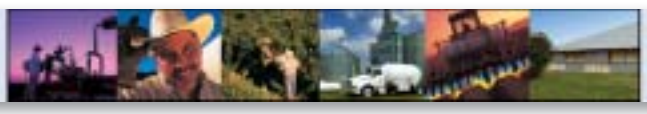
PROPANE education & research COUNCIL

Dispensing Propane Safely into Agricultural Equipment



PROPANE EXCEPTIONAL ENERGY®

Dispensing Propane Safely into Agricultural Equipment

Readers of this material should consult the law of their individual jurisdiction for the codes, standards and legal requirements applicable to them. This material merely suggests methods which the reader may find useful in implementing applicable codes, standards and legal requirements. This material is not intended nor should it be construed to:

(1) Set forth procedures which are the general custom or practice in the gas industry;
(2) Establish the legal standard of care owed by propane distributors to their customers; or
(3) Prevent the reader from using different methods to implement applicable codes, standards or legal requirements.

This material was designed to be used as a resource only to assist expert and experienced supervisors and managers in training personnel in their organizations and does not replace federal, state, local, or company safety rules. The user of this material is solely responsible for the method of implementation. The Propane Education & Research Council and Gas Training & Development assume no liability for reliance on the contents of this training material.

Issuance of this material is not intended to nor should it be construed as an undertaking to perform services on behalf on any party either for their protection or for the protection of third parties.

ABOUT THE PROGRAM

Dispensing Propane Safely into Agricultural Equipment is a training tool designed to guide a training event for those refueling mobile agriculture equipment. It covers the proper steps to transfer propane into tanks permanently mounted onto agriculture equipment. It is recommended that propane marketers and equipment manufacturer representatives be utilized as resources to facilitate training.

The following training materials are included in this manual or otherwise available:

a. This instruction manual includes:
   i. Training requirements for individuals transferring propane
   ii. Propane properties and safety
   iii. Transfer equipment
   iv. Transfer procedures
   v. Propane Material Safety Data Sheet
   vi. Quizzes, answer keys, and certificate of completion

b. Available for free download at www.propanesafety.com are various instructor resources including:
   i. Propane Workforce Training materials
      • Certified Employee Training Program
      • Gas Check program materials
   ii. Regulatory and code compliance materials
      • OSHA, DOT, EPA regulations
      • Fire Safety Analysis materials
      • Operations & Maintenance Manual
   iii. Consumer Safety Education brochures
   iv. Fire Fighter Safety and the Propane Emergencies program

Acknowledgements

The Propane Education & Research Council (PERC) and the National Propane Gas Association (NPGA) gratefully acknowledge the cooperation and contribution of the following individuals and organizations for providing personnel, equipment, and technical assistance.

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Introduction to Filling Propane Tanks on Agricultural Equipment

INTRODUCTION

Among the portfolio of energy sources available to farmers, none can match propane's unique combination of benefits. Propane is portable, diverse, and readily available on the farm. Propane is also clean-burning, environmentally friendly, and a good energy value. It is because of these attributes that nearly 80 percent of U.S. farms rely on propane.

While many propane applications are stationary, many new mobile propane applications are again gaining acceptance. To promote safety during refueling this mobile propane equipment, anyone dispensing propane must have a thorough understanding of the fuel, the equipment, and the proper procedures to follow.

The objectives of this chapter are to:
- Identify scope of training and dispenser operators' responsibilities.
- Identify various types of propane dispensing equipment.
- Identify dispenser operators' training requirements.

Training Scope and Operators' Responsibilities

This program applies to anyone dispensing propane into tanks permanently mounted on mobile agriculture equipment. It includes:
(1) Training requirements for individuals transferring propane
(2) Propane properties and safety
(3) Propane transfer equipment
(4) Proper propane transfer procedures

This training material is not designed to train and/or qualify individuals to inspect, requalify, and/or fill ICC/DOT cylinders, such as those used on propane grills, campers, or torches. Consult the Propane Education & Research Council for training materials to refill these cylinders.

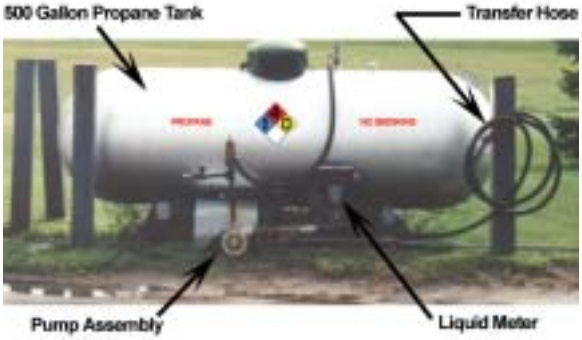
The responsibilities of propane dispenser operators include:
- Demonstrating the safe operation of dispensing equipment and knowledge of regulations.
- Performing routine inspections of dispensing equipment and following proper procedures to report and/or repair any defect found.
- Inspecting the tank to be filled to ensure it is safe and may continue in service.
- Filling tanks to their maximum allowable levels and ensuring that they are not overfilled.
- Securing dispensing equipment to prevent tampering while not in use.
- Controlling ignition sources and preventing the uncontrolled release of propane in the refueling area.
- Knowing how to shut down and secure the dispenser in the event of an emergency.

Propane Dispensing Equipment

The capacity of a stationary propane dispenser for agriculture use will vary depending upon the volume of propane required by farm equipment. Shown here is a typical stationary dispenser.

Portable dispensers typically are mounted on a chassis.

It is important to understand that any type of dispensing system is required to meet all applicable codes. Consult your propane dealer or other appropriate professionals to assist with designing, installing, or fabricating any propane refueling system. When the system is transported over public highways, it will need to comply with U.S. Department of Transportation Regulations. Special farm cart permits (currently DOT#: SP11209) may be applicable to your intended use. Consult the National Propane Gas Association or a propane retailer for the latest regulatory information on this permit for transporting propane on and between farms.



September 5, 2006

U.S. Department of Transportation

Pipeline and Hazardous Materials Safety Administration

DOT-SP 11209
(EIGHTH REVISION)

EXPIRATION DATE: July 31, 2011

(FOR RENEWAL, SEE 49 CFR § 107.109)

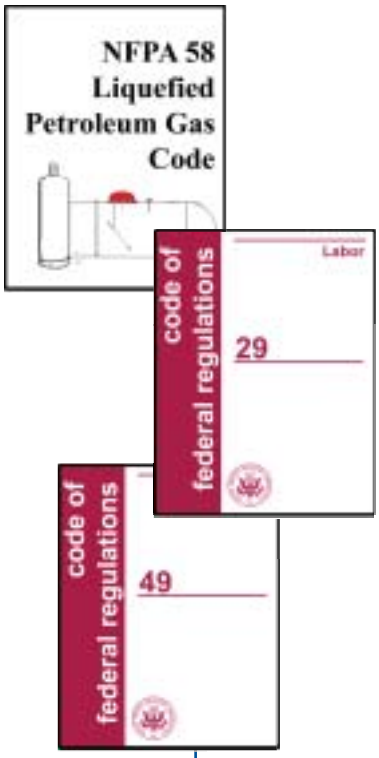
1. GRANTEE: Persons represented by their agent, The National Propane Gas Association, Arlington, VA (On File with the Office Hazardous Materials Special Permits and Approvals)

2. PURPOSE AND LIMITATION:

a. This special permit authorizes the transportation in commerce of liquefied petroleum gas (LPG) in non-DOT specification cargo tank motor vehicles exclusively for agricultural purposes when operated by a private carrier. This special permit provides no relief from the Hazardous Materials Regulations (HMR) other than as specifically stated herein.

Dispenser Operators' Training Requirements

There are specific training requirements published in nationally recognized codes (such as National Fire Protection Association 58, Liquefied Petroleum Gas Code) and by government agencies such as the U.S. Department of Transportation (DOT), the Department of Labor (DOL), and the Occupational Safety & Health Administration (OSHA).



These training requirements are in place to help promote the safety of propane dispenser operators and to make sure that propane tanks are properly filled.

These codes require that persons who transfer propane:
(1) Be trained in proper handling procedures,
(2) Receive refresher training at least every three years, and
(3) Maintain a record of training received.

A record of training verifies that training has been conducted and that the individual is qualified to perform the expected duties. Items to consider for placement in the training record:

- Copy of certificate of completion for sessions attended,
- Original signed copy of quizzes, tests, or other knowledge/ skills assessments when available, and
- Original signed copy of documents verifying supervised evaluation of a task or procedure if available.

It is suggested that the employer maintain this file on employees and equipment operators that will operate propane dispensing equipment as a separate part of their personnel file.

2.0

Propane Properties and Safety

2.0

PROPANE PROPERTIES AND SAFETY

Safe dispensing of propane requires dispenser operators to be familiar with its physical properties and aware of safety precautions.

The objectives of this chapter are to:

2.1 Identify the physical and combustion properties of propane.

2.2 Identify safety precautions and procedures for handling emergencies.

Physical and Combustion Properties of Propane

Propane is classified as a hazardous material. By law, a Material Safety Data Sheet (MSDS) must be available and accessible to all employees in the work-place where hazardous materials are transferred, stored, or used. The MSDS for propane is available from propane suppliers or distributors. A complete MSDS for propane can be found in Appendix A of this manual.


MATERIAL SAFETY DATA SHEET - ODORIZED PROPANE

This chapter will discuss specific information from the MSDS that relates to the job of dispensing propane.

The propane stored in containers can be either a liquid or gas. To permit the storage and transportation of propane in liquid form at temperatures warmer than its boiling point (-44°F), pressure-tight containers are used. Propane liquid stored in these containers at temperatures at or above – 44°F will vaporize and expand to pressurize the vapor space inside of the container. This vapor pressure naturally forces the propane from the container to the gas utilization equipment.

In its natural state, propane is colorless and odorless. To increase the likelihood that a propane leak can be detected, an odorant (ethyl- mercaptan) is added to propane. This odorant is added to allow propane to be detected by smell usually long before a combustible mixture is present.

Learn to recognize the odor of propane and always be sensitive to the slightest gas smell.

The Propane Education & Research Council (PERC) has produced consumer safety education and warning brochures that incorporate an odorant "scratch-n-sniff" patch.

Contact PERC or your propane supplier to obtain these brochures to test your sense of smell and verify that you can sense the presence of the odorant. (See Appendix A for more information on these brochures.)

Be aware that under certain conditions, the intensity of the odorant may diminish or fade. Some people may not be able to smell the odorant. While the odorant may not pass on the warning of the presence of propane in every instance, it is generally effective in a majority of situations.

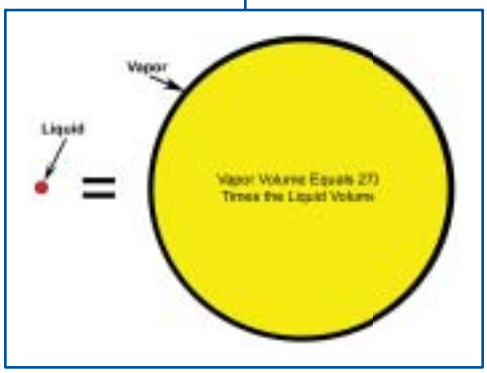
If for any reason you or fellow employees cannot smell odorized propane, immediately notify your supervisor. Your safety and the safety of fellow workers may depend on your ability to smell propane in the event of a leak. For additional information on the odorant, refer to the Propane MSDS in Appendix A.

Propane liquid expands and contracts with temperature change. When the temperature of the liquid propane increases, both the liquid volume and vapor pressure increase inside the tank. The opposite is also true: A temperature drop will cause the liquid propane volume to contract and pressure to drop.

To allow for this expansion, propane containers are typically filled to 80 percent of their capacity. New portable tanks are equipped with an over-filling prevention device to limit the maximum propane level to 80 percent.

If propane liquid is released into the air, it quickly vaporizes, expanding 270 times its original volume. Therefore, a liquid propane leak can be more hazardous than a vapor leak due to the expanding vapor cloud.

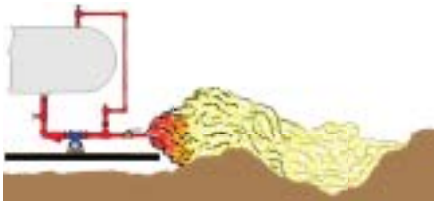
When liquid propane is released into the atmosphere, it rapidly vaporizes and causes a refrigerating effect that makes everything it touches extremely cold. If it comes in contact with skin, it will cause third-degree or deep-freeze burns to the skin.



Department of Labor (DOL) and/or Occupational Safety & Health Administration (OSHA) regulations require that proper personal protective equipment (PPE) be worn when transferring propane. Your employer is required to determine what PPE is required, provide training on when and how to use it, and verify that you are using it as required. Generally, propane PPE includes special vinyl gloves resistant to the actions of propane, and eye or face protection.

Propane is nontoxic, but will displace air if released into a confined area. Therefore, avoid inhaling propane. Propane vapor is 1.5 times heavier than air. If released into still air, it may initially concentrate in low-lying areas.

However, if there is sufficient air movement, especially outside, the vapor should dissipate in the air.

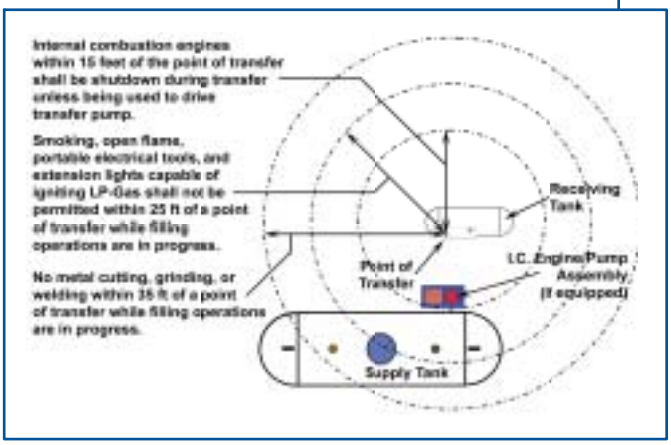


Every leak or release creates the potential for a hazardous situation and is a reason to take immediate action. When a leak is discovered and it is safe to do so, the equipment should immediately be shut down and all sources of ignition in the immediate area eliminated. Then contact your propane supplier or the local fire department.

To minimize the likelihood of sources of ignition during propane transfer operations, the area surrounding the dispensing station and tank filling area should be a restricted area.

To dispense propane safely, operators' should know the following:

- The location and operational procedures for pump controls and emergency shutdown devices.
- The location, condition, and knowledge of proper use of fire extinguishers.
- Fire prevention and emergency evacuation procedures.
- That ignition sources are not permitted within specific distances.
- Tanks are suitable for filling and continued use.



Safety Precautions and Planning for Emergencies

The best way to avoid an incident is to transport the product in the specified containers, store the product in the correct location with the containers in the proper position, follow proper procedures to transfer propane from one container to another, and use the product in a proper manner.

Planning for Emergencies

To save precious time and prevent costly mistakes, it is necessary to plan for emergencies.

When planning for emergencies, consider the following:

1. Always use proper personal protective equipment to avoid personal injury.

2. Identify valves that control the flow of propane.
   a. Manual or emergency shutoff valves in tank openings or piping.
   b. Hose-end valves.

3. Know the location and operational procedures for any emergency shutoff valves.

4. Each dispensing location shall have an accessible, approved portable fire extinguisher having a minimum capacity of 18 lbs. of dry chemical with a B:C rating, and each employee must be trained in the proper use and operation of it. OSHA requires employees to be trained on fire extinguisher use upon initial hiring and annually thereafter.

   NFPA 10 requires monthly visual inspection of all fire extinguishers. This includes checking the extinguisher to be sure it is fully charged and has a tag showing the last annual inspection. If the extinguisher is due for inspection, low on charge, damaged, or even missing the inspection tag, filling operations should be stopped. Notify your supervisor immediately.

Fire extinguishers are not intended to put out propane fires. Propane flames should not be extinguished unless by doing so the fuel supply can be turned off, as an explosion hazard much greater than the fire hazard may be created.

Fire extinguishers have a limited application area. They are only effective for small fires, such as those involving combustible materials. They are also valuable in providing an escape route for personnel.

5. Know emergency telephone numbers for your local fire department or emergency responders, and propane supplier.

6. Operators should secure transfer equipment against unauthorized operation with fencing at least 6 feet high, or by securing the controls and hose end valve with locking devices.

7. In the event of an uncontrolled leak or fire, remain calm and do the following if it is safe to do so:
   a. If there is an emergency shutdown device, activate it.
   b. Immediately eliminate all sources of ignition.
   c. Immediately evacuate the area.
   d. Contact the fire department from a safe location and do not re-enter the area until it has been determined to be safe.
   e. Move and stay upwind of a propane leak, fire, or vapor cloud.
   f. Shutoff the electrical power at the main power supply - NOT AT THE DISPENSER.
   g. Contact your propane supplier from a safe location.

After a fire, do not operate a dispenser exposed to fire until it has been thoroughly inspected and repaired by a qualified technician.

It is important to be aware of the characteristics of propane as well as safety and emergency procedures to protect you and fellow workers.

3.0

Propane Containers and Transfer Equipment

PROPANE CONTAINERS AND EQUIPMENT

The National Fire Protection Association Pamphlet 58, Liquefied Petroleum Gas Code, requires propane dispenser operators to be trained in proper handling procedures and to be aware of the required equipment and its operation to safely dispense propane.

The objectives of this chapter are to:

3.1 Identify various types of propane dispensing systems.

3.2 Identify the basic components of the dispensing system.

Various Applications of Propane Dispensing Systems

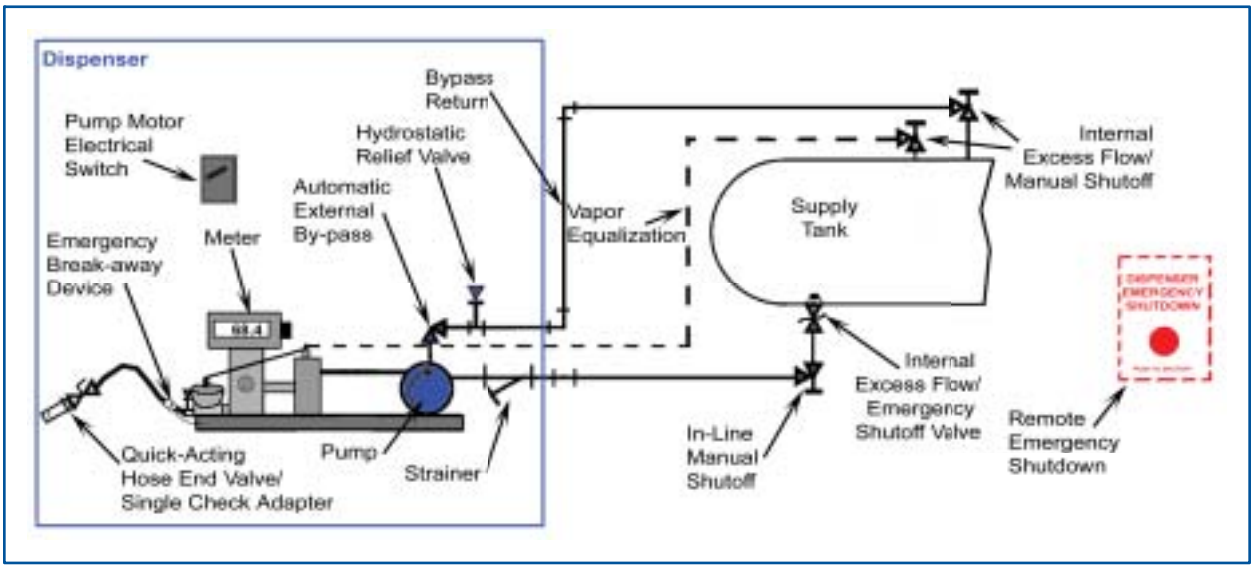
Dispensing equipment offers a convenient source of propane for fueling agricultural equipment. Some applications of dispensing equipment may be part of a larger installation at the farm site, while others may be a smaller, 500- or 1,000-gallon stationary tank and dispenser installed at a stationary location.

Other dispenser designs may have the tank and related equipment installed on a trailer frame, as portable dispensers.

Propane dispenser operators need a thorough understanding of the propane storage tanks, the transfer or dispensing equipment, the receiving tank, and its valves and fittings. It is the operators' responsibility to check all equipment for compliance with applicable codes and is in good working order before the refueling of propane equipment takes place.

Basic Components of the Dispensing System

The dispensing station includes equipment designed to store propane (the supply tank), transfer liquid propane (the pumping system), and measure the volume transferred (the meter) into permanently mounted containers on agricultural equipment (not shown in this illustration).



Whether stationary or portable, the equipment will be similar. As an added safety measure, portable dispensers and mobile propane-fueled equipment should use chock blocks to prevent rolling. NFPA states: Each cargo tank vehicle and trailer shall carry chock blocks, which shall be used to prevent rolling of the vehicle whenever it is being loaded or unloaded or is parked.

This dispensing system consists of a 1,000-gallon propane tank and a dispenser cabinet permanently installed at a fixed location on a common base. Crash protection, in the form of reinforced concrete-filled steel pipes, have been placed around the perimeter of both the tank and dispenser to reduce the risks of damage from an accidental collision.

Liquid propane is withdrawn from the bottom of the propane supply tank through a manual shutoff-excess flow valve.

Piping from the manual shutoff valve extends toward the dispenser cabinet.

Depending on the equipment, there may be additional shutoff valves in the downstream piping. On this dispenser, an emergency shutoff valve (ESV), a fusible element and a remote shutdown cable are installed downstream in the liquid piping before it enters the dispenser cabinet.

In the event of an emergency, the ESV is designed to close manually when the remote shutdown cable is pulled by the dispenser operator, and/or automatically if a fire develops and heats the fusible element above its melting point.

On this dispenser, the transfer pump is located just inside of the cabinet. Downstream of the pump is the liquid meter, transfer hose with hose-end valve, and single check adapter. For security, all this equipment is located inside the dispenser cabinet.

Although not required in all jurisdictions, many propane dispensers designed for filling permanently mounted tanks incorporate a liquid meter to accurately measure the gallons pumped during each fill.

A pump-bypass return line is required to permit excess product from the pump discharge to return to the propane tank. This line must also have a manual shutoff excess-flow valve installed in the tank opening and must be open when pumping propane.

NFPA 58 requires that protection against trespassing and tampering be provided for dispensing equipment. Where a cabinet has been provided, one method of protection would be to keep the cabinet locked when not in use.

If a cabinet is not a part of the stationary installation, the valves shall be locked when not in use per NFPA 58.

An alternative to locking the valves or dispenser cabinet would be to fence the dispenser with industrial type or chain link fence a minimum of 6 feet high. The access gate in any fencing shall also be locked except when in use.

The important point to remember is to safeguard against unqualified individuals tampering with the equipment causing a propane release, explosion or fire, personal injury or death, and loss of property.

It is important to understand that any type of dispensing system is required to meet all applicable codes. Consult your propane dealer or other appropriate professionals to assist with designing, installing, or fabricating any propane refueling system. If the system will be transported over public highways, the system may need to comply with the U.S. Department of Transportation Regulations. Special DOT farm permits (currently DOT#: SP11209) may be applicable to your intended use. Consult the National Propane Gas Association or a propane retailer for the latest regulatory information on special permits for transporting propane on and between farms.

For applications where the propane tank and dispensing equipment are portable, the same pump is typically used as on stationary systems; however, the pump is typically driven by an internal combustion engine and V-belt. All other components will be similar to the stationary system.

To secure the hose-end valve when not in use, a lockable box has been added to place the valve in and then lock the top closed.

It is the operator's responsibility to understand the features of the dispenser and ensure that all components are in proper working order. If in doubt about the system and equipment, contact your supervisor, propane supplier, or another qualified technician for inspection or repair.

4.0

Propane Transfer Procedures

PROPANE TRANSFER PROCEDURES

Dispenser operators must be aware of the required equipment and its operation to safely transfer propane. Dispensing equipment will vary with the location. This material will provide general transfer procedures. It is the operator's responsibility to fully understand the specific equipment being used and to operate it properly.

The objectives of this chapter are to:

4.1 Identify pre-fill inspection considerations for the dispensing site and equipment.
4.2 Identify procedures for filling permanently mounted portable ASME tanks.
4.3 Identify post-filling procedures.

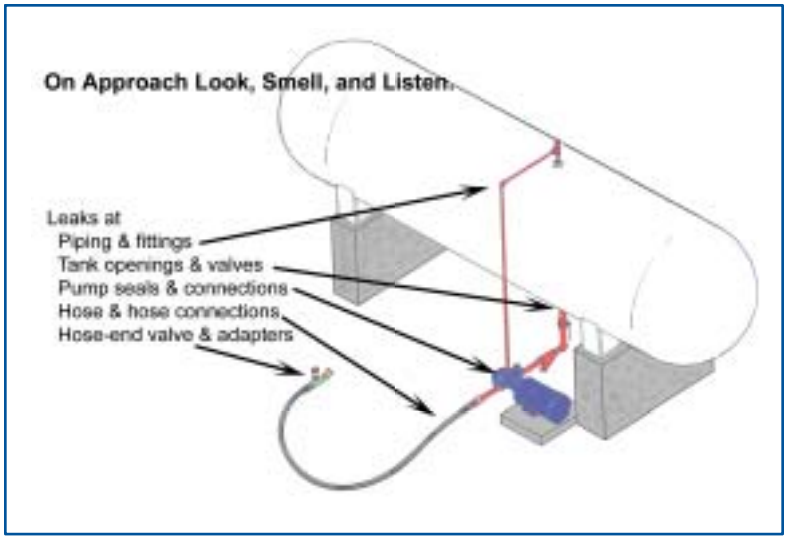
Pre-Fill Inspection Considerations for the Dispensing Site and Equipment

Prior to operating a dispenser, a routine visual inspection of both the dispenser and the propane equipment should be performed by the operator to establish that it is safe for use. This inspection will help identify problems that could cause component failure, a propane leak, or lead to personal injury or loss of property. It may be too late to correct problems once the filling process has begun.

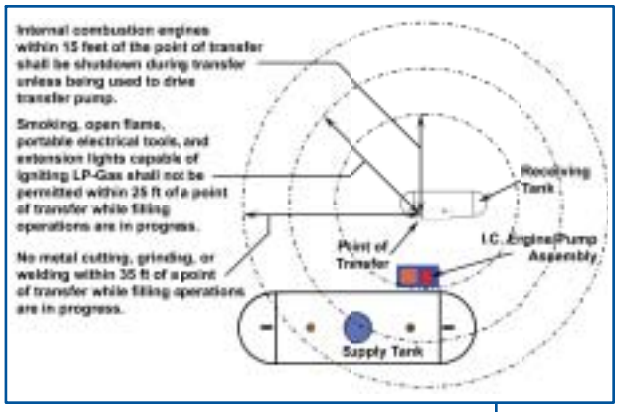
Pre-Transfer Inspection:

1) As the dispenser operator approaches the propane dispenser and/or equipment, he/she should check for:
   A) Any debris or flammable material that may have accumulated on any of the equipment, and remove it.
   B) Any hissing sounds that may be caused by propane vapor leaking from tank valves and connections; piping fittings; transfer pump; or on the dispensing hose, hose-end valve and adapters.
   C) Any white mist resulting from a liquid propane leak anywhere in or on the system.
   D) The smell of the odorant used in propane.

   Any leaks detectable by sounds, sight, or smell should be repaired before the dispenser is used.



2) The area must be checked for potential sources of ignition. If any are found, these should be eliminated. NFPA 58 prohibits:
   A) Smoking, open flames, portable electrical tools, and extension lights within 25 feet of the tank being filled.
   B) Metal cutting, grinding, or welding within 35 feet of the tank being filled.
   C) Filling tanks until metal objects that have been heated to temperatures capable of igniting propane (above 920°F) have been allowed to cool.



3) Verify that a fire extinguisher containing a minimum of 18 pounds of dry chemical and a B:C rating is properly charged, has been inspected, and is available for use in an emergency.

4) Obtain proper personal protective equipment:
   A) Vinyl gloves resistant to the actions of propane.
   B) Eye protection – safety glasses, goggles, or face shield.
   C) Hearing protection – where the noise level in the area exceeds 85 decibels averaged over the course of an 8-hour work week.

5) Prior to connecting the transfer hose to the receiving tank, check the hose and hose-end connections for wear and/or damage that could lead to hose failure. If any deficiencies exist, immediately have them corrected by a qualified technician before operating the equipment or transferring propane.

6) Make sure wheels are chocked to prevent rolling. Refer to page 13 for more information.

When in doubt about the equipment or the procedures to follow, contact your supervisor, a propane retailer, or another trained and experienced operator to assist you.

Procedures for Filling Permanently Mounted ASME Portable Tanks

The process of filling a propane tank should not be taken lightly. The individual responsible for a filling operation must wear proper personal protective equipment.

The transfer of propane can be summarized into the following steps:

1) Pre-Fill Inspection of the Receiving Tank
2) Check to See Tank Is Not Already Full
3) Connecting the Quick-Acting Hose-End Valve and Single Check Adapter
4) Turn On All Valves in Supply Tank and Piping
5) Start the Pumping System
6) Slowly Open the Quick-Acting Hose-End Valve
7) Filling the ASME Portable Tank
8) Shutting Down the Filling Process
9) Bleed-off Trapped Propane and Disconnect the Hose-End Valve and Single Check Adapter
10) Post-Filling Check for Leakage of Connection
11) Re-Install the Dust Cap
12) Shutting Down the Dispensing Equipment

Step 1: **Pre-Fill Inspection of the Receiving Tank**

To be filled, the receiving tank shall be of ASME specification, in good condition, and have the required valves and fittings in accordance with NFPA 58. Although ASME tanks do not require periodic inspection and requalification, any questionable container, valve, or fitting is cause to not fill the container.

Note: For this portion of the training it will be useful to have a sample of the actual equipment on hand to view and identify all critical componentry.

Prior to filling, ASME tanks are required to be visually inspected to ensure:

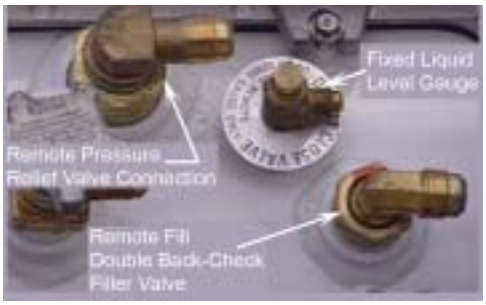
- It is free of leaks.
- Adequately painted.
- It is properly secured.
- It is fitted with all required valves and gauges including:
  - Double backflow check filler valve.
  - Fixed maximum liquid level gauge.
  - Manual shutoff liquid or vapor valve with internal excess-flow check valve.

- Some tanks built since 2005 may also incorporate an electric shutoff.
  - Full internal or flush type full internal pressure relief valve.
- The start-to-leak setting of a pressure relief valve shall be the same as the working pressure of the tank.
  - Automatic stop-fill valve.
  - Although not required, most will also have a float gauge.
- That all valves and gauges are in proper working order, free of leaks, and protected from damage.
- It has a legible manufacturer's data plate.
- It is designed for use with propane.
- The tank has the correct maximum allowable working pressure (MAWP).
  - Tanks built on or after April 1, 2001, are required to have a 312-psi MAWP.
  - Tanks built before April 1, 2001, may have either a 250- or 312-psi MAWP.

If it appears the tank or any of the valves and/or fittings require more detailed inspection or repair by a qualified person, do not fill the tank.

On most applications, the filling connection is located directly on the tank through the double back-check filler valve.

To allow better access for filling, some applications have the filler valve and possibly the fixed maximum liquid level gauge piped to the outside of the vehicle and attached to the frame. This is referred to as remote filling.



If the tank has been installed in an enclosed space, the pressure relief valve is also required to be piped to the outside. In accordance with NFPA 58, on tanks equipped with an automatic stop-fill valve it is not necessary to extend the fixed liquid level gauge to the remote filling location.

Where remote connections have been installed, a Double Back-Check Fill Valve is still required at the remote location. If the tank has been fitted with an automatic stop-fill valve, there may not be a remote fixed liquid level gauge. If one does exist, it is typically located next to the remote filler valve.

Step 2: **Check to Determine that Tank Is Not Already Full**

CAUTION PPE Required! Although the float gauge is not considered accurate for filling, observing the position of the gauge should give an indication of the approximate level of propane in the tank. If the gauge is indicating a near-empty condition, the filling process can continue.

Another method used to verify the tank is not already full is to open the fixed liquid level gauge and observe the discharge. If no white mist is observed, the tank should not be full and the filling process can continue.

Step 3: **Connecting the Quick-Acting Hose-End Valve and Single Check Adapter**

Once assured that all equipment is suitable for filling and the receiving tank is not already full, the operation can continue by removing the dust cap from the filler valve on the tank or at the remote connection, whichever is applicable.

Check that the flat gasket or O-ring in the filler valve is in place and is not damaged; ensure the valve is free of debris; be aware of any leaks detectable through visual observation, audio awareness, or smell; and make sure that the external threads are not worn or damaged.

Connect the dispenser hose quick-acting hose-end valve with the attached back-check adapter to the receiving tank filler valve.

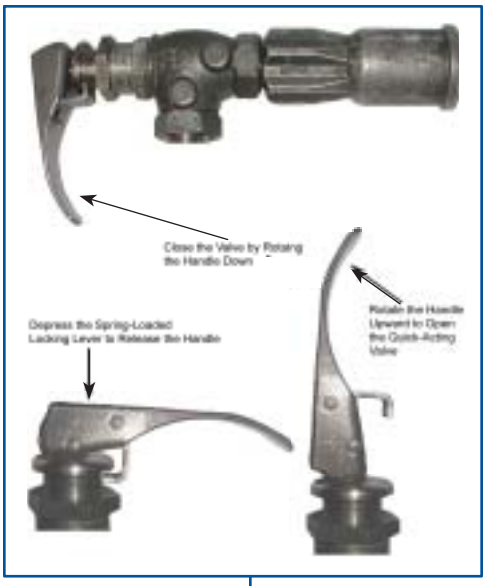
Step 4: **Turn On All Valves in Supply Tank and Piping**

Open the dispenser tank internal valve and any additional shutoff valves installed between the tank, the pump, and the quick-acting hose-end valve. DO NOT open the quick-acting hose-end valve at this time. Also see that any shutoff valves in return lines are opened.

Step 5: **Start the Pumping System**

Depending on the dispenser, turn on the pump's electric motor or start the internal combustion engine for the pump following the manufacturer's instructions.

Step 6: **Open the Quick-Acting Hose-End Valve**
Once all supply tank and piping valves are open, the connection has been made, and the pump is operating, open the quick-acting hose-end valve. In accordance with NFPA 58, the operator is required to remain at the hose-end valve until the tank reaches capacity, the hose-end valve is closed, and the valve and adapter have been disconnected.



Note: In accordance with NFPA 58, all dispensers are required to have a quick-acting hose-end valve. If the dispenser has a different style of quick-acting hose-end valve, operate the valve in accordance with the manufacturer's instructions.

Step 7: **Filling the ASME Portable Tank**
For ASME portable tanks that are not equipped with an automatic stop-fill valve, use the fixed maximum liquid level gauge to determine when the tank has been properly filled. The fixed liquid level gauge should remain open during the entire filling process to safeguard against overfill. When a white mist begins to vent from the gauge, immediately close the quick-acting hose-end valve to see the tank is not overfilled. Then close the fixed liquid level gauge.

Note: The magnetic float gauge may be used only as a guide and should not be used as the sole means of determining the maximum fill level.

For ASME portable tanks equipped with an automatic stop-fill valve, the filling should stop automatically when the liquid level reaches 80 percent by volume. Filling to this level will provide adequate room for expansion of the liquid propane due to heat from the agricultural equipment or the atmosphere.

Note: If the fixed liquid level gauge is open during the filling of tanks equipped with an automatic stop-fill valve, and a white mist appears, immediately close the quick-acting hose-end valve and then close the fixed maximum liquid level gauge. If the automatic stop-fill valve does not close, it may need to be repaired or replaced. Notify the container owner and/or user, per NFPA 58, and/or contact a qualified individual for repair or replacement.

Step 8: **Shutting Down the Filling Process**

After the quick-acting hose-end valve and the fixed liquid level gauge have been closed, stop the pump by either turning off the electrical switch to the pump's motor or shutting off the internal combustion engine.

Step 9: **Bleed-off Trapped Propane and Disconnect the Hose-End Valve and Single Check Adapter**

Open the bleed-off valve on the quick-acting valve or loosen the hose-end valve coupling and adapter just enough to permit any trapped gas to slowly bleed off.

CAUTION! Do not completely disconnect the valve and adapter until the venting propane and/or pressure have dissipated. Caution must be taken to see that the back-check valves in the filler valve have closed. If the venting gas and/or pressure continues, re-tighten the hose coupling and adapter.

Try venting the gas and/or pressure from between the hose-end valve and the single check adapter. If the venting gas and/or pressure stops, disconnect the hose-end valve coupling from the back-check adapter, leaving the adapter on the tank's filler valve.

Notify the container owner and user, per NFPA 58, and/or contact a qualified individual for repair or replacement.

If the venting gas and/or pressure stops within 3–5 seconds, disconnect the filler hose valve and single check adapter from the filler valve.

Step 10: **Post-Filling Check for Leakage of Connection**

After disconnecting the hose-end valve and single check adapter, check the filler valve on the receiving tank with an approved leak-detection solution to see that it is not leaking.

Step 11: **Re-Install the Dust Cap**
Re-install the dust cap on the portable tank's fill valve or remote fill valve.

Step 12: **Shutting Down the Dispensing Equipment**
Once the filling operation is complete, it is necessary to shut down and secure the dispensing equipment to prevent unauthorized tampering or product theft.

1) Close the valves previously opened in the piping and on the dispensing tank.
2) Return the transfer hose and quick-acting hose-end valve to the dispenser holder.
3) Secure the tank, dispenser, and all shutoff valves against tampering.

Post-Filling Procedures

To safeguard against unqualified individuals tampering with the propane-dispensing equipment and causing a propane release, explosion or fire, personal injury or death, and loss of property, NFPA 58 requires that protection against trespassing and tampering be provided for dispensing equipment.

Where a cabinet has been provided, one method of protection would be to keep the cabinet locked at all times except when in use.

If a cabinet is not a part of the stationary installation, the valves should be locked at all times except when in use per NFPA 58.

To secure the hose-end valve on this dispenser when it is not in use, a lockable box has been added.

As an alternative to locking the valves or cabinet, NFPA 58 states that the dispenser shall be fenced with industrial type or chain link fence a minimum of 6 feet high. The access gate in any fencing shall also be locked at all times except when in use.

Additional security measures may be necessary depending on local jurisdiction requirements and company safety procedures. Always follow applicable codes and company procedures to guard against tampering, unauthorized use, and/or theft.

Appendix A

Referenced Publications, Additional Resources, Safety and Warning Information

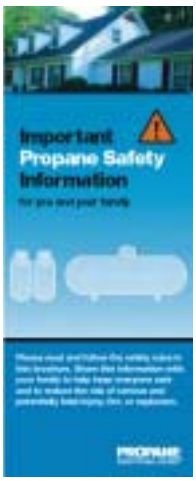
Referenced Publications

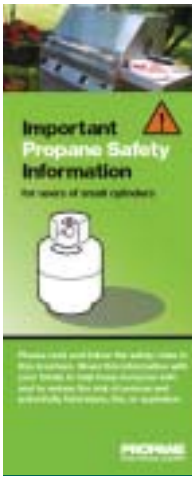
NFPA 58 Liquefied Petroleum Gas Code, 2004 Edition
49 CFR U.S. Department of Transportation Regulations
29 CFR U.S. Department of Labor Regulations
PERC Consumer Safety Education Brochures

Additional Resources

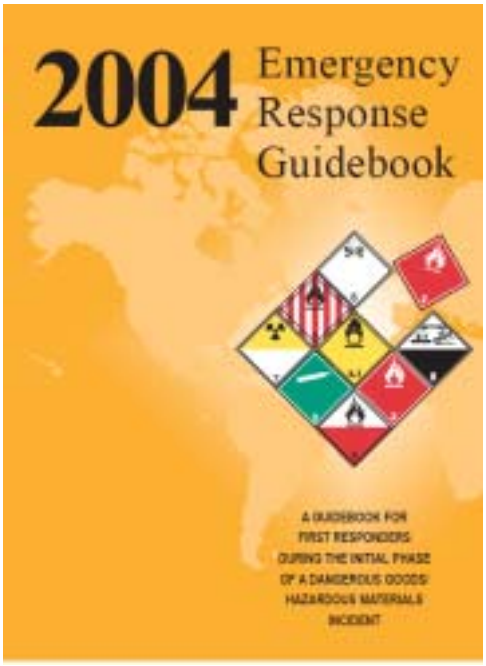
National Fire Protection Association (NFPA)	1 Batterymarch Park P.O. Box 9101 Quincy, MA 02269-9101	617.770.3000 www.nfpa.org
National Propane Gas Association (NPGA)	1150 17th Street NW, Suite 310 Washington, DC 20036	202.466.7200 www.npga.org
Propane Education & Research Council (PERC)	1140 Connecticut Ave. NW, Suite 1075 Washington, DC 20036	202.452.8975 www.propanecouncil.org www.propanesafety.com www.propanecatalog.com
U.S. Department of Transportation	400 7th Street SW, Washington, DC 20590	202.366.4000 www.dot.gov
U.S. Department of Labor	Frances Perkins Building, 200 Constitution Ave. NW Washington, DC 20210	866.487.2365 www.dol.gov

Consumer Safety Education Brochures Available from the Propane Education & Research Council





Emergency Response Guidebook



The 2004 Emergency Response Guidebook is designed for emergency responders during the initial phase of a dangerous goods/hazardous materials incident. The information contained in the guidebook Guide Number 115 is specifically for responding to a propane incident. By referencing and following this information, individuals responding will be able to bring the incident under control more quickly and safely.

Emergency Response Guide 115 Gases – Flammable – ERG2004

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- EXTREMELY FLAMMABLE.
- Will be easily ignited by heat, sparks, or flames.
- Will form explosive mixtures with air.
- Vapors from liquefied gas are initially heavier than air and spread along ground.
- Vapors may travel to source of ignition and flashback.
- Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

HEALTH

- Vapors may cause dizziness or asphyxiation without warning.
- Some may be irritating if inhaled at high concentrations.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Fire may produce irritating and/or toxic gases.

PUBLIC SAFETY

- CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper is not available or no answer, refer to the appropriate telephone numbers listed on the back cover of the ERG.
- As an immediate precautionary measure, isolate spill or leak area for at least 330 feet (100 meters) in all directions.
- Keep unauthorized personnel away.
- Stay upwind.
- Many gases are heavier than air and will concentrate at ground level and in low or confined areas (sewers, basements, tanks).
- Keep out of low areas.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.
- Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least half mile (800 meters).

Fire

- If tank, rail car or tank truck is involved in fire, ISOLATE for one mile (1,600 meters) in all directions; also, consider initial evacuation for one mile (1,600 meters) in all directions.

EMERGENCY RESPONSE

FIRE:

- DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.

Small Fires

- Dry Chemical or CO_2.

Large Fires

- Water spray or fog.
- Move containers from fire area if you can do it without risk.

Fire Involving Tanks

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks, or flames in immediate area).
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Do not direct water at spill or source of leak.
- Prevent spreading of vapors through sewers, ventilation systems, and confined areas.
- Isolate area until gas has been dispersed.

CAUTION: When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.

FIRST AID

- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- Clothing frozen to the skin should be thawed before being removed.
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water.
- In case of burns, immediately cool affected skin for as long as possible with cold water.
- Do not remove clothing if adhering to skin.
- Keep victim warm and quiet.
- Ensure that medical personnel are aware of the material(s) involved, and that they take precautions to protect themselves.

Material Safety Data Sheet – Odorized Propane


MATERIAL SAFETY DATA SHEET - ODORIZED PROPANE

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Odorized Commercial Propane
Chemical Name: Propane
Chemical Family: Hydrocarbon
Formula: C_3H_8
Synonyms: Dimethylmethane, LP-Gas, Liquefied Petroleum Gas (LPG), Propane, Propyl Hydride
Transportation Emergency No.: 800/424-9300 (CHEMTREC)

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME / CAS NUMBER	PERCENTAGE	OSHA PEL
Propane / 74-98-6	87.5-100	
Ethane / 74-84-0	0-7.5	
Propylene / 115-07-1	0-10.0	1000 ppm
Butanes/various	0-2.5	
Ethyl Mercaptan / 75-08-1	16-25 ppm	0.5 ppm

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

DANGER! Flammable liquefied gas under pressure. Keep away from heat, sparks, flame, and all other ignition sources. Vapor replaces oxygen available for breathing and may cause suffocation in confined spaces.Use only with adequate ventilation. Odor may not provide adequate warning of potentially hazardous concentrations. Vapor is heavier than air. Liquid can cause freeze burn similar to frostbite. Do not get liquid in eyes, on skin, or on clothing. Avoid breathing of vapor. Keep container valve closed when not in use.

NFPA 704 Hazard Identification System

POTENTIAL HEALTH EFFECTS INFORMATION

Routes of Exposure:

Inhalation: Asphyxiant. It should be noted that before suffocation could occur, the lower flammability limit of propane in air would be exceeded, possibly causing both an oxygen-deficient and explosive atmosphere. Exposure to concentrations >10% may cause dizziness. Exposure to atmospheres containing 8%-10% or less oxygen will bring about unconsciousness without warning, and so quickly that the individuals cannot help or protect themselves. Lack of sufficient oxygen may cause serious injury or death.

Eye Contact: Contact with liquid can cause freezing of tissue.

Skin Contact: Contact with liquid can cause frost bite.

[Skin Absorption]: None.

[Ingestion]: Liquid can cause freeze burn similar to frostbite. Ingestion not expected to occur in normal use.

Chronic Effects: None.

Medical Conditions Aggravated by Overexposure: None.

Other Effects of Overexposure: None.

Carcinogenicity: Propane is not listed by NTP, OSHA, or IARC.

4. FIRST-AID MEASURES

INHALATION: Persons suffering from lack of oxygen should be removed to fresh air. If victim is not breathing, administer artificial respiration. If breathing is difficult, administer oxygen. Obtain prompt medical attention.

EYE CONTACT: Contact with liquid can cause freezing of tissue. Gently flush eyes with lukewarm water. Obtain medical attention immediately.

SKIN CONTACT: Contact with liquid can cause frostbite. Remove saturated clothes, shoes, and jewelry. Immerse affected area in lukewarm water not exceeding 105°F. Keep immersed. Get prompt medical attention.
INGESTION: If swallowed, get immediate medical attention.
NOTES TO PHYSICIAN: None.

5. FIRE-FIGHTING MEASURES

FLASH POINT: -156°F (-104°C)
AUTOIGNITION: 842°F (432°C)
IGNITION TEMPERATURE IN AIR: 920-1120°F
FLAMMABLE LIMITS IN AIR BY VOLUME: Lower: 2.15% Upper: 9.6%
EXTINGUISHING MEDIA: Dry chemical, CO2, water spray, or fog for surrounding area. Do not extinguish fire until propane source is shut off.

SPECIAL FIRE-FIGHTING INSTRUCTIONS: Evacuate personnel from danger area. Evacuated personnel should stay upwind, and away from tank ends, and move to a distance at least 1 mile or more away from containers subject to direct flame. Immediately cool container(s) (especially upper half) with water spray from maximum distance and the sides of containers, taking care not to extinguish flames. If flames are extinguished, explosive re-ignition may occur. Stop flow of gas, if possible without risk, while continuing cooling water spray.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Propane is easily ignited. It is heavier than air; therefore, it can collect in low areas while dissipating. Vapors may be moved by wind or water spray. Vapors may move to areas where ignition sources are present and ignite, flashing back to the source. Pressure in a container can build up due to heat, and container may rupture if pressure relief devices should fail to function.

HAZARDOUS COMBUSTION PRODUCTS: In typical use in properly adjusted and maintained gas appliances–none. If propane combustion is incomplete, poisonous carbon monoxide (CO) may be produced. Defective; improperly installed; adjusted; maintained; or improperly vented appliances may produce carbon monoxide or irritating aldehydes.

6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Evacuate the immediate area. Eliminate any possible sources of ignition and provide maximum ventilation. Shut off source of propane, if possible. If leaking from container or valve, contact your supplier and/or fire department.

7. HANDLING AND STORAGE

HANDLING PRECAUTIONS: Propane vapor is heavier than air and can collect in low areas that are without sufficient ventilation. Leak-check system with a leak detector or approved solution, never with flame. Make certain the container service valve is shut off prior to connecting or disconnecting. If container valve does not operate properly, discontinue use and contact supplier. Never insert an object (e.g., wrench, screwdriver, pry bar, etc.) into pressure relief valve or cylinder cap openings. Do not drop or abuse cylinder. Never strike an arc on a gas container or make a container part of an electrical circuit. See 16. OTHER INFORMATION for additional precautions.

STORAGE PRECAUTIONS: Store in a safe, authorized location (outside, detached storage is preferred) with adequate ventilation. Specific requirements are listed in NFPA 58, Liquefied Petroleum Gas Code. Isolate from heat and ignition sources. Containers should never be allowed to reach temperature exceeding 125°F (52°C). Isolate from combustible materials. Provide separate storage locations for other compressed and flammable gases. Propane containers should be separated from oxygen cylinders, or other oxidizers, by a minimum distance of 20 feet, or by a barrier of non-combustible material at least 5 feet high, having a fire rating of at least 1 hour. Full and empty cylinders should be segregated. Store cylinders in upright position or with pressure relief valve in vapor space. Cylinders should be arranged so that pressure-relief valves are not directed toward other cylinders. Do not drop or abuse cylinders. Keep container valve closed and plugged or capped when not in use. Install protective caps when cylinders are not connected for use. Empty containers retain some residue and should be treated as if they were full.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS

Ventilation: Provide ventilation so propane does not reach a flammable mixture.

Ignition Source Control: Electrical wiring in liquid transfer areas must be Class I, Group D, and Explosion-proof. Other possible ignition sources should be kept away from transfer areas. NO SMOKING Signs should be posted at all approaches and entries to transfer areas. Transfer and storage areas must be kept free of flammables, combustibles, and vegetation.

RESPIRATORY PROTECTION (SPECIFY TYPE)

General Use: None.

Emergency Use: If concentrations are high enough to warrant supplied-air or self-contained breathing apparatus, then the atmosphere may be flammable (See Section 5). Appropriate precautions must be taken regarding flammability.

PROTECTIVE CLOTHING: Avoid skin contact with liquid propane because of possibility of freeze burn. Wear gloves and protective clothing that are impervious to the product for the duration of the anticipated exposure.

EYE PROTECTION: Safety glasses are recommended when filling and handling cylinders.

OTHER PROTECTIVE EQUIPMENT: Safety shoes are recommended when handling cylinders.

9. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT: @ 14.7 psia = -44°F
SPECIFIC GRAVITY (DENSITY) OF VAPOR (Air = 1) at 60°F: 1.50
SPECIFIC GRAVITY OF LIQUID (Water = 1) at 60°F: 0.504
VAPOR PRESSURE: @ 70°F = 127 psig @ 105°F = 210 psig
EXPANSION RATIO (From liquid to gas @ 14.7 psia): 1 to 270
SOLUBILITY IN WATER: Slight, 0.1 to 1.0%
APPEARANCE AND ODOR: A colorless and tasteless gas at normal temperature and pressure. An odorant has been added to provide a strong unpleasant odor.

ODORANT WARNING: Odorant is added to aid in the detection of leaks. One common odorant is ethyl mercaptan, CAS No. 75-08-01. Odorant has a foul smell. The ability of people to detect odors varies widely. In addition, certain chemical reactions with material in the propane system, or fugitive propane gas from underground leaks passing through certain soils, can reduce the odor level. No odorant will be 100% effective in all circumstances. If odorant appears to be weak, notify propane supplier immediately.

10. STABILITY AND REACTIVITY

STABILITY: Stable.
Conditions to Avoid: Keep away from high heat, strong oxidizing agents, and sources of ignition.

REACTIVITY:
Hazardous Decomposition Products: Products of combustion are fumes, smoke, carbon monoxide, and aldehydes and other decomposition products. Incomplete combustion can cause carbon monoxide, a toxic gas while burning or when used as an engine fuel.
Hazardous polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Propane is nontoxic and is a simple asphyxiate; however, it does have slight anesthetic properties, and higher concentrations may cause dizziness.

[IRRITANCY OF MATERIAL]: None
[SENSITIZATION TO MATERIAL]: None
[REPRODUCTIVE EFFECTS]: None
[TERATOGENICITY]: None
[MUTAGENICITY]: None
[SYNERGISTIC MATERIALS]: None

12. ECOLOGICAL INFORMATION

No adverse ecological effects are expected. Propane does not contain any Class I or Class II ozone-depleting chemicals (40 CFR Part 82.) Propane is not listed as a marine pollutant by DOT (49 CFR Part 171).

13. DISPOSAL CONSIDERATIONS

WASTE-DISPOSAL METHOD: Do not attempt to dispose of residual or unused product in the container. Return to supplier for safe disposal.

Residual product within process system may be burned at a controlled rate, if a suitable burning unit (flare stack) is available on site. This shall be done in accordance with federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

DOT SHIPPING NAME: Liquefied Petroleum Gas
HAZARD CLASS: 2.1 (Flammable Gas)
IDENTIFICATION NUMBER: UN 1075
PRODUCT RQ: None
SHIPPING LABEL(S): Flammable gas
IMO SHIPPING NAME: Propane
PLACARD (When Required): Flammable gas
IMO IDENTIFICATION NUMBER: UN 1978
SPECIAL SHIPPING INFORMATION: Container should be transported in a secure, upright position in a well-ventilated vehicle.

15. REGULATORY INFORMATION

The following information concerns selected regulatory requirements potentially applicable to this product. Not all such requirements are identified. Users of this product are responsible for their own regulatory compliance on federal, state [provincial], and local levels.

U.S. FEDERAL REGULATIONS:

EPA - Environmental Protection Agency

CERCLA - Comprehensive Environmental Response, Compensation and Liability Act of 1980
(40 CFR Parts 117 and 302):
Reportable Quantity (RQ): None

SARA - Superfund Amendment and Reauthorization Act

- SECTIONS 302/304: Require emergency planning on threshold planning quantities (TPQ) and release reporting on reportable quantities (RQ) of EPA's extremely hazardous substances (40 CFR Part 355).
  Extremely Hazardous Substances: None
  Threshold Planning Quantity (TPQ): None
- SECTIONS 311/312: Require submission of material safety data sheets (MSDSs) and chemical inventory reporting with identification of EPA-defined hazard classes (40 CFR Part 370). The hazard classes for this product are:
  ACUTE HEALTH: Yes
  CHRONIC HEALTH: No
  PRESSURE: Yes
  DELAYED: No
  REACTIVITY: No
  FLAMMABLE: Yes

- SECTION 313: Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.
  Propane does not require reporting under Section 313.

40 CFR PART 68 Risk Management for Chemical Accidental Release

TSCA - Toxic Substance Control Act
Propane is not listed on the TSCA inventory.

OSHA - Occupational Safety and Health Administration

29 CFR 1910.119: Process Safety Management of Highly Hazardous Chemicals.

FDA - Food and Drug Administration

21 CFR 184.1655: Generally recognized as safe (GRAS) as a direct human food ingredient when used as a propellant, aerating agent and gas.

16. OTHER INFORMATION

SPECIAL PRECAUTIONS: Use piping and equipment adequately designed to withstand pressures to be encountered.

NFPA 58 Liquefied Petroleum Gas Code and OSHA 29 CFR 1910.110 require that all persons employed in handling LP-gases be trained in proper handling and operating procedures, which the employer shall document. Contact your propane supplier to arrange for the required training. Allow only trained and qualified persons to install and service propane containers and systems.

WARNING: Be aware that with odorized propane, the intensity of ethyl mercaptan stench (its odor) may fade due to chemical oxidation (in the presence of rust, air, or moisture), adsorption or absorption. Some people have nasal perception problems and may not be able to smell the ethyl mercaptan stench. Leaking propane from underground lines may lose its odor as it passes through certain soils. While ethyl mercaptan may not impart the warning of the presence of propane in every instance, it is generally effective in a majority of situations. Familiarize yourself, your employees and customers with this warning and other facts associated with the so-called "odor-fade" phenomenon. If you do not already know all the facts, contact your propane supplier for more information about odor, electronic gas alarms, and other safety considerations associated with the handling, storage, and use of propane.

Issue Date: November, 2001 ISSUE INFORMATION

This material safety data sheet and the information it contains is offered to you in good faith as accurate. Much of the information contained in this data sheet was received from outside sources. To the best of our knowledge, this information is accurate, but the Propane Education and Research Council does not guarantee its accuracy or completeness. Health and safety precautions in this data sheet may not be adequate for all individuals and/or situations. It is the user's obligation to evaluate and use this product safely, comply with all applicable laws and regulations and to assume the risks involved in the use of this product.

NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSES, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE.

The purpose of this MSDS is to set forth general safety information and warnings related to the use of propane. It is not intended to be an exhaustive treatment of the subject and should not be interpreted as precluding other authoritative information or safety procedures that would enhance safe LP-gas storage, handling, or use. Issuance of this MSDS is not intended nor should it be construed as an undertaking to perform services on behalf of any party either for their protection or for the protection of third parties. The Propane Education and Research Council assumes no liability for reliance on the contents of this material safety data sheet.

Source: National Propane Gas Association

Appendix B

Forms

Items or Areas to Consider for a Dispenser Inspection

Identify any deficiencies of the:

____ • Supply container and attachments.

____ • Container openings, fittings, valves, and gauges.

____ • Discharge system, including delivery hose assemblies and piping, to ensure that they are of sound quality, without obvious defects detectable through visual observation and audio awareness, and that connections are secure.

____ Vehicle fuel dispensers and dispensing stations shall be located away from pits with no drains or blow-offs from the unit directed toward or within 15 feet of a sewer system's opening.

____ Vehicle fuel dispensers and dispensing stations shall not be located within a building, except as allowed in Chapter 10 of NFPA 58-04.

____ Where a vehicle fuel dispenser 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.

____ Control for the pump used to transfer LP-gas through the unit into containers shall be provided at the device in order to minimize the possibility of leakage or accidental discharge.

____ An excess-flow check valve or a differential back pressure valve shall be installed in or on the dispenser at the point at which the dispenser hose is connected to the liquid piping.

____ Piping and the dispensing hose shall be provided with hydrostatic relief valves in accordance with NFPA 58-04, 6.11.

____ A manual shutoff valve and an excess-flow check valve shall be located in the liquid line between the pump and dispenser inlet where the dispensing device is installed at a remote location and is not part of a complete storage and dispensing unit mounted on a common base.

____ All dispensers either shall be installed on a concrete foundation or shall be part of a complete storage and dispensing unit mounted on a common base and installed in accordance with NFPA 58-04, 6.6.3.1(G).

____ Protection against physical damage shall be provided for containers and dispensers.

____ 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.

____ The markings for the switches or breakers shall be visible at the point of liquid transfer.

Flexible transfer hose shall be in good condition and comply with the following:

____ • Hose length shall not exceed 18 feet unless approved by the authority having jurisdiction.

____ • Shall be designed and listed for a working pressure of 350 psig with a safety factor of 5 to 1 and shall be continuously marked with LP-GAS, PROPANE, 350 PSI WORKING PRESSURE, and with the manufacturer's name or trademark.

____ • When not in use, hoses shall be secured to protect them from damage.

____ A listed quick-acting shutoff valve shall be installed at the discharge end of the transfer hose.

____ A listed emergency breakaway device complying with UL 567 and designed to retain liquid on both sides of the breakaway point, or other devices affording equivalent protection approved by the authority having jurisdiction, shall be installed.

____ Filling adapters are in good condition.

____ All valves and switches all operable.

____ Fire extinguisher present containing a minimum of 18 pounds of dry chemical and a B: C rating, with current inspection information available.

____ Pipes, wires, brackets, and valves in good working order.

____ Trash, debris, and other combustibles; remove if found.

____ Protection against trespassing and tampering shall be in place at all times, except when a qualified person is in attendance. (See NFPA 58-04, 6.16.5)

____ No metal-cutting, grinding, or welding within 35 feet of the point of transfer or other ignition sources within 25 feet of the point of transfer. (Exception: The internal combustion engine being used to drive the pump shall be a minimum of 15 feet from the point of transfer.)

Suggested Labels for Storage Tank/Dispenser Systems

NO SMOKING

NO SMOKING: Minimum 2-inch block letters; Position on all visible sides.

PROPANE

PROPANE: Minimum 2-inch block letters; Position on all visible sides.

FLAMMABLE GAS

FLAMMABLE GAS: May be used in place of PROPANE; Minimum 2-inch block letters; Position on all visible sides.

NFPA 704 Warning Placard: Minimum size visible from 100 feet; Position on all visible sides and ends.

UN1075 Placards for DOT Specification containers only: Transported on Public Roadways. (They are not intended for stationary storage containers.)

EMERGENCY ELECTRICAL SHUTOFF: Must be visible from dispenser; Position at actual shutoff location; Location not less than 20 feet or more than 100 feet from the dispensing device; Must describe what action to take–i.e., Push Switch, Pull Switch, Rotate Switch, etc.

Hazardous Materials Transportation Security Plan for Agricultural Operations

As part of the government's response to 9/11/01, Effective March 25, 2003, the U.S. Department of Transportation, established 49CFR§172.800; Security Plans. Shippers and carriers of certain highly hazardous materials must develop and implement security plans. In addition, all shippers and carriers of hazardous materials must assure that their employee training includes a security component. If an agriculture user is transporting more than 119 gallons of propane in a single container or more than 1000 pounds of propane in multiple containers they are required to comply with the Department of Transportation's Security Plan regulations. Exception: Transportation activities of a farmer, who generates less than $500,000 annually in gross receipts from the sale of agricultural commodities or products, are not subject to this subpart if such activities are:

- Conducted by highway or rail
- In direct support of their farming operations
- Conducted within a 150-mile radius of those operations

Agricultural Operation Name: _____

Operation Contact Name Preparing Plan: _____

Town/Community of Operation: _____

Phone Number(s) of Operation & Contact(s): _____

Fully complete the following information based on this agricultural operation's transport of the hazardous materials:

This agricultural operation transport(s) the following materials for agricultural use in amounts that require placarding:

Explosives

Any amount of:

- Dynamite _

More than 1,000 pounds (total, if in multiple containers) in a single shipment of:

- Detonators/Blasting Agents _

Flammable/Combustible Liquids or Gases

More than 119 gallons in a single container OR More than 1,000 pounds in multiple containers in a single shipment of:

- Ammonium Nitrate Fertilizers _
- Butane _
- Diesel Fuel _
- Fuel Oil _
- Gasoline _
- Propane/Liquefied Petroleum Gas _

Toxic by Inhalation

More than 119 gallons in a single container OR More than 1,000 pounds in multiple containers in a single shipment of:

- Anhydrous Ammonia _

Poisonous/Toxic Solids or Liquids with DOT "Poison Label"

More than 119 gallons in a single container OR More than 1,000 pounds in multiple containers in a single shipment of:

- Pesticides/Herbicides (List below) _

Personnel Security

To the extent feasible and practical, references, employment history, and immigration status will be checked for personnel hired after September 25, 2003, who will be responsible for transporting these listed hazardous materials from any supplier to this operation. Personnel responsible for transporting the listed hazardous materials from any supplier to this agricultural operation will be instructed on how to adhere to this security plan.

Unauthorized Access

If it is necessary to stop during transportation of the listed hazardous materials, authorized personnel of this agricultural operation's (operation personnel) will to the extent practical prevent unauthorized persons from gaining access to the shipment by monitoring the shipment during the stop, locking the shipment inside the transport vehicle, securing the shipment to the transport vehicle, and/or securing closures on the container(s) or package(s).

If it is necessary to stop during transportation of the listed hazardous materials, operational personnel will check the vehicle and the shipment after the stop to evaluate whether tampering or illegal activity has taken place.

Operation personnel will report suspicious incidents or events to local law enforcement officials and/or the FBI as soon as is practical, using the contact information supplied below.

Local Police:
Local Fire/Emergency Rescue/HazMat Response:
Nearest FBI Field Office:

Security During Transport

Operation personnel will to the extent practical minimize transit time for the listed hazardous materials by going directly from the supplier to the operation.

Operation personnel will report suspicious incidents or events to local law enforcement officials or the FBI as soon as is practical, using the contact information supplied above.

For your records and personnel use, keep a copy of this plan in an accessible, but secure location at the agricultural operation.

Prepared By: _____ **Date:** _____

Revised/Edited/Reviewed by: _____ **Date:** _____

Appendix C

Instructors Planning Points, Notes, and Quizzes and Quiz Answer Keys

Instructors:

When planning your training, consider the following:

- Contact your propane supplier to assist you or to serve as a reference as necessary.
- Check to ensure that required personal protective equipment is available for use during training and on the job.
- Check the equipment for proper placards and warning decals and review them with attendees.

  √ Refer to Appendix B for a suggested list of placards for use on tanks and connected dispenser equipment.

- Obtain copies of consumer safety education brochures from your propane supplier to verify that all individuals can detect the odorant used in propane and for other important safety points.
- Arrange to have the equipment available for hands-on demonstrations and completing skill assessments with attendees.

The anticipated time required for presenting this material to individuals who will be filling propane tanks permanently mounted on agricultural equipment from stationary and/or portable dispensing equipment is approximately two hours.

- Note: This time can vary depending on the knowledge and/or experience of individuals and the number of hands-on exercises implemented to demonstrate proper procedures.

Each individual who will be filling propane tanks shall be given a copy of this manual for their personal use during the training session and as a future reference manual.

A quiz (Documentation of Training) is located in the back of each manual.

- This quiz is to be completed by the attendee receiving the manual at the end of the training session.
- This quiz must be corrected and signed by both the attendee and the instructor to verify the individual's qualifications to properly transfer propane into tanks on agricultural equipment.
- This quiz has been designed for removal to allow for retention by the employer as documentation of training. It is suggested that the individual also retain a copy for his or her own records.

This Safety Quiz (Documentation of Training) should be placed in your training file at your place of employment. It is also recommended that you keep a copy for yourself.

Name (Print):_____ Date: _____

Name (Signature): _____

Supervisor's Name (Print): _____

Supervisor's Signature: _____

Choose the most correct answer to each question and write the answer in the blank or place the letter on the line by the number.

____ 1. There are specific training requirements for individuals who transfer propane listed in the ____.

A. Federal Highway Code
B. National Fire Protection Association 58
C. U.S. Propane Dispensing Code
D. National Fuel Gas Code

____ 2. Codes require that individuals who transfer propane receive initial training before they perform any unsupervised propane transfer and receive refresher training every ____.

A. 3 years
B. 2 years
C. 1 year
D. 5 years

____ 3. By law a(n) ____, must be available and accessible to all employees in the workplace where that hazardous material is transferred, stored, or used.

A. Flammability report
B. Odorization record
C. Evacuation plan
D. Material Safety Data Sheet (MSDS)

____ 4. ____ is added to propane to increase the likelihood that a propane leak will be detected.

A. Moisture
B. An identifying color
C. Additional vapor
D. Odorant

____ 5. In order to allow for liquid expansion, propane containers are typically filled to approximately ____ percent of their capacity.

A. 60
B. 80
C. 85
D. 90

____ 6. When propane liquid is released into the air, it quickly vaporizes, expanding ____ times its original volume.

A. 44
B. 120
C. 312
D. 270

____ 7. Gloves and other personal protective equipment are required when filling containers because of the ____ of liquid propane.

A. Refrigerating effects
B. Vaporization rate
C. Expansion properties
D. Toxicity

____ 8. Propane is nontoxic, however, if released into a confined area it will displace air.

A. True
B. False

____ 9. Propane vapor is ____ than air and will accumulate in ____ areas when released into the atmosphere and little or no wind is present.

A. Heavier; Low
B. Lighter; Low
C. Lighter; Higher
D. Heavier; Higher

____ 10. When a leak is discovered and it is safe to do so, the equipment should ____.

A. Be operated until the current tank is filled
B. Immediately be shut down
C. Only used when the wind is blowing
D. Only be used if downwind from any sources of ignition

____ 11. In an emergency where there is a propane fire, flames should not be extinguished unless the propane supply can be ____.

A. Turned on
B. Shut off
C. Replenished
D. Recharged

____ 12. Each dispensing location shall have an accessible, approved portable fire extinguisher having a minimum capacity of __ lbs. of dry chemical with a ____ rating.
A. 18 – I:B:C
B. 20 – B:C
C. 10 – A:B
D. 18 – B:C

____ 13. NFPA 10 requires ____ visual inspections of all fire extinguishers and the display of a tag documenting the last annual inspection.
A. Daily
B. Weekly
C. Monthly
D. Annually

____ 14. When the operator is not in attendance, the propane dispenser should be _____.
A. Maintained and lubricated
B. Shut down and secured
C. Calibrated and cleaned
D. Open to the public

____ 15. Each time prior to operating a dispenser, a _____ should be performed by the operator, to check that it is safe for use.
A. Written safety inspection
B. Ten-point fire inspection
C. Routine visual inspection
D. Pressure test

____ 16. During transfer operations, smoking, open flames, portable electrical tools, extension lights within ____ feet of the tank being filled shall be eliminated.
A. 10
B. 15
C. 35
D. 25

____ 17. Typical personal protective equipment required during propane transfer includes vinyl gloves resistant to the actions of propane and ____.
A. Torso protection
B. Eye/Face protection
C. Foot protection
D. Shin guards

____ 18. During a pre-transfer routine visual inspection, if any deficiencies exist, ____.
A. Immediately correct them or have them corrected before transferring propane
B. Only use the equipment if you must get the tank filled
C. Be careful while operating the equipment
D. Have someone assist you with the transfer

____ 19. Prior to filling, ASME tanks are required to be visually inspected to ensure they are ____, adequately painted, properly secured, and fitted with all required valves and gauges.
A. Properly sized
B. Certified by DOT
C. Free of leaks
D. Pressure rated for 375 psig

____ 20. Modern ASME portable tanks built on or after April 1, 2001, are required to have a ____ psi MAWP.
A. 200
B. 250
C. 375
D. 312

____ 21. Where a remote fill for the tank has been installed, a(n) ____ valve is still required at the remote location.
A. Excess flow
B. Pressure relief
C. Maximum fixed liquid level gauge
D. Double back-check fill

____ 22. Prior to connecting the fill hose end valve/adapter to the receiving tank, check that the _____ in the filler valve is in place and is not damaged.
A. Flat gasket or O-ring
B. Back check
C. Dust cap
D. Quick disconnect

____ 23. During tank filling, when a white mist begins to vent from the fixed liquid level gauge, immediately ____ to ensure the tank is not overfilled.
A. Shutoff the pump
B. Close the maximum fixed liquid level gauge
C. Close the supply tank internal valve
D. Close the quick-acting hose-end valve

____ 24. After tank filling is completed, begin to disconnect slowly and do not completely disconnect the hose-end valve/adapter until____.

A. The pump is shutoff
B. The supply tank internal valve is closed
C. The venting propane and/or pressure have dissipated
D. It is time to move the vehicle

____ 25. If gas continues to vent from the hose-end/fill valve, it may be necessary to ____.

A. Remove the hose-end valve/adapter quickly to check the fill valve
B. Reconnect the hose-end valve/adapter then disconnect the hose-end valve from the adapter
C. Reconnect the hose-end valve/adapter and empty the tank to enable repairs
D. Hit the hose-end valve/adapter and fill valve with a hammer to close it

____ 26. After disconnecting the hose-end valve and single check adapter, ____ to ensure that it is not leaking.

A. Check the filler valve on the receiving tank with an approved leak detection solution
B. Install the dust cap and tighten it with a wrench
C. Insert a second gasket or O-ring
D. Put thread locking compound on the dust cap threads

____ 27. To safeguard against unqualified individuals tampering with the propane dispensing equipment, NFPA 58 requires that protection against trespassing and tampering be provided for dispensing equipment ____.

A. From sunset to sunrise
B. When not in use
C. When not in use and/or when no one is present
D. After hours only

____ 28. As an alternative to locking the valves or cabinet, NFPA 58 states that the dispenser shall be fenced with industrial type or chain link fence a minimum of ____ feet high.

A. 3
B. 4
C. 6
D. 10

1-B; 2-A; 3-D; 4-D; 5-B; 6-D; 7-A; 8-A; 9-A; 10-B; 11-B; 12-D; 13-C; 14-B; 15-C; 16-D; 17-B; 18-A; 19-C; 20-D; 21-D; 22-A; 23-D; 24-C; 25-B; 26-A; 27-C; 28-C

Notes

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