Corona Fire Department

Liquefied Petroleum Gas
Guideline per 2016 California Fire Code

PURPOSE

The intent of this guideline is to provide the minimum standards necessary for the storage, use and handling of LP-gas and the installation of LP-gas equipment. Failure to comply with these standards shall be due cause for denial or revocation of required permits and filing for civil or criminal prosecution. The Fire Chief may waive any of these requirements upon receipt of alternate methods and materials that meet the intent of these standards.

SCOPE

This guideline shall apply to liquefied petroleum gas. For the purposes of clarity, the terms "liquefied petroleum gas(es)", "LP-Gas", and "LPG" are synonymous and shall mean any material having a vapor pressure not exceeding that allowed for commercial propane composed predominantly of the following hydrocarbons, either by themselves or as mixtures: propane, propylene, butane (normal butane or isobutane), and butylene (including isomers).

LPG is generally stored at normal room temperature and atmospheric pressure. LPG liquefies under moderate pressure, and vaporizes upon release of this pressure. It is this property that facilitates transporting and storage of LPG in a concentrated liquid form, and use in a vapor form (gas). LPG vapors are heavier than air.

GUIDELINES

A. PERMITS AND PLANS

1. Requirements are from the 2016 edition of the California Fire Code, Chapter 61, NFPA 58, and the Corona Municipal Code.
2. A permit is required for storage and use of LPG per CFC Chapter 1, Section 105.6.28.
3. A permit is required to install or modify LPG containers per CFC Chapter 1, Section 105.7.12.
4. For installation, applicant shall submit three (3) sets of plans, containing the following information, to the building department for review and approval.
    a. A site plan showing the number, location and capacities of container(s) in relation to property lines, buildings, and access roadways.
    b. The number of dispensing units or appliances.
    c. The amount of LPG stored in each container.
    d. The manufacturer and serial number of the container(s).[1],[2]
    e. The location and type of portable fire extinguishers.
    f. Emergency control information.
    g. A copy of training and safe handling information.
    h. Method of security and protection from vehicles.
5. Applicant shall provide the following information before a permit may be processed:

[1] Exception: Storage of portable containers of 1000 pounds or less, whether filled, partially filled or empty, at consumer sites or distribution points, and for resale by dealers or resellers.
[2] See requirements for "Storage of portable containers awaiting use or resale.

a. A completed CFC permit application

b. A copy of the plan, approved by the Fire Department

B. RECORDS

1. Installers shall maintain a record of installations for which a permit is not required, and shall have record available for inspection by the Corona Fire Department.

   a. Exception: Installation of gas-burning appliances and replacement of portable cylinders.

C. REQUIREMENTS AND LIMITATIONS

1. Storage of LPG in storage facilities and equipment having a storage capacity of two thousand gallons of water or less, shall be permitted in any zone of the City as defined in Title 17 of the Corona Municipal Code, if approved by the Fire Chief, and when a permit for the location has been issued by the Fire Prevention Division.
2. Storage of LPG in storage facilities and equipment having a storage capacity of two thousand gallons of water or more, shall be permitted only in the M-2 and M-3 zones, as defined in Title 17 of the Corona Municipal Code, if approved by the Fire Chief, and when a permit for the location has been issued by the Fire Prevention Division.
3. The storage and transportation of LPG and installation and maintenance of pertinent equipment shall be in accordance with CFC Chapter 61, NFPA 58, and subject to approval by the Chief.
4. Upon receipt of a written application for a permit to store liquefied petroleum gas, the Fire Prevention Division shall review the proposed location. If it makes a finding that such facilities would not constitute a danger to the public peace, health, safety and general welfare of the City, it may issue a permit to such facilities complying with any reasonable conditions for the safety of persons or property immediately surrounding the location.
5. Locations of containers with respect to property lines, buildings and public ways, shall meet the requirements of CFC 6104 and CFC Table 6104.3. Containers awaiting use or resale shall meet the requirements of CFC 6109 and CFC Table 6109.12.
6. Multiple container installations with a total storage water capacity of more than 180,000 gallons (150,000 LP-gas capacity), shall be subdivided into groups containing not more than 180,000 gallons and separated by a distance of not less than 50 feet, unless the tanks are protected with one of the following:

   a. Mounded in an approved manner,

   b. Protected with approved insulation on areas that are subject to impingement of ignited gas from pipelines or other leakage,

   c. Protected by firewalls of approved construction,

   d. Protected by an approved system for application of water as specified in NFPA 58, Table 6.4.2,

   e. Protected by other approved means.

   When one of these forms of protection is provided, the separation shall not be less than 25 feet between container groups.
7. Multiple container installations shall meet the requirements of CFC Section 6104.4 and NFPA 58, with respect to special hazards such as aboveground flammable/combustible liquid tanks, oxygen or gaseous hydrogen containers, flooding, electrical power lines, or combustible materials.
8. Dispensing of LP-gases shall be performed by a qualified attendant.
9. NO SMOKING signs shall be posted. Smoking within 25’ of a point of transfer, while filling operations are in progress, is prohibited, per CFC 6107.2.
10. Placarding of tanks in accordance with NFPA 704 is required.

11. Weeds, grass, brush, trash and other combustible materials shall be kept not less than 10' from tanks or containers.
12. LP-gas containers shall be protected from vehicular damage by crash posts in accordance with CFC Section 312.
    a. Crash posts are to be 6' in length; 4" in diameter.
    b. Posts shall be installed with 3' in the ground, encased in concrete.
    c. Posts are to be filled with concrete.
    d. Posts to be set a maximum of 48" on center, 3' from the tank shell. Where used for filling forklifts, crash posts may be required to be set closer together, or have curb protection provided. When forklifts are used, posts and/or curbs shall be 4' from the shell of the tank.
13. Fire Extinguishers complying with CFC Section 906 shall be provided as specified in NFPA 58.

D. ADDITIONAL REQUIREMENTS FOR STORAGE OF PORTABLE CONTAINERS FOR USE OR RESALE

1. Storage of portable containers of 1,000 pounds or less, whether filled, partially filled, or empty, at consumer sites or distribution points, and for resale by dealers shall meet the following requirements in accordance with CFC 6109.
2. Containers in storage shall be located in a manner to limit exposure to excessive temperature rise, physical damage and/or tampering.
3. Containers in storage having individual water capacity greater than 2 ½ pounds shall be positioned with the pressure-relief valve in direct communication with the vapor space of the container.
4. Containers stored in buildings shall not be located near exit-access doors, exits, stairways, or in areas normally used, or intended to be used, as a means of egress.
5. Empty containers shall be treated as full containers for the purpose of determining the maximum quantities of LP-gas allowed.
6. LPG containers shall not be stored on roofs.
7. LPG containers shall not be stored in basements or below grade. LPG containers shall not be stored in above-grade under floor spaces or basements unless such location is approved and provided with a means of adequate ventilation.
8. Container valves shall be protected by screw on caps or collars. Container outlet valves shall be closed or plugged.
9. Cylinders meeting DOT specifications and not exceeding 2 ½ pounds water capacity are allowed to be stored in a building open to the public. The quantity of LPG shall not exceed 200 pounds unless contained in a room used for gas manufacturing, and meeting CFC 6109.11.
10. The maximum quantity permitted in buildings not open to the public, such as industrial buildings, shall not exceed 735 pound water capacity (nominal 300 pounds of LPG). Multiple storage areas per building on the same floor shall be separated by 300'. Storage not meeting these limitations shall meet the requirements for gas manufacturing and CFC 6109.11.

E. CONTAINERS NOT IN SERVICE

1. Containers whose normal use has been temporarily discontinued shall:
    a. be disconnected from appliance piping,
    b. have container outlets, except relief valves, closed or plugged, and
    c. be positioned with the relief valve in direct communication with the container vapor space.
2. Containers permanently out of service shall be removed from the site.

F. LP-GAS TANK VEHICLES

1. LP-gas tank vehicles shall not be left unattended at any time on residential streets, or within 500' of a residential area, apartment or hotel complex, educational facility, hospital or care facility, or in any location determined to present an extreme life hazard.

TABLE 6104.3 LOCATION OF CONTAINERS

Container Capacity (water gallons)	Minimum separation between containers and buildings, public ways, or lines of adjoining property that can be built upon		Minimum separation between containers [2],[3] (feet)
	Mounded or Underground containers [1] (feet)	Aboveground containers [2]	
Less than 125 [3],[4]	10	5[5]	None
125 to 250	10	10	None
251 to 500	10	10	3
501 to 2,000	10	25[5], [6]	3
2,001 to 30,000	50	50	5
30,001 to 70,000	50	75	(0.25 of sum of diameters of adjacent containers)
70,001 to 90,000	50	100	
90,001 to 120,000	50	125	

[1] Minimum distance for underground containers shall be measured from the pressure-relief device and the filling or liquid level gauge vent connection at the container, except that all parts of an underground container shall be 10 feet or more from a building or line of adjoining property which can be built upon.

[2] For other than installations in which the overhanging structure is 50 feet or more above the relief-valve discharge outlet. In applying the distance between buildings and ASME containers with a water capacity of 125 gallons or more, a minimum of 50 percent of this horizontal distance shall apply to all portions of the building which project more than 5 feet from the building wall and which are higher than the relief discharge valve 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. Distances to the building wall shall not be less than those prescribed in this table.

[3] When underground multicontainer installations are comprised of individual containers having a water capacity of 125 gallons or more, such containers shall be installed so as to provide access at their ends or sides to facilitate working with cranes or hoists.

[4] 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 gallons, is 500 gallons or more, the minimum distance shall comply with the appropriate portion of Table 6104.3, applying the aggregate capacity per container. If more than one such installation is made, each installation shall be separated by at least 25'. Minimum distances between containers need not be applied.

[5]The following shall apply to aboveground containers installed alongside buildings:

1. Containers of less than a 125-gallon water capacity are allowed next to the building they serve when in compliance with items 2,3 and 4.
2. Department of Transportation specification containers shall be located and installed so that the discharge from the container pressure relief valve is at least 3' horizontally from building openings below the level of such discharge and shall not be beneath buildings unless the 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' from exterior sources of ignition, openings into direct vent (sealed combustion system) appliances, or mechanical ventilation air intakes.
3. ASME containers of less than 125-gallon water capacity shall be located and installed such that the discharge from pressure relief devices shall not terminate in or beneath buildings and shall be located at least 5' horizontally from building openings below the level of such discharge and not less than 5' from exterior sources of ignition, openings into direct vent (sealed combustion system) appliances, or mechanical ventilation air intakes.
4. The filling connection and the vent from liquid level gauges on either DOT or ASME containers filled at the point of installation shall not be less than 10' from exterior sources of ignition, openings into direct vent (sealed combustion system) appliances, or mechanical ventilation air intakes.

[6] This distance is allowed to be reduced to not less than 10' for a single container of 1,200-gallon water capacity or less, provided such container is at least 25' from other LP-gas containers of more than 125-gallon water capacity.

TABLE 6109.12 SEPARATION FROM EXPOSURES OF CONTAINERS AWAITING USE, RESALE OR EXCHANGE STORED OUTSIDE OF BUILDINGS FROM EXPOSURES

Quantity of LP-Gas stored (pounds)	MINIMUM SEPARATION DISTANCE FROM STORED CYLINDERS TO (feet):						
	Nearest important building or group of buildings or line of adjoining property that may be built upon	Line of adjoining property occupied by schools, places of worship, hospitals, athletic fields, or other places of public gathering; busy roads or sidewalks	LP-gas dispensing station	Doorway or opening to a building with two or more means of egress	Doorway or opening to a building with one means of egress	Combustible materials	Motor vehicle fuel dispensing
720 or less	0	0	5	5	10	10	20
721 – 2,500	0	10	10	5	10	10	20
2,501 – 6,000	10	10	10	10	10	10	20
6,001 – 10,000	20	20	20	20	20	10	20
Over 10,000	25	25	25	25	25	10	20