

(c) Inspected and approved by the industrial commission of Wisconsin.

History: Cr. Register, May, 1961, No. 65, eff. 6-1-61.

Ind 9.03 Requirement for construction, inspection and stamping.

(1) Containers used with systems embodied in sections Ind 9.30, Ind 9.50, Ind 9.70, except as provided in section Ind 9.72 (4) and section Ind 9.97 (1) (a) (b), shall be designed, constructed, and tested in accordance with the Wisconsin Boiler and Unfired Pressure Vessel Code.

(2) The provisions of section Ind 9.03 (1) shall not be construed as prohibiting the continued use or reinstallation of containers constructed and maintained in accordance with the general orders on Liquefied Petroleum Gases for Wisconsin.

(3) Containers used with systems embodied in section Ind 9.72 (4) shall carry the ICC stamping.

(4) Welding to the shell, head, or any other part of the container subject to internal pressure, shall be done in compliance with the code under which the tank was fabricated. Other welding is permitted only on saddle plates, lugs or brackets attached to the container by the tank manufacturer.

(5) Where repair or modification involving welding of ICC containers is required, the container shall be returned to a qualified manufacturer making containers of the same type, and who is authorized to imprint the ICC stamping on such containers.

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Ind 9.04 Markings on containers. (1) Each container or system, except as provided in section Ind 9.72, shall be marked as specified in the following:

(a) With a marking identifying compliance with, and other markings required by the rules of the code under which the container is constructed; or with the stamp and other markings required by the Wisconsin Boiler and Unfired Pressure Vessel Code (section Ind 41.09).

(b) With notation as to whether container is designed for underground or aboveground installation or both. If intended for both and different style hoods are provided, the marking shall indicate the proper hood for each style of installation.

(c) With the name and address of the supplier of the system, or the trade name of the system.

1. Underground and aboveground: System nameplate.

(d) With the water capacity of the container in pounds or gallons, U. S. Standard.

(e) With the working pressure in pounds per square inch for which the container is designed.

(f) With the wording "This container shall not contain a product having a vapor pressure in excess of—p.s.i. gauge at 100° F." (See section Ind 9.13 (5).)

1. Underground and aboveground: System nameplate or tag on filler connection.

(g) With the tare weight in pounds or other identified unit of weight for containers with a water capacity of 300 lbs. or less.

(h) With marking indicating the maximum level to which the container may be filled with liquid at temperatures between 20° F. and

130° F. except on containers provided with fixed maximum level indicators, or which are filled by weighing. Markings shall be in increments of not more than 20° F.

1. Aboveground and underground: System nameplate or on liquid level gauging device.

(i) With the outside surface area in square feet.

1. Underground: System nameplate.

2. Aboveground: Container.

(2) Markings specified on "container" shall be on the container itself. Markings specified on "system nameplate" shall be on a metal tag or nameplate attached to the system, located in such a manner as to be readily visible.

History: Cr. Register, May, 1961, No. 65, eff. 6-1-61.

Ind 9.05 Location of containers and regulating equipment. (1) Containers and first stage regulating equipment shall be located outside of buildings other than buildings especially provided for this purpose, except containers and regulating equipment may be used indoors under the following conditions:

(a) If temporarily used for demonstration purposes and the container has a maximum water capacity of 12 pounds.

(b) If used with a completely self-contained gas hand torch or similar equipment, and the container has a maximum water capacity of 2½ pounds.

(c) As provided in sections Ind 9.80, Ind 9.26, and Ind 9.70.

(2) (b) Each individual container shall be located with respect to the nearest important building or group of buildings or line of adjoining property which may be built on in accordance with the following table:

Water Capacity per Container	Underground	Minimum Distances	
		Containers Aboveground	Between Aboveground Containers
Less than 125 gallons	10 feet	None	None
125 to 500 gallons	10 feet	10 feet	3 feet
501 to 2,000 gallons	25 feet*	25 feet*	3 feet
2,001 to 30,000 gallons	50 feet	50 feet	5 feet
30,001 to 70,000 gallons	50 feet	75 feet	¼ of sum of diameters of adjacent containers
70,001 to 90,000 gallons	50 feet	100 feet	

*Note: The above distance requirements may be reduced to not less than 10 feet for a single container of 1200 gallons water capacity or less, providing such a container is at least 25 feet from any other LP-Gas container or more than 125 gallons water capacity.

(3) No containers while installed for use shall be stacked one above the other.

(4) In cases of bulk storage in heavily populated or congested areas, the industrial commission of Wisconsin shall determine restrictions of individual tank capacity, total storage, and distance to line of adjoining property which may be built on and other reasonable protective methods.

(5) In industrial installations involving containers of 150,000 gallons aggregate water capacity or more, where serious mutual ex-

posures between the container and adjacent properties prevail, the industrial commission of Wisconsin may require fire walls designed and constructed in accordance with good engineering practice.

(6) In the case of buildings devoted exclusively to gas manufacturing and distributing operations the above distances may be reduced provided that in no case shall containers of water capacity exceeding 500 gallons be located closer than 10 feet to such gas manufacturing and distributing buildings.

(7) Any container used in domestic or commercial service, where transfer of liquid is made from such containers into portable containers such as on tractors, skid tanks, or similar applications shall be located not less than 50 feet from nearest important building. Special attention shall be given to maintaining the above distances on such transferring in trailer camps with respect to any trailer.

(8) Readily ignitable material such as weeds and long dry grass shall be removed within 10 feet of any container.

(9) The minimum separation between liquefied petroleum gas containers and flammable liquid tanks or container shall be 20 feet, and the minimum separation between a container and the center line of the dike shall be 10 feet. The foregoing provision shall not apply if LP containers of 125 gallons or less capacity are installed adjacent to Class III flammable liquid tanks of 275 gallons or less.

(10) Suitable means shall be taken to prevent the accumulation of flammable liquids under adjacent liquefied petroleum gas containers, such as by diking, diversion curbs or grading.

(11) When dikes are used with flammable liquid tanks, no liquefied petroleum gas containers shall be located within the diked area.

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Ind 9.06 Container valves and accessories. (1) All valves, fittings and accessories connected directly to the container including primary shut-off valves, shall have a rated working pressure of at least 250 psig and shall be of material and design suitable for LP-gas service. Cast iron shall not be used for container valves, fittings, and accessories. This does not prohibit the use of container valves made of malleable or nodular iron*.

(2) All connections to containers, except safety relief connections, liquid level gauging devices and plugged openings, shall have shut-off valves located as close to the container as practicable (except as provided in section Ind 9.06 (5)).

(3) Excess flow valves where required by these standards shall close automatically at the rated flows of vapor or liquid as specified by the manufacturer. The connections or line including valves, fittings, etc., being protected by an excess flow valve shall have a greater capacity than the rated flow of the excess flow valve.

(4) Liquid level gauging devices which are so constructed that outward flow of container contents shall not exceed that passed by a No. 54 drill size opening, need not be equipped with excess flow valves.

(5) Openings from tank or through fittings attached directly on tank to which pressure gauge connection is made need not be equipped

* For information as to the suitability of malleable or nodular iron for this use, refer to Standards of the American Society of Testing Materials A(47-52 or A339-51T).

with shut-off or excess flow valves if such openings are restricted to not larger than No. 54 drill size opening.

(6) Excess flow and back pressure check valves where required by these standards shall be located inside of the container or at a point outside where the line enters the container; in the latter case, installation shall be made in such manner that any undue strain beyond the excess flow or back pressure check valve will not cause breakage between the container and such valve. (See section Ind 9.50 for tank truck requirements.)

(7) Excess flow valves shall be designed with a by-pass, not to exceed a No. 60 drill size opening to allow equalization of pressures.

Note: Where hoods or covers are provided, they shall not be locked unless the service valve is shut off.

History: Cr. Register, May, 1961, No. 65, eff. 6-1-61.

Ind 9.07 Piping, tubing, and fittings. (1) Piping, except as provided in section Ind 9.75 (1), shall be wrought iron or steel (black or galvanized), brass or copper pipe; or seamless copper, brass, steel or aluminum tubing. All piping or tubing shall be suitable for a working pressure of not less than 125 pounds per square inch. Copper tubing may be of the standard grade K or L, or equivalent and shall have a minimum wall thickness of 0.032 inches. Aluminum tubing shall not be used in exterior locations or where it is in contact with masonry or plaster walls or insulation.

(2) In systems where the gas in liquid form without pressure reduction enters the building (see section Ind 9.12) only heavy walled seamless brass or copper tubing with an internal diameter not greater than 3/32 inch, and a wall thickness of not less than 3/64 inch shall be used. This requirement shall not apply to research and experimental laboratories, buildings or separate fire divisions of buildings used exclusively for housing internal combustion engines, and to commercial gas plants or bulk stations where containers are charged, nor to industrial vaporizer buildings.

(3) Pipe joints may be screwed, flanged, welded, soldered or brazed with a material having a melting point exceeding 1000° F. Joints on seamless copper, brass, steel or non-ferrous gas tubing shall be made by means of approved gas tubing fittings, soldered or brazed with a material having a melting point exceeding 1000° F.

(4) For operating pressures of 125 psig or less, fittings shall be designed for a pressure of at least 125 psig, except for tank truck requirements, as provided in section Ind 9.53 (2). For operating pressures above 125 psig, fittings shall be designed for a minimum of 250 psig.

(5) The use of threaded cast iron pipe fittings such as ells, tees, crosses, couplings and unions is prohibited.

(6) Strainers, regulators, meters, compressors, pumps, etc., are not to be considered as pipe fittings. This does not prohibit the use of malleable, nodular or higher strength gray iron for such equipment.

(7) All materials such as valve seats, packing, gaskets, diaphragms, etc., shall be of such quality as to be resistant to the action of liquefied petroleum gas under the service conditions to which they are subjected.

horizontally away from any opening into the building below the level of such discharge.

(e) On a container having a water capacity greater than 2,000 gallons, the discharge from the safety relief valves shall be vented away from the container vertically upwards to a point at least 7 feet above the container, and unobstructed to the open air in such a manner as to prevent any impingement of escaping gas upon the container; loose fitting rain caps shall be used. Suitable provision shall be made so that any liquid or condensate that may accumulate inside of the relief valve or its discharge pipe will not render the valve inoperative. If a drain is used, a means shall be provided to protect the container, adjacent containers, piping or equipment against impingement of flame resulting from ignition of product escaping from the drain. (See section Ind 9.09 (9))

(3) UNDERGROUND CONTAINERS. On all containers, which are installed underground and which contain no liquid fuel until buried and covered, the rate of discharge of spring-loaded relief valve installed thereon may be reduced to a minimum of 30% of the specified rate of discharge in appendix A. Containers so protected shall not be uncovered after installation until the liquid fuel has been removed therefrom. Containers which may contain liquid fuel before being installed underground and before being completely covered with earth are to be considered aboveground containers when determining the rate of discharge requirement of the relief valves.

(4) UNDERGROUND CONTAINERS; MORE THAN 2,000 GALLONS WATER CAPACITY. On underground containers of more than 2,000 gallons water capacity, the discharge from safety relief devices shall be piped vertically and directly upward to a point at least 7 feet above the ground.

(a) Where there is a probability of the manhole or housing becoming flooded, the discharge from regulator vent lines shall be above the highest probable water level. All manholes or housings shall be provided with ventilated louvers or their equivalent, the area of such openings equalling or exceeding the combined discharge areas of the safety relief valves and other vent lines which discharge their content into the manhole housing.

(5) VAPORIZERS. Safety devices for vaporizers shall be provided as follows:

(a) Vaporizers of less than one quart total capacity, heated by the ground or the surrounding air, need not be equipped with safety relief valves provided that adequate tests certified by any of the authorities listed in section Ind 9.02 demonstrate that the assembly is safe without safety relief valves.

(b) No vaporizer shall be equipped with fusible plugs.

(c) In industrial and gas manufacturing plants, safety relief valves on vaporizers within a building shall be piped to a point outside the building and be discharged upward.

History: Cr. Register, May, 1961, No. 65, eff. 6-1-61.

Ind 9.34 Reinstallation of containers. Containers installed underground may be reinstalled underground or aboveground if they do not show evidence of harmful external corrosion or other damage. Where containers are re-installed underground, the corrosion-resistant coat-

ing shall be put in good condition. (See sections Ind 9.36 (4) and Ind 9.33 for relief valve requirements.) Where containers are reinstalled aboveground, the requirements for safety devices and gauging devices shall comply with section Ind 9.16 and section Ind 9.33 respectively for aboveground containers.

History: Cr. Register, May, 1961, No. 65, eff. 6-1-61.

Ind 9.35 Capacity of liquid containers. A storage container shall not exceed 90,000 gallons water capacity.

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Ind 9.36 Installation of storage containers. (1) Containers installed aboveground except as provided in section Ind 9.36 (6) shall be provided with substantial masonry or non-combustible structural supports on firm masonry foundation.

(2) Aboveground containers shall be supported as follows:

(a) Horizontal containers shall be mounted on saddles in such a manner as to permit expansion and contraction. Every container shall be so supported as to prevent the concentration of excessive loads on the supporting portion of the shell. Structural metal supports may be employed when they are protected against fire in an approved manner. Suitable means of preventing corrosion shall be provided on that portion of the container in contact with the foundations or saddles.

(b) Containers of 1,200 gallons water capacity or less may be installed with non-fireproofed ferrous metal supports if mounted on concrete pads or footings, and if the distance from the outside bottom of the container shell to the ground does not exceed 24 inches.

(3) Any container may be installed with non-fireproofed ferrous metal supports if mounted on concrete pads or footings, and if the distance from the outside bottom of the container to the ground does not exceed 5 feet, provided the container is in an isolated location and such installation is approved by the industrial commission of Wisconsin.

(4) Containers buried underground shall be placed so that the top of container is not less than 6 inches below grade. Where an underground container might be subject to abrasive action or physical damage due to vehicular traffic or other causes, then it shall be:

(a) Placed not less than 2 feet below grade, or

(b) Otherwise protected against physical damage. It will not be necessary to cover the portion of the container to which manhole and other connections are affixed; however, where necessary, protection shall be provided against vehicular damage. When necessary to prevent floating, containers shall be securely anchored or weighted.

(c) Containers may be partially buried provided the following requirements are met:

1. The portion of the container below the surface and for a vertical distance not less than 3 inches above the surface of the ground is protected to resist corrosion, and the container is protected against settling and corrosion as required for fully buried containers. (See section Ind 9.36 (5).)

2. Spacing requirements shall be as specified for underground tanks in section Ind 9.05 (2).

3. Relief valve capacity shall be as required for aboveground containers.