TEXAS LP-GAS EXAMINATION STUDY GUIDE

DOT Cylinder Filler Employee Level

RAILROAD COMMISSION OF TEXAS

September 2012

NOTICE

This publication is intended for use in its entirety as a guide for persons preparing to take Railroad Commission LP-gas qualifying examinations. Any other use or distribution of this publication or use or distribution of any portion of this publication for any purpose whatsoever is considered by the Railroad Commission of Texas to be misuse of this publication.

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Exam administration

Taking an examination in Austin

You may take any LP-gas qualifying examination in Austin without pre-registering ("walk-in") on any business day, excluding holidays, from 8:00 a.m. to 12:00 noon at the AFRED Training Center. The Training Center is located at 6506 Bolm Road, at the intersection of U.S. Highway 183.

Tuesdays and Thursdays are the preferred days for walk-in examinations.

(See map to Training Center on page 16.)

Taking an examination outside of Austin

You may also take any Railroad Commission qualifying examination at more than two dozen other locations statewide. Exam dates, times and locations are listed three months in advance on the Commission's web site. To view a complete schedule, go to www.rrc.state.tx.us. From the drop-down menu under "Education and Training," choose "Training Classes & Qualifying Exams" and click on "Class/Exam Schedule." The online schedule has links to maps showing each class and exam location.

You must register at least two business days in advance to take an examination outside of Austin. To register online, go to www.rrc.state.tx.us. From the drop-down menu under "Education and Training," choose "Training Classes & Qualifying Exams" and click on "Register Now." The web site allows you to register up to four people for an examination, a training class, or both.

When you register online, you will receive a return e-mail confirming the registration and the dates and locations of the exams. You will also receive advance notification of any changes in the examination date, time or location.

Payment for exams; LPG Form 16; ID required

The fee is $40.00 for each employee-level exam and $70.00 for each management-level exam. Fees are non-refundable by state law, and cash cannot be accepted.

You may pay the required examination fee at any exam location by check or money order payable to the Railroad Commission of Texas. LP-Gas Form 16, "Application for Examination," may also be completed at the examination site. Examinees must also present an official state-issued driver's license or photo ID at the exam site.

You may also pay your examination fee by credit card in advance online. To pay by credit card, go to www.rrc.state.tx.us. From the drop-down menu under "Education and Training," choose "Training Classes & Qualifying Exams" and click on "Pay Online." Be sure to print out the confirmation page in Step 6. Make a copy of the confirmation page for your records and bring a copy with you to the examination site.

Open-book examinations

All Railroad Commission LP-gas employee-level qualifying examinations are open book.

Examinees may use a copy of NFPA 58, 2008 edition; the Railroad Commission's *LP-Gas Safety Rules*; or a Railroad Commission Texas Propane Training course manual to take their DOT cylinder filler examination. This study guide may not be used during any employee-level examination.

The questions on the examination are not organized by topic as they are in this study guide.

Examination time limit

The DOT cylinder filler examination must be completed within two hours after the examination is given to you, including any breaks you elect to take. The examination proctor is the official timekeeper. You must submit your examination and your answer sheet to the proctor within the two-hour limit.

Grades, reports and retakes

The minimum passing grade is 75 percent on all LP-gas examinations.

All examinations administered at the Training Center in Austin are graded on-site, and examinees are immediately informed of the results. If you fail an examination that you took in Austin, you may retake that same examination only one additional time during a business day. Any subsequent examination must be taken on another business day, unless approved by the Commission.

Exams taken outside of Austin are graded as soon as possible, and the results of the examination are reported within 10 working days. If you pass an examination, the Railroad Commission will issue you a blue certification card within 10 working days. You will be notified by letter if you fail an examination.

Required first-year training class

Certified DOT cylinder fillers are subject to Railroad Commission training and continuing- education requirements. To maintain your certification, you must complete one of the following Railroad Commission eight-hour courses by the next May 31 after you pass your initial examination. (NOTE: If you pass the examination between March 1 and May 31, then you have until May 31 the next year to complete your training requirement.)

1.1	Introduction to Propane
2.1	Dispenser Operations [preferred]

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LP-GAS EXAMINATION STUDY GUIDE EMPLOYEE-LEVEL DOT CYLINDER FILLER

Who should use this guide?

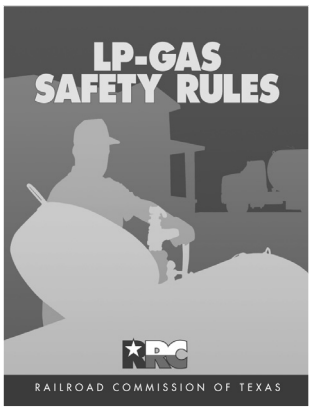
You should use this guide if you plan to take the Railroad Commission's employee-level qualifying examination to fill U.S. Department of Transportation (DOT) LP-gas cylinders. Passing this examination will qualify you to inspect, requalify, fill, disconnect and connect DOT cylinders, including forklift cylinders, and replace cylinder valves. To requalify cylinders, your employer must have a Requalifier Identification Number (RIN) issued by the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration.

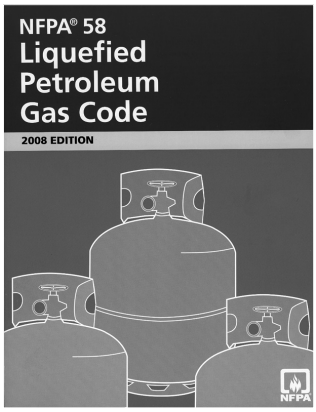
This examination will not qualify you to fill ASME motor fuel tanks or mobile fuel containers.

What books do I need?

This examination tests your knowledge of the laws and standards that apply to DOT cylinder-filling operations in Texas. These laws and standards are found in two books:

LP-Gas Safety Rules (Texas Railroad Commission)
NFPA 58: *Liquefied Petroleum Gas Code* (National Fire Protection Association, 2008)





Where do I get these books?

You may download the current edition of the Railroad Commission's LP-Gas Safety Rules free online at www.propane.tx.gov. Click on "Training and Examinations," select "Examinations and Certification" from the drop-down menu, and scroll down to "LPG Safety Rules (PDF)." You may also buy a printed copy of the book for $10.00, tax included, by calling the Railroad Commission's publications office at (512) 463-7309. Printed copies of NFPA 58 are available for purchase from the Texas Propane Gas Association by calling toll-free (800) 392-0023. 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 on pp. 7-8 of this study guide. You should also know the contents of the following sections of the codes and standards. The actual examination may not include questions on all of the listed sections and topics.

NOTE: Section (§) 9.402(c) of the *LP-Gas Safety Rules* states, "Container capacity, piping system, and appliance exceptions. 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, or to any LP-gas piping system or appliance attached or connected to such a container."

LP-Gas Safety Rules

§9.135	Unsafe or Unapproved Containers, Cylinders or Piping
§9.136	Filling of DOT Containers
§9.403	NFPA 58, §5.2.8.4
	NFPA 58, §5.7.3.1
	NFPA 58, Table §5.7.4.1

NFPA 58 (2008)

§3.3	General Definitions
§5.2	Containers
§5.7.2	Pressure Relief Devices
§5.7.3	Overfilling Prevention Devices
§5.7.4	Container Valves and Other Appurtenances
§5.9	Piping (Including Hose), Fittings, and Valves
§6.4.5	Other Container Location Requirements
§6.7	Installation of Container Appurtenances
§6.23	LP-Gas Systems on Vehicles (Other Than Engine Fuel Systems)
§6.24	Vehicle Fuel Dispenser and Dispensing Stations
§6.25	Fire Protection
§7.2	Operational Safety
§7.4	Quantity of LP-Gas in Containers
§8.2	General Provisions
§9.3	Transportation in Portable Containers
§11.3	Containers
§11.12	Industrial (and Forklift) Trucks Powered by LP-Gas

Terms and definitions

As a DOT cylinder filler you need to know the terms, definitions, facts, rules and procedures relating to the responsibilities of dispenser operators, dispenser equipment and operations, required signs and labels, and the specifications, design features, markings, inspection and procedures for filling DOT cylinders.

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

NFPA 58 (2008)

Container. Any vessel, including cylinders, tanks, portable tanks, and cargo tanks, used to transport or store LP-gases.
NFPA 58, §3.3.13

Container Appurtenances ["valves and fittings"]. 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, §3.3.14

Cylinder. A container designed, constructed, tested and marked according to U.S. Department of Transportation specifications (Title 49, *Code of Federal Regulations*).
NFPA 58, §3.3.16

Dispensing Station. Fixed equipment in which LP-gas is stored and dispensed into portable containers.
NFPA 58, §3.3.20

DOT. U.S. Department of Transportation.
NFPA 58, §3.3.21

Fixed Maximum Liquid Level Gauge ["outage gauge," "spitter valve," "spew gauge"]. A fixed liquid level gauge that indicates when the liquid level in a container has reached its maximum permitted filling limit.
NFPA 58, §3.3.29.2

Liquefied Petroleum Gas ["LP-gas"]. Any material whose vapor pressure does not exceed that allowed for commercial propane and that is composed predominantly of the following hydrocarbons, either by themselves or as mixtures: propane, propylene, butane (normal butane or isobutane), and butylenes.
NFPA 58, §3.3.36

NFPA. National Fire Protection Association.
NFPA 58, §3.3.47

Overfilling Prevention Device ["OPD," "stop valve"]. A safety device that is designed to automatically prevent a container from being filled beyond its maximum permitted filling limit.
NFPA 58, §3.3.49

Point of Transfer. The location where connections and disconnections are made or where LP-gas is vented to the atmosphere during transfer operations.
NFPA 58, §3.3.54

Portable Container. A container designed to be moved readily, as opposed to a container designed for stationary installations.
NFPA 58, §3.3.55

Pressure Relief Valve ["popoff valve"]. A type of pressure relief device designed to both open and close to maintain internal pressure.
NFPA 58, §3.3.74.5

Sources of Ignition. Devices or equipment that are capable of igniting flammable LP-gas vapor-air mixtures and that will permit propagation of flame away from them.
NFPA 58, §3.3.67

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 withdrawal appurtenances function properly in either position.
NFPA 58, §3.3.73

Water Capacity. The amount of water at 60°F required to fill a container.
NFPA 58, §3.3.79

SAMPLE QUESTION

A cylinder that can be used in either the vertical or horizontal position, and whose fixed maximum liquid level gauge, pressure relief valve and withdrawal appurtenances will work properly in either position, is called a _____ cylinder.

A. Combination
B. Dual-purpose
C. Universal
D. VP or HP

Answer: C

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. Then, when you take the examination, read each question very carefully.

1. Cylinders and Cylinder Markings

Cylinders must be designed, fabricated, tested, and marked (or stamped) in accordance with the regulations of the U.S. Department of Transportation (DOT).
NFPA 58, §5.2.1.1

Containers fabricated to earlier editions of regulations, rules, or codes and the Interstate Commerce Commission, prior to April 1, 1967, may continue to be used.
NFPA 58, §5.2.1.1(B)

The service pressure of cylinders must be in accordance with the applicable regulations of 49 *Code of Federal Regulations*, "Transportation."
NFPA 58, §5.2.4.1

Cylinders of 1,000 lb. water capacity, 420 lb. propane capacity or less must incorporate protection against physical damage to cylinder appurtenances and immediate connections to such appurtenances when not in use by means of a ventilated cap or a ventilated collar.
NFPA 58, §5.2.6.1

When being transported, cylinders must be marked and labeled in accordance with 49 *Code of Federal Regulations*, "Transportation."
NFPA 58, §5.2.8.1(B)

Cylinders must be marked with the following information:

(1) The water capacity of the cylinder in pounds, and
(2) The tare weight of the cylinder in pounds, fitted for service.
NFPA 58, §5.2.8.2

Warning labels must be applied to all cylinders of 4.2 lb. to 100 lb. LP-gas capacity that are not filled on site. The label must include information on the potential hazards of LP-gas.
LP-Gas Safety Rules, §9.403; NFPA 58, §5.2.8.4 (1)

Cylinders installed on recreational vehicles or on other vehicles must be constructed for at least a 240 psig service pressure.
NFPA 58, §6.23.3.1(B)

Forklift cylinders must be designed and constructed for at least a 240 psig service pressure.
NFPA 58, §11.3.1.6

SAMPLE QUESTION

A warning label must be affixed to all cylinders of _____ lb. to _____lb. LP-gas capacity that are not filled on site.

A. 4.2 lb. / 40 lb.
B. 1 lb. / 100 lb.
C. 4.2 lb. / 100 lb.
D. 40 lb. / 100 lb.

Answer: C

2. Cylinder Appurtenances

All cylinders used in industrial truck service (including forklift truck cylinders) must have the cylinder's pressure relief valve replaced by a new or unused valve within 12 years of the date of manufacture of the cylinders and every 10 years thereafter.
NFPA 58, §5.7.2.13

Cylinders with 4.2 lb. through 40 lb. propane capacity for vapor service must be equipped or fitted with a listed overfilling prevention device (OPD) that complies with UL 2227, Overfilling Prevention Devices, and a fixed maximum liquid level gauge. These devices must be permitted to be a part of the container valve assembly.
LP-Gas Safety Rules §9.403; NFPA 58, §5.7.3.1

The following types of cylinders are exempt from the requirement of installing a listed overfilling prevention device:

(1) Cylinders used in industrial truck service and cylinders identified and used for industrial welding and cutting gases, and
(2) 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, §5.7.3.5

Horizontal cylinders exempted from the overfilling prevention device requirement must be marked with a label to indicate that they are not equipped with the device.
NFPA 58, §5.7.3.6

An overfilling prevention device is not required for engine fuel cylinders used on industrial (and forklift) trucks powered by LP-gas or for engine fuel cylinders used on vehicles (including floor maintenance machines) having LP-gas powered engines mounted on them.
NFPA 58, §5.7.4.1(E)

Cylinders greater than 40 lb. through 100 lb. propane capacity filled by volume must have a fixed maximum liquid level gauge.
NFPA 58, §5.7.4.1(H)

Pressure relief devices on cylinders must be installed to minimize the possibility of relief device discharge impingement on the cylinder.
NFPA 58, §6.7.2.2

An overfilling prevention device must 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 cylinder pressure relief valve discharge on a industrial truck cylinder must be directed upward within 45 degrees of vertical and otherwise must not impinge on the cylinder, the exhaust system, or any other part of the industrial truck.
NFPA 58, §11.12.2.6

SAMPLE QUESTION

Where an overfilling prevention device (OPD) is a not available, a cylinder designed to be installed in the horizontal position and manufactured prior to _____ is exempt from the OPD requirement.

A. January 1, 1984
B. September 30, 1998
C. July 1, 2000
D. October 1, 1998

Answer: D

3. Cylinder Inspection

A licensee or the licensee's employees must not introduce LP-gas into any container or cylinder if the licensee or employee has 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 in accordance with the statutes or the *LP-Gas Safety Rules*.
LP-Gas Safety Rules, §9.135

A DOT cylinder, other than a DOT 4E specification (aluminum) cylinder or a composite cylinder, that has been involved in a fire and shows no distortion must be requalified for continued service, and all of the cylinder's appurtenances must be replaced before the cylinder is used or reinstalled.
NFPA 58, §5.2.1.2

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

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

A cylinder with an expired requalification date must not be refilled until it is requalified by the methods prescribed in DOT regulations.
NFPA 58, §5.2.2.2 and §11.3.1.5

Any cylinder that fails one or more of the criteria of the visual inspection requirements in §5.2.3.3 must not be refilled or continued in service until the condition is corrected.
NFPA 58, §5.2.3.1

Visual inspection must be performed in accordance with the following:

(1) The cylinder is checked for exposure to fire, dents, cuts, digs, gouges, and corrosion.
(2) The cylinder protective collar (where utilized) and the foot ring are intact and are firmly attached.
(3) The cylinder is painted or coated to minimize corrosion.
(4) The cylinder pressure relief valve indicates no visible damage, corrosion of operating components, or obstructions.
(5) There is no leakage from the cylinder or its appurtenances that is detectable without the use of instruments.

NFPA 58, §5.2.3.3

Cylinders requalified after September 30, 1998, must be equipped with a listed overfilling prevention device and a fixed maximum liquid level gauge.
NFPA 58, §5.7.3.2

4. Filling Cylinders, Product Transfer and Cylinder Transportation

DOT containers of less than 101 pounds LP-gas capacity, other than containers designed to be used on forklift or industrial trucks, must be filled by weight only. The weight of such containers must be determined by scales that meet the specifications of the National Institute of Standards and Technology's *Handbook 44*.
LP-Gas Safety Rules, §9.136

Scales at licensees' facilities must be currently registered with the Texas Department of Agriculture. The scales must have a rated weighing capacity which exceeds the total weight of the cylinders being filled. The scales must be accurate during the filling of the cylinder.
LP-Gas Safety Rules, §9.136

The formula for filling LP-gas containers by weight is as follows:

(1) Determine the propane capacity in pounds by multiplying the total water capacity in pounds by 0.42.

(2) Add the tare weight of the cylinder to the liquid weight of the product plus the weight of the hose and nozzle. The total weight of these three is the proper scale setting.

LP-Gas Safety Rules, §9.136(a)

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

NFPA 58, §6.24.3.14

An LP-gas fire must not be extinguished until the source of the burning gas is shut off.

NFPA 58, §6.25.4.3

At least one qualified person must remain in attendance at a 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

Transfer of LP-gas to and from a container must be accomplished only by qualified individuals trained in proper handling and operating procedures.

NFPA 58, §7.2.2.1

Sources of ignition must 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

Smoking, open flame, portable electrical tools, and extension lights capable of igniting LP-gas must not be permitted within 25 ft. of a point of transfer while filling operations are in progress.

NFPA 58, §7.2.3.2(B)

Closed-bodied vehicles such as passenger cars, vans, and station wagons must not be used for transporting more than 215 lb. water capacity [90 lb. propane capacity] but not more than 108 lb. water capacity [45 lb. propane capacity] per cylinder, unless the driver and engine compartments are separated from the cargo space by a vapor-tight partition that contains no means of access to the cargo space.

NFPA 58,§9.3.2.5(B)

Cylinders and their appurtenances must be determined to be leak-free before being loaded into vehicles.

NFPA 58, §9.3.2.6

Cylinders must be fastened in position to minimize the possibility of movement, tipping, and physical damage.

NFPA 58, §9.3.2.8

When a cylinder with a propane capacity over 45 lb. is being transported in an open vehicle, the relief valve must communicate with the vapor space of the cylinder.

NFPA 58, §9.3.2.9

The fixed maximum liquid level gauge on an industrial truck cylinder must indicate the maximum permitted filling level in either the vertical or horizontal position.
NFPA 58, §11.12.2.3

SAMPLE QUESTION

An LP-gas fire must be put out _____.

A. Immediately
B. Only after the Railroad Commission has been notified
C. Only after the source of the burning gas has been shut off
D. Only after local fire officials have arrived

Answer: C

5. Storage Containers; Cylinder Storage

Loose or piled combustible material and weeds and long dry grass must be separated from containers by a minimum of 10 feet.
NFPA 58, §6.4.5.2

Transfer locations must have at least one approved fire extinguisher having a minimum capacity of 18 lb. dry chemical with a B:C rating.
NFPA 58, §6.25.4.2

Cylinders in storage must be located to minimize exposure to excessive temperature rises, physical damage, or tampering.
NFPA 58, §8.2.1.1

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

6. Hose, Hose Connections and Flexible Connectors

Hose, hose connections, and flexible connectors must be fabricated of materials that are resistant to the action of LP-gas both as liquid and vapor.
NFPA 58, §5.9.6.1

Hose must be designed for a working pressure of 350 psig with a safety factor of 5 to 1 and must be continuously marked with LP-GAS, PROPANE, 350 PSI WORKING PRESSURE, and with the manufacturer's name or trademark.
NFPA 58, §5.9.6.4(A)

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

Hose assemblies must be inspected at least annually.
NFPA 58, §7.2.4.2

Inspection of pressurized hose assemblies must 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 and
(5) Leakage other than permeability leakage.
NFPA 58, §7.2.4.3

Hose assemblies must be replaced, repaired, or continued in service based on the results of this inspection.
NFPA 58, §7.2.4.4

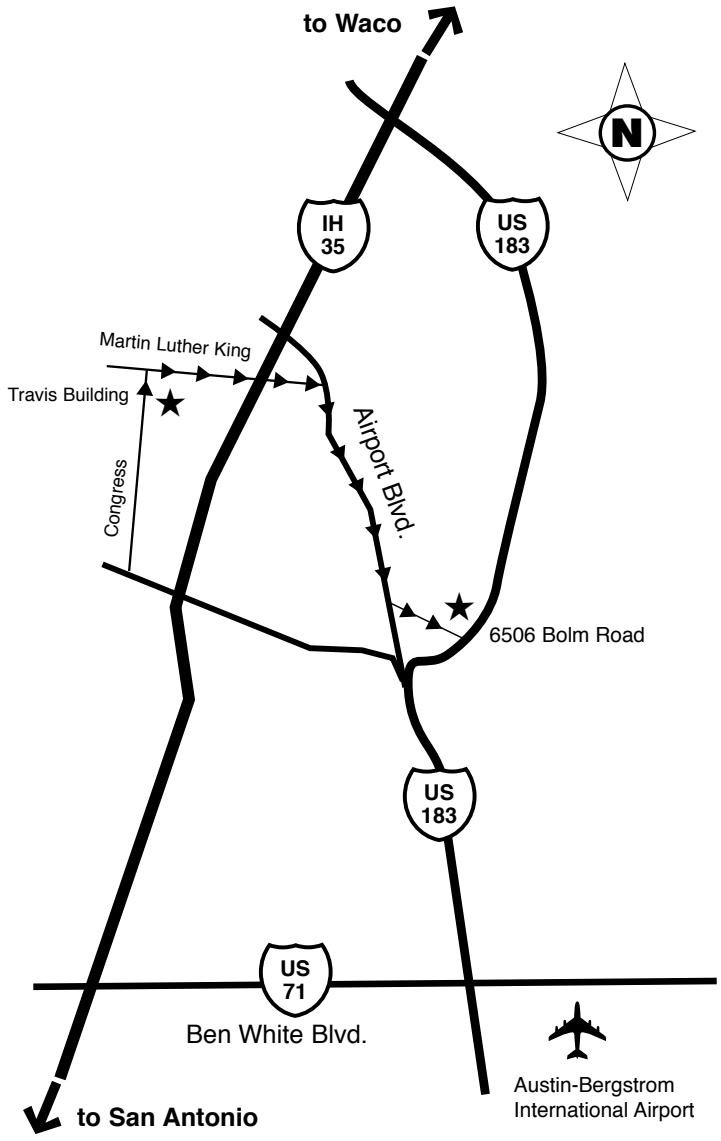
SAMPLE QUESTION

Hose, hose connections, and flexible connectors must be fabricated of materials that are resistant to the action of LP-gas as _____.

A. Liquid
B. Vapor
C. Both liquid and vapor

Answer: C

RRC/AFRED TRAINING CENTER 6506 BOLM RD., AUSTIN



DIRECTIONS TO RRC ALTERNATIVE FUELS TRAINING CENTER, AUSTIN

From the Travis Building:
Go one block north to Martin Luther King, Jr. Blvd. Turn right on MLK and go about 2 miles to Airport Blvd. Turn right (south) on Airport and go about 1 1⁄2 miles. The fifth traffic light, just over the railroad bridge, is Bolm Road. Turn left (east) onto Bolm Road and go about 1 mile. 6506 is the last building on the left before U.S. 183.

Entering Austin on I-35 going south:

Take exit 239/240 for Hwy 183 South/ Austin-Bergstrom International Airport. Stay on 183 past Cameron Road, U.S. 290, Manor Road, Loyola Lane, and Techni-Center Drive. Proceed down the hill on 183 and take the Bolm Road exit. At the light, turn right onto Bolm Road. The Training Center is on the northwest corner of 183 and Bolm Road. Enter through the double glass doors on the south side of the building.

Entering Austin on I-35 going north:

Take exit 230 for Texas Hwy. 71/Ben White Blvd. Turn right toward Bastrop. Stay on 71 for approximately 4.3 miles. Exit onto U.S. 183 North. Stay on 183 past the Colorado River bridge. Stay in the right lane and take the Bolm Road exit. Turn left at the light onto Bolm Road and go under the overpass. The Training Center is on the northwest corner of 183 and Bolm Road. Enter through the double glass doors on the south side of the building.