026\(m\)\(3\)\(iii\)](#) - The employer shall ensure that *objective data* are maintained and made available in accordance with [29 CFR 1910.1020 - access to employee exposure and medical records](#).
- [1910.1026\(m\)\(4\)](#) - *Medical surveillance*. [Reference [paragraph \(m\)\(4\)\(i\) - \(iii\)](#)].
  - [1910.1026\(m\)\(4\)\(iii\)](#) - The employer shall ensure that *medical records* are maintained and made available in accordance with [29 CFR 1910.1020 - access to employee exposure and medical records](#).

## 1910.1027 – Cadmium

**Scope:** This [standard](#) provides the requirements pertaining to cadmium.

**Special Requirements:** Permissible exposure limit, engineering controls, work practice controls, regulated areas, demarcation, respirators, PPE, authorized persons, exposure monitoring, determine, monitor, training, time-weighted average, methods, data, work practices, demonstrating, sampling, action level, job classification, (written) compliance program, report, schedule of implementation, housekeeping, HEPA vacuuming, work practice program, description, (written) plan for emergency situations, procedures, reporting, physician, written opinion, monitoring results, hazard communication program, warning signs, medical removal, medical surveillance, posted, labeling, examinations, tests, safety data sheets, medical records, observation procedures, exposure records, references other standards

[1910.1027\(a\)](#) - *Scope*. This standard applies to all occupational exposures to cadmium and cadmium compounds, in all forms, and in all industries covered by the Occupational Safety and Health Act, except the construction-related industries, which are covered under 29 CFR 1926.63 ([1926.1127](#)) - *cadmium*.

[1910.1027\(c\)](#) - *Permissible Exposure Limit (PEL)*. The employer shall assure that no employee is exposed to an airborne concentration of cadmium in excess of five micrograms per cubic meter of air ( $5 \mu\text{g}/\text{m}^3$ ), calculated as an *eight-hour time-weighted average exposure (TWA)*.

[1910.1027\(d\)](#) - *Exposure monitoring*.

- [1910.1027\(d\)\(1\)\(i\)](#) - Each employer who has a workplace or work operation covered by this section shall *determine* if any employee may be exposed to cadmium at or above the *action level*.
- [1910.1027\(d\)\(1\)\(ii\)](#) - *Determinations* of employee exposure shall be made from breathing zone air samples that reflect the *monitored* employee's regular, daily 8-hour *TWA exposure* to cadmium.
- [1910.1027\(d\)\(1\)\(iii\)](#) - *Eight-hour TWA exposures* shall be *determined* for each employee on the basis of one or more personal breathing zone air samples reflecting full shift exposure on each shift, for each *job classification*, in each work area. Where several employees perform the same job tasks, in the same *job classification*, on the same shift, in the same work area, and the length, duration, and level of *cadmium exposures* are similar, an employer may sample a representative fraction of the employees instead of all employees in order to meet this requirement. In *representative sampling*, the employer shall sample the employee(s) expected to have the highest *cadmium exposures*.

- [1910.1027\(d\)\(2\)\(i\)](#) - *Initial monitoring*. Except as provided for in [paragraphs \(d\)\(2\)\(ii\)](#) and [\(d\)\(2\)\(iii\)](#) of this section, the employer shall *monitor employee exposures* and shall base initial *determinations* on the *monitoring results*.
- [1910.1027\(d\)\(2\)\(ii\)](#) - Where the employer has *monitored* after September 14, 1991, under conditions that in all important aspects closely resemble those currently prevailing and where that *monitoring* satisfies all other requirements of this section, including the accuracy and confidence levels of [paragraph \(d\)\(6\)](#) of this section, the employer may rely on such earlier *monitoring results* to satisfy the requirements of [paragraph \(d\)\(2\)\(i\)](#) of this section.
- [1910.1027\(d\)\(2\)\(iii\)](#) - Where the employer has objective data, as defined in [paragraph \(n\)\(2\)](#) of this section, *demonstrating that employee exposure* to cadmium will not exceed the action level under the expected conditions of processing, use, or handling, the employer may rely upon such *data* instead of implementing initial *monitoring*.
- [1910.1027\(d\)\(3\)](#) - *Monitoring Frequency (periodic monitoring)*. [Reference [paragraph \(d\)\(3\)\(i\) - \(ii\)](#)].
- [1910.1027\(d\)\(4\)](#) - *Additional Monitoring*. The employer also shall institute the *exposure monitoring* required under [paragraphs \(d\)\(2\)\(i\)](#) and [\(d\)\(3\)](#) of this section whenever there has been a change in the raw materials, equipment, personnel, *work practices*, or finished products that may result in additional employees being *exposed* to cadmium at or above the action level or in employees already *exposed* to cadmium at or above the *action level* being exposed above the PEL, or whenever the employer has any reason to suspect that any other change might result in such further *exposure*.
- [1910.1027\(d\)\(5\)](#) - *Employee Notification of Monitoring Results*. [Reference [paragraph \(d\)\(5\)\(i\) - \(ii\)](#)].
- [1910.1027\(d\)\(6\)](#) - *Accuracy of measurement*. The employer shall use a method of *monitoring and analysis* that has an accuracy of not less than plus or minus 25 percent ( $\pm 25\%$ ), with a confidence level of 95 percent, for airborne concentrations of cadmium at or above the *action level*, the *permissible exposure limit (PEL)*, and the separate *engineering control* air limit (SECAL).

#### [1910.1027\(e\)](#) - *Regulated areas*.

- [1910.1027\(e\)\(1\)](#) - *Establishment*. The employer shall establish a *regulated area* wherever an employee's exposure to airborne concentrations of cadmium is, or can reasonably be expected to be in excess of the *permissible exposure limit (PEL)*.
- [1910.1027\(e\)\(2\)](#) - *Demarcation*. *Regulated areas* shall be *demarcated* from the rest of the workplace in any manner that adequately establishes and alerts employees of the boundaries of the *regulated area*.
- [1910.1027\(e\)\(3\)](#) - *Access*. Access to *regulated areas* shall be limited to *authorized persons*.

- [1910.1027\(e\)\(4\)](#) - *Provision of respirators*. Each person entering a *regulated area* shall be supplied with and required to use a *respirator*, selected in accordance with [paragraph \(g\)\(2\)](#) of this section.
- [1910.1027\(e\)\(5\)](#) - *Prohibited activities*. The employer shall assure that employees do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in *regulated areas*, carry the products associated with these activities into *regulated areas*, or store such products in those areas.

[1910.1027\(f\)](#) - *Methods of compliance*.

- [1910.1027\(f\)\(1\)\(i\)](#) - Except as specified in [paragraphs \(f\)\(1\)\(ii\), \(iii\) and \(iv\)](#) of this section the employer shall implement *engineering and work practice controls* to reduce and maintain *employee exposure* to cadmium at or below the PEL, except to the extent that the employer can *demonstrate that such controls* are not feasible.
- [1910.1027\(f\)\(1\)\(ii\)](#) - Except as specified in [paragraphs \(f\)\(1\)\(iii\) and \(iv\)](#) of this section, in industries where a separate *engineering control* air limit (SECAL) has been specified for particular processes [See [Table 1](#) in this [paragraph \(f\)\(1\)\(ii\)](#)], the employer shall implement *engineering and work practice controls* to reduce and maintain employee exposure at or below the SECAL, except to the extent that the employer can *demonstrate* that such controls are not feasible.
- [1910.1027\(f\)\(1\)\(iii\)](#) - The requirement to implement *engineering and work practice controls* to achieve the PEL or, where applicable, the SECAL does not apply where the employer demonstrates the following: [Reference [paragraph \(f\)\(1\)\(iii\)\(A\) - \(B\)](#)].
- [1910.1027\(f\)\(1\)\(iv\)](#) - Wherever *engineering and work practice controls* are required and are not sufficient to reduce *employee exposure* to or below the PEL or, where applicable, the SECAL, the employer nonetheless shall implement such controls to reduce exposures to the lowest levels achievable. The employer shall supplement such controls with *respiratory protection* that complies with the requirements of [paragraph \(g\)](#) of this section and the PEL.
- [1910.1027\(f\)\(1\)\(v\)](#) - The employer shall not use employee rotation as a *method of compliance*.
- [1910.1027\(f\)\(2\)\(i\)](#) - Where the PEL is exceeded, the employer shall establish and implement a *written compliance program* to reduce *employee exposure* to or below the PEL by means of *engineering and work practice controls*, as required by [paragraph \(f\)\(1\)](#) of this section. To the extent that *engineering and work practice controls* cannot reduce exposures to or below the PEL, the employer shall include in the *written compliance program* the use of appropriate *respiratory protection* to achieve compliance with the PEL.
- [1910.1027\(f\)\(2\)\(ii\)](#) - *Written compliance programs* shall include at least the following: [Reference [paragraph \(f\)\(2\)\(ii\) - \(iv\)](#)].

[1910.1027\(g\)\(1\)](#) - General. For employees who use *respirators* required by this section, the employer must provide each employee an appropriate *respirator* that complies with the



requirements of this paragraph. *Respirators* must be used during: [Reference [paragraph \(g\)\(1\)\(ii\) - \(vii\)](#)].

[1910.1027\(g\)\(2\)](#) - *Respirator program*. [Reference [paragraph \(g\)\(2\) - \(3\)](#)].

[1910.1027\(h\)](#) - Emergency situations. The employer shall develop and implement a *written plan for dealing with emergency situations* involving substantial releases of airborne cadmium. The *plan* shall include provisions for the use of appropriate *respirators and personal protective equipment*. In addition, employees not essential to correcting the emergency situation shall be restricted from the area and normal operations halted in that area until the emergency is abated.

[1910.1027\(i\)\(1\)](#) - Provision and use. If an employee is exposed to airborne cadmium above the PEL or where skin or eye irritation is associated with cadmium exposure at any level, the employer shall provide at no cost to the employee, and assure that the employee uses, appropriate *protective work clothing and equipment* that prevents contamination of the employee and the employee's garments. *Protective work clothing and equipment* includes, but is not limited to: [Reference [paragraph \(i\)\(1\) - \(3\)](#)].

[1910.1027\(j\)](#) - *Hygiene areas and practices*.

- [1910.1027\(j\)\(1\)](#) - *General*. For employees whose airborne exposure to cadmium is above the PEL, the employer shall provide clean change rooms, handwashing facilities, showers, and lunchroom facilities that comply with [29 CFR 1910.141 - sanitation](#).
- [1910.1027\(j\)\(2\)](#) - Change rooms. The employer shall assure that change rooms are equipped with separate storage facilities for street clothes and for *protective clothing and equipment*, which are designed to prevent dispersion of cadmium and contamination of the employee's street clothes.
- [1910.1027\(j\)\(3\)](#) - *Showers and handwashing facilities*. [Reference [paragraph \(j\)\(3\)\(i\) - \(ii\)](#)].
- [1910.1027\(j\)\(4\)\(ii\)](#) - The employer shall assure that employees do not enter lunchroom facilities with *protective work clothing or equipment* unless surface cadmium has been removed from the *clothing and equipment by HEPA vacuuming* or some other method that removes cadmium dust without dispersing it.

[1910.1027\(k\)](#) - *Housekeeping*. [Reference [paragraph \(k\)\(1\) - \(7\)](#)].

[1910.1027\(l\)](#) - *Medical surveillance*. [Reference [paragraph \(l\)\(1\) - \(5\)](#)].

- [1910.1027\(l\)\(6\)](#) - *Examination for respirator use*. [Reference [paragraph \(l\)\(6\) - \(8\)](#)].
- [1910.1027\(l\)\(9\)](#) - *Information provided to the physician*. The employer shall provide the following *information* to the examining *physician*: [Reference [paragraph \(l\)\(9\)\(i\) - \(v\)](#)].



- [1910.1027\(l\)\(10\)](#) - *Physician's written medical opinion*. [Reference [paragraph \(l\)\(10\)\(i\) - \(iii\)](#)].
- [1910.1027\(l\)\(11\)](#) - *Medical Removal Protection (MRP)*. [Reference [paragraph \(l\)\(11\)\(i\) - \(vi\)](#)].
- [1910.1027\(l\)\(12\)](#) - *Medical Removal Protection Benefits (MRPB)*. [Reference [paragraph \(l\)\(12\)\(i\) - \(iv\)](#)].
- [1910.1027\(l\)\(13\)](#) - *Multiple physician review*. [Reference [paragraph \(l\)\(13\)\(i\) - \(v\)](#)].
- [1910.1027\(l\)\(14\)](#) - *Alternate physician determination*. The employer and an employee or designated employee representative may agree upon the use of any alternate form of physician determination in lieu of the multiple *physician review* provided by [paragraph \(l\)\(13\)](#) of this section, so long as the alternative is expeditious and at least as protective of the employee.
- [1910.1027\(l\)\(15\)](#) - *Information the employer must provide the employee*. [Reference [paragraph \(l\)\(15\)\(i\) - \(iii\)](#)].
- [1910.1027\(l\)\(16\)](#) - *Reporting*. In addition to other medical events that are required to be reported on the OSHA Form No. 200 ([OSHA Form 300](#)), the employer shall report any abnormal condition or disorder caused by occupational exposure to cadmium associated with employment as specified in Chapter (V)(E) of the Reporting Guidelines for Occupational Injuries and Illnesses.

[1910.1027\(m\)](#) - *Communication of cadmium hazards to employees*.

- [1910.1027\(m\)\(1\)\(i\)](#) - Chemical manufacturers, importers, distributors and employers shall comply with all requirements of the *Hazard Communication Standard (HCS)* ([§ 1910.1200](#)) for cadmium.
- [1910.1027\(m\)\(1\)\(ii\)](#) - In *classifying* the hazards of cadmium at least the following hazards are to be addressed: Cancer; lung effects; kidney effects; and acute toxicity effects.
- [1910.1027\(m\)\(1\)\(iii\)](#) - Employers shall include cadmium in the *hazard communication program* established to comply with the HCS ([§ 1910.1200](#)). Employers shall ensure that each employee has access to *labels* on containers of cadmium and to *safety data sheets*, and is trained in accordance with the requirements of HCS and [paragraph \(m\)\(4\)](#) of this section.
- [1910.1027\(m\)\(2\)](#) - *Warning signs*. [Reference [paragraph \(m\)\(2\)\(i\) - \(iv\)](#)].
- [1910.1027\(m\)\(3\)](#) - *Warning labels*. [Reference [paragraph \(m\)\(3\)\(i\) - \(iv\)](#)].
- [1910.1027\(m\)\(4\)](#) - *Employee information and training*. [Reference [paragraph \(m\)\(4\)\(i\) - \(iv\)](#)].

[1910.1027\(n\)](#) - *Recordkeeping*. [Reference [paragraph \(n\)\(1\) - \(3\)](#)].

- [1910.1027\(n\)\(4\)\(i\)](#) - Except as otherwise provided for in this section, access to all records required to be maintained by [paragraphs \(n\)\(1\) through \(3\)](#) of this section shall be in accordance with the provisions of [29 CFR 1910.1020](#) - *access to employee exposure and medical records*.

- [1910.1027\(n\)\(4\)\(ii\)](#) - *Within 15 days* after a request, the employer shall make an employee's *medical records* required to be kept by [paragraph \(n\)\(3\)](#) of this section available for examination and *copying* to the subject employee, to designated representatives, to anyone having the specific *written consent* of the subject employee, and after the employee's death or incapacitation, to the employee's family members.

[1910.1027\(o\)](#) - *Observation of monitoring*. [Reference [paragraph \(o\)\(1\) - \(2\)](#)].

## **1910.1028 – Benzene**

**Scope:** This [standard](#) provides the requirements pertaining to benzene.

**Special Requirements:** Permissible exposure limit, short-term exposure level, time-weighted average, regulated areas, exposure monitoring, determination, employee notification, results, methods, measuring, engineering controls, work practice controls, document, compliance program (written), hazard communication program, respirator program, PPE (i.e., respirators), records, recordkeeping, medical surveillance, medical surveillance program, examinations, physician, referrals, information, description, statement, medical removal plan, written opinion, medical removal protection benefits, chemical manufacturers, importers, distributors, classifying hazards, warning signs, labels, safety data sheets, post, information, training, training program, plan, reviewed, revised, safety and health procedures, classifying hazards, observation of monitoring, observation procedures, references other standards

[1910.1028\(c\)](#) - *Permissible exposure limits (PELs)*. [Reference [paragraph \(c\)\(1\) - \(2\)](#)].

[1910.1028\(d\)](#) - *Regulated areas*. [Reference [paragraph \(d\)\(1\) - \(3\)](#)].

[1910.1028\(e\)](#) - *Exposure monitoring*.

- [1910.1028\(e\)\(1\)](#) - General. [Reference [paragraph \(e\)\(1\)\(i\) - \(iv\)](#)].
- [1910.1028\(e\)\(2\)](#) - *Initial monitoring*. [Reference [paragraph \(e\)\(2\)\(i\) - \(ii\)](#)].
- [1910.1028\(e\)\(3\)](#) - *Periodic monitoring and monitoring frequency*. [Reference [paragraph \(e\)\(3\)\(i\) - \(iv\)](#)].
- [1910.1028\(e\)\(4\)](#) - *Termination of monitoring*. [Reference [paragraph \(e\)\(4\)\(i\) - \(ii\)](#)].
- [1910.1028\(e\)\(5\)](#) - *Additional monitoring*. [Reference [paragraph \(e\)\(5\)\(i\) - \(ii\)](#)].
- [1910.1028\(e\)\(6\)](#) - *Accuracy of monitoring*. *Monitoring* shall be accurate, to a confidence level of 95 percent, to within plus or minus 25 percent for airborne concentrations of benzene.
- [1910.1028\(e\)\(7\)](#) - *Employee notification of monitoring results*. [Reference [paragraph \(e\)\(7\)\(i\) - \(ii\)](#)].

[1910.1028\(f\)](#) - *Methods of compliance*.

- [1910.1028\(f\)\(1\)](#) - *Engineering controls and work practices*. [Reference [paragraph \(f\)\(1\)\(i\) - \(iii\)](#)].
- [1910.1028\(f\)\(2\)](#) - *Compliance program*. [Reference [paragraph \(f\)\(2\)\(i\) - \(iii\)](#)].
  - [1910.1028\(f\)\(2\)\(i\)](#) - When any exposures are over the *PEL*, the employer shall establish and implement a *written program* to reduce employee exposure to or below the *PEL* primarily by means of *engineering and work practice controls*, as required by [paragraph \(f\)\(1\)](#) of this section.
  - [1910.1028\(f\)\(2\)\(ii\)](#) - The *written program* shall include a *schedule* for development and implementation of the *engineering and work practice controls*. These *plans* shall be *reviewed and revised* as appropriate based on the most recent exposure *monitoring data*, to reflect the current status of the *program*.

[1910.1028\(g\)](#) - *Respiratory protection*.

- [1910.1028\(g\)\(1\)](#) - General. For employees who use *respirators* required by this section, the employer must provide each employee an appropriate *respirator* that complies with the requirements of this paragraph. *Respirators* must be used during: [Reference [paragraph \(g\)\(1\)\(i\) - \(iv\)](#)].
- [1910.1028\(g\)\(2\)](#) - *Respirator program*. [Reference [paragraph \(g\)\(2\)\(i\) - \(iii\)](#)].
  - [1910.1028\(g\)\(2\)\(i\)](#) - The employer must implement a *respiratory protection program* in accordance with [§ 1910.134\(b\) through \(d\) \[except \(d\)\(1\)\(iii\), \(d\)\(3\)\(iii\)\(B\)\(1\) and \(2\)\]](#), and [\(f\) through \(m\)](#), which covers each employee required by this section to use a *respirator*.
- [1910.1028\(g\)\(3\)](#) - *Respirator selection*. [Reference [paragraph \(g\)\(3\)\(i\) - \(ii\)](#)].

[1910.1028\(h\)](#) - *Protective clothing and equipment*. *Personal protective clothing and equipment* shall be worn where appropriate to prevent eye contact and limit dermal exposure to liquid benzene. *Protective clothing and equipment* shall be provided by the employer at no cost to the employee and the employer shall assure its use where appropriate. *Eye and face protection* shall meet the requirements of [29 CFR 1910.133](#) - *eye and face protection*.

[1910.1028\(i\)](#) - *Medical surveillance*. [Reference [paragraph \(i\)\(1\)\(i\) - \(iv\)](#)].

- [1910.1028\(i\)\(1\)\(i\)](#) - The employer shall make available a *medical surveillance program* for employees who are or may be exposed to benzene at or above the action level 30 or more days per year; for employees who are or may be exposed to benzene at or above the *PELs* 10 or more days per year; for employees who have been exposed to more than 10 ppm of benzene for 30 or more days in a year prior to the effective date of the standard when employed by their current employer; and for employees involved in the tire building operations called tire building machine operators, who use solvents containing greater than 0.1 percent benzene.
- [1910.1028\(i\)\(2\)](#) - *Initial examination*. [Reference [paragraph \(i\)\(2\)\(i\) - \(ii\)](#)].

- [1910.1028\(i\)\(3\)](#) - *Periodic examinations*. [Reference [paragraph \(i\)\(3\)\(i\) - \(iii\)](#)].
- [1910.1028\(i\)\(4\)](#) - *Emergency examinations*. [Reference [paragraph \(i\)\(4\)\(i\) - \(iv\)](#)].
- [1910.1028\(i\)\(5\)](#) - *Additional examinations and referrals*. [Reference [paragraph \(i\)\(5\)\(i\) - \(iv\)](#)].
- [1910.1028\(i\)\(6\)](#) - *Information provided to the physician*. The employer shall provide the following *information* to the examining *physician*: [Reference [paragraph \(i\)\(6\)\(i\) - \(v\)](#)].
- [1910.1028\(i\)\(7\)](#) - *Physician's written opinions*. [Reference [paragraph \(i\)\(7\)\(i\) - \(ii\)](#)].
- [1910.1028\(i\)\(8\)](#) - *Medical removal plan*. [Reference [paragraph \(i\)\(8\)\(i\) - \(v\)](#)].
- [1910.1028\(i\)\(9\)](#) - *Medical removal protection benefits*. [Reference [paragraph \(i\)\(9\)\(i\) - \(iii\)](#)].

[1910.1028\(j\)](#) - *Communication of hazards*.

- [1910.1028\(j\)\(1\)\(i\)](#) - *Chemical manufacturers, importers, distributors and employers* shall comply with all requirements of the *Hazard Communication Standard (HCS)* ([§ 1910.1200](#)) for benzene.
- [1910.1028\(j\)\(1\)\(ii\)](#) - In *classifying the hazards* of benzene at least the following hazards are to be addressed: Cancer; central nervous system effects; blood effects; aspiration; skin, eye, and respiratory tract irritation; and flammability.
- [1910.1028\(j\)\(1\)\(iii\)](#) - Employers shall include benzene in the *hazard communication program* established to comply with the *HCS* ([§ 1910.1200](#)). Employers shall ensure that each employee has access to *labels* on containers of benzene and to *safety data sheets*, and is *trained* in accordance with the requirements of *HCS* and [paragraph \(j\)\(3\)](#) of this section.
- [1910.1028\(j\)\(2\)](#) - *Warning signs and labels*. [Reference [paragraph \(j\)\(2\)\(i\) - \(iv\)](#)].

[1910.1028\(j\)\(3\)](#) - *Information and training*.

- [1910.1028\(j\)\(3\)\(i\)](#) - The employer shall provide employees with *information and training* at the time of their *initial assignment* to a work area where benzene is present. If exposures are above the *action level*, employees shall be *provided with information and training* at least *annually* thereafter.
- [1910.1028\(j\)\(3\)\(ii\)](#) - The *training program* shall be in accordance with the requirements of [29 CFR 1910.1200\(h\)\(1\) and \(2\)](#) - *hazard communication*, and shall include specific *information* on benzene for each category of *information* included in that section.
- [1910.1028\(j\)\(3\)\(iii\)](#) - In addition to the *information* required under [29 CFR 1910.1200](#) - *hazard communication*, the employer shall: [Reference [paragraph \(j\)\(3\)\(iii\)\(A\) - \(B\)](#)].

[1910.1028\(k\)](#) - *Recordkeeping*.

- [1910.1028\(k\)\(1\)](#) - *Exposure measurements*.

- [1910.1028\(k\)\(1\)\(i\)](#) - The employer shall establish and maintain an accurate *record* of all *measurements* required by [paragraph \(e\)](#) of this section, in accordance with 29 CFR 1910.20 ([1910.1020 - access to employee exposure and medical records](#)).
- [1910.1028\(k\)\(1\)\(ii\)](#) - This *record* shall include: [Reference [paragraph \(k\)\(1\)\(ii\)\(A\) - \(D\)](#)].
- [1910.1028\(k\)\(1\)\(iii\)](#) - The employer shall maintain this *record* for at least 30 years, in accordance with 29 CFR 1910.20 ([1910.1020 - access to employee exposure and medical records](#)).
- [1910.1028\(k\)\(2\)](#) - *Medical surveillance*.
  - [1910.1028\(k\)\(2\)\(i\)](#) - The employer shall establish and maintain an accurate *record* for each employee subject to *medical surveillance* required by [paragraph \(i\)](#) of this section, in accordance with 29 CFR 1910.20 ([1910.1020 - access to employee exposure and medical records](#)).
  - [1910.1028\(k\)\(2\)\(ii\)](#) - This *record* shall include: [Reference [paragraph \(k\)\(2\)\(ii\)\(A\) - \(E\)](#)].
  - [1910.1028\(k\)\(2\)\(iii\)](#) - The employer shall maintain this *record* for at least the *duration of employment plus 30 years*, in accordance with 29 CFR 1910.20 ([1910.1020 - access to employee exposure and medical records](#)).
- [1910.1028\(k\)\(3\)\(ii\)](#) - *Employee exposure monitoring records* required by this paragraph shall be provided upon request for examination and *copying* to employees, employee representatives, and the Assistant Secretary in accordance with 29 CFR 1910.20(a) *through (e)* and *(g) through (i)*.
- [1910.1028\(k\)\(3\)\(iii\)](#) - *Employee medical records* required by this paragraph shall be provided upon request for examination and *copying*, to the subject employee, to anyone having the specific *written consent* of the subject employee, and to the Assistant Secretary in accordance with 29 CFR 1910.20 ([1910.1020 - access to employee exposure and medical records](#)).
- [1910.1028\(k\)\(4\)](#) - *Transfer of records*. The employer shall comply with the requirements involving transfer of *records* as set forth in [29 CFR 1910.1020\(h\)](#).

[1910.1028\(l\)\(1\)](#) - *Employee observation*. The employer shall provide *affected employees*, or their designated representatives, an opportunity to observe the *measuring or monitoring* of employee exposure to benzene conducted pursuant to [paragraph \(e\)](#) of this section.

[1910.1028\(l\)\(2\)](#) - *Observation procedures*. When *observation* of the *measuring or monitoring* of employee exposure to benzene requires entry into areas where the use of *protective clothing and equipment or respirators* is required, the employer shall provide the observer with *personal protective clothing and equipment or respirators* required to be worn by employees working in the area, assure the use of such *clothing and equipment or respirators*, and require the observer to comply with all other applicable *safety and health procedures*.



[1910.1028\(n\)](#) - *Appendices*. The *information* contained in [Appendices A](#), [B](#), [C](#), and [D](#) is not intended, by itself, to create any additional obligations not otherwise imposed or to detract from any existing obligations.

## 1910.1029 - Coke Oven Emissions

**Scope:** This [standard](#) provides the requirements pertaining to coke oven emissions.

**Special Requirements:** Regulated areas, PEL, authorized person, exposures, engineering controls, work practices, respiratory protection, exposure monitoring, method, accuracy, posting results, in writing, employee notification, monitoring program, compliance program (written), training, training program, schedules, information and training program, compliance procedures (written), engineering plans, monitoring data, respiratory protection, post, respirator program, protective clothing and equipment, inform, medical surveillance, medical surveillance program, hygiene facilities and practices (i.e., change rooms, showers), employee participation, labels, safety data sheets, hazard communication, hazard communication program, medical examination, physician, training materials, signed statement, information, written opinion, post signs, records, recordkeeping, observation, observation procedures, references other standards

[1910.1029\(c\)](#) - *Permissible exposure limit*. The employer shall assure that no employee in the *regulated area* is exposed to coke oven emissions at concentrations greater than 150 micrograms per cubic meter of air (150 µg/m<sup>3</sup>), averaged over any 8-hour period.

[1910.1029\(d\)](#) - *Regulated areas*.

- [1910.1029\(d\)\(1\)](#) - The employer shall establish *regulated areas* and shall limit access to them to *authorized persons*.
- [1910.1029\(d\)\(2\)](#) - The employer shall establish the following as *regulated areas*: [Reference [paragraph \(d\)\(2\)\(i\) - \(ii\)](#)].

[1910.1029\(e\)](#) - *Exposure monitoring and measurement*.

- [1910.1029\(e\)\(1\)](#) - *Monitoring program*. [Reference [paragraph \(e\)\(1\)\(i\) - \(iv\)](#)].
- [1910.1029\(e\)\(2\)](#) - *Redetermination*. Whenever there has been a production, process, or control change which may result in new or additional *exposure* to coke oven emissions, or whenever the employer has any other reason to suspect an increase in *employee exposure*, the employer shall repeat the *monitoring and measurements* required by [paragraph \(e\)\(1\)](#) of this section for those employees affected by such change or increase.
- [1910.1029\(e\)\(3\)](#) - *Employee notification*. [Reference [paragraph \(e\)\(3\)\(i\) - \(ii\)](#)].
- [1910.1029\(e\)\(4\)](#) - *Accuracy of measurement*. The employer shall use a *method of monitoring and measurement* which has an accuracy (with a confidence level of



95%) of not less than plus or minus 35% for concentrations of coke oven emissions greater than or equal to 150 µg/m<sup>3</sup>.

1910.1029(f) - *Methods of compliance*. The employer shall control employee exposure to coke oven emissions by the use of *engineering controls, work practices and respiratory protection* as follows: [Reference paragraph (f)(1) - (7)].

- 1910.1029(f)(1) - *Priority of compliance methods*. [Reference paragraph (f)(1)(i) - (iii)].
- 1910.1029(f)(2) - *Engineering controls*. [Reference paragraph (f)(2)(i) - (ii)].
- 1910.1029(f)(3) - *Work practice controls*. [Reference paragraph (f)(3)(i) - (iv)].
- 1910.1029(f)(6) - *Compliance program*. [Reference paragraph (f)(6)(i) - (iv)].
- 1910.1029(f)(7) - *Training in compliance procedures*. The employer shall incorporate all *written procedures and schedules* required under this paragraph (f) in the *information and training program* required under paragraph (k) of this section and, where appropriate, *post in the regulated area*.

1910.1029(g) - *Respiratory protection*.

- 1910.1029(g)(1) - *General*. For employees who use respirators required by this section, the employer must provide each employee an appropriate *respirator* that complies with the requirements of this paragraph. *Respirators* must be used during: [Reference paragraph (g)(1)(i) - (iv)].
- 1910.1029(g)(2) - *Respirator program*. The employer must implement a *respiratory protection program* in accordance with §1910.134(b) through (d) [except (d)(1)(iii)], and (f) through (m), which covers each employee required by this section to use a *respirator*.
- 1910.1029(g)(3) - *Respirator selection*. Employers must select, and provide to employees, the appropriate *respirators* specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134; however, employers may use a *filtering facepiece respirator* only when it functions as a *filter respirator* for coke oven emissions particulates.

1910.1029(h) - *Protective clothing and equipment*.

- 1910.1029(h)(1) - *Provision and use*. The employer shall provide and assure the use of appropriate *protective clothing and equipment*, such as but not limited to: [Reference paragraph (h)(1)(i) - (vi)].
  - 1910.1029(h)(1)(iii) - *Face shields or vented goggles* which comply with §1910.133(a)(2) - *eye and face protection*, of this part;
  - 1910.1029(h)(1)(v) - *Safety shoes* which comply with §1910.136 - *foot protection*, of this part; and
  - 1910.1029(h)(1)(vi) - *Protective helmets* which comply with §1910.135 - *head protection*, of this part.
- 1910.1029(h)(2) - *Cleaning and replacement*. [Reference paragraph (h)(2)(i) - (vi)].

1910.1029(i) - Hygiene facilities and practices. [Reference [paragraph \(i\)\(1\) - \(5\)](#)].

- [1910.1029\(i\)\(2\)\(ii\)](#) - The employer shall provide shower facilities in accordance with [§1910.141\(d\)\(3\)](#) - *sanitation*, of this part.
- [1910.1029\(i\)\(4\)\(ii\)](#) - The employer shall provide lavatory facilities in accordance with [§1910.141\(d\)\(1\)](#) and [\(2\)](#) - *sanitation*, of this part.

1910.1029(j) - Medical surveillance.

- [1910.1029\(j\)\(1\)\(i\)](#) - Each employer shall institute a *medical surveillance program* for all employees who are employed in a *regulated area* at least 30 days per year. [Reference [paragraph \(j\)\(1\)\(i\) - \(iv\)](#)].
- [1910.1029\(j\)\(2\)](#) - *Initial examinations*. At the time of initial assignment to a *regulated area* or upon the institution of the *medical surveillance program*, the employer shall provide a *medical examination* for employees covered under [paragraph \(j\)\(1\)\(i\)](#) of this section including at least the following elements: [Reference [paragraph \(j\)\(2\)\(i\) - \(vii\)](#)].
- [1910.1029\(j\)\(3\)](#) - *Periodic examinations*. [Reference [paragraph \(j\)\(3\)\(i\) - \(iii\)](#)].
- [1910.1029\(j\)\(4\)](#) - *Information provided to the physician*. The employer shall provide the following *information* to the *examining physician*: [Reference [paragraph \(j\)\(4\)\(i\) - \(v\)](#)].
- [1910.1029\(j\)\(5\)](#) - *Physician's written opinion*. [Reference [paragraph \(j\)\(5\)\(i\) - \(iii\)](#)].

1910.1029(k) - Employee information and training.

- [1910.1029\(k\)\(1\)](#) - *Training program*.
  - [1910.1029\(k\)\(1\)\(i\)](#) - The employer shall *train* each employee who is employed in a *regulated area* in accordance with the requirements of this section. The employer shall institute a *training program* and ensure *employee participation* in the *program*.
  - [1910.1029\(k\)\(1\)\(iv\)](#) - The *training program* shall include *informing* each employee of: [Reference [paragraph \(k\)\(1\)\(iv\)\(a\) - \(e\)](#)].
- [1910.1029\(k\)\(2\)](#) - *Access to training materials*. [Reference [paragraph \(k\)\(2\)\(i\) - \(ii\)](#)].

1910.1029(l) - Communication of hazards.

- [1910.1029\(l\)\(1\)](#) - *Hazard communication—general*. The employer shall include coke oven emissions in the *program* established to comply with the *Hazard Communication Standard (HCS) (§1910.1200)*. The employer shall ensure that each employee has access to *labels* on containers of chemicals and substances associated with coke oven processes and to *safety data sheets*, and is *trained* in accordance with the provisions of *HCS* and [paragraph \(k\)](#) of this section. The employer shall ensure that at least the following hazard is addressed: Cancer.

- [1910.1029\(l\)\(2\)\(i\)](#) - The employer shall *post signs* in the *regulated area* bearing the legend: [Reference [paragraph \(l\)\(2\)\(i\) - \(vi\)](#)].
- [1910.1029\(l\)\(3\)\(i\)](#) - The employer shall ensure that *labels* of containers of contaminated *protective clothing and equipment* include the following *information*: [Reference [paragraph \(l\)\(3\)\(i\) - \(ii\)](#)].

#### [1910.1029\(m\)](#) - *Recordkeeping*.

- [1910.1029\(m\)\(1\)](#) - *Exposure measurements*. The employer shall establish and maintain an accurate *record* of all measurements taken to *monitor employee exposure* to coke oven emissions required in [paragraph \(e\)](#) of this section. [Reference [paragraph \(m\)\(1\)\(i\) - \(ii\)](#)].
- [1910.1029\(m\)\(2\)](#) - *Medical surveillance*. The employer shall establish and maintain an accurate *record* for each employee subject to *medical surveillance* as required by [paragraph \(j\)](#) of this section. [Reference [paragraph \(m\)\(2\)\(i\) - \(iii\)](#)].
- [1910.1029\(m\)\(3\)\(ii\)](#) - *Employee exposure measurement records* and *employee medical records* required by this paragraph shall be provided upon request to employees, designated representatives, and the Assistant Secretary in accordance with [29 CFR 1910.1020\(a\)-\(e\)](#) and [\(g\)-\(i\)](#) - *access to employee exposure and medical records*.
- [1910.1029\(m\)\(4\)\(i\)](#) - Whenever the employer ceases to do business, the successor employer shall receive and *retain all records* required to be maintained by [paragraph \(m\)](#) of this section.
- [1910.1029\(m\)\(4\)\(ii\)](#) - The employer shall also comply with any additional requirements involving transfer of records set forth in [29 CFR 1910.1020\(h\)](#) - *access to employee exposure and medical records*.

#### [1910.1029\(n\)](#) - *Observation of monitoring*.

- [1910.1029\(n\)\(1\)](#) - *Employee observation*. The employer shall provide *affected employees* or their representatives an opportunity to observe any *measuring or monitoring* of *employee exposure* to coke oven emissions conducted pursuant to [paragraph \(e\)](#) of this section.
- [1910.1029\(n\)\(2\)](#) - *Observation procedures*. [Reference [paragraph \(n\)\(2\)\(i\) - \(ii\)](#)].

### **1910.1030 - Bloodborne Pathogens**

**Scope:** This [standard](#) provides the requirements for exposure to bloodborne pathogens.

**Special Requirements:** Exposure control plan (written), annual review of plan, exposures, training, procedures, schedule and method of implementation, hepatitis B vaccine, post exposure evaluation, PPE, HIV and HBV Research Laboratories and Production Facilities, launder, solicit input, work practice controls, list of job classifications, list of procedures, exposure determination, engineering controls, sharps injury log, document,

inspected, determine (employer), universal precautions, demonstrate, decontamination schedule (written), labels, color-coded, authorized persons, universal biohazard symbol, training program, biosafety manual (reviewed), instructions, practices, professional staff, written policies and procedures, hazard warning signs (posted), certified (annually) biological safety cabinet, pre-screening program, US Public Health, healthcare written opinion, declination statement, hand washing and an eye wash facility, accredited laboratory, medical records, references other standards

*Bloodborne Pathogens* means pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV).

1910.1030(c)(1) - Exposure control plan.

- 1910.1030(c)(1)(i) - Each employer having an employee(s) with *occupational exposure* as defined by paragraph (b) of this section shall establish a *written Exposure Control Plan* designed to eliminate or minimize *employee exposure*.
- 1910.1030(c)(1)(ii) - The *Exposure Control Plan* shall contain at least the following elements: [Reference paragraph (c)(1)(ii)(A) - (C)].
- 1910.1030(c)(1)(iii) - Each employer shall ensure that a *copy of the Exposure Control Plan* is accessible to employees in accordance with 29 CFR 1910.20(e) - *access to records (1910.1020 - access to employee exposure and medical records)*.
- 1910.1030(c)(1)(iv) - The *Exposure Control Plan* shall be *reviewed and updated* at least *annually and whenever necessary* to reflect new or modified tasks and *procedures* which affect occupational exposure and to reflect new or revised employee positions with occupational exposure. The review and update of such *plans* shall also: [Reference paragraph (c)(1)(iv)(A) - (B)].
- 1910.1030(c)(1)(v) - An employer, who is required to establish an *Exposure Control Plan* shall *solicit input* from non-managerial employees responsible for direct patient care who are potentially exposed to injuries from contaminated sharps in the identification, *evaluation*, and selection of effective *engineering and work practice controls* and shall *document the solicitation in the Exposure Control Plan*.
- 1910.1030(c)(1)(vi) - The *Exposure Control Plan* shall be made available to the Assistant Secretary and the Director upon request for *examination and copying*.
- 1910.1030(c)(2)(i) - Each employer who has an employee(s) with *occupational exposure* as defined by paragraph (b) of this section shall prepare an *exposure determination*. This *exposure determination* shall contain the following: [Reference paragraph (c)(2)(i)(A) - (C)].
- 1910.1030(c)(2)(ii) - This *exposure determination* shall be made without regard to the use of *personal protective equipment*.

1910.1030(d) - Methods of compliance.

- [1910.1030\(d\)\(1\)](#) - General. *Universal precautions* shall be observed to prevent contact with blood or other potentially infectious materials. Under circumstances in which differentiation between body fluid types is difficult or impossible, all body fluids shall be considered potentially infectious materials.
- [1910.1030\(d\)\(2\)](#) - *Engineering and work practice controls*. [Reference [paragraph \(d\)\(2\)\(i\) - \(xiv\)](#)].
- [1910.1030\(d\)\(3\)](#) - *Personal protective equipment* - [Reference [paragraph \(d\)\(3\)\(i\) - \(xii\)](#)].
- [1910.1030\(d\)\(4\)\(i\)](#) - General. Employers shall ensure that the worksite is maintained in a clean and sanitary condition. The employer shall *determine and implement an appropriate written schedule for cleaning and method of decontamination* based upon the location within the facility, type of surface to be cleaned, type of soil present, and tasks or *procedures* being performed in the area.
- [1910.1030\(d\)\(4\)\(ii\)\(A\)](#) - Contaminated work surfaces shall be *decontaminated* with an appropriate disinfectant after completion of *procedures*; immediately or as soon as feasible when surfaces are overtly contaminated or after any spill of blood or other potentially infectious materials; and at the end of the work shift if the surface may have become contaminated since the last cleaning.
- [1910.1030\(d\)\(4\)\(ii\)\(C\)](#) - All bins, pails, cans, and similar receptacles intended for reuse which have a reasonable likelihood for becoming contaminated with blood or other potentially infectious materials shall be *inspected* and *decontaminated* on a *regularly scheduled basis* and cleaned and decontaminated immediately or as soon as feasible upon visible contamination.
- [1910.1030\(d\)\(4\)\(iii\)\(A\)](#) - *Contaminated Sharps Discarding and Containment*. [Reference [paragraph \(d\)\(4\)\(iii\)](#) for all *procedures* for regulated waste)].
  - [1910.1030\(d\)\(4\)\(iii\)\(A\)\(1\)\(iv\)](#) - *Labeled or color-coded* in accordance with [paragraph \(g\)\(1\)\(i\)](#) of this standard.
- [1910.1030\(d\)\(4\)\(iii\)\(C\)](#) - Disposal of all regulated waste shall be in accordance with applicable *regulations* of the United States, States and Territories, and political subdivisions of States and Territories.
- [1910.1030\(d\)\(4\)\(iv\)\(B\)](#) - The employer shall ensure that employees who have contact with contaminated laundry wear *protective gloves and other appropriate personal protective equipment*.
- [1910.1030\(d\)\(4\)\(iv\)\(C\)](#) - When a facility ships contaminated laundry off-site to a second facility which does not utilize *Universal Precautions* in the handling of all laundry, the facility generating the contaminated laundry must place such laundry in bags or containers which are *labeled or color-coded* in accordance with [paragraph \(g\)\(1\)\(i\)](#).

[1910.1030\(e\)](#) - *HIV and HBV Research Laboratories and Production Facilities*.

- [1910.1030\(e\)\(2\)\(ii\)](#) - *Special practices*. [Reference [paragraph \(e\)\(2\)\(ii\)\(A\) - \(M\)](#)].
- [1910.1030\(e\)\(2\)\(iii\)\(A\)](#) - *Certified biological safety cabinets* (Class I, II, or III) or other appropriate combinations of personal protection or physical containment devices,



such as *special protective clothing, respirators, centrifuge safety cups, sealed centrifuge rotors, and containment caging for animals*, shall be used for all activities with other potentially infectious materials that pose a threat of exposure to droplets, splashes, spills, or aerosols.

- [1910.1030\(e\)\(2\)\(iii\)\(B\)](#) - Biological safety cabinets shall be *certified* when installed, whenever they are moved and at least *annually*.
- [1910.1030\(e\)\(3\)](#) - *HIV and HBV research laboratories* shall meet the following criteria: [Reference [paragraph \(e\)\(3\)\(i\) - \(ii\)](#)].
- [1910.1030\(e\)\(5\)](#) - *Training Requirements*. Additional *training requirements* for employees in *HIV and HBV research laboratories and HIV and HBV production facilities* are specified in [paragraph \(g\)\(2\)\(ix\)](#).

#### [1910.1030\(f\)](#) - *Hepatitis B vaccination and post-exposure evaluation and follow-up*

- [1910.1030\(f\)\(1\)\(i\)](#) - The employer shall make available the *hepatitis B vaccine and vaccination series* to all employees who have occupational exposure, and *post-exposure evaluation and follow-up* to all employees who have had an exposure incident.
- [1910.1030\(f\)\(1\)\(ii\)](#) - The employer shall ensure that all *medical evaluations and procedures* including the *hepatitis B vaccine and vaccination series and post-exposure evaluation and follow-up*, including prophylaxis, are: [Reference [paragraph \(f\)\(1\)\(ii\)\(A\) - \(D\)](#)].
- [1910.1030\(f\)\(1\)\(iii\)](#) - The employer shall ensure that all *laboratory tests* are conducted by an *accredited laboratory* at no cost to the employee.
- [1910.1030\(f\)\(2\)\(i\)](#) - *Hepatitis B vaccination* shall be made available after the employee has received the *training* required in [paragraph \(g\)\(2\)\(vii\)](#) and within 10 working days of initial assignment to all employees who have occupational exposure unless the employee has previously received the complete *hepatitis B vaccination series*, antibody testing has revealed that the employee is immune, or the vaccine is contraindicated for medical reasons.
- [1910.1030\(f\)\(2\)\(ii\)](#) - The employer shall not make participation in a *prescreening program* a prerequisite for receiving *hepatitis B vaccination*.
- [1910.1030\(f\)\(2\)\(iv\)](#) - The employer shall assure that employees who decline to accept *hepatitis B vaccination* offered by the employer *sign the statement* in [appendix A - Hepatitis B Vaccine Declination \(Mandatory\)](#).
- [1910.1030\(f\)\(2\)\(v\)](#) - If a routine booster dose(s) of hepatitis B vaccine is recommended by the *U.S. Public Health Service* at a future date, such booster dose(s) shall be made available in accordance with [section \(f\)\(1\)\(ii\)](#).
- [1910.1030\(f\)\(3\)](#) - *Post-exposure Evaluation and Follow-up*. Following a *report of an exposure incident*, the employer shall make immediately available to the exposed employee a confidential *medical evaluation and follow-up*, including at least the following elements: [Reference [paragraph \(f\)\(3\)\(i\) - \(vi\)](#)].
- [1910.1030\(f\)\(4\)](#) - *Information Provided to the Healthcare Professional*. [Reference [paragraph \(f\)\(4\)\(i\) - \(ii\)](#)].



- [1910.1030\(f\)\(5\)](#) - *Healthcare Professional's Written Opinion*. The employer shall obtain and provide the employee with a *copy* of the *evaluating healthcare professional's written opinion* within *15 days* of the completion of the *evaluation*. [Reference [paragraph \(f\)\(5\)\(i\) - \(iii\)](#)].
- [1910.1030\(f\)\(6\)](#) - *Medical recordkeeping*. *Medical records* required by this standard shall be maintained in accordance with [paragraph \(h\)\(1\)](#) of this section.

[1910.1030](#) - *Communication of hazards to employees*.

- [1910.1030\(g\)\(1\)\(i\)](#) - *Labels* [Reference [paragraph \(g\)\(1\)\(i\)\(A\) - \(L\)](#)].
- [1910.1030\(g\)\(1\)\(ii\)](#) - *Signs*. [Reference [paragraph \(g\)\(1\)\(ii\)\(A\) - \(B\)](#)].
- [1910.1030\(g\)\(2\)\(i\)](#) - The employer shall *train* each employee with occupational exposure in accordance with the requirements of this section. Such *training* must be provided at no cost to the employee and during working hours. The employer shall institute a *training program* and ensure employee participation in the *program*.
- [1910.1030\(g\)\(2\)\(ii\)](#) - *Training* shall be provided as follows: [Reference [paragraph \(g\)\(2\)\(ii\)\(A\) - \(B\)](#)].
- [1910.1030\(g\)\(2\)\(iv\)](#) - *Annual training* for all employees shall be provided within one year of their previous *training*.
- [1910.1030\(g\)\(2\)\(v\)](#) - Employers shall provide additional *training* when changes such as modification of *tasks or procedures* or institution of new *tasks or procedures* affect the employee's *occupational exposure*. *The additional training* may be limited to addressing the new *exposures* created.
- [1910.1030\(g\)\(2\)\(vi\)](#) - *Material* appropriate in content and vocabulary to educational level, literacy, and language of employees shall be used.
- [1910.1030\(g\)\(2\)\(vii\)](#) - The *training program* shall contain at a minimum the following elements: [Reference [paragraph \(g\)\(2\)\(vii\)\(A\) - \(N\)](#)].
- [1910.1030\(g\)\(2\)\(viii\)](#) - The person conducting the *training* shall be *knowledgeable* in the subject matter covered by the elements contained in the *training program* as it relates to the workplace that the *training* will address.
- [1910.1030\(g\)\(2\)\(ix\)](#) - Additional *Initial Training* for Employees in HIV and HBV Laboratories and Production Facilities. Employees in HIV or HBV research laboratories and HIV or HBV production facilities shall receive the following *initial training* in addition to the above *training* requirements. [Reference [paragraph \(g\)\(2\)\(ix\)\(A\) - \(C\)](#)].

[1910.1030\(h\)\(1\)](#) - *Medical Records*.

- [1910.1030\(h\)\(1\)\(i\)](#) - The employer shall establish and maintain an accurate *record* for each employee with *occupational exposure*, in accordance with [29 CFR 1910.1020](#) - *access to employee exposure and medical records*.
- [1910.1030\(h\)\(1\)\(ii\)](#) - This *record* shall include: [Reference [paragraph \(h\)\(1\)\(ii\)\(A\) - \(E\)](#)].

- [1910.1030\(h\)\(1\)\(iii\)](#) - Confidentiality. The employer shall ensure that employee *medical records* required by [paragraph \(h\)\(1\)](#) are: [Reference [paragraph \(h\)\(1\)\(iii\)\(A\) - \(B\)](#)].
- [1910.1030\(h\)\(1\)\(iv\)](#) - The employer shall maintain the *records* required by [paragraph \(h\)](#) for at least the *duration of employment plus 30 years* in accordance with [29 CFR 1910.1020](#) - *access to employee exposure and medical records*.

[1910.1030\(h\)\(2\)](#) - *Training records*.

- [1910.1030\(h\)\(2\)\(i\)](#) - *Training records* shall include the following *information*: [Reference [paragraph \(h\)\(2\)\(i\)\(A\) - \(D\)](#)].
- [1910.1030\(h\)\(2\)\(ii\)](#) - *Training records* shall be maintained for 3 years from the date on which the *training* occurred.

[1910.1030\(h\)\(3\)\(i\)](#) - The employer shall ensure that all *records* required to be *maintained* by this section shall be made available upon request to the Assistant Secretary and the Director for *examination and copying*.

[1910.1030\(h\)\(3\)\(ii\)](#) - Employee *training records* required by this paragraph shall be provided upon request for *examination and copying* to employees, to employee representatives, to the Director, and to the Assistant Secretary.

[1910.1030\(h\)\(3\)\(iii\)](#) - Employee *medical records* required by this paragraph shall be provided upon request for *examination and copying* to the subject employee, to anyone having written consent of the subject employee, to the Director, and to the Assistant Secretary in accordance with [29 CFR 1910.1020](#) - *access to employee exposure and medical records*.

[1910.1030\(h\)\(4\)](#) - *Transfer of Records*. The employer shall comply with the requirements involving transfer of *records* set forth in [29 CFR 1910.1020\(h\)](#).

[1910.1030\(h\)\(5\)](#) - *Sharps injury log*.

- [1910.1030\(h\)\(5\)\(i\)](#) - The employer shall establish and maintain a *sharps injury log* for the *recording* of percutaneous injuries from contaminated sharps. The information in the *sharps injury log* shall be recorded and maintained in such manner as to protect the confidentiality of the injured employee. The *sharps injury log* shall contain, at a minimum: [Reference [paragraph \(h\)\(5\)\(i\)\(A\) - \(C\)](#)].
- [1910.1030\(h\)\(5\)\(ii\)](#) - The requirement to establish and maintain a *sharps injury log* shall apply to any employer who is required to maintain a *log of occupational injuries and illnesses* under [29 CFR part 1904](#) - *recordkeeping*.
- [1910.1030\(h\)\(5\)\(iii\)](#) - The *sharps injury log* shall be maintained for the period required by [29 CFR 1904.33](#) - *recordkeeping, retention and updating*.

## 1910.1043 - Cotton Dust

**Scope:** This [standard](#) provides the requirements pertaining to cotton dust.

**Special Requirements:** Permissible exposure limit, action level, exposure monitoring, measurements, sampling program, certification, test data, manufacturer, information, statement (written notice), methods of compliance, engineering controls, work practice controls, compliance program (written), monitoring data, descriptions, engineering plans, studies, schedule, demonstrate, written programs, work practices (written program), respiratory program, respirators, revise, maintenance, physician, medical surveillance, medical surveillance program, examinations, questionnaire, determination, physician's written opinion, affected employee, personal protective equipment, training, training program, training materials, post standard, warning signs, post, records recordkeeping, log, procedure, observation of monitoring, safety and health procedures, measurement procedures, results, documentation, NIOSH-approved training course, references other standards

[1910.1043\(c\)](#) - *Permissible exposure limits and action levels.*

- [1910.1043\(c\)\(1\)](#) - *Permissible exposure limits (PEL).* [Reference [paragraph \(c\)\(1\)\(i\) - \(iii\)](#)].
- [1910.1043\(c\)\(2\)](#) - *Action levels.* [Reference [paragraph \(c\)\(2\)\(i\) - \(iii\)](#)].

[1910.1043\(d\)](#) - *Exposure monitoring and measurement.* [Reference [paragraph \(d\)\(1\)\(i\) - \(iv\)](#)].

- [1910.1043\(d\)\(2\)](#) - *Initial monitoring.* Each employer who has a place of employment within the scope of [paragraph \(a\)\(1\)](#), [\(a\)\(4\)](#), or [\(a\)\(5\)](#) of this section shall conduct *monitoring* by obtaining *measurements* which are representative of the exposure of all employees to airborne concentrations of lint-free respirable cotton dust over an eight-hour period. The *sampling program* shall include at least one *determination* during each shift for each work area.
- [1910.1043\(d\)\(3\)](#) - *Periodic monitoring.* [Reference [paragraph \(d\)\(3\)\(i\) - \(iii\)](#)].
- [1910.1043\(d\)\(4\)](#) - *Employee notification.* [Reference [paragraph \(d\)\(4\)\(i\) - \(ii\)](#)].

[1910.1043\(e\)](#) - *Methods of compliance.*

- [1910.1043\(e\)\(1\)](#) - *Engineering and work practice controls.* The employer shall institute *engineering and work practice controls* to reduce and maintain employee exposure to cotton dust at or below the *permissible exposure limit* specified in [paragraph \(c\)](#) of this section, except to the extent that the employer can establish that such *controls* are not feasible.
- [1910.1043\(e\)\(2\)](#) - Whenever feasible *engineering and work practice controls* are not sufficient to reduce employee exposure to or below the *permissible exposure*

*limit*, the employer shall nonetheless institute these *controls* to reduce exposure to the lowest feasible level, and shall supplement these *controls* with the use of *respirators* which shall comply with the provisions of [paragraph \(f\)](#) of this section.

- [1910.1043\(e\)\(3\)](#) - *Compliance program*. [Reference [paragraph \(e\)\(3\)\(i\) - \(vi\)](#)].
- [1910.1043\(e\)\(4\)](#) - Mechanical ventilation. When mechanical ventilation is used to control exposure, *measurements* which *demonstrate* the effectiveness of the system to control exposure, such as capture velocity, duct velocity, or static pressure shall be made at reasonable intervals.

[1910.1043\(f\)](#) - *Respiratory protection*. [Reference [paragraph \(f\)\(1\)\(i\) - \(v\)](#)].

- [1910.1043\(f\)\(2\)](#) - *Respirator program*.
  - [1910.1043\(f\)\(2\)\(i\)](#) - The employer must implement a *respiratory protection program* in accordance with [§ 1910.134\(b\) through \(d\)](#) [except [\(d\)\(1\)\(iii\)](#)], and [\(f\) through \(m\)](#), which covers each employee required by this section to use a respirator.
- [1910.1043\(f\)\(3\)](#) - *Respirator selection*. [Reference [paragraph \(f\)\(3\)\(i\) - \(ii\)](#)].

[1910.1043\(g\)](#) - *Work practices*. Each employer shall, regardless of the level of employee exposure, immediately establish and implement a *written program of work practices* which shall minimize cotton dust exposure. The following shall be included were applicable: [Reference [paragraph \(g\)\(1\) - \(4\)](#)].

[1910.1043\(h\)](#) - *Medical surveillance*. [Reference [paragraph \(h\)\(1\)\(i\) - \(iii\)](#)].

- [1910.1043\(h\)\(2\)](#) - *Initial examinations*. The employer shall provide *medical surveillance* to each employee who is or may be exposed to cotton dust. For new employees, this examination shall be provided prior to initial assignment. The *medical surveillance* shall include at least the following: [Reference [paragraph \(h\)\(2\)\(i\) - \(iv\)](#)].
- [1910.1043\(h\)\(3\)](#) - *Periodic examinations*. [Reference [paragraph \(h\)\(3\)\(i\) - \(iv\)](#)].
- [1910.1043\(h\)\(4\)](#) - *Information provided to the physician*. The employer shall provide the following *information* to the examination *physician*: [Reference [paragraph \(h\)\(4\)\(i\) - \(v\)](#)].
- [1910.1043\(h\)\(5\)](#) - *Physician's written opinion*. [Reference [paragraph \(h\)\(5\)\(i\) - \(ii\)](#)].

[1910.1043\(i\)](#) - *Employee education and training*.

- [1910.1043\(i\)\(1\)](#) - *Training program*. [Reference [paragraph \(i\)\(1\)\(i\) - \(ii\)](#)].
- [1910.1043\(i\)\(2\)](#) - *Access to training materials*. [Reference [paragraph \(i\)\(2\)\(i\) - \(ii\)](#)].

[1910.1043\(j\)](#) - *Signs*. [Reference [paragraph \(j\)\(1\) - \(2\)](#)].

- [1910.1043\(j\)\(1\)](#) - The employer shall *post the following warning sign* in each work area where the *permissible exposure limit* for cotton dust is exceeded: [Reference [paragraph \(j\)\(1\)](#)].

#### [1910.1043\(k\)](#) - Recordkeeping.

- [1910.1043\(k\)\(1\)](#) - *Exposure measurements*. [Reference [paragraph \(k\)\(1\)\(i\) - \(iii\)](#)].
- [1910.1043\(k\)\(2\)](#) - *Medical surveillance*. [Reference [paragraph \(k\)\(2\)\(i\) - \(iii\)](#)].
- [1910.1043\(k\)\(3\)](#) - *Availability*.
  - [1910.1043\(k\)\(3\)\(i\)](#) - The employer shall make all *records* required to be maintained by [paragraph \(k\)](#) of this section available to the Assistant Secretary and the Director for examination and *copying*.
  - [1910.1043\(k\)\(3\)\(ii\)](#) - *Employee exposure measurement records and employee medical records* required by this paragraph shall be provided upon request to employees, designated representatives, and the Assistant Secretary in accordance with [29 CFR 1910.1020\(a\) through \(e\) and \(g\) through \(i\)](#) - *access to employee exposure and medical records*.
- [1910.1043\(k\)\(4\)](#) - *Transfer of records*. [Reference [paragraph \(k\)\(4\)\(i\) - \(ii\)](#)].
  - [1910.1043\(k\)\(4\)\(ii\)](#) - The employer shall also comply with any additional requirements involving *transfer of records set forth in 29 CFR 1910.1020(h)* - *access to employee exposure and medical records*.

#### [1910.1043\(l\)](#) - Observation of monitoring. [Reference [paragraph \(l\)\(1\) - \(3\)](#)].

- [1910.1043\(l\)\(1\)](#) - The employer shall provide *affected employees* or their designated representatives an opportunity to observe any *measuring or monitoring of employee exposure* to cotton dust conducted pursuant to [paragraph \(d\)](#) of this section.
- [1910.1043\(l\)\(2\)](#) - Whenever *observation* of the measuring or monitoring of employee exposure to cotton dust requires entry into an area where the use of personal protective equipment is required, the employer shall provide the observer with and assure the use of such equipment and shall require the observer to comply with all other applicable *safety and health procedures*.
- [1910.1043\(l\)\(3\)](#) - Without interfering with the *measurement*, observers shall be entitled to: [Reference [paragraph \(l\)\(3\)\(i\) - \(ii\)](#)].

#### [1910.1043\(m\)](#) - Washed Cotton. [Reference [paragraph \(m\)\(1\) - \(6\)](#)].

### **1910.1044 - 1,2-dibromo-3-chloropropane**

**Scope:** This [standard](#) provides the requirements pertaining to 1,2-dibromo-3-chloropropane.

**Special Requirements:** Permissible exposure limit, regulated areas, authorized person, exposure monitoring, determination, determine, respirator, employee notification, posting



results, corrective action, description, methods of compliance, engineering controls, work practice controls, compliance program (written), revise annually, written plans, respirator program, maintenance, emergency situation (written plan), alerting employees, medical surveillance, medical surveillance program, examination, physician, procedures, information, copy, physician's written opinion, protective clothing and equipment, inform, housekeeping, affected employees, hygiene facilities and practices (i.e., change rooms, showers), training, training program, instruct, training materials, hazard communication, hazard communication program, records, recordkeeping, label, sign, safety data sheets, post signs, observation of monitoring, employee participation, safety and health procedure, measurement procedures, references other standards

1910.1044(c) - *Permissible exposure limit*. [Reference paragraph (c)(1) - (2)].

1910.1044(e) - *Regulated areas*. [Reference paragraph (e)(1) - (2)].

1910.1044(f) - *Exposure monitoring*. [Reference paragraph (f)(1)(i) - (ii)].

- 1910.1044(f)(2) - *Initial*. Each employer who has a place of employment in which DBCP is present, shall *monitor* each workplace and work operation to accurately *determine* the airborne concentrations of DBCP to which employees may be exposed.
- 1910.1044(f)(3) - *Frequency*. [Reference paragraph (f)(3)(i) - (ii)].
- 1910.1044(f)(4) - *Additional*. Whenever there has been a production, process, control, or personnel change which may result in any new or additional *exposure* to DBCP, or whenever the employer has any reason to suspect new or additional exposures to DBCP, the employer shall *monitor* the employees potentially affected by such change for the purpose of redetermining their *exposure*.
- 1910.1044(f)(5) - *Employee notification*. [Reference paragraph (f)(5)(i) - (ii)].
- 1910.1044(f)(6) - *Accuracy of measurement*. The employer shall use a *method of measurement* which has an accuracy, to a confidence level of 95 percent, of not less than plus or minus 25 percent for concentrations of DBCP at or above the *permissible exposure limit*.

1910.1044(g) - *Methods of compliance*.

- 1910.1044(g)(1) - *Priority of compliance methods*. The employer shall institute *engineering and work practice controls* to reduce and maintain *employee exposures* to DBCP at or below the *permissible exposure limit*, except to the extent that the employer establishes that such *controls* are not feasible. Where feasible *engineering and work practice controls* are not sufficient to reduce employee exposures to within the *permissible exposure limit*, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these *controls*, and shall supplement them by use of *respiratory protection*.
- 1910.1044(g)(2) - *Compliance program*. [Reference paragraph (g)(2)(i) - (iv)].



#### 1910.1044(h) - Respiratory protection.

- 1910.1044(h)(1) - General. For employees who are required to use *respirators* by this section, the employer must provide each employee an appropriate *respirator* that complies with the requirements of this paragraph. *Respirators* must be used during: [Reference paragraph (h)(1)(i) - (iv)].
- 1910.1044(h)(2) - *Respirator program*. The employer must implement a *respiratory protection program* in accordance with § 1910.134(b) through (d) [except (d)(1)(iii)], and (f) through (m), which covers each employee required by this section to use a *respirator*.
- 1910.1044(h)(3) - *Respirator selection*. Employers must: [Reference paragraph (h)(3)(i) - (ii)].

#### 1910.1044(i) - Emergency situations.

- 1910.1044(i)(1) - *Written plans*. [Reference paragraph (i)(1)(i) - (ii)].
  - 1910.1044(i)(1)(i) - A *written plan* for emergency situations shall be developed for each workplace in which DBCP is present.
- 1910.1044(i)(4) - *Alerting employees*. Where there is a possibility of *employee exposure* to DBCP due to the occurrence of an emergency, a *general alarm* shall be installed and maintained to promptly alert employees of such occurrences.
- 1910.1044(i)(5) - *Medical surveillance*. For any employee exposed to DBCP in an emergency situation, the employer shall provide *medical surveillance* in accordance with paragraph (m)(6) of this section.
- 1910.1044(i)(6) - *Exposure monitoring*. [Reference paragraph (i)(6)(i) - (ii)].

#### 1910.1044(j) - Protective clothing and equipment.

- 1910.1044(j)(1) - *Provision and use*. Where there is any possibility of eye or dermal contact with liquid or solid DBCP, the employer shall provide, at no cost to the employee, and assure that the employee wears impermeable *protective clothing and equipment* to protect the area of the body which may come in contact with DBCP. *Eye and face protection* shall meet the requirements of § 1910.133 - eye and face protection, of this part.
- 1910.1044(j)(2) - *Removal and storage*. [Reference paragraph (j)(2)(i) - (v)].
- 1910.1044(j)(3) - *Cleaning and replacement*. [Reference paragraph (j)(3)(i) - (iii)].

#### 1910.1044(k) - Housekeeping. [Reference paragraph (k)(1) - (3)].

#### 1910.1044(l) - Hygiene facilities and practices. [Reference paragraph (l)(1) - (5)].

- 1910.1044(l)(4)(ii) - The employer shall provide a sufficient number of lavatory facilities which comply with 29 CFR 1910.141(d)(1) and (2) - sanitation.

1910.1044(m) - Medical surveillance. [Reference [paragraph \(m\)\(1\)\(i\) - \(ii\)](#)].

- [1910.1044\(m\)\(1\)\(i\)](#) - The employer shall make available a *medical surveillance program* for employees who work in *regulated areas* and employees who are subjected to DBCP exposures in an emergency situation.
- [1910.1044\(m\)\(2\)](#) - *Frequency and content.* At the time of initial assignment, and annually thereafter, the employer shall provide a *medical examination* for employees who work in *regulated areas*, which includes at least the following: [Reference [paragraph \(m\)\(2\)\(i\) - \(iv\)](#)].
- [1910.1044\(m\)\(3\)](#) - *Additional examinations.* If the employee for any reason develops signs or symptoms commonly associated with exposure to DBCP, the employer shall provide the employee with a *medical examination* which shall include those elements considered appropriate by the examining *physician*.
- [1910.1044\(m\)\(4\)](#) - *Information provided to the physician.* The employer shall provide the following *information* to the examining *physician*: [Reference [paragraph \(m\)\(4\)\(i\) - \(iv\)](#)].
- [1910.1044\(m\)\(5\)](#) - *Physician's written opinion.* [Reference [paragraph \(m\)\(5\)\(i\) - \(ii\)](#)].
- [1910.1044\(m\)\(6\)](#) - *Emergency situations.* If the employee is exposed to DBCP in an *emergency situation*, the employer shall provide the employee with a sperm count test as soon as practicable, or, if the employee has been vasectomized or is unable to produce a semen specimen, the hormone tests contained in [paragraph \(m\)\(2\)\(iii\)](#) of this section. The employer shall provide these same tests three months later.

1910.1044(n) - Employee information and training.

- [1910.1044\(n\)\(1\)](#) - *Training program.*
  - [1910.1044\(n\)\(1\)\(i\)](#) - The employer shall *train* each employee who may be exposed to DBCP in accordance with the requirements of this section. The employer shall institute a *training program* and ensure *employee participation in the program*.
  - [1910.1044\(n\)\(1\)\(ii\)](#) - The employer shall assure that each employee is *informed* of the following: [Reference [paragraph \(n\)\(1\)\(ii\)\(a\) - \(e\)](#)].
- [1910.1044\(n\)\(2\)](#) - *Access to training materials.* [Reference [paragraph \(n\)\(2\)\(i\) - \(ii\)](#)].

1910.1044(o) - Communication of hazards.

- [1910.1044\(o\)\(1\)](#) - *Hazard communication - general.*
  - [1910.1044\(o\)\(1\)\(i\)](#) - *Chemical manufacturers, importers, distributors and employers* shall comply with all requirements of the *Hazard Communication Standard (HCS)* ([§ 1910.1200](#)) for DBCP.
  - [1910.1044\(o\)\(1\)\(ii\)](#) - In *classifying the hazards* of DBCP at least the following hazards are to be addressed: Cancer; reproductive effects; liver effects;

kidney effects; central nervous system effects; skin, eye and respiratory tract irritation; and acute toxicity effects.

- [1910.1044\(o\)\(1\)\(iii\)](#) - Employers shall include DBCP in the *hazard communication program* established to comply with the HCS ([§ 1910.1200](#)). Employers shall ensure that each employee has access to *labels* on containers of DBCP and to *safety data sheets*, and is *trained* in accordance with the requirements of HCS and [paragraph \(n\)](#) of this section.
- [1910.1044\(o\)\(1\)\(iv\)](#) - The employer shall ensure that no *statement* appears on or near any *sign or label* required by this [paragraph \(o\)](#) which contradicts or detracts from the meaning of the required *sign or label*.
- [1910.1044\(o\)\(2\)](#) - *Signs*.
  - [1910.1044\(o\)\(2\)\(i\)](#) - The employer shall *post signs* to clearly indicate all *regulated areas*. These *signs* shall bear the legend: [Reference [paragraph \(o\)\(2\)\(i\) - \(ii\)](#)].
- [1910.1044\(o\)\(3\)](#) - *Labels*. [Reference [paragraph \(o\)\(3\)\(i\) - \(iii\)](#)].

#### [1910.1044\(p\)](#) - *Recordkeeping*.

- [1910.1044\(p\)\(1\)](#) - *Exposure monitoring*. [Reference [paragraph \(p\)\(1\)\(i\) - \(iii\)](#)].
- [1910.1044\(p\)\(2\)](#) - *Medical surveillance*. [Reference [paragraph \(p\)\(2\)\(i\) - \(iii\)](#)].
- [1910.1044\(p\)\(3\)](#) - *Availability*.
  - [1910.1044\(p\)\(3\)\(i\)](#) - The employer shall assure that all *records* required to be maintained by this section be made available upon request to the Assistant Secretary and the Director for examination and *copying*.
  - [1910.1044\(p\)\(3\)\(ii\)](#) - Employee *exposure monitoring records and employee medical records* required by this paragraph shall be provided upon request to employees, designated representatives, and the Assistant Secretary in accordance with [29 CFR 1910.1020\(a\) through \(e\) and \(g\) through \(i\)](#) - *access to employee exposure and medical records*.
- [1910.1044\(p\)\(4\)](#) - *Transfer of records*.
  - [1910.1044\(p\)\(4\)\(i\)](#) - If the employer ceases to do business, the successor employer shall receive and retain all *records* required to be maintained by paragraph (p) of this section for the prescribed period.
  - [1910.1044\(p\)\(4\)\(ii\)](#) - The employer shall also comply with any additional requirements involving *transfer of records set forth in 29 CFR 1910.1020(h)* - *access to employee exposure and medical records*.

#### [1910.1044\(q\)](#) - *Observation of monitoring* -

- [1910.1044\(q\)\(1\)](#) - *Employee observation*. The employer shall provide *affected employees*, or their designated representatives, with an opportunity to *observe any monitoring of employee exposure* to DBCP required by this section.
- [1910.1044\(q\)\(2\)](#) - *Observation procedures*.

- [1910.1044\(q\)\(2\)\(i\)](#) - Whenever observation of the *measuring or monitoring of employee exposure* to DBCP requires entry into an area where the use of *protective clothing or equipment* is required, the employer shall provide the observer with *personal protective clothing or equipment* required to be worn by employees working in the area, assure the use of such *clothing and equipment*, and require the observer to comply with all other applicable *safety and health procedures*. [Reference [paragraph \(q\)\(2\)\(i\) - \(ii\)](#)].

## 1910.1045 – Acrylonitrile

**Scope:** This [standard](#) provides the requirements pertaining to acrylonitrile.

**Special Requirements:** Permissible exposure limit, time weighted average, ceiling level, exposure monitoring, determinations, determine, employee notification, results, receipt, affected employee, notify, written notice (statement), corrective action, description, writing, regulated area, demarcated, authorized person, methods of compliance, engineering controls, work practice controls, compliance program (written), written plans, report, respirators, protective equipment and clothing, respirator program, label, safety data sheets, emergency situations (written plan), inform, housekeeping, hygiene facilities and practices (i.e., change rooms, showers), medical surveillance, medical surveillance program, examinations, physician, procedures, information, physician's written opinion, statement, instruct, copy, employee information, training, training program, employee participation, training materials, chemical manufacturers, importers, distributors, records, recordkeeping, hazard communication, hazard communication program, classifying hazards, signs, post, data, references other standards

[1910.1045\(c\)](#) - *Permissible exposure limits*. [Reference [paragraph \(c\)\(1\) - \(2\)](#)].

[1910.1045\(e\)](#) - *Exposure monitoring*. [Reference [paragraph \(e\)\(1\)\(i\) - \(ii\)](#)].

- [1910.1045\(e\)\(2\)](#) - *Initial monitoring*. Each employer who has a place of employment in which AN is present shall *monitor* each such workplace and work operation to accurately *determine* the airborne concentrations of AN to which employees may be exposed.
- [1910.1045\(e\)\(3\)](#) - *Frequency*. [Reference [paragraph \(e\)\(3\)\(i\) - \(iii\)](#)].
- [1910.1045\(e\)\(4\)](#) - *Additional monitoring*. Whenever there has been a production, process, control, or personnel change which may result in new or additional exposures to AN, or whenever the employer has any other reason to suspect a change which may result in new or additional exposures to AN, *additional monitoring* which complies with this paragraph shall be conducted.
- [1910.1045\(e\)\(5\)](#) - *Employee notification*. [Reference [paragraph \(e\)\(5\)\(i\) - \(ii\)](#)].
- [1910.1045\(e\)\(6\)](#) - *Accuracy of measurement*. The *method of measurement* of employee *exposures* shall be accurate to a confidence level of 95 percent, to within plus or minus 35 percent for concentrations of AN at or above the *permissible*

*exposure limits*, and plus or minus 50 percent for concentrations of AN below the *permissible exposure limits*.

1910.1045(f) - Regulated areas. [Reference [paragraph \(f\)\(1\) - \(4\)](#)].

- [1910.1045\(f\)\(1\)](#) - The employer shall establish *regulated areas* where AN concentrations are in excess of the *permissible exposure limits*.
- [1910.1045\(f\)\(2\)](#) - *Regulated areas* shall be demarcated and segregated from the rest of the workplace, in any manner that minimizes the number of persons who will be exposed to AN.
- [1910.1045\(f\)\(3\)](#) - Access to *regulated areas* shall be limited to *authorized persons* or to persons otherwise *authorized* by the act or regulations issued pursuant thereto.

1910.1045(g) - Methods of compliance.

- [1910.1045\(g\)\(1\)](#) - *Engineering and work practice controls*. [Reference [paragraph \(g\)\(1\)\(i\) - \(ii\)](#)].
- [1910.1045\(g\)\(2\)](#) - *Compliance program*.
  - [1910.1045\(g\)\(2\)\(i\)](#) - The employer shall establish and implement a *written program* to reduce *employee exposures* to or below the *permissible exposure limits* solely by means of *engineering and work practice controls*, as required by [paragraph \(g\)\(1\)](#) of this section.
  - [1910.1045\(g\)\(2\)\(ii\)](#) - *Written plans* for these *compliance programs* shall include at least the following: [Reference [paragraph \(g\)\(2\)\(i\) - \(v\)](#)].

1910.1045(h) - Respiratory protection.

- [1910.1045\(h\)\(1\)](#) - General. For employees who use *respirators* required by this section, the employer must provide each employee an appropriate *respirator* that complies with the requirements of this paragraph. *Respirators* must be used during: [Reference [paragraph \(h\)\(1\)\(i\) - \(iv\)](#)].
- [1910.1045\(h\)\(2\)](#) - *Respirator program*.
  - [1910.1045\(h\)\(2\)\(i\)](#) - The employer must implement a *respiratory protection program* in accordance with [§ 1910.134\(b\) through \(d\) \[except \(d\)\(1\)\(iii\), \(d\)\(3\)\(iii\)\(B\)\(1\), and \(2\)\], and \(f\) through \(m\)](#), which covers each employee required by this section to use a *respirator*. [Reference [paragraph \(h\)\(2\)\(i\) - \(ii\)](#)].
- [1910.1045\(h\)\(3\)](#) - *Respirator selection*. Employers must: [Reference [paragraph \(h\)\(3\)\(i\) - \(ii\)](#)].
  - [1910.1045\(h\)\(3\)\(i\)](#) - Select, and provide to employees, the appropriate *respirators* specified in [paragraph \(d\)\(3\)\(i\)\(A\) of 29 CFR 1910.134](#).

1910.1045(i) - Emergency situations.



- [1910.1045\(i\)\(1\)](#) - *Written plans*. [Reference [paragraph \(i\)\(1\)\(i\) - \(iii\)](#)].
  - [1910.1045\(i\)\(1\)\(i\)](#) - A *written plan for emergency situations* shall be developed for each workplace where liquid AN is present. Appropriate portions of the *plan* shall be implemented in the event of an emergency.
- [1910.1045\(i\)\(2\)](#) - *Alerting employees*. Where there is the possibility of employee exposure to AN in excess of the ceiling limit, a general alarm shall be installed and used to promptly alert employees of such occurrences.

[1910.1045\(j\)](#) - *Protective clothing and equipment*.

- [1910.1045\(j\)\(1\)](#) - *Provision and use*. Where eye or skin contact with liquid AN may occur, the employer shall provide at no cost to the employee, and assure that employees wear, impermeable *protective clothing or other equipment* to protect any area of the body which may come in contact with liquid AN. The provision of §§ [1910.132](#) - *PPE, general requirements*, and [1910.133](#) - *eye and face protection*, shall be complied with.
- [1910.1045\(j\)\(2\)](#) - *Cleaning and replacement*. [Reference [paragraph \(j\)\(2\)\(i\) - \(v\)](#)].

[1910.1045\(k\)](#) - *Housekeeping*. [Reference [paragraph \(k\)\(1\) - \(3\)](#)].

[1910.1045\(l\)](#) - *Waste disposal*. AN waste, scrap, debris, bags, containers, or equipment shall be *decontaminated* before being incorporated in the general waste disposal system.

[1910.1045\(m\)](#) - *Hygiene facilities and practices*. [Reference [paragraph \(m\)\(1\) - \(4\)](#)].

[1910.1045\(n\)](#) - *Medical surveillance*. [Reference [paragraph \(n\)\(1\)\(i\) - \(ii\)](#)].

- [1910.1045\(n\)\(1\)\(i\)](#) - The employer shall institute a *program of medical surveillance* for each employee who is or will be exposed to AN at or above the *action level*, without regard to the use of *respirators*. The employer shall provide each such employee with an opportunity for *medical examinations and tests* in accordance with this paragraph.
- [1910.1045\(n\)\(2\)](#) - *Initial examinations*. At the time of initial assignment, or upon institution of the *medical surveillance program*, the employer shall provide each *affected employee* an opportunity for a medical examination, including at least the following elements: [Reference [paragraph \(n\)\(2\)\(i\) - \(iv\)](#)].
- [1910.1045\(n\)\(3\)](#) - *Periodic examinations*. [Reference [paragraph \(n\)\(3\)\(i\) - \(ii\)](#)].
- [1910.1045\(n\)\(4\)](#) - *Additional examinations*. If the employee for any reason develops signs or symptoms which may be associated with exposure to AN, the employer shall provide an appropriate *examination* and emergency medical treatment.
- [1910.1045\(n\)\(5\)](#) - *Information provided to the physician*. The employer shall provide the following *information* to the examining *physician*: [Reference [paragraph \(n\)\(5\)\(i\) - \(vi\)](#)].
- [1910.1045\(n\)\(6\)](#) - *Physician's written opinion*. [Reference [paragraph \(n\)\(6\)\(i\) - \(iii\)](#)].



1910.1045(o) - *Employee information and training.*

- 1910.1045(o)(1) - *Training program.* [Reference paragraph (o)(1)(i) - (ii)].
- 1910.1045(o)(2) - *Access to training materials.* [Reference paragraph (o)(2)(i) - (ii)].

1910.1045(p) - *Communication of hazards.*

- 1910.1045(p)(1) - *Hazard communication - general.* [Reference paragraph (p)(1)(i) - (iv)].
  - 1910.1045(p)(1)(i) - *Chemical manufacturers, importers, distributors and employers shall comply with all requirements of the Hazard Communication Standard (HCS) (§ 1910.1200) for AN and AN-based materials not exempted under paragraph (a)(2) of this section.*
  - 1910.1045(p)(1)(ii) - *In classifying the hazards of AN and AN-based materials at least the following hazards are to be addressed: Cancer; central nervous system effects; liver effects; skin sensitization; skin, respiratory, and eye irritation; acute toxicity effects; and flammability.*
  - 1910.1045(p)(1)(iii) - *Employers shall include AN and AN-based materials in the hazard communication program established to comply with the HCS (§ 1910.1200). Employers shall ensure that each employee has access to labels on containers of AN and AN-based materials and to safety data sheets, and is trained in accordance with the requirements of HCS and paragraph (o) of this section.*
- 1910.1045(p)(2) - *Signs.*
  - 1910.1045(p)(2)(i) - *The employer shall post signs to clearly indicate all workplaces where AN concentrations exceed the permissible exposure limits. The signs shall bear the following legend: [Reference paragraph (p)(2)(i) - (iii)].*
- 1910.1045(p)(3) - *Labels.* [Reference paragraph (p)(3)(i) - (iii)].

1910.1045(q) - *Recordkeeping.*

- 1910.1045(q)(1) - *Objective data for exempted operations.* [Reference paragraph (q)(1)(i) - (iii)].
- 1910.1045(q)(2) - *Exposure monitoring.* [Reference paragraph (q)(2)(i) - (iii)].
- 1910.1045(q)(3) - *Medical surveillance.* [Reference paragraph (q)(3)(i) - (iii)].
- 1910.1045(q)(4) - *Availability.* [Reference paragraph (q)(4)(i) - (ii)].
  - 1910.1045(q)(4)(ii) - *Records required by paragraphs (q)(1) through (q)(3) of this section shall be provided upon request to employees, designated representatives, and the Assistant Secretary in accordance with 29 CFR 1910.1020 (a) through (e) and (q) through (i). Records required by paragraph (q)(1) shall be provided in the same manner as exposure monitoring records.*
- 1910.1045(q)(5) - *Transfer of records.* [Reference paragraph (q)(5)(i) - (ii)].

- [1910.1045\(q\)\(5\)\(ii\)](#) - The employer shall also comply with any additional requirements involving transfer of *records* set forth in [29 CFR 1910.1020\(h\)](#).

#### [1910.1045\(r\)](#) - *Observation of monitoring.*

- [1910.1045\(r\)\(1\)](#) - *Employee observation.* The employer shall provide *affected employees*, or their designated representatives, an opportunity to observe any *monitoring* of employee exposure to AN conducted pursuant to [paragraph \(e\)](#) of this section.
- [1910.1045\(r\)\(2\)](#) - *Observation procedures.* [Reference [paragraph \(r\)\(2\)\(i\) - \(ii\)](#)].

### 1910.1047 - Ethylene Oxide

**Scope:** This [standard](#) provides the requirements pertaining to ethylene oxide.

**Special Requirements:** Permissible exposure limit, time-weighted average, excursion limit, exposure monitoring, determination, determine, document, monitoring results, posting results, in writing, regulated areas, demarcated, methods of compliance, engineering controls, work practice controls, compliance program (written), schedule, leak detection surveys, written plan (emergency situations), respiratory protection, methods, respirator program, hazard communication, hazard communication program, personal protective equipment, medical surveillance, alerting employees, affected employees, physician, examinations, procedures, information, description, physician's written opinion, statement, informed, instruct, receipt, chemical manufacturers, importers, safety data sheets, labels, train, signs, post, distributors, training, records, recordkeeping, data, measurements, sampling, observation, safety and health procedures, authorized person, written consent, references other standards

[1910.1047\(c\)](#) - *Permissible exposure limits.* [Reference [paragraph \(c\)\(1\) - \(2\)](#)].

[1910.1047\(d\)](#) - *Exposure monitoring.* [Reference [paragraph \(d\)\(1\)\(i\) - \(iii\)](#)].

- [1910.1047\(d\)\(2\)](#) - *Initial monitoring.* [Reference [paragraph \(d\)\(2\)\(i\) - \(iii\)](#)].
- [1910.1047\(d\)\(3\)](#) - *Monitoring frequency (periodic monitoring).* [Reference [paragraph \(d\)\(3\)\(i\) - \(iv\)](#)].
- [1910.1047\(d\)\(4\)](#) - *Termination of monitoring.* [Reference [paragraph \(d\)\(4\)\(i\) - \(iv\)](#)].
- [1910.1047\(d\)\(5\)](#) - *Additional monitoring.* Notwithstanding the provisions of [paragraph \(d\)\(4\)](#) of this section, the employer shall institute the *exposure monitoring* required under [paragraphs \(d\)\(2\)\(i\)](#) and [\(d\)\(3\)](#) of this section whenever there has been a change in the production, process, control equipment, *personnel* or *work practices* that may result in new or additional exposures to EtO or when the employer has any reason to suspect that a change may result in new or additional exposures.
- [1910.1047\(d\)\(6\)](#) - *Accuracy of monitoring.* [Reference [paragraph \(d\)\(6\)\(i\) - \(ii\)](#)].

- [1910.1047\(d\)\(7\)](#) - *Employee notification of monitoring results*. [Reference [paragraph \(d\)\(7\)\(i\) - \(ii\)](#)].

[1910.1047\(e\)](#) - *Regulated areas*. [Reference [paragraph \(e\)\(1\) - \(3\)](#)].

[1910.1047\(f\)](#) - *Methods of compliance*.

- [1910.1047\(f\)\(1\)](#) - *Engineering controls and work practices*. [Reference [paragraph \(f\)\(1\)\(i\) - \(iii\)](#)].
  - [1910.1047\(f\)\(1\)\(i\)](#) - The employer shall institute *engineering controls and work practices* to reduce and maintain employee *exposure* to or below the *TWA* and to or below the excursion limit, except to the extent that such controls are not feasible.
- [1910.1047\(f\)\(2\)](#) - *Compliance program*. [Reference [paragraph \(f\)\(2\)\(i\) - \(iv\)](#)].
  - [1910.1047\(f\)\(2\)\(i\)](#) - Where the *TWA* or *excursion limit* is exceeded, the employer shall establish and implement a *written program* to reduce exposure to or below the *TWA* and to or below the excursion limit by means of *engineering and work practice controls*, as required by [paragraph \(f\)\(1\)](#) of this section, and by the use of *respiratory protection* where required or permitted under this section.
  - [1910.1047\(f\)\(2\)\(ii\)](#) - The *compliance program* shall include a *schedule for periodic leak detection surveys* and a *written plan* for emergency situations, as specified in [paragraph \(h\)\(1\)](#) of this section.
  - [1910.1047\(f\)\(2\)\(iii\)](#) - *Written plans* for a *program* required in [paragraph \(f\)\(2\)](#) shall be developed and furnished upon request for examination and copying to the Assistant Secretary, the Director, *affected employees* and designated employee representatives. Such *plans* shall be reviewed at least every 12 months, and shall be updated as necessary to reflect significant changes in the status of the employer's *compliance program*.

[1910.1047\(g\)](#) - *Respiratory protection and personal protective equipment*. [Reference [paragraph \(g\)\(1\)\(i\) - \(iv\)](#)].

- [1910.1047\(g\)\(2\)](#) - *Respirator program*. The employer must implement a *respiratory protection program* in accordance with [§1910.134\(b\) through \(d\) \[except \(d\)\(1\)\(iii\)\]](#), and [\(f\) through \(m\)](#), which covers each employee required by this section to use a *respirator*.
- [1910.1047\(g\)\(3\)](#) - *Respirator selection*. Employers must: [Reference [paragraph \(g\)\(3\)\(i\) - \(iii\)](#)].
- [1910.1047\(g\)\(4\)](#) - *Protective clothing and equipment*. When employees could have eye or skin contact with EtO or EtO solutions, the employer must select and provide, at no cost to the employee, appropriate *protective clothing or other equipment* in accordance with [29 CFR 1910.132 - PPE, general requirements](#), and [1910.133 - eye and face protection](#), to protect any area of the employee's body that may come in

contact with the EtO or EtO solution, and must ensure that the employee wears the *protective clothing and equipment* provided.

1910.1047(h) - *Emergency situations.*

- 1910.1047(h)(1) - *Written plan.*
  - 1910.1047(h)(1)(i) - A *written plan for emergency situations* shall be developed for each workplace where there is a possibility of an emergency. Appropriate portions of the *plan* shall be implemented in the event of an emergency.
  - 1910.1047(h)(1)(ii) - The *plan* shall specifically provide that employees engaged in correcting emergency conditions shall be equipped with *respiratory protection* as required by paragraph (g) of this section until the emergency is abated.
  - 1910.1047(h)(1)(iii) - The *plan* shall include the elements prescribed in 29 CFR 1910.38 and 29 CFR 1910.39, "*Emergency action plans*" and "*Fire prevention plans*," respectively.
- 1910.1047(h)(2) - *Alerting employees.* Where there is the possibility of employee exposure to EtO due to an emergency, means shall be *developed to alert* potentially affected employees of such occurrences promptly. *Affected employees* shall be immediately evacuated from the area in the event that an emergency occurs.

1910.1047(i) - *Medical Surveillance.* [Reference paragraph (i)(1)(i) - (ii)].

- 1910.1047(i)(1)(i)(A) - The employer shall institute a *medical surveillance program* for all employees who are or may be exposed to EtO at or above the action level, without regard to the use of *respirators*, for at least 30 days a year.
- 1910.1047(i)(2) - *Medical examinations and consultations.* [Reference paragraph (i)(2)(i) - (ii)].
- 1910.1047(i)(3) - *Information provided to the physician.* The employer shall provide the following *information* to the examining *physician*: [Reference paragraph (i)(3)(i) - (v)].
- 1910.1047(i)(4) - *Physician's written opinion.* [Reference paragraph (i)(4)(i) - (iii)].

1910.1047(j) - *Communication of hazards.*

- 1910.1047(j)(1)(i) - *Chemical manufacturers, importers, distributors* and employers shall comply with all requirements of the *Hazard Communication Standard (HCS) (§1910.1200)* for EtO.
- 1910.1047(j)(1)(ii) - In *classifying the hazards* of EtO at least the following hazards are to be addressed: Cancer; reproductive effects; mutagenicity; central nervous system; skin sensitization; skin, eye and respiratory tract irritation; acute toxicity effects; and flammability.

- [1910.1047\(j\)\(1\)\(iii\)](#) - Employers shall include EtO in the *hazard communication program* established to comply with the HCS ([§1910.1200](#)). Employers shall ensure that each employee has access to *labels* on containers of EtO and to *safety data sheets*, and is trained in accordance with the requirements of HCS and [paragraph \(j\)\(3\)](#) of this section.
- [1910.1047\(j\)\(2\)](#) - *Signs and labels*.
  - [1910.1047\(j\)\(2\)\(i\)\(A\)](#) - The employer shall *post and maintain legible signs demarcating regulated areas* and entrances or access ways to regulated areas that bear the following legend: [Reference [paragraph \(j\)\(2\)\(i\)\(A\) - \(B\)](#)].
  - [1910.1047\(j\)\(2\)\(ii\)\(A\)](#) - The employer shall ensure that *labels* are affixed to all containers of EtO whose contents are capable of causing employee exposure at or above the *action level* or whose contents may reasonably be foreseen to cause employee exposure above the excursion limit, and that the *labels* remain affixed when the containers of EtO leave the workplace. For the purposes of this [paragraph \(j\)\(2\)\(ii\)](#), reaction vessels, storage tanks, and pipes or piping systems are not considered to be containers. [Reference [paragraph \(j\)\(2\)\(ii\)\(A\) - \(C\)](#)].
- [1910.1047\(j\)\(3\)](#) - *Information and training*. [Reference [paragraph \(j\)\(3\)\(i\) - \(iii\)](#)].
  - [1910.1047\(j\)\(3\)\(ii\)](#) - Employees shall be *informed* of the following: [Reference [paragraph \(j\)\(3\)\(ii\)\(A\) - \(D\)](#)].
  - [1910.1047\(j\)\(3\)\(iii\)](#) - *Employee training* shall include at least: [Reference [paragraph \(j\)\(3\)\(iii\)\(A\) - \(D\)](#)].

#### [1910.1047\(k\)](#) - *Recordkeeping*.

- [1910.1047\(k\)\(1\)](#) - *Objective data for exempted operations*. [Reference [paragraph \(k\)\(1\)\(i\) - \(iii\)](#)].
- [1910.1047\(k\)\(2\)](#) - *Exposure measurements*. [Reference [paragraph \(k\)\(2\)\(i\) - \(iii\)](#)].
- [1910.1047\(k\)\(3\)](#) - *Medical surveillance*. [Reference [paragraph \(k\)\(3\)\(i\) - \(iii\)](#)].
- [1910.1047\(k\)\(4\)](#) - *Availability*. [Reference [paragraph \(k\)\(4\)\(i\) - \(iii\)](#)].
  - [1910.1047\(k\)\(4\)\(ii\)](#) - The employer, upon request, shall make any *exemption and exposure records* required by [paragraphs \(k\)\(1\) and \(2\)](#) of this section available for examination and copying to affected employees, former employees, designated representatives and the Assistant Secretary, in accordance with [29 CFR 1910.1020 \(a\) through \(e\) and \(g\) through \(i\)](#) - *access to employee exposure and medical records*.
  - [1910.1047\(k\)\(4\)\(iii\)](#) - The employer, upon request, shall make *employee medical records* required by [paragraph \(k\)\(3\)](#) of this section available for examination and copying to the subject employee, anyone having the specific *written consent* of the subject employee, and the Assistant Secretary, in accordance with [29 CFR 1910.1020](#) - *access to employee exposure and medical records*.



- [1910.1047\(k\)\(5\)](#) - *Transfer of records*. The employer shall comply with the requirements concerning transfer of records set forth in [29 CFR 1910.1020\(h\)](#) - *access to employee exposure and medical records*.

[1910.1047\(l\)](#) - *Observation of monitoring*. [Reference [paragraph \(l\)\(1\) - \(2\)](#)].

- [1910.1047\(l\)\(2\)](#) - *Observation procedures*. When observation of the monitoring of employee exposure to EtO requires entry into an area where the use of *protective clothing or equipment* is required, the observer shall be provided with and be required to use such *clothing and equipment* and shall comply with all other applicable *safety and health procedures*.

## 1910.1048 – Formaldehyde

**Scope:** This [standard](#) provides the requirements for formaldehyde.

**Special Requirements:** Permissible exposure limit, time-weighted average, short term exposure level, action level, results, sampling, exposure monitoring, medical surveillance, identify, determine, notify, in writing, posting results, affected employee, corrective action, description, regulated areas, signs, methods of compliance, engineering controls, work practice controls, personal protective equipment and clothing, respirators, respirator program, authorized persons, communicate, trained, end-of-service-life indicators, approved, NIOSH, inform, label, hygiene protection (i.e., quick drench showers, eyewash), housekeeping, inspections, (leak detection) program, preventive maintenance, (emergency) procedures, medical surveillance, medical surveillance program, information, written medical opinion, medical removal, medical questionnaire, physician, examinations, communication of hazards, hazard communication, hazard communication program, safety data sheets, chemical manufacturers, importers, distributors, classify hazards, determinations, training, training program, written consent, training materials (written), records, recordkeeping, measurements, methods, fit-tests, references other standards

[1910.1048\(c\)](#) - *Permissible Exposure Limit (PEL)*. [Reference [paragraph \(c\)\(1\) - \(2\)](#)].

[1910.1048\(d\)](#) - *Exposure monitoring*.

- [1910.1048\(d\)\(1\)\(i\)](#) - Each employer who has a workplace covered by this standard shall *monitor* employees to determine their exposure to formaldehyde. [Reference [paragraph \(d\)\(1\)\(i\) - \(iv\)](#)].
- [1910.1048\(d\)\(2\)](#) - *Initial monitoring*. The employer shall *identify* all employees who may be exposed at or above the action level or at or above the *STEL* and accurately *determine* the *exposure* of each employee so identified. [Reference [paragraph \(d\)\(2\)\(i\) - \(iii\)](#)].
- [1910.1048\(d\)\(3\)](#) - *Periodic monitoring*. [Reference [paragraph \(d\)\(3\)\(i\) - \(iii\)](#)].



- [1910.1048\(d\)\(4\)](#) - *Termination of monitoring*. The employer may discontinue *periodic monitoring* for employees if results from two consecutive *sampling* periods taken at least 7 days apart show that *employee exposure* is below the *action level* and the *STEL*. The results must be statistically representative and consistent with the employer's knowledge of the job and work operation.
- [1910.1048\(d\)\(5\)](#) - *Accuracy of monitoring*. Monitoring shall be accurate, at the 95 percent confidence level, to within plus or minus 25 percent for airborne concentrations of formaldehyde at the *TWA and the STEL* and to within plus or minus 35 percent for airborne concentrations of formaldehyde at the action level.
- [1910.1048\(d\)\(6\)](#) - *Employee notification of monitoring results*. The employer must, within 15 working days after the receipt of the results of any monitoring performed under this section, *notify* each *affected employee* of these results either individually in *writing or by posting the results* in an appropriate location that is accessible to employees. If employee exposure is above the PEL, *affected employees* shall be provided with a *description of the corrective actions* being taken by the employer to decrease exposure.
- [1910.1048\(d\)\(7\)](#) - *Observation of monitoring*. [Reference [paragraph \(d\)\(7\)\(i\) - \(ii\)](#)].

#### [1910.1048\(e\)](#) - *Regulated areas*.

- [1910.1048\(e\)\(1\)\(i\)](#) - The employer shall establish *regulated areas* where the concentration of airborne formaldehyde exceeds either the *TWA or the STEL* and post all entrances and access ways with signs bearing the following legend: [Reference [paragraph \(e\)\(1\)\(i\) - \(ii\)](#)].
- [1910.1048\(e\)\(2\)](#) - The employer shall limit access to *regulated areas* to *authorized persons* who have been *trained* to recognize the hazards of formaldehyde.
- [1910.1048\(e\)\(3\)](#) - An employer at a multiemployer worksite who establishes a *regulated area* shall *communicate* the access restrictions and locations of these areas to other employers with work operations at that worksite.

#### [1910.1048\(f\)](#) - *Methods of compliance*.

- [1910.1048\(f\)\(1\)](#) - *Engineering controls and work practices*. The employer shall institute *engineering and work practice controls* to reduce and maintain *employee exposures* to formaldehyde at or below the *TWA and the STEL*.

#### [1910.1048\(g\)](#) - *Respiratory protection*.

- [1910.1048\(g\)\(1\)](#) - *General*. For employees who use *respirators* required by this section, the employer must provide each employee an appropriate *respirator* that complies with the requirements of this paragraph. *Respirators* must be used during: [Reference [paragraph \(g\)\(1\)\(i\) - \(iv\)](#)].
- [1910.1048\(g\)\(2\)](#) - *Respirator program*.

- [1910.1048\(g\)\(2\)\(i\)](#) - The employer must implement a *respiratory protection program* in accordance with [§ 1910.134\(b\) through \(d\)](#) [except [\(d\)\(1\)\(iii\)](#), [\(d\)\(3\)\(iii\)\(B\)\(1\)](#), and [\(2\)](#)], and [\(f\) through \(m\)](#), which covers each employee required by this section to use a *respirator*.
- [1910.1048\(g\)\(2\)\(ii\)](#) - When employees use air-purifying respirators with chemical cartridges or canisters that do not contain *end-of-service-life indicators approved by the National Institute for Occupational Safety and Health*, employers must replace these cartridges or canisters as specified by paragraphs [\(d\)\(1\)\(iii\)](#), [\(d\)\(3\)\(iii\)\(B\)\(1\)](#), and [\(2\)](#) of [29 CFR 1910.134](#), or at the end of the workshift, whichever condition occurs first.
- [1910.1048\(g\)\(3\)](#) - *Respirator selection*. [Reference [paragraph \(g\)\(3\)\(i\) - \(iii\)](#)].

[1910.1048\(h\)](#) - *Protective equipment and clothing*. Employers shall comply with the provisions of [29 CFR 1910.132](#) - PPE, general requirements, and [29 CFR 1910.133](#) - eye and face protection. When *protective equipment or clothing* is provided under these provisions, the employer shall provide these protective devices at no cost to the employee and assure that the employee wears them.

- [1910.1048\(h\)\(1\)](#) - Selection. The employer shall select *protective clothing and equipment* based upon the form of formaldehyde to be encountered, the conditions of use, and the hazard to be prevented. [Reference [paragraph \(h\)\(1\)\(i\) - \(iv\)](#)].
- [1910.1048\(h\)\(2\)](#) - *Maintenance of protective equipment and clothing*. [Reference [paragraph \(h\)\(2\)\(i\) - \(vi\)](#)].

[1910.1048\(i\)](#) - *Hygiene protection*. [Reference [paragraph \(i\)\(1\) - \(3\)](#)].

- [1910.1048\(i\)\(1\)](#) - The employer shall provide change rooms, as described in [29 CFR 1910.141](#) - sanitation, for employees who are required to change from work clothing into *protective clothing* to prevent skin contact with formaldehyde.

[1910.1048\(j\)](#) - *Housekeeping*. For operations involving formaldehyde liquids or gas, the employer shall conduct a *program* to detect leaks and spills, including *regular visual inspections*. [Reference [paragraph \(j\)\(1\) - \(4\)](#)].

[1910.1048\(k\)](#) - *Emergencies*. For each workplace where there is the possibility of an emergency involving formaldehyde, the employer shall assure appropriate *procedures* are adopted to minimize injury and loss of life. Appropriate *procedures* shall be implemented in the event of an emergency.

[1910.1048\(l\)](#) - *Medical surveillance*.

- [1910.1048\(l\)\(1\)\(i\)](#) - The employer shall institute *medical surveillance programs* for all employees exposed to formaldehyde at concentrations at or exceeding the *action level or exceeding the STEL*.

- [1910.1048\(l\)\(2\)](#) - *Examination by a physician*. All medical procedures, including administration of *medical disease questionnaires*, shall be performed by or under the supervision of a *licensed physician* and shall be provided without cost to the employee, without loss of pay, and at a reasonable time and place.
- [1910.1048\(l\)\(3\)](#) - *Medical disease questionnaire*. The employer shall make the following *medical surveillance* available to employees prior to assignment to a job where formaldehyde exposure is at or above the action level or above the STEL and annually thereafter. The employer shall also make the following *medical surveillance* available promptly upon determining that an employee is experiencing signs and symptoms indicative of possible overexposure to formaldehyde. [Reference [paragraph \(l\)\(3\)\(i\) - \(ii\)](#)].
- [1910.1048\(l\)\(4\)](#) - *Medical examinations*. Medical examinations shall be given to any employee who the physician feels, based on information in the *medical disease questionnaire*, may be at increased risk from exposure to formaldehyde and at the time of initial assignment and at least annually thereafter to all employees required to wear a *respirator* to reduce exposure to formaldehyde. The *medical examination* shall include: [Reference [paragraph \(l\)\(4\)\(i\) - \(iv\)](#)].
- [1910.1048\(l\)\(5\)](#) - *Examinations for employees exposed in an emergency*. The employer shall make *medical examinations* available as soon as possible to all employees who have been exposed to formaldehyde in an emergency. [Reference [paragraph \(l\)\(5\)\(i\) - \(ii\)](#)].
- [1910.1048\(l\)\(6\)](#) - *Information provided to the physician*. The employer shall provide the following *information* to the examining *physician*: [Reference [paragraph \(l\)\(6\)\(i\) - \(vi\)](#)].
- [1910.1048\(l\)\(7\)](#) - *Physician's written opinion*. [Reference [paragraph \(l\)\(7\)\(i\) - \(iii\)](#)].
- [1910.1048\(l\)\(8\)](#) - *Medical removal*. [Reference [paragraph \(l\)\(8\)\(i\) - \(ix\)](#)].
- [1910.1048\(l\)\(9\)](#) - *Multiple physician review*. [Reference [paragraph \(l\)\(9\)\(i\) - \(vi\)](#)].

[1910.1048\(m\)](#) - *Communication of hazards*. [Reference [paragraph \(m\)\(1\) - \(2\)](#)].

- [1910.1048\(m\)\(1\)\(i\)](#) - *Chemical manufacturers, importers, distributors and employers* shall comply with all requirements of the *Hazard Communication Standard (HCS)* ([§ 1910.1200](#)) for formaldehyde.
- [1910.1048\(m\)\(1\)\(iii\)](#) - Employers shall include formaldehyde in the *hazard communication program* established to comply with the HCS ([§ 1910.1200](#)). Employers shall ensure that each employee has access to *labels* on containers of formaldehyde and to *safety data sheets*, and is trained in accordance with the requirements of HCS and [paragraph \(n\)](#) of this section.
- [1910.1048\(m\)\(2\)\(i\)](#) - In addition to the requirements in [paragraphs \(m\)\(1\) through \(m\)\(1\)\(iv\)](#) of this section, for materials listed in [paragraph \(m\)\(1\)\(iv\)](#) capable of releasing formaldehyde at levels above 0.5 ppm, *labels* shall appropriately address all hazards as defined in [paragraph \(d\)](#) of [§ 1910.1200](#) and [Appendices A and B](#) to [§ 1910.1200](#), including cancer and respiratory sensitization, and shall contain the *hazard statement "May Cause Cancer."*

#### 1910.1048(n) - *Employee information and training.*

- 1910.1048(n)(1) - *Participation*. The employer shall assure that all employees who are assigned to workplaces where there is exposure to formaldehyde participate in a *training program*, except that where the employer can show, using *objective data*, that employees are not exposed to formaldehyde at or above 0.1 ppm, the employer is not required to provide *training*.
- 1910.1048(n)(2) - *Participation*. The employer shall assure that all employees who are assigned to workplaces where there is exposure to formaldehyde participate in a *training program*, except that where the employer can show, using *objective data*, that employees are not exposed to formaldehyde at or above 0.1 ppm, the employer is not required to provide *training*.
- 1910.1048(n)(3) - *Training program*. The *training program* shall be conducted in a manner which the employee is able to understand and shall include: [Reference paragraph (n)(3)(i) - (vii)].
- 1910.1048(n)(4) - *Access to training materials*. [Reference paragraph (n)(4)(i) - (iii)].

#### 1910.1048(o) - *Recordkeeping.*

- 1910.1048(o)(1) - *Exposure measurements*. The employer shall establish and maintain an accurate *record* of all measurements taken to monitor employee exposure to formaldehyde. This *record* shall include: [Reference paragraph (o)(1)(i) - (vi)].
- 1910.1048(o)(2) - *Exposure determinations*. Where the employer has determined that no *monitoring* is required under this standard, the employer shall maintain a *record of the objective data* relied upon to support the *determination* that no employee is exposed to formaldehyde at or above the *action level*.
- 1910.1048(o)(3) - *Medical surveillance*. The employer shall establish and maintain an accurate *record* for each employee subject to *medical surveillance* under this standard. This *record* shall include: [Reference paragraph (o)(3)(i) - (iv)].
- 1910.1048(o)(4) - *Respirator fit testing*. [Reference paragraph (o)(4)(i) - (ii)].
- 1910.1048(o)(5) - *Record retention*. The employer shall *retain records* required by this standard for at least the following periods: [Reference paragraph (o)(5)(i) - (iii)].
- 1910.1048(o)(6)(ii) - The employer shall make employee *exposure records*, including estimates made from representative monitoring and available upon request for examination, and *copying* to the subject employee, or former employee, and employee representatives in accordance with 29 CFR 1910.1020(a)-(e) and (g)-(i) - *access to employee exposure and medical records*.
- 1910.1048(o)(6)(iii) - Employee *medical records* required by this standard shall be provided upon request for examination and copying, to the subject employee or former employee or to anyone having the specific *written consent* of the subject employee or former employee in accordance with 29 CFR 1910.1020(a)-(e) and (g)-(i) - *access to employee exposure and medical records*.

## 1910.1050 – Methylenedianiline

**Scope:** This [standard](#) provides the requirements pertaining to methylenedianiline.

**Special Requirements:** Permissible exposure limit, action levels, exposures, exposure monitoring, representation, medical surveillance, examinations, emergency plan (written), alerting employees, results, notification, receipt, visual monitoring, protective measures, corrective action, regulated areas, demarcation, PPE, authorized persons, engineering controls, work practice controls, compliance program (written), respiratory protection, respirator program, inform, label, safety data sheets, hazard communication, hazard communication program, hygiene facilities (i.e., change rooms, showers), signs (post), training, affected employees, training program, training materials, housekeeping, leak detection program, inspections, records, recordkeeping, tests, physician, written opinion, medical removal, medical removal protection benefits, data, measurements, observation procedures, classifying the hazards, chemical manufacturers, importers, distributors, job classification, safety and health procedures, notify, determinations, recommendations, description, references other standards

[1910.1050\(c\)](#) - *Permissible exposure limits (PEL)*. The employer shall assure that no employee is exposed to an airborne concentration of MDA in excess of ten parts per billion (10 ppb) as an 8-hour time-weighted average or a STEL of 100 ppb.

[1910.1050\(d\)](#) - *Emergency situations*.

- [1910.1050\(d\)\(1\)](#) - *Written plan*.
  - [1910.1050\(d\)\(1\)\(i\)](#) - A written plan for emergency situations shall be developed for each workplace where there is a possibility of an emergency. Appropriate portions of the plan shall be implemented in the event of an emergency.
  - [1910.1050\(d\)\(1\)\(ii\)](#) - The plan shall specifically provide that employees engaged in correcting emergency conditions shall be equipped with the appropriate *personal protective equipment and clothing* as required in [paragraphs \(h\)](#) and [\(i\)](#) of this section until the emergency is abated.
  - [1910.1050\(d\)\(1\)\(iii\)](#) - The plan shall specifically include provisions for alerting and evacuating *affected employees* as well as the elements prescribed in [29 CFR 1910.38](#) and [29 CFR 1910.39](#), "*Emergency action plans*" and "*Fire prevention plans*," respectively.
- [1910.1050\(d\)\(2\)](#) - *Alerting employees*. Where there is the possibility of employee exposure to MDA due to an emergency, means shall be developed to alert promptly those employees who have the potential to be directly exposed. *Affected employees* not engaged in correcting emergency conditions shall be evacuated immediately in the event that an emergency occurs. Means shall also be *developed* and implemented for *alerting* other employees who may be exposed as a result of the emergency.



### 1910.1050(e) - *Exposure monitoring.*

- 1910.1050(e)(1)(i) - *Determinations of employee exposure* shall be made from breathing zone air samples that are representative of each employee's exposure to airborne MDA over an eight (8) hour period. *Determination of employee exposure to the STEL* shall be made from breathing zone air samples collected over a 15 minute sampling period.
- 1910.1050(e)(1)(ii) - Representative *employee exposure* shall be *determined* on the basis of one or more samples representing full shift exposure for each shift for each *job classification* in each work area where exposure to MDA may occur.
- 1910.1050(e)(1)(iii) - Where the employer can *document* that exposure levels are equivalent for similar operations in different work shifts, the employer shall only be required to *determine representative employee exposure* for that operation during one shift.
- 1910.1050(e)(2) - *Initial monitoring.* Each employer who has a workplace or work operation covered by this standard shall perform *initial monitoring to determine* accurately the airborne concentrations of MDA to which employees may be exposed.
- 1910.1050(e)(3) - *Periodic monitoring and monitoring frequency.* [Reference paragraph (e)(3)(i) - (iii)].
- 1910.1050(e)(4) - *Termination of monitoring.* [Reference paragraph (e)(4)(i) - (ii)].
- 1910.1050(e)(5) - *Additional monitoring.* The employer shall institute the *exposure monitoring* required under paragraphs (e)(2) and (e)(3) of this section when there has been a change in production process, chemicals present, control equipment, personnel, or *work practices* which may result in new or additional exposures to MDA, or when the employer has any reason to suspect a change which may result in new or additional exposures.
- 1910.1050(e)(6) - *Accuracy of monitoring.* Monitoring shall be accurate, to a confidence level of 95 percent, to within plus or minus 25 percent for airborne concentrations of MDA.
- 1910.1050(e)(7) - *Employee notification of monitoring results.* [Reference paragraph (e)(7)(i) - (ii)].
- 1910.1050(e)(8) - *Visual monitoring.* The employer shall make *routine inspections* of employee hands, face and forearms potentially exposed to MDA. Other potential dermal exposures *reported* by the employee must be referred to the appropriate medical personnel for observation. If the employer *determines* that the employee has been exposed to MDA the employer shall: [Reference paragraph (e)(8)(i) - (iii)].

### 1910.1050(f) - *Regulated areas.*

- 1910.1050(f)(1) - *Establishment.* [Reference paragraph (f)(1)(i) - (ii)].
- 1910.1050(f)(2) - *Demarcation.* *Regulated areas* shall be *demarcated* from the rest of the workplace in a manner that minimizes the number of persons potentially exposed.



- [1910.1050\(f\)\(3\)](#) - Access. Access to *regulated areas* shall be limited to *authorized persons*.
- [1910.1050\(f\)\(4\)](#) - *Personal protective equipment and clothing*. Each person entering a *regulated area* shall be supplied with, and required to use, the appropriate *personal protective clothing and equipment* in accordance with [paragraphs \(h\)](#) and [\(i\)](#) of this section.
- [1910.1050\(f\)\(5\)](#) - *Prohibited activities*. The employer shall ensure that employees do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in *regulated areas*.

[1910.1050\(g\)](#) - *Methods of compliance*.

- [1910.1050\(g\)\(1\)](#) - *Engineering controls and work practices*. [Reference [paragraph \(g\)\(1\)\(i\) - \(ii\)](#)].
- [1910.1050\(g\)\(2\)](#) - *Compliance program*. [Reference [paragraph \(g\)\(2\)\(i\) - \(ii\)](#)].

[1910.1050\(h\)](#) - *Respiratory protection*.

- [1910.1050\(h\)\(1\)](#) - General. For employees who use respirators required by this section, the employer must provide each employee an appropriate *respirator* that complies with the requirements of this paragraph. *Respirators* must be used during: [Reference [paragraph \(h\)\(1\)\(i\) - \(iv\)](#)].
- [1910.1050\(h\)\(2\)](#) - *Respirator program*. The employer must implement a *respiratory protection program* in accordance with [§ 1910.134 \(b\) through \(d\)](#) (except [\(d\)\(1\)\(iii\)](#)), and [\(f\) through \(m\)](#), which covers each employee required by this section to use a *respirator*.
- [1910.1050\(h\)\(3\)](#) - *Respirator selection*. [Reference [paragraph \(h\)\(3\)\(i\) - \(iv\)](#)].

[1910.1050\(i\)](#) - *Protective work clothing and equipment*.

- [1910.1050\(i\)\(1\)](#) - *Provision and use*. Where employees are subject to dermal exposure to MDA, where liquids containing MDA can be splashed into the eyes, or where airborne concentrations of MDA are in excess of the *PEL*, the employer shall provide, at no cost to the employee, and ensure that the employee uses, appropriate *protective work clothing and equipment* which prevent contact with MDA such as, but not limited to: [Reference [paragraph \(i\)\(1\)\(i\) - \(iv\)](#)].
  - [1910.1050\(i\)\(1\)\(iv\)](#) - Other appropriate *protective equipment* which comply with [§ 1910.133](#) - *eye and face protection*.
- [1910.1050\(i\)\(2\)](#) - *Removal and storage*. [Reference [paragraph \(i\)\(2\)\(i\) - \(v\)](#)].
- [1910.1050\(i\)\(3\)](#) - *Cleaning and replacement*. [Reference [paragraph \(i\)\(3\)\(i\) - \(vi\)](#)].

[1910.1050\(j\)](#) - *Hygiene facilities and practices*. [Reference [paragraph \(j\)\(1\) - \(3\)](#)].

[1910.1050\(k\)](#) - *Communication of hazards*.

- [1910.1050\(k\)\(1\)\(i\)](#) - *Chemical manufacturers, importers, distributors* and employers shall comply with all requirements of the *Hazard Communication Standard (HCS)* ([§ 1910.1200](#)) for MDA.
- [1910.1050\(k\)\(1\)\(ii\)](#) - In *classifying the hazards* of MDA at least the following hazards are to be addressed: Cancer; liver effects; and skin sensitization.
- [1910.1050\(k\)\(1\)\(iii\)](#) - Employers shall include MDA in the *hazard communication program* established to comply with the *HCS* ([§ 1910.1200](#)). Employers shall ensure that each employee has access to *labels* on containers of MDA and to *safety data sheets*, and is *trained* in accordance with the requirements of *HCS* and [paragraph \(k\)\(4\)](#) of this section.
- [1910.1050\(k\)\(2\)](#) - *Signs and labels*.
  - [1910.1050\(k\)\(2\)\(i\)](#) - *Signs*. [Reference [paragraph \(k\)\(2\)\(i\)\(A\) - \(B\)](#)].
  - [1910.1050\(k\)\(2\)\(ii\)](#) - *Labels*. Prior to June 1, 2015, employers may include the following information workplace *labels in lieu of the labeling* requirements in [paragraph \(k\)\(1\)](#) of this section:
- [1910.1050\(k\)\(3\)](#) - *Safety data sheets (SDS)*. In meeting the obligation to provide *safety data sheets*, employers shall make appropriate use of the *information* found in [Appendices A - substance data sheet and B - substance technical guidelines](#), to [§ 1910.1050](#).
- [1910.1050\(k\)\(4\)](#) - *Information and training*. [Reference [paragraph \(k\)\(4\)\(i\) - \(ii\)](#)].
- [1910.1050\(k\)\(5\)](#) - *Access to training materials*. [Reference [paragraph \(k\)\(5\)\(i\) - \(ii\)](#)].

[1910.1050\(l\)](#) - *Housekeeping*. [Reference [paragraph \(l\)\(1\) - \(6\)](#)].

- [1910.1050\(l\)\(2\)](#) - The employer shall institute a *program for detecting MDA leaks, spills, and discharges*, including regular *visual inspections* of operations involving liquid or solid MDA.

[1910.1050\(m\)](#) - *Medical surveillance*.

- [1910.1050\(m\)\(1\)\(i\)](#) - The employer shall make available a *medical surveillance program* for employees exposed to MDA: [Reference [paragraph \(m\)\(1\)\(i\) - \(ii\)](#)]
- [1910.1050\(m\)\(2\)](#) - *Initial examinations*. [Reference [paragraph \(m\)\(2\)\(i\) - \(ii\)](#)]
- [1910.1050\(m\)\(3\)](#) - *Periodic examinations*. [Reference [paragraph \(m\)\(3\)\(i\) - \(ii\)](#)]
- [1910.1050\(m\)\(4\)](#) - *Emergency examinations*. If the employer *determines* that the employee has been exposed to a potentially hazardous amount of MDA in an emergency situation as addressed in [paragraph \(d\)](#) of this section, the employer shall provide *medical examinations* in accordance with [paragraphs \(m\)\(3\)\(i\) and \(ii\)](#) of this section. If the *results* of liver function testing indicate an abnormality, the employee shall be removed in accordance with [paragraph \(m\)\(9\)](#) of this section. Repeat liver *function tests* shall be conducted on the *advice of the physician*. If the *results* of the tests are normal, tests must be repeated two to three weeks from the *initial testing*. If the *results* of the second set of tests are normal and, on the advice of the *physician*, no additional *testing* is required.

- [1910.1050\(m\)\(5\)](#) - *Additional examinations*. Where the employee develops signs and symptoms associated with exposure to MDA, the employer shall provide the employee with an additional medical examination including a liver *function test*. Repeat liver *function tests* shall be conducted on the advice of the physician. If the results of the tests are normal, tests must be repeated two to three weeks from the initial testing. If the results of the second set of tests are normal and, on the advice of the physician, no additional testing is required.
- [1910.1050\(m\)\(6\)](#) - Multiple physician review mechanism. [Reference [paragraph \(m\)\(6\)\(i\) - \(v\)](#)]
- [1910.1050\(m\)\(7\)](#) - Information provided to the examining and consulting physicians. [Reference [paragraph \(m\)\(7\)\(i\) - \(ii\)](#)]
- [1910.1050\(m\)\(8\)](#) - Physician's written opinion. [Reference [paragraph \(m\)\(8\)\(i\) - \(ii\)](#)]
- [1910.1050\(m\)\(9\)](#) - Medical removal (Benefits) [Reference [paragraph \(m\)\(9\)\(i\) - \(vi\)](#)]

#### [1910.1050\(n\)](#) - Recordkeeping.

- [1910.1050\(n\)\(1\)](#) - Monitoring data for exempted employers. [Reference [paragraph \(n\)\(1\)\(i\) - \(iii\)](#)]
- [1910.1050\(n\)\(2\)](#) - Objective data for exempted employers. [Reference [paragraph \(n\)\(2\)\(i\) - \(iii\)](#)]
- [1910.1050\(n\)\(3\)](#) - Exposure measurements. [Reference [paragraph \(n\)\(3\)\(i\) - \(iii\)](#)]
  - [1910.1050\(n\)\(3\)\(i\)](#) - The employer shall establish and maintain an accurate record of all measurements required by [paragraph \(e\)](#) of this section, in accordance with [29 CFR 1910.1020](#) - access to employee exposure and medical records.
- [1910.1050\(n\)\(4\)](#) - Medical surveillance. [Reference [paragraph \(n\)\(4\)\(i\) - \(iv\)](#)]
  - [1910.1050\(n\)\(4\)\(iv\)](#) - The employer shall maintain this record for at least the duration of employment plus 30 years, in accordance with [29 CFR 1910.1020](#) - access to employee exposure and medical records.
- [1910.1050\(n\)\(5\)](#) - Medical removals. [Reference [paragraph \(n\)\(5\)\(i\) - \(iii\)](#)]
- [1910.1050\(n\)\(6\)](#) - Availability.
  - [1910.1050\(n\)\(6\)\(i\)](#) - The employer shall assure that records required to be maintained by this section shall be made available, upon request, to the Assistant Secretary and the Director for examination and copying.
  - [1910.1050\(n\)\(6\)\(ii\)](#) - Employee exposure monitoring records required by this section shall be provided upon request for examination and copying to employees, employee representatives, and the Assistant Secretary in accordance with [29 CFR 1910.1020 \(a\)-\(e\) and \(g\)-\(i\)](#) - access to employee exposure and medical records.
  - [1910.1050\(n\)\(6\)\(iii\)](#) - Employee medical records required by this section shall be provided upon request for examination and copying, to the subject employee, to anyone having the specific written consent of the subject employee, and to the Assistant Secretary in accordance with [29 CFR 1910.1020](#) - access to employee exposure and medical records.

- [1910.1050\(n\)\(7\)](#) - *Transfer of records*. The employer shall comply with the requirements involving transfer of records set forth in [29 CFR 1910.1020\(h\)](#) - *access to employee exposure and medical records*.

[1910.1050\(o\)](#) - *Observation of monitoring*.

- [1910.1050\(o\)\(1\)](#) - *Employee observation*. The employer shall provide *affected employees*, or their designated representatives, an opportunity to observe the *measuring or monitoring of employee exposure* to MDA conducted pursuant to [paragraph \(e\)](#) of this section.
- [1910.1050\(o\)\(2\)](#) - *Observation procedures*. When *observation of the measuring or monitoring of employee exposure* to MDA requires entry into areas where the use of *protective clothing and equipment or respirators* is required, the employer shall provide the observer with *personal protective clothing and equipment or respirators* required to be worn by employees working in the area, assure the use of such *clothing and equipment or respirators*, and require the observer to comply with all other applicable *safety and health procedures*.

## 1910.1051 - 1,3-Butadiene

**Scope:** This [standard](#) provides the requirements pertaining to 1,3-Butadiene.

**Special Requirements:** Permissible exposure limit, time-weighted average, short-term exposure limit, exposure monitoring, determinations, job classification, document, notification, monitoring results, observation of monitoring, observation procedures, receipt, posting, schedule, information, corrective action (writing), regulated areas, demarcated, communicate, methods, engineering controls, work practices, compliance plan (written), respiratory protection, respirator program, records, training, review plans, exposure goal program (written), leak prevention, detection, and repair program, demonstrate, procedure, data, label, NIOSH, end-of-service-life indicator, protective clothing, emergency situation plans (written, medical screening and surveillance program, medical surveillance, health questionnaire, medical procedures, examinations, lab tests, physician, information, medical opinion (written), communication, hazard communication, classifying hazards, chemical manufacturers, distributors, importers, employee information, labels, safety data sheets, training program, records, recordkeeping, measurements, references other standards

[1910.1051\(c\)](#) - *Permissible exposure limits (PELs)*. [Reference [paragraph \(c\)\(1\) - \(2\)](#)].

[1910.1051\(d\)](#) - *Exposure monitoring*.

- [1910.1051\(d\)\(1\)\(i\)](#) - *Determinations* of employee exposure shall be made from breathing zone air samples that are representative of the 8-hour *TWA* and 15-minute *short-term exposures* of each employee.

- [1910.1051\(d\)\(1\)\(ii\)](#) - Representative 8-hour TWA *employee exposure* shall be *determined* on the basis of one or more samples representing *full-shift exposure* for each shift and for each *job classification* in each work area.
- [1910.1051\(d\)\(1\)\(iii\)](#) - Representative 15-minute short-term employee exposures shall be *determined* on the basis of one or more samples representing 15-minute *exposures* associated with operations that are most likely to produce *exposures* above the STEL for each shift and for each *job classification* in each work area.
- [1910.1051\(d\)\(1\)\(iv\)](#) - Except for the initial *monitoring* required under [paragraph \(d\)\(2\)](#) of this section, where the employer can *document* that *exposure levels* are equivalent for similar operations on different work shifts, the employer need only *determine* representative *employee exposure* for that operation from the shift during which the highest exposure is expected.
- [1910.1051\(d\)\(2\)](#) - *Initial monitoring*. [Reference [paragraph \(d\)\(2\)\(i\) - \(ii\)](#)].
- [1910.1051\(d\)\(3\)](#) - Periodic *monitoring* and its frequency. [Reference [paragraph \(d\)\(3\)\(i\) - \(iv\)](#)].
- [1910.1051\(d\)\(4\)](#) - Termination of *monitoring*. [Reference [paragraph \(d\)\(4\)\(i\) - \(ii\)](#)].
- [1910.1051\(d\)\(5\)](#) - Additional *monitoring*. [Reference [paragraph \(d\)\(5\)\(i\) - \(ii\)](#)].
- [1910.1051\(d\)\(6\)](#) - Accuracy of *monitoring*. *Monitoring* shall be accurate, at a confidence level of 95 percent, to within plus or minus 25 percent for airborne concentrations of BD at or above the 1 ppm TWA limit and to within plus or minus 35 percent for airborne concentrations of BD at or above the action level of 0.5 ppm and below the 1 ppm TWA limit.
- [1910.1051\(d\)\(7\)](#) - Employee *notification of monitoring results*. [Reference [paragraph \(d\)\(7\)\(i\) - \(ii\)](#)].
- [1910.1051\(d\)\(8\)](#) - *Observation of monitoring*. [Reference [paragraph \(d\)\(8\)\(i\) - \(ii\)](#)].

[1910.1051\(e\)](#) - *Regulated areas*. [Reference [paragraph \(e\)\(1\) - \(4\)](#)].

[1910.1051\(f\)](#) - *Methods of compliance*. [Reference [paragraph \(f\)\(1\) - \(2\)](#)].

- [1910.1051\(f\)\(1\)](#) - *Engineering controls and work practices*. [Reference [paragraph \(f\)\(1\)\(i\) - \(ii\)](#)].
- [1910.1051\(f\)\(2\)](#) - *Compliance plan*. [Reference [paragraph \(f\)\(2\)\(i\) - \(iv\)](#)].

[1910.1051\(g\)](#) - *Exposure Goal Program*. [Reference [paragraph \(g\)\(1\) - \(5\)](#)].

- [1910.1051\(g\)\(5\)\(i\)](#) - A *leak prevention, detection, and repair program*. [Reference [paragraph \(g\)\(5\)\(i\) - \(vi\)](#)].

[1910.1051\(h\)](#) - *Respiratory protection*.

- [1910.1051\(h\)\(1\)](#) - General. For employees who use *respirators* required by this section, the employer must provide each employee an appropriate *respirator* that



complies with the requirements of this paragraph. *Respirators* must be used during: [Reference [paragraph \(h\)\(1\)\(i\) - \(iv\)](#)].

- [1910.1051\(h\)\(2\)](#) - *Respirator program*. [Reference [paragraph \(h\)\(2\)\(i\) - \(iv\)](#)].
  - [1910.1051\(h\)\(2\)\(i\)](#) - The employer must implement a *respiratory protection program* in accordance with [§ 1910.134\(b\) through \(d\)](#) [except [\(d\)\(1\)\(iii\)](#), [\(d\)\(3\)\(iii\)\(B\)\(1\)](#), and [\(2\)](#)], and [\(f\) through \(m\)](#), which covers each employee required by this section to use a *respirator*.
- [1910.1051\(h\)\(3\)](#) - *Respirator selection*. [Reference [paragraph \(h\)\(3\)\(i\) - \(iii\)](#)].

[1910.1051\(i\)](#) - *Protective clothing and equipment*. Where appropriate to prevent eye contact and limit dermal exposure to BD, the employer shall provide *protective clothing and equipment* at no cost to the employee and shall ensure its use. *Eye and face protection* shall meet the requirements of [29 CFR 1910.133](#) - *eye and face protection*.

[1910.1051\(j\)](#) - *Emergency situations. Written plan*. A *written plan* for emergency situations shall be developed, or an *existing plan* shall be modified, to contain the applicable elements specified in [29 CFR 1910.38](#) and [29 CFR 1910.39](#), "*Emergency action plans*" and "*Fire prevention plans*," respectively, and in [29 CFR 1910.120](#), "*Hazardous Waste Operations and Emergency Response*," for each workplace where there is the possibility of an emergency.

[1910.1051\(k\)](#) - *Medical screening and surveillance*.

- [1910.1051\(k\)\(1\)](#) - *Employees covered*. The employer shall institute a *medical screening and surveillance program* as specified in this paragraph for: [Reference [paragraph \(k\)\(1\)\(i\) - \(ii\)](#)].
- [1910.1051\(k\)\(2\)](#) - *Program administration*. [Reference [paragraph \(k\)\(2\)\(i\) - \(iii\)](#)].
- [1910.1051\(k\)\(3\)](#) - *Frequency of medical screening activities*. The employer shall make *medical screening* available on the following *schedule*: [Reference [paragraph \(k\)\(3\)\(i\) - \(iii\)](#)].
- [1910.1051\(k\)\(4\)](#) - *Content of medical screening*. [Reference [paragraph \(k\)\(4\)\(i\) - \(ii\)](#)].
- [1910.1051\(k\)\(5\)](#) - *Additional medical evaluations and referrals*. [Reference [paragraph \(k\)\(5\)\(i\) - \(ii\)](#)].
- [1910.1051\(k\)\(6\)](#) - *Information provided to the physician or other licensed health care professional*. The employer shall provide the following *information* to the *examining physician or other licensed health care professional* involved in the evaluation: [Reference [paragraph \(k\)\(6\)\(i\) - \(v\)](#)].
- [1910.1051\(k\)\(7\)](#) - *The written medical opinion*. [Reference [paragraph \(k\)\(7\)\(i\) - \(ii\)](#)].
- [1910.1051\(k\)\(8\)](#) - *Medical surveillance*. [Reference [paragraph \(k\)\(8\)\(i\) - \(ii\)](#)].

[1910.1051\(l\)](#) - *Communication of BD hazards to employees*.



- [1910.1051\(l\)\(1\)\(i\)](#) - *Chemical manufacturers, importers, distributors and employers shall comply with all requirements of the Hazard Communication Standard (HCS) (§ [1910.1200](#)) for BD.*
- [1910.1051\(l\)\(1\)\(ii\)](#) - *In classifying the hazards of BD at least the following hazards are to be addressed: Cancer; eye and respiratory tract irritation; central nervous system effects; and flammability.*
- [1910.1051\(l\)\(1\)\(iii\)](#) - *Employers shall include BD in the hazard communication program established to comply with the HCS (§ [1910.1200](#)). Employers shall ensure that each employee has access to labels on containers of BD and to safety data sheets, and is trained in accordance with the requirements of HCS and [paragraph \(l\)\(2\)](#) of this section.*
- [1910.1051\(l\)\(2\)](#) - *Employee information and training.* [Reference [paragraph \(l\)\(2\)\(i\) - \(iv\)](#)].
- [1910.1051\(l\)\(3\)](#) - *Access to information and training materials.* [Reference [paragraph \(l\)\(3\)\(i\) - \(ii\)](#)].

#### [1910.1051\(m\)](#) - *Recordkeeping.*

- [1910.1051\(m\)\(1\)](#) - *Objective data for exemption from initial monitoring.* [Reference [paragraph \(m\)\(1\)\(i\) - \(ii\)](#)].
- [1910.1051\(m\)\(2\)](#) - *Exposure measurements.* [Reference [paragraph \(m\)\(2\)\(i\) - \(iii\)](#)].
- [1910.1051\(m\)\(4\)](#) - *Medical screening and surveillance.* [Reference [paragraph \(m\)\(4\)\(i\) - \(iii\)](#)].
- [1910.1051\(m\)\(5\)\(ii\)](#) - *Access to records required to be maintained by [paragraphs \(l\)\(1\)-\(3\)](#) of this section shall be granted in accordance with [29 CFR 1910.1020\(e\)](#) - access to employee exposure and medical records.* [Reference [paragraph \(m\)\(5\)\(i\) - \(ii\)](#)].
- [1910.1051\(m\)\(6\)](#) - *Transfer of records.* The employer shall transfer medical and exposure records as set forth in [29 CFR 1910.1020\(h\)](#) - access to employee exposure and medical records.

## **1910.1052 - Methylene Chloride**

**Scope:** This [standard](#) provides the requirements pertaining to methylene chloride.

**Special Requirements:** Permissible exposure limit, short-term exposure levels, exposure monitoring, exposure monitoring program, medical surveillance, medical surveillance program, time-weighted average, employee notification, monitoring results, authorized person, employee observation, observation procedures, regulated areas, methods of compliance, engineering controls, work practice controls, leak detection procedures, respiratory protection, respirator program, hazard communication, hazard communication program, demarcate, safety data sheets, signs, labels, medical evaluation, examinations, protective work clothing and equipment, physician, hygiene facilities (i.e., change room, showers), affect employees, information, reports, demonstrate, medical opinion (written),

recommendations, statement, instruct, medical removal (protection benefits), records, recordkeeping, data, chemical manufacturers, importers, distributors, measurements, inform, evidence, schedule, job classification, determinations, alerts, training, references other standards

1910.1052(c) - *Permissible exposure limits (PELs)*.

- 1910.1052(c)(1) - *Eight-hour time-weighted average (TWA) PEL*. The employer shall ensure that no employee is exposed to an airborne concentration of MC in excess of twenty-five parts of MC per million parts of air (25 ppm) as an 8-hour *TWA*.
- 1910.1052(c)(2) - *Short-term exposure limit (STEL)*. The employer shall ensure that no employee is exposed to an airborne concentration of MC in excess of one hundred and twenty-five parts of MC per million parts of air (125 ppm) as determined over a *sampling period* of fifteen minutes.

1910.1052(d) - *Exposure monitoring*.

- 1910.1052(d)(1) - Characterization of *employee exposure*. [Reference [paragraph \(d\)\(1\)\(i\) - \(iii\)](#)].
- 1910.1052(d)(2) - Initial *determination*. Each employer whose employees are exposed to MC shall perform initial *exposure monitoring* to *determine* each affected employee's exposure, except under the following conditions: [Reference [paragraph \(d\)\(2\)\(i\) - \(iii\)](#)].
- 1910.1052(d)(3) - Periodic *monitoring*. Where the initial *determination* shows employee exposures at or above the *action level* or *above the STEL*, the employer shall establish an *exposure monitoring program* for *periodic monitoring* of employee exposure to MC in accordance with Table 1: [Reference [paragraph \(d\)\(3\)](#)].
- 1910.1052(d)(4) - Additional *monitoring*. [Reference [paragraph \(d\)\(4\)\(i\) - \(ii\)](#)].
- 1910.1052(d)(5) - *Employee notification of monitoring results*. [Reference [paragraph \(d\)\(5\)\(i\) - \(ii\)](#)].
- 1910.1052(d)(6) - *Observation of monitoring*. [Reference [paragraph \(d\)\(6\)\(i\) - \(ii\)](#)].

1910.1052(e) - *Regulated areas*. [Reference [paragraph \(e\)\(1\) - \(7\)](#)].

- 1910.1052(e)(6) - The employer shall *demarcate regulated areas* from the rest of the workplace in any manner that adequately establishes and *alerts* employees to the boundaries of the area and minimizes the number of *authorized employees* exposed to MC within the *regulated area*.

1910.1052(f) - *Methods of compliance*.

- 1910.1052(f)(1) - *Engineering and work practice controls*. The employer shall institute and maintain the effectiveness of *engineering controls and work practices* to reduce *employee exposure* to or below the PELs except to the extent

that the employer can *demonstrate* that such *controls* are not feasible. Wherever the feasible *engineering controls and work practices* which can be instituted are not sufficient to reduce *employee exposure* to or below the 8-TWA PEL or STEL, the employer shall use them to reduce *employee exposure* to the lowest levels achievable by these *controls* and shall supplement them by the use of *respiratory protection* that complies with the requirements of [paragraph \(g\)](#) of this section.

- [1910.1052\(f\)\(3\)](#) - Leak and spill *detection*.
  - [1910.1052\(f\)\(3\)\(i\)](#) - The employer shall implement *procedures* to detect leaks of MC in the workplace. In work areas where spills may occur, the employer shall make provisions to contain any spills and to safely dispose of any MC-contaminated waste materials.
  - [1910.1052\(f\)\(3\)\(ii\)](#) - The employer shall ensure that all incidental leaks are repaired and that incidental spills are cleaned promptly by employees who use the appropriate *personal protective equipment* and are *trained* in proper *methods* of cleanup. Note to [paragraph \(f\)\(3\)\(ii\)](#): See [appendix A - substance safety data sheet](#), of this section for examples of *procedures* that satisfy this requirement. Employers covered by this standard may also be subject to the hazardous waste and emergency response provisions contained in [29 CFR 1910.120\(q\)](#) - *hazardous waste operations and emergency response*.

[1910.1052\(g\)](#) - *Respiratory protection*.

- [1910.1052\(g\)\(1\)](#) - General. For employees who use *respirators* required by this section, the employer must provide each employee an appropriate *respirator* that complies with the requirements of this paragraph. *Respirators* must be used during: [Reference [paragraph \(g\)\(1\)\(i\) - \(v\)](#)].
- [1910.1052\(g\)\(2\)](#) - *Respirator program*.
  - [1910.1052\(g\)\(2\)\(i\)](#) - The employer must implement a *respiratory protection program* in accordance with [§ 1910.134\(b\) through \(m\)](#) [except [\(d\)\(1\)\(iii\)](#)], which covers each employee required by this section to use a *respirator*.
- [1910.1052\(g\)\(3\)](#) - *Respirator selection*. Employers must: [Reference [paragraph \(g\)\(3\)\(i\) - \(iii\)](#)].
- [1910.1052\(g\)\(4\)](#) - *Medical evaluation*. Before having an employee use a supplied-air respirator in the negative-pressure mode, or a gas mask with an organic-vapor canister for emergency escape, the employer must: [Reference [paragraph \(g\)\(4\)\(i\) - \(ii\)](#)].

[1910.1052\(h\)](#) - *Protective Work Clothing and Equipment*. [Reference [paragraph \(h\)\(1\) - \(3\)](#)].

- [1910.1052\(h\)\(1\)](#) - Where needed to prevent MC-induced skin or eye irritation, the employer shall provide clean *protective clothing and equipment* which is resistant to MC, at no cost to the employee, and shall ensure that each *affected employee* uses it. *Eye and face protection* shall meet the requirements of [29 CFR](#)

1910.133 - eye and face protection, or 29 CFR 1915.153 - eye and face protection, as applicable.

1910.1052(i) - Hygiene facilities. [Reference paragraph (i)(1) - (2)].

1910.1052(j) - Medical surveillance.

- 1910.1052(j)(1) - Affected employees. The employer shall make *medical surveillance* available for employees who are or may be exposed to MC as follows: [Reference paragraph (j)(1)(i) - (iii)].
- 1910.1052(j)(2) - Costs. The employer shall provide all required *medical surveillance* at no cost to affected employees, without loss of pay and at a reasonable time and place.
- 1910.1052(j)(3) - Medical personnel. The employer shall ensure that all *medical surveillance procedures* are performed by a *physician or other licensed health care professional*, as defined in paragraph (b) of this section.
- 1910.1052(j)(4) - Frequency of medical surveillance. The employer shall make *medical surveillance* available to each *affected employee* as follows: [Reference paragraph (j)(4)(i) - (iv)].
- 1910.1052(j)(5) - Content of *medical surveillance*. [Reference paragraph (j)(5)(i) - (iv)].
- 1910.1052(j)(6) - Content of *emergency medical surveillance*. The employer shall ensure that *medical surveillance* made available when an employee has been exposed to MC in emergency situations includes, at a minimum: [Reference paragraph (j)(6)(i) - (iv)].
- 1910.1052(j)(7) - Additional examinations and referrals. Where the *physician or other licensed health care professional determines* it is necessary, the scope of the *medical examination* shall be expanded and the appropriate additional *medical surveillance*, such as *referrals* for consultation or examination, shall be provided.
- 1910.1052(j)(8) - Information provided to the *physician or other licensed health care professional*. The employer shall provide the following *information* to a *physician or other licensed health care professional* who is involved in the diagnosis of MC-induced health effects: [Reference paragraph (j)(8)(i) - (v)].
- 1910.1052(j)(9) - Written medical opinions. [Reference paragraph (j)(9)(i) - (ii)].
- 1910.1052(j)(10) - Medical presumption. For purposes of this paragraph (j) of this section, the *physician or other licensed health care professional* shall presume, unless medical evidence indicates to the contrary, that a medical condition is unlikely to require medical removal from MC exposure if the employee is not exposed to MC above the 8-hour TWA PEL. If the *physician or other licensed health care professional recommends* removal for an employee exposed below the 8-hour TWA PEL, the *physician or other licensed health care professional* shall cite specific *medical evidence*, sufficient to rebut the presumption that exposure below the 8-hour TWA PEL is unlikely to require removal, to support the *recommendation*. If such evidence is cited by the *physician or other licensed health care professional*,

the employer must remove the employee. If such *evidence* is not cited by the *physician or other licensed health care professional*, the employer is not required to remove the employee.

- [1910.1052\(j\)\(11\)](#) - *Medical Removal Protection (MRP)*. [Reference [paragraph \(j\)\(11\)\(i\) - \(ii\)](#)].
- [1910.1052\(j\)\(12\)](#) - *Medical removal protection benefits*. [Reference [paragraph \(j\)\(12\)\(i\) - \(iv\)](#)].
- [1910.1052\(j\)\(13\)](#) - Voluntary removal or restriction of an employee. Where an employer, although not required by this section to do so, removes an employee from exposure to MC or otherwise places any limitation on an employee due to the effects of MC exposure on the employee's medical condition, the employer shall provide *medical removal protection benefits* to the employee equal to those required by [paragraph \(j\)\(12\)](#) of this section.
- [1910.1052\(j\)\(14\)](#) - Multiple *health care professional review* mechanism. [Reference [paragraph \(j\)\(14\)\(i\) - \(vi\)](#)].

#### [1910.1052\(k\)](#) - *Hazard communication*.

- [1910.1052\(k\)\(1\)\(i\)](#) - *Chemical manufacturers, importers, distributors* and employers shall comply with all requirements of the *Hazard Communication Standard (HCS)* ([§ 1910.1200](#)) for MC.
- [1910.1052\(k\)\(1\)\(ii\)](#) - In *classifying the hazards* of MC at least the following hazards are to be addressed: Cancer, cardiac effects (including elevation of carboxyhemoglobin), central nervous system effects, liver effects, and skin and eye irritation.
- [1910.1052\(k\)\(1\)\(iii\)](#) - Employers shall include MC in the *hazard communication program* established to comply with the *HCS* ([§ 1910.1200](#)). Employers shall ensure that each employee has access to *labels* on containers of MC and to *safety data sheets*, and is *trained* in accordance with the requirements of HCS and [paragraph \(l\)](#) of this section.

#### [1910.1052\(l\)](#) - *Employee information and training*. [Reference [paragraph \(l\)\(1\) - \(8\)](#)].

#### [1910.1052\(m\)](#) - *Recordkeeping*.

- [1910.1052\(m\)\(1\)](#) - *Objective data*. [Reference [paragraph \(m\)\(1\)\(i\) - \(iii\)](#)].
- [1910.1052\(m\)\(2\)](#) - *Exposure measurements*. [Reference [paragraph \(m\)\(2\)\(i\) - \(iv\)](#)].
  - [1910.1052\(m\)\(2\)\(iv\)](#) - The employer shall maintain this *record* for at least thirty (30) years, in accordance with [29 CFR 1910.1020](#) - *access to employee exposure and medical records*.
- [1910.1052\(m\)\(3\)](#) - *Medical surveillance*. [Reference [paragraph \(m\)\(3\)\(i\) - \(iii\)](#)].
  - [1910.1052\(m\)\(3\)\(iii\)](#) - The employer shall ensure that this *record* is maintained for the duration of employment plus thirty (30) years, in



accordance with [29 CFR 1910.1020](#) - *access to employee exposure and medical records*.

- [1910.1052\(m\)\(4\)](#) - Availability.
  - [1910.1052\(m\)\(4\)\(i\)](#) - The employer, upon written request, shall make all records required to be maintained by this section available to the Assistant Secretary and the Director for examination and copying in accordance with [29 CFR 1910.1020](#) - *access to employee exposure and medical records*.
  - [1910.1052\(m\)\(4\)\(ii\)](#) - The employer, upon request, shall make any *employee exposure and objective data records* required by this section available for examination and copying by *affected employees*, former employees, and designated representatives in accordance with [29 CFR 1910.1020](#) - *access to employee exposure and medical records*.
  - [1910.1052\(m\)\(4\)\(iii\)](#) - The employer, upon request, shall make *employee medical records* required to be kept by this section available for examination and copying by the subject employee and by anyone having the specific written consent of the subject employee in accordance with [29 CFR 1910.1020](#) - *access to employee exposure and medical records*.
- [1910.1052\(m\)\(5\)](#) - Transfer of records. The employer shall comply with the requirements concerning transfer of records set forth in [29 CFR 1910.1020\(h\)](#) - *access to employee exposure and medical records*.

## 1910.1053 - Respirable Crystalline Silica

**Scope:** This [standard](#) provides the requirements pertaining to respirable crystalline silica.

**Special Requirements:** Permissible exposure limit, action level, assess, reassess, exposure assessment, performance option, exposures, laboratory, scheduled monitoring, job classification, monitoring, methods, housekeeping, employee notification, evaluated, written notification, corrective action, regulated areas, protective clothing, respirator, respirator program, hazard communication, hazard communication program, observation of monitoring, demarcation, signs, post, authorized person, procedures, methods of compliance, engineering controls, labels, safety data sheets, work practice controls, exposure control plan (written), demonstrate, description, measures, medical surveillance, medical surveillance program, physician, medical examinations, tests, information, train, training, records, recordkeeping, data, medical report (written), results, statement, recommendations, signs (post), medical opinion (written), references other standards

[1910.1053\(d\)](#) - *Exposure assessment*.

- [1910.1053\(d\)\(1\)](#) - General. The employer shall *assess* the *exposure* of each employee who is or may reasonably be expected to be exposed to respirable crystalline silica at or above the *action level* in accordance with either the *performance option* in [paragraph \(d\)\(2\)](#) or the *scheduled monitoring option* in [paragraph \(d\)\(3\)](#) of this section.



- [1910.1053\(d\)\(2\)](#) - *Performance option*. The employer shall assess the 8-hour *TWA* exposure for each employee on the basis of any combination of *air monitoring data* or *objective data* sufficient to accurately characterize employee exposures to respirable crystalline silica.
- [1910.1053\(d\)\(3\)](#) - *Scheduled monitoring option*. [Reference [paragraph \(d\)\(3\)\(i\) - \(v\)](#)].
- [1910.1053\(d\)\(4\)](#) - *Reassessment of exposures*. The employer shall *reassess* exposures whenever a change in the production, process, control equipment, personnel, or *work practices* may reasonably be expected to result in new or additional exposures *at or above the action level*, or when the employer has any reason to believe that new or additional exposures *at or above the action level* have occurred.
- [1910.1053\(d\)\(5\)](#) - *Methods of sample analysis*. The employer shall ensure that all samples taken to satisfy the *monitoring* requirements of [paragraph \(d\)](#) of this section are *evaluated by a laboratory* that *analyzes air samples* for respirable crystalline silica in accordance with the *procedures* in Appendix A to this section.
- [1910.1053\(d\)\(6\)](#) - *Employee notification of assessment results*. [Reference [paragraph \(d\)\(6\)\(i\) - \(ii\)](#)].
- [1910.1053\(d\)\(7\)](#) - *Observation of monitoring*. [Reference [paragraph \(d\)\(7\)\(i\) - \(ii\)](#)].

#### [1910.1053\(e\)](#) - *Regulated areas*.

- [1910.1053\(e\)\(1\)](#) - *Establishment*. The employer shall establish a *regulated area* wherever an employee's exposure to airborne concentrations of respirable crystalline silica is, or can reasonably be expected to be, in excess of the *PEL*.
- [1910.1053\(e\)\(2\)](#) - *Demarcation*. [Reference [paragraph \(e\)\(2\)\(i\) - \(ii\)](#)].
- [1910.1053\(e\)\(3\)](#) - *Access*. The employer shall limit access to *regulated areas* to: [Reference [paragraph \(e\)\(3\)\(A\) - \(C\)](#)].
- [1910.1053\(e\)\(4\)](#) - *Provision of respirators*. The employer shall provide each employee and the employee's designated representative entering a *regulated area* with an appropriate *respirator* in accordance with [paragraph \(g\)](#) of this section and shall require each employee and the employee's *designated representative* to use the *respirator* while in a *regulated area*.

#### [1910.1053\(f\)](#) - *Methods of compliance*.

- [1910.1053\(f\)\(1\)](#) - *Engineering and work practice controls*. The employer shall use *engineering and work practice controls* to reduce and maintain employee exposure to respirable crystalline silica to or below the *PEL*, unless the employer can *demonstrate* that such controls are not feasible. Wherever such feasible *engineering and work practice controls* are not sufficient to reduce employee exposure to or below the *PEL*, the employer shall nonetheless use them to reduce employee exposure to the lowest feasible level and shall supplement them with the use of *respiratory protection* that complies with the requirements of [paragraph \(g\)](#) of this section.

- [1910.1053\(f\)\(2\)](#) - *Written exposure control plan*.
  - [1910.1053\(f\)\(2\)\(i\)](#) - The employer shall establish and implement a *written exposure control plan* that contains at least the following elements: [Reference [paragraph \(f\)\(2\)\(i\) - \(iii\)](#)].
  - [1910.1053\(f\)\(3\)](#) - Abrasive blasting. In addition to the requirements of [paragraph \(f\)\(1\)](#) of this section, the employer shall comply with other OSHA standards, when applicable, such as [29 CFR 1910.94](#) (*Ventilation*), [29 CFR 1915.34](#) (*Mechanical paint removers*), and [29 CFR 1915 Subpart I](#) (*Personal Protective Equipment*), where abrasive blasting is conducted using crystalline silica-containing blasting agents, or where abrasive blasting is conducted on substrates that contain crystalline silica.

[1910.1053\(g\)](#) - *Respiratory protection*.

- [1910.1053\(g\)\(1\)](#) - General. Where *respiratory protection* is required by this section, the employer must provide each employee an appropriate *respirator* that complies with the requirements of this paragraph and [29 CFR 1910.134](#). *Respiratory protection* is required: [Reference [paragraph \(g\)\(1\)\(i\) - \(iv\)](#)].
- [1910.1053\(g\)\(2\)](#) - *Respiratory protection program*. Where *respirator* use is required by this section, the employer shall institute a *respiratory protection program* in accordance with [29 CFR 1910.134](#).

[1910.1053\(h\)](#) - *Housekeeping*. [Reference [paragraph \(h\)\(1\) - \(2\)](#)].

- [1910.1053\(h\)\(1\)](#) - The employer shall not allow dry sweeping or dry brushing where such activity could contribute to employee exposure to respirable crystalline silica unless wet sweeping, HEPA-filtered vacuuming or other *methods* that minimize the likelihood of exposure are not feasible.

[1910.1053\(i\)](#) - *Medical surveillance*.

- [1910.1053\(i\)\(1\)\(i\)](#) - The employer shall make *medical surveillance* available at no cost to the employee, and at a reasonable time and place, for each employee who will be occupationally *exposed* to respirable crystalline silica at or above the *action level* for 30 or more days per year.
- [1910.1053\(i\)\(1\)\(ii\)](#) - The employer shall ensure that all *medical examinations and procedures* required by this section are performed by a *PLHCP* as defined in paragraph (b) of this section.
- [1910.1053\(i\)\(2\)](#) - *Initial examination*. The employer shall make available an *initial (baseline) medical examination* within 30 days after initial assignment, unless the employee has received a *medical examination* that meets the requirements of this section within the last three years. The examination shall consist of: [Reference [paragraph \(i\)\(2\)\(i\) - \(vi\)](#)].

- [1910.1053\(i\)\(3\)](#) - *Periodic examinations*. The employer shall make available *medical examinations* that include the *procedures* described in [paragraph \(i\)\(2\)](#) of this section [except [paragraph \(i\)\(2\)\(v\)](#)] at least every three years, or more frequently if recommended by the *PLHCP*.
- [1910.1053\(i\)\(4\)](#) - *Information* provided to the *PLHCP*. The employer shall ensure that the examining *PLHCP* has a *copy* of this standard, and shall provide the *PLHCP* with the following *information*: [Reference [paragraph \(i\)\(4\)\(i\) - \(iv\)](#)].
- [1910.1053\(i\)\(5\)](#) - *PLHCP's written medical report* for the employee. The employer shall ensure that the *PLHCP explains* to the employee the *results* of the *medical examination* and provides each employee with a *written medical report* within 30 days of each medical examination performed. The *written report* shall contain: [Reference [paragraph \(i\)\(5\)\(i\) - \(iv\)](#)].
- [1910.1053\(i\)\(6\)](#) - *PLHCP's written medical opinion* for the employer. [Reference [paragraph \(i\)\(6\)\(i\) - \(iii\)](#)].
- [1910.1053\(i\)\(7\)](#) - *Additional examinations*. [Reference [paragraph \(i\)\(7\)\(i\) - \(iv\)](#)].

[1910.1053\(j\)](#) - *Communication* of respirable crystalline silica hazards to employees.

- [1910.1035\(j\)\(1\)](#) - *Hazard communication*. The employer shall include respirable crystalline silica in the *program* established to comply with the *hazard communication standard (HCS)* ([29 CFR 1910.1200](#)). The employer shall ensure that each employee has access to *labels* on containers of crystalline silica and *safety data sheets*, and is *trained* in accordance with the provisions of *HCS* and [paragraph \(j\)\(3\)](#) of this section. The employer shall ensure that at least the following hazards are addressed: Cancer, lung effects, immune system effects, and kidney effects.
- [1910.1053\(j\)\(2\)](#) - *Signs*. The employer shall *post signs* at all entrances to *regulated areas* that bear the following legend: [Reference [paragraph \(j\)\(2\)](#)].
- [1910.1053\(j\)\(3\)](#) - *Employee information and training*. [Reference [paragraph \(j\)\(3\)\(i\) - \(ii\)](#)].

[1910.1053\(k\)](#) - *Recordkeeping*.

- [1910.1053\(k\)\(1\)](#) - *Air monitoring data*. [Reference [paragraph \(k\)\(1\)\(i\) - \(iii\)](#)].
  - [1910.1053\(k\)\(1\)\(iii\)](#) - The employer shall ensure that *exposure records* are maintained and made available in accordance with [29 CFR 1910.1020](#) - *access to employee exposure and medical records*.
- [1910.1053\(k\)\(2\)](#) - *Objective data*. [Reference [paragraph \(k\)\(2\)\(i\) - \(iii\)](#)].
  - [1910.1053\(k\)\(2\)\(iii\)](#) - The employer shall ensure that *objective data* are maintained and made available in accordance with [29 CFR 1910.1020](#) - *access to employee exposure and medical records*.
- [1910.1053\(k\)\(3\)](#) - *Medical surveillance*. [Reference [paragraph \(k\)\(3\)\(i\) - \(iii\)](#)].
  - [1910.1053\(k\)\(3\)\(iii\)](#) - The employer shall ensure that *medical records* are maintained and made available in accordance with [29 CFR 1910.1020](#) - *access to employee exposure and medical records*.

## 1910.1096 - Ionizing Radiation

**Scope:** This [standard](#) provides the requirements pertaining to ionizing radiation.

**Radiation** includes alpha rays, beta rays, gamma rays, X-rays, neutrons, high-speed electrons, high-speed protons, and other atomic particles; but such term does not include sound or radio waves, or visible light, or infrared or ultraviolet light.

**Special Requirements:** Exposures, restricted areas, precautionary procedures, personal monitoring, caution signs (posted), labels, signals, symbols, alarm signal, labels, signal-generating system, testing, tests, inspections, checks, instruction, notification, notify, report (writing), records, Nuclear Regulatory Commission, DOT, licenses, reference other standards

[1910.1096\(b\)](#) - *Exposure of individuals to radiation in restricted areas.* [Reference [paragraph \(b\)\(1\) - \(4\)](#)].

[1910.1096\(c\)](#) - *Exposure to airborne radioactive material.* [Reference [paragraph \(c\)\(1\) - \(3\)](#)].

[1910.1096\(d\)](#) - *Precautionary procedures and personal monitoring.* [Reference [paragraph \(d\)\(1\) - \(3\)](#)].

[1910.1096\(e\)](#) - *Caution signs, labels, and signals*

- [1910.1096\(e\)\(1\)\(i\)](#) - *Symbols* prescribed by this paragraph shall use the conventional radiation caution colors (magenta or purple on yellow background).  
The *symbol* prescribed by this paragraph is the conventional three-bladed design:
- [1910.1096\(e\)\(2\)](#) - Radiation area. Each radiation area shall be conspicuously *posted with a sign or signs* bearing the radiation *caution symbol* described in [subparagraph \(1\)](#) of this paragraph and the words:
- [1910.1096\(e\)\(3\)\(i\)](#) - Each high radiation area shall be conspicuously *posted with a sign or signs* bearing the radiation *caution symbol* and the words:
- [1910.1096\(e\)\(3\)\(ii\)](#) - Each high radiation area shall be equipped with a control device which shall either cause the level of radiation to be reduced below that at which an individual might receive a dose of 100 millirems in 1 hour upon entry into the area or shall energize a conspicuous visible or *audible alarm signal* in such a manner that the individual entering and the employer or a supervisor of the activity are made aware of the entry. In the case of a high radiation area established for a period of 30 days or less, such control device is not required.
- [1910.1096\(e\)\(4\)\(ii\)](#) - Each airborne radioactivity area shall be conspicuously *posted with a sign or signs* bearing the radiation *caution symbol* described in [paragraph \(e\)\(1\)](#) of this section and the words:
- [1910.1096\(e\)\(5\)\(i\)](#) - Each area or room in which radioactive material is used or stored and which contains any radioactive material (other than natural uranium or

thorium) in any amount exceeding 10 times the quantity of such material specified in [appendix C to 10 CFR part 20](#) shall be conspicuously *posted with a sign or signs* bearing the radiation *caution symbol* described in [paragraph \(e\)\(1\)](#) of this section and the words:

- [1910.1096\(e\)\(5\)\(ii\)](#) - Each area or room in which natural uranium or thorium is used or stored in an amount exceeding 100 times the quantity of such material specified in [10 CFR part 20](#) shall be conspicuously *posted with a sign or signs* bearing the radiation *caution symbol* described in [paragraph \(e\)\(1\)](#) of this section and the words:
- [1910.1096\(e\)\(6\)\(i\)](#) - Each container in which is transported, stored, or used a quantity of any radioactive material (other than natural uranium or thorium) greater than the quantity of such material specified in [appendix C to 10 CFR part 20](#) shall bear a durable, clearly visible *label* bearing the radiation *caution symbol* described in [paragraph \(e\)\(1\)](#) of this section and the words:
- [1910.1096\(e\)\(6\)\(ii\)](#) - Each container in which natural uranium or thorium is transported, stored, or used in a quantity greater than 10 times the quantity specified in [appendix C to 10 CFR part 20](#) shall bear a durable, clearly visible *label* bearing the radiation *caution symbol* described in [paragraph \(e\)\(1\)](#) of this section and the words:
- [1910.1096\(e\)\(6\)\(iii\)](#) - Notwithstanding the provisions of [paragraphs \(e\)\(6\)\(i\) and \(ii\)](#) of this section a *label* shall not be required: [Reference [paragraph \(e\)\(6\)\(iii\)\(a\) - \(b\)](#)].
- [1910.1096\(e\)\(6\)\(iv\)](#) - Where containers are used for storage, the *labels* required in this subparagraph shall state also the quantities and kinds of radioactive materials in the containers and the date of measurement of the quantities.

[1910.1096\(f\)](#) - Immediate evacuation *warning signal*. [Reference [paragraph \(f\)\(1\) - \(3\)](#)].

- [1910.1096\(f\)\(1\)](#) - *Signal characteristics*. [Reference [paragraph \(f\)\(1\)\(i\) - \(vi\)](#)].
- [1910.1096\(f\)\(2\)](#) - *Design objectives*. [Reference [paragraph \(f\)\(2\)\(i\) - \(vi\)](#)].
- [1910.1096\(f\)\(3\)](#) - *Testing*. [Reference [paragraph \(f\)\(3\)\(i\) - \(viii\)](#)].

[1910.1096\(g\)](#) - Exceptions from *posting* requirements. Notwithstanding the provisions of [paragraph \(e\)](#) of this section: [Reference [paragraph \(g\)\(1\) - \(3\)](#)].

[1910.1096\(h\)](#) - Exemptions for radioactive materials packaged for shipment. Radioactive materials packaged and *labeled* in accordance with regulations of the *Department of Transportation published in 49 CFR Chapter I*, are exempt from the *labeling and posting* requirements of this subpart during shipment, provided that the inside containers are *labeled* in accordance with the provisions of [paragraph \(e\)](#) of this section.

[1910.1096\(i\)](#) - *Instruction* of personnel, *posting*. [Reference [paragraph \(i\)\(1\) - \(3\)](#)].

[1910.1096\(l\)](#) - *Notification* of incidents.



- [1910.1096\(l\)\(1\)](#) - Immediate *notification*. Each employer shall immediately notify the Assistant Secretary of Labor or his duly authorized representative, for employees not protected by the *Nuclear Regulatory Commission* by means of [10 CFR part 20; paragraph \(p\)\(2\)](#) of this section, or the requirements of the laws and regulations of States named in [paragraph \(p\)\(3\)](#) of this section, by telephone or telegraph of any incident involving radiation which may have caused or threatens to cause: [Reference [paragraph \(l\)\(1\)\(i\) - \(ii\)](#)].
- [1910.1096\(l\)\(2\)](#) - Twenty-four hour *notification*. Each employer shall within 24 hours following its occurrence notify the Assistant Secretary of Labor or his duly authorized representative for employees not protected by the *Nuclear Regulatory Commission* by means of [10 CFR part 20; paragraph \(p\)\(2\)](#) of this section, or the requirements of the laws and applicable regulations of States named in [paragraph \(p\)\(3\)](#) of this section, by telephone or telegraph of any incident involving radiation which may have caused or threatens to cause: [Reference [paragraph \(l\)\(2\)\(i\)](#)].

[1910.1096\(m\)](#) - *Reports of overexposure* and excessive levels and concentrations. [Reference [paragraph \(m\)\(1\) - \(2\)](#)].

[1910.1096\(n\)](#) - *Records*. [Reference [paragraph \(n\)\(1\) - \(2\)](#)].

[1910.1096\(o\)](#) - Disclosure to former employee of individual employee's *record*. [Reference [paragraph \(o\)\(1\)](#)].

[1910.1096\(p\)](#) - *Nuclear Regulatory Commission licensees - NRC contractors operating NRC plants and facilities - NRC Agreement State licensees or registrants*. [Reference [paragraph \(p\)\(1\) - \(3\)](#)].

## **1910.1200 - Hazard Communication**

**Scope:** This [standard](#) provides the requirements pertaining to hazard communication.

**Special Requirements:** Information, labeling, safety data sheets, training, workplace program, transmit information, communication, protective measures, training programs, hazard communication program (written), forms of warning, classified, tagged, marked, measures, displayed, evaluate, hazard classification, lists, procedures, scientific literature, test, evidence, chemical manufacturers and importers, determine, labeling system, written materials, procedures, methods, inform, non-routine tasks, unlabeled pipes, precautionary measures, references other standards

[1910.1200\(a\)\(1\)](#) - The purpose of this section is to ensure that the hazards of all chemicals produced or imported are *classified*, and that information concerning the *classified hazards* is transmitted to employers and employees. The requirements of this section are intended to be consistent with the provisions of the *United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS)*, primarily Revision 7. The



transmittal of *information* is to be accomplished by means of *comprehensive hazard communication programs*, which are to include container *labeling* and other *forms of warning, safety data sheets and employee training*.

[1910.1200\(a\)\(2\)](#) - This occupational safety and health standard is intended to address comprehensively the issue of *classifying* the potential hazards of chemicals, and *communicating information* concerning hazards and appropriate *protective measures* to employees, and to preempt any legislative or regulatory enactments of a state, or political subdivision of a state, pertaining to this subject. *Classifying* the potential hazards of chemicals and *communicating information* concerning hazards and appropriate *protective measures* to employees, may include, for example, but is not limited to, provisions for: developing and maintaining a *written hazard communication program* for the workplace, including lists of hazardous chemicals present; *labeling* of containers of chemicals in the workplace, as well as of containers of chemicals being shipped to other workplaces; preparation and distribution of *safety data sheets* to employees and downstream employers; and development and implementation of employee *training programs* regarding hazards of chemicals and *protective measures*. Under section 18 of the Act, no state or political subdivision of a state may adopt or enforce any requirement relating to the issue addressed by this Federal standard, except pursuant to a Federally-approved state plan.

[1910.1200\(b\)\(1\)](#) - This section requires chemical manufacturers or importers to classify the hazards of chemicals which they produce or import, and all employers to provide *information* to their employees about the hazardous chemicals to which they are exposed, by means of a *hazard communication program, labels and other forms of warning, safety data sheets, and information* and training. In addition, this section requires distributors to *transmit the required information* to employers. (Employers who do not produce or import chemicals need only focus on those parts of this rule that deal with establishing a *workplace program and communicating information* to their workers.)

[1910.1200\(b\)\(3\)\(i\)](#) - Employers shall ensure that *labels* on incoming containers of hazardous chemicals are not removed or defaced;

[1910.1200\(b\)\(3\)\(ii\)](#) - Employers shall *maintain any safety data sheets* that are received with incoming shipments of hazardous chemicals, and ensure that they are *readily accessible* during each workshift to laboratory employees when they are in their work areas;

[1910.1200\(b\)\(3\)\(iii\)](#) - Employers shall ensure that laboratory employees are provided *information and training* in accordance with [paragraph \(h\)](#) of this section, except for the location and availability of the *written hazard communication program* under [paragraph \(h\)\(2\)\(iii\)](#) of this section; and,

[1910.1200\(b\)\(3\)\(iv\)](#) - Laboratory employers that ship hazardous chemicals are considered to be either a *chemical manufacturer or a distributor* under this rule, and thus must ensure that any containers of hazardous chemicals leaving the laboratory are *labeled* in accordance with [paragraph \(f\)](#) of this section, and that a *safety data sheet is provided* to distributors and other employers in accordance with [paragraphs \(g\)\(6\) and \(g\)\(7\)](#) of this section.

[1910.1200\(b\)\(4\)](#) - In work operations where employees only handle chemicals in sealed containers which are not opened under normal conditions of use (such as are found in marine cargo handling, warehousing, or retail sales), this section applies to these operations only as follows:

- [1910.1200\(b\)\(4\)\(i\)](#) - Employers shall ensure that *labels* on incoming containers of hazardous chemicals are not removed or defaced;
- [1910.1200\(b\)\(4\)\(ii\)](#) - Employers shall *maintain copies of any safety data sheets* that are received with incoming shipments of the sealed containers of hazardous chemicals, shall obtain a *safety data sheet* as soon as possible for sealed containers of hazardous chemicals received without a *safety data sheet* if an employee requests the *safety data sheet*, and shall ensure that the *safety data sheets* are readily *accessible during each work shift* to employees when they are in their work area(s); and,
- [1910.1200\(b\)\(4\)\(iii\)](#) - Employers shall ensure that employees are provided with *information and training* in accordance with [paragraph \(h\)](#) of this section (except for the location and availability of the *written hazard communication program* under [paragraph \(h\)\(2\)\(iii\)](#) of this section), to the extent necessary to protect them in the event of a spill or leak of a hazardous chemical from a sealed container.

[1910.1200\(b\)\(5\)](#) - This section does not require *labeling* of the following chemicals:  
[Reference [paragraph \(b\)\(5\)\(i\) - \(vi\)](#)].

[1910.1200\(b\)\(6\)](#) - This section does not apply to (*References other standards*):  
[Reference [paragraph \(b\)\(6\)\(i\) - \(xii\)](#)].

[1910.1200\(d\)\(1\)](#) - *Chemical manufacturers and importers* shall *evaluate* chemicals produced in their workplaces or imported by them to *classify* the chemicals in accordance with this section. Employers are not required to *classify chemicals* unless they choose not to rely on the *classification* performed by the *chemical manufacturer or importer* for the chemical to satisfy this [paragraph \(d\)\(1\)](#). For each chemical, the *chemical manufacturer or importer* shall *determine* the hazard classes, and where appropriate, the category of each class that apply to the chemical being classified. The *hazard classification* shall include any hazards associated with the chemical's intrinsic properties including:  
[Reference [paragraph \(d\)\(1\)\(i\) - \(ii\)](#)].

1910.1200(d)(2) - *Chemical manufacturers, importers or employers classifying chemicals shall identify and consider the full range of available scientific literature and other evidence concerning the potential hazards. There is no requirement to test the chemical to determine how to classify its hazards. [Appendix A - health hazard criteria \(mandatory\)](#) to [§ 1910.1200](#) shall be consulted for classification of health hazards, and [Appendix B - physical criteria \(mandatory\)](#), to [§ 1910.1200](#) shall be consulted for the classification of physical hazards.*

1910.1200(d)(3)(i) - *Chemical manufacturers, importers, or employers evaluating chemicals shall follow the procedures described in [Appendix A - health hazard criteria \(mandatory\)](#) and [Appendix B - physical criteria \(mandatory\)](#) to [§ 1910.1200](#) to classify the hazards of the chemicals, including determinations regarding when mixtures of the classified chemicals are covered by this section.*

1910.1200(d)(3)(ii) - *When classifying mixtures they produce or import, chemical manufacturers and importers of mixtures may rely on the information provided on the current safety data sheets of the individual ingredients, except where the chemical manufacturer or importer knows, or in the exercise of reasonable diligence should know, that the safety data sheet misstates or omits information required by this section.*

1910.1200(e) - *Written hazard communication program.*

- 1910.1200(e)(1) - Employers shall develop, implement, and maintain at each workplace, a *written hazard communication program* which at least describes how the criteria specified in [paragraphs \(f\), \(g\), and \(h\)](#) of this section for *labels* and other forms of *warning, safety data sheets, and employee information and training* will be met, and which also includes the following:
  - 1910.1200(e)(1)(i) - A *list of the hazardous chemicals* known to be present using a product identifier that is referenced on the appropriate *safety data sheet* (the list may be compiled for the workplace as a whole or for individual work areas); and,
  - 1910.1200(e)(1)(ii) - The *methods* the employer will use to *inform* employees of the hazards of *non-routine tasks* (for example, the cleaning of reactor vessels), and the hazards associated with chemicals contained in *unlabeled pipes* in their work areas.
- 1910.1200(e)(2) - Multi-employer workplaces. Employers who produce, use, or store hazardous chemicals at a workplace in such a way that the employees of other employer(s) may be exposed (for example, employees of a construction contractor working on-site) shall additionally ensure that the *hazard communication programs* developed and implemented under this [paragraph \(e\)](#) include the following:
  - 1910.1200(e)(2)(i) - The *methods* the employer will use to provide the other employer(s) on-site access to *safety data sheets* for each hazardous

chemical the other employer(s)' employees may be exposed to while working;

- [1910.1200\(e\)\(2\)\(ii\)](#) - The *methods* the employer will use to *inform* the other employer(s) of any *precautionary measures* that need to be taken to protect employees during the workplace's normal operating conditions and in foreseeable emergencies; and,
- [1910.1200\(e\)\(2\)\(iii\)](#) - The *methods* the employer will use to *inform* the other employer(s) of the *labeling system* used in the workplace.
- [1910.1200\(e\)\(3\)](#) - The employer may rely on an existing *hazard communication program* to comply with these requirements, provided that it meets the criteria established in this [paragraph \(e\)](#).
- [1910.1200\(e\)\(4\)](#) - The employer shall make the *written hazard communication program* available, upon request, to employees, their designated representatives, the Assistant Secretary and the Director, in accordance with the requirements of [§ 1910.1020\(e\)](#) - *access to employee exposure and medical records, access to records*.
- [1910.1200\(e\)\(5\)](#) - Where employees must travel between workplaces during a workshift, *i.e.*, their work is carried out at more than one geographical location, the *written hazard communication program* may be kept at the primary workplace facility.

#### [1910.1200\(f\)](#) - *Labels and other forms of warning.*

- [1910.1200\(f\)\(1\)](#) - *Labels* on shipped containers. The *chemical manufacturer, importer, or distributor* shall ensure that each container of hazardous chemicals leaving the workplace is *labeled, tagged or marked*. Hazards not otherwise *classified* and hazards identified and *classified* under [\(d\)\(1\)\(ii\)](#) do not have to be addressed on the container. Where the *chemical manufacturer, importer, or distributor* is required to *label, tag or mark* the following shall be provided: [Reference [paragraph \(f\)\(1\)\(i\) - \(vi\)](#)].
- [1910.1200\(f\)\(2\)](#) - The *chemical manufacturer, importer, or distributor* shall ensure that the *information* provided under [paragraphs \(f\)\(1\)\(i\) through \(v\)](#) of this section is in accordance with [Appendix C - allocation of label elements \(Mandatory\) to § 1910.1200](#), for each hazard class and associated hazard category for the hazardous chemical, *prominently displayed*, and in English (other languages may also be included if appropriate).
- [1910.1200\(f\)\(3\)](#) - The *chemical manufacturer, importer, or distributor* shall ensure that the *information* provided under [paragraphs \(f\)\(1\)\(ii\) through \(iv\)](#) of this section is located together on the *label, tag, or mark*.
- [1910.1200\(f\)\(4\)\(i\)](#) - For solid metal (such as a steel beam or a metal casting), solid wood, or plastic items that are not exempted as articles due to their downstream use, or shipments of whole grain, the required *label* may be transmitted to the customer at the time of the initial shipment, and need not be included with

subsequent shipments to the same employer unless the *information on the label* changes;

- [1910.1200\(f\)\(4\)\(ii\)](#) - The *label* may be transmitted with the initial shipment itself, or with the *safety data sheet* that is to be provided prior to or at the time of the first shipment; and,
- [1910.1200\(f\)\(4\)\(iii\)](#) - This exception to requiring *labels* on every container of hazardous chemicals is only for the solid material itself, and does not apply to hazardous chemicals used in conjunction with, or known to be present with, the material and to which employees handling the items in transit may be exposed (for example, cutting fluids or pesticides in grains).
- [1910.1200\(f\)\(5\)\(i\)](#) - *Chemical manufacturers, importers, or distributors* shall ensure that each container of hazardous chemicals leaving the workplace is *labeled, tagged, or marked* in accordance with this section in a manner which does not conflict with the requirements of the *Hazardous Materials Transportation Act (49 U.S.C. 5101 et seq.) and regulations* issued under that Act by the *Department of Transportation (49 CFR subtitle B)*.
- [1910.1200\(f\)\(5\)\(ii\)](#) - The *label* for bulk shipments of hazardous chemicals must be on the immediate container, transmitted with the shipping papers or the bills of lading, or, with the agreement of the receiving entity, transmitted by technological or electronic means so that it is immediately available to workers in *printed form* on the receiving end of shipment.
- [1910.1200\(f\)\(5\)\(iii\)](#) - Where a *pictogram* required by the *Department of Transportation under title 49 of the Code of Federal Regulations* appears on a shipped container, the *pictogram* specified in [appendix C.4 - allocation of label elements \(mandatory\)](#), to this section for the same hazard is not required on the *label*.
- [1910.1200\(f\)\(6\)](#) - *Workplace labeling*. Except as provided in [paragraphs \(f\)\(7\) and \(f\)\(8\)](#) of this section, the employer shall ensure that each container of hazardous chemicals in the workplace is *labeled, tagged or marked* with either: [Reference [paragraph \(f\)\(6\)\(i\) - \(ii\)](#)].
- [1910.1200\(f\)\(7\)](#) - The employer may use *signs, placards, process sheets, batch tickets, operating procedures, or other such written materials* in lieu of affixing *labels* to individual stationary process containers, as long as the *alternative method* identifies the containers to which it is applicable and conveys the *information* required by [paragraph \(f\)\(6\)](#) of this section to be on a *label*. The employer shall ensure the *written materials* are readily accessible to the employees in their work area throughout each work shift.
- [1910.1200\(f\)\(8\)](#) - The employer is not required to *label* portable containers into which hazardous chemicals are transferred from *labeled* containers, and which are intended only for the immediate use of the employee who performs the transfer. For purposes of this section, drugs which are dispensed by a pharmacy to a health care provider for direct administration to a patient are exempted from *labeling*.



- [1910.1200\(f\)\(9\)](#) - The employer shall not remove or deface existing *labels* on incoming containers of hazardous chemicals, unless the container is immediately *marked* with the required *information*.
- [1910.1200\(f\)\(10\)](#) - The employer shall ensure that *workplace labels or other forms of warning* are legible, in English, and *prominently displayed* on the container, or readily available in the work area throughout each work shift. Employers having employees who speak other languages may add the information in their language to the material presented, as long as the *information* is presented in English as well.
- [1910.1200\(f\)\(11\)\(i\)](#) - *Chemical manufacturers, importers, distributors*, or employers who become newly aware of any significant *information* regarding the hazards of a chemical shall revise the *labels* for the chemical within six months of becoming aware of the new *information* and shall ensure that *labels* on containers of hazardous chemicals shipped after that time contain the new information. For chemicals that have been released for shipment and are awaiting future distribution, *chemical manufacturers, importers, distributors*, or employers have the option not to relabel those containers; however, if they do not *relabel* the containers, they must provide the updated *label* for each individual container with each shipment.
- [1910.1200\(f\)\(11\)\(ii\)](#) - If the chemical is not currently produced or imported, the *chemical manufacturer, importer, distributor*, or employer shall add the *information to the label* before the chemical is shipped or introduced into the workplace again.
- [1910.1200\(f\)\(12\)](#) - *Small container labelling*. [Reference [paragraph \(f\)\(12\)\(i\) - \(iv\)](#)].

[1910.1200\(g\)](#) - *Safety data sheets*. [Reference [paragraph \(g\)\(1\) - \(11\)](#)].

[1910.1200\(h\)](#) - Employee information and training.

- [1910.1200\(h\)\(1\)](#) - Employers shall provide employees with effective *information and training* on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new chemical hazard the employees have not previously been *trained* about is introduced into their work area. *Information and training* may be designed to cover categories of hazards (e.g., flammability, carcinogenicity) or specific chemicals. Chemical-specific *information* must always be available through *labels and safety data sheets*.
- [1910.1200\(h\)\(2\)](#) - *Information*. Employees shall be *informed* of:  
[Reference [paragraph \(h\)\(2\)\(i\) - \(iii\)](#)].
- [1910.1200\(h\)\(3\)](#) - *Training*. Employee *training* shall include at least:  
[Reference [paragraph \(h\)\(3\)\(i\) - \(iv\)](#)].

[1910.1200\(i\)\(1\)](#) - Trade secrets - The chemical manufacturer, importer, or employer may withhold the specific chemical identity, including the chemical name, other specific identification of a hazardous chemical, and/or the exact percentage (concentration) or



concentration range of the substance in a mixture, from section 3 of the *safety data sheet*, provided that: [Reference [paragraph \(i\)\(1\) - \(13\)](#)].

## **1910.1201 - Retention of DOT Markings, Placards and Labels**

**Scope:** This [standard](#) provides the requirements for the retention of DOT markings, placards and labels.

**Special Requirements:** Markings, labels, placards, marked, placarded, labeled, references other standards

[1910.1201\(a\)](#) - Any employer who receives a package of hazardous material which is required to be *marked, labeled or placarded* in accordance with the U. S. Department of Transportation's [Hazardous Materials Regulations \(49 CFR Parts 171 through 180\)](#) shall retain those *markings, labels and placards* on the package until the packaging is sufficiently cleaned of residue and purged of vapors to remove any potential hazards.

- [1910.1201\(b\)](#) - Any employer who receives a freight container, rail freight car, motor vehicle, or transport vehicle that is required to be *marked or placarded* in accordance with the *Hazardous Materials Regulations* shall retain those *markings and placards* on the freight container, rail freight car, motor vehicle or transport vehicle until the hazardous materials which require the *marking or placarding* are sufficiently removed to prevent any potential hazards.

[1910.1201\(c\)](#) - *Markings, placards and labels* shall be maintained in a manner that ensures that they are readily visible.

[1910.1201\(d\)](#) - For non-bulk packages which will not be reshipped, the provisions of this section are met if a *label* or other acceptable *marking* is affixed in accordance with the *Hazard Communication Standard (29 CFR 1910.1200)*.

[1910.1201\(e\)](#) - For the purposes of this section, the term "hazardous material" and any other terms not defined in this section have the same definition as in the [Hazardous Materials Regulations \(49 CFR Parts 171 through 180\)](#).

## **1910.1450 - Occupational Exposure to Hazardous Chemicals in Laboratories**

**Scope:** This [standard](#) provides the requirements for occupational exposure to hazardous chemicals in laboratories.

**Special Requirements:** Medical surveillance, records, medical consultation, measures, informed, determined by employer, evaluate, chemical hygiene plan (written), plan review, chemical hygiene officer, PPE (i.e., respiratory protection), engineering controls, hygiene

practices, employee notification, results (in writing), exposure, action level, information, physician, training, exposure monitoring, permissible exposure level (PEL), chemical hygiene committee, written opinion, procedures, labels, safety data sheets, designation, methods, references other standards

*Laboratory* means a facility where the "laboratory use of hazardous chemicals" occurs. It is a workplace where relatively small quantities of hazardous chemicals are used on a non-production basis.

*Laboratory scale* means work with substances in which the containers used for reactions, transfers, and other handling of substances are designed to be easily and safely manipulated by one person. "Laboratory scale" excludes those workplaces whose function is to produce commercial quantities of materials.

[1910.1450\(a\)\(2\)](#) - Where this section applies, it shall supersede, for laboratories, the requirements of all other *OSHA health standards in 29 CFR part 1910, subpart Z - toxic and hazardous substances*, except as follows: [Reference [paragraph \(a\)\(2\)\(i\) - \(iii\)](#)].

[1910.1450\(c\)](#) - *Permissible exposure limits*. For laboratory uses of OSHA regulated substances, the employer shall assure that laboratory employees' *exposures* to such substances do not exceed the *permissible exposure limits* specified in *29 CFR part 1910, subpart Z - toxic and hazardous substances*.

[1910.1450\(d\)\(1\)](#) - *Initial monitoring*. The employer shall *measure* the employee's *exposure* to any substance regulated by a standard which requires *monitoring* if there is reason to believe that *exposure levels* for that substance routinely exceed the *action level* (or in the absence of an *action level*, the PEL).

[1910.1450\(d\)\(2\)](#) - *Periodic monitoring*. If the initial *monitoring* prescribed by [paragraph \(d\)\(1\)](#) of this section discloses employee exposure over the action level (or in the absence of an *action level*, the PEL), the employer shall immediately comply with the *exposure monitoring* provisions of the relevant standard.

[1910.1450\(d\)\(3\)](#) - *Termination of monitoring*. *Monitoring* may be terminated in accordance with the relevant *standard*.

[1910.1450\(d\)\(4\)](#) - *Employee notification of monitoring results*. The employer shall, within 15 *working days* after the *receipt of any monitoring results*, *notify* the employee of these *results in writing* either individually or by *posting results* in an appropriate location that is accessible to employees.

[1910.1450\(e\)](#) - *Chemical hygiene plan - General*. ([Appendix A](#) of this section is non-mandatory but provides guidance to assist employers in the development of the *Chemical Hygiene Plan*).

- [1910.1450\(e\)\(1\)](#) - Where hazardous chemicals as defined by this standard are used in the workplace, the employer shall develop and carry out the provisions of a *written Chemical Hygiene Plan* which is: [Reference [paragraph \(e\)\(1\)\(i\) - \(ii\)](#)].
- [1910.1450\(e\)\(2\)](#) - The *Chemical Hygiene Plan* shall be readily available to employees, employee representatives and, upon request, to the Assistant Secretary.
- [1910.1450\(e\)\(3\)](#) - The *Chemical Hygiene Plan* shall include each of the following elements and shall indicate specific *measures* that the employer will take to ensure laboratory employee protection; [Reference [paragraph \(e\)\(3\)\(i\) - \(viii\)](#)].
- [1910.1450\(e\)\(4\)](#) - The employer shall *review and evaluate* the effectiveness of the *Chemical Hygiene Plan at least annually* and update it as necessary.

[1910.1450\(f\)](#) - *Employee information and training.*

- [1910.1450\(f\)\(1\)](#) - The employer shall provide employees with *information and training* to ensure that they are apprised of the hazards of chemicals present in their work area.
- [1910.1450\(f\)\(2\)](#) - Such *information* shall be provided at the time of an employee's initial assignment to a work area where hazardous chemicals are present and prior to assignments involving new exposure situations. The frequency of refresher *information and training* shall be *determined* by the employer.
- [1910.1450\(f\)\(3\)](#) - *Information*. Employees shall be *informed* of: [Reference [paragraph \(f\)\(3\)\(i\) - \(v\)](#)].
- [1910.1450\(f\)\(4\)\(i\)](#) - *Employee training* shall include: [Reference [paragraph \(f\)\(4\)\(i\) - \(ii\)](#)].

[1910.1450\(g\)](#) - *Medical consultation and medical examinations.*

- [1910.1450\(g\)\(1\)](#) - The employer shall provide all employees who work with hazardous chemicals an opportunity to receive medical attention, including any follow-up examinations which the examining *physician determines* to be necessary, under the following circumstances: [Reference [paragraph \(g\)\(1\)\(i\) - \(iii\)](#)].
- [1910.1450\(g\)\(2\)](#) - All *medical examinations and consultations* shall be performed by or under the direct supervision of a *licensed physician* and shall be provided without cost to the employee, without loss of pay and at a reasonable time and place.
- [1910.1450\(g\)\(3\)](#) - *Information* provided to the *physician*. The employer shall provide the following *information to the physician*: [Reference [paragraph \(g\)\(3\)\(i\) - \(iii\)](#)].
- [1910.1450\(g\)\(4\)\(i\)](#) - For examination or consultation required under this standard, the employer shall obtain a *written opinion* from the examining *physician* which shall include the following: [Reference [paragraph \(g\)\(4\)\(i\) - \(ii\)](#)].

[1910.1450\(h\)](#) - *Hazard identification.*

- [1910.1450\(h\)\(1\)](#) - With respect to *labels and safety data sheets*: [Reference [paragraph \(h\)\(1\) - \(2\)](#)].

[1910.1450\(i\)](#) - Use of *respirators*. Where the use of *respirators* is necessary to maintain exposure below *permissible exposure limits*, the employer shall provide, at no cost to the employee, the proper *respiratory equipment*. *Respirators* shall be selected and used in accordance with the requirements of [29 CFR 1910.134](#) - *respiratory protection*.

[1910.1450\(j\)\(1\)](#) - The employer shall establish and maintain for each employee an accurate *record of any measurements taken to monitor employee exposures* and any *medical consultation and examinations including tests or written opinions* required by this standard.

[1910.1450\(j\)\(2\)](#) - The employer shall assure that such *records* are kept, transferred, and made available in accordance with [29 CFR 1910.20](#) ([1910.1020](#) - *access to employee exposure and medical records*).

## **Additional Assistance for General Industry**

If the employer still has questions regarding the OSHA standards or North Carolina state-specific standards, they can submit an inquiry about safety and health requirements to Ask OSH through the [online form](#) or by phone at 919-707-7876.

Resource information can be found on the [safety and health topics pages](#) [[General Industry Resources](#) ([Scan QR Code](#))] and [29 CFR 1910 - General Industry Standards with Special Requirements](#). These resources should be used with the webpages for [Which OSHA Standards Apply](#) and [OSHA Standards With Special Requirements](#).

Example safety and health [programs](#) ([table](#) of standards requiring programs, plans and procedures in general industry, [table](#) of standards requiring inspections in general industry) and [presentations](#) ([table](#) of standards requiring training in general industry), and [presentations](#) ([pre-recorded webinars](#)) along with [publications](#) are available to assist the employer in meeting standards requirements. Specifically, the brochure on [top ten most frequently cited serious violations](#) can be useful in identifying frequently cited violations by industry. For more information regarding the required state and federal workplace posters, go to the [NCDOL State and Federal workplace posters](#) webpage.

The [NCDOL Library](#) also offers free safety and health videos and related research assistance on consensus standards (i.e., ANSI, NFPA, NEC). The education, training and technical assistance bureau provides [free online safety and health training](#) and [outreach services](#) (i.e., speaker's bureau requests, safety booths) upon request. In addition, the [consultative services bureau](#) provides free confidential on-site employer assistance.

## **Special Emphasis Programs**

The North Carolina Special Emphasis Programs (SEPs) are part of the NC OSH Division's five year strategic management plan for which its two principal goals are: 1) to reduce the state's workplace fatality rate by at least 2%; and 2) to reduce the state's non-fatal injury and illness rate by at least 5%. For each SEP that applies to a specific industrial sector, similar goals for reducing the fatality rate and/or non-fatal injury and illness rate are applied.

### **Special Emphasis Programs**

#### **What is a Special Emphasis Program?**

From the context of occupational safety and health, a special emphasis program (SEP) is a concerted effort for which the goals are:

- To reduce or eliminate fatalities overall and within specific industry sectors;
- To reduce injury and illness rates in specific business sectors to levels below the national average for those sectors; and
- To reduce or eliminate employee exposure to specific types of hazards.

#### **What SEPs are currently in effect in North Carolina?**

The special emphasis programs in effect in North Carolina are part of the OSH Division five-year strategic management plan. The SEPs currently in effect or added as part of the next five-year strategic management plan are listed below with links provided to the corresponding safety and health topic page:

- [Amputations Special Emphasis Program](#)
- [Construction Special Emphasis Program](#)
- [Food Manufacturing Special Emphasis Program](#)
- [Health Hazards Special Emphasis Program](#) (see [Lead](#), [Isocyanates](#), [Hexavalent Chromium](#), [Silica](#), [Beryllium](#))
- [Long Term Care Special Emphasis Program](#)
- [Logging and Arboriculture Special Emphasis Program](#)
- <sup>New!</sup> [Struck-By Special Emphasis Program](#)
- [Warehousing and Storage and Related Product Distribution Special Emphasis Program](#)

#### **How does the OSH Division conduct a Special Emphasis Program?**

Each of the bureaus in the OSH Division has designated responsibilities within each SEP.

- The East and West Compliance Bureaus conduct [enforcement activity](#) targeted at covered industries to ensure compliance with occupational safety and health rules and regulations towards the goal of reducing or eliminating employee exposure to the focus hazards of that SEP.
- The [Consultative Services Bureau](#) (CSB) conducts on-site visits and audits to assist employers that voluntarily seek help in identifying and eliminating hazards and improving their overall safety and health programs.
- The Education, Training and Technical Assistance (ETTA) Bureau provides [outreach training](#) for each SEP to assist employers to identify and abate hazards in the workplace and to learn the requirements of applicable OSH standards.
- The Planning, Statistics and Information Management (PSIM) Bureau develops targeting schedules for each SEP to better allocate compliance resources and provides the SEP team leaders with updated injury and illness incidence rates to assist them in determining the impact of that focus.

### What are the various types of emphasis programs?

- National Emphasis Program ([NEP](#))
  - Apply to all Federal OSHA Regions
  - State Plan States required to implement the same or equally effective emphasis programs
- Local Emphasis Program ([LEP](#))
  - Administered by Federal OSHA
  - Designed and implemented at regional office and/or area office level
  - Intended to address hazards or industries that pose a particular risk to workers in the office's jurisdiction
  - Accompanied by outreach
  - Apply only to states under Federal OSHA jurisdiction
- North Carolina Special Emphasis Program ([SEP](#))
  - May be identical to OSHA NEP or LEP
  - Often unique to circumstances in North Carolina (OSHA state plan state)

## North Carolina State-Specific Standards

These webpages are designed to assist employers in complying with standards that have "**special requirements**". For the purpose of this technical guidance, special requirements includes programs, plans, procedures, policies, inspections, certifications, competent persons, qualified persons, training, medical surveillance, exposure monitoring, signs, tags, markings, tests, records and recordkeeping requirements that are applicable in meeting the requirements of OSHA standards by industry. *If a standard or subpart are not listed, it did not have one of these types of special requirements.*



**Note:** While all attempts have been made to ensure the accuracy of the content and completeness in the information provided, it may not include all the specific standards that have special requirements that may be required by an OSHA standard. To ensure completeness in meeting each standard's requirement, the specific standard should be referenced.

To learn more about these special requirements, click on the tabs below.

## Special Requirements

This webpage is to be used in conjunction with the [Which OSHA Standards Apply](#) webpages for [North Carolina State-Specific Standards](#).

- NCGS 95-129(1) - [General Duty Clause](#)
- NCGS 95-173 through 95-218 - [Hazardous Chemical Right To Know Act](#)
- 13 NCAC 7A .0600 through .0606 - [Safety and Health Programs and Committees](#)
- 13 NCAC 07F .0103 - [Hazardous Materials](#)
- 13 NCAC 07F .0600 through .0609 - [Communication Tower Standards](#)
- 13 NCAC 07G .0101 - [Handling of Antineoplastic Agents](#)
- [Additional Assistance on North Carolina State-Specific Standards](#)

## NCGS 95-129(1) - [General Duty Clause](#)

The [NCGS 95-129\(1\)](#) - General Duty Clause is used when there isn't a standard for a recognized hazard that can cause death or serious injury or serious physical harm.

To learn if NCGS 95-129(1) applies to you, go to [Does the "General Duty Clause" Apply to You?](#)

## Special Requirements

### NCGS 95-129(1) - General Duty Clause

**Scope:** This [standard](#) is used when there isn't a standard for a recognized hazard that can cause death or serious injury or serious physical harm.

**Special Requirements:** Rights and duties, recognized

*Rights and duties* of employers shall include but are not limited to the following provisions: [Reference [NCGS 95-129\(1\) - \(8\)](#)].

- (1) Each employer shall furnish to each of his employees conditions of employment and a place of employment free from *recognized* hazards that are causing or are likely to cause death or serious injury or serious physical harm to his employees;

## **NCGS 95-173 through 95-218 - [Hazardous Chemical Right To Know Act](#)**

[NCGS 95-173 through 95-218](#) - Hazardous Chemical Right To Know Act provides the standards for the Hazardous Chemicals Right to Know Act applicable in North Carolina.

To learn if NCGS 95-173 through 95-218 applies to you, go to [Does the "Hazardous Chemical Right To Know Act" Apply to You?](#)

### **Special Requirements**

## **NCGS 95-173 through 95-218 - Hazardous Chemical Right To Know Act**

**Scope:** This [standard](#) provides the standards for the right to know about hazardous chemicals.

**Special Requirements:** Label, list, information, notify, emergency response plan, evacuation procedures, safety data sheet, updated quarterly/annually, fire chief, fire department, inspection, chemical manufacturers and distributors, in writing, written request, contingency plan, testify, prefire plan, request, written notification, inspect, commissioner of labor, complaints, investigations, credentials, administrative hearings, healthcare provider, determines, written statement, posting, confidentiality agreement, references other standards

### **§ 95-191. *Hazardous Substance List.***

- (a) All employers who manufacture, process, use, store, or produce hazardous chemicals, shall compile and maintain a *Hazardous Substance List* which shall contain all of the following *information* for each hazardous chemical stored in the facility in quantities of 55 gallons or 500 pounds, whichever is greater:  
[Reference [95-191 - paragraph \(a\)\(1\) - \(3\)](#)]
  - (1) The chemical name or the common name used on the *SDS or container label*.
- (b) The *Hazardous Substance List* shall be *updated quarterly* if necessary, but not less often than annually; however, if a chemical is deleted from, or added to, the *Hazardous Substance List*, or if the quantity changes sufficiently to cause the chemical to be in a different class as defined in subsection (a) of this section, the employer shall update the *Hazardous Substance List* to reflect those changes as soon as practicable, but in any event within 30 days of such change.

- (b1) In lieu of the *information* required by subdivisions (a)(1) through (a)(3), employers may substitute the *information* specified in [section 312\(d\)\(2\) of the Superfund Amendments and Reauthorization Act of 1986, P.L. 99-499.](#)
- (c) The *Hazardous Substance List* may be prepared for the facility as a whole, or for each area in a facility where hazardous chemicals are stored, at the option of the employer but shall include only chemicals used or stored in North Carolina.

§ 95-192. *Safety data sheets.*

- (a) *Chemical manufacturers and distributors* shall provide *safety data sheets (SDSs)* to manufacturing and nonmanufacturing purchasers of hazardous chemicals in North Carolina for each hazardous chemical purchased.
- (b) Employers shall *maintain* the most current *SDS* received from *manufacturers or distributors* for each hazardous chemical purchased. If an *SDS* has not been provided by the *manufacturer or distributor* for chemicals on the *Hazardous Substance List* at the time the chemicals are received at the facility, the employer shall *request* one in *writing* from the *manufacturer or distributor* within 30 days after receipt of the chemical. If the employer does not receive an *SDS* within 30 days after his *written request*, he shall *notify the Commissioner of Labor* of the failure by *manufacturer or distributor* to provide the *SDS*.

§ 95-193. *Labels.*

- Existing *labels* on incoming containers of hazardous chemicals shall not be removed or defaced. All containers of hazardous substances must be clearly designated as hazardous.

§ 95-194. *Emergency information.*

- (a) An employer who normally stores at a facility any hazardous chemical in an amount of at least 55 gallons or 500 pounds, whichever is greater, shall provide the *Fire Chief* of the *Fire Department* having jurisdiction over the facility, *in writing*, (i) the name(s) and telephone number(s) of knowledgeable representative(s) of the employer who can be contacted for further *information* or in case of an emergency and (ii) a *copy of the Hazardous Substance List*.
- (b) Each employer shall provide a *copy of the Hazardous Substance List* to the *Fire Chief*. The employer shall *notify the Fire Chief in writing* of any updates that occur in the previously submitted *Hazardous Substance List* as provided in G.S. 95-191(b).
- (c) The *Fire Chief* or his representative, upon request, shall be permitted on-site *inspections* at reasonable times of the chemicals located at the facility on the *Hazardous Substance List* for the sole purpose of preplanning *Fire Department* activities in the case of an emergency and insuring by *inspection* the usefulness and accuracy of the *Hazardous Substance List and labels*.

- (d) Employers shall provide to the *Fire Chief, upon written request of the Fire Chief, a copy of the SDS* for any chemical on the *Hazardous Substance List*.
- (e) Upon *written request of the Fire Chief*, an employer shall prepare an *emergency response plan* for the facility that includes *facility evacuation procedures*, a *list of emergency equipment* available at the facility, and *copies of other emergency response plans*, such as the *contingency plan* required under rules governing the management of hazardous waste adopted pursuant to [Article 9 of Chapter 130A of the General Statutes](#). A *copy of the emergency response plan* or any *prefire plan* or *emergency response plan* required under applicable North Carolina or federal *statute or rule or regulation* shall, upon *written request by the Fire Chief*, be given to the *Fire Chief*.
- (f) The *Fire Chief* shall make *information* from the *Hazardous Substance List*, the *emergency response plan*, and *SDSs* available to members of the *Fire Department* having jurisdiction over the facility and to personnel responsible for preplanning emergency response, police, medical or fire activities, but shall not otherwise distribute or disclose (or allow the disclosure of) *information* not available to the public under G.S. 95-208. Such persons receiving such *information* shall not disclose the *information* received and shall use such *information* only for the purpose of preplanning emergency response, police, medical or fire activities.
- (g) Any knowing distribution or disclosure (or permitted disclosure) of any *information* referred to in subsection (f) of this section in any manner except as specifically permitted under that subsection (f) shall be punishable as a Class 1 misdemeanor. Restrictions concerning confidentiality or nondisclosure of information under this Article 18 shall be exemptions from the [Public Records Act contained in Chapter 132 of the General Statutes](#), and such *information* shall not be disclosed notwithstanding the provisions of *Chapter 132 of the General Statutes*.

§ 95-195. Complaints, investigations, penalties.

- (a) *Complaints* of violations of this Part shall be *filed in writing* with the Commissioner of Labor. Such complaints received *in writing from any Fire Chief* relating to alleged violations of this Part shall be *investigated* in a timely manner by the *Commissioner of Labor* or his designated representative.
- (b) Duly designated representatives of the *Commissioner of Labor*, upon presentation of appropriate *credentials* to the employer, shall have the right of entry into any facility at reasonable times to *inspect and investigate complaints* within reasonable limits, and in a reasonable manner. Following the investigation, the *Commissioner* shall make appropriate findings. Either the employer or the person complaining of a violation may request an *administrative hearing* pursuant to *Chapter 150B of the General Statutes*. This request for an administrative hearing shall be submitted to the *Commissioner of Labor* within 14 days following the *Commissioner* making his findings. The *Commissioner* shall within 30 days of receiving the request hold an *administrative hearing* in accordance with [Article 3 of Chapter 150B of the General Statutes](#).

- (c) If the *Commissioner of Labor* finds that the employer violated this Article, the *Commissioner* shall order the employer to comply within 14 days following *receipt of written notification* of the violation. Employers not complying within 14 days following *receipt of written notification* of a violation shall be subject to civil penalties of not more than one thousand dollars (\$1,000) per violation imposed by the *Commissioner of Labor*. There shall be a separate offense for each day the violation continues. The clear proceeds of civil penalties provided for in this section shall be remitted to the Civil Penalty and Forfeiture Fund in accordance with [G.S. 115C-457.2](#).
- (d) Any order by the *Commissioner* under subsection (b) or (c) of this section shall be subject to judicial review as provided under [Article 4 of Chapter 150B of the General Statutes](#).

§ 95-196. Employee rights.

- No employer shall discharge, or cause to be discharged, or otherwise discipline or in any manner discriminate against an employee at the facility because the employee has assisted the *Commissioner of Labor* or his representative or the *Fire Chief* or his representative who may make or is making an *inspection* under [G.S. 95-194\(c\)](#) or [G.S. 95-195\(b\)](#), or has *testified or is about to testify* in any proceeding under this Article, or has used the provisions of [G.S. 95-208](#).

§ 95-197. Withholding hazardous substance trade secret *information*. [Reference [95-197, paragraph \(a\) - \(d\)](#)].

§ 95-198. Medical emergency and nonemergency situations.

- (a) Where a treating *health care provider determines* that a medical emergency exists and the specific chemical identity of a hazardous chemical is necessary for emergency or first-aid treatment, the *chemical manufacturer, importer, or employer* shall immediately disclose the specific chemical identity of a hazardous substance trade secret substance to that treating physician or nurse, regardless of the existence of *written statement of need* or a *confidentiality agreement*. The *chemical manufacturer, importer, or employer* may require a *written statement of need* and a *confidentiality agreement* as soon as circumstances permit.
  - The *confidentiality agreement* (i) may restrict the use of the *information* to the health purposes indicated in a *written statement of need*; (ii) may provide for appropriate legal remedies in the event of a breach of the *agreement*, including stipulation of a reasonable pre-estimate of likely damages; and (iii) may not include requirements for the *posting* of a penalty bond. The parties are not precluded from pursuing noncontractual remedies to the extent permitted by law.
- (b) In nonemergency situations, a *chemical manufacturer, importer, or employer* shall, upon request, disclose a specific chemical identity, otherwise permitted to be

withheld under this section, to a responsible party, as defined in the standards adopted in Title 13, Subchapter 7F of the [North Carolina Administrative Code \(13 NCAC 7F\)](#), providing medical or other occupational health services to exposed persons if the request is *in writing* and states the medical need for the *information*. The employer may require that the responsible party sign a *confidentiality agreement* prior to release of the *information*. The parties are not precluded from pursuing noncontractual remedies to the extent permitted by law.

- (c) If the *chemical manufacturer, importer* or employer denies a *written request for hazardous substance trade secret release*, or does not provide this *information* within 30 days, the Department of Labor shall initiate the *trade secret claim determination* process under G.S. 95-197.

§ 95-208. *Community information* on hazardous chemicals.[Reference 95-208, [paragraph \(a\) - \(b\)](#)].

§ 95-217. Preemption of *local regulations*. [Reference [95-217](#)].

## **13 NCAC 7A .0600 through .0606 - [Safety and Health Programs and Committees](#)**

[13 NCAC 7A .0600 through .0606](#) - Safety and Health Programs and Committees establishes programs which promote safety and health for all North Carolina employers with a workers' compensation experience rate modifier of 1.5 or above.

To learn if 13 NCAC 7A .0600 through .0606 applies to you, go to [Does "Safety and Health Programs and Committees" Apply to You?](#)

### **Special Requirements**

#### **13 NCAC 07A .0603 - Safety and Health Programs**

**Scope:** This [standard](#) provides requirements for safety and health programs.

**Special Requirements:** Safety and health programs, committee, participation, communicated, corrective action, controls, investigated, record, compliance plans, inspected, affected employees, safety committee, checklist (written), investigation, self-audit, safe work practices, marked, enforced, analyze, rules, informed, safety data sheets, statement, written findings, measured, written program, copy, retained, references other standards



(a) All *Safety and Health* programs established under [G.S. 95-251](#) for both fixed locations and non-fixed locations shall meet or exceed the requirements of [G.S. 95-251\(b\)\(1\)-\(9\)](#).

(b) The *written program* shall also include:

- (1) The manner in which managers, supervisors, and employees are responsible for implementing the *program* and how the continued *participation* of management will be established, *measured*, and maintained including specifically what the leadership role of the top employer official at the worksite shall be in regard to the *program*.
- (2) The manner in which the *plan* will be communicated to all *affected employees* so that they are *informed* of work-related hazards and *controls*.
- (3) The manner in which *safe work practices and rules* will be enforced.
- (4) The manner in which workplace accidents will be *investigated and corrective action* implemented. The employer shall keep a *comprehensive record* of accident *investigations*, findings, and corresponding *corrective action taken*.
- (5) The manner in which near-miss incidents will be *investigated*. Special emphasis will be placed on identifying all contributing factors to any near-miss incident. The employer shall keep a *comprehensive record* of each such incident and the findings relating to it, and shall keep a *record* of all corresponding *corrective action taken*.
- (6) The *methods* used to identify, *analyze* and control new or existing hazards, conditions and operations, and the manner in which changes will be incorporated into the *safety program, safety committee checklist, and communicated* to all *affected employees*.
- (7) *Written compliance plans* as required by either the *Mine Safety laws or OSHA standards*, whichever is applicable to the employer. *Written compliance plans* shall include, the following *OSHA standards*, when applicable: Excavations, Hazard Communication, Occupational Noise Exposure, Control of Hazardous Energy Sources (Lockout/Tagout), Respiratory Protection, Process Safety Management of Highly Hazardous Chemicals, Bloodborne Pathogens, Life Safety Code, Cotton Dust, and Confined Spaces.
- (8) A *written checklist* of all potential hazards to be *inspected* during the *quarterly inspections* required pursuant to [G.S. 95-252\(c\)\(4\)d](#), if applicable, including, but not limited to, checking for properly *marked* doors (including exit doors and doors not leading to an exit); properly working fire extinguishers; unlisted hazardous substances, improperly located hazardous substances, or hazardous substances for which there are no *material safety data sheets*; doorways or exit pathways that are cluttered; improperly grounded equipment and exposed live wiring and parts; and unguarded machinery. Each item on the aforementioned *written checklist* shall be *checked* during the quarterly *inspections* and a *copy of the list* shall be *retained* by the employer for not less than two years. All conditions or items deemed to be out of compliance shall be immediately abated, unless circumstances beyond the control of the employer requires a longer period of time.

- (9) The employer shall conduct an *annual self-audit* of all required *safety and health programs*. *Written findings and a statement* of remedial actions taken shall be retained for not less than two years. Companies with less than 11 employees that are not required to have *safety and health committees* shall appoint a company safety officer to conduct the *annual self-audit*.
- (10) The purpose and operation of the *Safety and Health Committee* where such *committee* exists.
- (11) The *methods* used to *communicate* requirements of the *program* to other employers or subcontractors and their employees who may be present at the same site.

### 13 NCAC 07A .0604 - Selection of Safety Committees

**Scope:** This [standard](#) provides the requirements for safety and health committees.

**Special Requirements:** Safety and health committees, determined, certified collective bargaining agent, nomination, ballots, employee meeting, statute, written documentation, processes, retain, collective bargaining process, election process, approved methods, references other standards

(a) An employer may elect to implement any one of the following selection processes as a means of meeting the requirements for selection of representatives to employee *Safety and Health committees* pursuant to [G.S. 95-252\(d\)](#). The employer shall *retain written documentation* outlining any utilized *selection process*. An employer whose employees are represented by a *collective bargaining* representative must utilize either subsection 8, 9, or 10 for *committee* selection purposes. Any non-management employees who choose not to participate in the *collective bargaining process* are still considered to be represented by the *collective bargaining* representative for purposes of this Rule for *committee* selection purposes.

- (1) The employer may devise and implement any means of employee selection so long as: (A) the employee representatives are selected "by and from among the employer's nonmanagement employees" as specified in the *statute*, (B) minimum numbers are met, and (C) the intent of the statute is satisfied.
- (2) The employer may require that all non-management employees serve on a *Safety and Health Committee*. In the instance of a small employer, there may be one committee comprised of all nonmanagement employees which serves the entire organization. In a larger organization, there may be *several committees*, each addressing one or more of the responsibilities of the *safety committee* as outlined in [G.S. 95-252](#), with employees divided among the *committees*.
- (3) The employer may conduct an election at either a *meeting* or through the distribution of *ballots*. The *election process* shall provide for the *nomination* by non-management employees (including self-nominations) of non-management employees in the numbers specified by the employer, but shall not be less than one

nor more than the number of non-management members specified by *statute*. The number of non-management employees specified by *statute* receiving the most *nominations* shall serve on the *Safety and Health Committee*.

- (4) The employer may conduct an *employee meeting* at which open nominations are held and secret *ballots* are used to elect employee representatives. The meeting may be for all non-management employees or by working unit.
- (5) The employer may conduct an employee meeting at which non-management employees nominate one peer by *listing* that employee's name on a *ballot*. The *ballots* shall be tallied and the appropriate number of representatives, in the numbers required by *statute*, shall be *determined* by those employees named on the most *ballots*.
- (6) The employer may solicit *nominations* from all non-management employees for employee representatives to serve on the committee, then select representatives by lottery from among those *nominated* to obtain the statutorily appropriate number of employee representatives for the *safety and health committee*.
- (7) The employer may solicit volunteers and nominations from among the non-management employees for a pool of applicants to serve as employee representatives on the *safety committee*. (If no volunteers or nominations are received, the employer shall require that nominations be submitted from a cross section of employee work units within the establishment.) The members of the *applicant pool* shall select from among its ranks the initial employee representatives necessary to meet minimum numbers as specified in the *statute*.
- (8) Employees shall be selected to serve on a *safety and health committee(s)* in accordance with any contract that exists between a *collective bargaining* unit and the employer. Should the contract not otherwise specify selection of a *safety and health committee*, non-management members shall be selected in a manner approved by the *certified collective bargaining agent*.
- (9) Employers having more than one *collective bargaining unit* shall devise and implement a means of employee selection utilizing the provisions of the existing contracts or *methods approved* by the *certified collective bargaining agents*. *Safety committee* members shall be selected in proportionate numbers to the number of employees represented by the *certified collective bargaining agents*.
- (10) Employers having some non-management employees represented by a *collective bargaining agent or agents* and some not represented shall devise a means that utilizes language in the contract or *methods approved* by the *certified collective bargaining agent(s)* for selection of bargaining unit representatives, and one or more of the above means for selecting non-management employee members not represented by the bargaining agent(s). *Safety committee* members shall be selected in proportion to the number of employees represented by the *certified collective bargaining agent(s)* and the number of employees not represented.

## 13 NCAC 07A .0605 - Safety and Health Committee Requirements

**Scope:** This [standard](#) provides the requirements for safety committees.

**Special Requirements:** Safety and health committee, notify(ing), chairperson, general contractor, distribute information, meetings, designate, legislation, references other standards

(a) Multi-Site Employers:

- (1) Employers with 11 or more employees who do not report to a fixed or regular location worksite are required to have a *Safety and Health Committee* to represent those employees. The employer must have a separate *Safety and Health Committee* for each mobile work crew consisting of 11 or more employees.
- (2) Employers with employees who report to a fixed or regular location worksite must have a separate *safety and health committee* for each location with 11 or more employees.
  - (b) Multi-Employer Worksites: (1) At multi-employer fixed or regular location worksites, any employer required to establish a *Safety and Health Committee pursuant to G.S. 95-252* shall *notify* the *general contractor* or equivalent of the requirements of this *legislation and of the chairpersons* of their *committee*. (2) The *general contractor* or equivalent shall *designate* a representative to attend the *Safety and Health Committee meetings* of the *notifying* employer(s). (3) The *notifying* employer shall work with the *general contractor* or equivalent to distribute information as required by [G.S. 95-251\(b\)\(9\)](#).

## 13 NCAC 07A .0606 - Training and Education

**Scope:** This [standard](#) provides the requirements for training and education.

**Special Requirements:** Safety and health committee, training, affected employees, frequently cited violations, education, committee's duties, accident investigation, recordkeeping, procedures, system, PPE, hazard identification, safety and health programs, work practice, references other standards

(a) All *safety and health committee* members shall receive *training and education* based on the type of business activity in which the employer is involved and the scope of the *committee's duties*. At a minimum, employers shall provide *training* regarding the following: [Reference [paragraph \(a\)\(1\) - \(6\)](#)].

- (2) Principles regarding effective accident and incident *investigations*.
- (3) Employee and employer rights and responsibilities under the *Safety and Health Programs and Committees Act (G.S. 95-250 et al.)* and the *Mine Safety laws* or *OSHANC*.
- (4) *Recordkeeping* requirements of the *North Carolina Workers' Compensation Act (G.S. 97-1 et seq.)* and the *Mine Safety laws* or *OSHANC*. (5) The most common causes of on-the-job accidents.

- (6) The most *frequently cited violations* of either the *Mine Safety laws* or *OSHA*.

(b) There shall also be established for employees whether or not a *safety and health committee* is required:

- (1) A *system for training and education* of all employees in occupational safety and health hazards at the worksite. The *system* shall contain specific requirements that new employees not be allowed to begin work, except when participating in *carefully supervised on-the-job training*, until thoroughly *trained* in the safe use of all applicable equipment and substances, and *procedures* relating to their workplace environment.
- (2) A *system of training and education* for any existing employee given a new work assignment.
- (3) A *system of training and education* for all *affected employees* when a new substance, process, *procedure* or piece of equipment is introduced into the workplace and presents a new hazard to safety or health.
- (4) A *system of training and education* for all *affected employees* when any new *personal protective equipment* or different *work practice* is used on existing hazards.
- (5) *Training* to comply with all applicable *OSHA employee training* requirements, including, but not limited within General Industry to Means of Egress; Powered Platforms, Manlifts, and Vehicle- Mounted Work Platforms; Occupational Health and Environmental Control; Hazardous Materials; Personal Protective Equipment; General Environmental Controls; Medical and First Aid; Fire Protection; Materials Handling and Storage; Machinery and Machine Guarding; Welding, Cutting and Brazing; Special Industries; Electrical; Commercial Diving Operations; Toxic and Hazardous Substances, and Occupational Exposure to Hazardous Chemicals in Laboratories; including, but not limited within the Construction Industry to General Safety and Health Provisions; Occupational Health and Environmental Controls; Personal Protective and Life Saving Equipment; Fire Protection and Prevention; Signs, Signals, and Barricades; Tools - Hand and Power; Welding and Cutting; Electrical; Ladders and Scaffolding; Cranes, Derricks, Hoists, Elevators and Conveyors; Motor Vehicles, Mechanized Equipment, and Marine Operations; Excavations; Concrete and Masonry Construction; Underground Construction, Caissons, Cofferdams and Compressed Air; Demolitions; Blasting and Use of Explosives; Power Transmission Distribution; Stairways and Ladders; including, but not limited within Agriculture to Roll-Over Protective Structures, and Safety for Agricultural Equipment; and including, but not limited to the Process Safety Management Standard, the Confined Spaces Standard, Hazard Communication Standard, and the Bloodborne Pathogens Standard.

(c) The required *safety and health training* shall be provided by someone trained to recognize, evaluate and control safety and health hazards. The *training* may be provided on-site or off-site.

## 13 NCAC 07F .0103 - [Hazardous Materials](#)

13 NCAC 07F .0103 - [Hazardous Materials](#) adds a new level of training to the standard on hazardous waste operations and emergency response for individuals who respond to hydrocarbon fuel leaks; "first responder operations plus level".

To learn if 13 NCAC 07F .0103 applies to you, go to [Does "Hazardous Materials" Apply to You?](#)

### Special Requirements

#### 13 NCAC 07F .0103 - Hazardous Materials

**Scope:** This [standard](#) applies to hazardous waste operations and emergency response for individuals who respond to hydrocarbon fuel leaks.

**Special Requirements:** First responders, training, certify, demonstrates competency, risk assessment techniques, decontamination procedures, PPE, references other standards

Subpart H - Hazardous Materials, [29 CFR 1910.120](#), *Hazardous waste operations and emergency response*, [1910.120\(q\)\(6\)](#) is amended by adding a new level of *training*:

"(vi) *First responder operations plus level. First responders* at operations plus level are individuals who respond to hydrocarbon fuel tank leaks where the leaking tanks contain a hydrocarbon fuel which is used to propel the vehicle on which the tank is located. Only those vehicles designed for highway use or those used for industrial, agricultural or construction purposes are covered. *First responders* at the operations plus level shall have received at least *training* equal to first responder operations level and, in addition, shall receive *training* or have had sufficient experience to objectively *demonstrate competency* in the following areas and the employer shall so *certify*:

- (a) Know how to select and use proper specialized *personal protective equipment* provided to the first responder at operations plus level;
- (b) *Understand* basic hazardous materials terms as they pertain to hydrocarbon fuels;
- (c) Understand hazard and *risk assessment techniques* that pertain to gasoline, diesel fuel, propane and other hydrocarbon fuels;
- (d) Be able to perform control, containment, or confinement operations for gasoline, diesel fuel, propane and other hydrocarbon fuels within the capabilities of the available resources and *personal protective equipment*; and
- (e) *Understand* and know how to implement *decontamination procedures* for hydrocarbon fuels."



## 13 NCAC 07F .0600 through .0609 - [Communication Tower Standards](#)

[13 NCAC 07F .0600 through .0609](#) - Communication Tower Standards provides requirements for policies, procedures, and safe work practices to protect employees throughout North Carolina from the hazards of working on communication towers during construction, alteration, repair, operation, inspection, and maintenance activities.

To learn if 13 NCAC 07F .0600 through .0609 applies to you, go to [Does the "Communication Tower Standards" Apply to You?](#)

### Special Requirements

#### 13 NCAC 07F .0603 - Employer Responsibilities

**Scope:** This [standard](#) provides the requirements pertaining to employer responsibilities.

**Special Requirements:** Competent person, inspect, references other standards

(a) The employer shall require employees to adhere to acceptable conditions for access, as defined by [13 NCAC 07F .0602\(1\)](#) - *definitions*, prior to climbing the tower at heights above six feet.

(b) The employer shall ensure that at least two employees, including at least one *competent person*, are on site at all times when employees are exposed to fall hazards above six feet, provided however, an employer shall not be required to have more than two employees on site at any given time.

(c) A *competent person* shall visually *inspect* the tower base for damage, deterioration, structural deficiencies and functionality of safety features and anchorages before employees are allowed to climb the tower at heights above six feet. Additionally, the employer shall ensure that the tower is *visually inspected* for these items, as it is ascended, to the elevation point where work is being performed.

#### 13 NCAC 07F .0604 - Hazard Identification and Assessment

**Scope:** This [standard](#) provides for hazard identification and assessment.

**Special Requirements:** Hazard assessment, identify meteorological conditions, inspections, competent person, controls, evaluate, assess, document, information, rule, PPE, references other standards

(a) In addition to the *inspections* required by [13 NCAC 07F .0603\(c\)](#) - *employer responsibilities*, and [13 NCAC 07F .0605\(b\)](#) - *fall protection*, the employer shall conduct a *hazard assessment* to identify, assess, and control employee exposure to hazards as required by the rules in this Section and any other applicable *state or federal statutes, rules or regulations*.

(b) The employer shall perform and *document the hazard assessments* required by this *Rule*:

- (1) Initially and daily for each site prior to permitting employees to climb the structure; and
- (2) When *safety and health information* or change in workplace conditions indicates that a new or increased hazard may be present.

(c) The *hazard assessments* required by this *Rule* shall:

- (1) Be performed by a *competent person*;
- (2) *Evaluate* new equipment, materials, and processes for hazards before they are introduced into the workplace; and
- (3) *Identify meteorological conditions* that could affect work at heights above six feet on a tower, such as wind, rain, snow or ice.

(d) If hazards are *identified*, the employer shall *assess* the severity of identified hazards and implement means to *control* such hazards, including providing employees with *personal protective equipment (PPE)* designed to control the identified hazards and ensuring the proper use of the *PPE* by the employees.

## 13 NCAC 07F .0605 - Fall Protection

**Scope:** This [standard](#) provides the fall protection requirements.

**Special Requirements:** Fall protection systems, inspection, rescue team, verify, rescue plans, competency, simulated rescue operations, communicate (documented), available, tested, alternative means, inspect, competent person, planning, documentation, documented, fall protection equipment, trained, procedures (documented), designate, qualified climber, demonstrate, fall protection plan, PFAS, manufacturer's recommendations, American Red Cross, first aid/CPR certification, first aid supplies, training, references other standards

(a) General. Prior to employees climbing the tower at heights above six feet, the employer shall ensure that *100% fall protection systems* compatible with the tasks assigned are provided, used, and maintained. The *rules* in this Section shall not require the retrofitting of communication towers; provided, that employees who are exposed to fall hazards above

six feet while performing work on communication towers are protected from such hazards by means of a *100% fall protection system*.

*(b) Pre-Climb Planning and Inspection.* In addition to the criteria for *pre-climb planning and inspection* included in Paragraph (g) of this *Rule*, the employer shall ensure that the following items occur prior to employees climbing the tower at heights above six (6) feet:

- (1) All climbing jobs shall be *planned by a competent person*;
- (2) All climbing facilities shall be *visually inspected daily* at the tower base by a *competent person* for rust, corrosion, deterioration, or other hazards. Additionally, the employer shall ensure that the climbing facilities are *visually inspected* for these items, as it is ascended, to the elevation point where work is being performed. If any such hazard is identified during this *inspection*, employees shall not use the climbing facility until such hazards are abated;
- (3) A *competent person* shall ensure that all *fall protection equipment is inspected prior to each use* for wear, damage, defect or other deterioration by employees who have been trained in accordance with [13 NCAC 07F.0609 - training](#). Defective equipment shall be identified as defective and immediately removed from service;
- (4) Components of a fall protection system and the *fall protection equipment* utilized by employees shall be compatible with one another and shall be utilized in accordance with the *manufacturer's recommendations*; and
- (5) The employer shall ensure that the *planning and inspections* are performed and *documented*. The *documentation* shall be *maintained* on site while work is being performed, and thereafter by the employer at its place of business. The *documentation* shall include the date of the *planning and inspection*, the name of the *competent person* performing the *planning and inspection*, and the site location.

*(c) Fall Protection Systems.* In order to comply with the requirements of Subparagraph (a)(1) of this *Rule*, the employer may permit employees to utilize the *100% fall protection systems* described in Paragraphs (d) through (g) of this *Rule*. If the *fall protection systems* described therein are not present on the tower, the employer shall not permit employees to climb the tower at heights above six feet unless:

- (1) an *alternative means of 100% fall protection* is utilized that is at least as effective as the *fall protection systems* described in Paragraphs (d) through (g) of this *Rule*;
- (2) an *alternative means* of access to the work area is utilized such as an aerial lift or elevated work platform; or
- (3) the employer can *demonstrate* that the requirements for a fall protection plan under Paragraph (i) of this *Rule* have been met.

*(d) Guardrail Systems.* The employer shall ensure that guard rail systems and their components that are utilized by employees as a means of *100% fall protection* conform to the criteria in [29 CFR 1926.502\(b\)](#) - *fall protection systems and criteria*

(e) *Personal Fall Arrest Systems (PFAS)*. The employer shall ensure that personal fall arrest systems and their components that are utilized by employees as a means of *100% fall protection* conform to the criteria in [29 CFR 1926.502\(d\)](#) - *fall protection systems and criteria*, and are utilized according to the manufacturer's recommendations. When utilized by employees as an anchorage as part of a *PFAS*, the employer shall ensure that step bolts and the attachment point to the structure are designed to meet the requirements of an approved anchorage in accordance with [29 CFR 1926.502\(d\)](#), and are designed to ensure the connector will not slip off the end of the step bolt.

(f) *Positioning Device System*. The employer shall ensure that *positioning device systems* and their components that are utilized by employees as a means of *100% fall protection* conform to the criteria in [29 CFR 1926.502\(e\)](#).

(g) *Ladder Safety Systems*. The employer shall ensure that, in addition to the applicable criteria in 29 CFR 1926, [Subpart X](#) - *stairways and ladders, ladder safety systems* and related support systems for fixed ladders that are utilized by employees as a means of *100% fall protection* conform to the following criteria: [Reference [paragraph \(g\)\(1\) - \(3\)](#)].

(h) *Fall Protection Plan*. This Paragraph applies when employees are working on a structure where no adequate tie-off anchorage point(s) exist, the *fall protection systems* described in Paragraph (c) of this *Rule* are not feasible or create a greater hazard, and the work can not be completed utilizing an *alternative means* of access to the work area such as an aerial lift or elevated work platform. If an employer *demonstrates* the foregoing conditions are present, then in addition to the criteria in [29 CFR 1926.502\(k\)](#), the employer shall conform to the following provisions:

- (1) The employer shall ensure that each employee under the *fall protection plan* has been *trained as a qualified climber*;
- (2) The *fall protection plan* shall be made *available and communicated* to exposed employee(s) prior to the employee(s) beginning work, and such *communication* shall be *documented*; and
- (3) The *fall protection plan* shall identify each location on the tower structure where *fall protection methods* as described in Paragraph (c) of this *Rule* cannot be used. As soon as adequate tie-off anchorage points or other *fall protection systems* can be established, the employer shall utilize any of the *fall protection systems* described in Paragraph (c) of this *Rule*.

(i) *Emergency and Rescue Procedures*. [Reference [paragraph \(i\)\(1\) - \(3\)](#)].

(j) *First Aid/CPR Training and Supplies*. In addition to the requirements of [29 CFR 1910.151](#) - *medical services and first aid*, and [29 CFR 1926.50](#) - *medical services and first aid*, the employer shall ensure that at least two employees on site are *trained* and hold current *certifications* in basic *first aid and cardiopulmonary resuscitation (CPR)* issued by the *American Red Cross* or any other organization whose standards are equivalent to

the *American Red Cross*; provided, however, where there are only two employees on site, then an employer may comply with the requirements of this Paragraph if one employee is *trained* and holds current *certifications* in basic *first aid and CPR* and one employee has been *designated* by the employer as a probationary employee and has been employed for less than six months.

## 13 NCAC 07F .0606 - Nonionizing Radiation

**Scope:** This [standard](#) provides the requirements pertaining to nonionizing radiation.

**Special Requirements:** Federal Communications Commission (FCC), engineering controls, administrative controls, tagged out, locked out, LOTO devices, method, notified, checked, competent person, written control procedures, exposure, assess, exposure levels, written safety and health program, RF Safety Program, post temporary signage, RF protective clothing, PPE, references other standards

(a) General. Employers shall ensure that employees performing work on communication towers are not exposed to Radio Frequency (RF) Electromagnetic Fields in excess of the *Federal Communications Commission (FCC)* maximum permissible exposure (MPE) limits for *exposure* as prescribed in 47 CFR 1.1310.

(b) Protection from Radiation *Exposure*.

- (1) Employees shall not enter areas where *RF exposure levels* are above the general population/uncontrolled MPE's described in 47 CFR 1.1310 unless they understand the potential for exposure and can exercise control over the *exposure*.
- (2) *Control Procedures*. Prior to employees performing work in areas on a communication tower where *RF exposure levels* exceed the occupational/controlled MPE values stated in 47 CFR 1.1310, the employer shall enact and enforce *written control procedures* that provide for the reduction, elimination, avoidance or protection from such RF levels. These *written control procedures* shall include the following:
  - (A) Reducing the transmitter power to a level that ensures *RF exposure levels* in areas where employees are working do not exceed the occupational/controlled MPE values stated in 47 CFR 1.1310, and that the transmitter power level is not increased until all employees have ceased working in those areas. If this method is chosen, the transmitter power shall be *locked out and tagged out* at the reduced level by a *competent person* in accordance with [29 CFR 1910.147](#) - *the control of hazardous energy*. Prior to removing *lock out/tag out devices* and restoring the original transmitter power level, all employees shall be *notified* and the work area shall be *checked* to ensure that all employees have been safely positioned and removed;

- (B) If the transmitter power level in areas where employees are working cannot be reduced and maintained at a level that ensures RF exposure levels do not exceed the occupational/controlled MPE values stated in 47 CFR 1.1310, the transmitter power shall be *locked out and tagged out by a competent person* in accordance with [29 CFR 1910.147](#) - *the control of hazardous energy*. Prior to removing lock out/tag out devices and restoring the transmitter power level, all employees shall be *notified* and the work area shall be *checked* to ensure that all employees have been safely positioned and removed;
- (C) If the transmitter power level can not be reduced or eliminated, an employer may permit its employees to access areas where the occupational/controlled MPE values stated in 47 CFR 1.1310 are exceeded if it implements *engineering or administrative controls* that comply with the *FCC's regulations* concerning such *exposure*, including limiting the duration of the exposure and utilizing monitoring equipment, *RF protective clothing* and other related *PPE*; or
- (D) If an employer cannot ensure that the conditions in Parts (A), (B) or (C), of this Subparagraph, are met, employees shall not be permitted to access areas where *RF exposure levels* exceed the occupational/controlled MPE values stated in 47 CFR 1.1310.

(c) *Use of Controls*. Prior to commencing work on a communication tower, a *competent person* shall assess potential RF hazards of areas which may be accessed by employees in the course of their work, and *post temporary signage* to indicate areas where the RF hazard exceeds the general population/uncontrolled MPE limits for exposure set forth in 47 CFR 1.1310. *Temporary signage* shall remain in place while work is performed and the hazard exists.

(d) *RF Safety Program*. When employees are exposed to RF fields in excess of the general population/uncontrolled MPE limits established in 47 CFR 1.1310 as a consequence of their employment, the employer shall develop, implement, and maintain a *written safety and health program* with site specific *procedures* and elements based on the electromagnetic radiation hazards present, in accordance with [13 NCAC 07F .0609\(g\)](#) - *training*.

## 13 NCAC 07F .0607 - Hoists and Gin Poles

**Scope:** This [standard](#) provides the requirements for hoists and gin poles.

**Special Requirements:** Marked, inspection (documented), testing, design, competent person, qualified person, maintenance, manufacturer, licensed professional engineer, documentation, training certification, operating manual, gin pole load chart, manufacturer specifications, stamped, monitoring, load limits, documentation, references other standards



(a) Hoists. Hoists used during the construction, alteration, repair, maintenance, or demolition of communication towers shall meet the following requirements:

[Reference [paragraph \(a\)\(1\) - \(4\)](#)].

- (1) All hoists shall meet the requirements set forth in this rule, 29 CFR 1910, [Subpart N - materials handling and storage](#), and 29 CFR 1926, [Subpart N - helicopters, hoists, elevators, and conveyors](#), where applicable.
- (2) All hoists shall meet applicable requirements for *design*, construction, installation, *testing, inspection, maintenance*, and operation as prescribed by the manufacturer, or a *licensed professional engineer*.
- (3) Employers shall maintain at the work site the *operating manual* developed by the manufacturer for the specific make and model hoist being used, as well as *documentation* for any *inspection, testing, and operator training certification* required by the rules in this Section,

(b) Gin Poles.

- (1) Rigging Equipment. [Reference [paragraph \(b\)\(1\)\(A\) - \(E\)](#)].
  - (A) Wire rope, slings, chains, shackles, turnbuckles, links, hooks, sheaves, rotating rooster heads, blocks, and hoists, used in a gin pole lifting arrangement shall meet the *manufacturer's safe working load limits*. In addition, each component shall have a nominal breaking strength of no less than five times the static load applied. Consideration for end fitting losses and actual positioning of connecting parts shall be given;
  - (B) Lugs or other devices for lifting or attaching the gin pole in position shall be *designed* with load and resistance factors appropriate for their intended use;
  - (C) Only alloy chains *marked* by the manufacturer with an 8, *T*, or an *A*, *rated* for lifting, shall be used;
  - (D) Only quenched and tempered hooks and shackles shall be used. The *manufacturer's load rating* shall be stamped on the product; and
- (2) Gin Pole Use.
  - (A) A user's *gin pole load chart* shall be provided for each pole; [Reference [paragraph \(b\)\(2\)\(A\) - \(D\)](#)].
  - (B) Any special engineered pick, which is outside of the *load chart*, shall only be allowed at the direction of a *licensed professional engineer*. *Monitoring* and measuring conditions, as specified by a *licensed professional engineer*, shall be provided and used during all special engineered picks;
  - (C) Modifications or repairs of a gin pole shall be made with like or similar materials to meet or exceed the original *specifications*. Modifications or repairs shall be *recertified* by a *licensed professional engineer*; and
- (3) Wire Rope. Wire rope used for rigging shall be as follows: [Reference [paragraph \(b\)\(3\)\(A\) - \(E\)](#)].

- (B) Lubricated in accordance to *manufacturer specifications* to prevent corrosion and wear;
- (C) End connections shall be terminated per industry and *manufacturer's specifications*;
- (4) *Inspections*.
  - (A) Gin poles shall have a *documented inspection annually by a qualified person*;
  - (B) In addition to the *annual inspection*, the employer shall *designate a competent person* who shall *visually inspect* the gin pole and rigging *prior to each use, and during use*, to make sure it is in safe operating condition. Any deficiencies shall be repaired before use continues;
  - (C) During each *inspection*, the *qualified or competent person* shall *inspect* the legs and bracing members for bends or distortion;
  - (D) During each *inspection*, the *qualified or competent person* shall *inspect* the straightness tolerances for the overall assembly (including leg and bracing members);
  - (E) During each *inspection*, the *qualified or competent person* shall *visually inspect* the welds for quality, deformation, cracks, rust, or pitting or loss of cross sectional area;
  - (F) During each *inspection*, the *qualified or competent person* shall *inspect* the members for excessive rust or pitting or loss of cross sectional area;
  - (G) During each *inspection*, the *qualified or competent person* shall *inspect* the sling attachment points for distortion, wear, cracks, and rust;
  - (H) During each *inspection*, the *qualified or competent person* shall ensure that proper bolts are utilized and all associated hardware is in good condition;
  - (I) During each *inspection*, the *qualified or competent person* shall *inspect* side plates on rooster heads for distortion or other damage;
  - (J) During each *inspection*, the *qualified or competent person* shall *inspect* all attachment hardware, including rigging and parts such as cables, slings, and sling attachment points, shackles, hooks, and sockets for wear, distortion, cracks, and rust; and
  - (K) During each *inspection*, the *qualified or competent person* shall ensure that all problems identified during the *inspection* are corrected before placing the gin pole into service.

## 13 NCAC 07F .0608 – Recordkeeping

**Scope:** This [standard](#) provides the requirements for recordkeeping.

**Special Requirements:** Records, tests, maintenance, calibration, analysis, material, program, references other standards

In order to fulfill responsibilities under the provisions of the *rules* in this Section, the employer shall, upon request, provide the *Deputy Commissioner of Labor* for Occupational Safety and Health or his designee access to the following *records*:

- (1) *Training Records*. All material related to the employer's *training and education program*, pursuant to [13 NCAC 07F .0609 - training](#).
- (2) *Medical Records and Non-Ionizing Radiation Exposure Records*. All medical records [in accordance to [29 CFR 1910.1020\(d\)\(1\)\(i\)](#) - access to employee exposure and medical records] and material related to each analysis using exposure or medical records (in accordance with [29 CFR 1910.1020\(d\)\(1\)\(iii\)](#)).
- (3) *Equipment Inspections and Testing Records*. All material related to the modification, repair, test, calibration or maintenance service of all equipment.

## 13 NCAC 07F .0609 – Training

**Scope:** This [standard](#) provides the training requirements.

**Special Requirements:** Approved, qualified person, training, retraining, training records, competency, written work procedures, manufacturers' operating manuals, operating procedures, instructed, fall protection training, inspecting, PPE, fall protection systems, materials, pictures, symbols, supervision, training program, instruction, references other standards

(a) In order for employees to work at heights above six feet on a communication tower, they must be *approved* for such work by a *qualified person*.

(b) *Competency of the Trainer*. Training of employees in communication tower work shall be performed by or under the *supervision of a qualified person*.

(c) *Written Work Procedures*.

- (1) The employer's *written work procedures* shall be provided to employees as part of their *training*.
- (2) *Pictures and symbols* may be used as a means of *instruction* if employee understanding is improved using this method.
- (3) *Manufacturers' operating manuals* for personnel hoisting systems satisfy the requirement for *operating procedures* for the respective equipment, or can serve as the basis for these *procedures*.

(d) *Hazardous Materials Training*. Employees required to handle or use flammable liquids, gases, or toxic materials shall be instructed in the safe handling and use of these materials and made aware of the specific requirements contained in [29 CFR 1926.55 - Gases, vapors, fumes, dusts, and mists](#), and [29 CFR 1910.1200 - hazard communication](#), as applicable.

(e) *Fall Protection Training.*

- (1) The employer shall provide a *training program* for each employee who might be exposed to fall hazards.
- (2) The *program* shall enable each employee to recognize the hazards of falling and shall *train* each employee in the *procedures* to be followed in order to minimize these hazards.
- (3) The employer shall ensure that each employee has been *trained* by or under the *supervision of a qualified person* in the following areas: [Reference [paragraph \(e\)\(3\)\(A\) - \(H\)](#)].

(f) *Hoist Operator Training.* The employer shall maintain *documentation* that the hoist operator has practical *training* on the hoist he is operating. *Training* of hoist operators shall meet the requirements of [29 CFR 1910.179](#) - overhead and gantry cranes, and 29 CFR 1926, [Subpart N](#) - helicopters, hoists, elevators, and conveyors.

(g) *RF Training.* [Reference [paragraph \(g\)\(1\) - \(2\)](#)].

(h) *Retraining.* Unless stated otherwise in this *Rule*, when the employer or *qualified person* has reason to believe that any employee who has already been *trained* does not have the understanding and skill required to safely perform the work assigned, the employer shall *retrain* each such employee. Circumstances where *retraining* is required include situations where: [Reference [paragraph \(h\)\(1\) - \(3\)](#)].

(i) *Training Records.* [Reference [paragraph \(i\)\(1\) - \(5\)](#)].

## 13 NCAC 07G .0101 - [Handling of Antineoplastic Agents](#)

[13 NCAC 07G .0101](#) - Handling of Antineoplastic Agents states that the recommendations contained in the NIOSH Alert on the handling of antineoplastic agents are incorporated by reference, including subsequent amendments and editions; applicable in North Carolina.

To learn if 13 NCAC 07G .0101 applies to you, go to [Does the "Handling of Antineoplastic Agents" Apply to You?](#)

## Special Requirements

### 13 NCAC 07G .0101 - Handling of Antineoplastic Agents

**Scope:** This [standard](#) applies to the handling of antineoplastic agents.

**Special Requirements:** Recommendations, NIOSH Alert, references other standards

(a) The following *recommendations* with respect to the handling of antineoplastic agents are *incorporated by reference*, including subsequent amendments and editions: The *recommendations* issued by the *National Institute for Occupational Safety and Health (NIOSH)* of the *Centers for Disease Control and Prevention (CDC)*, as contained in the *Alert: Preventing Occupational Exposure to Antineoplastic and Other Hazardous Drugs in Health Care Settings*, as published in 2004. Copies of the 2004 NIOSH Alert and subsequent amendments may be accessed at no charge at <http://www.cdc.gov/niosh/docs/2004-165/>. (b) For enforcement purposes, nothing in this Rule is intended to supersede *federal regulations* adopted and enforced by the *North Carolina Department of Labor* or *state-specific rules codified in the North Carolina Administrative Code*. (c) Where the *NIOSH recommendations* are inconsistent with *State or federal laws, regulations, or rules*, compliance with the *State or federal law, regulation, or rule* shall be accepted in lieu of compliance with the *NIOSH recommendations*. **Note:** The [NIOSH Alert](#) was archived 1/7/2026; superseded by [2025-103](#).

### **Additional Assistance on North Carolina State-Specific Standards**

If the employer still has questions regarding the OSHA standards or North Carolina state-specific standards, they can submit an inquiry about safety and health requirements to Ask OSH through the [online form](#) or by phone at 919-707-7876.

Resource information can be found on the [safety and health topics pages](#). In addition, the webpages for [Which OSHA Standards Apply](#) and [OSHA Standards With Special Requirements](#) can assist the employer with applicable OSHA standards and special requirements.

Example safety and health [programs](#) ([table](#) of standards requiring programs, plans and procedures in general industry; [table](#) of standards requiring inspections in general industry; [table](#) of standards requiring programs, plans and procedures in construction; [table](#) of standards requiring inspections in construction) and [presentations](#) ([table](#) of standards requiring training in general industry; [table](#) of standards requiring training in construction); [pre-recorded webinars](#); along with [publications](#) are available to assist the employer in meeting standards requirements. Specifically, the brochure on [top ten most frequently cited serious violations](#) can be useful in identifying frequently cited violations by industry. For more information regarding the required state and federal workplace posters, go to the [NCDOL State and Federal workplace posters](#) webpage.

The [NCDOL Library](#) also offers free safety and health videos and related research assistance on consensus standards (i.e., ANSI, NFPA, NEC). The education, training and technical assistance bureau provides [free online safety and health training](#) and [outreach](#)



[services](#) (i.e., speaker's bureau requests, safety booths) upon request. In addition, the [consultative services bureau](#) provides free confidential on-site employer assistance.