

(xix) The equipment operator shall be instructed not to permit riders or observers on the machine unless approved seating and protection is provided.

(xx) The equipment operator shall be instructed to shut down the engine when the equipment is stopped, apply brake locks and ground moving elements before he dismounts.

(xxi) The equipment operator shall be instructed, when any equipment is transported from one job location to another, to transport it on a vehicle of sufficient rated capacity and the equipment shall be properly secured during transit.

(xxii) When any equipment is being moved or operated in the vicinity of an electric distribution line a minimum clearance of ten feet shall be maintained between the electric distribution line and all elements of the machine.

(7) *Explosives.* Only trained and experienced personnel shall handle or use explosives. Usage shall comply with the requirements of § 1910.109.

(d) *Equipment protective devices—stationary and mobile equipment.*—(1) *Operator's manual.* There shall be an operator's manual or operating instructions with each machine. It will describe operation, maintenance, and safe practices.

(2) *Protective canopy.* A protective canopy shall be provided for the operator of mobile equipment. It shall be so constructed as to protect the operator from injury due to falling trees or limbs, limbs or branches which might enter the compartment side areas, and snapping winch lines or other objects.

(1) The canopy shall be of adequate size so as not to impair the operator's movements.

(2) The canopy framework shall consist of at least two arches, either transverse or longitudinal. If transverse, one arch shall be installed behind the operator and one immediately in front of the operator. They shall be joined at the top by at least two longitudinal braces. There shall be two braces which shall act as deflecting guards extending from the leading edge of the forward arch to the front part of the frame of the tractor. If longitudinal arches are used, they shall be extended from behind the operator to the front part of the frame and each arch shall have an intermediate support located immediately ahead of the operator so that ingress or egress is not impeded. Regardless of the type of construction used, the fabrication and method of connecting to the tractor shall be of such design as to develop a strength equivalent to the upright members.

(3) The overhead covering shall be of solid material and extend the full width of the canopy.

(4) The lower portion of cab shall be completely enclosed with solid material, except at entrances, to prevent the operator from being injured from obstacles entering the cab.

(5) The upper rear portion of cab shall be fully enclosed with open mesh material with openings of such a size as to reject the entrance of an object larger

than 1½ inch in diameter. It shall provide maximum rearward visibility.

(6) Open mesh shall be extended forward as far as possible from the rear corners of the cab sides so as to give the maximum protection against obstacles, branches, etc., entering the cab area.

(7) Deflectors shall also be installed ahead of the operator to deflect whipping saplings and branches. These shall be located so as to not impede ingress or egress from the compartment.

(8) The entrance opening of the canopy shall be not less than 52 inches in vertical height.

(9) Where glass is used it shall be safety glass. An approved substitute may be used.

(10) An additional metal screen shall be used where glass alone is not adequate operator protection.

(11) Provision shall be made to clean glass to assure adequate visibility.

(12) *Guards.* Guards shall be provided for exposed moving elements such as shafts, pulleys, belts, conveyors and gears in accordance with § 1910.219 and American National Standard Safety Code for Conveyors, Cableways, and Related Equipment, B20.1—1957. Guards shall be in place at all times machine is in operation.

(13) *Mufflers.* Mufflers provided by the manufacturer or their equivalent shall be in place at all times the machine is in operation.

(14) *Guywires.* Guywires shall be arranged in such manner that stresses will be imposed on not less than two guywires. Stumps used for anchoring guywires shall be carefully chosen as to position and strength. They shall be tied back if necessary. Standing trees shall not be used for this purpose.

(15) *Stability and reliability.* Crane and loader stability and boom reliability shall be in accordance with American National Standard Safety Code for Cranes, Derricks and Hoists Overhead and Gantry Cranes, B30.2.0—1967, and American National Standard Safety Code for Cranes, Derricks and Hoists—Crawler, Locomotive, and Truck Cranes, B30.5—1968.

(16) *Pulpwood harvesting.*—(1) *Felling, general.* (i) Work areas shall be assigned such that a tree cannot fall into an adjacent work area. The recommended distance between workers is twice the height of trees being felled.

(ii) When trees may fall into public roads a flagman shall be assigned to direct traffic.

(iii) Workers shall be instructed not to approach a feller closer than twice the height of trees being felled until the feller has acknowledged the signal of approach.

(iv) Lodged trees shall be pulled to the ground at first opportunity with mechanical equipment or animal.

(v) Workers shall be instructed not to work under a lodged tree.

(vi) Special precautions shall be taken to prevent felling trees into powerlines.

(vii) If a tree does make contact with a powerline the power company shall be notified immediately and all personnel shall remain clear of the area until

power company personnel advises that conditions are safe.

(2) *Manual felling.* (i) The feller shall be instructed to plan retreat path and clear path as necessary before cut is started.

(ii) The feller shall be instructed to appraise situation for dead limbs, the lean of tree to be cut, wind conditions, location of other trees and other hazards and exercise proper precautions before cut is started.

(iii) Undercuts shall be about one-third the diameter of the tree to guide tree and reduce possibility of splitting. (Local practice where small diameter trees are felled without being undercut is acceptable if the direction of fall is controlled by the practice.)

(iv) Back or felling cut shall be parallel to the inner edge of the undercut and approximately two inches higher than the undercut.

(v) The saw shall be shut off before feller starts his retreat.

(vi) On terrain where trees are likely to slide or roll fellers shall be instructed to fell trees from the uphill side and arrange to keep uphill from previously felled trees.

(3) *Bucking.* (i) Bucking on slopes shall be from the uphill side unless the log has been securely blocked to prevent rolling or swinging.

(ii) Spring poles and trees under stress shall be cut so that employee is clear when the tension is released. (This is accomplished by cutting under the bend.)

(iii) Trees piled for bucking shall be piled in an orderly parallel manner that minimizes hazard to employees.

(4) *Limbing.* Spring poles and limbs under stress shall be cut in such a manner that the employee is clear when tension is released.

(5) *Mechanical debarking and delimbing.* Guarding shall be provided so as to protect employees from flying chunks, logs, chips, bark, limbs, and other material and to prevent the worker from contacting moving parts.

(6) *Skidding and prehauling, general.*—(i) Only a designated, trained operator shall operate a skid or prehaul machine.

(ii) Choker setters shall work on uphill side of log.

(iii) No passenger personnel shall ride on a prehaul vehicle, logs, pallets, skid pans or other load unless adequate seating and protection is provided except on animal powered wagons.

(iv) Chokers shall be positioned near the end of the log or tree length to allow turning of the prehaul vehicle, to prevent the penetration of the operator station and to reduce possibility of striking the wheel or track.

(v) During winching, the equipment shall be positioned so that the winch line is in alignment with the long axis of the prehaul machine.

(vi) A stuck or inoperative vehicle shall be towed. A loaded pallet shall not be pushed.

(vii) Stakes shall not be added to permit a load beyond the rated capacity of pallets and trailers.

(viii) The operator shall be instructed to be observant and cautious of height of load and vehicle when traveling under trees, limbs, and other overhead obstructions.

(7) *Skidding and prehauling equipment requirements.* (i) Arches, fairleads, drawbars, hitches and bumpers or fenders shall be designed and constructed to allow a minimum radius vehicle turn without the load contacting a rear tire or the rear of a track assembly.

(ii) Towed equipment such as skid pans, pallets and trailers shall be attached in such a manner as to allow a full 90° turn, prevent overrunning of the towed vehicle, and assure control of the towed equipment.

(iii) Animal towed equipment shall be equipped with a hand brake within reach of the driver.

(iv) Prehaulers shall have a means for securely retaining pallets or pulpwood.

(v) Prehaulers shall have a means of securely retaining loader for transport when so equipped.

(vi) Provision shall be made to securely fasten and to protect all tools and material on the carrier.

(8) *Personnel transport.* (i) The driver shall be properly licensed.

(ii) Flammable liquids shall not be transported on personnel carriers unless a safe and adequate compartment is provided.

(iii) Seats shall be securely fastened.

(9) *Off highway truck transport.* Truck drivers shall be instructed to stop their vehicles, dismount, check and tighten loose load binders, either just before or immediately after leaving a private road to enter a public road.

(10) *Manual loading.* (i) The carrier shall be positioned to provide safe working clearance between carrier and pile.

(ii) Proper lifting techniques shall be used, i.e., straight back and bend knees.

(iii) The stick shall be placed in the carrier in such manner that it is or will be properly secured.

(iv) Manual handling shall be limited to a weight consistent with safe practices.

(11) *Machine loading.* (i) Piles shall be located to provide a safe work area.

(ii) Only the machine operator and slingman, where used, shall be in the work area.

(iii) The load shall be positioned for balance and to prevent slippage or loss. Slings shall be placed to secure and balance the load.

(12) *Storage.* Piles shall be located and constructed in a manner to provide safe working areas around them.

(13) *Banding and piling bundles.* (i) Steel bands in good condition shall be used.

(ii) Bands shall be placed when bundle is close to ground.

(iii) No part of the body shall be under the bundle at any time. Bundles shall be placed on runners. Bundles may be double stacked with top end bundle one half or more back from the lower rank end bundle.

(14) *Chipping (in-woods locations).* (i) Access covers or doors shall not be opened until the drum or disk is at a complete stop.

RULES AND REGULATIONS

(ii) Infeed and discharge ports shall be designed to prevent contact by personnel with disc, knives, or blower blades.

(15) *Roads and trails, general.* (i) Roads shall be maintained and hazardous conditions corrected.

(ii) Where vision is limited warnings shall be posted.

(iii) Curve radii shall be the maximum consistent with terrain.

(iv) When nightwork is necessary adequate lighting shall be provided.

(v) Local road standards and maximum weight of traffic expected shall be used as guides for materials, construction features and drainage.

(16) *Road and trail pioneering and earthwork.* (i) Banks at the borrow area shall be sloped to prevent slides.

(ii) Backfill shall be adequately compacted.

(iii) Roadside banks shall be sloped or stabilized to prevent slides.

(iv) Overhanging banks, large rocks and debris shall be removed or secured.

(v) Where riprap is used the material and design shall assure safe containment of material.

(vi) Trees or snags which may fall into the road shall be felled.

(17) *Road and trail drainage.* (i) Drainage shall be provided to prevent washouts and landslides.

(ii) Culverts shall be of adequate strength and of a size to handle maximum runoff.

(iii) Where necessary, ditches and banks shall be stabilized by vegetation, riprap or other adequate means.

(18) *Road and trail surfacing.* Road surface shall be properly compacted, graded and crowned.

(19) *Bridges.* (i) Construction shall provide for maximum anticipated loads and side thrust with a substantial safety factor.

(ii) Bridges shall be decked and curbed.

(3) *Effective dates.* (1) The provisions of this § 1910.266 shall become effective on August 27, 1971, except as provided in the remaining subparagraphs of this paragraph.

(2) Paragraph (d) (2) of this section shall become effective on February 15, 1972.

(3) Notwithstanding anything in subparagraph (1), (2), or (4) of this paragraph, any provision in any other paragraph of this section which contains in itself a specific effective date or time limitation shall become effective on such date or shall apply in accordance with such limitation.

(4) Notwithstanding anything in subparagraph (1) of this paragraph, if any standard in 41 CFR Part 50-204, other than a national consensus standard incorporated by reference in § 50-204.2 (a) (1), is or becomes applicable at any time to any employment and place of employment, by virtue of the Walsh-Healey Public Contracts Act, or the Service Contract Act of 1965, or the National Foundation on Arts and Humanities Act of 1965, any corresponding established Federal standard in this § 1910.266 which is derived from 41 CFR Part 40-204 shall also become effective, and shall be applicable to such employment and place of employment, on the same date.

§ 1910.267 Agricultural operations.

(a) (1) The standards referenced in the remaining subparagraphs of this paragraph apply to the indicated operations, whether or not they include as a part of, agricultural operations.

(2) Sanitation in temporary labor camps—§ 1910.142.

(3) Storage and handling of anhydrous ammonia—§ 1910.111 (a) and (b).

(4) Pulpwood logging—§ 1910.266.

(5) Slow-moving vehicles—§ 1910.145.

(b) Except to the extent specified in paragraph (a) of this section, the standards contained in Subparts B through S of this part do not apply to agricultural operations.

(c) The development of standards having more general application to agricultural operations will be the subject of study under section 6 of the Act.

§ 1910.268 Sources of standards.

Sec. Source

1910.261 --- ANSI F1.1—1969, Safety Standard for Pulp, Paper, and Paperboard Mills.

1910.264 --- ANSI L1.1—1956, Textile Safety Code.

1910.263 --- ANSI Z50.1—1947, Safety Code for Bakery Equipment.

1910.262 --- ANSI Z8.1—1961, Safety Code for Laundry Machinery and Operations.

1910.265 --- ANSI C2.1—1969, Safety Requirements for Sawmills.

1910.266 --- ANSI C3.1—1970, Pulpwood Logging Safety Standards.

§ 1910.269 Standards organizations.

Specific standards of the following organizations have been referenced in this subpart. Copies of the referenced standards may be obtained from the issuing organizations. The names and addresses of the issuing organizations are as follows:

American National Standards Institute (ANSI), 1430 Broadway, New York, NY 10018.

National Fire Protection Association (NFPA), 60 Batterymarch Street, Boston, MA 02110.

American Society of Mechanical Engineers, Inc., United Engineering Center, 345 East 47th Street, New York, NY 10017.

Institute of Makers of Explosives, 420 Lexington Avenue, New York, NY 10017.

Underwriters Laboratories, Inc., 207 East Ohio Street, Chicago, IL 60611.

Support 5—Electrical

§ 1910.308 Application.

(a) *General.* Section 1910.309 adopts as a national consensus standard the National Electrical Code NFPA 70-1971; ANSI C1-1971 (Rev. of 1968), which is incorporated by reference in this subpart.

(b) *Purpose of the National Electrical Code.* (1) The purpose of the National Electrical Code is the practical safeguarding of any persons and of buildings and their contents from hazards arising from the use of electricity for light, heat, power, radio, signaling, and for other purposes. The standards contained therein are occupational safety and health standards to the extent that they safeguard any person who is an employee of an employer.

(2) The National Electrical Code con-

RULES AND REGULATIONS

tains basic minimum provisions considered necessary for safety.

(c) *Scope*—(1) *Covered*. The provisions of this Subpart S cover electrical installations and utilization equipment installed or used within or on public and private buildings, structures and other premises including:

- (i) Yards.
- (ii) Carnivals.
- (iii) Parking lots.
- (iv) Mobile homes.
- (v) Recreational vehicles.
- (vi) Conductors that connect an installation to a supply of electricity, and
- (vii) Other outside conductors adjacent to the premises.

(2) *Not covered*. The provisions of this subpart do not cover:

- (i) Installations in ships, watercraft, railway rolling stock, aircraft or automotive vehicles.
- (ii) Installations underground in mines.
- (iii) Installations of railways for generation, transformation, transmission, or distribution of power used exclusively for operation of rolling stock or installations used exclusively for signaling and communication purposes.

(iv) Installations of communication equipment under exclusive control of communication utilities, located outdoors or in building spaces used exclusively for such installation, or

(v) Installations under the exclusive control of electric utilities for the purpose of communication, metering or for the generation, control, transformation, transmission, and distribution of electric energy, located in buildings used exclusively by the utilities for such purposes or located outdoors on property owned or leased by the utilities or on public highways, streets, roads, etc., or outdoors by established rights on private property.

(d) *Definitions applicable to this Subpart S*—(1) *Approved*. Some provisions of the National Electrical Code, NFPA 70-1971; ANSI C1-1971 (Rev. of 1968), which is adopted in this Subpart S, require installations or equipment to be approved. In Article 100 of the Code, "approved" is defined to mean "acceptable to the authority enforcing this Code." The authority enforcing the Code under subpart S is the Assistant Secretary of Labor for Occupational Safety and Health. The definitions in this subsection indicate what is acceptable to the Assistant Secretary of Labor, and therefore approved within the meaning of the Code as incorporated in this subpart S.

(2) *Acceptable*. An installation or equipment is acceptable to the Assistant Secretary of Labor, and approved within the meaning of this Subpart S: (i) If it is accepted, or certified, or listed, or labeled, or otherwise determined to be safe by a nationally recognized testing laboratory, such as, but not limited to, Underwriters' Laboratories, Inc. and Factory Mutual Engineering Corp.; or (ii) with respect to an installation or equipment of a kind which no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe, if it is inspected or tested by another Federal agency, or by a State, municipal, or other local authority responsible for

enforcing occupational safety provisions of the National Electrical Code, and found in compliance with the provisions of the National Electrical Code as applied in § 1910.309; or (iii) with respect to custom-made equipment or related installations which are designed, fabricated for, and intended for use by, a particular customer, if it is determined to be safe for its intended use by its manufacturer on the basis of test data which the employer keeps and makes available for inspection to the Assistant Secretary and his authorized representatives.

(3) For purposes of subparagraph (2) of this paragraph:

(i) *Listed*. Equipment is "listed" if it is of a kind mentioned in a list which (a) is published by a nationally recognized laboratory which makes periodic inspection of the production of such equipment, and (b) states such equipment meets nationally recognized standards or has been tested and found safe for use in a specified manner;

(ii) *Labeled*. Equipment is "labeled" if there is attached to it a label, symbol, or other identifying mark of a nationally recognized testing laboratory which (a) makes periodic inspections of the production of such equipment, and (b) whose labeling indicates compliance with nationally recognized standards or tests to determine safe use in a specified manner;

(iii) *Accepted*. An installation is "accepted" if it has been inspected and found by a nationally recognized testing laboratory to conform to specified plans or to procedures of applicable codes;

(iv) *Certified*. Equipment is "certified" if it (a) has been tested and found by a nationally recognized testing laboratory to meet nationally recognized standards or to be safe for use in a specified manner, or (b) is of a kind whose production is periodically inspected by a nationally recognized testing laboratory, and (c) it bears a label, tag, or other record of certification;

(v) *Utilization equipment*. Utilization equipment means equipment which utilizes electric energy for mechanical, chemical, heating, lighting, or similar useful purpose.

§ 1910.309 National Electrical Code.

(a) The requirements contained in the following articles and sections of the National Electrical Code, NFPA 70-1971; ANSI C1-1971 (Rev. of 1968) shall apply to all electrical installations and utilization equipment:

Articles:	
500	Hazardous Locations.
501	Class I Installations (Hazardous Locations).
502	Class II Installations (Hazardous Locations).
503	Class III Installations (Hazardous Locations).

Sections:	
250-58 (a) and (b).	Equipment on Structural Metal.
250-59 (a), (b), and (c).	Portable and/or Cord Connected and Plug Connected Equipment Grounding Method.

Sections—Continued:

400-3 (a) and (b).	Flexible Cords and Cable Uses.
400-4	Flexible Cords and Cable Prohibited.
400-5	Flexible Cords and Cables, Splices.
400-6	Overcurrent Protection and Ampacities of Flexible Cords.
400-10	Full at Joints and Terminals of Flexible Cords and Cables.
422-8	Installation of Appliances with Flexible Cords.
422-9	Installation of Portable Immersion Heaters.
422-10	Installation Adjacent to Combustible Material.
422-11	Standards for Portable Appliances.
422-12	Signals for Heated Appliances.
422-14	Water Heaters.
422-15 (a), (b), and (c).	Installation of Infrared Lamp and Industrial Heating Appliances.
110-14 (a) and (b).	Electric Connection.
110-17 (a), (b), and (c).	Grounding Live Part.
110-18	Arcing Parts.
110-21	Marking.
110-22	Identification.
240-16 (a), (b), (c), and (d).	Location in Premises for Overcurrent Protection Devices.
240-19 (a) and (b).	Guarding of Arcing or Suddenly Moving Parts of Overcurrent Protection Devices.
250-3 (a) and (b).	D.C. System Grounding.
250-5 (a), (b), and (c).	A.C. Circuits and Systems To Be Grounded.
250-7	Circuits Not To Be Grounded.
250-42 (a), (b), (c), and (d).	Fixed Equipment Grounding, General.
250-43 (a), (b), (c), (d), (e), (f), (g), (h), and (i).	Fixed Equipment Grounding, Specific.
250-44 (a), (b), (c), (d), and (e).	Nonelectrical Equipment Grounding.
250-45 (a), (b), (c), and (d).	Equipment Connected by Cord and Plug Grounding.
430-142 (a), (b), (c), and (d).	Stationary Motor Grounding.
430-143	Portable Motors Grounding.
250-50 (a) and (b).	Equipment Grounding Connections.
250-51	Effective Grounding.
250-57 (a) and (b).	Fixed Equipment Method of Grounding.
422-18	Appliance Grounding.
422-17	Installation of Wall-mounted Ovens and Counter-mounted Cooking Units.

(b) Every new electrical installation and all new utilization equipment installed after March 15, 1972, and every replacement, modification, or repair or rehabilitation, after March 15, 1972, of any part of any electrical installation or utilization equipment installed before March 15, 1972, shall be installed or made, and maintained, in accordance with the provisions of the 1971 National Electrical Code, NFPA 70-1971; ANSI C1-1971 (Rev. of 1968).

arrangement with relation to other materials, under tension.

(24) *Undercut*. The term "undercut" means a notch cut in a tree to guide the tree in felling.

(25) *Widow maker*. The term "widow maker" means an overhanging limb or section of tree which could become dislodged and drop to the ground (see also "lodged tree").

(26) *Wood hook*. The terms "wood hook" and "pulp hook" mean a device to be held in one hand which is fitted with a pointed section. The device is used to assist in the manual piling and handling of bolts of wood (see Pickaroon).

(c) *General requirements*—(1) *Clothing, personal protective devices, and first aid*.

(i) Gloves shall be provided for use when working with wire rope in any form.

(ii) Safety boots or shoes (excluding low cut shoes) shall be provided in accordance with American National Standard and for Men's Safety-Toe Footwear, Z41.1-1967.

(iii) Safety helmets of approved design in accordance with American National Standard for Safety Requirements for Industrial Head Protection, Z89.1-1969 shall be provided.

(iv) Eye or face protection in accordance with American National Standard for Practice for Occupational and Educational Eye and Face Protection, Z87.1-1968 shall be provided for use where chips and sawdust or flying particles are sent.

(v) Dust masks in accordance with American National Standard Practices for Respiratory Protection Z88.2-1969 shall be provided for use where conditions warrant.

(vi) Protection against the effects of noise exposure shall be provided when the sound levels exceed those shown in Table G-16 of § 1910.95 when measured on the A scale of a standard sound level meter at slow response.

(vii) First aid kits sufficient for the number of employees shall be provided at the work site and on all transport vehicles. In all areas where poisonous snakes may exist, snake bite kits shall be a part of the regular first aid equipment. First aid kits shall be regularly inspected and replenished.

(2) *Handtools*. (i) The employer shall be responsible for the safe condition of tools when furnished by him and user shall inspect tool to assure safe condition.

(ii) Handles shall be sound, straight and light fitting.

(iii) Driven tools shall be dressed to remove any mushrooming.

(iv) Cutting tools shall be kept sharp and properly shaped.

(v) Wood hooks and pickaroons of good grade steel shall be used.

(vi) Tools shall be used for purposes for which they were designed.

(vii) Hands tools shall be sheathed or used if transported in a vehicle with personnel. If not contained in a box, the sheathed tools shall be fastened to the vehicle.

RULES AND REGULATIONS

22339

(viii) Proper storage facilities shall be provided for hand tools. Tools shall be stored in the provided location at all times when not in use.

(ix) Periodic inspections shall be made to assure all tools are serviceable and others removed from use.

(3) *Environmental conditions*. (i) All work shall terminate and employees moved to a place of safety during electrical storms and periods of high winds or other unusual weather conditions are dangerous to personnel.

(ii) Dead, broken, or rotted limbs or trees that are a hazard (widow makers) shall be felled or otherwise removed before commencing logging operations, building roads, trails or landing, in their vicinity.

(4) *Work areas*. (i) All persons shall be instructed to work within the vocal range of other workmen unless a procedure has been established for periodically checking their location and welfare.

(ii) All men shall be accounted for at the end of each work day.

(iii) An approved (Underwriters Laboratories or Factory Mutual Engineering Corp.) fire extinguisher shall be provided at locations where machines are operating and/or on each vehicle.

(iv) Fuel shall be stored only in approved (Underwriters Laboratories or Factory Mutual Engineering Corp.) well-marked containers located for safe access for fueling vehicles and equipment and at a safe distance from all fire hazards.

(5) *Chain saw operations*. (i) Chain saw operators shall be instructed to daily inspect the saws daily to assure that all handles and guards are in place and tight, that all controls function properly, and that the muffler is operative.

(ii) Chain saw operators shall be instructed to follow manufacturer's instructions as to operation and adjustment.

(iii) Chain saw operators shall be instructed to fuel the saw only in safe areas and not under conditions conducive to fire such as near men smoking, hot engine, etc.

(iv) Chain saw operators shall be instructed to hold the saw with both hands during operation.

(v) Chain saw operators shall be instructed to start the saw at least 10 feet away from fueling area.

(vi) Chain saw operators shall be instructed to start the saw only on the ground or when otherwise firmly supported.

(vii) Chain saw operators shall be instructed to be certain of footing and to clear away brush which might interfere before starting to cut.

(viii) Chain saw operators shall be instructed not to use engine fuel for starting fires or as a cleaning solvent.

(ix) Chain saw operators shall be instructed to shut off the saw when carrying it for a distance greater than from tree to tree or in hazardous conditions such as slippery surfaces or heavy underbrush. The saw shall be at idle speed when carried short distances.

(x) Chain saw operators shall be instructed to carry the saw in a manner to prevent contact with the chain and muffler.

(xi) Chain saw operators shall be instructed not to use the saw to cut directly overhead or at a distance that would require the operator to relinquish a safe grip on the saw.

(6) *Stationary and mobile equipment operation*. (i) Equipment operators shall be instructed as to the manufacturers recommendations for equipment operation, maintenance, safe practices, and site operating procedures.

(ii) Equipment shall be kept free of flammable material.

(iii) Equipment shall be kept free of any material which might contribute to slipping and falling.

(iv) Engine of equipment shall be shut down during fueling, servicing, and repairs except where operation is required for adjustment.

(v) Equipment shall be inspected for evidence of failure or incipient failure.

(vi) The equipment operator shall be instructed to walk completely around machine and assure that no obstacles or personnel are in the area before startup.

(vii) The equipment operator shall be instructed to start and operate equipment only from the operator's station or from safe area recommended by the manufacturer.

(viii) Seat belt shall be provided on mobile equipment.

(ix) The equipment operator shall be instructed to check all controls for proper function and response before starting working cycle.

(x) The equipment operator shall be instructed to ground or secure all movable elements when not in use.

(xi) The equipment operator shall be advised of the load capacity and operating speed of the equipment.

(xii) The equipment operator shall be advised of the stability limitations of the equipment.

(xiii) The equipment operator shall be instructed to maintain adequate distance from other equipment and personnel.

(xiv) Where signalmen are used, the equipment operator shall be instructed to operate the equipment only on signal from the designated signalman and only when signal is distinct and clearly understood.

(xv) The equipment operator shall be instructed not to operate movable elements (boom, grapple, load, etc.) close to or over personnel.

(xvi) The equipment operator shall be instructed to signal his intention before operation when personnel are in or near the working area.

(xvii) The equipment operator shall be instructed to dismount and stand clear for all loading and unloading of his mobile vehicle by other mobile equipment. The dismounted operator shall be visible to loader operator.

(xviii) The equipment operator shall be instructed to operate equipment in a manner that will not place undue shock loads on wire rope.

(8) *Debark.* The term "debark" means the action of removing bark from trees or sections of trees. Debark generally de-

(23) *Spring pole*. The term "spring pole" means a section of tree, sapling, limb, etc. which is, by virtue of its ar-

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FEDERAL REGISTER, VOL. 37, NO. 202—WEDNESDAY, OCTOBER 18, 1972

(c) Provisions shall be made for alerting and warning employees before starting band head saws, and measures shall

(c) Circular gang resaws shall not be operated at speeds exceeding those recommended by the manufacturer.

(f) *Dry kilns and facilities*—(1) *Kiln foundations.* Dry kilns shall be con-

(e) Unloading lines, crotch lines, or equally effective means shall be arranged and used in a manner to minimize the possibility of any log from swinging or rolling back.

cabin-type boats to prevent accumulation of harmful gases or vapors.

from the log haul runway, the entrance shall be guarded.

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SUBJECT INDEX FOR 20 CFR 1010—OCCUPATIONAL SAFETY AND HEALTH STANDARDS—Continued

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RULES

FEDERAL REGISTER, VOL. 37, NO. 202—WEDNESDAY, OCTOBER 18, 1972

(iv) *Stick*

shall be pro
sary to ins
operating co

(v) *Sticker alignment.* Stickers shall extend the full width of the package shall be uniformly spaced, and shall be aligned one above the other. Stickers may be lapped with a minimum overlapping of 12 inches. Stickers shall not protrude more than 2 inches beyond the sides of the package.

(vi) *Pile height.* The height of unit package piles shall be dependent on the dimensions of the packages and shall be

such as to provide stability under normal operating conditions. Adjacent lumber piles may be

(28) *Lum*
built and se
transit.

(29) *Burn*
burner stack is not self-supporting, it shall be guyed or otherwise supported.

(ii) *Runway.* The conveyor runway to the burner shall be equipped with a standard handrail. If the runway crosses a roadway or thoroughfare standard toe

(30) *Vehi*
shall include

(ii) *Warning*—All vehicles shall be equipped with a warning device, such as a flashing light, which shall be used in the event of an emergency, such as a breakdown, accident, or other emergency situation. The warning device shall be used in accordance with the following requirements:

(iii) **Lights.** All vehicles operated in

(iv) **Overhead guard.** All vehicles

operated in areas where overhead hazards exist shall be equipped with an approved overhead guard. See American National Standard Safety Code for

(v) *Platje*
ator is expo

the vehicle
platform gun
arranged as
from vehicle

(vi) *Exposed parts.* Vehicle flywheels, gears, sprockets, chains, shear points, and other exposed parts constituting a

hazard to the operator or other persons shall be guarded in accordance with the requirements of § 1910.219.

(vii) *Operation in buildings.* Vehicles powered by internal combustion engines shall not operate in buildings unless the buildings are adequately ventilated.

(viii) *Load limits.* No vehicle shall be operated with loads exceeding its safe load capacity.

(ix) *Brake*
equipped wit
and controll
load upon

(x) *Lift trucks.* Lift trucks shall be designed, constructed, maintained, and

(xi) *Carriers.* (a) Carriers shall be so

designed and constructed that the operator's field of vision is not necessarily restricted.

(b) Stakes, stake pockets, racks, tighteners, and binders shall provide adequate means to secure the load

shall be locked when supporting loads during transit.

Highway Grade Crossing Protection) should be utilized.

(iv) **Aisles, passageways, and roadways.** Aisles, passageways, and roadways shall be sufficiently wide to provide safe side clearance. One-way aisles may be

age—(1) Log unloading methods, equipment, and facilities—(i) Unloading methods. (a) Stakes and chocks which trip shall be constructed in such man-

except when released by remote control devices or except when person making release is protected by racks or stanchions or other equivalent means.

strength placed around the load, or the load shall be otherwise secured so the fouled binder can be safely removed.

lically operated log handling machines

(c) A limit switch shall be installed on

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RULES AND REGULATIONS

22323

(d) **Walkways, docks, and platforms.**—Width. Walkways, docks, and platforms shall be of sufficient width to provide adequate passage and working areas.

(i) **Maintenance.** Walkways shall be evenly floored and kept in good repair.

(ii) **Docks.** Docks and runways used for the operation of lift trucks and other vehicles shall have a substantial guard or shear timber except where loading and unloading are being performed.

(iv) **Elevated walkways.** All elevated walkways, runways, or platforms, if 4 feet or more from the floor level, shall be provided with a standard railing except on loading or unloading sides of platforms. If height exceeds 6 feet, a standard toe board also shall be provided to prevent material from rolling or falling off.

(v) **Elevated platforms.** Where elevated platforms are used routinely on a daily basis they shall be equipped with stairways or fixed ladders in accordance with § 1910.27.

(vi) **Hazardous locations.** Where required, walkways and stairways with standard handrails shall be provided in elevated and hazardous locations. Where such passageways are over walkways or work areas, standard toe boards shall be provided.

(5) **Stairways.** (i) **Construction.** Stairways shall be constructed in accordance with § 1910.24.

(ii) **Handrails.** Stairways shall be provided with a standard handrail on at least one side or on any open side. Where stairs are more than four feet wide there shall be a standard handrail at each side, and where more than eight feet wide, a third standard handrail shall be erected in the center of the stairway.

(iii) **Lighting.** All stairways shall be adequately lighted as prescribed in Subparagraph (g) of this paragraph.

(6) **Emergency exits including doors and fire escapes.**—(i) **Opening.** Doors shall not open directly on or block a flight of stairs, and shall swing in the direction of exit travel.

(ii) **Identification.** Exits shall be located and identified in a manner that affords ready exit from all work areas.

(iii) **Swinging doors.** All swinging doors shall be provided with windows; with one window for each section of double swinging doors. Such windows shall be of shatterproof or safety glass unless otherwise protected against breakage.

(iv) **Sliding doors.** Where sliding doors are used as exits, an inner door shall be cut out of the main doors and arranged to open outward.

(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.

(7) **Air requirements.** Ventilation shall be provided to supply adequate fresh, salt-free air to rooms, buildings, and work areas.

(8) **Vats and tanks.** All open vats and tanks into which workmen could fall shall be guarded.

(9) *Lighting*—(i) *Adequacy*. Illumination shall be provided and designed to supply adequate general and local lighting to rooms, buildings, and work areas during the time of use.

(ii) *Effectiveness*. Factors upon which the adequacy and effectiveness of illumination will be judged, include the following:

(a) The quantity of light in foot-candle intensity shall be sufficient for the work being done.

(b) The quality of the light shall be such that it is free from glare, and has correct direction, diffusion, and distribution.

(c) Shadows and extreme contrasts shall be avoided or kept to a minimum.

(10) *Ladders*. Ladders shall be installed and maintained as specified in §§ 1910.25, 1910.26, and 1910.27.

(11) *Hazard marking*. Physical hazard marking shall be as specified in § 1910.144 of this part.

(12) *Electrical wiring and equipment*.

(i) All electrical equipment should be installed and maintained in accordance with requirements specified in Subpart S of this part.

(ii) *Repairs*. Electrical repairs shall be made only by authorized and qualified personnel.

(iii) *Identification*. Marks of identification on electrical equipment shall be clearly visible.

(iv) *Protective equipment*. Rubber protective equipment shall be provided as required by § 1910.137.

(v) *Open switches*. Before working on electrical equipment, switches shall be open and shall be tagged, blocked, or locked.

(vi) *Concealed conductors*. Where electrical conductors are known to be concealed, no work shall be performed until such conductors are located.

(vii) *Overload relays*. Overload relays shall be reset by authorized qualified personnel only.

(viii) *Passageways to panels*. Passageways to switch centers or panels shall at all times be kept free from obstruction. Not less than 3 feet of clear space shall be maintained in front of switch centers or panels at all times.

(ix) *Bridging fuses*. Doubling or bridging fuses shall be prohibited.

(x) *Hydraulic systems*. Means shall be provided to block, chain, or otherwise secure equipment normally supported by hydraulic pressure so as to provide for safe maintenance.

(14) *Liquefied petroleum gas storage and handling*. Storage and handling of liquefied petroleum gas shall be in accordance with the requirements of § 1910.110.

(15) *Gas piping and appliances*. All gas piping and appliances shall be installed in accordance with the American National Standard Requirements for the Installation of Gas Appliances and Gas Piping Z21.30—1954.

(16) *Flammable liquids*. Flammable liquids shall be handled in accordance with § 1910.106.

(17) *Storage, handling, and use of chemicals*—(i) *Threshold limits*. Employees shall not be exposed to airborne

concentration of toxic dusts, fumes, vapors, mists or gases that exceed the threshold limit values set forth by § 1910.93.

(h) *Protective equipment.* The use of chemicals shall be controlled so as to protect employees from harmful exposure to toxic materials. Where necessary, employees shall be provided with and required to wear such protective equipment afford adequate protection against harmful exposure as required by Subpart I of this part.

(ii) *Open surface tank operation.* Open surface tank operations shall conform to the requirements of § 1910.94(d).

(18) *Conveyors.*—(i) *Standards.* Construction, operation, and maintenance of conveyors shall be in accordance with American National Standard B20.1—1957.

(ii) *Guarding.* Spiked live rolls shall be guarded.

(19) *Stationary tramways and trestles.*—*Foundations and walkways.* Tramways and trestles shall have substantial mud sills or foundations which shall be frequently inspected and kept in repair. When vehicles are operated on tramways and trestles which are used for foot passage, traffic shall be controlled or a walkway with standard handrails at the outer edge and shear timber on the inner edge shall be provided. This walkway shall be wide enough to allow adequate clearance over the tramway walkways cross over other thoroughfares they shall be solidly fenced at the outer edge to a height of 42 inches over such thoroughfares.

(ii) *Clearance.* Stationary tramways and trestles shall have a verticle clearance of 22 feet over railroad rails. When constructed over carrier docks or roads, they shall have a clearance of 6 feet above the driver's feet, over the carrier, and in no event shall this clearance be less than 12 feet from the roadway. In existing operations where it is impractical to obtain such clearance, telltales, electric signals, signs or other precautionary measures shall be installed.

(20) *Blower, collecting, and exhaust systems.*—(i) *Design, construction, and maintenance.* Blower collecting, and exhaust systems should be designed, constructed, and maintained in accordance with American National Standards Z33.1—1961 (For the Installation of Blower and Exhaust Systems for Dust, Stock, and Vapor Removal or Conveying) and Z12.2—1962 (R1969) (Code for the Prevention of Dust Explosion in Woodworking and Wood Flour Manufacturing Plants).

(ii) *Collecting systems.* All mills containing one or more machines that create dust, shavings, chips or slivers during a period of time equal to or greater than one-fourth of the working day, shall be equipped with a collecting system. It may be either continuous or automatic, and shall be of sufficient strength and capacity to enable it to remove such refuse from points of operation and immediately the vicinity of machines and work areas.

(iii) *Exhaust or conveyor systems.* Each woodworking machine that creates

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RULES AND REGULATIONS

RULES AND REGULATIONS

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(b) Each body-type ironer, roll or shoe type, including sleeve and band ironers shall be equipped with a safety bar or other guard across the entire length of the feed roll or shoe, so arranged that the striking of the bar or guard by the hands of the operator or other person will stop

SUBJECT INDEX FOR 29 CFR 1910—OCCUPATIONAL SAFETY AND HEALTH STANDARDS—Continued	Section No.	Subject Term	Federal Register Page No.
Stowaway Carriage, Disposal Systems	1430	22129	21239
Acetylene Industrial Disposal Systems	1430(a)	22129	21239
Compressed Gas, Specifications	1430(b)	22129	21239
Portable Pallet Construction	1430(c)	22129	21239
Reinforcing, Joint Specifications	1430(d)	22129	21239
Storage Pit Construction	1430(e)	22129	21239
Structural Steel	22130	21240	21240
Structural Steel, Welding	22130(a)	21240	21240
Structural Steel, Welding, General Requirements	22130(b)	21240	21240
Structural Steel, Welding, Inspection, Maintenance & Hydrostatic Tests	22130(c)	21240	21240
Structural Steel, Welding, Portable Metal Ladders	22130(d)	21240	21240
Structural Steel, Welding, Testing	22130(e)	21240	21240
Structural Steel, Welding, Tackling	22130(f)	21240	21240
Structural Steel, Welding, Tackling, General Requirements	22130(g)	21240	21240
Structural Steel, Welding, Tackling, Inspection, Maintenance & Hydrostatic Tests	22130(h)	21240	21240
Structural Steel, Welding, Tackling, Portable Metal Ladders	22130(i)	21240	21240
Structural Steel, Welding, Tackling, Testing	22130(j)	21240	21240
Structural Steel, Welding, Tackling, Tackling, General Requirements	22130(k)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Inspection, Maintenance & Hydrostatic Tests	22130(l)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Portable Metal Ladders	22130(m)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Testing	22130(n)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, General Requirements	22130(o)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Inspection, Maintenance & Hydrostatic Tests	22130(p)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Portable Metal Ladders	22130(q)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Testing	22130(r)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, General Requirements	22130(s)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Inspection, Maintenance & Hydrostatic Tests	22130(t)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Portable Metal Ladders	22130(u)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Testing	22130(v)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, General Requirements	22130(w)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Inspection, Maintenance & Hydrostatic Tests	22130(x)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Portable Metal Ladders	22130(y)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Testing	22130(z)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, General Requirements	22130(aa)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Inspection, Maintenance & Hydrostatic Tests	22130(ab)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Portable Metal Ladders	22130(ac)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Testing	22130(ad)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, General Requirements	22130(ae)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Inspection, Maintenance & Hydrostatic Tests	22130(af)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Portable Metal Ladders	22130(ag)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Testing	22130(ah)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, General Requirements	22130(ai)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Inspection, Maintenance & Hydrostatic Tests	22130(aj)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Portable Metal Ladders	22130(ak)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Testing	22130(al)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, General Requirements	22130(am)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Inspection, Maintenance & Hydrostatic Tests	22130(an)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Portable Metal Ladders	22130(ao)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Testing	22130(ap)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, General Requirements	22130(aq)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Inspection, Maintenance & Hydrostatic Tests	22130(ar)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Portable Metal Ladders	22130(as)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Testing	22130(at)	21240	21240
Structural Steel, Welding, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, Tackling, General Requirements	22130(au)	21240	21240
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22329

for dampers shall be adjusted to obtain "fluent air for combustion at the minimum oven output. Where stack dampers are used in connection with oil- or gas-fired ovens, they shall be equipped with means to turn the burner off when the damper is closed.

(x) Where the initial pressure of the fuel is lower than the air pressure used for combustion, check valves shall be installed in the fuel line to prevent air from backing up into the fuel lines. For instance, in gas burner apparatus, which uses air at pressures exceeding the gas service pressure, a check valve shall be provided in the gas line next to the mixing device.

(xi) Where the gas supply pressure is substantially higher than that which would be required for the desired rate of operation, a gas pressure regulator shall be employed.

(a) Gas pressure regulators, where used, shall maintain the gas pressure to the manifold within 10 percent of the operating pressure from maximum to minimum consumption rates.

(b) Regulators shall be of the spring-loaded, self-aligning, or pressure-balanced type. Spring- or weight-loaded regulators shall have springs or weights covered by suitable housing. Under no circumstances shall a weight and lever type of regulator be used.

(c) A gas pressure regulator, requiring access to atmosphere for successful operation, shall be vented to the outer air.

(d) A relief valve shall be placed on the outlet side of gas pressure regulators where gas is supplied at high pressure. The discharge from this valve shall be piped to the outside of the building.

(xii) All chambers which have to be connected to the atmosphere, but are separated from any gaseous or other volatile material by a diaphragm, as, for instance, a diaphragm, bellows, etc., shall be connected by a pipe of at least one-half inch size to the outside atmosphere. The outside end of this pipe shall be protected against flooding or accidental plugging by ice formation, insects, or other causes, by providing a "tee" with double elbow connections pointing downward from the pipe and screened outlets. Where several of such chambers are used in close proximity, a common vent line may be used.

(xiii) Where accumulation of dust in the air supply might affect the proper functioning of mixing devices and burners, the air supply inlet shall be equipped with suitable air filters. A standby filter should be available for periodic exchanging filters for cleaning purposes.

(10) *Direct-fired ovens.* (i) Direct-fired ovens shall be safeguarded against failure of fuel, air, or ignition.

(ii) To prevent the possible accumulation of explosive gases from being ignited after a shutdown, all direct-fired ovens with a heating capacity over 150,000 B.t.u. per hour shall be ventilated by a mechanical system, combustion air "wiper," and the like, to insure that the prevention shall insure at least four complete changes of atmosphere in the baking chamber by discharging the oven atmosphere to the outside of the building and entraining fresh air into it. The prevention shall be repeated whenever the heating equipment is shut down by a safety device.

(11) *Direct recirculating ovens.* (i) Each circulating fan in direct recirculating ovens shall be interconnected with the shut-off of such a manner that the fuel is shut off by a safety valve when the fan is not running.

(ii) The flame of the burner or burners in direct recirculating ovens shall be protected by a quick-acting flame-sensitive safeguard which will automatically shut off the fuel supply in case of burner failure.

(iii) Direct recirculating ovens shall be equipped with ventilating devices.

(iv) Fans in direct recirculating ovens shall be constructed of materials suitable for the temperatures at which they will operate and designed with an ample safety factor to prevent rupture of the wheel.

(v) Fan wheel in direct recirculating oven shall be protected against direct impingement of the flame of the burner or burners.

(vi) Direct recirculating ovens, and particularly fans in and on such ovens, shall be protected from overheating by means of a temperature limiting device.

(vii) When the burner or burners on direct recirculating ovens are mounted at elevated positions permanent steps shall be provided for safe and convenient access to the burner or burners.

(12) *Flue-type ovens.* (i) Flue-type ovens shall be operated in such a way that less than atmospheric pressure is maintained in the flues.

(ii) Gas burners in flue-type ovens shall be protected against flame failure.

(iii) Oil burners on flue-type ovens shall be equipped with combustion safeguards as listed by the Underwriters Laboratories, Inc.

(iv) Solid-fuel stoker-fired flue-type ovens shall have the stack damper interlocked with the stoker so that the stoker cannot be operated when the damper is closed.

(13) *Indirect-fired multiple burner ovens.* (i) Indirect-fired multiple-burner ovens shall be equipped with safety shut-off valves which are interlocked with the ignition system, the air pressure and the gas pressure.

(ii) Parts of enclosures reaching through the wall of indirect-fired multiple-burner ovens, and observation windows on such ovens, shall be tested at least once each year with repeated explosions, and afterward inspected for leaks.

(14) *Steam-tube ovens.* Steam-tube ovens shall be protected against overfiring (firing at an excessive rate) and overheating (heating to excessive temperatures) by devices which control the maximum amount of fuel admitted to the furnace and the maximum permissible temperature in the baking chamber.

(15) *Indirect recirculating ovens.* (i) Indirect recirculating ovens shall have all oil and gas burners equipped with quick-acting flame sensitive combustion safeguards.

(ii) Duct systems in indirect-recirculating ovens shall be protected by explosion vents having a minimum total area of 1 square foot of vent to 15 cubic feet of total duct volume. These explosion vents shall be so located that they will discharge of hot gases or flying parts in the direction of an operator.

(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.

(iv) Fans and other parts in indirect recirculating ovens shall comply with requirements as listed under subparagraph (c) of this paragraph.

(16) *Electric ovens.* Electric ovens shall be installed, operated, and maintained in accordance with Subpart S of this part.

§ 1910.264 Laundry machinery and operations.

Definitions applicable to this section. (1) *Laundry.* The term "laundry" shall mean an establishment wherein the washing, ironing, or other finishing of clothes, or any other textiles is done, but excluding printing, bleaching, dry cleaning, or dyeing of clothes or other textiles.

(2) *Marking machine.* The term "marking machine" shall mean a power-driven machine used for marking clothes or other textiles.

(3) *Washing machine.* The term "washing machine" shall mean a power-driven machine used for washing clothes or other textiles. It generally consists of a stationary case or shell inside of which is a revolving perforated cylinder.

(4) *Extractor.* The term "extractor" shall mean a power-driven centrifugal machine used for removing surplus moisture from clothes or other textiles by centrifugal action.

(5) *Wringer.* The term "wringer" shall mean one or more power-driven rolls used for removing surplus moisture from clothes or other textiles.

(6) *Starcher.* The term "starcher" shall mean a power-driven machine used for mixing or processing starch.

(7) *Starching machine.* The term "starching machine" shall mean a power-driven machine used for the starching of clothes or other textiles.

(8) *Drying tumbler.* The term "drying tumbler" shall mean a machine within which clothes or other textiles are dried by air, and which usually consists of an enclosure inside of which is a revolving cylinder.

(9) *Shaker.* The term "shaker" (clothes tumbler) shall mean a revolving cylinder used for shaking out clothes or other textiles.

(10) *Drying room.* The term "drying room" shall mean an enclosure used for drying clothes or other textiles, and containing a power-driven mechanical device.

(11) *Dampening machine.* The term "dampening machine" shall mean a machine used for dampening clothes or other textiles.

22327

ments can be made when the oven is in normal operating condition.

(iii) Dampers controlling the draft on ovens equipped with atmospheric gas-burning systems shall be interconnected with the gas supply so that no gas can be admitted to the burners if the damper is closed.

(a) Atmospheric pipe burners extending into the baking chamber of ovens fired with atmospheric gas-burning systems shall have secondary air ducts installed below each burner and extending over its full length. Air inlets for these ducts shall be placed outside the baking chamber.

(b) Lock dampers on ovens equipped with atmospheric gas-burning systems shall have a hole of the following diameter:

Diameter of flue	Diameter of opening
3 to 5	$\frac{1}{4}$
6 to 10	1
11 to 15	$1\frac{1}{2}$

Dimensions given in inches.

(iv) Nozzle or blast burners on atmospheric gas-burning systems shall be equipped with gas pilots or electric ignition, with the exception that burners operated on a maximum-minimum flame or modulating principle which are equipped with quick acting combustion safeguards actuated by the main burner flame may be equipped with automatic or hand torch ignition to be used for initial lighting only.

(v) Burners of the perforated pipe, ribbon, slot, tip, or similar types, having any individual ports, shall be capable of maintaining a stable flame over the entire length (or surface) of the burner throughout the turndown range and under all draft conditions which may arise in the operation of the oven, unless ignition of gas from every port shall immediately result from the ignition of gas at any single port, when gas is supplied to the burner at the highest and lowest rating of the burners.

(vi) Premixed gas burners shall be so designed that the burner will not back-fire or blow off within the operating range of the burner.

(a) Tip or ribbon burners, such as ribbon, strip, or tip burners, when used on premixed gas systems, shall be capable of instant ignition of the burner over its entire length when operated within the proper range of the burner, either in a normal or steam-laden oven atmosphere or under any other oven conditions which might extinguish the flame.

(b) Where a number of premixed gas burners are connected to a single premixing device, each burner shall be equipped with electric or gas ignition.

(vii) High-pressure inspirators (using gas at pressures exceeding 1 p.s.i.) shall be so constructed and machined as to insure perfect alignment of the gas jet with the axis of the inspirator.

(a) No high-pressure inspirator shall be installed with a valve or other obstruction between the inspirator and the burner.

(b) Each high-pressure inspirator shall have a gas adjustment consisting of a fixed replaceable orifice or an adjustable orifice.

(b) All diaphragm or similar chambers shall be connected to the atmosphere outside of the building.

(c) An automatic safety shutoff valve shall be provided in the gas line leading to the mixing valve which will close the gas supply in case the action disappears at the compressor inlet or the current to the compressor is shutoff.

(d) Air inlets to gas mixing machines shall be piped to a location outside the building and shall be located at a point protected against dust.

(e) No valve or obstruction shall be installed between mixing blowers and burners.

(f) Mixing blowers shall be so constructed that they will supply a mixture of air and gas that will not blow off or backfire over the entire range of adjustments.

(g) Mixing blowers shall be provided with a pressure regulator in the gas line at the inlet to the mixing valve (to prevent variations in the air-gas ratio).

(h) Housings of mixing blowers shall be constructed to withstand any possible internal explosion.

(i) Mixing blowers shall be provided with an automatic safety shutoff valve in the gas line leading to the blower, which safety shutoff valve will close in case of failure of either gas pressure or electric current.

(j) **Oil-burning equipment.** (1) The storage and distribution of fuel oil in bakeries shall be arranged according to reference NFPA 31—1968 Standard for Installation of Oil Burning Equipment.

(2) Oil burners shall be of the type approved by Underwriters Laboratories, Inc.

(a) Each oil burner shall be equipped with an electric ignition or gas pilot.

(b) Oil burners shall be protected against flame failure and overflowing of oil by a quick-acting combustion safeguard operated by the main burner flame. The time interval between flame failure and fuel shutoff shall be short enough to prevent a dangerous accumulation of an explosive mixture or the entry of a dangerous amount of fuel oil into the heating system; with the exception that on ovens requiring 150,000 B.t.u. per hour or less any combustion safeguard designed by Underwriters Laboratories, Inc., may be used.

(c) The shutting off of the fuel supply shall be accomplished by stopping the individual burner pump equipped with a pressure cutoff valve, or by closing a suitable valve.

(d) Oil-fired ovens shall have dampers so arranged that a small amount of air is bypassed through the furnace at all times.

(e) Oil burners capable of being withdrawn from the furnace (for adjustment, etc.) shall be provided with an interlock which will prevent the burners from starting when in the withdrawal position.

(f) Preheating of oil, where necessary, shall be done by steam, hot water, or electric heater, and shall be thermostatically controlled. Heaters shall be substantially constructed with all joints made oil tight. Thermometers shall be

147
148
149
150
151
152
153
154
155
156

VOL. 37, NO. 202—WEDNESDAY, OCTOBER 18, 1972

3

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