

WAC 296-24-47509 Systems utilizing containers other than DOT containers. (1) **Application.** This section applies specifically to systems utilizing storage containers other than those constructed in accordance with DOT specifications. WAC 296-24-47505 of this section applies to this section unless otherwise noted in WAC 296-24-47505.

(2) **Design pressure and classification of storage containers.** You must design and classify containers in accordance with Table H-31.

(3) **Container valves and accessories, filler pipes, and discharge pipes.**

(a) You must not locate the filling pipe inlet terminal inside a building. For containers with a water capacity of 125 gallons or more, you must locate such terminals not less than 10 feet from any building (see WAC 296-24-47505 (6)(b)), and preferably not less than 5 feet from any driveway, and you must locate them in a protective housing built for the purpose.

TABLE H-31

Container type	For gases with vapor press. Not to exceed lb. per sq. in. gage at 100°F (37.8°C.)	Minimum design pressures of container lb. per sq. in. gage	
		1949 and earlier editions of ASME Code (Par. U-68 U-69)	1949 edition of Code (Par. U-200, U-201); 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of ASME Code; All editions of API-ASME Code ³
80 ¹	80 ¹	80 ¹	100 ¹
100	100	100	125
125	125	125	156
150	150	150	187
175	175	175	219
200 ²	215	200	250

¹ New storage containers of the 80 type have not been authorized since Dec. 31, 1947.
² Container type may be increased by increments of 25. The minimum design pressure of containers must be 100% of the container type designations when constructed under 1949 or earlier editions of the ASME Code (Par. U-68 and U-69). The minimum design pressure of containers must be 125% of the container type designation when constructed under: (1) The 1949 ASME Code (Par. U-200 and U-201), (2) 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of the ASME Code, and (3) all editions of the API-ASME Code.
³ Construction of containers under the API-ASME Code is not authorized after July 1, 1961.

(b) You must fit the filling connection with one of the following:

- (i) Combination back-pressure check valve and excess flow valve.
- (ii) One double or two single back-pressure check valves.
- (iii) A positive shut-off valve in conjunction with either:
 - (A) An internal back pressure valve, or
 - (B) An internal excess flow valve.

(c) You must equip all openings in a container with approved automatic excess flow valves except in the following: Filling connections as provided in (3)(b) of this section; safety relief connections, liquid-level gaging devices as provided in WAC 296-24-47505 (7)(d), (19)(c) and (19)(h); pressure gage connections as provided in WAC 296-24-47505 (7)(e), as provided in (3)(d), (f) and (g) of this section.

(d) An excess flow valve is not required in the withdrawal service line providing the following are complied with:

(i) Such systems' total water capacity does not exceed 2,000 U.S. gallons.

(ii) The discharge from the service outlet is controlled by a suitable manually operated shut-off valve which is:

(A) Threaded directly into the service outlet of the container; or

(B) Is an integral part of a substantial fitting threaded into or on the service outlet of the container; or

(C) Threaded directly into a substantial fitting threaded into or on the service outlet of the container.

(iii) The shut-off valve is equipped with an attached handwheel or the equivalent.

(iv) The controlling orifice between the contents of the container and the outlet of the shut-off valve does not exceed 5/16 inch in diameter for vapor withdrawal systems and one-eighth inch in diameter for liquid withdrawal systems.

(v) An approved pressure-reducing regulator is directly attached to the outlet of the shut-off valve and is rigidly supported, or that an approved pressure-reducing regulator is attached to the outlet of the shut-off valve by means of a suitable flexible connection, provided the regulator is adequately supported and properly protected on or at the tank.

(e) You must label all inlet and outlet connections except safety relief valves, liquid level gaging devices and pressure gauges on containers of 2,000 gallons water capacity, or more, and on any container used to supply fuel directly to an internal combustion engine, to designate whether they communicate with vapor or liquid space. Labels may be on valves.

(f) In lieu of an excess flow valve openings may be fitted with a quick-closing internal valve which, except during operating periods must remain closed. The internal mechanism for such valves may be provided with a secondary control which must be equipped with a fusible plug (not over 220°F melting point) which will cause the internal valve to close automatically in case of fire.

(g) You must not permit more than 2 plugged openings on a container of 2,000 gallons or less water capacity.

(h) You must provide containers of 125 gallons water capacity or more manufactured after July 1, 1961, with an approved device for liquid evacuation, the size of which must be 3/4 inch national pipe thread minimum. A plugged opening will not satisfy this requirements.

(4) Safety devices.

(a) All safety devices must comply with the following:

(i) You must locate all container safety relief devices on the containers and they must have direct communication with the vapor space of the container.

(ii) In industrial and gas manufacturing plants, discharge pipe from safety relief valves on pipe lines within a building must discharge vertically upward and must be piped to a point outside a building.

(iii) You must locate safety relief device discharge terminals so as to provide protection against physical damage and you must fit such discharge pipes with loose raincaps. You must not permit return bends and restrictive pipefittings.

(iv) If desired, discharge lines from two or more safety relief devices located on the same unit, or similar lines from two or more different units, may be run into a common discharge header, provided that the cross-sectional area of such header be at least equal to the

sum of the cross-sectional area of the individual discharge lines, and that the setting of safety relief valves are the same.

(v) You must provide each storage container of over 2,000 gallons water capacity with a suitable pressure gauge.

(vi) You must equip a final stage regulator of an LP-gas system (excluding any appliance regulator) on the low-pressure side with a relief valve which is set to start to discharge within the limits specified in Table H-30.

(vii) When a regulator or pressure relief valve is installed inside a building, the relief valve and the space above the regulator and relief valve diaphragms must be vented to the outside air with the discharge outlet located not less than 3 feet horizontally away from any opening into the building which is below such discharge. (These provisions do not apply to individual appliance regulators when protection is otherwise provided. In buildings devoted exclusively to gas distribution purposes, the space above the diaphragm need not be vented to the outside.)

(b) You must provide safety devices for aboveground containers as follows:

(i) Containers of 1,200 gallons water capacity or less which may contain liquid fuel when installed above ground must have the rate of discharge required by WAC 296-24-47505 (10)(b) provided by a spring-loaded relief valve or valves. In addition to the required spring-loaded relief valve(s) suitable fuse plug(s) may be used provided the total discharge area of the fuse plug(s) for each container does not exceed 0.25 square inch.

(ii) The fusible metal of the fuse plugs must have a yield temperature of 208°F minimum and 220°F maximum. Relief valves and fuse plugs must have direct communication with the vapor space of the container.

(iii) On a container having a water capacity greater than 125 gallons, but not over 2,000 gallons, the discharge from the safety relief valves must be vented away from the container vertically upwards and unobstructed to the open air in such a manner as to prevent any impingement of escaping gas upon the container; you must use loose-fitting rain caps. You must make suitable provision for draining condensate which may accumulate in the relief valve or its discharge pipe.

(iv) On containers of 125 gallons water capacity or less, the discharge from safety relief devices must be located not less than 5 feet horizontally away from any opening into the building below the level of such discharge.

(v) On a container having a water capacity greater than 2,000 gallons, the discharge from the safety relief valves must 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; you must use loose-fitting rain caps. You must make suitable provision so that any liquid or condensate that may accumulate inside of the safety relief valve or its discharge pipe will not render the valve inoperative. If a drain is used, you must provide a means to protect the container, adjacent containers, piping, or equipment against impingement of flame resulting from ignition of product escaping from the drain.

(c) On all containers which are installed underground and which contain no liquid fuel until buried and covered, the rate of discharge of the spring-loaded relief valve installed thereon may be reduced to a minimum of 30% of the rate of discharge specified in WAC

296-24-47505 (10) (b). You must not uncover containers so protected 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.

(d) On underground containers of more than 2,000 gallons water capacity, the discharge from safety relief devices must be piped vertically and directly upward to a point at least 7 feet above the ground.

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

(e) You must provide safety devices for vaporizers as follows:

(i) Vaporizers of less than 1 quart total capacity, heated by the ground or the surrounding air, need not be equipped with safety relief valves provided that adequate tests certified by any of the authorities referred to in WAC 296-24-47505(2), demonstrate that the assembly is safe without safety relief valves.

(ii) You must not equip any vaporizer with fusible plugs.

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

(5) **Reinstallation of containers.** Containers may be reinstalled if they do not show any evidence of harmful external corrosion or other damage. Where containers are reinstalled underground, you must put the corrosion resistant coating in good condition (see (7)(f) of this section). Where containers are reinstalled above ground, the safety devices and gaging devices must comply with (4) of this section and WAC 296-24-47505(19) respectively for aboveground containers.

(6) **Capacity of containers.** A storage container must not exceed 90,000 gallons water capacity.

(7) **Installation of storage containers.**

(a) You must provide containers installed above ground, except as provided in (7)(g) of this section, with substantial masonry or non-combustible structural supports on firm masonry foundation.

(b) Aboveground containers must be supported as follows:

(i) You must mount horizontal containers on saddles in such a manner as to permit expansion and contraction. Structural metal supports may be employed when they are protected against fire in an approved manner. You must provide suitable means of preventing corrosion on that portion of the container in contact with the foundations or saddles.

(ii) Containers of 2,000 gallons water capacity or less may be installed with nonfireproofed ferrous metal supports if mounted on concrete pads or footings, and if the distance from the outside bottom of the container shell to the concrete pad, footing, or the ground does not exceed 24 inches.

(c) Any container may be installed with nonfireproofed 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.

(d) Containers may be partially buried providing the following requirements are met:

(i) 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.

(ii) Spacing requirements must be as specified for underground tanks in WAC 296-24-47505 (6) (b).

(iii) Relief valve capacity must be as required for aboveground containers.

(iv) Container is located so as not to be subject to vehicular damage, or is adequately protected against such damage.

(v) Filling densities must be as required for aboveground containers as specified in Table H-27. See WAC 296-24-47505.

(e) You must place containers buried underground so that the top of the 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 you must:

(i) Place it not less than 2 feet below grade, or

(ii) Otherwise protect it against such 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, you must provide protection against vehicular damage. When necessary to prevent floating, you must securely anchor or weight containers.

(f) You must give containers a protective coating before being placed underground. This coating must be equivalent to hot-dip galvanizing or to two coatings of red lead followed by a heavy coating of coal tar or asphalt. In lowering the container into place, you must exercise care to prevent damage to the coating. You must repair any damage to the coating before backfilling.

You must set containers on a firm foundation (firm earth may be used) and surrounded with earth or sand firmly tamped in place. Backfill should be free of rocks or other abrasive materials.

(g) You must design, install, and use containers with foundations attached (portable or semiportable containers with suitable steel "runners" or "skids" and popularly known in the industry as "skid tanks") in accordance with these rules subject to the following provisions:

(i) If they are to be used at a given general location for a temporary period not to exceed 6 months they need not have fire-resisting foundations or saddles but must have adequate ferrous metal supports.

(ii) You must not locate them with the outside bottom of the container shell more than 5 feet above the surface of the ground unless fire-resisting supports are provided.

(iii) The bottom of the skids must not be less than 2 inches or more than 12 inches below the outside bottom of the container shell.

(iv) You must protect flanges, nozzles, valves, fittings, and the like, having communication with the interior of the container, against physical damage.

(v) When not permanently located on fire-resisting foundations, piping connections must be sufficiently flexible to minimize the possibility of breakage or leakage of connections if the container settles, moves, or is otherwise displaced.

(vi) You must secure skids, or lugs for attachment of skids, to the container in accordance with the code or rules under which the

container is designed and built (with a minimum factor of safety of four) to withstand loading in any direction equal to four times the weight of the container and attachments when filled to the maximum permissible loaded weight.

(h) Where necessary you must make field welding only on saddle plates or brackets which were applied by the manufacturer of the tank.

(i) For aboveground containers, you must provide secure anchorage or adequate pier height against possible container flotation wherever sufficiently high floodwater might occur.

(j) When permanently installed containers are interconnected, you must make provisions to compensate for expansion, contraction, vibration, and settling of containers, and interconnecting piping. Where flexible connections are used, they must be of an approved type and must be designed for a bursting pressure of not less than five times the vapor pressure of the product at 100°F. The use of nonmetallic hose is prohibited for permanently interconnecting such containers.

(k) Container assemblies listed for interchangeable installation above ground or under ground must conform to the requirements for aboveground installations with respect to safety relief capacity and filling density. For installation above ground all other requirements for aboveground installations must apply. For installation under ground all other requirements for underground installations must apply.

(8) Protection of container accessories.

(a) You must protect valves, regulating, gaging, and other container accessory equipment against tampering and physical damage. You must also protect such accessories during the transit of containers intended for installation underground.

(b) On underground or combination aboveground-underground containers, the service valve handwheel, the terminal for connecting the hose, and the opening through which there can be a flow from safety relief valves must be at least 4 inches above the container and this opening must be located in the dome or housing. You must install underground systems so that all the above openings, including the regulator vent, are located above the normal maximum water table.

(c) You must locate all connections to the underground containers within a substantial dome, housing, or manhole and with access thereto protected by a substantial cover.

(9) Drips for condensed gas. Where vaporized gas on the low-pressure side of the system may condense to a liquid at normal operating temperatures and pressures, you must provide suitable means for re-vaporization of the condensate.

(10) Damage from vehicles. When damage to LP-gas systems from vehicular traffic is a possibility, you must take precautions against such damage.

(11) Pits and drains. Every effort should be made to avoid the use of pits, except pits fitted with automatic flammable vapor detecting devices. You must not direct any drains or blowoff lines into or in proximity to sewer systems used for other purposes.

(12) General provisions applicable to systems in industrial plants (of 2,000 gallons water capacity and more) and to bulk filling plants.

(a) When standard watch service is provided, it must be extended to the LP-gas installation and personnel properly trained.

(b) If loading and unloading are normally done during other than daylight hours, you must provide adequate lights to illuminate storage containers, control valves, and other equipment.

(c) You must provide suitable roadways or means of access for extinguishing equipment such as wheeled extinguishers or fire department apparatus.

(d) To minimize trespassing or tampering, you must enclose the area which includes container appurtenances, pumping equipment, loading and unloading facilities, and cylinder-filling facilities with at least a 6-foot-high industrial type fence unless otherwise adequately protected. There must be at least 2 means of emergency access.

(13) Container-charging plants.

(a) You must locate the container-charging room not less than:

(i) 10 feet from bulk storage containers.

(ii) 25 feet from line of adjoining property which may be built upon.

(b) You must locate the tank truck filling station outlets not less than:

(i) 25 feet from line of adjoining property which may be built upon.

(ii) 10 feet from pumps and compressors if housed in one or more separate buildings.

(c) The pumps or compressors may be located in the container-charging room or building, in a separate building, or outside of buildings. When housed in separate building, such building (a small noncombustible weather cover is not to be construed as a building) must be located not less than:

(i) 10 feet from bulk storage tanks.

(ii) 25 feet from line of adjoining property which may be built upon.

(iii) 25 feet from sources of ignition.

(d) When a part of the container-charging building is to be used for a boiler room or where open flames or similar sources of ignition exist or are employed, you must separate the space to be so occupied from container charging room by a partition wall or walls of fire-resistant construction continuous from floor to roof or ceiling. Such separation walls must be without openings and must be joined to the floor, other walls, and ceiling or roof in a manner to effect a permanent gas-tight joint.

(e) Electrical equipment and installations must conform with WAC 296-24-47505 (17) and (18).

(14) Fire protection.

(a) You must provide each bulk plant with at least one approved portable fire extinguisher having a minimum rating of 12-B, C.

Note: For additional requirements relating to portable fire extinguishers see WAC 296-800-300.

(b) In industrial installations involving containers of 150,000 gallons aggregate water capacity or more, you must make provisions for an adequate supply of water at the container site for fire protection in the container area, unless other adequate means for fire control are provided. Water hydrants must be readily accessible and so spaced as to provide water protection for all containers. You must provide sufficient lengths of firehose at each hydrant location on a hose cart, or other means provided to facilitate easy movement of the hose in the container area. It is desirable to equip the outlet of each hose line with a combination fog nozzle. You must provide a shelter to protect the hose and its conveyor from the weather.

(15) **Painting.** You must keep aboveground containers properly painted.

(16) **Lighting.** Electrical equipment and installations must conform to WAC 296-24-47505 (17) and (18).

(17) **Vaporizers for internal combustion engines.** The provisions of WAC 296-24-47511(8) apply.

(18) **Gas regulating and mixing equipment for internal combustion engines.** The provisions of WAC 296-24-47511(9) apply.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. WSR 15-24-100, § 296-24-47509, filed 12/1/15, effective 1/5/16. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. WSR 01-17-033, § 296-24-47509, filed 8/8/01, effective 9/1/01; Order 73-5, § 296-24-47509, filed 5/9/73 and Order 73-4, § 296-24-47509, filed 5/7/73.]