Safe Dispensing of Propane

PROpane DIsPENSEnG uNIty OpERAtOr TRAIning MANuAl

FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES
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INTRODUCTION

This course is designed to introduce you, the dispensing unit operator, to the procedures, regulations, and practical aspects of propane dispensing. For some of you, this will be a refresher course. It covers Florida laws concerning safe handling, storage, and transportation of liquefied petroleum gas as well as the characteristics and properties of propane. The purpose of this material is to set forth general safety practices—it is not meant to be an exhaustive treatment of the subject. Additionally, other procedures which could enhance safe dispensing unit operation are not meant to be precluded by this material. This material will deal primarily with propane since it is the most commonly dispensed LP gas product in the state of Florida.

The Bureau of Liquefied Petroleum Gas Inspection recommends each dispensing unit operator have a copy of the current Chapter 527, Florida Statutes (Florida law governing all propane usage), Rule Chapter 5F-11, Florida Administrative Code (Florida administrative rules governing all propane usage), and NFPA 58, Liquefied Petroleum Gas Code (formerly referred to as NFPA Pamphlet #58 – Florida’s adopted national safety code) on your premises at all times, as these publications govern all dispensing operations and should be used as guides when dispensing propane.

The state of Florida requires that all persons involved with the dispensing of LP gas must be adequately trained in the proper procedures and safe handling of this product. Your safety, as well as that of your customers and your fellow employees, depends on your knowledge of Florida’s code and rule requirements and your commitment to ensuring safe operations.

It is very important that you meet your responsibilities under Florida law. Operators who do not comply may be subject to administrative penalties which can include fines and the possibility of suspension or revocation of your license.

Note: Many terms used in this training manual are words and phrases commonly used among LP gas industry personnel. A glossary of these terms can be found at the end of this training manual.

FOR MORE INFORMATION, VISIT US ONLINE AT WWW.800HELPFLA.COM OR CALL 1-800-HELP-FLA (435-7352)
The Bureau of Liquefied Petroleum Gas Inspection is a part of the Florida Department of Agriculture and Consumer Services, Division of Consumer Services. This office regulates the storage, handling, sale and use of LP gases through:

- Inspections
- Regulation and Enforcement
- Accident Investigations
- Training
- Consumer Assistance

Propane, the most widely used liquefied petroleum gas, is an energy source for hotels, restaurants, schools, hospitals, nursing homes, universities, private homes, recreational vehicles, agricultural and industrial facilities, and is used as an alternative fuel for vehicles. Directly or indirectly, propane touches the lives of almost every Floridian.

The Bureau of Liquefied Petroleum Gas Inspection enforces all applicable LP gas laws, rules and regulations in this state, which include the following: Chapter 527, Florida Statutes; Rule Chapter 5F-11, Florida Administrative Code; NFPA 58, Liquefied Petroleum Gas Code (formerly, National Fire Protection Association Pamphlet 58); NFPA 54, National Fuel Gas Code (formerly, National Fire Protection Association Pamphlet 54). Pursuant to Chapter 527, Florida Statutes, the bureau has the following duties and responsibilities: inspection of liquefied petroleum gas facilities in Florida (including bulk plants, dispensing units, bulk storage sites, cylinder cages, trucks, etc.); the investigation of accidents, fires or explosions where reason exists to believe liquefied petroleum gas is involved; licensure of persons engaged in LP gas activities in this state; and training and examination of industry and emergency response personnel. These licensing, inspection, investigation and training activities enable the Bureau of Liquefied Petroleum Gas Inspection to insure that those persons engaged in LP gas business activities in this state are trained and compliance with acceptable safety codes and standards is achieved statewide.

Enforcement of LP gas safety laws and regulations is the bureau's primary concern; however, everyone involved with the handling of liquefied petroleum gas shares a role in maintaining safe practices. Through our training and education programs, both industry and public members can be kept well-informed of the various aspects of LP gas safety. Accident prevention and safety are responsibilities that need a commitment from everyone. Working together and sharing these responsibilities will help us all achieve these safety goals.

**THE DISPENSING UNIT OPERATOR’S (DISPENSER’S) LICENSE**

The Bureau of LP Gas Inspection licenses and inspects over 1,000 dispensing units in this state annually. The license category for dispensing units is known as a type and class 06-04, Category II Liquefied Petroleum Gas Dispenser. A dispensing unit that requires a license in this state is one where LP gas is dispensed for sale to the public. A dispensing unit that would not require licensure would be a unit installed strictly for the owner’s use.

When you apply for a dispensing unit license in Florida, certain procedures must be followed. Here are the basic steps to becoming licensed:
• **Dispensing unit site plans must be submitted to the bureau for approval.** (527.0605, F.S.) - Prior to the start of any installation activity, the installer of the dispensing unit must submit a site plan (along with a $200 site plan fee) to the bureau’s Tallahassee office for approval. If approved, the bureau will stamp the site plan “Approved” and return a copy to the installer. Once approved, installation activity/construction may begin.

• **License fees and application must be submitted to the bureau, along with proof of insurance.** (527.02, F.S.) - Currently, Florida law requires each business location at which a dispensing unit is to be operated to pay a license fee of $525 for an original license, with an annual renewal fee of $375. Proof of insurance must be submitted with the application and fee, and will be verified by the bureau. Insurance required is a minimum of $1 million bodily injury liability and property damage liability insurance.

• **Qualifying examination.** (527.0201, F.S.) - Each dispensing unit operator must employ one “Qualifier.” A qualifier is a person who has successfully completed an examination administered by the Bureau of LP Gas Inspection. The Qualifier Card received as a result of passing the exam is NOT a license. The qualifier CANNOT serve as the qualifier at more than one licensed location at the same time.

• **Final inspection of the dispensing unit.** (527.0605, F.S.) - Once the dispensing unit is installed and all construction is complete, the installer (or the operator) must contact the Tallahassee bureau office and request a final inspection of the unit. No dispenser may be put into service without final approval of the bureau. Operating a dispenser prior to approval by the bureau will result in a fine of up to $3,000 per violation.

When all license requirements are met, the Bureau of LP Gas Inspection will issue your license to operate. Your license will usually be issued one week to ten (10) days from the date of final approval.

**Once you become a licensed dispenser in Florida, you assume many responsibilities.**

**These responsibilities include:**

• Proper operation of the dispensing unit;
• Maintenance of the dispensing unit (housekeeping);
• Response to all correspondence from the Bureau concerning your license or dispensing unit;
• Reporting of accidents;
• Reporting vacancy in qualifier position(s);
• Training and supervision of your dispensing unit personnel and documentation of training; and
• Compliance with all regulations governing your dispensing operation.
Failure to comply with any of Florida’s laws or rules governing LP gas can result in administrative action, including fines of up to $3,000 per violation and/or license suspension or revocation.

Often, dispensing units are the property of the gas supplier who has installed them. If this is the case with your operation, REMEMBER - your company has been issued a license by the state of Florida and will ultimately be held responsible for the dispensing unit and its operation. You are not, however, to perform any type of service or repair work to the unit - this is to be done only by a properly licensed LP gas company or individual.

One of your responsibilities as an operator is that of reporting to the Bureau of LP Gas Inspection any accidents that may occur involving your dispenser or your customers. Accidents that meet the reporting criteria of the bureau must be reported as required in

Section 527.065, Florida Statutes. This section provides as follows:

§527.065 Notification of accidents; leak calls.—
1. Immediately upon discovery, all liquefied petroleum gas licensees shall notify the department of any liquefied petroleum gas-related accident involving a liquefied petroleum gas company or customer account:
   (a) Which caused a death or personal injury requiring professional medical treatment;
   (b) Where uncontrolled ignition of liquefied petroleum gas resulted in death, personal injury, or property damage exceeding $1,000; or
   (c) Which caused estimated damage to property exceeding $1,000.

By reporting accidents to the Bureau of LP Gas Inspection, you are helping to prevent future occurrences.

Another responsibility held by dispensers is that of TRAINING. ALL employees who dispense propane must be trained in the safe operation of the dispensing unit. If your personnel are not trained, contact your propane supplier or the Bureau of LP Gas Inspection for assistance.

YOUR SAFETY - AS WELL AS THE SAFETY OF YOUR EMPLOYEES AND CUSTOMERS - DEPENDS ON YOU.
1. When must a dispensing unit have a license to operate in the state of Florida?

2. What are the insurance requirements for dispensing units in Florida?

3. What kind of accidents must be reported to the Bureau of LP Gas Inspection?

4. When must accidents be reported?

5. Who regulates the sale of LP gas in Florida?

6. What is a Qualifier?

7. Who is allowed to dispense LP gas in Florida?

8. Who is responsible for the safe operation of your dispensing unit?

9. Who is allowed, by law, to repair leaks and replace parts on your dispensing unit?

10. What penalties may be levied by the Bureau of LP Gas Inspection for violations of Florida’s LP gas laws?
PROPANE PROPERTIES AND CHARACTERISTICS

WHAT IS PROPANE?
Propane, LP gas, bottled gas, butane and propylene are some of the names used to identify liquefied petroleum gas. LP gases are in the family of hydrocarbons, but not all hydrocarbons are LP gases.

Propane is normally stored in a pressure vessel as both a vapor and a liquid under moderate pressure. In its natural state it is colorless, tasteless, odorless and non-toxic. It is produced through the oil refining process or is stripped-out of natural gas. In most cases, an odorant is added to serve as a warning agent of a possible gas leak. The odorant most commonly used is Ethyl Mercaptan.

PROPANE EXPANDS
Propane liquid will expand 270 times as it changes from a liquid state to vapor state. For example, 1 gallon of liquid stored under pressure in a container will expand to approximately 270 gallons of vapor if released to the atmosphere. Consequently, a small amount of liquid propane has the potential to create a serious hazard. This rapid expansion ratio of 1 part liquid to 270 parts vapor makes propane an effective refrigerant.

PROPANE TEMPERATURE
Propane boils at 44 degrees below zero (−44°F). Through this refrigeration process, heat is rapidly absorbed. If your skin should come in contact with propane liquid, a severe freeze burn or frostbite may occur. First aid treatment for frostbite is the application of lukewarm water to the affected area. As with any serious burn, immediate medical treatment should be sought.

PROPANE SPECIFIC GRAVITY
Specific Gravity is the weight of a product compared to the weight of water or air. The specific gravity of propane vapor is approximately 1.50; air is 1. This means that propane vapor weighs one and one-half times more than air. The specific gravity of propane liquid is 0.504; water is 1. Therefore, we know that propane liquid is lighter than water. Since propane is heavier than air, it will normally seek out low areas. This behavior, however, can easily be affected by air currents.

The fact that propane is heavier than air also creates the hazard of a simple asphyxiate. Oxygen needed to sustain life can be displaced by propane. If a large accumulation of propane liquid or vapor is present, always remain upwind. Never enter a concentrated area of propane vapor. Inhaling vapor can cause dizziness, unconsciousness and respiratory arrest.
## POTENTIAL EFFECTS OF OXYGEN-DEFICIENT ATMOSPHERES

<table>
<thead>
<tr>
<th>% By Volume At Atmospheric Pressure</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.05%</td>
<td>Minimum permissible oxygen level.</td>
</tr>
<tr>
<td>15-19%</td>
<td>Decreased ability to work strenuously. May impair coordination and may induce early symptoms in persons with coronary, pulmonary or circulatory problems.</td>
</tr>
<tr>
<td>12-14%</td>
<td>Respiration increases in exertion; pulse up; impaired coordination, perception and judgment.</td>
</tr>
<tr>
<td>10-12%</td>
<td>Respiration further increases in rate and depth; poor judgment; lips blue.</td>
</tr>
<tr>
<td>08-10%</td>
<td>Mental failure; fainting; unconsciousness; ashen face; lips blue; nausea and vomiting.</td>
</tr>
<tr>
<td>06-08%</td>
<td>8 minutes, 100% fatal; 6 minutes, 50% fatal; 4-5 minutes, recovery with treatment.</td>
</tr>
<tr>
<td>04-06%</td>
<td>Coma in 40 seconds; convulsions; respiration ceases; death.</td>
</tr>
</tbody>
</table>

*These values are approximate and vary as to the individual’s state of health and level of physical activity.*

*Exposure to atmospheres containing 12% or less oxygen can bring about unconsciousness without warning and affects the body so quickly that the individual cannot help or protect themselves.*
**APPROXIMATE PROPERTIES OF LP GASES**

*Commercial Propane* - Properties of Propane from NFPA 58, Annex B

<table>
<thead>
<tr>
<th>Vapor Pressure in PSIG at:</th>
<th>Specific Gravity of Vapor at 600 F (air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>700 F</td>
<td>127 PSIG</td>
</tr>
<tr>
<td>1000 F</td>
<td>195 PSIG</td>
</tr>
<tr>
<td>1040 F</td>
<td>210 PSIG</td>
</tr>
<tr>
<td>1300 F</td>
<td>287 PSIG</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specific Gravity of Liquid at 600 F</th>
<th>0.504</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Boiling Point at 14.7 PSI</td>
<td>-44°F</td>
</tr>
<tr>
<td>Weight per Gallon of Liquid at 600 F</td>
<td>4.20</td>
</tr>
<tr>
<td>Specific Heat of Liquid, Bulb at 600 F</td>
<td>0.630</td>
</tr>
<tr>
<td>Cubic Ft. of Vapor per Gallon at 600 F</td>
<td>36.38</td>
</tr>
<tr>
<td>Cubic Ft. of Vapor per Pound at 600 F</td>
<td>8.66</td>
</tr>
</tbody>
</table>

**PROpane WEIGHT**

One gallon of propane weighs 4.2 pounds.

**HOW OUTSIDE TEMPERATURE AFFECTS PROpane**

Temperature has a direct relationship to propane pressure. A covered pot of water placed on a stove at a high temperature will eventually boil over. In the same way, an increase in outside temperatures will cause an increase in the pressure within an LP gas container. As the pressure increases, the volume of the liquid will also expand in the container. For example, water expands 2.2%. At a temperature rise from 160°F to 600°F, liquid propane would expand 25% and steel would expand only 0.19%. The fact that propane reacts more quickly to outside temperature changes and expands more rapidly emphasizes the importance of NEVER overfilling an LP gas container. No LP gas container should ever be filled more than 80% full.

**PROpane FlamMability**

“Range of Flammability” is a term used to describe that certain mixture of air and LP gas which will readily burn. Any mix outside this range will not burn easily. Propane has a relatively narrow range of flammability when compared to other petroleum products. It has a flammable range of 2.15 to 9.60, meaning that if propane is released to the atmosphere, a propane/air mixture containing less than 2.15% gas is too lean to burn and a mixture containing more than 9.6% gas, is too rich to burn.

This range of flammability is important to remember when LP gas is being transferred or discharged. If the propane/air mixture is within the flammability range, sources of ignition could include fans, electrical switches, auto ignitions, static electricity or cigarettes.
MATERIAL SAFETY DATA SHEET*

Section 1.
Suppliers Name ___________________________ Emergency Phone No. ___________________________
Address ______________________________________________________
Chemical Name Liquefied Petroleum Gas or Propane CAS Registry No. 74-98-6
Chemical Family Hydrocarbon Formula C3H8

HAZARDOUS INGREDIENTS

Section 2.
Hazardous Mixtures Air with 2.1 to 9.60 percent propane

PHYSICAL DATA

Section 3.
Boiling Point __44°F__ Specific Gravity (H2O=1) ___0.51_ Vapor Pressure (mm HG) at 100°F __9825__ Percent, Volatile by Volume (%) __100__
Vapor Density (Air=1) __1.52_ Evaporative Rate None_ Solubility in Water Slightly Appearance and Odor Clear - unpleasant odor caused by odorant

FIRE AND EXPLOSION HAZARD DATA

Section 4.
Flammable Limits
Flash Point N/A Classification Flammable Gas UN 1075 LEL 2.15 UEL 9.60
Extinguishing Media Water Spray Class A-B-C or BC Fire Extinguishers
Special Fire Fighting Procedures Stop flow of gas. Use water to keep fire-exposed containers cool. Use water spray to disperse unignited gas or vapor. If ignition has occurred and no water available, tank metal may weaken from overheating. Evacuate area. If gas has not ignited, LP-gas liquid or vapor may be dispersed by water spray or flooding.

HEALTH HAZARD

Section 5.
Threshold Limit Value 1,000 PPM Permissible Exposure Limit 1,000 PPM Effects of Overexposure Inhalation -- concentration can lead to symptoms ranging from dizziness to anesthesia and respiratory arrest. Eyes -- moderate irritation. Emergency and First Aid Procedures Inhalation -- remove to fresh air. Guard against self-injury. Apply artificial respiration if breathing has stopped.

REACTIVITY DATA

Section 6.
Stable X Unstable _ Hazardous Decomposition Products None
Incompatibility (materials to avoid) Mixing with oxygen or air except at burner
Hazardous Polymerization: May Occur ______________ Will Not Occur ______ X______

SPILL OR LEAK PROCEDURES

Section 7.
Steps to be taken in case material is released: Keep public away. Shut off supply of gas. Eliminate sources of ignition. Ventilate the area. Disperse with water spray. Contact between skin and these gases in liquid form can cause freezing of tissue causing injury similar to thermal burn. Waste Disposal Method Controlled burning. Contact supplier.

SPECIAL PROTECTION INFORMATION

Section 8.
Respiratory Protection Stay out of gas or vapor (because of fire hazard)
Ventilation Explosion-proof motors and keep sources of ignition at safe distances.
Personal Protective Equipment and Apparel Heavy duty gloves, goggles for protection against accidental release of pressurized products.

SPECIAL PRECAUTIONS

Section 9.
Precautions to be taken when handling and storing Keep containers away from heat sources and store in upright position. Containers should not be dropped. Keep container valve closed when not in use.
Other precautions Install protective caps when not connected for use.

TOXICOLOGICAL INFORMATION

Section 10.
OSHA Carcinogen Classification (29 CFR 1910) Not listed/applicable X

DOT LABELING INFORMATION (49 CFR 100-199)

Section 11.
Proper Shipping Name Liquefied Petroleum Gas Hazardous Classification Flammable Gas Identification No. UN 1075
Label(s) Required Flammable, Class 2

* This is a sample Material Safety Data Sheet (MSDS) provided for illustration/training purposes only. Your propane supplier should provide you with a Material Safety Data Sheet in compliance with the Federal Community Right-To-Know Act. This sample sheet is not intended to serve as a substitute for an MSDS form or to be used to comply with the Federal Community Right-To-Know Act.
1. Name three characteristics of propane.

2. What is the initial boiling point of propane at 14.7 PSI?

3. What does one gallon of liquid propane weigh in pounds?

4. How heavy is propane vapor compared to air? Propane liquid to water?

5. What is the Range of Flammability of propane and what do the propane/air mix percentages mean?

6. What is the most commonly used odorant in LP gases and why is it added?

7. When liquid propane is released to the atmosphere, what is its expansion ratio?

8. Is propane toxic?

9. Name several potential sources of ignition.

10. When the outside temperature increases, what happens to propane inside a container?
PROPANE CONTAINERS

As a dispensing unit operator, you will encounter two common types of LP gas containers - **ASME** tanks, and more often, **DOT** cylinders.

**ASME TANKS** are manufactured according to specifications of the American Society of Mechanical Engineers. This type of propane container will most frequently be encountered in mobile installations such as recreational vehicles, and as motor fuel containers on vehicles. ASME tanks are more commonly used in residential, industrial and commercial applications to store propane for use in various heating and cooking applications. ASME containers used in these applications are fixed in place and are considered stationary tanks.

**DOT CYLINDERS** are portable and are manufactured according to U.S. Department of Transportation (DOT) specifications. Prior to 1967, specifications for these cylinders came under the authority of the Interstate Commerce Commission (ICC), therefore, many times DOT cylinders are also referred to as "DOT (ICC)" cylinders. These cylinders are the type you will most commonly encounter, as they are extremely portable and are used to store propane for gas grills, fork lift motor fuel and various other heating and cooking activities.

Regardless of their construction specifications, both ASME and DOT tanks have basic parts that share common functions as shown in the table below:

<table>
<thead>
<tr>
<th>BASIC CONTAINER COMPONENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ASME CONTAINER</strong></td>
</tr>
<tr>
<td>Valve protection</td>
</tr>
<tr>
<td>Data Plate</td>
</tr>
<tr>
<td>Container Openings</td>
</tr>
<tr>
<td>Container Body</td>
</tr>
<tr>
<td>Mounting Hardware</td>
</tr>
</tbody>
</table>

Propane containers are constructed for the safe storage of this product under pressure. Containers are marked with a maximum allowable working pressure which tells you the highest pressure a container is designed to hold safely.

As you know, propane under pressure is stored as a liquid; however, no container may be filled to more than 80% of its water capacity. This means that a container filled to the legal limit will have propane stored inside as both a vapor and a liquid, allowing for expansion within the container.
STORAGE OF PROPANE IN CONTAINERS

ASME CONTAINERS
Here are some things to remember about ASME containers:

- All ASME containers are made of steel
- All ASME containers are required to have a legible, metal data plate attached that gives you valuable information about the container
- ASME containers used in mobile service MUST ALWAYS be securely fastened - NEVER fill a container that is unsecured
- All ASME container capacities are expressed in the maximum amount of water gallons the tank can hold

ASME TANK DATA PLATES
One of the most important parts of any propane container is the area where the container markings are present. On an ASME container, this information is on a **data plate**. The data plate carries information vital to the identification and safe use of the container and should be securely attached to the container. If a customer should request that you fill an ASME tank with a missing or illegible data plate and cannot produce a data sheet for the tank, you should refuse - for their protection and yours.

Container data plates are required to give you the following information about the propane container:

- **NAME AND ADDRESS OF MANUFACTURER**
- **TYPE OF SERVICE OR INTENDED USE**
- **MAXIMUM ALLOWABLE WORKING PRESSURE**
- **WATER CAPACITY IN GALLONS**
- **OUTSIDE SURFACE AREA OF TANK (IN SQUARE FT.)**

Also, the date plate must contain the wording:

> “THIS CONTAINER SHALL NOT CONTAIN A PRODUCT HAVING A VAPOR PRESSURE IN EXCESS OF ___ PSIG AT 1000 F.”

Other information, such as the year of manufacture, head and shell thickness, length of the tank, serial number, material of construction, dip tube length, etc, may also be found on the container data plate.

SAMPLE DATA PLATE - ASME CONTAINER

![Sample Data Plate](image-url)
DOT CONTAINERS

DOT (ICC) containers:

- Have all container data stamped into the body or collar (neck ring) of the container.
- Are made of steel, aluminum or composite.
- Must be retested for use according to DOT specifications.
- Capacities are expressed in the amount of propane in pounds they can contain.

The container markings on a DOT cylinder can be found permanently stamped into the container collar or neck ring or on the cylinder body. Occasionally, a metal plate will carry this information much like the ASME tank data plate and will be attached to the body of the DOT cylinder. Information required for DOT (ICC) cylinders is:

<table>
<thead>
<tr>
<th>DESIGN OR MANUFACTURE CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>WATER CAPACITY</td>
</tr>
<tr>
<td>TARE WEIGHT</td>
</tr>
<tr>
<td>RETEST DATE</td>
</tr>
</tbody>
</table>

As is the case with missing or illegible ASME data plates, DOT cylinders without all required markings or with illegible markings should never be filled.

The tare weight of a container is what the container weighs when it is empty. This weight includes the weight of the valves, and is important to know when filling containers by weight.

The water capacity of a container is the weight of water needed to completely fill the container. DO NOT CONFUSE WATER CAPACITY OF A CONTAINER WITH ITS PROPANE CAPACITY. To determine the propane capacity of a container, simply multiply its water capacity by 42% (.42).

**DOT containers are required to be certified for safe continued use at specific intervals.**

STEEL AND ALUMINUM CYLINDERS

The first test is required 12 years after the manufacture date. After the 12-year test, the container must be tested every 5, 7 or 12 years, depending on the type of examination or procedure performed. There are three methods of retesting and requalification of DOT cylinders:

1. **Visual Requalification**
   The recorded visual requalification is documented on a DOT form. If suitable for continued use, the month and year of the visual requalification is then stamped on the container near the original date of manufacture or the previous requalification date, followed by the letter “E” indicating visual (external) retest. **This type of requalification is valid for a period of five (5) years.**

2. **Simple Hydrostatic Test**
   The simple hydrostatic is performed by pressurizing the DOT (ICC) cylinder with water with at least two-times (2x) the design working pressure of the cylinder. This test is also documented on a DOT form. If suitable for continued use, the
month and year of the test is stamped on the container near the original date of manufacture or the previous requalification date (with the testing company’s Federal DOT identification number between the month and year), followed by the letter “S” indicating Simple Hydrostatic Test. **This type of test is generally valid for a 7-year period.**

3. **Water Jacket Hydrostatic Test**
As with the simple hydrostatic test, the DOT (ICC) cylinder is pressurized with water (with at least two-times (2x) the design working pressure). During this test, a metal jacket filled with water surrounds the cylinder. This water jacket is used to measure the amount of expansion of the cylinder body when under pressure. Once this test is completed, an extensive inspection of the cylinder is conducted. After this method of requalification and if the container is suitable for continued use, the month and year only stamped on the cylinder (no letters) with the testing company’s federal DOT identification number between the month and year. **The Water Jacket Hydrostatic Test is valid for a 12-year period.**

The DOT **cylinder** markings will play an important part in the length of time any of these three certification methods is valid. This code tells the design code of the tank and its service pressure. Note the table below:

**INSTRUCTION AND TEST PERIODS FOR STEEL AND ALUMINUM DOT (ICC) PROPANE CYLINDERS ONLY**

<table>
<thead>
<tr>
<th>CYLINDER TYPE</th>
<th>FIRST TEST DATE</th>
<th>NEXT REQUIRED TEST DATE AND TEST LETTER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WATER JACKET</td>
<td>SIMPLE HYDROSTATIC TEST “S”</td>
</tr>
<tr>
<td>4B</td>
<td>12 Years</td>
<td>12 Years</td>
</tr>
<tr>
<td>4BA</td>
<td>12 Years</td>
<td>12 Years</td>
</tr>
<tr>
<td>4BW</td>
<td>12 Years</td>
<td>12 Years</td>
</tr>
<tr>
<td>4E</td>
<td>12 Years</td>
<td>12 Years</td>
</tr>
</tbody>
</table>

**NOTE: TEST DATE REQUIREMENT SHOULD BE BASED ON MOST RECENT DATE STAMPED ON CONTAINER.**
Although ASME containers are not required to be tested in the same manner as DOT cylinders, ASME containers should be visually inspected prior to filling to determine their suitability for continued use.

**COMPOSITE CYLINDERS**

The Composite Cylinder must be pressure tested five (5) years after the manufacture date and every five (5) years thereafter. The maximum usage period for a composite cylinder is 15 years from the manufacture date, at which time the cylinder must be disposed-of.

These periodic testing procedures are designed to detect leaks or damage to cylinders which could pose a safety hazard if the cylinder is allowed to remain in service.

**ONLY THOSE PERSONS/COMPANIES LICENSED BY THE FLORIDA BUREAU OF LIQUIFIED PETROLEUM GAS INSPECTION AS A “REQUALIFIER OF CYLINDERS” OR A “CATEGORY I LP GAS DEALER” MAY RETEST OR RECERTIFY CYLINDERS.**

**EFFECTIVE OCTOBER 1, 2002, ALL PERSONS REQUALIFYING CYLINDERS WERE REQUIRED TO BE REGISTERED WITH THE U.S. DEPARTMENT OF TRANSPORTATION, RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION AND TO OBTAIN A REGISTRATION IDENTIFICATION NUMBER (RIN) FROM THAT AGENCY - THIS INCLUDES VISUAL REQUALIFICATION!**

**COMPANIES PERFORMING EITHER THE SIMPLE OR WATER JACKET HYDROSTATIC TEST MUST ALSO HOLD A U.S. DEPARTMENT OF TRANSPORTATION LICENSE FOR THIS WORK.**
1. Name two types of specifications which propane containers are manufactured under.

2. What does DOT stand for? ASME?

3. How long after manufacture may a DOT steel or aluminum cylinder be used before recertification is required? How many re-certifications are allowed?

4. How long after manufacture may an ASME propane container be used before recertification is required?

5. How long after manufacture may a DOT composite cylinder be used before recertification is required? How many re-certifications are allowed?

6. Where is the identification information found on a DOT cylinder? On an ASME tank?

7. If an ASME container does not have a data plate, but appears to be in good condition, can it be filled?

8. Can a licensed dispensing unit operator re-qualify DOT cylinders for continued use?

9. Name 3 types of requalification that can determine if a DOT cylinder is acceptable for safe continued use.

10. The cylinder marking 4BW-240 tells you what?
As a dispensing unit operator, you should be able to identify the different valves and fittings on propane containers and know their purposes. Your instructor will show you examples of these valves and fittings and discuss the purpose of each.

**FILL VALVE OR BACK FLOW CHECK VALVE**
This type valve will always remain closed except when fuel flow from outside forces it open (as happens during the filling process).

**EXCESS FLOW CHECK VALVE**
This valve permits flow of gas in either direction, but closes automatically when the outward gas flow exceeds a safe rate.

**PRESSURE RELIEF VALVE**
*External Type and Internal Type*
These valves are held closed by a spring unless the tank’s internal pressure becomes higher than the maximum working pressure.

**LIQUID SERVICE VALVE**
*(with integral excess flow check valve)*
Used primarily in motor fuel applications such as fork lift trucks.

**POL VALVE**
Service valve with built-in pressure relief for vapor withdrawal from cylinders. This valve should be plugged or capped whenever the container is disconnected from use. Always check the relief valve for damage before filling.

**MAGNETIC FLOAT GAUGE**
A device which indicates the percentage of gas in a container based on an internal float located at and moving with the liquid inside the tank. **NOT** to be used as a guide for filling containers.

**FIXED LIQUID LEVEL GAUGE**
Used during the filling process to determine when the container is filled to 80% full. A tube attached to the valve is in communication with the vapor space of the container. When the container is at 80%, liquid will go through the tube and bleed through the gauge when open. This gauge is to remain closed except when filling a container.
OPD (REDUNDANT PRESSURE TIGHT SEAL) OVERFILL PREVENTION DEVICES

Found on all DOT cylinders between 4 and 40 lbs, manufactured after September 30, 1998, this valve, commonly referred to as the “OPD”, is designed to detect the liquid level of product inside a DOT container and to help prevent overfilling of the container. No cylinder (4 lbs through 45 lbs) may be filled unless it is equipped with a listed OPD.

NOTE: Exception - those cylinders used in industrial truck applications, including forklifts, cylinders for industrial welding or cutting gases, and floor maintenance machines, or similar applications as exempted in the code.

OPD’s are NOT an approved method of filling a container.

IDENTIFYING OPD’S
Cylinders equipped with the OPD are identifiable by the different hand-wheel configuration. Diagram #1 below represents the common round hand-wheel configuration for older cylinders; Diagram #2 is representative of the OPD triangular-shaped hand-wheel configuration.

IMPORTANT: The old-style hand-wheel may be different from manufacturer to manufacturer. The new OPD hand-wheel will be uniform and will bear the OPD stamp.
1. How does a back flow check valve work?

2. What is the purpose of a relief valve?

3. What information does a fixed liquid level gauge give you?

4. What should a vapor service valve (POL) be equipped with when disconnected?

5. What does the excess flow in a liquid service valve do?

6. What is an OPD and what is its purpose?

7. Can you rely on an OPD valve for accurate filling of a D.O.T cylinder?

8. Is the float gauge alone a suitable method for filling?
**FILLING PROPANE CONTAINERS**

**TRAINING**
By law, all dispensing unit personnel must be adequately trained in proper LP gas transfer procedures. It is the responsibility of the licensed operator to have only qualified persons filling containers. A qualified person is one who understands the types of containers and the conditions under which they may be filled. This person must be well trained in the use of dispensing equipment and in the actual transfer of liquid propane gas. Emergency training is also vital to all dispensing operations.

Proof-of-training for each person dispensing gas must be maintained on-site and must be available to the Bureau of LP Gas Inspection at all times. The bureau has the authority to review these records at any time during your regular business hours and by law, does not have to notify you in advance that training records may be requested. Failure to maintain training records for all dispensing personnel may subject the license holder to a fine and/or other penalty as provided by law.

Your liquefied petroleum gas supplier will give you hands-on training on the filling of propane containers for portable cylinders, recreational vehicles, motor fuel tanks, forklifts, etc. Filling procedures may differ slightly since tanks and cylinders vary. Adapters may also be required in order to connect some types of containers. This section will give you valuable safety information concerning these procedures.

**NOTE:** Refresher training is required a minimum of once every three (3) years. The Bureau of LP Gas Inspection routinely reviews training records for personnel conducting dispensing activities. It is a violation of NFPA 58 to fail to obtain and document completion of refresher training.

**REFILLING CONTAINERS**
Each container’s specifications and condition must be visually inspected every time it is filled to determine if it is suitable for propane service. If the container is wrapped with a sleeve (e.g., plastic overwrap) of any type of material, it must be removed. **NOTE: Corrosion is OFTEN found under these plastic sleeves.**

Always visually inspect the container for excessive corrosion, dents, gouges, leaks, exposure to fire, damaged relief valves and damaged collars/foot rings. The bottom, foot rings and legs are the most susceptible areas for corrosion and rust. Make certain that all identifying marks are complete and legible. Inspect the OPD/QCC valve for damage to the seat disk (O ring seal).

By Florida law, propane containers **MAY NOT** be filled if:

- You do not have the owner’s permission.
- Identifying marks are missing or not legible.
- A DOT cylinder has not been requalified as periodically required by the requalification method.
- The container has excessive pitting, dents, gouges, or other damage.
- The container has a visible bulge(s).
- The container has been exposed to fire.
- The container is not approved for propane gas.
- The container or fitting possesses leaks.
- The container is damaged or has obstructed relief valves.
• There is no collar or cap to protect the valves in transit or the collar is damaged.
• There is no foot ring or the foot ring is damaged. If it is a motor fuel tank, it must be securely fastened in place.

NEW CONTAINERS - PURGING BEFORE FILLING
Purging of new containers is required for efficient and safe use with propane. A new container may contain water, air or other contaminants. These must be removed before filling.

The purging process must be done in compliance with Section 7.3.2.3, NFPA 58, which reads as follows:

Venting of containers outdoors shall be performed under conditions that result in rapid dispersion of the product being released.

For the dispensing unit operator, container venting must always be performed out-of-doors. Make sure all sources of ignition are eliminated. Smoking should not be allowed within 25 feet of the purging operation.

The following steps should be followed in purging and venting of containers:

1. If the container is pressurized, this pressure must be vented and reduced to zero-pounds pressure.
2. Pressurize the tank with propane vapor; approximately 15 to 25 P.S.I. Vent the air/gas mixture through a vent stack. Repeat 3 or 4 times for total purging.
3. If water appears to be present, methanol must be used to remove it. Contact your propane supplier for assistance.

Failure to purge a container may create other hazards. A higher-than-normal pressure could cause the relief valve to operate, releasing a gas/air mixture. Failure to purge could also result in appliance malfunction, burner outage or internal corrosion of the cylinder.

On-the-job-training and a demonstration of the actual purging procedure should be provided by your propane supplier.

CONTAINER FILL PROCEDURE
The following fill procedures provide a general guideline for the safe filling of propane containers. These procedures are not meant to preclude other safety procedures.

BEFORE YOU FILL
1. If your dispenser is located inside a fenced area, make sure both gates are open.
2. NO SMOKING, open flame, portable electrical tools, and extension lights capable of igniting LP Gas within 25 feet.
3. If your dispensing unit container is larger than 2,000 gallons water capacity, vehicles with permanently mounted LP gas containers must be at least 10 feet from the unit while containers are being filled.
4. Use protective gloves and eyewear while filling cylinders.
5. Wear appropriate shoes. Cylinders can be dropped or may tip-over during dispensing. Even an empty cylinder can do damage to an unprotected foot.
6. Check the cylinder valves to determine their suitability for LP gas service.
7. Visually inspect the condition of each container for the following:
   • Excessive corrosion
   • Deep dents or gouges
   • Leaks of any kind
   • Evidence of exposure to fire
**DOT CYLINDERS**

1. Check container dates to verify that the container has been requalified in accordance with DOT regulations (see Section 3 for requalification information).
2. Check the tare weight of the cylinder (empty) and water capacity of the cylinder - these will be found stamped on the cylinder body or collar.
3. Set the scales
   - Determine Propane Capacity by multiplying Water Capacity (WC) by 0.42. For example, if the WC of a container is 48 pounds, the Propane Capacity will be 20 pounds, and so forth.
   - Add the Tare Weight (TW) and Propane Capacity together to determine the total filled weight of the cylinder.
   - Determine the weight of the hose end.
   - Set scales to indicate the combined weight of the filled container and hose end.
4. Stop filling when the scale balances.
5. Check weight of the filled cylinder after the filling connector has been disconnected to insure the container has not been overfilled.
6. ALWAYS check for leaks after filling any container before giving it back to the consumer.
7. Apply the required decals to the container.

**AFTER CONTAINER FILLING OPERATION IS COMPLETED OR ANY TIME STATION IS UNATTENDED**

1. Shut off pump.
2. Close valves at storage tank.
3. Coil hose on rack inside fence or protected area.
4. Lock fence protected area to secure installation against tampering.

**THINGS TO REMEMBER**

1. Fill only approved containers.
2. Fill DOT cylinders that are within the proper requalification time limits.
3. You (the attendant) must remain at the transfer area during the filling operation.
4. Wear protective clothing, eye protection, gloves, and footwear.
5. Double check tank for overfilling.
6. Check all valves and fittings with leak detector solution for leaks.
7. Be sure containers are transported in the proper position.
8. Be sure that the container has transportation/warning labels and POL plug or cap, if required.
9. Be sure valves are protected by collar or cap.
10. Follow proper filling and safety procedures every time/all the time.

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**RECREATIONAL VEHICLES**

1. Vehicle motors should be turned off.
2. All pilots and burners should be turned off.
3. All electrical circuits should be turned off.
4. All ignition sources should be eliminated.
5. All passengers should be out of the vehicle.

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**MOTOR FUEL CONTAINERS**

1. Make sure the vehicle ignition is OFF.
2. The brakes should be set (or chocks blocks in place).
3. All passengers should be out of the vehicle BEFORE you begin.

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**NEVER LEAVE A FILLING PROCESS UNATTENDED**

**NEVER GIVE AN OVERFILLED OR LEAKING CYLINDER BACK TO A CUSTOMER**
1. What must be done before a new DOT container may be filled?

2. Before filling a motor home or “RV”, what steps should you take?

3. What is the maximum amount of propane you may dispense into a container?

4. What must be done before any propane container may be refilled?

5. Personnel dispensing propane gas must have ________

6. Sources of ignition, including cigarettes, should be eliminated within how many feet of the filling procedure?

7. How do you determine the gas capacity of a DOT cylinder? Of an ASME container?

8. How do you determine if a DOT cylinder is overfilled? What may happen if a container is overfilled?

9. How often is refresher training required?

10. How do you determine the scale set weight when filling a DOT cylinder?
TRANSPORTATION OF CONTAINERS

Cylinders of not more than 45 lbs. propane capacity may be transported in enclosed vehicles. The cylinder and its valves must be protected and determined to be leak free and securely fastened, with consumer warning and shipping labels attached.

If your customer is transporting a propane container in an enclosed vehicle, you should recommend that the vehicle be kept cool and ventilated and that the cylinder be removed as soon as possible. If a hissing noise or odor of propane is noticed, the cylinder must be removed at once, taking special precautions to avoid all possible sources of ignition.

By law, the largest amount (total pounds) of propane that may be transported at one time in an enclosed vehicle is 90 pounds aggregate; however, no single container can exceed 45 lbs. propane capacity.

Cylinders must be transported in a position where the relief valve is in direct contact with the vapor space. With most cylinders, this is an upright (vertical) position, standing on the container foot ring. Some cylinders, however, are designed to “lie down” or be positioned horizontally (see Section 3).

If the relief valve comes in contact with the liquid stored in the cylinder, a rise in tank pressure would cause the escape of propane liquid. The expansion of this liquid released to the atmosphere (270 times) could create an immediate safety hazard due to the large amount of propane present and the possibility of ignition.

REMEMBER

1. Containers shall not be transported inside vehicles, such as motor homes/RV’s, where ignition sources (pilot lights, burners, etc.) are present.

2. Smoking should be prohibited when containers are transported in the space opened to the passenger area.

3. Containers shall be secured and transported only with the relief valve in contact with the vapor space of the container; usually this is in an upright position.

4. A leaking container should never be placed inside a vehicle.

5. POL valve outlets should be plugged to avoid accidental release of propane.

6. Cylinders should not be transported without valve protection by use of cap, collar or other acceptable method.
1. What is the largest amount of propane that can be transported in an enclosed vehicle at one time?

2. What is the largest size propane container that can be transported in an enclosed vehicle?

3. In what position should a container be transported?

4. After filling a propane container and placing it in an enclosed vehicle, you observe a white vapor and hear a slight hissing sound. What should you do?

5. It’s a hot July day and you just finished loading a filled container into the trunk of a car. Your customer tells you that he is headed to a nearby mall to shop for several hours before heading home. What should you do?
CARE AND MAINTENANCE OF YOUR DISPENSING UNIT

Proper care and maintenance of your dispensing unit will ensure the safe continual use of the unit. If you are a licensed LP gas dispensing unit operator, your unit will be inspected at least annually by the Bureau of LP Gas Inspection. Additionally, your gas supplier may inspect the unit prior to each filling operation. As the unit operator, however, you should routinely inspect your unit for any leaks or potential problems.

HOUSEKEEPING
Simple good housekeeping around your dispensing area is a good common sense approach to safety. Keep the area free of flammable materials such as weeds and trash, and don’t use your unit as a storage rack for rags, pails, etc. Section 6.4.5.2 of NFPA 58 states as follows:

Loose or piled combustible material and weeds and long dry grass shall be separated from containers by a minimum of 10 feet.

LEAKS
No leaks of any size or type should be permitted at a container filling area. Leaks at your dispensing unit may be indicated by:

- An oily residue observed around fittings;
- A hissing sound; or
- A smell of propane when cabinet is first opened.

Any leak should be reported to your gas supplier immediately. By law, leak calls must be responded to within 24 hours of the first report. Never attempt to repair your dispensing unit - this should be left to a properly licensed company. A major leak at your dispenser is an immediate hazard - the area should be evacuated and emergency responders contacted as well as your gas supplier.

THE BUREAU RECOMMENDS CHECKING YOUR DISPENSER FOR LEAKS AT LEAST MONTHLY WITH A LEAK DETECTOR SOLUTION. Leak detector solution will indicate a gas leak by formation of bubbles at the leak site. Check with your gas supplier for a recommended solution. Never use a solution that contains ammonia, as it may damage your equipment.

FIRE EXTINGUISHERS
Make sure your fire extinguisher(s) is dry chemical with a BC rating. Extinguishers must be fully charged and located within 50 ft. of the dispensing unit and easily accessible. The extinguisher must be inspected, recertified and tagged by a licensed technician annually.

POSTING OF SIGNS
Dispensing units are required to be marked for safety. Filling procedures must be posted at each dispenser. “No Smoking,” signage must be prominently posted on visible or approachable sides and ends of the container. “Propane” or “Flammable Gas” signs must be prominently posted on visible or approachable sides of the container. Signage can be accomplished via decals or painting and must be readable at all times – faded signage must be corrected as this is a violation of LP gas codes and rules. Smoking or other open flames are not permitted within 25 ft. of the unit.
DISPENSING UNIT EQUIPMENT
NFPA 58 requires:

6.24.3.9—Emergency Shut-Off Valve
An identified and accessible remote emergency shutoff device for either the internal valve or the emergency shutoff valve as required by 6.24.3.8 (1) or (2) shall be installed not less than 3 ft or more than 100 ft from the liquid transfer point.

6.24.3.14—Emergency Electrical Shut-Off Switch
An identified and accessible switch or circuit breaker shall 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.

Routinely check remote and emergency shut-off valves and switches to affirm that they are operational and accessible. Your propane supplier will advise you on the proper operation of this equipment.

Insure crash protection from potential vehicular traffic meets code requirements.

Make sure all gates are open during transfer operations and closed when not in operation.

DISPENSING UNIT OPERATOR CHECKLIST
Use this list as a safety reminder and inspect your unit regularly.

☐ The area around the dispensing unit is free of flammable materials.

☐ The area around the dispensing unit is free of weeds and tall grass.

☐ The dispensing unit has been checked for leaks.

☐ Any leaks found have been reported to gas supplier for repair.

☐ Fire extinguisher is readily accessible and fully charged.

☐ Filling procedures are properly posted in a prominent position.

☐ Required signs are properly posted and visible from all approachable sides.

☐ Dispensing unit hoses and fittings are in good shape with no visible signs of wear.

☐ Check to insure you have adequate supplies: leak solution, labels, plugs and caps.

☐ Remote and emergency shutoff valves are accessible and operational.

☐ All employees who dispense product have received proper training in filling procedures, safety practices and emergency procedures.

☐ Emergency phone numbers are clearly posted.
1. How many feet around the dispensing unit must be kept free of debris, trash and other combustible materials?

2. What type of repairs are dispensing unit operators allowed to make to their unit?

3. If you suspect a leak, what signs should you look for?

4. How would you check for a leak around a fitting?

5. Where must your fire extinguisher be located?

6. If you detect a leak, who would you call?

7. When must a reported leak be investigated by your gas supplier?

8. How often must the fire extinguisher be inspected and re-certified by a licensed technician?
SAFETY PRECAUTIONS AND HANDLING OF EMERGENCY SITUATIONS

SAFETY PRECAUTIONS WHEN FILLING
Liquid propane will expand 270 times as it converts from liquid to vapor. This rapid conversion of liquid to vapor causes intense chilling and literally freezes whatever it comes in contact with. For this reason, precautions should be taken to protect eyes and skin from the liquid since freeze burn or frostbite is possible.

Proper clothing and eye protection should be available at any transfer operation. Gloves approved for use with LP Gas should be used. Safety glasses, goggles or a face shield should be used. Foot protection is useful as a protection against injury should a tank, cylinder or hose end be dropped.

PROPANE FLAMMABILITY
For any fire to occur, three ingredients are needed - fuel, heat and oxygen. LP gas vapor makes an excellent fuel, and heat can exist in the form of an open flame, a lighted cigar or cigarette, an arc formed by an electrical switch, ignition arc on an auto, or static electricity. In the right combination with oxygen, these three ingredients make up the necessary components of the “fire triangle.”

While propane vapor is readily ignitable, it has a very narrow flammability range when compared to other petroleum products. In order to ignite, the propane/oxygen mix must contain from 2.15 to 9.60 percent propane vapor. This means that a propane/air mixture containing less than 2.15 percent gas is too lean to burn. If the mixture contains more than 9.6 percent gas, it is too rich to burn.

The range of flammability is important to remember when LP gas is transferred or discharged. If the propane/air mixture is within the flammability range, sources of ignition could include fans, electrical switches, auto ignition, static electricity or cigarettes. The ignition temperature of propane is approximately 9200 F to 11200 F. By comparison, a cigarette will burn at approximately 6000 F to 13500 F, and a light switch will arc at 20000 F.

Propane is non-toxic and is not harmful to breathe in small concentrations. However, breathing large concentrations may result in suffocation. Inhaling propane vapor may produce dizziness, loss of coordination, unconsciousness or death. This depends upon the level of concentration and the time of exposure. Never enter an area if a vapor cloud is present, or if the area is suspected of having a high vapor concentration.

Should a propane leak occur, eliminate all possible sources of ignition immediately. Try to stop the flow by shutting off all valves. Remember to approach with the wind at your back.

If propane reaches a source of ignition, a flash, fire or explosion may result. The fire should never be extinguished until the flow of gas has been turned off. Should the fire be extinguished and the supply of fuel is not turned off, a greater fire hazard may exist or an explosion may occur. If the fire is small, you may be able to control it with a BC fire extinguisher. When using an extinguisher, always approach the fire from upwind. After use, make sure your extinguisher is recharged immediately.

Florida law requires that an 18 lb. BC fire extinguisher be readily available for use at LP gas dispensing units. Large quantities of water or water spray are also an acceptable control method. Water helps cool the container and disperse the vapor. If the fire is not controlled, immediately notify the fire department and evacuate all personnel to a safe area.
1. If you observe a propane vapor cloud around the dispensing unit or area, what should you not do?

2. If a leak occurs, what is the first thing you should do?

3. What 3 things are needed for a fire to occur?

4. If a propane fire occurs, what should you attempt to do first?

5. When fighting a small propane fire with a fire extinguisher; from which direction should you approach the fire?

6. Why should gloves, eye protection and protective clothing be worn during filling procedures?

7. Other than an 18 lb. BC rated fire extinguisher, what other method of control is acceptable for handling propane emergencies?
# Glossary of Commonly Used Terms

<table>
<thead>
<tr>
<th>ASME</th>
<th>American Society of Mechanical Engineers</th>
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<tbody>
<tr>
<td>BC FIRE EXTINGUISHER</td>
<td>A type of fire extinguisher required at dispensing stations.</td>
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<tr>
<td>DATA PLATE</td>
<td>Plate attached to ASME containers with all pertinent information for the container.</td>
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<tr>
<td>DOT</td>
<td>United States Department of Transportation</td>
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<tr>
<td>ETHYL MERCAPTAN</td>
<td>An odorant used in liquefied petroleum gases to aid in detecting leaks.</td>
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<tr>
<td>FLOAT GAUGE</td>
<td>Device which indicates the percentage of gas in a container based on an internal float located at and moving with the liquid inside the tank.</td>
</tr>
<tr>
<td>ICC</td>
<td>Interstate Commerce Commission which formerly set forth specifications for the manufacture of portable cylinders. This responsibility now lies with the U.S. Department of Transportation (DOT).</td>
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<tr>
<td>LPG</td>
<td>(Liquefied Petroleum Gases) - Gases belonging to the hydrocarbon family. Commonly referred to as propane, LP gas, bottled gas, butane, propylene, etc.</td>
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<tr>
<td>NFPA</td>
<td>National Fire Protection Association – nationally-recognized private safety association that promulgates and publishes fire safety standards</td>
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<tr>
<td>NPGA</td>
<td>National Propane Gas Association - formerly the National Liquefied Petroleum Gas Association (NLPGA).</td>
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<tr>
<td>OPD</td>
<td>Overfill Prevention Device. A device which causes the cylinder to stop accepting propane when the container becomes 80% liquid level full.</td>
</tr>
<tr>
<td>POL</td>
<td>This abbreviation (commonly referred to as “Put On Left”) is used to describe different types of fittings, service valves, plugs, filler couplings, adapters, etc., all with a left-hand thread.</td>
</tr>
<tr>
<td>POL PLUG</td>
<td>A metal or plastic plug for the service valve required to be used during the transportation of propane containers that are not fitted with the OPD valve.</td>
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<tr>
<td>Term</td>
<td>Definition</td>
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<tr>
<td>POL VALVE</td>
<td>A vapor service valve with built-in pressure relief for vapor withdrawal from cylinders.</td>
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<tr>
<td>PSIG</td>
<td>Pounds per Square Inch Gauge - measurement of pressure inside a container.</td>
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<tr>
<td>QUALIFIER</td>
<td>A supervisor, manager or employee who has passed the required state Bureau of LP Gas Inspection examination.</td>
</tr>
<tr>
<td>RANGE OF FLAMMABILITY</td>
<td>A term used to describe that certain mixture of air and propane required to achieve combustion.</td>
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<tr>
<td>RELIEF VALVE</td>
<td>A fitting designed to release vapor pressure to atmosphere to maintain a predetermined level of pressure inside the container.</td>
</tr>
<tr>
<td>REQUALIFICATION</td>
<td>The testing, certifying, retesting or recertifying of DOT (ICC) cylinders to determine suitability for continued safe use.</td>
</tr>
<tr>
<td>SERVICE VALVE</td>
<td>The container valve that turns the gas on or off.</td>
</tr>
<tr>
<td>SPECIFIC GRAVITY</td>
<td>Product weight compared to air (vapor) or water (liquid).</td>
</tr>
<tr>
<td>TARE WEIGHT (TW)</td>
<td>Weight of an empty container, including its valve.</td>
</tr>
<tr>
<td>TRANSFER OPERATION</td>
<td>Act of transferring liquid product from one container (dispensing device) to another.</td>
</tr>
<tr>
<td>WC</td>
<td>Water Capacity. The amount of water in pounds or gallons that an LP gas container can hold when full.</td>
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