

**FIRE DEPARTMENT • CITY OF NEW YORK**



**STUDY MATERIAL FOR THE EXAMINATION FOR  
CERTIFICATE OF FITNESS  
FOR  
LPG/CNG**

<b>You must read the following:</b>	
<b>Definitions</b>	
<b>Part 1</b>	<ul style="list-style-type: none"><li>• Storage and Handling of LPG/CNG</li></ul>
<b>Part 8</b>	<ul style="list-style-type: none"><li>• Case Studies</li></ul>
<b>Part 9</b>	<ul style="list-style-type: none"><li>• Lithium-Ion Safety</li></ul>
<b>COF Part</b>	See below for specific exam

<b>COF</b>	<b>For:</b>	<b>Part</b>
<b>G-22</b>	<ul style="list-style-type: none"><li>• Use of LPG/CNG in Powered Industrial Truck Operations</li></ul>	<b>5</b>
<b>G-23</b>	<ul style="list-style-type: none"><li>• Use of LPG/CNG at Outdoors Events and Mobile Cooking</li><li>• Mobile cooking</li><li>• Use of LPG/CNG at Outdoors Events and Mobile Cooking</li></ul>	<b>3</b>
<b>G-24</b>	<ul style="list-style-type: none"><li>• Use of LPG/CNG in Emergency Indoor Repairs</li></ul>	<b>6</b>
<b>G-34</b>	<ul style="list-style-type: none"><li>• Use of LPG in Hot-Air Balloon</li></ul>	<b>7</b>
<b>G-36</b>	<ul style="list-style-type: none"><li>• Use of LPG/CNG in Manhole Operations</li><li>• Manhole heating</li></ul>	<b>4</b>
<b>G-40</b>	<ul style="list-style-type: none"><li>• Use and Handling Use of LPG/CNG for Tar Kettles, Asphalt Melter &amp; Marking Street Line</li><li>• Heating devices in roofing or street repair</li></ul>	<b>2</b>
<b>G-44</b>	<ul style="list-style-type: none"><li>• Storage and Handling of LPG/CNG</li></ul>	<b>1</b>

# TABLE OF CONTENTS

<b>EXAM SPECIFIC INFORMATION FOR.....</b>	<b>A</b>
<b>INTRODUCTION.....</b>	<b>2</b>
<b>PART 1. COMPRESSED GASES.....</b>	<b>8</b>
<b>1.1 HANDLING, USE, AND STORAGE OF COMPRESSED GAS.....</b>	<b>8</b>
<i>General Guidance.....</i>	<i>8</i>
<i>Related Equipment.....</i>	<i>13</i>
<i>Moving Compressed Gas Containers.....</i>	<i>14</i>
<i>Separation from hazardous conditions.....</i>	<i>15</i>
<b>1.2 GENERAL DESCRIPTION OF LIQUID PETROLEUM GAS (LPG).....</b>	<b>15</b>
<i>DESCRIPTION OF LIQUID PETROLEUM GAS.....</i>	<i>15</i>
<i>DESCRIPTION OF LPG CONTAINERS.....</i>	<i>16</i>
<b>1.3 USING LPG.....</b>	<b>18</b>
<i>Control Valve and Pressure Relief Valve.....</i>	<i>18</i>
<i>Regulator and Quick Release Connector.....</i>	<i>19</i>
<i>Excess Flow Check Valve.....</i>	<i>21</i>
<i>Regular Inspection.....</i>	<i>22</i>
<i>LPG Operation.....</i>	<i>22</i>
<i>Moving LPG.....</i>	<i>23</i>
<b>1.4 GENERAL DESCRIPTION OF COMPRESSED NATURAL GAS (CNG).....</b>	<b>23</b>
<b>1.5 CHECK FOR LEAKS.....</b>	<b>24</b>
<b>1.6 PORTABLE FIRE EXTINGUISHERS.....</b>	<b>26</b>
<i>Operation Instructions for a Fire Extinguisher.....</i>	<i>27</i>
<i>Fire Extinguishers.....</i>	<i>28</i>
<i>Typical Fire Extinguishers.....</i>	<i>29</i>
<i>Portable Fire Extinguisher (PFE) Tags.....</i>	<i>30</i>
<i>Portable Fire Extinguisher Inspections.....</i>	<i>31</i>
<b>1.7 INDOOR AND OUTDOOR STORAGE RULES.....</b>	<b>32</b>
<i>General Indoor Storage Rules.....</i>	<i>32</i>
<i>General Outdoor Storage Rules.....</i>	<i>34</i>
<b>1.8 CONSTRUCTION SITE USE &amp; STORAGE.....</b>	<b>36</b>
<b>PART 2. USE AND HANDLING USE OF LPG/CNG FOR TAR KETTLE, ASPHALT MELTER AND MARKING TRAFFIC LINES.....</b>	<b>39</b>
<b>2.1 FDNY PERMIT.....</b>	<b>39</b>
<b>2.2 TAR KETTLE.....</b>	<b>39</b>
<b>2.3 ASPHALT MELTER.....</b>	<b>41</b>
<i>Hot-mop roofing using asphalt.....</i>	<i>44</i>
<b>2.4 MARKING TRAFFIC LINE.....</b>	<b>45</b>
<b>2.5 FIRE SUPPRESSION.....</b>	<b>45</b>
<b>PART 3. LPG/CNG USED TO FUEL COOKING EQUIPMENT AT OUTDOORS EVENTS.....</b>	<b>46</b>
<b>3.1 MOBILE COOKING USES.....</b>	<b>46</b>
<b>3.2 COMMERCIAL ESTABLISHMENTS.....</b>	<b>48</b>
<b>3.3 STREET FAIRS AND SIMILAR OUTDOOR PUBLIC GATHERINGS.....</b>	<b>48</b>
<i>Deep fat fryers.....</i>	<i>49</i>
<b>3.4 FIRE SUPPRESSION.....</b>	<b>50</b>
<i>Mobile Cooking.....</i>	<i>50</i>
<i>Street Fairs and Similar Outdoor Gathering Events.....</i>	<i>50</i>
<b>PART 4. LPG/CNG USE IN MANHOLE OPERATIONS.....</b>	<b>51</b>
<b>PART 5. USE OF LPG/CNG IN POWERED INDUSTRIAL TRUCK OPERATIONS.....</b>	<b>54</b>
<b>5.1 LPG/CNG POWERED INDUSTRIAL TRUCK OPERATIONS.....</b>	<b>54</b>
<b>5.2 SPECIAL NOTES FOR FORKLIFT USING LPG CONTAINERS.....</b>	<b>55</b>
<b>PART 6. USE OF LPG/CNG IN EMERGENCY INDOOR REPAIRS.....</b>	<b>59</b>
<b>PART 7. USE OF LPG IN HOT AIR BALLOON.....</b>	<b>60</b>
<b>PART 8. CASE STUDIES.....</b>	<b>61</b>
<b>PART 9. LITHIUM-ION BATTERY SAFETY.....</b>	<b>64</b>

## EXAM SPECIFIC INFORMATION FOR

**G-22: Use of LPG/CNG in Powered Industrial Truck Operations**

**G-23: Use of LPG/CNG at Outdoors Events and Mobile Cooking**

**G-24: Use of LPG/CNG in Emergency Indoor Repair**

**G-34: Use of LPG in Hot-Air Balloon**

**G-36: Use of LPG/CNG in Manhole Operations**

**G-40: Storage, Use and Handling Use of LPG/CNG for Tar Kettles,  
Asphalt Melter and Marking Street Line**

**G-44: Storage and Handling of LPG/CNG**

***Applicants who submitted and paid online for an exam before arriving at the FDNY will not need to wait in line to enter the FDNY.***

***It can take about 30 minutes to complete. Completing application and paying online will eliminate waiting outside in the long lines.***

Simplified instructions for online application and payment can be found here:

<https://www1.nyc.gov/assets/fdny/downloads/pdf/business/fdny-business-cof-individuals-short.pdf>

Create an Account and Log in to:

<http://fires.fdnycloud.org/CitizenAccess/SAML/NYCIDLogin.aspx>

### **REQUIREMENTS FOR CERTIFICATE OF FITNESS APPLICATION**

#### **General requirements:**

Review the General Notice of Exam:

<http://www1.nyc.gov/assets/fdny/downloads/pdf/business/general-notice-of-exam-cof.pdf>

**Special requirements for the LPG Certificate of Fitness:** None

#### **Application fee (Cash is NO LONGER ACCEPTED):**

Pay the **\$25** application fee online or in person by one of the following methods:

- Credit card (*American Express, Discover, MasterCard, or Visa*)
- Debit card (*MasterCard or Visa*)
- In person: Personal or company check or money order (*made payable to the New York City Fire Department*)

A convenience fee of 2% will be applied to all credit card payments.

For fee waivers submit: ***(Only government employees who will use their COF for their work-related responsibilities are eligible for fee waivers.)***

- A letter requesting fee waiver on the Agency's official letterhead stating applicant full name, exam type and address of premises; **AND**
- Copy of identification card issued by the agency

## **REQUIREMENTS FOR ALTERNATIVE ISSUANCE PROCEDURE** **(AIP)**

The G-22 and G-44 certificate of fitness can be obtained by the alternative issuance procedure. Qualified applicants should review and complete the G-22 and G-44 Certificate of Fitness Alternative Issuance Procedure Application Affirmation Forms:

G-22 AIP:

<https://www1.nyc.gov/assets/fdny/downloads/pdf/business/cof-g22-aip.pdf>

G-44 AIP:

<https://www1.nyc.gov/assets/fdny/downloads/pdf/business/cof-g44-aip.pdf>

The AIP applicants must submit the application, required documents and payment on **FDNY Business**:

<https://fires.fdnyccloud.org/>

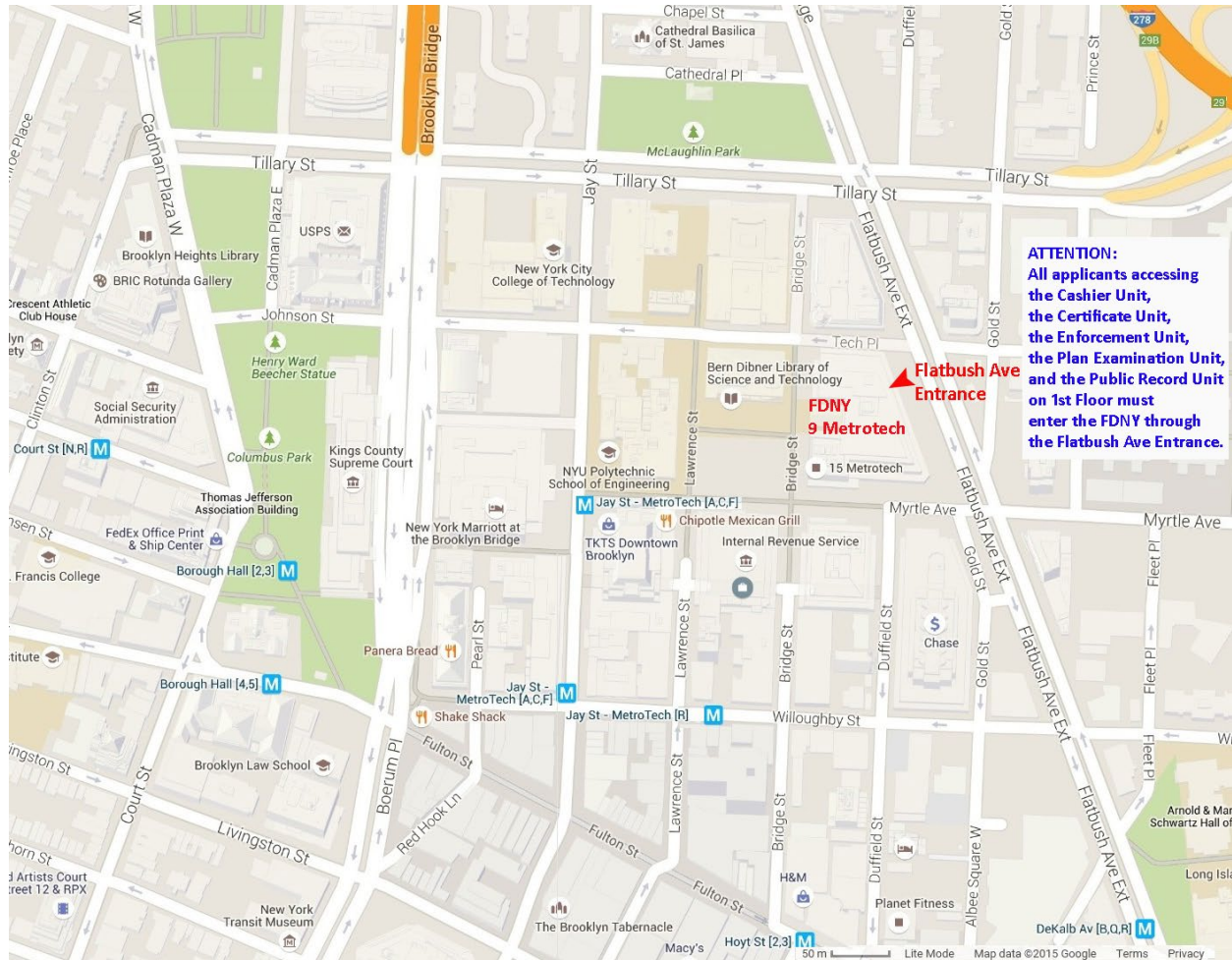
### **EXAM INFORMATION**

The **G-22, G-23, G-36, G-40 and G-44** exams will consist of **25** multiple-choice questions. The **G-24, G-34 and G-36** exams will consist of **20** multiple-choice questions. All exams administered on a “touch screen” computer monitor. All tests are time-limit exams. Based on the amount of the questions, you will have 38 minutes to complete G-22, G-23, G-36, G-40 or G-44 exams; you will have 30 minutes to complete G-24, G-34 or G-36 exams. A passing score of at least 70% is required in order to secure a Certificate of Fitness. Call (718) 999-1988 for additional information and forms.

Please always check for the latest revised booklet at FDNY website before you take the exam.

**EXAM SITE:**

**FDNY Headquarters, 9 MetroTech Center, Brooklyn, NY. Enter through the Flatbush Avenue entrance (between Myrtle Avenue and Tech Place).**



**RENEWAL REQUIREMENTS**

**General renewal requirements:**

Review the General Notice of Exam:

<https://www1.nyc.gov/assets/fdny/downloads/pdf/business/general-notice-of-exam-cof.pdf>

**Special renewal requirements.** LPG Certificate of Fitness: None

**QUESTIONS?**

**FDNY Business Support Team:** For questions, call 311 and ask for the FDNY Customer Service Center or send an email to [FDNY.BusinessSupport@fdny.nyc.gov](mailto:FDNY.BusinessSupport@fdny.nyc.gov).

## STUDY MATERIAL AND TEST DESCRIPTION

### About the Study Material

This study material will help you prepare for 7 examinations for the Certificate of Fitness for different handling and using Liquefied Petroleum Gases (LPG) and Compressed Natural Gas (CNG). The study material includes information taken from the 2022 NYC Code. The study material does not contain all of the information you need to know to work with LPG/CNG. It is your responsibility to become familiar with all applicable rules and regulations of the city of New York, even if they are not covered in this study material.

### Sample Questions

*The following questions represent the “format” of the exam questions, not the content of the real exam.*

**1. Which of the following are allowed to be used/displayed while taking a Certificate of Fitness examination at 9 Metro Tech Center?**

- I. cellular phone**
- II. study material booklet**
- III. reference material provided by the FDNY**
- IV. mp3 player**

- A. III only
- B. I, II, and III
- C. II and IV
- D. I only

*Only reference material provided by the FDNY is allowed to be used during Certificate of Fitness examinations. Therefore, the correct answer would be A. You would touch “A” on the computer terminal screen.*

**2. If you do not know the answer to a question while taking an examination, who should you ask for help?**

- A. the person next to you
- B. the firefighters
- C. the examiner in the testing room
- D. you should not ask about test questions since FDNY staff can not assist applicants

*You should not ask about examination questions or answers since FDNY staff cannot assist applicants with their tests. Therefore, the correct answer would be D. You would touch "D" on the computer terminal screen.*

**3. If the screen on your computer terminal freezes during your examination, who should you ask for help?**

- A. the person next to you
- B. the firefighters
- C. the examiner in the testing room
- D. the computer help desk

*If you have a computer related question, you should ask the examiner in the testing room. Therefore, the correct answer would be C. You would touch C. You would touch "C" on the computer terminal screen.*




**INTRODUCTION**

This document outlines the New York City Fire Department regulations for the storage, handling, and use of Liquid Petroleum Gas (LPG) and Compressed Natural Gas (CNG). LPG/CNG is widely used as a fuel in heating appliances and vehicles. These gases are pressurized and flammable. LPG and CNG are considered hazardous gases. This document also outlines the special guidelines for different LPG/CNG purposes in construction sites and outdoor heating equipment.

According to the Fire Code, a Certificate of Fitness is needed for connecting and disconnecting of LPG/CNG containers. LPG containers equal to or greater than **16.4 oz** and CNG containers with a capacity greater than **8.7 SCF**.

When connecting and disconnecting is performed by an LPG/CNG supplier or distributor, a card or tag must be visibly posted at the premises identifying:

- the name and address of the supplier or distributor
- the name of the Certificate of Fitness holder
- and the number and expiration date of the Certificate of Fitness.

Example of LPG container with a capacity of 16.4 ounces (e.g. camping style tank)	Example of LPG container with a capacity of 20 lbs. (e.g. BBQ tank)	Example of LPG container with a capacity of 100 lbs.
		

**Permits**

Storage, handling, or use of more than 400 SCF (Standard Cubic Feet) of LPG/CNG needs a permit. For LPG, 400 SCF is approximately 47 lbs. The following table lists the number of LPG containers (storage, handling, use, or transportation) requiring a permit. This permit will be issued after the location has been inspected and approved as acceptable for such practices. A permit is required for a single 20-pound LPG container at a construction site. Residential 1 and 2 family homes are allowed to store two-20-pound containers **WITHOUT** a permit.

LPG Container Capacity	Number of Containers Requiring Permit
14.1 oz	54
16.4 oz	46
20 lbs.	2
20 lbs. (for construction site only)	1
33.5 lbs.	2
40 lbs.	2
100 lbs.	1

Portable **LPG** containers with a capacity greater than **16.4 oz** and **CNG** containers with a capacity greater than **8.7 SCF** must **NOT** be stored, handled, or used indoors in the following occupancies (as mentioned in the Building code):

- residential
  - factory and industrial
  - educational
  - and institutional
- except as the commissioner may authorize by rule.

An LPG/CNG permit will not be issued by the FDNY for a fixed LPG/CNG installation located in an area where access to piped natural gas from a public utility is available.

### **Types of Permits (FC 105.6)**

#### (1) Site-specific permit



This permit allows the permit holder to store, handle, use LPG/CNG or perform an operation (e.g., manhole operation; tar kettle or asphalt melter; forklift) at a specific location. A site-specific permit may be permanent or temporary.

All permits are valid for a maximum of 12 months. Every permit or renewal requires an inspection and will expire after twelve months.

Temporary permits may be valid from one day to 12 months depending on the construction or operational need.

For example, a temporary permit could be issued to a construction site and is valid until the Department of Buildings permit expires which can vary; a one-day temporary permit may be issued to a street fair event.

## Example of a site specific FDNY permit

			
<b>FIRE DEPARTMENT PERMIT (SITE-SPECIFIC)</b>			
ISSUE DATE 04/09/2024	DO 19	ACCOUNT NO. [REDACTED]	
	EXPIRATION DATE 06/19/2024	CONTROL # 426753630124432	
PREMISES ADDRESS 450 11 AVENUE MANHATTAN NY 10018			
BLOCK/LOT 00708/0065	BIN # 1080352	ZIPCODE 10018	
ADMIN CO. E034	BATTALION 7	DIVISION 1	
ISSUED TO			
CORPORATION NAME [REDACTED]			
DBA			
HOURS OF OPERATION	PHONE # [REDACTED]		
PERMIT DESCRIPTION			
QTY	TYPE/DESCRIPTION	DETAILS	FLOOR NO.
1	LPG STORAGE >= 20LB (PER CAGE)	062-00	GROUND FLOOR
1	TORCH USE - ANY OPEN FLAME IN A TORCH-APPLIED ROOF SYSTEM	069-02	THROUGHOUT
<small>This permit authorizes the above-referenced owner to manufacture, store, handle, use, transport or sell a hazardous or combustible material and/or conduct an operation or maintain a facility regulated by the New York City Fire Code, as specified above, at the premises set forth above, subject to the strict observance of the Fire Code and other laws, rules, and regulations enacted for the protection of the public. This permit is not transferable to any other person, firm or corporation and shall remain in effect for the period specified unless suspended or revoked by the fire department prior to expiration</small>			
BY ORDER OF THE FIRE COMMISSIONER			
<small>New York City Fire Code Section FC105.3.5 requires that permits be posted in a conspicuous location on the premises at all times and be readily available for inspection by any representative of the Department.</small>			
<small>Fire Department, City of New York 9 MetroTech Center, Brooklyn New York 11201-3857</small>			

### (2) Citywide permit

A city-wide permit is valid for up to 30 days and all LPG/CNG containers must be removed from the site at the end of each workday. A new application must be submitted if a job will last more than 30 days.

A site-specific permit must be obtained for LPG/CNG storage, handling and use on a construction site. A citywide LPG/CNG permit must be obtained for a

- tar kettle
- asphalt melter
- and torch operations

where no extra storage is needed and the LPG/CNG containers are removed from the site at the end of each workday. The construction work requiring LPG/CNG use is to be completed within 30 days.

Permits are not transferable and any change in:

- occupancy
- operation
- lease
- and/or ownership

requires that a new permit be issued. The Certificate of Fitness holder is responsible for making sure that all fire safety regulations and procedures are followed on the premises. All permits and Certificates of Fitness must be readily available on the premise for inspection by Fire Department representatives.

This booklet consists of seven parts. The test covers the booklet and any tables. **The booklet will not be available during the test. It is critical that you read and understand this booklet to help increase your chance of passing this exam.**

The storage, handling, and use of LPG and CNG are required to comply with the following Fire Code and Rules:

- Compressed Natural Gas: **[FC Section 5811]**
- Liquefied Petroleum Gases: **[FC Chapter 61]**
- Liquefied Petroleum Gas Code: **[NFPA 58, 2014 edition]**
- Tar Kettle: **[FC Section 303]**
- Compressed Natural Gas: **[Rule 3508-01]**
- Liquefied Petroleum Gases: **[Rule 3809-01]**

## **DEFINITIONS**

**ASPHALT MELTER.** An approved device designed to heat asphalt, typically for waterproofing operations, that, utilizing a flammable gas or a combustible liquid, generates an enclosed flame that indirectly heats a vessel containing the asphalt.

**CNG.** Compressed natural gas.

**COMPRESSED GAS.** A material, or mixture of materials, that is a gas at 68°F (20°C) or less at 14.7 (101 kPa) psia of pressure; and has a boiling point of 68°F (20°C) or less at 14.7 psia (101 kPa) of pressure; and has a boiling point of 68°F or less at 14.7 psia that is either liquefied, nonliquefied or in solution at that temperature and pressure, except that gases which have no other health-or physical-hazard properties are not considered to be compressed until the pressure in the packaging exceeds 41 psia (282kPa) at 68°F (20°C). Compressed gases shall be classified as follows:

Nonliquefied compressed gases. Gases, other than those in solution, that are in a packaging under the charged pressure and are entirely gaseous at a temperature of 68°F (20°C).

Liquefied compressed gases. Gases that, in a packaging under the charged pressure, are partially liquid at a temperature of 68°F (20°C).

Compressed gases in solution. Nonliquefied gases that are dissolved in a solvent.

Compressed gas mixtures. A mixture of two or more compressed gases contained in a single packaging, the hazard properties of which are represented by the properties of the mixture as a whole.

**ELECTRIC BARBECUE.** Any device designed for heating or cooking food on an open grate cooking surface above exposed heating elements. An electric grill that has its heating elements embedded within a solid cooking surface is not an electric barbecue.

**FLAMMABLE GAS.** A material which has a boiling point and becomes a gas at 68°F (20°C) or less at 14.7 pounds per square inch absolute (psia) (101 kPa) of pressure which:

1. Is ignitable at 14.7 psia (101 kPa) when in a mixture of 13 percent or less by volume with air, in accordance with testing procedures set forth in ASTM E 681; or
2. Has a flammable range at 14.7 psia (101 kPa) with air of at least 12 percent, regardless of the lower explosive limit, in accordance with testing procedures set forth in ASTM E 681.

**GENERAL SUPERVISION.** Supervision by the holder of any FDNY certificate who is responsible for performing the duties stated in the NYC Fire Code (Certificates of Fitness and Qualification) but need not be personally present on the premises at all times.

**LIQUEFIED PETROLEUM GAS (LPG).** A material which is composed predominantly of the following hydrocarbons or mixtures of them: propane, propylene, butane (normal butane or isobutane) and butylenes. Methylacetylene-propadiene mixtures (MAPP-gas) shall be deemed to be an LPG.

**OPEN FIRES.** The burning of materials wherein products of combustion are emitted directly into the ambient air without passing through a stack or chimney from an enclosed chamber. For the purpose of this definition, a chamber shall be regarded as enclosed when, during the time combustion occurs, only apertures, ducts, stacks, flues or chimneys necessary to provide combustion air and permit the escape of exhaust gas are open.

**OPEN FLAME.** A flame that is generated by any material or device in a sustained and controlled manner and that is not securely enclosed by noncombustible material, such as a candle that is unenclosed or enclosed in a globe or lantern, or a gas light lantern, but not a flame contained in a furnace or other similar approved device, equipment or system. Torches operated in accordance with FC Chapter 26 and lighted smoking paraphernalia shall not be considered an open flame.

**POWERED INDUSTRIAL TRUCK.** A forklift, tractor, platform lift truck or motorized hand truck powered by a lead-acid battery system, a metal hydride hydrogen storage system or an internal combustion engine. Powered industrial trucks do not include farm vehicles or motor vehicles for highway use.

**PERSONAL SUPERVISION.** Supervision by the holder of any FDNY Certificate of Fitness is required to be personally present on the premises, or other proximate location acceptable to the FDNY, while performing the duties for which the certificate is required.

**TAR KETTLE.** A device designed to heat tar, asphalt, pitch or similar materials, typically for waterproofing operations, that, utilizing a flammable gas or a combustible liquid, generates a flame to heat a vessel containing such a material. Tar kettle does not include asphalt melters.

## **PART 1. COMPRESSED GASES**

---

LPG and CNG are potential hazards because:

1. of the pressure within the container
2. their flammability
3. and/or their toxicity

The chemical is in gaseous form and pressurized. It can quickly contaminate a large area in the event of a leak.

### **1.1 Handling, Use, and Storage of Compressed Gas**

#### General Guidance

##### (1) Label all compressed gas containers clearly

The contents of any compressed gas containers must be clearly identified. Gas identification should be stenciled or stamped on the container or a label. It is typically applied near the neck of the container. **Do not rely solely on the color of the container to identify the contents. Do NOT use any container that is unmarked or has conflicting marking or labels.**

Storage, handling, or use of LPG in any equipment used or previously used for natural gas is prohibited in New York City. It may be authorized by the commissioner on an emergency basis. Storage, handling, or use of CNG in any equipment used or previously used for LPG is also prohibited in New York City, except as it may be authorized by the commissioner on an emergency basis.

##### (2) Do not refill containers

Gas containers must be replaced when they are empty. It is illegal to refill gas containers in New York City. They should be marked empty. **Empty containers must be handled in the same manner as full ones.** The container valve or regulator tap must be closed and stored separately from full containers. All empty containers must be promptly removed by vendors. Damaged or unusable LPG/CNG containers must be promptly removed from the premises and disposed of properly.

##### (3) Upright position

**All LPG/CNG containers must be secured in an upright position. They must not be stacked or stored on shelves.** Gas containers must be maintained in an upright position when used. This is true for both the portable and the manifold system. The gas containers used for on-site jobs must be secured on a hand truck. The containers are less likely to be damaged when secured to a hand truck and allows the containers to be moved safely.

All gas containers must be:

1. secured from tipping over
2. should be stored in an upright position
3. be equipped with a pressure regulator designed for the specific gas
4. marked for its maximum container pressure.

You can use appropriate materials, such as chains, plastic coated wire cables, commercial straps, etc., to secure gas containers.

#### (4) Well-ventilated areas

Indoor compressed gas storage and compressed gas use areas must be located in well-ventilated areas. LPG/CNG containers must not be used in a:

- cellar
- basement
- pit or other areas below grade

LPG containers must not be used in an:

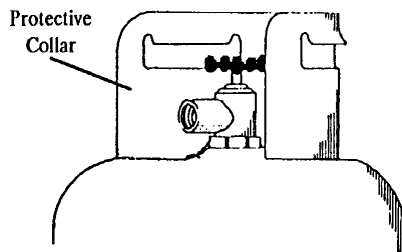
- above-grade under floor space or
- basement

Unless such location is provided with an approved means of ventilation.

**Exceptions:** Portable LPG containers are allowed to be used in approved self-contained torch assemblies. Such containers must not exceed 16.4 ounces of LPG.

#### (5) Always replace the protective cap

Most gas containers have protective caps. LPG containers have a collar. These devices protect the container control valve from physical damage. The protective cap is shaped like an inverted cup, and it is screwed on top of the gas container. It must be in place when the gas container is not in use. The protective collar is welded to the top of the container. The collar extends above the height of the container's control valve. An example of a protective collar installed is shown below.



**A Typical Protective Collar**

#### (6) Away from Temperature and Physical Damage

**All gas containers and their related equipment must be protected from extreme temperature and physical damage.** For example, gas containers must be placed on firm and non-combustible foundations. High temperatures (e.g., above 125 °F) can cause the pressure inside the container to increase to a dangerous level. A protective partition must be used to shield the containers that are exposed to hot air blown by a heating appliance. **All containers must be secured in an upright position and must not be stacked or stored on shelves.**

#### (7) Regular Inspection

The Certificate of Fitness holder must regularly visually check the:

- compressed gas containers
- connections
- appliances

for leaks. The damaged containers must be removed from service.

Quick visual check of compressed gas containers:

- No extreme denting, gouging, or corrosion is on the compressed gas container.
- The container protective cap/collar and the foot ring are intact and are firmly attached.
- The container is painted or coated to minimize corrosion.
- The container pressure relief valve indicates no visible damage, corrosion of operating components, or obstructions.
- There is no leakage from the compressed gas container.

The container is installed on a firm foundation and is not in contact with the soil.

## PROHIBITIONS OF LPG

Storage, handling, and use of LPG in basements, cellars, rooftops or below grade areas is strictly prohibited.

**ALLOWED ONLY:** to conduct emergency indoor repairs with 16.4 oz containers (unoccupied place of assembly), manhole operations.

Storage, handling, and/or use in or bring into any residential occupancy or lot containing a building used for a residential occupancy or any non-residential occupancy is strictly prohibited for any LPG container with a capacity greater than 16.4 oz.

**ALLOWED ONLY:** to conduct emergency indoor repairs (unoccupied place of public assembly).

**Handling and use** of LPG cylinders on **rooftops** of any building made of combustible materials is strictly prohibited for LPG containers with a capacity greater than 16.4 oz (exceptions can be made for construction purposes).

**ALLOWED ONLY:** to conduct emergency repairs (unoccupied place of assembly) asphalt melter.

Storage, handling and or use of LPG in or on **motor vehicles** is strictly prohibited.

**ALLOWED ONLY:** temporary storage incidental to transportation. Or as a fuel for generating motive power for a motor vehicle.

Storage, handling or use for a stationary installation in any area where access to **pipeds natural gas** from a public utility is unavailable, except as authorized by the commissioner is strictly prohibited.

Storage, handling or use it for **space heating or water heating** is strictly prohibited.

**ALLOWED ONLY:** for curing and drying purposes but not for human comfort at construction sites.

Use of **non-metallic pipes**, tubing and components is strictly prohibited.

**ALLOWED ONLY:** for construction sites, emergency indoor repairs, manhole operations, street fairs.

Dispense LPG, fill a container with LPG, or transfer LPG from one container to another is strictly prohibited.

## PROHIBITIONS OF CNG

Storage, handling, and use of CNG in a basement, cellar or below grade area is strictly prohibited.

**ALLOWED ONLY:** for emergency indoor repairs (unoccupied place of public assembly), manhole operations.

Storage, handling or use in, or bring it or allow it into, any residential occupancy, or on any lot containing a building used for a residential occupancy, or any non-residential building is strictly prohibited for any CNG container with a capacity greater than 8.7 SCF.

**ALLOWED ONLY:** for emergency indoor repairs (but not allowed in an occupied place of public assembly).

Handling or use it on the roof (combustible materials) of any building is strictly prohibited for any CNG containers with a capacity greater than 8.7 SCF.

**ALLOWED ONLY:** for emergency repairs (it is not allowed in an occupied place of public assembly)/asphalt melter.

Storage, handling or use it in or on motor vehicles is strictly prohibited.

**ALLOWED ONLY:** temporary storage incidental to transportation. Also, as a fuel for generating motive power for a motor vehicle.

Storage, handling or use for a stationary installation in any area where access to piped natural gas from a public utility is unavailable, except as authorized by the commissioner is strictly prohibited.

Store, handle, or use it for space heating or water heating is strictly prohibited.

**ALLOWED ONLY:** to use on residentially occupied moored vessels.

Use of non-metallic pipe, tubing, and components on CNG cylinders is strictly prohibited.

**ALLOWED ONLY:** for construction sites, emergency indoor repairs, manhole operations.

Dispense CNG, fill a container with CNG, or transfer CNG from one container to another is strictly prohibited.

**ALLOWED ONLY:** to fill the permanently mounted CNG containers on CNG-powered vehicles

## Related Equipment

### (1) Control valve

A control valve is on the top of each gas container. This valve can be opened or closed to control the flow of the contents of the gas container. The handle is simply turned to open most gas control valves. **The control valve must be opened by hand.** Container valves must be closed before:

1. moving a gas container
2. when the torch is not in use
3. when the gas container is empty

### (2) Regulator

**Before gas containers can be used, a regulator must be attached to each of the control valves.** A regulator is one of the most important parts of a compressed gas system. The purpose of the regulator is to control the flow of gas. It also lowers the pressure from the container to the appliance. The regulator acts as:



1. a control regarding the flow and distribution of gas, but also
2. as a safety barrier between the high pressure of the gas container and the end use appliance.

Always select the regulators recommended by the manufacturer. Do not interchange regulators between different sizes/types of containers without manufacturer approval.

**Do not open the gas container valve or regulator tap until the regulator is securely attached.** Regulator connections to gas container valves must be:

1. completely free of dirt
2. dust
3. oil
4. and grease

The regulator controls the discharge rate of gas from the container. Examples of typical regulators are shown below.

A Typical Regulator of LPG Container	A Typical Regulator of CNG Container
	

### (3) Hose, Piping and Tubing

The regulator is connected to a hose that supplies the gas to the appliance. This hose must be securely connected to the appliance. Nonmetallic pipe, tubing, and components for any installation, appliance or equipment using LPG or CNG is prohibited.

However, a nonmetallic hose may be allowed at construction sites. **Hoses must be as short as practical, protecting them from mechanical injury.** They must not be close to an open flame. Hoses must be protected from physical damage, and no hose is allowed to exceed 30 feet. When gas containers are used inside buildings, the hose must not pass through any partitions, walls, ceilings, or floors. (NFPA 58 6.22.3.2)

Piping in systems must be run as directly as possible from one point to another, with as few fittings as needed. All piping and tubing must be protected against damage by vehicles and by corrosion-causing substances.

### Moving Compressed Gas Containers

CNG/LPG containers must not be moved unless the **container's valves are closed. A compressed gas container must not be rolled on its side or its rim.** It must be moved only by using approved lifting equipment. Containers must never be dropped or thrown from any height. Before transporting any compressed gas containers make sure that the valves are tightly closed.

Compressed gas containers must be moved in an upright position and using an approved method. When containers are moved by hand cart, it must be designed for the secure movement of containers. Carts and trucks used for moving containers outdoors must be designed so that the containers will be secured. They can't be dropped or struck against each other or surfaces. Ropes, chains, or slings must not be used to suspend compressed gas containers. The containers have to be designed for such handling. Valves of compressed gas containers must not be used for lifting.



1. Compressed gas container should be used, handled, and stored in upright position, except those designed for use in a horizontal position.
2. Compressed gas containers placed on carts and trucks must be individually restrained.

Compressed gas containers must be moved using an approved method.

If compressed gas containers need to be transported between floors, use an elevator (e.g.; freight elevator, construction elevator, or passenger elevator when approved). Such elevator must be occupied by the minimum number of people.

All compressed gas containers must be transported only in approved vehicles. An FDNY city-wide permit issued by the Bureau of Fire Prevention's Hazardous Cargo Unit is required for each vehicle transporting quantities exceeding 400 SCF of any flammable gas (e.g., LPG/CNG). Compressed gas containers can be delivered **ONLY** to sites displaying a permit or Letter of Authorization issued by the Fire Commissioner.

#### Separation from hazardous conditions

All compressed gas containers and systems in storage or use must be kept away from materials and conditions that present potential hazards. It is recommended to group containers according to:

- the type of gas (e.g., flammable, oxidizer)
- whether containers are full or empty
- if they are stored at the same location

Generally, the compressed gas containers must be kept away from:

- Sources of ignition
- Extreme temperatures (Above 125 °F)
- Corrosive chemicals or fumes
- Falling objects
- Unwanted tampering
- Ledges, unprotected platforms, elevators or other areas where the container could drop a distance exceeding one-half the height of the container

## **1.2 GENERAL DESCRIPTION OF LIQUID PETROLEUM GAS (LPG)**

Liquefied petroleum gas (LP Gas or LPG) is often used as a fuel source. LPG includes:

1. propane
2. propylene
3. butane
4. and butylene

The most commonly used LPG is butane and propane. LPG is used in domestic, commercial, agricultural, and industrial settings. Propane is commonly used for domestic heating, cooking, and fuel for forklifts. The storage of LPG in quantities requiring a permit must be under the general supervision of a person holding a Certificate of Fitness.

#### DESCRIPTION OF LIQUID PETROLEUM GAS

Manufacturing LPG is prohibited in NYC. **LPG is naturally colorless and odorless.** It is given an odor by mixing an additive with the gas (mercaptan). The additive causes LPG to smell like rotten eggs. This odor allows a leak of LPG to be easily detected. LPG is extremely flammable and highly explosive if ignited in an enclosed area. LPG is non-toxic; however, it can cause suffocation. **LPG is heavier than air** and tends to lay close to the ground and spread horizontally. The use of LPG in a liquid form is prohibited in New York City.

LPG is stored under pressure inside specially designed containers usually in liquid form. The gas changes into a vapor when it leaves the container. When the gas changes into a vaporous state it expands to 269 times its original volume. **The expansion rate causes liquid LPG to be a much greater fire hazard than a vapor leak. A liquid LPG leak can cause an explosion even in an outdoor location.** Safety procedures must be strictly followed to reduce the danger of a potential unintended release of LPG.

### DESCRIPTION OF LPG CONTAINERS

In New York City, LPG must be stored in portable containers. These containers must be approved for use by the Federal Department of Transportation. **LPG containers must be tested by a DOT approved vendor every five years.** The Certificate of Fitness holder is responsible for ensuring the container's condition includes the marked date for testing due. Containers due for testing must be sent to be tested to ensure that it is safe for use.

Containers **MUST** not be filled to capacity with LPG. A vapor space is left in the container to allow for expansion of the gas. This is necessary because LPG expands when it becomes warmer. **When portable containers are moved, they must be secured to a specially designed hand truck. LPG containers and their related equipment must be protected from damage.**

LPG is sensitive to temperature change. Very low temperatures may prevent the proper function of the gas. High temperatures can cause the pressure inside the container to increase to a dangerous level. LPG containers must never be allowed to reach a temperature exceeding 125 °F.

A protective barrier must be used to shield the containers that are exposed to hot air blown by a heating appliance. Any blower-type and radiant-type units must not be directed toward any LPG container within 20 feet. (NFPA 58 6.19.4.6) An example of a typical LPG container is shown below. (Add photo of 100 lbs. max allowed in NYC) Add photo from Haz Cargo



**A Typical LPG Container**

## Markings

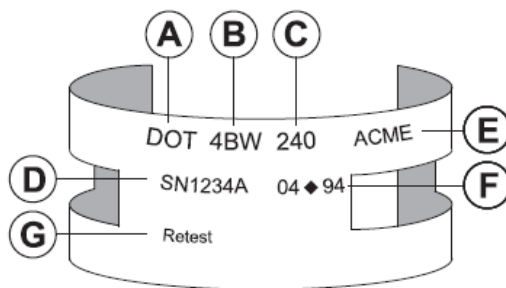
Several markings are made by stamping, embossing, using self-adhesive stickers or by spraying onto a form. They may be placed on their:

- collar
- neck
- base
- body
- or a steel plate welded onto the container

LPG containers must be marked with the water capacity of the container. Normally, LPG containers are also marked with the following:

1. manufacturer's mark
2. DOT identification number
3. serial number assigned by the manufacturer
4. date of the first test (month/year or month-year, e.g., 05/2007 or 5-07)
5. date of the first periodical test

In addition to markings, warning labels must be applied to all LPG containers of 100 lbs. capacity or less that are not filled on site. They must include information on the potential hazards of LPG.



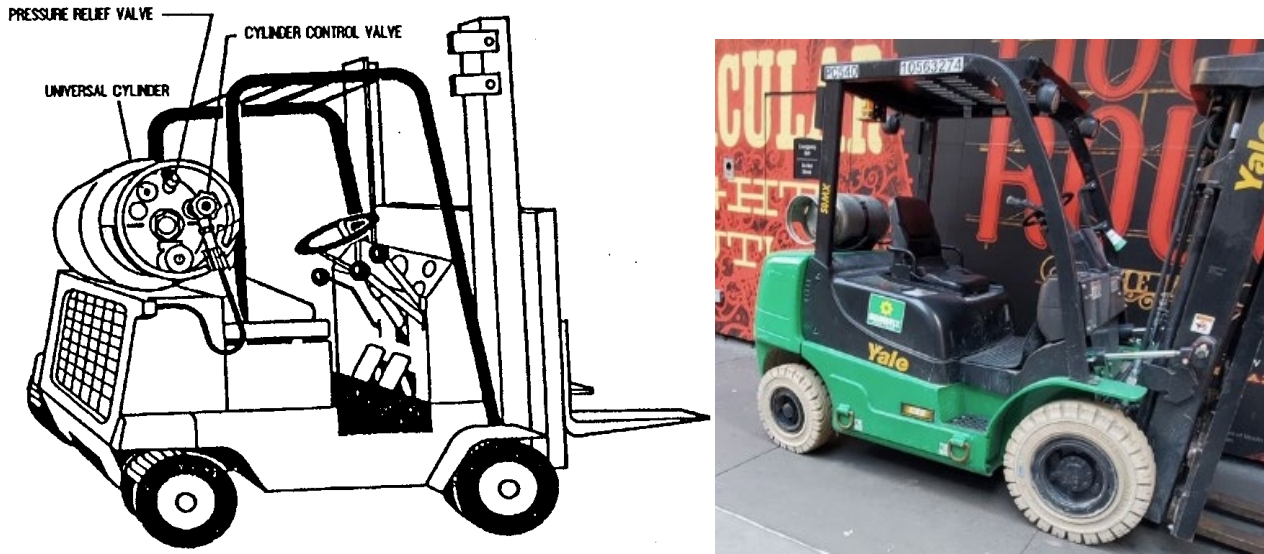
- (A) Manufactured to U.S. DOT specifications
- (B) Cylinder specification type (e.g. 4B, 4BA, 4BW, and 4E)
- (C) Cylinder service pressure (psig)
- (D) Cylinder serial number
- (E) Manufacturer's name (or registered symbol)
- (F) Original manufacture/test date, month and year, and inspector's mark, as required (i.e., this diagram indicates April 1994 and inspector's mark ♦)
- (G) Area for date requalified/retested

\* Additional markings may be present as authorized by HMR under the specification

## Two Types of LPG Containers

There are two types of LPG containers. One type is known as the **STANDARD**-type container. A pressure relief valve is installed on the top of the LPG container. The relief valve opens when the pressure in the tank becomes too great for safe operation. The valve allows the excess pressure to escape into the atmosphere. When the pressure in the container returns to a safe level, the valve closes. The relief valve will operate properly only if the container is in the upright position. Otherwise, the liquid gas will escape. Therefore, **the standard type of container must always be kept in an upright position when it is being used or transported.**

The other type of container is called a forklift container. The forklift container may be used either in an upright or a horizontal position. A special pressure relief valve is installed on the forklift container. These containers are used when it is difficult to maintain a standard type of container in an upright position. A forklift container may be used to fuel a forklift truck by strapping it horizontally to the rear of the truck as shown below.



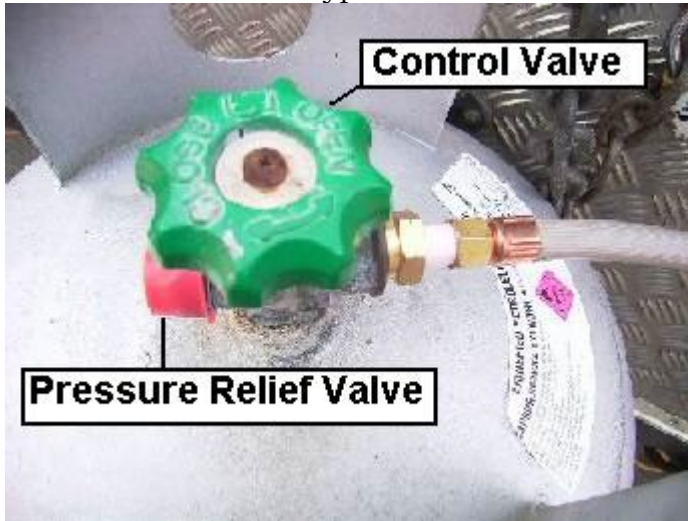
**A Typical Forklift Truck**

### **1.3 USING LPG**

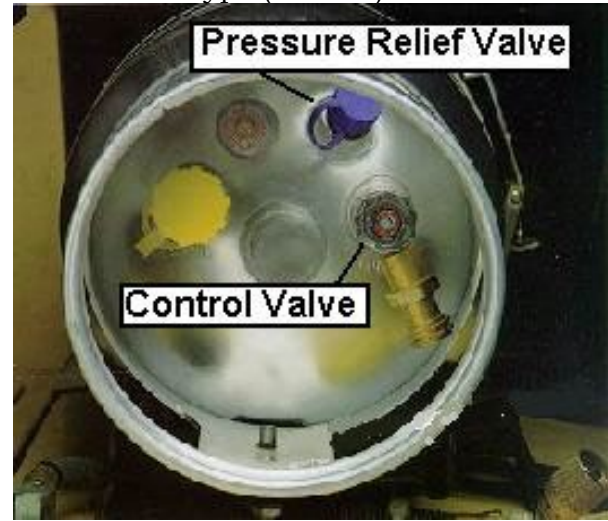
#### Control Valve and Pressure Relief Valve

LPG is released from the container by opening the control valve. **The control valve must be opened by hand.** The valve should be opened carefully to make sure that it is not damaged. The control valve is opened by turning the valve two full revolutions in a counterclockwise direction. **The valve must never be forced open by using a wrench and** it must not be forced past the fully open position since that might damage the valve. Operating a forklift that uses LPG, the operator **MUST** have a G-22 Certificate of Fitness.

Standard type container



Forklift type (Forklift) container



The **pressure relief valve** opens to allow the LPG to escape into the atmosphere when the pressure becomes too great in the container. This is a safety feature to prevent an explosion caused by the pressure build-up.

The relief valve or its discharge system must be designed to minimize the possibility of water or dirt entering the system. If you observe or hear any gas leak from the pressure relief valve, **call 911 immediately**.

#### Regulator and Quick Release Connector

**The regulator must be installed before any LPG container is used to fuel any appliance.** The regulator is one of the most important parts of an LPG system.

The purpose of the regulator is to:

1. control the flow of gas
2. and lower the pressure from the container to the appliance.

The regulator controls the flow and distribution of LPG. It also helps as a safety barrier between the high pressure of the container and the end use appliance.

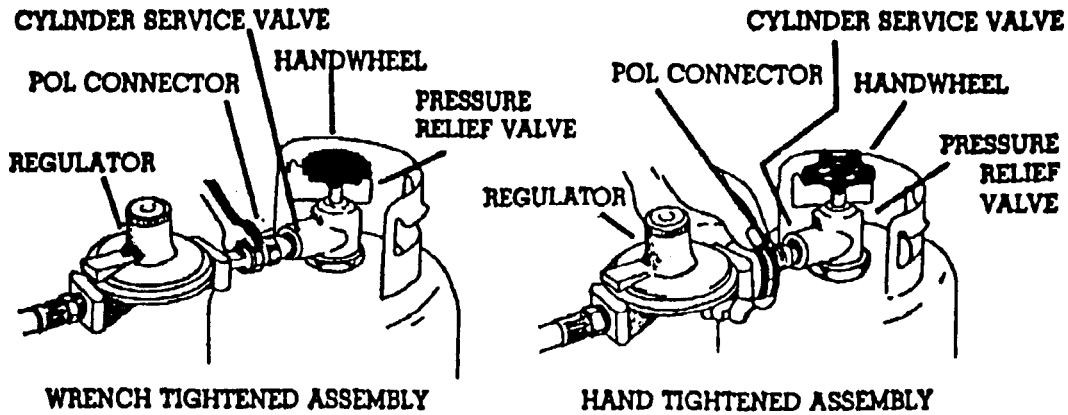
Always select the regulators recommended by the manufacturer. Do not interchange regulators between different sizes/types of LPG containers without consulting the manufacturer. **Do not open the container valve or regulator tap until the regulator is securely attached.**

The regulator controls the discharge rate of LPG from the container. The discharge rate of the regulator is factory set and should **NEVER** be adjusted. An example of a typical regulator is shown below.



### A Typical Regulator

The regulator is threaded into the control valve at the top of the LPG container. They are tightened by turning the assembly counterclockwise. Some connections may be tightened by hand only. Other connections must be tightened with a wrench. An example of each type of connection is shown below.



A rubber slip connection is prohibited in LPG containers. Flexible nonmetallic hose may be allowed at some applications (e.g., construction sites, emergency indoor repairs, manhole operations, etc.).

The length of the hose must not exceed 30 feet when the activity is performed outdoors. The hose cannot exceed 6 feet if the activity is performed indoors.

The nonmetallic hose also must be DOT approved. For activities performed outdoors a working pressure of not less than 250 psi is required. A working pressure of 350 psi must be maintained when activities are performed indoors.



This is designed for a rubber slip which is prohibited.

A quick release connection set may be used to connect the regulator to the control valve. This allows the user to make the connection without the use of tools. An example of a quick release connection set is shown below.



This hose is a couple-safe quick connect. **A** is the gas appliance connector which connects to any appliance using LPG. **B** is the regulator connector designed to fit a gas regulator.

### Excess Flow Check Valve

When LPG is used as a fuel for forklifts or for other purposes (such as marking traffic lanes or cooking equipment in mobile units), the excess flow check valve must be an essential part of the LPG container.

The excess flow check valve acts as a safety device when the control valve is open. It shuts off the gas supply to the appliance (grill, heater, or forklift) when the regulator is physically damaged.

The excess flow check valve will shut off the gas supply if the LPG container falls and the regulator gets damaged. The excess flow check valve may shut off the gas supply when the control valve is opened too quickly.

The Certificate of Fitness holder is responsible to ensure the excess flow check is installed by the manufacturer. Without an excess flow check valve, the LPG cylinder **MUST NOT** be used as fuel for forklifts. It must be returned to the supplier.

## Regular Inspection

The Certificate of Fitness holder must regularly inspect the LPG containers, connections, and appliances for leaks. The damaged containers must be removed from service.

Quick visual check of LPG containers must ensure that:

- No extreme denting, gouging, or corrosion is visible on the LPG container.
- The container protective cap/collar and the foot ring are intact and are firmly attached.
- The container is painted or coated to minimize corrosion.
- The container pressure relief valve indicates no visible damage, corrosion of operating components, or obstructions.
- There is no leakage from the LPG container.
- The container is installed on a firm foundation and is not in contact with the soil.
- The inspection results are documented and retained for a 5-year period.

## LPG Operation

LPG is highly explosive when it accumulates in one area. **As a precaution, LPG must only be used in well-ventilated areas. The LPG container must not be placed or used underground or in a below grade location.** The container must remain above ground at all times. The special considerations in manhole underground operations are addressed on the page 53-54 of this booklet.

LPG must only be used with LPG appliances which are approved by Nationally Recognized Testing Laboratories (NRTL). Connecting an LPG container to a non-approved appliance could result in serious injury. Connecting and disconnecting of LPG containers must be performed outdoors.

Where LPG use indoors is allowed, the connection and disconnection of the containers must be performed in a well-ventilated area. All valves on the appliance and container must be closed when changing the container. This prevents the accidental leaking of gas into the atmosphere.

Sometimes LPG is used for construction related curing and drying purposes. Heaters must only be used in a well-ventilated area and must not be placed on unprotected wood flooring. Heaters used for curing and drying must be located at least 6 feet from the LPG container and in an upright position.

**All LPG containers must be secured in an upright position and must not be stacked or stored on shelves (20 pounds or greater). Combustible materials must not be located less than 10 feet within any LPG appliance or container.** On construction sites, if two or more heating-appliance units are located in an unpartitioned area on the same floor, the LPG containers must be separated by at least 20 feet. (NFPA 58 6.19.4.7).

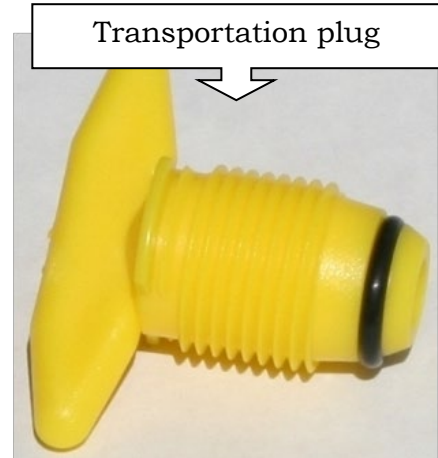
A sign explaining safe handling procedures for LPG should be posted near all LPG appliances. This sign should indicate the following:

- a) How to handle LPG containers safely.
- b) How to connect all regulators, manifolds, and hoses to containers and appliances.
- c) How to detect LPG leaks safely.
- d) How to start up and shut down the appliance and related equipment.
- e) The names, address, and telephone number of a local supplier.
- f) Emergency number: 911.

#### Moving LPG

All LPG containers should be marked:

- “Flammable” and either
- “LP-Gas,” or
- “Propane,” or
- “Butane.”



When being transported, containers must be marked and labeled “Transportation”. The LPG containers must be secured in the upright position. The protective caps or plugs must be in place. The container's valve must be closed when the containers are being transported or are not in use.

LPG containers with a capacity of 20 pounds **MUST** be provided with transportation plugs that tightly secure the container's outlet valve connection. LPG containers with a capacity of more than 20 pounds must be moved to another floor of the building only by freight elevator, construction elevator, or passenger elevator when approved.

Such elevator must be occupied only by those people moving the containers. LPG containers with a capacity of 20 pounds or less must be moved in the same manner. Except that they may be moved in building stairwells if such stairwells are unoccupied.

LPG containers may be transported only in approved vehicles. A FDNY city-wide permit issued by the Bureau of Fire Prevention’s Hazardous Cargo Unit is required for each vehicle transporting quantities exceeding 400 SCF (approximately 47 lbs.). LPG containers may be delivered only to sites displaying a permit or Letter of Authorization issued by the Fire Commissioner.

#### **1.4 GENERAL DESCRIPTION OF COMPRESSED NATURAL GAS (CNG)**

CNG (Compressed Natural Gas) is made by compressing natural gas which is mainly composed of methane. Unlike LPG, CNG does not liquefy under high pressure. It is stored inside the container in a gaseous state. **Any single CNG container must not exceed 381 SCF.** (Fire Code 5811.3)

Processed natural gas is tasteless and odorless. Before gas is distributed to consumers, it is scented by adding small amounts of chemicals to assist in leak detection.

Breathing natural gas in trace amounts is harmless. Natural gas is an asphyxiant and can kill if it replaces air to the point where the oxygen content will not support life. It is prohibited to store, handle, use or sell any CNG that has not been satisfactorily odorized with mercaptans or other approved chemicals.

Natural gas is a flammable gas. Natural gas is lighter than air and tends to escape into the atmosphere. It makes CNG safer than LPG once there is a leak in the system. When natural gas is confined, within an enclosed space, gas concentrations can reach explosive limits and, if ignited, result in blasts that could be catastrophic. An example of typical CNG containers is shown below.



**CNG Containers**

The Certificate of Fitness holder must take care when connecting and disconnecting the containers to appliances and for use should be performed outdoors. Where CNG use indoors is allowed, the connection and disconnection of the containers must be performed in a well-ventilated area. All valves on the appliance and the container must be closed when changing the container. This prevents the accidental leaking of gas into the atmosphere.

Flexible nonmetallic hose may be allowed at some applications (e.g., construction sites, emergency indoor repairs, manhole operations, etc.). However, the length of the hose must not exceed 30 feet when the activity is performed outdoors. It must also not exceed 6 feet if the activity is performed indoors. The hose must be made-up of materials that are designed for use with CNG, and the hose must be color-coded red.

### **1.5 CHECK FOR LEAKS**

The gas containers, valves, hoses, and related equipment should be visually checked for physical damage. Special care should be taken to identify any defects that may cause a leak. **Any defective components that are discovered must be marked and replaced before the equipment may be used again.**

If any leak of flammable gases or oxygen is detected, move the gas container to an isolated, well-ventilated area away from combustible materials. Post signs that describe the hazard. The **Certificate of Fitness holder must NOT attempt to do any repairs, only take the equipment out of service.** This equipment is very sensitive and must be repaired by the manufacturer only.

After the new container has been connected to the appliance, all connections must be checked for leaks. Most of these leaks occur at the top of the gas container in areas such as:

- valve threads,
- pressure safety device,
- valve stem
- and valve outlet.

These areas must be checked using a soap and water solution. **NEVER CHECK FOR LEAKS WITH A FLAME.** It is extremely dangerous when a leak meets a flame as it could cause catastrophic consequences. First make sure that all connections are tight. Then open the container valve. Each connection is checked by brushing or spraying a soap and water mixture on the connection.

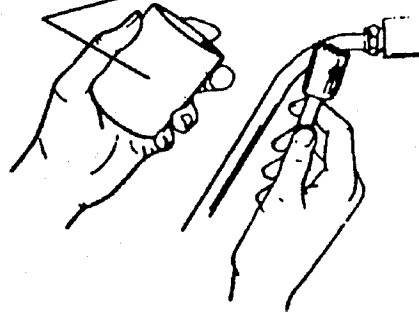
The connection should be checked to see if any air bubbles are present. If no air bubbles are visible there is likely no leak. However, if bubbles are present there may be a problem with the connection.



The suspected fittings should be disconnected and cleaned. Then the connection is tightened, and the checking procedure is repeated.

If the bubbles are still visible, there is a problem with the connection. The fittings should be repaired or replaced before the equipment is used again. **A lit flame (for example, a match) should never be used when checking a connection for a leak.**

Soap and Water Solution



Occasionally, ice or moisture may build up on the regulator. Icy build-up indicates that the compressed gas is exiting the gas container in a liquid state. This is caused by a dangerous defect in the gas container. If ice builds-up on an appliance or connectors, you must:

- 1) shut off the main control valve of the fuel container
- 2) take it out of service
- 3) and return it to the supplier immediately

If the ice build-up is on the gas container itself or its control valve, you should **call 911 immediately.**

## 1.6 PORTABLE FIRE EXTINGUISHERS



A portable fire extinguisher with at least a 10-B:C rating is required at all locations where LPG/CNG is used, stored, or transported. For construction sites a 40-B:C wheeled-type fire extinguisher is required for each storage location. The maximum travel distance to the portable fire extinguisher must be 30 feet from the work location. In case of a fire, 911 must be called.

In the event a fire extinguisher has been discharged, a fully charged replacement is required before work can resume. **It is recommended that the Certificate of Fitness holder be trained of proper use of portable fire extinguishers.**

Portable fire extinguishers are important in preventing a small fire from growing into a catastrophic fire, however, they are not intended to fight large or spreading fires.

**The trained Certificate of Fitness holders should only consider extinguishing fires when they are limited in size and spread such that they can readily be extinguished using a portable fire extinguisher.**

By the time the fire has spread, fire extinguishers, even if used properly, will not be adequate to extinguish the fire. Such fires should be extinguished by the building fire extinguishing systems or trained firefighters only.

In case of any fire, FDNY must be notified immediately. Fire extinguishers must be used in accordance with the instructions painted on the side of the extinguisher. They clearly describe how to use the extinguisher in case of an emergency. The Certificate of Fitness holder should be familiar with the use of portable fire extinguishers.

When it comes to using a fire-extinguisher just remember the acronym P.A.S.S. to help make sure you use it properly.

P.A.S.S. stands for Pull, Aim, Squeeze, Sweep.

All fire extinguishers must be installed so that the top of the extinguisher is not more than 5 ft above the floor and the clearance between the bottom of the extinguisher and the floor is not less than 4 in. In other words, **no fire extinguisher is allowed to be put on the floor.**



**Acceptable**  
Fire extinguisher in a construction site.



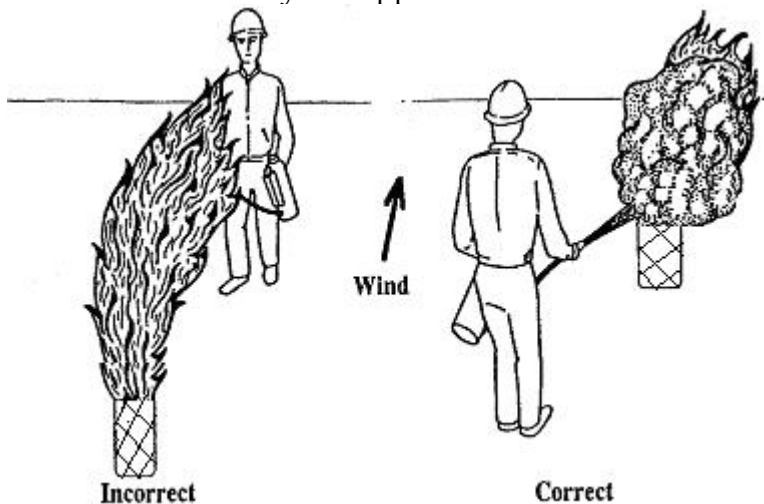
A stackable and portable stand is convenient for temporary extinguisher installation.



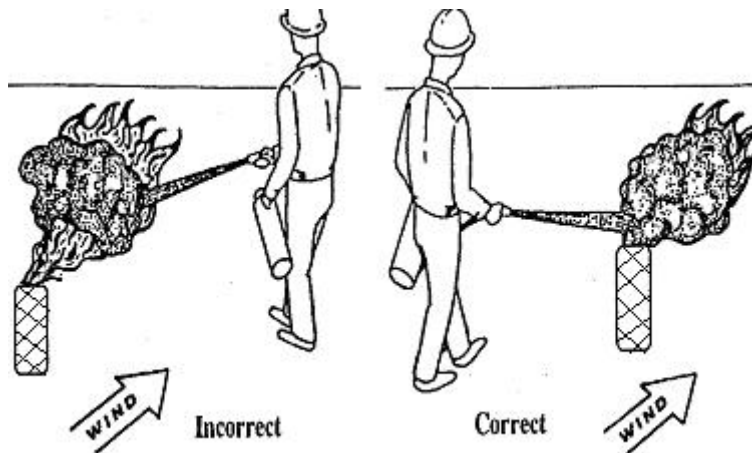
**Unacceptable**  
Improper floor placement of Fire Extinguisher.

### Operation Instructions for a Fire Extinguisher

Special care must be taken when extinguishing a gas fire caused by a leak. The easiest way to extinguish the fire is by using the Emergency Shut Off valve until the flame is extinguished. **In case of any fire, the Fire Department must be notified.** The flame must be approached from an upwind direction. This will prevent the Certificate of Fitness holder from being burned by the flames. **Never approach a fire from a downwind direction.** The correct ways to approach a fire are shown below.



The dry chemical stream must be directed toward the point where the flame begins. **Do not direct the chemical stream at the center of the flame.** This will not extinguish the fire. The correct way to direct the dry chemical stream is shown below.



**For piped gas, the gas supply must be shut off first and then call 911.** This is safer than allowing the flammable gas (e.g., acetylene or LPG) to leak out. A flammable gas leak could result in a serious explosion if it were ignited.

**Never attempt to extinguish the flame unless the gas supply is shut. When it is not possible to shut off the gas supply (e.g., the fire is near the control valve or the shut-off valve) and the gas supply is limited (e.g., it is from a cylinder), allow the flame to burn itself out and call 911.**

In the meantime, you should try to control the scene and prevent the fire from spreading to the surrounding materials. **The trained Certificate of Fitness holders should only consider extinguishing fires when they are limited in size and spread, and they can readily be extinguished using a portable fire extinguisher.**

By the time the fire has spread, fire extinguishers, even if used properly, will not be enough to extinguish the fire. Such fires should be extinguished by the building fire extinguishing systems or trained firefighters only.

### Fire Extinguishers

The Certificate of Fitness holder must be familiar with the different types of fire extinguishers available at the work site. The Certificate of Fitness holder must know how to operate the extinguishers in a safe and efficient manner. The Certificate of Fitness holder must also know the difference between the various types of extinguishers and when they may be used. A description of the classes of fires and the appropriate extinguishers are described below.

**Class A** fires are caused by ordinary combustible materials (such as wood, paper, and cloth). To extinguish a Class A fire, these extinguishers utilize either the heat-absorbing effects of water or the coating effects of certain dry chemicals.

**Class B** fires are caused by flammable or combustible liquids and gases such as oil, gasoline, etc. To extinguish a Class B fire, the blanketing-smothering effect of oxygen-excluding media such as CO<sub>2</sub>, dry chemical or foam is most effective.






**Class C** fires involve electrical equipment. These fires must be fought with fire extinguishers that do not conduct electricity. Foam and water type extinguishers must not be used to extinguish electrical fires. After shutting off the electrical equipment, extinguishers for Class A or B fires may be used.

**Class D** fires are caused by ignitable metals, such as magnesium, titanium, and metallic sodium, or metals that are combustible under certain conditions, such as calcium, zinc, and aluminum. Generally, water should not be used to extinguish these fires.

**Class K** fires from cooking oil fire and are caused by commercial deep fat fryers. Most often occur where cooking media (fats, greases, and oils) are used. Only the class K fire extinguisher is compatible with the wet chemical agents.

A multi-purpose dry chemical fire extinguisher may be used to extinguish more than 2 Classes fires. Examples of some fire extinguishers are shown below.

Examples of fire extinguishers






2-B:C (2BC)	10-B:C (10BC)	20-B:C (20BC), wheeled	3-A:40-B:C(3A40BC), wheeled	6 liter wet chemical Class K Fire Extinguisher
				

Typical Fire Extinguishers

Symbols may be painted on the extinguisher. The symbols indicate what kind of fires the extinguisher may be used on. Examples of these symbols are shown below.

**Fire Extinguisher Identification Symbols**

The symbol with the shaded background and the slash indicates when the extinguisher must not be used. The Certificate of Fitness holder must understand these symbols. All fire extinguishers should be kept in good working order at all times.

CLASSES OF FIRES	TYPES OF FIRES	PICTURE SYMBOL
<b>A</b>	Wood, paper, cloth, trash & other ordinary materials.	
<b>B</b>	Gasoline, oil, paint and other flammable liquids.	
<b>C</b>	May be used on fires involving live electrical equipment without danger to the operator.	
<b>D</b>	Combustible metals and combustible metal alloys.	
<b>K</b>	Cooking media (Vegetable or Animal Oils and Fats)	

Portable Fire Extinguisher (PFE) Tags

Installed portable fire extinguishers must have an FDNY standard PFE tag affixed. This tag will have important information about the extinguisher. By November 15, 2019, all portable fire extinguishers must have the new PFE tags. The FDNY will only recognize new PFE tags and will be issuing violations to business that have PFE installed without a proper tag.

The color of the fire extinguishers may be changed by the FDNY every few years. The FDNY recommends two ways to verify the tag's legitimacy:

1. Hologram:

A real hologram strip shown on the tag is 3 inches long by 1/4 inch wide. Counterfeit tags will NOT have a high-quality silver hologram. The hologram on a counterfeit tag will NOT change color as it is moved against the light.

2. QR code

IF you scan the QR code, it should direct you to the updated FDNY approved fire extinguisher company list. You can use the company list to verify if the company printed on the list is currently approved by the FDNY.

If your PFE tags cannot be verified via these two methods, contact your supervisor. If you suspect your PFE is a counterfeit, contact FDNY immediately by e-mail:

[Tags.Decal@fdny.nyc.gov](mailto:Tags.Decal@fdny.nyc.gov)



PFE tag (This tag is released for 2021-2023)

Fire Department also issues standard outdoor fire extinguisher tags. If the fire extinguishers may be placed outdoors, the COF holder should ask the fire extinguisher suppliers to provide the outdoor fire extinguisher tags for the fire extinguishers.

The special features of the outdoor tags:

1. The material is durable and tear-resistant
2. Different printings:
  - On the back of the tag, the series number will contain a “D” letter;
  - AND/OR
  - On the front of the tag, an “O” is printed on the top of the tag (this feature may not be on ALL outdoor tags)



Outdoor PFE tags

Portable Fire Extinguisher Inspections

**MONTHLY**

The portable fire extinguishers are required to be checked monthly. The owner of the business is responsible to select a person to do a monthly inspection. This monthly inspection is called a "quick check".

The QUICK CHECK should check if:

- the fire extinguisher is fully charged;
- it is in its designated place;
- it has not been actuated or tampered with;
- there is no obvious or physical damage or condition to prevent its operation.

The information of the monthly inspection record must include the date of the inspection, the name/initials of the person who did the inspection. This monthly quick check record must be kept on the back of the PFE tag or by an approved electronic method that provides a permanent record.

## **ANNUALLY**

At least annually all Portable Fire Extinguishers must be checked by a W-96 Certificate of Fitness holder from FDNY approved company. After each annual inspection W-96 COF holder will replace the PFE tag. The information of the annual inspection record must be indicated on the new PFE tag.

## **1.7 INDOOR AND OUTDOOR STORAGE RULES**

**No LPG/CNG container is allowed to be stored underground or in a below grade location or in a cellar.** A valid storage permit is required for any storage area storing LPG/CNG in excess of 400 SCF. The Certificate of Fitness holder is responsible for the safe storage, handling, and use of the gas containers. The LPG/CNG storage must be located away from the following:

- Electric power lines
- Piping containing flammable or combustible liquids
- Piping containing flammable gases
- Piping containing oxidizing materials

**All empty or in-use gas containers should be counted as full containers. The quantity of any empty gas container must be subject to the maximum allowable storage quantity.**

### General Indoor Storage Rules

Any LPG container with a capacity greater than 16.4 oz and any CNG containers with a capacity greater than 8.7 SCF must **NOT** be stored inside any

- residential occupancy
- non-residential occupancy
- or in any building where an outdoor LPG/CNG storage location is available

The authorized LPG/CNG indoor storage room must be used for LPG/CNG storage **ONLY**. It must be constructed of walls, floors and ceilings having at least a 2-hour fire resistance rating and be constructed with an access door that opens directly to the outdoors.

Any delivery and pick-up of the LPG/CNG containers to or from the storage room must be through the outdoors access door **ONLY**, not through the building. A room must be protected by at least one 10-B/C fire extinguisher attached to the outside of the storage room or placed at another readily accessible location not more than 30 feet from the room entrance.

Any indoor storage for flammable gas (CNG or LPG) of 3,500 SCF or less must be protected against damage or injury from falling objects or surrounding activity, and be located not less than:

- (1) 10 feet of any combustible materials
- (2) 20 feet from all classes of flammable and combustible liquids, oxidizing gases
- (3) 25 feet from open flames, ordinary electrical equipment or other sources of ignition.
- (4) 50 feet from air-conditioning equipment, air ventilation.
- (5) 50 feet from other flammable gas storage.

There may be more than one storage location of 3,500 SCF in a room, provided that each storage location does not exceed 3,500 SCF. The storage locations are to be separated by at least 50 feet or by an approved masonry barrier having a minimum fire resistance rating of 2 hours.

### Open Fires

LPG container storage in Group R-2 and R-3 occupancies **MUST** not exceed **four** containers per dwelling unit, each container having a capacity not exceeding 16.4 ounces of LPG. Storage of such LPG containers in a basement, cellar or other area below grade is **prohibited**.

Portable outdoor barbecues burning:

- charcoal
- powered by electricity
- or fueled by LPG containers or piped natural gas

may be stored and used on any residential premises in compliance with the requirements of the Fire Code.

Portable outdoor barbecues burning:

- charcoal,
- powered by electricity,
- or fueled by piped natural gas

may be stored and used on any other premises in compliance with the requirements of this section and the rules, except as may be restricted by the Zoning Resolution or the Department.

Stationary outdoor grills and other outdoor cooking equipment must be installed in accordance with the Building and Mechanical Codes and operated and maintained in accordance with this section.

- Only portable outdoor barbecues designed for use with LPG containers with a capacity of 16.4 ounces may be stored or used on the premises of a Group R-2 occupancy.
- Portable outdoor barbecues designed for use with LPG containers with a capacity of 20 pounds or LPG containers with a capacity of 16.4 ounces may be stored or

used on the premises of a Group R-3 occupancy.

Twenty-pound LPG containers MUST NOT be stored or used indoors, or on any rooftop, balcony, or fire escape. A maximum of **two** 20-pound LPG containers may be used to fuel a portable outdoor barbecue in one- and two-family residences ONLY.

Special requirements for indoor LPG storage capacity: (Fire Code 6109.9; 6109.10)

The maximum indoor LPG storage capacity is **200 lbs.** if storage location is within buildings that are accessible to the public. However, if the indoor storage location is not accessible to the public, such as industrial buildings, the capacity can be up to **300 lbs.**

General Outdoor Storage Rules

No more than 2,500 SCF of CNG must be stored in a pre-existing outdoor CNG storage facility unless such facility complies with the current Fire Code. Outdoor storage of LPG must be limited to not more than **400 lbs.** of LPG. (Fire Code 6109.12)

All LPG/CNG containers must be stored outdoors in an approved storage enclosure. The enclosure must:

- protect the containers against extreme temperatures,
- tipping over
- physical damage
- and tampering

They also must be protected by a metal open fence enclosure:

- at least 6 feet in height and
- secured by a locked gate opening outward
- or a lockable ventilated metal locker of a type acceptable to the Fire Department.

Such fence enclosure or locker must be mounted on and secured to a substantial concrete pad at grade level, protected to prevent the accumulation of rain and snow.

The enclosure must be located above ground in a well-ventilated area and be protected by at least one 10-B/C fire extinguisher located outside of the enclosure. For construction sites a 40 B:C a wheeled type of fire extinguisher is required for each storage location. The required fire extinguisher must be located no more than 30 feet from the storage location. **LPG/CNG containers must not be stored on the roof of any building.**

The outdoor storage of LPG for sale at mercantile locations and use of LPG requiring a permit must be under the general supervision of a Certificate of Fitness holder.

With the exception of automated container exchange systems, outdoor storage of LPG for sale at mercantile locations must be under the personal supervision of a Certificate of Fitness holder.

These automated container exchange systems at these mercantile locations must comply with the following requirements:

- each storage facility must not store more than 400 pounds of propane gas.
- each container cannot exceed 20 pounds.

- containers must be secured in a locked, fenced enclosure
- containers are accessible to Certificate of Fitness holders or by an automated container exchange system only
- a sign is to be posted at or near the entrance that states “**DO NOT BRING IN LPG CONTAINERS INTO THE BUILDING**”
- a durable sign posted at or near the cylinder storage enclosure identifying the vendor/supplier and the emergency contact information for the vendor/supplier.

The LPG/CNG storage must be accessible from the street. The location of **outdoor storage** must comply with the following table. The storage of LPG/CNG at construction sites must follow additional regulations listed in the “storage at construction site” section.

**LPG/CNG OUTDOOR STORAGE IF STORAGE IS BETWEEN 100 LBS AND 400 LBS**

Type of Outdoor Exposure	Minimum Distance to the Exposure
Any combustible materials (e.g., paper box)	10 feet
The nearest lot line, sidewalk, or building on an adjoining lot	10 feet
Any authorized parking for motor vehicles	10 feet
Any below ground flammable liquid or combustible liquid storage tank in excess of 1,000 gallons.	15 feet
Building openings or any exit access doors, or stairways.	20 feet
Motor vehicle fuel dispenser (e.g., Gas station)	20 feet
Any building occupied as a multiple dwelling	50 feet
Any school, hospital, church, or place of public assembly.	100 feet

Warning signs complying with OSHA requirements must be clearly posted at each LPG/CNG installation, storage location or use site. The sign should read:



(The sign must be at least 10 inches by 14 inches in size and the letters must be at least 2 inches high)

**Acceptable:**

1. The metal open fence enclosure was secured by a locker.
2. The storage was located in a well-ventilated area.
3. Provided with a portable fire extinguisher with at least a 10-B:C ratings attached to the outside of the storage facility. For construction sites a 40 B:C a wheeled type of fire extinguisher is required for each storage location.
4. The required sign was clearly posted.



**Unacceptable:**

**The fire extinguisher should be mounted:**  
The clearance between the bottom of the extinguisher and the floor must not be less than 4 inches.

**1.8 CONSTRUCTION SITE USE & STORAGE**

No LPG/CNG container is allowed to be stored underground or in a below grade location. A valid storage permit is required for any storage, handling, or use of more than 170 SCF of LPG/CNG. For LPG, 170 SCF is approximately 20 lbs.

The Certificate of Fitness holder is responsible for the safe storage and use of the gas containers. The LPG/CNG storage must be located away from the following:

- Electric power lines
- Piping containing flammable or combustible liquids
- Piping containing flammable gases
- Piping containing oxidizing materials

**All empty or in-use gas containers should be counted as full containers. In other words, the quantity of any empty gas container must be subject to the maximum allowable storage quantity.**

LPG/CNG containers must be stored in a storage enclosure and must be approved by FDNY. The enclosure must protect the containers against:

- extreme temperatures
- tipping over
- physical damage
- and tampering

They also must be protected by a metal open fence enclosure at least 6 feet in height and secured by a locked gate opening outward or a lockable ventilated metal locker of a type acceptable to the Fire Department.

Such fence enclosure or locker must be mounted on and secured to a substantial concrete pad (9x6 feet) at grade level, protected to prevent accumulation of rain and snow. Warning signs complying with OSHA requirements must be clearly posted at each

LPG/CNG installation, storage location or use site. The sign should be read as the one on page 24.

The Certificate of Fitness holder is responsible for the safe storage, handling, and use of the LPG/CNG containers. Only LPG/CNG containers in use are permitted inside a building under construction.

No extra containers may be in the building while work is in progress. Generally, LPG/CNG containers are not allowed to be stored inside any unoccupied building overnight and should be taken outside at the end of each workday.

However, there are circumstances when the Department may allow this. **Any indoor storage of LPG/CNG containers should be approved by the Fire Department prior to beginning such storage. LPG/CNG containers must not be stored on the roof of any building.**

The maximum allowable quantity of LPG and CNG on construction sites:

	LPG	CNG	Note
Single outdoor storage enclosure	2500 pounds	21,500 SCF	The distance between two locations on a construction site must be at least 50 feet.
Single indoor storage location	1250 pounds	10,625 SCF	The distance between two locations on a construction site must be at least 70 feet.
Total capacity on a construction site	5000 pounds	42,500 SCF	

**Any single standard portable LPG container must not exceed 100 lbs. in weight. Any single CNG container must not exceed 381 SCF. All empty or in-use gas containers should be counted as full containers. In other words, the quantity of any empty gas container must be subject to the maximum allowable storage quantity.**

All LPG/CNG containers, full or empty, and which are not in use must be stored in an outdoors storage enclosure located at least 25 feet away from the building under construction.

The storage enclosure must be kept securely locked when not in use. Flammable and combustible materials must be kept at a safe distance from the enclosure and must be located at least 50 feet from such enclosure.

It must be located at least 50 feet away from any building occupied as a multiple dwelling, and at least 100 feet away from any subway entrance, exit, vent or other opening and also at least 100 feet away from any school, hospital, church, or place of public assembly. All indoor storage must be at least 10 feet away from any flue, stairwell, or elevator shaft.



Each construction site storage enclosure must be equipped with at least one 40-B/C rated, wheeled, fire extinguisher. Such fire extinguisher must be kept outside of the storage facility or placed at another readily accessible location not more than 30 feet from the storage facility.

**PART 2. USE AND HANDLING USE OF LPG/CNG FOR TAR KETTLE, ASPHALT MELTER AND MARKING TRAFFIC LINES**

*Please see the following table to see if you should obtain G-41/G-42/G-60 instead of G-40*

Operation	Connecting to oxygen container?	Qualified Certificate of Fitness
LPG/CNG Torch operation for torch-applied roof systems	No	G-41, G-42 or G-60
Use of LPG/CNG for asphalt melter or tar kettle	No	G-40, G-42
Use of oxygen and flammable gases or LPG or CNG for any hot work operation	Yes	G-60
Use of oxygen and piped natural gas for hot work operation in jewelry manufactures and dental lab facilities	Yes	G-61

**2.1 FDNY PERMIT**

A FDNY permit is required to store, handle, or use a tar kettle or an asphalt melter.

**2.2 TAR KETTLE**

A tar kettle is designed to heat tar, asphalt, pitch, or similar materials before it can be used for construction purposes, typically for waterproofing operations or street repair. Tar kettles do not include asphalt melters. It is unlawful to store, handle or use tar kettles that utilize flammable liquid as a fuel.

The operation of a tar kettle that requires a permit must be under the personal supervision of a person holding a Certificate of Fitness.



Tar kettles must be equipped with tight-fitting lids and must not be moved when the heat source of the tar kettle is operating with the exception of when the tar kettle is in the process of patching road surfaces.

The LPG/CNG containers must be protected against physical damage and the heat generated by the kettle heater.

This is achieved by placing the LPG/CNG container behind a heat shield. The shield prevents radiated heat and flames from reaching the container.

The LPG/CNG must be located at least **10 feet** from the burner. (Fire Code 303.3) This is important because the pressure of the gas in the container could increase to a dangerous level.

Each tar kettle must also be equipped with metal covers. These covers are used to smother potential fires. Tar kettles must not be located within 20 feet of any:

1. combustible material,
2. combustible building surface
3. or any buildings opening.

Tar kettles must be within a controlled area identified by the use of traffic cones, barriers, or other approved means. Tar kettles should not be utilized inside of a building or structure. (Fire Code 303.2)

The following regulations must be followed when using LPG/CNG to heat a tar kettle:

- (a) A tar kettle may be used outdoors ONLY.
- (b) A tar kettle must **NOT** be used on any roof of a structure.
- (c) LPG/CNG Container valves must be closed when burners are not in use.
- (d) A gas regulator and excess flow valve must be installed on all heating devices. A shut off valve must also be installed on the LPG/CNG container.



- A fire was sparked by a kettle when the tar kettle was used on the roof of Northside Piers tower in Brooklyn. (Sep. 2007)
- No tar kettle is allowed to be used on roof according to the 2022 NYC Fire Code.

The tar kettle must be continuously supervised by a Certificate of Fitness holder. The holder must be within 100 feet of the kettle, have the kettle within sight and have unobstructed access to the kettle.

The Certificate of Fitness holder is responsible for the safe operation of the equipment and must also make sure that all safety regulations are observed. (Fire Code 303.4)

### 2.3 ASPHALT MELTER



Asphalt melters (or rubberized asphalt melter) are approved devices designed to heat asphalt, typically for waterproofing operations. It utilizes LPG or CNG (Compressed Natural Gas) to generate an enclosed flame.

**The use of CNG fueled asphalt melters must be operated in the same manner as LPG fueled tar kettles.** Only the LPG-fueled asphalt melters may be utilized on the roof of non-combustible construction in accordance with NYC Fire Rules. It is unlawful to store, handle or use tar kettles that utilize flammable liquid as a fuel.

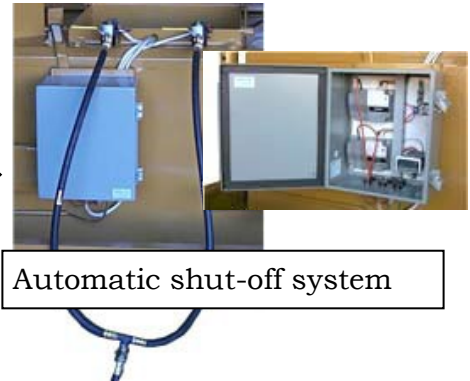
In summary, the asphalt melter must be designed to:

- (1) be constructed of noncombustible materials  
and
- (2) be equipped with tight-fitting lids  
and
- (3) utilize an enclosed flame indirectly  
and
- (4) provide with a thermostatic control  
and
- (5) provide with an automatic shut-off to limit the temperatures.



Thermostatic control

These devices help users to ensure the temperature of the asphalt does not exceed 425°F or 50°F below the flash point of

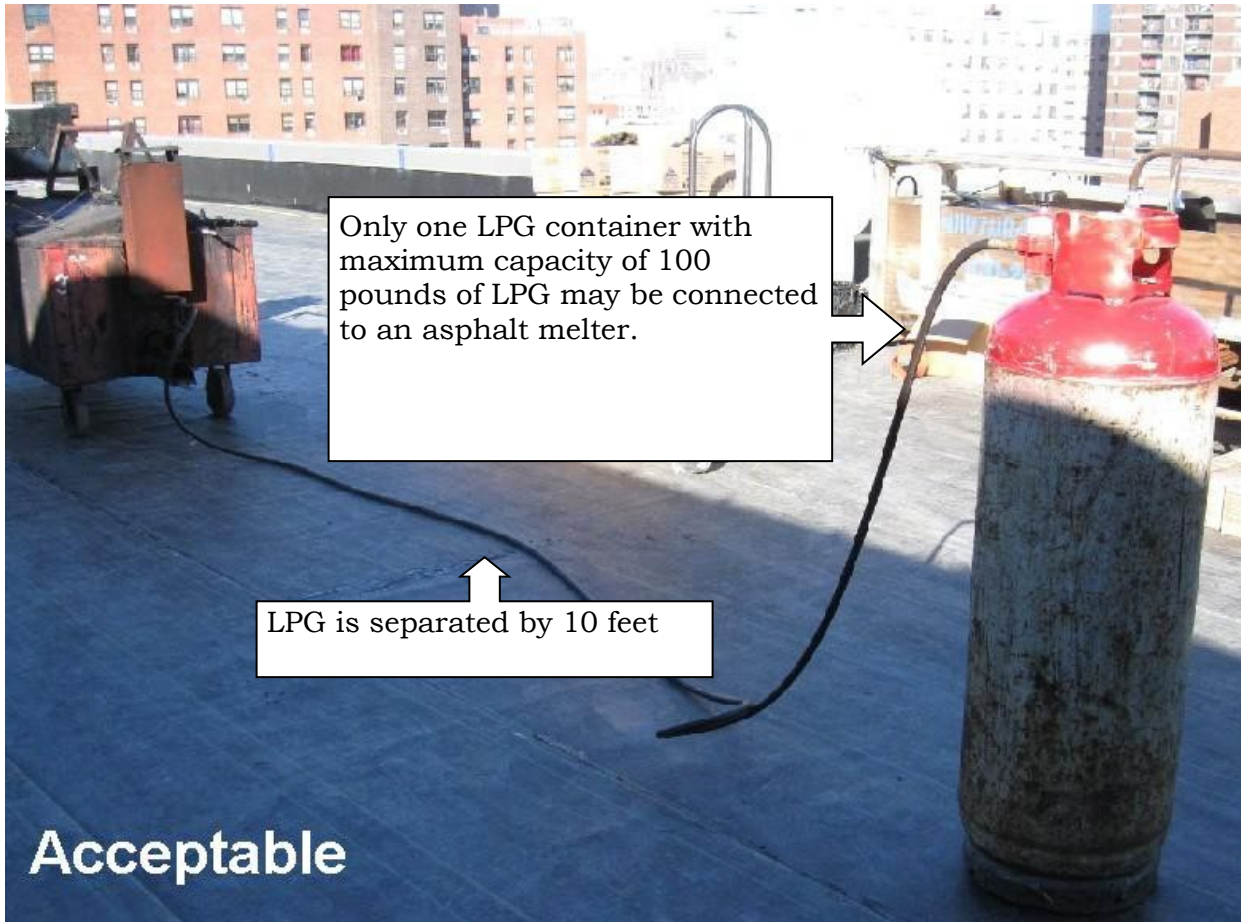


Automatic shut-off system

If any one of the above requirements are not met for the heating device, it may be categorized as a tar kettle instead of an asphalt melter. (Need better photo, CDA will provide)



The melter cover must be designed to close automatically.



Only one LPG container with maximum capacity of 100 pounds of LPG may be connected to an asphalt melter.

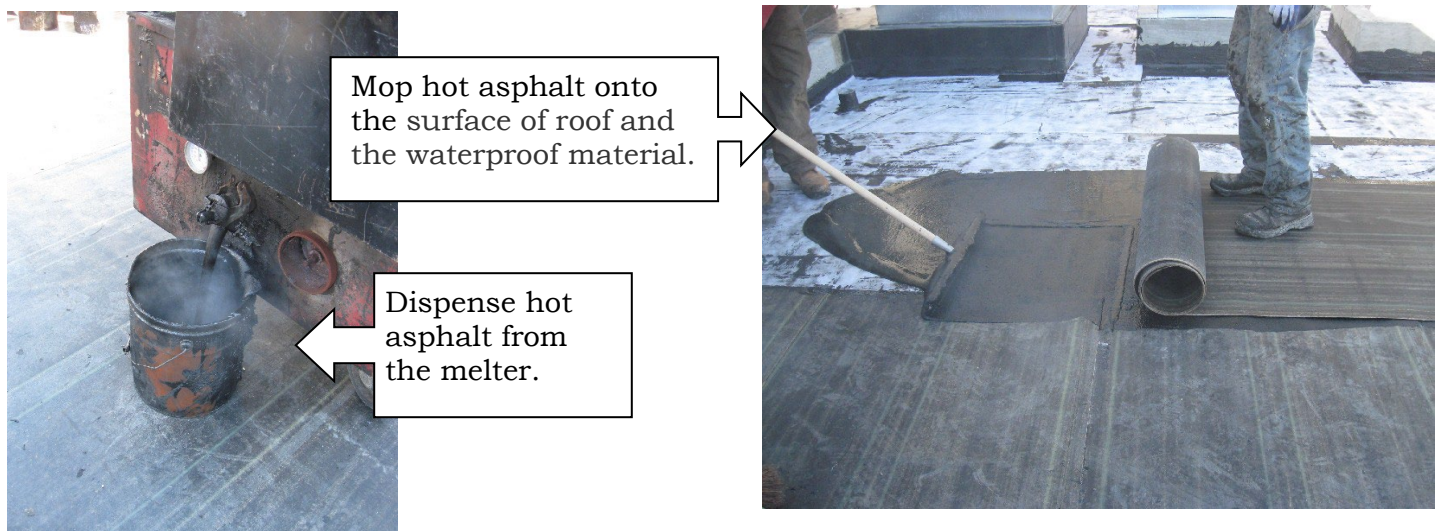
LPG is separated by 10 feet

Acceptable

## Hot-mop roofing using asphalt

An asphalt melter must only be used on non-combustible roofing operation. Asphalt melters must not be located within 20 feet of any combustible material, combustible building surface or any building opening and within a controlled area identified by the use of traffic cones, barriers, or other approved means. Asphalt melters must not block means of egress, gates, roadways, or entrances.

Roofing mops must be stored outdoors. When soaked with asphalt the mops are easily ignited. All roofing mops must be thoroughly cleaned after use. They must be kept at least 20 feet away from all sources of ignition. The procedures of hot-mop operation should be done as the follows:



LPG asphalt melters may be used on roof of non-combustible construction in accordance with NYC Fire Rules. The following requirements must be complied with:

- (a) The maximum capacity of the asphalt melter must not exceed 200 gallons of asphalt, or such lesser amount as may be safely supported by the roof structure.
- (b) 2 asphalt melters maximum on a roof.
- (c) The Certificate of Fitness holder is responsible for the personal supervision of asphalt melters must be provided with a cellular phone as means for immediate emergency notification.
- (d) Only LPG containers connected for use must be kept on the roof.

Asphalt melters must not be transported or otherwise moved when the heat source for the kettle or melter is operating. The asphalt melter must always be operated under the personnel supervision of a G-40 Certificate of Fitness holder.

The holder is responsible for the safe operation of the equipment and the holder must make sure that all safety regulations are followed including wearing appropriate personnel protective equipment.

An operating asphalt melter requiring a permit must be under the personal supervision of a person holding a G-40 certificate of fitness.

The certificate of fitness holder must be within 100 feet of the melter, have the melter within sight and have unobstructed access to the melter. Ladders and other obstacles must not form a part of the route between the certificate of fitness holder and the melter.

The certificate of fitness holder must not have to climb or descend a ladder or circumvent any obstacle to gain access to the melter.

## **2.4 MARKING TRAFFIC LINE**

LPG/CNG may be used to fuel the heating kettle for paint used to mark traffic lines or to do street repair. LPG storage and use on any motor vehicle for the purpose of marking traffic lanes must be limited to 4 containers and CNG must be limited to a total capacity of 3,400 SCF.

**LPG containers must not exceed 100 lbs. per and a single CNG container must not exceed 381 SCF.** The vehicle must be registered and approved by the Fire Commissioner.

The gas container or tank must be:

- (1) installed on the motor vehicle in a manner that will protect it from physical damage;
- (2) installed to prevent their shaking loose and slipping or rotating
- (3) securely mounted in a manner so that it is not subject to wear while the vehicle is in motion.

The Certificate of Fitness holder must:

- (1) personally supervise the truck used to mark traffic lines
- (2) make sure that all safety regulations are obeyed
- (3) make sure that all safety devices, vents, connecting lines, chains, and guards are kept in good condition and working order.

## **2.5 FIRE SUPPRESSION**

At least one 3-A:40-B:C rated fire extinguisher must be within 25 feet of each asphalt melter/tar kettle. One more 3-A:40-B:C rated fire extinguisher is needed on the roof being covered. For the kettle used for marking traffic lines or doing street repair, at least one 20-B:C rating fire extinguisher must be provided.

**PART 3. LPG/CNG USED TO FUEL COOKING EQUIPMENT AT OUTDOORS EVENTS**

**3.1 MOBILE COOKING USES**

Mobile food units such as a truck containing hot plates and other LPG/CNG cooking equipment, including mobile kitchens, and catering vehicles, must be limited to 2 LPG containers up to 100 pounds each as per the Department of Health. Non-motorized food units (e.g., push carts or stands) must have a container capacity not exceeding two (2) 20 lbs. for LPG, or not exceeding 170 SCF for CNG. Valves must be closed when the mobile food unit or its cooking equipment is not in use. **Any quantity over 47 pounds needs a city-wide permit issued by the FDNY Bureau of Fire Prevention’s Hazardous Cargo Unit.**



The LPG container capacity must not exceed two 20 lbs. and the container must be mounted securely.

The location of any mobile food units must comply with the following table.

<b>LPG/CNG MOBILE FOOD UNIT</b>	
Type of Outdoor Exposure	Minimum Distance to the Exposure
Any combustible materials (e.g., paper box)	2 feet
Any flammable gas storage, including another mobile food unit equipped with LPG/CNG containers	5 feet
Any subway vent or other opening, except a subway entrance or exit	5 feet
Any subway entrance or exit	10 feet
Any vent or fill line of any flammable liquid storage tank	10 feet
Any building, except as follows:	2 feet
Any below-grade building opening, including any door, openable window or intake or exhaust vent	5 feet
Any building of wood frame construction	10 feet
Any building entrance	20 feet
Any building occupied as a multiple dwelling	10 feet
Any school, hospital, church, or place of public assembly	10 feet

All mobile food units that are motor vehicles may never be left unattended in a public area within 50 feet of the property line of any building. Those occupied as a:

- multiple dwelling
- any school
- hospital
- church
- place of public assembly
- any subway entrances
- exit
- vent
- or other openings

Gas containers must be mounted securely on the vehicle or within the enclosing recess or cabinet. All LPG/CNG container valves, accessories, and connections must be protected to prevent damage from:

- accidental contacts with stationary objects
- from loose objects
- stones
- mud
- or ice

thrown up from the ground or floor, and from damage due to overturned or similar vehicular accidents. Where containers are located on the outside of a vehicle, weather protection must be provided. (NFPA 58 6.23.3.4)

### **EXCESS STORAGE OF PROPANE FOR FOOD CARTS**

Excess propane storage for food carts is **NOT** allowed. If excess propane is found the FDNY will take enforcement action as necessary and possibly remove the cylinders from the location.



### **3.2 COMMERCIAL ESTABLISHMENTS**

LPG/CNG storage, handling and use for cooking and oil burner ignition in commercial establishments must be limited to the LPG containers with a capacity not greater than 16.4 ounces or the CNG containers with a capacity not greater than 8.7 SCF unless the container is connected in a stationary installation. All LPG/CNG devices and equipment must be installed by a licensed plumber. Flexible metallic hoses and tubing which are designed for use with LPG/CNG may be acceptable, but the length of hose or tubing does not exceed 6 feet.

### **3.3 STREET FAIRS AND SIMILAR OUTDOOR PUBLIC GATHERINGS**

**It is prohibited to store, handle or use CNG at bazaars, carnivals, street fairs and similar outdoor events, including public gathering places.** The storage, handling, and use of LPG at street fairs and similar outdoor gatherings must be under the personal supervision of a person holding a certificate of fitness.

LPG storage, handling, and use in connection with any street fair, bazaar, concert, festival, or other similar outdoor public gathering must be limited to 2 LPG containers per device or equipment. Each container not greater than 20 lbs.

A separation distance of 5 feet must be maintained between LPG containers connected for use to LPG devices. All LPG containers must be located at least 50 feet away from the property line of any building. Those occupied as a:

- multiple dwelling
- any school
- hospital
- church
- place of public assembly
- any subway entrances
- exit
- vent
- or other opening

There must be a person responsible for the operation of each LPG device or equipment, one person cannot operate more than one LPG device.



A separation distance of **5 feet** must be maintained between LPG containers connected for use to LPG devices.

Nonmetallic hoses may be used at a street fair or other similar outdoor public gathering where LPG containers are stored, used, and connected. However, the length of the hose should not exceed 6 feet and the hose should be designed for a working pressure of not less than 250 psi.

The area surrounding the LPG equipment must be kept clean at all times. No combustible materials may be stored next to the LPG containers and related equipment. LPG containers must be at least 2 feet from any combustible material.

All garbage and waste materials must be stored in a covered container. The waste container must be designed to prevent accidental ignition of the collected waste materials. The waste container must not be overflow and should be emptied regularly.

The Certificate of Fitness holder must visually check each device, equipment of a system and incidental storage area prior to the start of use **each day** to make sure they are all in good working order.

A record of such visual check must be maintained either at a central location for all concessionaires, or at each concession area and must be available for inspection by any Department representative.

Sometimes conditions prevent strict compliance with the guidelines outlined above. In such cases the Fire Commissioner may modify or waive some of the required safeguards. If special circumstances arise the Fire Commissioner's office should be notified. Applications for modifications and waivers will be dealt with on an individual basis.

### Deep fat fryers

Deep-Fat Fryers are cooking vessels designed for the frying of foods in several inches or more of hot oil.

The frying temperature range is generally between 325 to 375 F (160 to 190 C.) It is best

to use fats such as peanut oil or beef tallow, which have very high smoke points. Oils such as sunflower oil have low smoke points. When heated to high temperatures, they will give the food a burnt taste and in a worst-case scenario they may burst into flames.

### **Location**

Deep fat fryers must be separated from any adjacent cooking equipment that uses an open flame by at least 16 inches. Instead of such separation distance, a 16-inch high by ½-inch thick steel baffle that is permanently attached to the longer of the two adjacent cooking appliances may be used.

The baffle must extend to the full depth of the cooking equipment to which it is attached.

### **High-limit controls**

Deep fat fryers must be equipped with an independent high-limit control in addition to the adjustable operating control (thermostat). Such high-limit control must be designed and arranged to shut off the fuel supply, including electrical energy, when the fat temperature reaches not more than 475°F.

## **3.4 FIRE SUPPRESSION**

### Mobile Cooking

Each mobile food unit must be provided with a portable fire extinguisher with at least a 2-B:C rating. The fire extinguishers must be mounted away from the heat source. If the mobile food units are motor vehicles, they must be provided with a portable fire extinguisher with at least a 20-B:C rating.

### Street Fairs and Similar Outdoor Gathering Events

Each concession area, or the location in which LPG is being stored, handled, or used, must be provided with a portable fire extinguisher with at least a 10-B:C rating.

A malfunctioning and/or misused deep fryer poses a serious fire risk, especially with gas-powered deep fryers. Putting water on oil fires will cause a fire boil over and aggravate the situation.

Portable fire extinguishers must be readily available for use in the cooking area but in any event no further than 30 feet of travel distance from the commercial cooking equipment.

### Deep fat fryers

When a deep fat fryer is installed in a cooking area, Class K portable fire extinguishers must be provided.

## **PART 4. LPG/CNG USE IN MANHOLE OPERATIONS**

LPG/CNG containers may be used to fuel appliances used at manholes or similar underground structures. The entire work site must be personally supervised by a Certificate of Fitness holder.

Flammable liquids and vapors often accumulate in manholes or other below ground locations. They accumulate because they are heavier than air and tend to fall to the lower ground level. They may be highly explosive and easily ignited. These liquids and vapors may also be toxic or suffocating.

These vapors pose a serious threat to the safety of those working in the manhole. The worker must be protected against these liquids and vapors. Various detection devices are often used to determine whether a danger from vapor or liquids is present.

When dangerous vapors are detected, work may not begin until the vapors are reduced to safe levels.



Sparks or any overheating can cause a large fireball because of high concentrations of carbon monoxide and neoprene gas in a manhole. The ignition can be sudden and explosive.

Any people or objects caught in a manhole explosion can be seriously injured or damaged.



The Certificate of Fitness holder must purge the manhole of dangerous vapors. Several powerful fans may be used to blow the gases away from the work location. These fans may also be used to ventilate the manhole while work is being conducted.

The work area must then be tested to determine the concentration of dangerous vapors in the manhole.

The area must be flushed of combustible liquids. Only when the work area is purged of dangerous vapors and liquids may work begin. The area should be checked periodically while work is in progress. The area should be ventilated until work is completed.

Tests must be conducted to determine the oxygen content in the manhole. Special equipment is used to measure the oxygen content. Under no circumstances should a worker be sent into a manhole if the oxygen content is below 19.5%.

The only exception to this rule is when a worker is wearing a self-contained breathing apparatus (SCBA). Testing should be repeated as often as necessary to maintain safe working conditions.

Hot Work Fire Safety Requirements

Hot work operations involving cutting or welding must be conducted at least 35 feet (10 668 mm) from combustible materials and combustible waste. Appropriate shielding to prevent sparks, slag, or heat from igniting exposed combustibles must be provided.

All hot work operations must be conducted at least 25 feet from combustible materials and combustible waste. Whenever there are hot work operations a Fire Guard **MUST** be present.

Containers




The LPG/CNG containers must be supported to prevent accidental movement. The LPG/CNG containers or heaters must not be brought into the manhole. The LPG/CNG containers and heaters must be kept at least 6 feet from the manhole opening.

Only two LPG containers with a maximum capacity of 33½ pounds or two CNG containers with a maximum capacity of 285 SCF can be used for each manhole work.

Nonmetallic hoses may be used at manhole operations where the portable LPG/CNG containers are stored, used, and connected. The length of the hose should not exceed 30 feet and the hose should be designed for a working pressure of not less than 250 psi.

In addition, the nonmetallic hose used to connect to the appliance and the **CNG container** must be color-coded red.

LPG/CNG containers must be removed from the job site at the end of the workday unless they are stored overnight in a locked steel tool cart. The tool cart must have a door at least ¼ inch thick that is locked at all times and be well-constructed for ventilation. The LPG/CNG containers shut-off valves must be unobstructed and readily accessible in the tool cart. The following two signs must be permanently attached to the cart:

6-IN DOT PLACARD 1075 for LPG	6-IN DOT PLACARD 1971 for CNG	No Smoking for LPG/CNG
		
<p>Must be affixed to 2 opposite exterior walls of the cart</p>	<p>Must be affixed to 2 opposite exterior walls of the cart</p>	<p>Must be affixed to the cart in a visible location</p>

The location of the tool cart must comply with the following table.

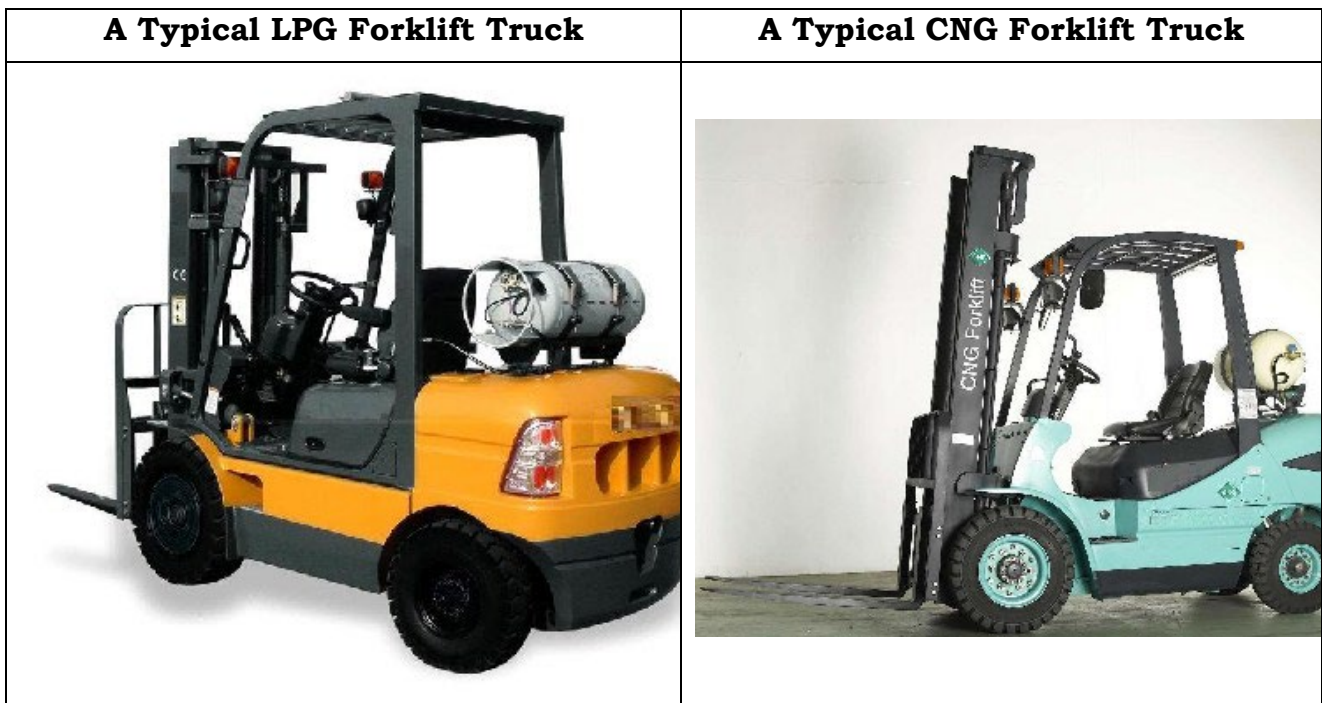
<u>Tool cart location</u>	
Type of Outdoor Exposure	Minimum Distance to the Exposure
The nearest lot line, sidewalk, or building on an adjoining lot	10 feet
Any vent or fill line of any flammable liquid or combustible liquid storage tank	15 feet
Any aboveground flammable liquid or combustible liquid storage tank	20 feet
Any building occupied as a multiple dwelling	50 feet
Any school, hospital, church, or place of public assembly.	100 feet

## **PART 5. USE OF LPG/CNG IN POWERED INDUSTRIAL TRUCK OPERATIONS**

### **5.1 LPG/CNG POWERED INDUSTRIAL TRUCK OPERATIONS**

Forklifts, tractors, and similar powered trucks are commonly used in modern businesses and industry. For example, they are used in many warehouses and in building sites to move heavy objects from one location to another.

To obtain the G-22 Certificate of Fitness, all operators should be trained and certified in the safe operation of forklifts in accordance with the *manufacturer's recommendations*, *Occupational Safety and Health Standards governing Powered industrial trucks (OSHA CFR 1910.178)*, *American National Standards Institute law governing Vehicle-Mounted Elevating and Rotating Aerial Devices (ANSI 92.2)*.



Many of these trucks are fueled by LPG/CNG. LPG/CNG is a convenient and economical way to fuel the trucks. The trucks are fueled using a removable LPG/CNG container.

Only one LPG/CNG container may be installed on a truck. The maximum capacity of the LPG container is 40 pounds and the maximum capacity of the CNG container is 340 SCF.

The LPG/CNG container or tank must be installed on the truck in a manner that will protect it from physical damage. The LPG/CNG container must be installed to prevent their shaking loose and slipping or rotating.

The LPG/CNG container must be securely mounted in a manner so that it is not subject to wear while the vehicle is in motion. For this reason, chains should not be used to secure the LPG/CNG container to the LPG/CNG powered industrial truck.

Any hose 60 inches in length or less must not be stainless steel wire braided construction. (NFPA 58 11.12.3) The nonmetallic hose must be as short as practical and be made of materials resistant to the action of LPG/CNG.

The LPG/CNG powered industrial trucks must be used and parked in well-ventilated areas. The truck must never be left unattended in a public area within 50 feet of the property line of any:

- multiple dwelling
- any school
- hospital
- church
- place of public assembly
- any subway entrances
- exit
- vent
- or other opening

Whenever the truck is parked, the LPG/CNG container shut-off valve must be closed. The truck may not be parked in areas of excessive heat. The excessive heat may cause the pressure inside the LPG/CNG container to increase to a dangerous level.

For example, the CNG powered industrial trucks must be parked and the CNG containers connected or disconnected not less than 25 feet away from any open flames or other ignition sources or other hazardous conditions.

Every forklift must be equipped with one 2-B:C rated fire extinguisher. The extinguisher is commonly attached to the roll bar at the rear of the truck.

The containers can only be changed by a Certificate of Fitness holder. All sources of ignition within 15 feet must be extinguished when replacing the LPG container. LPG containers should be replaced only in an outdoor area or in a well-ventilated area.

The LPG container valves, hoses, and related equipment should be visually checked for physical damage before replacing the container. Special care must be taken to identify any potential defects that may cause a leak.

Any defects that are discovered must be taken care of by replacing the defective part before the truck may be used again. **No extra storage of LPG/CNG containers is permitted without an FDNY permit.**

## **5.2 SPECIAL NOTES FOR FORKLIFT USING LPG CONTAINERS**

The LPG powered industrial truck must NOT be used or parked in the basement or cellar of any building. Several features are installed on the truck to make sure that the LPG is used safely.

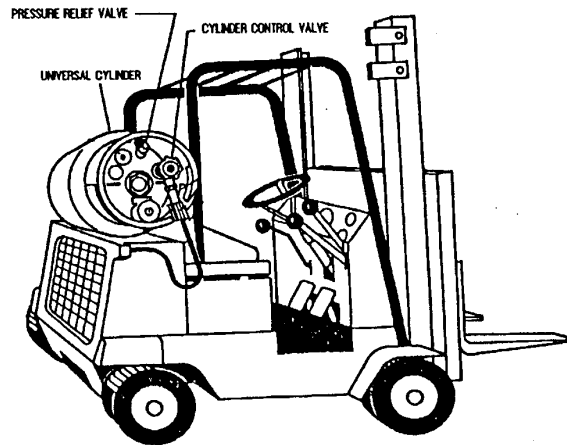
The truck is fitted with a pressure relief valve, excess flow valves, gauges (e.g., fixed liquid level gauge), and a regulating valve.

An automatic shut off valve may also be installed on the LPG container. This valve shuts off the gas supply to the truck when the flame goes out. The fixed liquid level gauge indicates the maximum filling level on the LPG container.

It may be read when the container is in either a horizontal or vertical position. It is used to make sure that the LPG container is not overfilled. It also acts as an easily read fuel gauge.

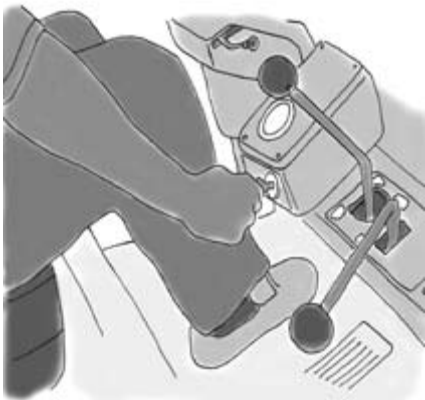


Usually, forklift type LPG containers are used to fuel such powered industrial trucks. Unlike the standard LPG containers, the forklift containers are mounted in either a vertical or horizontal position. A forklift LPG container fueling a truck is shown below.



**A Typical Forklift Truck**

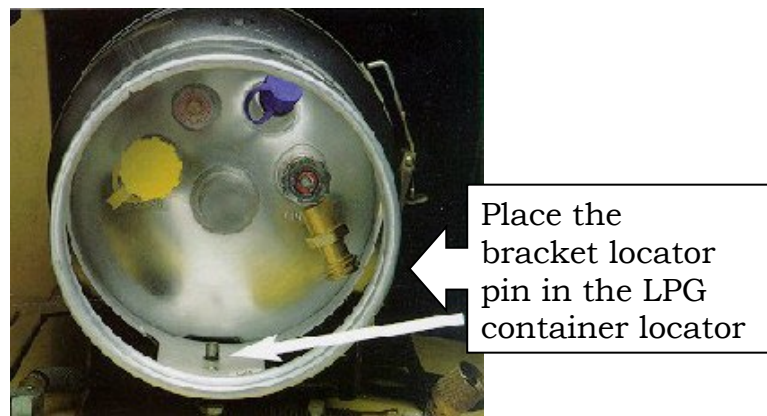
Procedures for exchanging forklift LPG containers:



The following procedures are the general procedures for exchanging LPG containers. **It is always best to follow the manufacturer's instructions for the forklift you are using.**

1. Turn the forklift engine off and set the parking brake. Always wear proper protective equipment (PPE) which includes gloves and eye protection when performing propane activities, including connecting or disconnecting a LPG container.

2. Close the LPG container valve (clockwise), turn it until it is securely closed. Loosen the hose connection to the tank by hand, keeping in mind it will turn in the opposite direction of a normal connection. Only use a non-sparking tool on these connections; they should be hand-tightened only.
3. Remove the LPG container from the forklift, using proper lifting techniques. Use a cart to transport the LPG container to the LP storage area. Exchange the empty LPG container for a full container, being certain to place the empty container in the designated area. The empty container must be returned to the supplier.
4. Lift the filled LPG container using proper lifting techniques and place it on the forklift with the locating pin properly inserted through the locating pin hole in the LPG container's neck ring.



5. Secure the restraining straps in place and make sure the LPG container is properly secured.
6. Make sure the hose is not cut or chafed. Connect and tighten the quick connect fittings. The connection should only be secured by hand, be certain to get a tight and secure seal. Slowly turn on the LPG container valve. Check for leaks using an approved leak-detector solution. If a leak is detected, turn the valve off and check the hose connections.

7. Make sure the hose or LPG container does not extend beyond the forklift's sides or rear. Make sure the LPG container is properly secured against movement or displacement. Start the engine and resume operation.

## **PART 6. USE OF LPG/CNG IN EMERGENCY INDOOR REPAIRS**

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**LPG/CNG may be used indoors (except in an occupied place of public assembly)**, for the purpose of performing emergency repairs. For example, LPG/CNG is needed when repairing damaged phone communication systems. LPG/CNG use, and containers must always be under the constant supervision of the Certificate of Fitness holder.

LPG/CNG containers must NOT be stored within the building and must be removed from the emergency repairs site at the end of each workday. No LPG container with a capacity greater than 16.4 oz or CNG containers with a capacity greater than 8.7 SCF is allowed to be left unattended.

The use of LPG/CNG containers for emergency repairs within the building is limited to:

- (1) Two (2) LPG containers of 20-pound capacity each; or
- (2) Two (2) CNG containers of 170 SCF capacity each.

Nonmetallic hoses may be used at emergency indoor repairs where the portable LPG/CNG containers are stored, used, and connected. However, the length of the hose must not exceed 6 feet.

The hose for LPG should be designed for a working pressure of not less than 350 psi. The hose for CNG must be fabricated of materials that are designed for use with CNG and the hose for CNG must be color-coded red.

A single LPG container with a capacity not greater than 16.4 oz or a single CNG container with a capacity not greater than 8.7 SCF may be used below grade for emergency indoor repairs, provided that the container is not left unattended.

## PART 7. USE OF LPG IN HOT AIR BALLOON

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There is a possibility of propane fires or explosions from leaks when operating LPG in a hot air balloon. When LPG is used for hot air balloon operations, the storage, handling, and use of LPG, including any reserve storage, must not exceed a total of 300 pounds.

The burner and fuel system are operated in accordance with the FAA (Federal Aviation Administration) Flight manual and manufacturer's instruction.

The entire operation must be continuously under the personal supervision of an FAA (Federal Aviation Administration) license holder and a Certificate of Fitness holder. LPG may be used in liquid form if required by the nature of the operation.

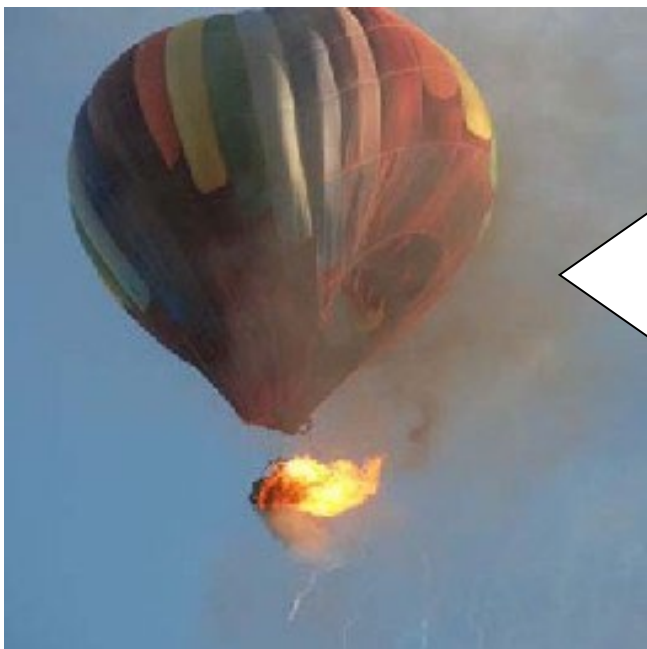
Nonmetallic hoses may be used at hot air operations; however, the length of the hose should be as short as practical, and the hose should be designed for a working pressure of not less than 350 psi.

The hot air balloon must be provided with a portable fire extinguisher with at least a 10-B:C rating. Hot air balloon operations must be at least 20 feet away from any storage, handling, or use of flammable or combustible liquids or other flammable gases.

Hot air balloons must be secured in an approved manner by not less than a three-point tie down during LPG operations and whenever the balloon is filled with hot air. LPG containers must not be left unattended.

LPG must be removed from the site at the conclusion of each day's hot air balloon operations and must not be left at the site overnight. The LPG storage area must be provided with a portable fire extinguisher with at least a 10-B:C rating.

**Smoking is prohibited** on the balloon or within 25 feet of any LPG storage, handling, or use.



2 dead and 11 injured in a hot air balloon fire:  
A fuel line became disconnected from a propane tank causing the explosion. In addition, there was no emergency shut-off valve to stop the propane from expanding and catching fire.

## **Part 8. CASE STUDIES**

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**These case studies are being provided for educational purposes only. The facts are based upon public reports and not meant to express any legal opinion or assessment by the FDNY. It is being provided as a “lesson(s) learned” so COF holders might learn from past publicly reported incidents.**

**It should lead to awareness. The format of these case studies includes fires. It will include a summary of reported facts and lessons learned.**

### **Illegal Use of Torch Operations in Queens Residential Building, NY December 2023**

A contractor was hired to perform lead remediation in a residential building in Queens, NY. The contractor was using an illegal torch to burn lead paint off of a metal closet door frame inside an unoccupied apartment. The contractor soon noticed that there were small flames on the wood studs and attempted to extinguish the flames with a bucket of water. The flames were already too far too deep into the walls of the building traveling to the attic which then spread to the rooftop. This fire was a five alarm fire, where nearly 200 firefighters and EMS workers responded to the scene to assist. It took nearly four and a half hours to extinguish. Eight civilians, four firefighters and two police officers suffered non-life threatening injuries. The blaze displaced 160 people from 68 different apartments and were in need of emergency assistance which included lodging and meals.

#### **Lessons Learned**

Lost control of hazardous materials  
Fire safety measures were not in place  
Illegal use of torch use caused extensive fire damage  
No fire guards were present

### **Repair Work with a Torch Brooklyn, NY April 2016**

Repair work in a garage sparked a massive fire in Brooklyn that ended up leaving several families homeless. FDNY Fire Marshals determined that the cause of the 6 alarm fire was caused by repair work involving a torch on a garage rooftop. Flames broke out around 6:30 p.m. in a garage that quickly spread to six other homes and a church. FDNY Deputy Chief Stephen Moro who was on scene stated that “it was the intensity of the fire and the spread of how close the buildings are, also, with the construction of the wood, that a lot of voids where fire can travel quickly”, ended up being a handful for the firefighters on scene. The fire was officially under control around 2:30 a.m. The fire also caused a partial collapse inside the building where the fire had started. Two people were hurt, one of them seriously injured.

#### **Lessons Learned**

Fire safety measures were not in place  
Illegal use of torch use caused extensive fire damage

### **Roof Worker Arrested in Fire at Historic Brooklyn Synagogue, November 2017**

A 71-year old man was arrested by police after he set fire to the roof of a historic synagogue in Brooklyn. No one was present at the synagogues when the fire occurred which allowed fire fighters the opportunity to rescue sacred religious objects. Fire officials stated that two men were working on the roof, one of the workers was using a blow torch when the roof was set on fire. The worker was charged with reckless endangerment. The fire had spread quickly due to the fact that the synagogue was built a long time ago. These structures have many voids which allows the fire to travel making it very difficult to fight. The synagogue was built over 100 years ago.

#### **Lessons Learned**

Fire safety measures were not in place  
Illegal use of torch use caused extensive fire damage

### **Brooklyn Building Manager Arrested after FDNY Inspectors Find 900 Propane Cylinders, January 2021**

A building manager was arrested for reckless endangerment when FDNY Fire Protection Inspectors conducted an inspection at 318 Nevins Street in Brooklyn, NY. The inspectors came upon a warehouse full of propane cylinders that were stacked from the floor to the ceiling. The building manager stated that he was storing the propane cylinders to sell to a third party who would then deliver these cylinders to restaurant businesses that were using outdoor heaters to provide heat for restaurants during the Covid-19 pandemic. In total 903 propane cylinders were confiscated from the premises.

#### **Lessons Learned**

Fire safety measures were ignored  
Illegal storage and use of propane cylinders  
No certificates of fitness or permits were present  
Over the allowable quantity of propane

### **Gas Tank Explosion Injures 2 Construction Workers At Landmark NYC Building, July 2023**

A gas tank exploded in a 37 story NYC building which injured two construction workers. The workers were using a cutting tool to open a box that was storing an acetylene tank. Unknown that the tank had a leak, the spark from the cutting tool caused an explosion. The NYC Department of Buildings conducted an inspection and found that the gas tank was being stored in an unapproved gang box that wasn't properly secured and the tank leaked which led to the explosion. The Fire Department found that the contractor failed to comply with FDNY's rules and regulations. FDNY inspectors issued relevant violations and issued a violation to stop all hot work operations.

#### **Lessons Learned**

Fire safety regulations were ignored  
Unapproved storage of acetylene tank in gang box

Using spark producing tools

**Food Truck Explosion Kills 2 and Injured Others, Philadelphia, PA, July 2014**

A food truck that was parked on a street in Philadelphia, Pennsylvania exploded and killed the owner and her teenage daughter. The owner of the food truck had filled their propane tank at a U-Haul location. According to authorities the filling of the tank was done incorrectly which led to the gas leak and then ultimately the deadly explosion. Three people were severely burned, and others were injured. Further investigation found that the propane tank was 70 years old when it failed.

**Lessons Learned**

Propane cylinder was 70 years old and should have been taken out of service.  
The filling of the propane tank was done incorrectly.  
No hydrostatic testing was done on the tank.

**Liberty Island Evacuated After Propane Tank Fire, Liberty Island, NYC, August 2018**

A construction mistake at Liberty Island in NYC caused a fire involving three 100-pound propane cylinders. The cylinders were in a location where a new Statue of Liberty museum was being built. One construction worker had minor burns. 3,400 tourists were evacuated by ferry boats back to Manhattan.

**Lessons Learned**

Fire safety measures were ignored  
The quantity was over the allowable limit

## Part 9. Lithium-Ion Battery Safety

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### **Lithium-ion safety**

Lithium-ion batteries are rechargeable batteries found in electric bikes, scooters, cars, laptops, tablets, phones, and many other common household devices.


Lithium-ion battery fires have caused deaths, serious injuries, and devastating damage to property around the city. It's important to follow rules for safe storage, charging, and disposal for these types of batteries.

If you own a lithium-ion powered device or plan to buy one, the FDNY has important safety tips that you should follow. These tips apply to all devices powered by lithium-ion batteries, including phones, tablets, laptops, e-cigarettes, toys, high-tech luggage, and even robotic vacuum cleaners.

**Immediately stop** using or charging battery and call 911 if you notice:

- **Fire or Smoke**
- **Overheating**
- **Change in color or shape**
- **Odd noises**
- **Leaking**
- **Strange smell**

### **ALWAYS:**

- purchase and use devices certified by a Nationally Recognized Testing Laboratory (NRTL). 
- follow the manufacturer's instructions for:
  - charging and storage.
  - correct battery, cord, and power adapter
- **keep exit path clear at all times.**
- plug directly into a wall electrical outlet for charging.
- keep batteries and devices at room temperature.
- store and/or charge batteries away from anything flammable.
- keep away from heat sources.
- bring batteries to a **NYC Battery Recycling Center**. Visit [nyc.gov/batteries](http://nyc.gov/batteries) for more information.

### **NEVER:**

- use aftermarket batteries or chargers.
- use damaged or altered batteries
- plug into a power strip or overload an outlet.
- overcharge or leave battery charging overnight.
- charge a battery or device under your pillow, on your bed, or near a couch.
- leave e-bikes or e-scooters unattended while charging.
- block your primary way in or out of a room/space with e-bikes, e-scooters, wheelchairs, etc.
- place batteries in Trash or Recycling bin. **It is ILLEGAL.** Visit [nyc.gov/batteries](http://nyc.gov/batteries) for disposal locations and information.

**In the event of a Fire,  
Leave and CLOSE the door.  
Call 911 once you are  
in a safe location.**



## Charging Lithium Ion

Lithium-ion batteries do not have to be fully charged; partial charge is the most suitable.

When **charging more than five (5)** personal mobility devices or their removable batteries, it must be in a **dedicated room with ventilation** and a self-closing door.

For a total battery capacity of 20 kilowatt-hours (kWh), a 2-foot separation between charging batteries is required. For a total battery capacity up to 50 kWh, a 3-foot separation is needed.

Chargers must only be used with a compatible battery pack. The original equipment manufacturer (OEM) charger interplays with the battery pack using the battery management system (BMS). The wrong battery/charger combination may not work safely. For example, the 100% cutoff to prevent overcharging, which damages batteries, may not work which can easily create hazardous conditions such as fires, explosions and/or injuries.

Always check with the manufacturer or retailer of the personal mobility device, an authorized repair shop or a testing laboratory such as Underwrites Laboratories (UL) to see if replacement is recommended or listed and safe for use with that device. Using unauthorized parts, including batteries and/or chargers, may cause damage, fire and possibly void your warranty.

## Extinguishing Lithium-ion

Water may not prevent a battery from burning and spreading. Battery cells are known to explode and quickly spread to another battery. It can spread to another devices.



**Fire Extinguishers**  
**do not work**  
on lithium-ion batteries

### **Unexpected Re-ignition.**

Reignition is common. Lithium-Ion Batteries are known to unexpectedly re-ignite (without warning) minutes, hours and even days after all visible fire has been put out.

Lithium-ion batteries can enter an uncontrollable, self-heating state. This can result in the release of gas, cause fire and possible explosion.

These batteries may continue to generate heat even when there is no visible sign of fire. Once heat reaches a certain level fire may reignite on the battery and surrounding area.

