

## **Subpart F - Fire Protection and Prevention**

### **§ 1926.150 - Fire protection.**

**(a) General requirements.**

**(a)(1)** The employer shall be responsible for the development of a fire protection program to be followed throughout all phases of the construction and demolition work, and he shall provide for the firefighting equipment as specified in this subpart. As fire hazards occur, there shall be no delay in providing the necessary equipment.

**(a)(2)** Access to all available firefighting equipment shall be maintained at all times.

**(a)(3)** All firefighting equipment, provided by the employer, shall be conspicuously located.

**(a)(4)** All firefighting equipment shall be periodically inspected and maintained in operating condition. Defective equipment shall be immediately replaced.

**(b) Water supply.**

**(b)(1)** A temporary or permanent water

supply, of sufficient volume, duration, and pressure, required to properly operate the firefighting equipment shall be made available as soon as combustible materials accumulate.

**(b)(2)** Where underground water mains are to be provided, they shall be installed, completed, and made available for use as soon as practicable.

**(c) Portable firefighting equipment.**

**(c)(1)** Fire extinguishers and small hose lines.

**(c)(1)(i)** A fire extinguisher, rated not less than 2A, shall be provided for each 3,000 square feet of the protected building area, or major fraction thereof. Travel distance from any point of the protected area to the nearest fire extinguisher shall not exceed 100 feet.

**(c)(1)(ii)** One 55-gallon open drum of water with two fire pails may be substituted for a fire extinguisher having a 2A rating.

**(c)(1)(iii)** A 1/2-inch diameter garden-type hose line, not to exceed 100 feet in length and equipped with a nozzle, may be substituted for a 2A-rated fire extinguisher, providing it is capable of discharging a minimum of 5 gallons per minute with a minimum hose stream range of 30 feet horizontally. The garden-type hose lines shall be mounted on conventional racks or reels. The number and location of hose racks or reels shall be such that at least one hose stream can be applied to all points in the area.

**(c)(1)(iv)** One or more fire extinguishers, rated not less than 2A, shall be provided on each floor. In multistory buildings, at least one fire extinguisher shall be located adjacent to stairway.

**(c)(1)(v)** Extinguishers and water drums, subject to freezing, shall be protected from freezing.

**(c)(1)(vi)** A fire extinguisher, rated not less than 10B, shall be provided within 50

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feet of wherever more than 5 gallons of flammable or combustible liquids or 5 pounds of flammable gas are being used on the jobsite. This requirement does not apply to the integral fuel tanks of motor vehicles.

(c)(1)(vii) Carbon tetrachloride and other toxic vaporizing liquid fire extinguishers are prohibited.

(c)(1)(viii) Portable fire extinguishers shall be inspected periodically and maintained in accordance with Maintenance and Use of Portable Fire Extinguishers, NFPA No. 10A-1970.

(c)(1)(ix) Fire extinguishers which have been listed or approved by a nationally recognized testing laboratory, shall be used to meet the requirements of this subpart.

(c)(1)(x) Table F-1 may be used as a guide for selecting the appropriate portable fire extinguishers.

(e) *Fire alarm devices.*

(e)(1) An alarm system, e.g., telephone system, siren, etc., shall be established by the employer whereby employees on the site and the local fire department can be alerted for an emergency.

(e)(2) The alarm code and reporting instructions shall be conspicuously posted at phones and at employee entrances.

**§ 1926.151 - Fire prevention.**

(a) *Ignition hazards.*

(a)(1) Electrical wiring and equipment for light, heat, or power purposes shall be installed in compliance with the requirements of Subpart K of this part.

(a)(2) Internal combustion engine powered equipment shall be so located that the exhausts are well away from combustible materials. When the exhausts are piped to outside the building under construction, a clearance of at least 6 inches shall be maintained between such piping and

combustible material.

(a)(3) Smoking shall be prohibited at or in the vicinity of operations which constitute a fire hazard, and shall be conspicuously posted: "No Smoking or Open Flame."

(b) *Temporary buildings.*

(b)(1) No temporary building shall be erected where it will adversely affect any means of exit.

(b)(3) Temporary buildings, located other than inside another building and not used for the storage, handling, or use of flammable or combustible liquids, flammable gases, explosives, or blasting agents, or similar hazardous occupancies, shall be located at a distance of not less than 10 feet from another building or structure. Groups of temporary buildings, not exceeding 2,000 square feet in aggregate, shall, for the purposes of this part, be considered a single temporary building.

(c) *Open yard storage.*

(c)(1) Combustible materials shall be piled with due regard to the stability of piles and in no case higher than 20 feet.

(c)(2) Driveways between and around combustible storage piles shall be at least 15 feet wide and maintained free from accumulation of rubbish, equipment, or other articles or materials. Driveways shall be so spaced that a maximum grid system unit of 50 feet by 150 feet is produced.


(c)(3) The entire storage site shall be kept free from accumulation of unnecessary combustible materials. Weeds and grass shall be kept down and a regular procedure provided for the periodic cleanup of the entire area.

(c)(4) When there is a danger of an underground fire, that land shall not be used for combustible or flammable storage.

(c)(5) Method of piling shall be solid wherever possible and in orderly and regular piles. No combustible material shall be stored

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TABLE F-1 FIRE EXTINGUISHERS DATA

		WATER TYPE					FOAM	CARBON DIOXIDE	DRY CHEMICAL		
		STORDED PRESSURE	CARTRIDGE OPERATED	WATER PUMP-TYPE	SODA ACID	TURN UPSIDE DOWN			SODIUM OR POTASSIUM BICARBONATE	MULTI-PURPOSE ABC	
 CLASS A FIRES WOOD, PAPER, TRASH HAVING GLIMING EMBERS CLASS B FIRES FLAMMABLE LIQUIDS GASOLINE, OIL, KEROSENE, ETC. CLASS C FIRES ELECTRICAL EQUIPMENT CLASS D FIRES COMBUSTIBLE METALS		YES	YES	DISCHARGE AND FILL WITH WATER ANNUALLY	DISCHARGE ANNUALLY RECHARGE	DISCHARGE ANNUALLY	DISCHARGE ANNUALLY	DISCHARGE ANNUALLY	DISCHARGE ANNUALLY	DISCHARGE ANNUALLY	DISCHARGE ANNUALLY
		YES	YES	DISCHARGE AND FILL WITH WATER ANNUALLY	DISCHARGE ANNUALLY RECHARGE	DISCHARGE ANNUALLY	DISCHARGE ANNUALLY	DISCHARGE ANNUALLY	DISCHARGE ANNUALLY	DISCHARGE ANNUALLY	DISCHARGE ANNUALLY
		NO	NO	DISCHARGE AND FILL WITH WATER ANNUALLY	DISCHARGE ANNUALLY RECHARGE	DISCHARGE ANNUALLY	DISCHARGE ANNUALLY	DISCHARGE ANNUALLY	DISCHARGE ANNUALLY	DISCHARGE ANNUALLY	DISCHARGE ANNUALLY
		NO	NO	DISCHARGE AND FILL WITH WATER ANNUALLY	DISCHARGE ANNUALLY RECHARGE	DISCHARGE ANNUALLY	DISCHARGE ANNUALLY	DISCHARGE ANNUALLY	DISCHARGE ANNUALLY	DISCHARGE ANNUALLY	DISCHARGE ANNUALLY
SPECIAL EXTINGUISHING AGENTS APPROVED BY RECOGNIZED TESTING											
		PULL PIN, SQUEEZE HANDLE	TURN UPSIDE DOWN AND BUMP	PUMP HANDLE	TURN UPSIDE DOWN	TURN UPSIDE DOWN	PULL PIN, SQUEEZE LEVER	PULL PIN, SQUEEZE LEVER	PULL PIN, SQUEEZE LEVER	PULL PIN, SQUEEZE LEVER	PULL PIN, SQUEEZE LEVER
		30" - 40"	30" - 40"	30" - 40"	30" - 40"	30" - 40"	3' - 8'	5' - 30'	5' - 30'	5' - 30'	5' - 30'
		CHECK AIR PRESSURE MONTHLY	WEIGH GAS CARTRIDGE AND RECHARGE ANNUALLY	DISCHARGE AND FILL WITH WATER ANNUALLY	DISCHARGE ANNUALLY RECHARGE	DISCHARGE ANNUALLY	WEIGH GAS CARTRIDGE AND RECHARGE ANNUALLY	WEIGH GAS CARTRIDGE AND RECHARGE ANNUALLY	WEIGH GAS CARTRIDGE AND RECHARGE ANNUALLY	WEIGH GAS CARTRIDGE AND RECHARGE ANNUALLY	WEIGH GAS CARTRIDGE AND RECHARGE ANNUALLY
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outdoors within 10 feet of a building or structure.

(c)(6) Portable fire extinguishing equipment,

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shall be provided at convenient, conspicuously accessible locations in the yard area. Portable fire extinguishers, rated not less than 2A, shall be placed so that maximum travel distance to the nearest unit shall not exceed 100 feet.

**§ 1926.152 - Flammable and combustible liquids.**

**(a) General requirements.**

**(a)(1)** Only approved containers and portable tanks shall be used for storage and handling of flammable and combustible liquids. Approved metal safety cans shall be used for the handling and use of flammable liquids in quantities greater than one gallon, except that this shall not apply to those flammable liquid materials which are highly viscous (extremely hard to pour), which may be used and handled in original shipping containers. For quantities of one gallon or less, only the original container or approved metal safety cans shall be used for storage, use, and handling of flammable liquids.

**(a)(2)** Flammable or combustible liquids shall not be stored in areas used for exits, stairways, or normally used for the safe passage of people.

**(b) Indoor storage of flammable and combustible liquids.**

**(b)(1)** No more than 25 gallons of flammable or combustible liquids shall be stored in a room outside of an approved storage cabinet. For storage of liquefied petroleum gas, see 1926.153.

**(b)(2)** Quantities of flammable and combustible liquid in excess of 25 gallons shall be stored in an acceptable or approved cabinet meeting the following requirements:

**(b)(2)(i)** Acceptable wooden storage cabinets shall be constructed in the following manner, or equivalent: The bottom, sides, and top shall be constructed of an exterior grade

of plywood at least 1 inch in thickness, which shall not break down or delaminate under standard fire test conditions. All joints shall be rabbeted and shall be fastened in two directions with flathead wood screws. When more than one door is used, there shall be a rabbeted overlap of not less than 1 inch. Steel hinges shall be mounted in such a manner as to not lose their holding capacity due to loosening or burning out of the screws when subjected to fire. Such cabinets shall be painted inside and out with fire retardant paint.

**(b)(2)(ii)** Approved metal storage cabinets will be acceptable.

**(b)(2)(iii)** Cabinets shall be labeled in conspicuous lettering, "Flammable-Keep Fire Away."

**(b)(3)** Not more than 60 gallons of flammable or 120 gallons of combustible liquids shall be stored in any one storage cabinet. Not more than three such cabinets may be located in a single storage area. Quantities in excess of this shall be stored in an inside storage room.

**(f) Handling liquids at point of final use.**

**(f)(1)** Flammable liquids shall be kept in closed containers when not actually in use.

**(f)(2)** Leakage or spillage of flammable or combustible liquids shall be disposed of promptly and safely.

**(f)(3)** Flammable liquids may be used only where there are no open flames or other sources of ignition within 50 feet of the operation, unless conditions warrant greater clearance.

**§ 1926.153 - Liquefied petroleum gas (LP-Gas).**

**(a) Approval of equipment and systems.**

**(a)(1)** Each system shall have containers, valves, connectors, manifold valve assemblies, and regulators of an approved

type.

(a)(2) All cylinders shall meet the Department of Transportation specification identification requirements published in 49 CFR Part 178, Shipping Container Specifications.

(a)(3) *Definition.* As used in this section, *Containers* - All vessels, such as tanks, cylinders, or drums, used for transportation or storing liquefied petroleum gases.

(b) *Welding on LP-Gas containers.* Welding is prohibited on containers.

(c) *Container valves and container accessories.*

(c)(1) Valves, fittings, and accessories connected directly to the container, including primary shut off valves, shall have a rated working pressure of at least 250 p.s.i.g. and shall be of material and design suitable for LP-Gas service.

(c)(2) Connections to containers, except safety relief connections, liquid level gauging devices, and plugged openings, shall have shutoff valves located as close to the container as practicable.

(d) *Safety devices.*

(d)(1) Every container and every vaporizer shall be provided with one or more approved safety relief valves or devices. These valves shall be arranged to afford free vent to the outer air with discharge not less than 5 feet horizontally away from any opening into a building which is below such discharge.

(d)(2) Shutoff valves shall not be installed between the safety relief device and the container, or the equipment or piping to which the safety relief device is connected, except that a shutoff valve may be used where the arrangement of this valve is such that full required capacity flow through the safety relief device is always afforded.

(d)(3) Container safety relief devices and

regulator relief vents shall be located not less than 5 feet in any direction from air openings into sealed combustion system appliances or mechanical ventilation air intakes.

(f) *Requirements for appliances.*

(f)(1) LP-Gas consuming appliances shall be approved types.

(f)(2) Any appliance that was originally manufactured for operation with a gaseous fuel other than LP-Gas, and is in good condition, may be used with LP-Gas only after it is properly converted, adapted, and tested for performance with LP-Gas before the appliance is placed in use.

(g) *Containers and regulating equipment installed outside of buildings or structures.* Containers shall be upright upon firm foundations or otherwise firmly secured. The possible effect on the outlet piping of settling shall be guarded against by a flexible connection or special fitting.

(h) *Containers and equipment used inside of buildings or structures.*

(h)(1) When operational requirements make portable use of containers necessary, and their location outside of buildings or structures is impracticable, containers and equipment shall be permitted to be used inside of buildings or structures in accordance with paragraphs (h)(2) through (11) of this section.

(h)(2) *Containers in use* means connected for use.

(h)(3) Systems utilizing containers having a water capacity greater than 2 1/2 pounds (nominal 1 pound LP-Gas capacity) shall be equipped with excess flow valves. Such excess flow valves shall be either integral with the container valves or in the connections to the container valve outlets.

(h)(4) Regulators shall be either directly connected to the container valves or to manifolds connected to the container valves.

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The regulator shall be suitable for use with LP-Gas. Manifolds and fittings connecting containers to pressure regulator inlets shall be designed for at least 250 p.s.i.g. service pressure.

(h)(5) Valves on containers having water capacity greater than 50 pounds (nominal 20 pounds LP-Gas capacity) shall be protected from damage while in use or storage.

(h)(6) Aluminum piping or tubing shall not be used.

(h)(7) Hose shall be designed for a working pressure of at least 250 p.s.i.g. Design, construction, and performance of hose, and hose connections shall have their suitability determined by listing by a nationally recognized testing agency. The hose length shall be as short as practicable. Hoses shall be long enough to permit compliance with spacing provisions of paragraphs (h)(1) through (13) of this section, without kinking or straining, or causing hose to be so close to a burner as to be damaged by heat.

(h)(8) Portable heaters, including salamanders, shall be equipped with an approved automatic device to shut off the flow of gas to the main burner, and pilot if used, in the event of flame failure. Such heaters, having inputs above 50,000 B.t.u. per hour, shall be equipped with either a pilot, which must be lighted and proved before the main burner can be turned on, or an electrical ignition system.

NOTE: The provisions of this subparagraph do not apply to portable heaters under 7,500 B.t.u. per hour input when used with containers having a maximum water capacity of 2 1/2 pounds.

(h)(9) Container valves, connectors, regulators, manifolds, piping, and tubing shall not be used as structural supports for heaters.

(h)(10) Containers, regulating equipment, manifolds, pipe, tubing, and hose shall be located to minimize exposure to high temperatures or physical damage.

(h)(11) Containers having a water capacity greater than 2 1/2 pounds (nominal

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1 pound LP-Gas capacity) connected for use shall stand on a firm and substantially level surface and, when necessary, shall be secured in an upright position.

(h)(12) The maximum water capacity of individual containers shall be 245 pounds (nominal 100 pounds LP-Gas capacity).

(h)(13) For temporary heating, heaters (other than integral heater-container units) shall be located at least 6 feet from any LP-Gas container. This shall not prohibit the use of heaters specifically designed for attachment to the container or to a supporting standard, provided they are designed and installed so as to prevent direct or radiant heat application from the heater onto the containers. Blower and radiant type heaters shall not be directed toward any LP-Gas container within 20 feet.

(h)(14) If two or more heater-container units, of either the integral or nonintegral type, are located in an unpartitioned area on the same floor, the container or containers of each unit shall be separated from the container or containers of any other unit by at least 20 feet.

(h)(15) When heaters are connected to containers for use in an unpartitioned area on the same floor, the total water capacity of containers, manifolded together for connection to a heater or heaters, shall not be greater than 735 pounds (nominal 300 pounds LP-Gas capacity). Such manifolds shall be separated by at least 20 feet.

(h)(16) Storage of containers awaiting use shall be in accordance with paragraphs (j) and (k) of this section.

(i) *Multiple container systems.*

(i)(1) Valves in the assembly of multiple container systems shall be arranged so that replacement of containers can be made without shutting off the flow of gas in the system. This provision is not to be construed

as requiring an automatic changeover device.

(i)(2) Heaters shall be equipped with an approved regulator in the supply line between the fuel cylinder and the heater unit. Cylinder connectors shall be provided with an excess flow valve to minimize the flow of gas in the event the fuel line becomes ruptured.

(i)(3) Regulators and low-pressure relief devices shall be rigidly attached to the cylinder valves, cylinders, supporting standards, the building walls, or otherwise rigidly secured, and shall be so installed or protected from the elements.

(j) *Storage of LPG containers.* Storage of LPG within buildings is prohibited.

(k) *Storage outside of buildings.*

(k)(1) Storage outside of buildings, for containers awaiting use, shall be located from the nearest building or group of buildings, in accordance with the following:

TABLE F-3

Quantity of LP-Gas stored	Distance (feet)
500 lbs. or less.	0
501 to 6,000 lbs.	10
6,001 to 10,000 lbs.	20
Over 10,000 lbs.	25

(k)(2) Containers shall be in a suitable ventilated enclosure or otherwise protected against tampering.

(l) *Fire protection.* Storage locations shall be provided with at least one approved portable fire extinguisher having a rating of not less than 20-B:C.

(n) When LP-Gas and one or more other gases are stored or used in the same area, the containers shall be marked to identify their content. Marking shall be in compliance with American National Standard Z48.1-1954, "Method of Marking Portable Compressed Gas Containers To Identify the Material

**Definitions applicable to this subpart**

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Contained."

(o) *Damage from vehicles.* When damage to LP-Gas systems from vehicular traffic is a possibility, precautions against such damage shall be taken.

**§ 1926.154 - Temporary heating devices.**

(a) *Ventilation.*

(a)(1) Fresh air shall be supplied in sufficient quantities to maintain the health and safety of workmen. Where natural means of fresh air supply is inadequate, mechanical ventilation shall be provided.

(a)(2) When heaters are used in confined spaces, special care shall be taken to provide sufficient ventilation in order to ensure proper combustion, maintain the health and safety of workmen, and limit temperature rise in the area.

(b) *Clearance and mounting.*

(b)(1) Temporary heating devices shall be installed to provide clearance to combustible material not less than the amount shown in Table F-4.

**TABLE F-4**

Heating appliances	Minimum clearance, (inches)		
	Sides	Rear	Chimney Connector
Room heater, circulating type	12	12	18
Room heater, radiant type	36	36	18

(b)(2) Temporary heating devices, which are listed for installation with lesser clearances than specified in Table F-4, may be installed in accordance with their approval.

(b)(3) Heaters not suitable for use on wood floors shall not be set directly upon

them or other combustible materials. When such heaters are used, they shall rest on suitable heat insulating material or at least 1-inch concrete, or equivalent. The insulating material shall extend beyond the heater 2 feet or more in all directions.

(b)(4) Heaters used in the vicinity of combustible tarpaulins, canvas, or similar coverings shall be located at least 10 feet from the coverings. The coverings shall be securely fastened to prevent ignition or upsetting of the heater due to wind action on the covering or other material.

(c) *Stability.* Heaters, when in use, shall be set horizontally level, unless otherwise permitted by the manufacturer's markings.

(d) *Solid fuel salamanders.* Solid fuel salamanders are prohibited in buildings and on scaffolds.

(e) *Oil-fired heaters.*

(e)(1) Flammable liquid-fired heaters shall be equipped with a primary safety control to stop the flow of fuel in the event of flame failure. Barometric or gravity oil feed shall not be considered a primary safety control.

(e)(2) Heaters designed for barometric or gravity oil feed shall be used only with the integral tanks.

(e)(4) Heaters specifically designed and approved for use with separate supply tanks may be directly connected for gravity feed, or an automatic pump, from a supply tank.

**§ 1926.155 - Definitions applicable to this subpart.**

(a) *Approved,* for the purpose of this subpart, means equipment that has been listed or approved by a nationally recognized testing laboratory such as Factory Mutual Engineering Corp., or Underwriters' Laboratories, Inc., or Federal agencies such as Bureau of Mines, or U.S. Coast Guard, which issue approvals for such equipment.



(b) *Closed container* means a container so sealed by means of a lid or other device that neither liquid nor vapor will escape from it at ordinary temperatures.

(c) *Combustible liquids* mean any liquid having a flash point at or above 140 deg. F. (60 deg. C.), and below 200 deg. F. (93.4 deg. C.).

(d) *Combustion* means any chemical process that involves oxidation sufficient to produce light or heat.

(f) *Fire resistance* means so resistant to fire that, for specified time and under conditions of a standard heat intensity, it will not fail structurally and will not permit the side away from the fire to become hotter than a specified temperature. For purposes of this part, fire resistance shall be determined by the Standard Methods of Fire Tests of Building Construction and Materials, NFPA 251-1969.

(g) *Flammable* means capable of being easily ignited, burning intensely, or having a rapid rate of flame spread.

(h) *Flammable liquids* means any liquid having a flash point below 140 deg. F. and having a vapor pressure not exceeding 40 pounds per square inch (absolute) at 100 deg F.

(i) *Flash point* of the liquid means the temperature at which it gives off vapor sufficient to form an ignitable mixture with the air near the surface of the liquid or within the vessel used as determined by appropriate test procedure and apparatus as specified below.

(i)(1) The flash point of liquids having a viscosity less than 45 Saybolt Universal Second(s) at 100 deg. F. (37.8 deg. C.) and a flash point below 175 deg. F. (79.4 deg. C.) shall be determined in accordance with the Standard Method of Test for Flash Point by the Tag Closed Tester, ASTM D-56-69.

(i)(2) The flash point of liquids having a

viscosity of 45 Saybolt Universal Second(s) or more at 175 deg. F. (79.4 deg. C.) or higher shall be determined in accordance with the Standard Method of Test for Flash

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Point by the Pensky Martens Closed Tester, ASTM D-93-69.

(j) *Liquefied petroleum gases, LPG* and *LP Gas* mean and include any material which is composed predominantly of any of the following hydrocarbons, or mixtures of them, such as propane, propylene, butane (normal butane or iso-butane), and butylenes.

(k) *Portable tank* means a closed container having a liquid capacity more than 60 U.S. gallons, and not intended for fixed installation.

(l) *Safety can* means an approved closed container, of not more than 5 gallons capacity, having a flash-arresting screen, spring-closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure.

(m) *Vapor pressure* means the pressure, measured in pounds per square inch (absolute), exerted by a volatile liquid as determined by the "Standard Method of Test for Vapor Pressure of Petroleum Products (Reid Method)." (ASTM D-323-58).