



## Liquefied Petroleum Gas (LP gas)

Guidelines for storing, handling, transporting and using liquefied petroleum gas are outlined in the National Fire Protection Association (NFPA) code – NFPA 58: Liquefied Petroleum Gas Code, 2011 Edition.

### Characteristics of LP gas

LP gas under moderate pressure is a liquid but upon relief of the pressure is converted into a gaseous phase. LP gas is a mixture of propane and butane and may also contain small amounts of other additives. An additional chemical is added as an odorant so the gas can be detected in the event of a leak. LP gas is typically transported and stored in the liquid phase. A regulator is used to reduce the pressure of the LP gas from the storage tank into the LP gas lines.

LP gas is heavier than air so proper installation guidelines must be followed regarding ventilation and separation distances from potential sources of ignition. LP gas pressure will vary depending on the temperature. As the liquid is heated, more of the liquid is vaporized into a gas, raising the pressure within the storage container. Cooling of the liquid will lower the pressure within the container.

### LP gas systems equipment and appliances

Accessories and regulators used in LP gas systems must be designed for use with LP gas and must be resistant to the chemical actions of LP gas under normal service conditions. For more information on LP gas regulators please refer to Loss Control Bulletin, *Liquefied Petroleum Gas Regulators*, R-2.

Containers used for the storage of LP gas must be equipped with at least one pressure relief valve designed to relieve vapor pressure in the container.

Pressure gauges shall be attached directly to the container opening or to a valve or fitting directly

attached to the container opening.

Shut-off valves shall be located as close to the container as possible and shall be readily accessible for operation and maintenance during normal and emergency conditions.

Piping shall be wrought iron or steel (black or galvanized), brass, copper, polyamide, or polyethylene.

Tubing shall be steel, stainless steel, brass, copper, polyamide, or polyethylene.

Hose, hose connections and flexible connectors shall be fabricated from materials that are resistant to the chemical action of LP gas. If wire braid is used as reinforcement, it must be made of a corrosion-resistant material such as stainless steel.

### Installation of LP gas systems

LP gas containers shall be located outside of buildings unless they are specifically allowed to be located inside buildings. LP gas powered vehicles, industrial trucks and portable and stationary engine fuel systems are allowed inside buildings as long as they meet certain guidelines. For additional information refer to NFPA 58.6.2.2.

Separation distances between containers, important buildings and property lines shall be in accordance with the following table (NFPA Table 6.3.1):

#### Minimum Distances

Water Capacity (gallons)	Above Ground Containers (feet)	Between Containers (feet)	Under-ground Containers (feet)
<b>Under 125</b>	0	0	10
<b>125 to 250</b>	10	0	10
<b>251 to 500</b>	10	3	10
<b>501 to 2,000</b>	25	3	10
<b>2,001 to 30,000</b>	50	5	50

\* Please note: For containers above 30,000 gallons, there are additional separation distance requirements. See NFPA Table 6.3.1.

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Containers shall be mounted on a firm and level non-combustible base. Combustible materials including weeds and dry grass shall be separated from any container by a minimum distance of at least 10 feet. Containers shall be protected from damage by vehicles or other equipment.

LP gas containers shall not be stored within 20 feet of any aboveground tanks containing flammable and combustible liquids that have a flash point below 200 degrees Fahrenheit.

The cover for LP gas controls on containers must be kept closed at all times to protect the controls from weather.

The point of discharge for a pressure relief device shall not be less than 5 feet from any source of ignition, openings into direct-vent appliances or mechanical ventilation air intakes.

Heaters used for temporary heating (such as in a building under construction or major renovation if unoccupied by the public) shall be located at least 6 feet from any cylinder, unless the heater was designed for the attachment of the heater to the cylinder.

The transfer of LP-Gas from one container to another shall not be performed within 50 feet of any potential source of ignition.

## Underground containers

No part of an underground container shall be less than 10 feet from a building or property line. Underground containers shall not be located

under a building or under an area of vehicular traffic (such as a driveway).

Underground containers must have a protective coating to protect the shell from the destructive elements of soil. The backfill around the container must be a material that will not damage the protective coating.

Underground containers are subject to electrolysis, which can create holes in the shell of the tank. An anode bag should be attached to the container with a wire and then buried along with the container to provide cathodic protection.

## LP gas cylinders

Cylinders can only be installed aboveground and shall have a firm foundation or be firmly secured. Cylinders shall not be in contact with the soil.

Cylinders shall not be stored near exits, stairways or in areas normally used or intended to be used for the safe egress of occupants.

Empty cylinders that have been in service shall be considered full cylinders and shall be stored as if they were a full cylinder.

## Piping, tubing and flexible hoses

Flexible LP gas hoses must be used with hanging appliances unless the appliance can be secured to prevent any movement.

LP gas lines must be adequately supported and secured to prevent undue movement which could result in damage to the piping connections.

Flexible LP gas hoses must not pass through any walls, partitions, ceilings or floors, or be concealed from view. Damage to a hose hidden from view could lead to a leak and possible fire or explosion.

Flexible LP gas hoses shall not rest on or pass over the top of a heater. The hoses are combustible and need to be located the proper distance from the heater according to the manufacturer's guidelines.

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