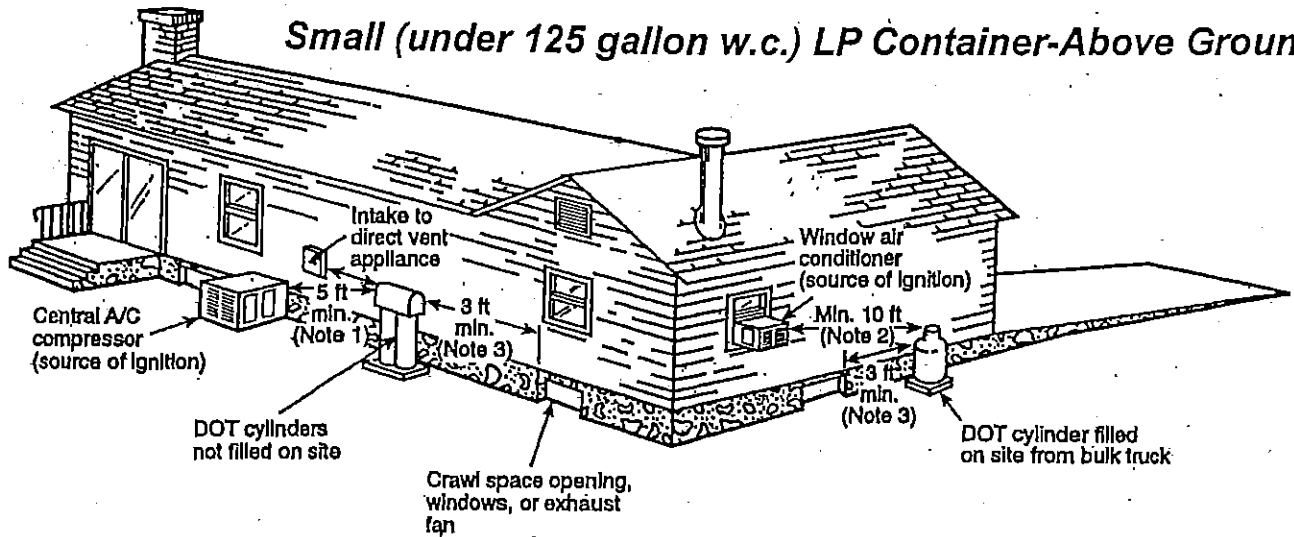


Appendix I Container Spacing

This Appendix is not a part of the requirements of this NFPA document but is included for informational purposes only.

Small (under 125 gallon w.c.) LP Container-Above Ground



Note 1: 5-ft minimum from relief valve in any direction away from any exterior source of ignition, openings into direct vent appliances, or mechanical ventilation air intakes. Refer to Note (b) (1) under Table 3-2.2.2.

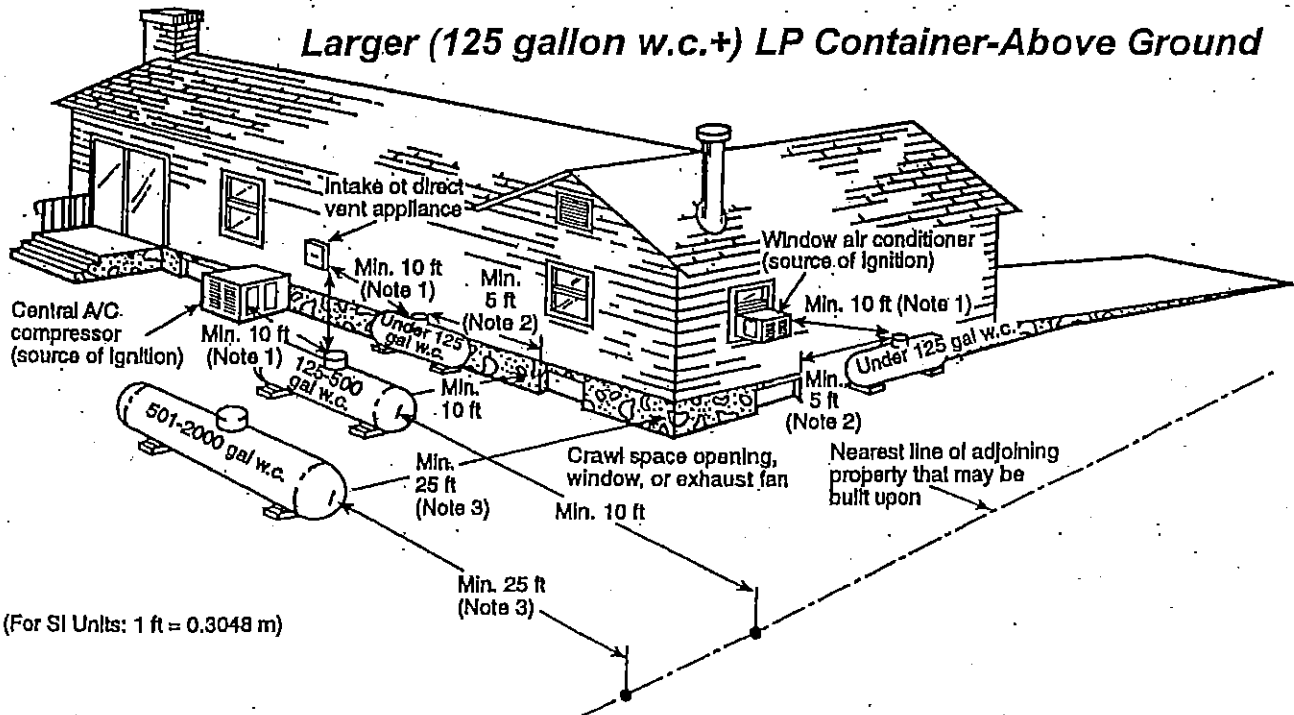
Note 2: If the DOT cylinder is filled on site from a bulk truck, the filling connection and vent valve must be at least 10 ft from any exterior source of ignition, openings into direct-vent appliances, or mechanical ventilation air intakes. Refer to Note (b) (3) under Table 3-2.2.2.

(For SI units: 1 ft = 0.3048 m)

Note 3: Refer to Note (b) (1) under Table 3-2.2.2.

Figure I-1 DOT cylinders.
(This figure for illustrative purposes only; text shall govern.)

Larger (125 gallon w.c.+) LP Container-Above Ground



(For SI Units: 1 ft = 0.3048 m)

Note 1: Regardless of its size, any ASME tank filled on site must be located so that the filling connection and fixed liquid level gauge are at least 10 ft from any external source of ignition (i.e., open flame, window A/C, compressor, etc.), intake to direct vented gas appliance or intake to a mechanical ventilation system. Refer to Note (b) (3) under Table 3-2.2.2.

Note 2: Refer to Note (b) (2) under Table 3-2.2.2.

Note 3: This distance may be reduced to no less than 10 ft (3 m) for a single container of 1,200-gal (4.5-m³) water capacity or less provided such container is at least 25 ft (7.6 m) from any other LP-Gas container of more than 125-gal (0.5-m³) water capacity. Refer to Note (c) under Table 3-2.2.2.

Figure I-2 Aboveground ASME containers.
(This figure for illustrative purposes only; text shall govern.)

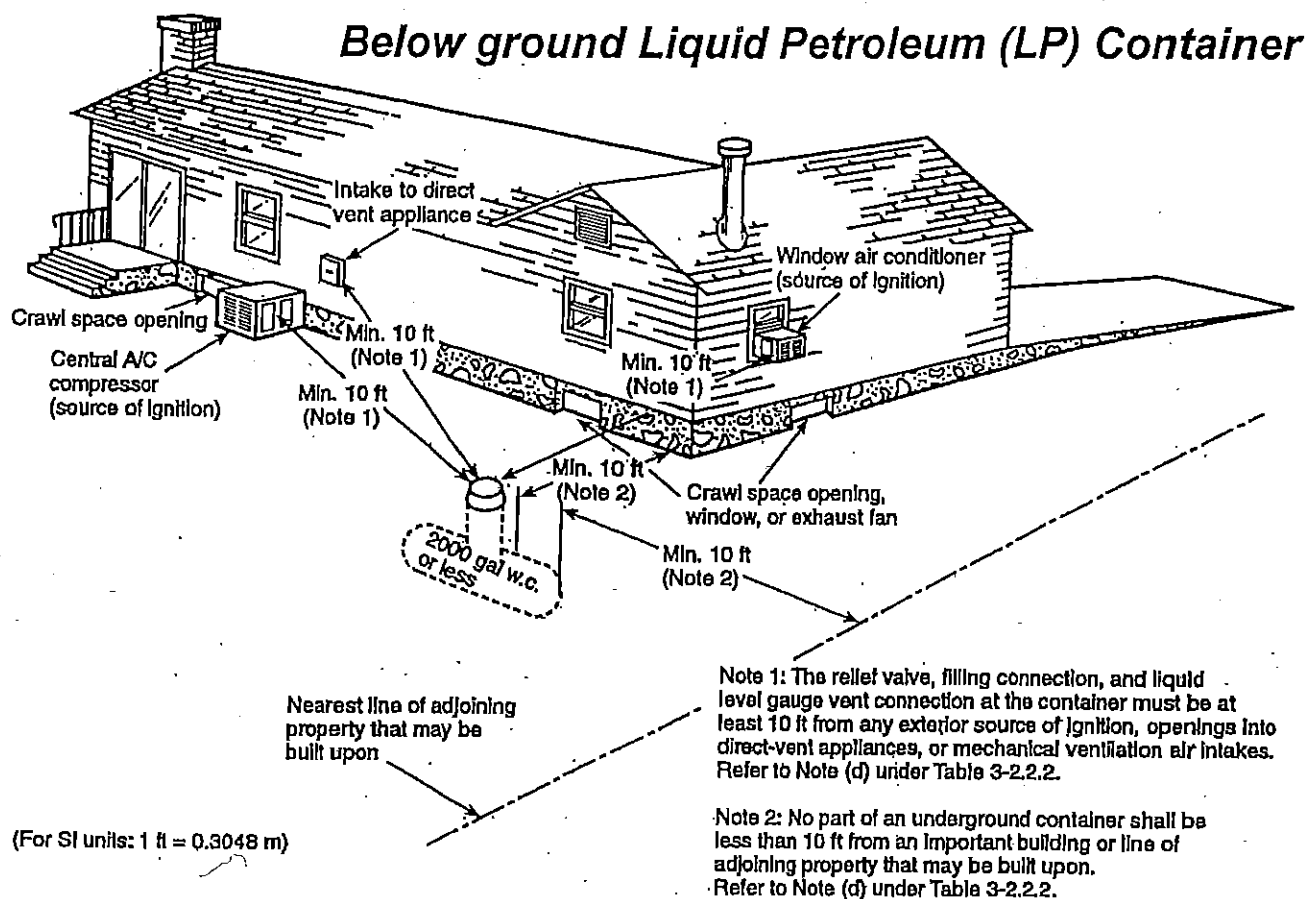


Figure I-3 Underground ASME containers.
(This figure for illustrative purposes only; text shall govern.)

Appendix J Referenced Publications

J-1 The following documents or portions thereof are referenced within this standard for informational purposes only and thus are not considered part of the requirements of this document. The edition indicated for each reference is the current edition as of the date of the NFPA issuance of this document.

J-1.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

NFPA 10, *Standard for Portable Fire Extinguishers*, 1994 edition.

NFPA 37, *Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines*, 1994 edition.

NFPA 50, *Standard for Bulk Oxygen Systems at Consumer Sites*, 1990 edition.

NFPA 50A, *Standard for Gaseous Hydrogen Systems at Consumer Sites*, 1994 edition.

NFPA 51, *Standard for the Design and Installation of Oxygen-Fuel Gas Systems for Welding, Cutting, and Allied Processes*, 1992 edition.

NFPA 61B, *Standard for the Prevention of Fires and Explosions in Grain Elevators and Facilities Handling Bulk Raw Agricultural Commodities*, 1989 edition.

NFPA 68, *Guide for Venting of Deflagrations*, 1994 edition.

NFPA 77, *Recommended Practice on Static Electricity*, 1993 edition.

NFPA 80, *Standard for Fire Doors and Fire Windows*, 1992 edition.

NFPA 220, *Standard on Types of Building Construction*, 1992 edition.

NFPA 251, *Standard Methods of Fire Tests of Building Construction and Materials*, 1990 edition.

NFPA 252, *Standard Methods of Fire Tests of Door Assemblies*, 1995 edition.

NFPA 321, *Standard on Basic Classification of Flammable and Combustible Liquids*, 1991 edition.

NFPA 780, *Lightning Protection Code*, 1992 edition.

J-1.2 API Publications. American Petroleum Institute, 2101 L St., NW, Washington, DC 20037.

API 620, *Design and Construction of Large, Welded, Low-Pressure Storage Tanks*, 1990.

API 1632, *Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems*, 1983.

API 2510, *Design and Construction of LP-Gas Installations*, 1989.

API-ASME Code for Unfired Pressure Vessels for Petroleum Liquids and Gases.

Table 3-2.2.2

Water Capacity Per Container Gallons (m ³)	Minimum Distances		
	Mounded or Underground Containers [Note (d)]	Aboveground Containers [Note (f)]	Between Containers [Note (e)]
Less than 125 (0.5) [Note (a)]	10 ft (3 m)	None [Note (b)]	None
125 to 250 (0.5 to 1.0)	10 ft (3 m)	10 ft (3 m)	None
251 to 500 (1.0 + to 1.9)	10 ft (3 m)	10 ft (3 m)	3 ft (1 m)
501 to 2,000 (1.9 + to 7.6)	10 ft (3 m)	25 ft (7.6 m) [Note (c)]	3 ft (1 m)
2,001 to 30,000 (7.6 + to 114)	50 ft (15 m)	50 ft (15 m)	5 ft (1.5 m)
30,001 to 70,000 (114 + to 265)	50 ft (15 m)	75 ft (23 m)	1/4 of sum of diameters of adjacent containers)
70,001 to 90,000 (265 + to 341)	50 ft (15 m)	100 ft (30 m)	
90,001 to 120,000 (341 + to 454)	50 ft (15 m)	125 ft (38 m)	
120,001 to 200,000 (454 to 757)		200 ft (61 m)	
200,001 to 1,000,000 (757 to 3 785)		300 ft (91 m)	
Over 1,000,000 (3 785)		400 ft (122 m)	

Notes to Table 3-2.2.2

Note (a): At a consumer site, if the aggregate water capacity of a multicontainer installation comprised of individual containers having a water capacity of less than 125 gal (0.5 m³) is 501 gal (1.9 + m³) or more, the minimum distance shall comply with the appropriate portion of this table, applying the aggregate capacity rather than the capacity per container. If more than one such installation is made, each installation shall be separated from any other installation by at least 25 ft (7.6 m). Do not apply the MINIMUM DISTANCES BETWEEN CONTAINERS to such installations.

Note (b): The following shall apply to aboveground containers installed alongside of buildings:

1. DOT specification containers shall be located and installed so that the discharge from the container pressure relief device is at least 3 ft (1 m) horizontally away from any building opening that is below the level of such discharge, and shall not be beneath any building unless this space is well ventilated to the outside and is not enclosed for more than 50 percent of its perimeter. The discharge from container pressure relief devices shall be located not less than 5 ft (1.5 m) in any direction away from any exterior source of ignition, openings into direct-vent (sealed combustion system) appliances, or mechanical ventilation air intakes.
2. ASME containers shall be located and installed so that the discharge from the container pressure relief device is at least 5 ft (1.5 m) horizontally away from any building opening that is below the level of such discharge, and not less than 10 ft (3 m) in any direction away from any exterior source of ignition, openings into direct-vent (sealed combustion system) appliances, or mechanical ventilation air intakes.
3. The filling connection and the vent from liquid level gauges on either DOT or ASME containers filled at the point of installation shall be not

less than 10 ft (3 m) in any direction away from any exterior source of ignition, openings into direct-vent (sealed combustion system) appliances, or mechanical ventilation air intakes.

Note (c): This distance may be reduced to not less than 10 ft (3 m) for a single container of 1,200 gal (4.5 m³) water capacity or less provided such container is at least 25 ft (7.6 m) from any other LP-Gas container of more than 125 gal (0.5 m³) water capacity.

Note (d): Minimum distances for underground containers shall be measured from the pressure relief device and filling or liquid level gauge vent connection at the container, except that no part of an underground container shall be less than 10 ft (3 m) from a building or line of adjoining property that may be built upon.

Note (e): Where underground multicontainer installations are made of individual containers having a water capacity of 125 gal (0.5 m³) or more, such containers shall be installed so as to permit access at their ends or sides to facilitate working with cranes or hoists.

Note (f): In applying the distance between buildings and ASME containers of 125 gal (0.5 m³) or more water capacity, a minimum of 50 percent of this horizontal distance shall also apply to all portions of the building that project more than 5 ft (1.5 m) from the building wall and that are higher than the relief valve discharge outlet. This horizontal distance shall be measured from a point determined by projecting the outside edge of such overhanging structure vertically downward to grade or other level upon which the container is installed. Under no conditions shall distances to the building wall be less than those specified in Table 3-2.2.2.

Exception to Note (f): Not applicable to installations in which overhanging structure is 50 ft (15 m) or more above the relief valve discharge outlet.

Table 3-2.2.4

Fire Protection Provided by	Maximum Number of Containers in One Group	Minimum Separation Between Groups—Feet
Hose streams only—see 3-10.2.3	6	50 (15 m)
Fixed monitor nozzles per 3-10.3.5*	6	25 (7.6 m)
Fixed water spray per 3-10.3.4*	9	25 (7.6 m)
Insulation per 3-10.3.1	9	25 (7.6 m)

*In the design of fixed water spray and fixed monitor nozzle systems, the area of container surface to be protected may reflect portion of containers not likely to be subject to fire exposure as determined by good fire protection engineering practices.

