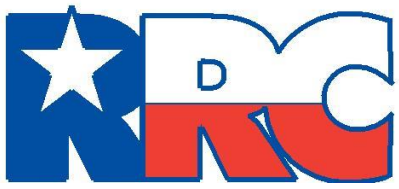
# TEXAS LP-GAS EXAMINATION STUDY GUIDE

## Category F, G, I, & J

Cylinder Filling Facility Operator, Motor & Mobile Fuel Dispensing Station Operator, Service Station & Cylinder Filling Transporter

## Management Level



**RAILROAD COMMISSION OF TEXAS**

Rev 1.2

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# LP-GAS EXAMINATION STUDY GUIDE
# Management-LEVEL
# Category F,G,I & J

## Who should use this guide?

You should use this guide to prepare for the Railroad Commission's management-level qualifying examination to apply for any of the following:

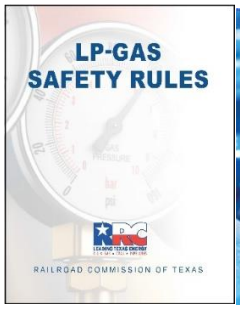
Category F (Cylinder Filling Facility Operator) license which authorizes the operation of a cylinder filling facility, including cylinder filling, the sale of LP-gas in cylinders, and the replacement of cylinder valves.

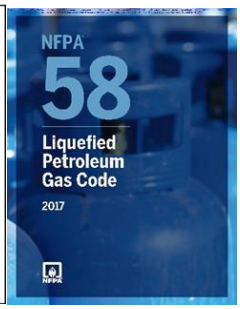
Category G (Motor & Mobile Fuel Dispensing Station Operator) which license authorizes the operation of LP-gas dispensing stations filling ASME containers designed for motor or mobile fuel.

Category I (ASME Service Station and Cylinder Filling Operator) license which authorizes any service stations and cylinder activity set out in Category F and Category G of this section.

Category J (Service Station & Cylinder filling Transporter) facilities which authorizes the operation of a cylinder filling facility, including cylinder filling and the sale, transportation, installation, and connection of LP-gas in cylinders, the replacement of cylinder valves, and the operation of an LP-gas service station as set out in Category G.

## What books do I need?




This examination tests your knowledge of the laws and standards that apply to motor fuel and mobile fuel container filling operations in Texas. These laws and standards are found in three books:

*LP-Gas Safety Rules* (Texas Railroad Commission)

*NFPA 58 Liquefied Petroleum Gas Code* (National Fire Protection Association, 2017)

## Where do I get these books?

You may download the current edition of the Railroad Commission's *LP-Gas Safety Rules* in PDF format free online at www.rrc.texas.gov. If you need printed copies, they may be purchased for $10.00, tax included, by calling the Railroad Commission's publications office at (512) 463-7309.

You may also order NFPA manuals online at www.nfpa.org; click on "Codes and Standards."

## Sections and Topics

Before you take this examination, you should know the definitions found in this study guide and the contents of the sections of the codes and standards listed below. The actual examination questions may not cover all of the listed sections and topics.

NOTE: Section (§) 9.402(c) of the *LP-Gas Safety Rules* states, "The Commission does not adopt language in any NFPA rule, chart, figure, or table pertaining to any LP-gas container having a water capacity of one gallon (4.2 pounds LP-gas capacity) or less."

## Terms and Definitions

NOTE: The list below is not exhaustive. You are responsible for knowing all the terms and definitions that apply to the LP-gas activities you will perform, as well as the rules and standards highlighted in this guide.

NOTE: Informal terms that are sometimes used in the propane industry instead of formal technical terms are given in brackets.

### Railroad Commission *LP-Gas Safety Rules*

***Alternative Fuel Safety (AFS).*** The RRC department responsible for LP-Gas training and inspection.
***LP-Gas Safety Rules, §9.2(1)***

***Company Representative.*** The individual designated to the Commission by a license applicant or a licensee as the principal individual in authority.
***LP-Gas Safety Rules, §9.2(12)***

***LP Gas Safety Rules.*** The rules adopted by the Railroad Commission in the Texas Administrative Code, Title 16, Part 1, Chapter 9, including any NFPA or other documents adopted by reference. The official text of the Commission's rules is that which is on file with the Secretary of State's office and available at www.sos.state.tx.us or through the Commission's web site
***LP-Gas Safety Rules, §9.2(22)***

***Mobile fuel container***. An LP-gas container mounted on a vehicle to store LP-gas as the fuel supply to an auxiliary engine other than the engine to propel the vehicle or for other uses on the vehicle.
***LP-Gas Safety Rules, §9.2(25)***

***Motor fuel container.*** An LP-gas container mounted on a vehicle to store LP-gas as the fuel supply to an engine used to propel the vehicle.
***LP-Gas Safety Rules, §9.2(27)***

***Operations Supervisor.*** The individual who is certified by the Commission to actively supervise a licensee's LP-gas operations and is authorized by the licensee to implement operational changes.
***LP-Gas Safety Rules, §9.2(31)***

***Outlet.*** A site operated by an LP-gas licensee from which any regulated LP-gas activity is performed.
***LP-Gas Safety Rules, §9.2(32)***

***Rules examination.*** The Commission's written examination that measures an examinee's working knowledge of Chapter 113 of the Texas Natural Resources Code and/or the current LP-Gas Safety Rules.
***LP-Gas Safety Rules, §9.2(41)***

## *NFPA 58 (2017)*

***ASME.*** American Society of Mechanical Engineers.
***NFPA 58, §3.3.6***

***Container.*** Any vessel, including cylinders, tanks, portable tanks, and cargo tanks, used for the transporting or storing of LP-Gases.
***NFPA 58, §3.3.14***

***Container Appurtenances.*** Devices installed in container openings for safety, control, or operating purposes. [Examples include pressure-relief devices; shutoff valves, backflow check valves, excess-flow valves and internal valves; liquid level gauges; pressure gauges; and plugs].
***NFPA 58, §3.3.15***

***Fixed Maximum Liquid Level Gauge*** ["bleeder valve," "outage gauge," "spitter valve," "spew gauge"]. A fixed liquid level gauge that indicates the liquid level at which the container is filled to its maximum permitted filling limit.
***NFPA 58, §3.3.34.2***

***Maximum Allowable Working Pressure (MAWP).*** The maximum pressure at which a pressure vessel is to operate as described by the ASME Boiler and Pressure Vessel Code
***NFPA 58, § 3.3.47***

***Leak Check.*** An operation performed on a gas piping system to verify that the system does not leak.
***NFPA 58, § 3.3.42***

***Liquefied Petroleum Gas (LP-Gas).*** Any material having a vapor pressure not exceeding that allowed for commercial propane that is composed predominantly of the following hydrocarbons, either by themselves (except propylene) or as mixtures: propane, propylene, butane (normal butane or isobutane), and butylenes.
***NFPA 58, §3.3.43***

***NFPA.*** National Fire Protection Association.
***NFPA 58, §3.3.53***

***Overfilling Prevention Device*** ["OPD," "stop valve"]. A device that is designed to provide an automatic means to prevent the filling of a container beyond a predetermined level.
***NFPA 58, §3.3.55***

***Point of Transfer.*** The location where connections and disconnections are made or where LP-Gas is vented to the atmosphere in the course of transfer operations.
***NFPA 58, §3.3.60***

***Portable Container.*** A container designed to transport LP-Gas.
***NFPA 58, §3.3.61***

***Pressure Relief Device*** ["popoff valve"]. A device designed to open to prevent a rise of internal pressure in excess of a specified value.
***NFPA 58, §3.3.65***

***Sources of Ignition.*** Devices or equipment that, because of their modes of use or operation, are capable of providing sufficient thermal energy to ignite flammable LP-Gas vapor–air mixtures when introduced into such a mixture or when such a mixture comes into contact with them, and that will permit propagation of flame away from them.
***NFPA 58, §3.3.78***

***Universal Cylinder.*** A cylinder that can be connected for service in either the vertical or the horizontal position so that the fixed maximum liquid level gauge, pressure relief device, and filling and withdrawal appurtenances function properly in either position
***NFPA 58, §3.3.17.1***

***Volumetric Method Filling.*** Filling a container to not more than the maximum permitted liquid volume.
***NFPA 58, §3.3.26.1***

***Water Capacity*** ["WC"]. The amount of water at 60°F (16°C) required to fill a container.
***NFPA 58, §3.3.90***

## Sample Question 1

A cylinder that can be connected for service in the _____ position so that the fixed maximum liquid level gauge, pressure relief device, and filling and withdrawal appurtenances function properly

A. Vertical
B. Horizontal
C. Full
D. Both A and B

***Answer on last page***

## Key Topics

NOTE: The list below is not exhaustive. You are responsible for knowing all the facts, rules, standards and procedures that apply to the LP-gas activities you will perform, as well as the rules and standards highlighted in this guide.

As you study the applicable codes and standards, pay special attention to the facts, rules and procedures related to the following key topics. When you take the examination, read each question very carefully.

## *ADMINISTRATIVE RULES* - GENERAL REQUIREMENTS

### Company License

No person may engage in any LP-gas activity until that person has obtained a license from the Commission authorizing the LP-gas activities.
***LP-Gas Safety Rules, §9.7(a)***

Licensees, registered manufacturers, company representatives, and operations supervisors at each outlet shall have copies of all current licenses and/or manufacturer registrations and certificates for employees at that location available for inspection during regular business hours.
***LP-Gas Safety Rules, §9.7(c)***

Licenses and manufacturer registrations issued under this chapter expire one year after issuance at midnight on the last day of the month prior to the month in which they are issued.
***LP-Gas Safety Rules, §9.7(d)***

A properly completed LPG Form 1 listing all names under which LP-gas related activities requiring licensing are to be conducted and the applicant's properly qualified company representative and the following forms or documents as applicable:
(A) LPG Form 1A for outlets
(B) LPG Form 7 for delivery units
(C) LPG Form 19 for transferring ownership
***LP-Gas Safety Rules, §9.7(f)***

### Application for a New Certificate

An applicant for a new certificate shall:

(1) file with AFS a properly completed LPG Form 16 and the applicable nonrefundable rules examination fee specified in §9.10 of this title (relating to Rules Examination); pass the applicable rules examination with a score of at least 75%
(2) pass the applicable rules examination with a score of at least 75%; and
(3) complete any required training and/or AFT in §9.51 and §9.52 of this title.
***LP-Gas Safety Rules, §9.8(c)***

## Certificate Renewal

Certificate holders shall remit the nonrefundable $35 annual certificate renewal fee to AFS on or before May 31 of each year. Individuals who hold more than one certificate shall pay only one annual renewal fee.

(1)Failure to pay the nonrefundable annual renewal fee by the deadline shall result in a lapsed certificate

(A) To renew a lapsed certification, the individual must pay the nonrefundable $35 annual renewal fee plus a nonrefundable $20 late-filing fee.
(B) If an individual's certificate lapses or expires, that individual shall immediately cease performance of any LP-gas activities authorized by the certificate.
(C) If an individual's certificate has been expired for more than two years from May 31 of the year in which the certificate lapsed, that individual shall comply with the requirements in §9.8 of this title (relating to Requirements and Application for a New Certificate) or §9.13 of this title.
***LP-Gas Safety Rules, §9.9(c)***

Continuing education. A certificate holder shall complete at least eight hours of continuing education every four years as specified in this subsection.

(1) Upon fulfillment of this requirement, the certificate holder's next continuing education deadline shall be four years after the May 31 following the date of the most recent class the certificate holder has completed, unless the course was completed on May 31, in which case the deadline shall be four years from that date.
***LP-Gas Safety Rules, §9.52(b)***

## Rules Examination

Failure of any exam shall immediately disqualify the individual from performing any LP-gas related activities covered by the exam which is failed, except for activities covered by a separate exam which the individual has passed.
***LP-Gas Safety Rules, §9.10(f)***

Individuals who pass an employee level rules examination between March 1 and May 31 of any year shall have until May 31 of the next year to complete any required training. Individuals who pass an employee level rules examination at other times shall have until the next May 31 to complete any required training.
***LP-Gas Safety Rules, §9.52(a)(3)***

## Trainees

A licensee or ultimate consumer may employ an individual as a trainee for a period not to exceed 45 calendar days without that individual having successfully completed the rules examination

The trainee shall be directly and individually supervised at all times by an individual who has successfully completed the Commission's rules examination for the areas of work being performed by the trainee.
***LP-Gas Safety Rules, §9.12***

No person shall perform work, directly supervise LP-gas activities, or be employed in any capacity requiring contact with LP-gas unless:

(1) that individual is a certificate holder
(2) that individual is a trainee
***LP-Gas Safety Rules, §9.8(a)***

**Sample Question 2**

A licensee or ultimate consumer may employ an individual as a trainee for a period not to exceed ____ calendar days without that individual having successfully completed the rules examination

A. 20
B. 31
C. 45
D. 75

***Answer on last page***

## *TRANSFER LOCATION RULES* - GENERAL REQUIREMENTS

### Designation and Responsibilities of Company Representatives and Operations Supervisors

Each licensee shall have at least one company representative for the license and at least one operations supervisor for each outlet.
***LP-Gas Safety Rules, §9.12***

A licensee maintaining one or more outlets shall file LPG Form 1 with AFS listing the physical location of the first outlet and designating the company representative for the license and LPG Form 1A designating the physical location and operations supervisor for each additional outlet.
***LP-Gas Safety Rules, §9.17(a)(1)***

A licensee may have more than one company representative.
***LP-Gas Safety Rules, §9.17(a)(2)***

An individual may be operations supervisor at more than one outlet provided that:

(A) each outlet has a designated LP-gas certified employee responsible for the LP-gas activities at that outlet;
(B) the certified employee's and/or operations supervisor's telephone number is posted at the outlet on a sign with lettering at least 3/4-inch high, visible and legible during regular business hours; and
(C) the certified employee and/or the operations supervisor monitors the telephone number and responds to calls during normal business hours.
***LP-Gas Safety Rules, §9.17(a)(3)***

The company representative may also serve as operations supervisor for one of the licensee's outlets provided that the individual meets both the company representative and the operations supervisor requirements in this section.
***LP-Gas Safety Rules, §9.17(a)(4)***

A licensee shall immediately notify AFS in writing upon conclusion of employment, for whatever reason, of its company representative or any operations supervisor and shall at the same time designate a replacement.
***LP-Gas Safety Rules, §9.17(a)(5)***

A licensee shall cease all LP-gas activities if it no longer employs a qualified company representative who complies with the Commission's requirements. A licensee shall not resume LP-gas activities until such time as it has a properly qualified company representative.
***LP-Gas Safety Rules, §9.17(a)(6)***

A licensee shall cease LP-gas activities at an outlet if it no longer employs a qualified operations supervisor at that outlet who complies with the Commission's requirements. A licensee shall not resume LP-gas activities at that outlet until such time as it has a properly qualified operations supervisor.
***LP-Gas Safety Rules, §9.17(a)(7)***

## Qualified Personnel

Persons whose duties fall within the scope of this code shall be provided with training that is consistent with the scope of their job activities and that includes proper handling and emergency response procedures.
***NFPA 58, §4.4.1***
Refresher training shall be provided at least every 3 years.
***NFPA 58, §4.4.3***

Initial and subsequent refresher training shall be documented.
***NFPA 58, §4.4.4***

At least one qualified person shall remain in attendance at the transfer operation from the time connections are made until the transfer is completed, shutoff valves are closed, and lines are disconnected.
***NFPA 58, §7.2.1.2***

Public access to areas where LP-Gas is stored and transferred shall be prohibited except where necessary for the conduct of normal business activities.
***NFPA 58, §7.2.3.1***

## Report of LP-Gas Incident/Accident

At the earliest practical moment or within two hours following discovery, a licensee owning, operating, or servicing equipment or an installation shall notify AFS by telephone of any event involving LP-gas which.

(1) caused a death or any personal injury requiring hospitalization;
(2) required taking an operating facility out of service;
(3) resulted in unintentional gas ignition requiring an emergency response;
(4) involved the LP-gas installation on any vehicle propelled by or transporting LP-gas;
(5) caused an estimated damage to the property of the operator, others, or both totaling $5,000 or more, including gas loss;
(6) could reasonably be judged as significant because of rerouting of traffic, evacuation of buildings, or media interest even though it does not meet paragraphs (1) - (5) of this subsection; or
(7) is required to be reported to any other state or federal agency (such as the Texas Department of Public Safety or the United States Department of Transportation).
***LP-Gas Safety Rules, §9.36(a)***

Each industrial plant, bulk plant, and distributing point shall be provided with at least one portable fire extinguisher having a minimum capacity of 18lb of dry chemical.
***NFPA 58, §6.29.4.2***

Have a minimum capacity of dry chemical with an A:B:C rating. (Required Fire Extinguishers)
***NFPA 58, §4.7(2)***

LP-Gas fires shall not be extinguished until the source of the burning gas has been shut off.
***NFPA 58, §6.29.4.3***

A licensee or the licensee's employees shall not introduce LP-Gas into any container or cylinder if the licensee or employee have knowledge or reason to believe that such container, cylinder, piping or the system or the appliance to which it is attached is unsafe or is not installed is accordance with the statutes or the rules in this chapter.
***LP-Gas Safety Rules, §9.135***

**Sample Question 3**

Each industrial plant, bulk plant, and distributing point shall be provided with at least one portable fire extinguisher having a minimum capacity of 18lb of _____

A. Wet chemical
B. Dry chemical
C. Foam
D. Water

***Answer on last page***

## Ignition Sources

Sources of ignition shall be turned off during transfer operations, while connections or disconnections are made, or while LP-Gas is being vented to the atmosphere.
***NFPA 58, §7.2.3.2***

Internal combustion engines within 15 ft of a point of transfer shall be shut down while such transfer operations are in progress.
***NFPA 58, §7.2.3.2 (A)***

Smoking, open flame, portable electrical tools, and extension lights capable of igniting LP-Gas shall not be permitted within 25 ft of a point of transfer while filling operations are in progress.
***NFPA 58, §7.2.3.2 (B)***

Metal cutting, grinding, oxygen–fuel gas cutting, brazing, soldering, or welding shall not be permitted within 35 ft of a point of transfer while filling operations are in progress.
***NFPA 58, §7.2.3.2 (C)***

Combustible materials shall not accumulate or be stored within 10 ft of a container.
***NFPA 58, §6.5.3.3***

## Dispenser Rules

Dispensing systems not located in LP-Gas bulk plants or industrial plants shall have an aggregate water capacity not greater than 30,000 gallons.
***NFPA 58, §5.2.1.9***

Commercial installations with an aggregate water capacity of less than 10,000 gallons.
Within 30 calendar days following the completion of a container installation, the licensee shall submit LPG Form 501 to AFS stating:

(A) the installation fully complies with the statutes and rules in this chapter;
(B) all necessary Commission licenses, certificates, and permits have been issued; and
(C) the date the installation has been placed into LP-gas service.
***LP-Gas Safety Rules, §9.101(b)(1)***

Aggregate water capacity of less than 10,000 gallons. After receipt of LPG Form 501, AFS shall conduct an inspection as soon as possible to verify that the installation described is in compliance with the rules in this chapter. The facility may be operated prior to inspection if it is in compliance with the rules in this chapter. If the initial inspection at a commercial installation results in the citation of non-compliance items, AFS may require that the subject container, including any piping, appliances, appurtenances, or equipment connected to it, be immediately removed from LP-gas service until the non-compliance items are corrected.
***LP-Gas Safety Rules, §9.109(b)***

Where a vehicle fuel dispenser or dispensing system is installed under a weather shelter or canopy, the area shall be ventilated and shall not be enclosed for more than 50 percent of its perimeter.
***NFPA 58, §6.27.3.3***

An aboveground LP-Gas container and any of its parts shall not be located within 6 ft. of a vertical plane beneath overhead electric power lines that are over 600 volts, nominal.
***NFPA 58, §6.5.3.13***

A hydrostatic relief valve shall be installed in each section of piping and hose in which liquid LP-Gas can be isolated between shutoff valves so as to relieve the pressure that could develop from the trapped liquid.
***NFPA 58, §6.15***

Clearance of at least three feet shall be maintained between the vehicular barrier protection and any part of an LP-gas transfer system or container or clearance of two feet for retail service station installations.
***LP-Gas Safety Rules, §9.17(d)(4)***

An identified and accessible remote emergency shutoff device for either the internal valve or the emergency shutoff valve shall be installed not less than 3 ft or more than 100 ft from the liquid transfer point.
***NFPA 58, §6.27.3.9***

An identified and accessible switch or circuit breaker shall be installed at a location not less than 20 ft or more than 100 ft from the dispensing device(s) to shut off the power in the event of a fire, accident, or other emergency.
***NFPA 58, §6.27.3.17***

Hose, hose connections, and flexible connectors shall be fabricated of materials that are resistant to the action of LP-Gas both as liquid and vapor.
***NFPA 58, §5.11.6.1***

Hose shall be designed for a working pressure of 350 psig with a safety factor of 5 to 1
***NFPA 58, §5.11.6.4 (A)***

Hose assemblies shall be observed for leakage or for damage that could impair their integrity before each use.
***NFPA 58, §7.2.4.1***

These hose assemblies shall be inspected at least annually.
***NFPA 58, §7.2.4.2***

Inspection shall include the following:
(1) Damage to outer cover that exposes reinforcement
(2) Kinked or flattened hose
(3) Soft spots or bulges in hose
(4) Couplings that have slipped on the hose, are damaged, have missing parts, or have loose bolts
(5) Leakage other than permeability leakage
***NFPA 58, §7.2.4.3***

A listed quick-acting shutoff valve or a listed quarter turn ball valve with a locking handle shall be installed at the discharge end of the transfer hose.
***NFPA 58, §6.27.3.16, LP-Gas Safety Rules, §9.403***

Hoses shall comply with the following:
(1) Hose length shall not exceed 18 ft unless approved by the authority having jurisdiction.
(2) All hoses shall be listed.
(3) When not in use, hoses shall be secured to protect them from damage.
***NFPA 58, §6.27.4.1***

Each LP-gas private or public motor/mobile or forklift refueling installation which includes a liquid dispensing system shall incorporate into that dispensing system a breakaway device.
***LP-Gas Safety Rules, §9.141(b)***

## System Protection Requirements

Areas that include features required in 6.21.4.1(2) shall be enclosed with a minimum 6 ft (1.8 m) high industrial type fence, chain-link fence, or equivalent protection
***NFPA 58, §6.21.4.2***

Uprights, braces, and corner posts of the fence shall be composed of noncombustible material
***LP-Gas Safety Rules, §9.140(c)(1)***

Fencing shall not be required where devices are provided that can be locked in place and prevent unauthorized operation of valves, equipment, and appurtenances.
***NFPA 58, §6.21.4.2(D)***

Clearance of at least three feet shall be maintained between the vehicular barrier protection and any part of an LP-gas transfer system or container or clearance of two feet for retail service station installations.
***LP-Gas Safety Rules, §9.140(d)(4)***

In addition to NFPA 58 §5.2.8.1, LP-gas installations shall comply with the sign and lettering requirements specified in Table 1 of this subsection. An asterisk indicates that the requirement applies to the equipment or location listed in that column.

***LP-Gas Safety Rules, §9.140(f)***

*(Partial chart shown below Full chart can be found in the 2020 LP- Gas Safety Rules)*

**Figure: 16 TAC §9.140(f)**
**§9.140. Uniform Protection Standards -- Table 1 (Revised February 2008)**

| Requirements | Self-service Dispenser Area | Storage Racks for DOT Portable or Forklift Containers | Licensee or Non-Licensee ASME 4001+ Gal. A.W.C. | Any Licensee Installation (DOT Container Filling and/or Service Station Only) |
|---|---|---|---|---|
| 1. Red letters at least 2" high (or at least 1 1/4" high for storage racks for DOT portable or forklift cylinders) on white or aluminum background: NO SMOKING | * | * | * | * |
| 2. Red letters at least 4" high on white or aluminum background: WARNING FLAMMABLE GAS | | | * | |
| 3. Black letters at least 4" high: NO TRESPASSING AUTHORIZED PERSONNEL ONLY | | | * | |
| 4. Letters at least 1/2" high: EXTINGUISH ALL PILOT LIGHTS AND OPEN FLAMES; VEHICLE MUST BE VACATED DURING FILLING PROCESS; TURN OFF ENGINE | * | | | * |
| 5. Letters at least 2" high on each operating side of the dispenser: PROPANE | * | | | |

## Sample Question 4

Hose shall be designed for a working pressure of____ psig with a safety factor of 5 to 1

A. 350
B. 250
C. 240
D. 100

***Answer on last page***

## *DOT CYLINDER* - GENERAL REQUIREMENTS

### Cylinder Inspection

Containers shall be designed, fabricated, tested, and marked (or stamped) in accordance with the regulations of the U.S. Department of Transportation (DOT 49 CFR); Federal Aviation Administration (FAA 14 CFR); the ASME Code, Section VIII, "Rules for the Construction of Unfired Pressure Vessels".
***NFPA 58, §5.2.1.1***

Containers that have been involved in a fire and show no distortion shall be re-qualified for continued service before being used or reinstalled
***NFPA 58, §5.2.1.2***

DOT 4E specification (aluminum) cylinders and composite cylinders involved in a fire shall be permanently removed from service.
***NFPA 58, §5.2.1.2(D)***

Containers that show excessive denting, bulging, gouging, or corrosion shall be removed from service.
***NFPA 58, §5.2.1.4***

A cylinder with an expired requalification date shall not be refilled until it is requalified by the methods prescribed in DOT regulations.
***NFPA 58, §5.2.2.3***

The service pressure of cylinders shall be in accordance with regulations published under Title 49 Code of Federal Regulations, "Transportation."
***NFPA 58, §5.2.4.1***

Cylinders shall be designed and constructed for at least a 240 psig service pressure.
***NFPA 58, §5.2.4.6***

Cylinders shall incorporate protection against physical damage to cylinder appurtenances and immediate connections to such appurtenances when not in use by any of the following means:
(1) A ventilated cap
(2) A ventilated collar
(3) A cylinder valve providing inherent protection as defined by DOT in 49 CFR 173.301(h)(3)
***NFPA 58, §5.2.6.1***

When being transported, cylinders shall be marked and labeled in accordance with 49 CFR-Transportation.
***NFPA 58, §5.2.8.1(B)***

Cylinders shall be marked with the following:
(1) The water capacity of the cylinder in pounds
(2) The tare weight of the cylinder in pounds, fitted for service
***NFPA 58, §5.2.8.2***

Warning labels shall meet the following requirements:
(1) Warning labels shall be applied to all cylinders of 100 lb (45.4 kg) propane capacity or less that are not filled onsite.
(2) Warning labels shall include information on the potential hazards of LP-Gas.
***NFPA 58, §5.2.8.4***

Cylinders with 4.2 lb through 40 lb propane capacity for vapor service shall be equipped or fitted with a listed Overfilling Prevention Device and a fixed maximum liquid level gauge.
***NFPA 58, §5.9.3.1; (with changes per LP-Gas Safety Rules 9.402.(c))***

An overfilling prevention device shall not be the primary means to determine when a cylinder is filled to the maximum allowable filling limit.
***NFPA 58, §7.4.4.1***

The following types of cylinders shall be exempt from the requirements of 5.9.3.1 through 5.9.3.4:
(1) Cylinders used in industrial truck service
(2) Cylinders identified and used for industrial welding and cutting gases
(3) Cylinders manufactured prior to October 1, 1998, and designed for use in the horizontal position and where an overfilling prevention device is not available
***NFPA 58, §5.9.3.5***

Exempted horizontal cylinders shall be marked with a label to indicate that they are not equipped with an overfilling prevention device.
***NFPA 58, §5.9.3.6***

## Sample Question 5

Warning labels shall include information on the potential hazards of _____

A. a fire
B. LP-Gas
C. carbon monoxide
D. smoke inhalation
E. All of the above

***Answer on last page***

## Universal Cylinders

Cylinders shall be designed, constructed, or fitted for installation and filling in either the vertical or horizontal position or, if the cylinder is a universal cylinder, in either position.
***NFPA 58, §11.13.2.1***

Universal cylinders intended for use in the horizontal position shall be installed with the positioning slot correctly positioned prior to use or filling.
***NFPA 58, §11.13.2.2***

The fixed maximum liquid level gauge shall indicate the maximum permitted filling level in either position.
***NFPA 58, §11.13.2.3***

The cylinder vapor or liquid withdrawal valves shall function in either position.
***NFPA 58, §11.13.2.5***

The cylinder pressure relief valve discharge shall be directed upward within 45 degrees of vertical and shall not impinge on the cylinder, the exhaust system, or any other part of the industrial truck.
***NFPA 58, §11.12.2.6***

All cylinders used in industrial truck service (including forklift truck cylinders) shall have the cylinder's pressure relief valve replaced by a new or unused valve within 12 years of the date of manufacture of the cylinder and every 10 years thereafter.
***NFPA 58, §5.9.2.14***

## Filling Cylinders

Before filling a cylinder, the individual shall conduct a visual inspection of the exposed, readily accessible areas of the cylinder for any obvious defects. Where the cylinder is dented, bulged, gouged or corroded such that the integrity of the cylinder is substantially reduced, it shall not be filled.
***LP-Gas Safety Rules, §9.137***

Containers shall be filled only after determination that they comply with the design, fabrication, inspection, marking, and requalification provisions of this code.
***NFPA 58, §7.2.2.8***

A licensee or the licensee's employees shall not introduce LP-Gas into any container or cylinder if the licensee or employee have knowledge or reason to believe that such container, cylinder, piping or the system or the appliance to which it is attached is unsafe or is not installed is accordance with the statutes or the rules in this chapter
***LP-Gas Safety Rules, §9.135***

Single-opening DOT containers of less than 101 pounds LP-gas capacity, shall be filled by weight only.
***LP-Gas Safety Rules, §9.136(a)***

The weight of such containers shall be determined by scales that meet the specifications of NIST Handbook 44. Scales at licensees' facilities shall be currently registered with the Texas Department of Agriculture. The scales shall have a rated weighing capacity which exceeds the total weight of the cylinders being filled. The scales shall be accurate during the filling of the cylinder.
***LP-Gas Safety Rules, §9.136(a)***

The propane capacity in pounds is determined by multiplying the total water capacity in pounds by .42.
***LP-Gas Safety Rules, §9.136(a)(1)***

The formula for filling LP-gas containers by weight under this section is as follows:
The proper scale setting is the total of
1. The Tare weight of the Cylinder
2. The propane capacity in pounds
3. The weight of the hose and nozzle
***LP-Gas Safety Rules, §9.136(a)(2)***

Containers designed to be used on forklifts or industrial trucks shall be filled as specified in NFPA 58, §11.13.
***LP-Gas Safety Rules, §9.136(b)***

## Sample Question 6

A cylinder with an expired requalification date shall not be refilled until it is requalified by the methods prescribed by the_____.

A. Texas Department of Agriculture
B. U.S. Department of Transportation
C. Texas Railroad Commission
D. American Society of Mechanical Engineers

***Answer on last page***

# *STORAGE AND TRANSPORTATION OF CYLINDERS*

## Storing Cylinders

Cylinders in storage shall be located to minimize exposure to excessive temperature rises, physical damage, or tampering.
***NFPA 58, §8.2.1.1***
Cylinders in storage having individual water capacity greater than 2.7 lb [1 lb LP-Gas capacity] shall be positioned so that the pressure relief valve is in direct communication with the vapor space of the cylinder.
***NFPA 58, §8.2.1.2***

If empty cylinders that have been in LP-Gas service are stored indoors, they shall be considered as full cylinders for the purposes of determining the maximum quantities of LP-Gas permitted.
***NFPA 58, §8.2.1.4***

Screw-on-type caps or collars shall be in place on all cylinders stored, whether they are full, partially full, or empty, and cylinder outlet valves shall be closed.
***NFPA 58, §8.2.2.2***

Cylinders at a location open to the public shall be protected by either of the following:
(1) An enclosure in accordance with 6.21.4.2
(2) A lockable ventilated enclosure of metal exterior construction
***NFPA 58, §8.4.2.1***

Storage outside of buildings for cylinders awaiting use or resale or that are part of a cylinder exchange point shall be located as follows:
(1) At least 5 ft (1.5 m) from any doorway or opening in a building frequented by the public where occupants have at least two means of egress
(2) At least 10 ft (3 m) from any doorway or opening in a building or sections of a building that has only one means of egress
(3) At least 20 ft (6.1 m) from any automotive service station fuel dispenser
***NFPA 58, §8.4.1.1***

## Transportation of Cylinders

The cargo space of the vehicle shall be isolated from the driver's compartment, the engine, and the engine's exhaust system.
***NFPA 58, §9.3.2.5***

Open-bodied vehicles shall be considered to be in compliance with this provision.
***NFPA 58, §9.3.2.5 (A)***

Closed-bodied vehicles having separate cargo, driver, and engine compartments shall be considered to be in compliance with this provision
***NFPA 58, §9.3.2.5 (B)***

Closed-bodied vehicles, such as passenger cars, vans, and station wagons, shall not be used for transporting more than 215 lb water capacity [nominal 90 lb propane capacity], but not more than 108 lb water capacity [nominal 45 lb propane capacity] per cylinder, unless the driver and engine compartments are separated from the cargo space by a vaportight partition that contains no means of access to the cargo space.
***NFPA 58, §9.3.2.5 (C)***

Cylinders shall be fastened in position to minimize the possibility of movement, tipping, and physical damage.
***NFPA 58, §9.3.2.8***

Cylinders and their appurtenances shall be determined to be leak-free before being loaded into vehicles.
***NFPA 58, §9.3.2.6***

Portable containers shall be transported with pressure relief devices in communication with the vapor space.
***NFPA 58, §9.3.3.6***

Cylinders being transported by vehicles shall be positioned in accordance with Table 9.3.2.9
***NFPA 58, §9.3.2.9***

**Table 9.3.2.9 Orientation of Cylinders on Vehicles**

| Propane Capacity of Cylinder | | | |
|---|---|---|---|
| lb | $m^3$ | Open Vehicles | Enclosed Spaces of Vehicles |
| ≤45 | 0.17 | Any position | |
| >45 | 0.17 | Relief valve in communication with the vapor space | |
| ≤4.2 | 0.016 | | Any position |
| >4.2 | 0.016 | | Relief valve in communication with the vapor space |

# *Motor Mobile Fuel* - GENERAL REQUIREMENTS

## Container Design Pressure

Containers shall be designed, fabricated, tested, and marked (or stamped) in accordance with the regulations of the ASME Boiler and Pressure Vessel Code, Section VIII, "Rules for the Construction of Unfired Pressure Vessels
***NFPA 58, §11.3.1.1***

(A) ASME mobile containers shall be in accordance with one of the following:
(1) A MAWP of 312 psig or higher where installed in enclosed spaces of vehicles
(2) A MAWP of 312 psig or higher where installed on passenger vehicles
(3) A MAWP of 250 psig or higher for containers where installed on the exterior of nonpassenger vehicles
(B) LP-Gas fuel containers used on passenger-carrying vehicles shall not exceed 200 gal aggregate WC.
(C) The capacity of individual LP-Gas containers on highway nonpassenger vehicles shall be 1000 gal (Maximum Container WC) or in accordance with U.S. Department of Transportation regulations
***NFPA 58, §6.26.3.1***

Cylinders shall be designed and constructed for at least a 240 psig service pressure.
***NFPA 58, §11.3.16***

### Sample Question 7

Portable containers shall be transported with pressure relief devices in communication with the _____ space.

A. liquid
B. vapor
C. empty
D. both liquid and vapor

***Answer on last Page***

## Name Plates

LP-Gas shall not be introduced into an ASME container unless it is equipped with an original nameplate or:
(1) Commission identification nameplate
(2) Duplicate nameplate (installed in a remote location)
(3) Modification or alteration nameplate
(4) Replacement nameplate
***LP-Gas Safety Rules, §9.129(a)***

Nameplates on LP-Gas motor fuel tanks shall be permanently attached in a manner which will minimize corrosion of the nameplate or its fastening means and not contribute to corrosion of the container.
***LP-Gas Safety Rules, §9.129(g)***

After a container is permanently installed on a vehicle, container markings shall be readable either directly or with a portable lamp and mirror.
***NFPA 58, §11.8.1.4***

## Overfill Prevention Devices

ASME containers fabricated after January 1, 1984, for use as engine fuel containers on vehicles shall be equipped or fitted with an overfilling prevention device.
***NFPA 58, §11.4.1.15***

Where an overfilling prevention device is installed on an ASME engine fuel container, venting of gas through the fixed maximum liquid level gauge during filling shall not be required.
***NFPA 58, §11.4.1.17***

Where the fixed maximum liquid level gauge is not used during filling in accordance with 11.4.1.17, the fixed maximum liquid level gauge or other approved means shall be used annually to verify the operation of the overfilling prevention device.
***NFPA 58, §11.4.1.18***

## Container Installation (Non-Engine Fuel)

The LP-Gas supply system, including the containers, shall be installed either on the outside of the vehicle or in a recess or cabinet vapor tight to the inside of the vehicle but accessible from and vented to the outside.
***NFPA 58, §6.26.3.3***

## Container Installation (Engine Fuel)

Containers shall be located to minimize the possibility of damage to the container and its fittings.
***NFPA 58, §11.8.1***

Where containers are located in the rear of the vehicle, they shall be protected.
***NFPA 58, §11.8.1.2***

Container valves, appurtenances, and connections shall be protected to prevent damage due to accidental contacts with stationary objects or from stones, mud, or ice and from damage due to an overturn or similar vehicular accident.
***NFPA 58, §11.8.2.1***

Protection of container valves, appurtenances, and connections shall be provided by one of the following:
(1) Locating the container so that parts of the vehicle furnish the necessary protection
(2) Use of a fitting guard furnished by the manufacturer of the container, or
(3) Other means to provide equivalent protection.
***NFPA 58, §11.8.2.2***

Containers shall not be mounted directly on the roofs or ahead of the front axle or beyond the rear bumper of the vehicles.
***NFPA 58, §11.8.3.1***

### Installation in the Interior of Vehicles

The container shall be installed in an enclosure that is securely mounted to the vehicle.
(A) The enclosure shall be gastight with respect to driver or passenger compartments and to any space containing radio transmitters or other spark-producing equipment.
(B) The enclosure shall be vented to the outside of the vehicle.
***NFPA 58, §11.9.1.2***

Fuel containers shall be installed so that no gas can be released inside of the passenger or luggage compartments by installing a remote filling device and a fixed maximum liquid level to the outside of the vehicle.
***NFPA 58, §11.9.1.4***

### Valves

Main shutoff valves on a container for liquid and vapor shall be readily accessible without the use of tools or other equipment shall be provided to shut off the container valves.
***NFPA 58, §11.8.4.3***

The pressure relief valve discharge from fuel containers on vehicles shall:
(1) Be directed up or down within 45 degrees of vertical.
(2) Not directly impinge on the fuel container, the exhaust system, or any other part of the vehicle.
(3) Not be directed into the interior of the vehicle.
***NFPA 58, §11.8.5.1***

### Label Requirements

All LP-Gas–fueled motor vehicles shall be identified by a weather-resistant **diamond-shaped** label affixed to its exterior vertical, or near vertical, lower right rear surface, but not attached to its bumper.
***NFPA 58, §12.3.4***

The label marking shall consist of a border and the word PROPANE in letters not less than 1 in. (25 mm) in height, centered in the diamond, of silver or white reflective luminous material on a black or Pantone 2945 C Royal Blue or equivalent background. (with changes per SR 9.403)
***NFPA 58, §12.3.4.2, LP-Gas Safety Rules, §9.403***

**Sample Question 8**

ASME containers fabricated after January 1, 1984, for use as engine fuel containers on vehicles shall be equipped or fitted with an

A. overfilling prevention device
B. Fixed liquid level gauge
C. diamond shaped label
D. nameplate

***Answer on last page***

## *CATEGORY J* - GENERAL REQUIREMENTS

### Transportation

The person who operates any container delivery unit, regardless of who owns the unit must be registered with AFS prior to the unit being used in LP-gas service.
***LP-Gas Safety Rules, §9.202(a)***

When all registration requirements have been met, AFS will issue LPG Form 4 which must be properly affixed. The LPG Form 4 authorizes the licensee to operate the unit.
***LP-Gas Safety Rules, §9.202(c)***

Vehicles transporting cylinders where the total weight is more than 1000 lb, including the weight of the LP-Gas and the cylinders, shall be placarded as required by DOT regulations or state law.
***NFPA 58, §9.3.2.10***

Vehicles used to carry portable containers must not be moved into any public garage for parking until all portable containers have been removed.
***NFPA 58, §9.7.3.2***

## Installation of Cylinders

Cylinders shall be installed only aboveground and shall be set upon a firm foundation of concrete, masonry or metal and be firmly secured against displacement.
***NFPA 58, §6.8.2.1, LP-Gas Safety Rules, §9.403***

The distance measured horizontally from the point of discharge of a container pressure relief valve to any building opening below the level of such discharge shall be in accordance with Table 6.4.4.3.
***NFPA 58, §6.4.4.3***

The distance measured in any direction from the point of discharge of a container pressure relief valve, vent of a fixed maximum liquid level gauge on a container, and the container filling connection to exterior sources of ignition, openings into direct-vent (sealed combustion system) appliances, and mechanical ventilation air intakes shall be in accordance with Table 6.4.4.3
***NFPA 58, §6.4.4.3***

**Table 6.4.4.3 Separation Distance Between Container Pressure Relief Valve and Building Openings**

| Container Type | Exchange or Filled on Site at Point of Use | Distance Horizontally from Relief Valve Discharge to Opening Below Discharge | | Discharge from Relief Valve, Vent Discharge, and Filling Connection to Exterior Source of Ignition, Openings into Direct-Vent Appliances, and Mechanical Ventilation Air Intakes | |
|---|---|---|---|---|---|
| | | ft | m | ft | m |
| Cylinder | Exchange | 3 | 0.9 | 5 | 1.5 |
| Cylinder | Filled on site at the point of use | 3 | 0.9 | 10 | 3.0 |
| ASME | Filled on site at the point of use | 5 | 1.5 | 10 | 3.0 |

Flexibility shall be provided in the connecting piping.
***NFPA 58, §6.8.2.3***

Flexible connectors shall be installed in accordance with the manufacturer's instructions.
***NFPA 58, §6.11.6***

Hose shall be prohibited between the first-stage and second-stage regulator except during temporary use.
***NFPA 58, §6.11.6.2***

All regulators for outdoor installations shall be designed, installed, or protected so their operation will not be affected by the elements (freezing rain, sleet, snow, ice, mud, or debris).
***NFPA 58, §6.10.1.4***

The point of discharge from the required pressure relief device on regulated equipment installed outside of buildings or occupiable structures in fixed piping systems shall be located not less than 3 ft (1 m) horizontally away from any building or occupiable structure opening below the level of discharge, and not beneath or inside any building or occupiable structure unless this space is not enclosed for more than 50 percent of its perimeter.
***NFPA 58, §6.10.1.5***

The point of discharge shall also be located not less than 5 ft (1.5 m) in any direction from any source of ignition, openings into direct-vent (sealed combustion system) appliances, or mechanical ventilation air intakes.
***NFPA 58, §6.10.1.6***

LP-gas piping shall be installed only by a licensee authorized to perform such installation, a registrant authorized by §9.13 of this title (relating to General Installers and Repairman Exemption), or an individual exempted from licensing as authorized by Texas Natural Resources Code, §113.081.
***LP-Gas Safety Rules, §9.134***

A licensee shall not connect an LP-gas container or cylinder to a piping installation made by a person who is not licensed to make such installation, except that connection may be made to piping installed by an individual on that individual's single family residential home.
***LP-Gas Safety Rules, §9.134***

A licensee may connect to piping installed by an unlicensed person provided the licensee has verified that the piping is free of leaks and has been installed according to the rules of this chapter, and filed with AFS a completed LPG Form 22, identifying the unlicensed person who installed the LP-gas piping
***LP-Gas Safety Rules, §9.134***

## Inspection and testing

Test pressure shall be measured with a manometer or with a pressure measuring device designed and calibrated to read, record, or indicate a pressure loss due to leakage during the pressure test period. The source of pressure shall be isolated before the pressure tests are made. Mechanical gauges used to measure test pressures shall have a range such that the highest end of the scale is not greater than 5 times the test pressure.
***NFPA 54, §8.1.4.1***

The leakage shall be located by means of an approved gas detector, a noncorrosive leak detection fluid, or other approved leak detection methods.
***NFPA 54, §8.1.5.2***

Leak checks using fuel gas shall be permitted in piping systems that have been pressure tested
***NFPA 54, §8.2.1***

During the process of turning gas on into a system of new gas piping, the entire system shall be inspected to determine that there are no open fittings or ends and that all valves at unused outlets are closed and plugged or capped.
***NFPA 54, §8.2.2***

Immediately after the gas is turned on into a new system or into a system that has been initially restored after an interruption of service, the piping system shall be checked for leakage. Where leakage is indicated, the gas supply shall be shut off until the necessary repairs have been made
***NFPA 54, §8.2.3***

Appliances and equipment shall not be placed in operation until after the piping system has been checked for leakage in accordance with 8.2.3, the piping system is purged in accordance with Section 8.3, and connections to the appliance are checked for leakage.
***NFPA 54, §8.2.4***

## Sample Question 9

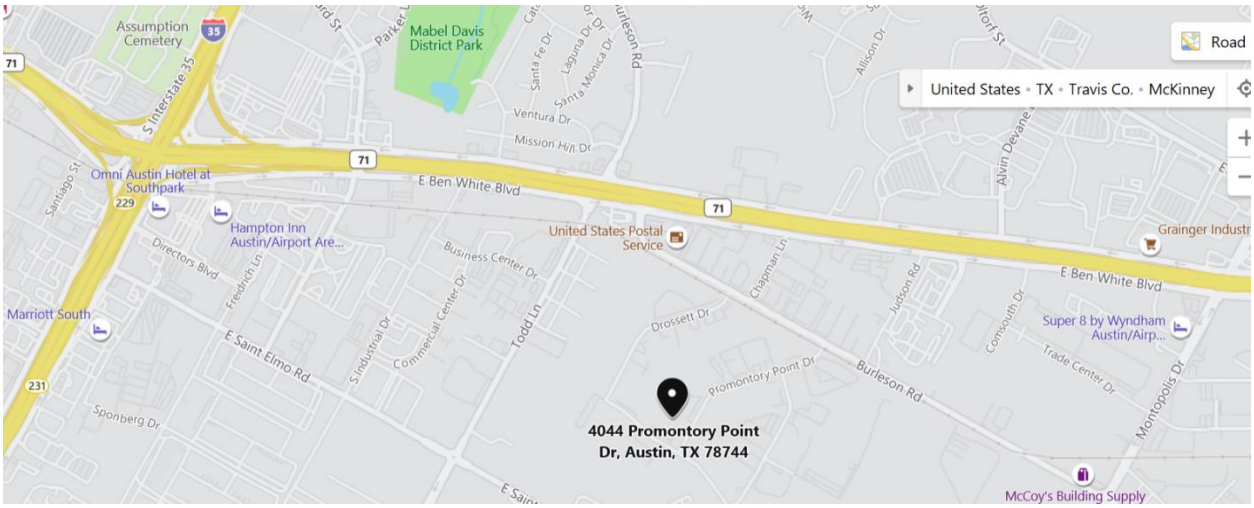
Flexible connectors shall be installed in accordance with the_____.

A. rules of the commission
B. manufacturer's instructions
C. specifications in code of federal regulations 49
D. Boiler pressure vessel code

***Answer on last page***

# ALTERNATIVE FUELS TRAINING CENTER

# 4044 Promontory Point Austin Texas 78744





**Sample Question Answers**

1. D
2. C
3. B
4. A
5. B
6. B
7. B
8. A
9. B