



# PROPANE TANKS – ODORANT VERIFICATION

### Propane Tanks in Service / Following Tank Manufacturers Safety Instructions

During the course of handling claims involving propane fires or explosions, there will be an evaluation of how codes and manufacturer's instructions were followed where there is any involvement of installation or servicing of a product. This has become evident when handling incidents involving possible odorant fade. Some propane tank manufacturers have provided safety instructions with their tanks that address odor fade and what safety precautions to take to prevent the reduction of the odorant ethyl mercaptan. Instructions may accompany the propane container, provided when received, online, or a combination thereof. While we continue to address reasons for suspected odorant fade, we want to remind policyholders to pay close attention to safety instructions provided by tank manufacturers. Depending on the circumstances, you may be asked how you followed the manufacturer's instructions. Although in this document we are discussing tank manufacturers, following manufacturer's instruction as well as safety instructions and warnings provided by some propane tank manufacturers.

#### **Contact Information**

Reporting Claims or Loss

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#### Odorant

Ethyl mercaptan is commonly used to odorize propane, so it can be detectable in the event of a leak. As a propane supplier you obtain a product that is odorized and then pass the product on to the consumer or end user. The terminal or facility that adds ethyl mercaptan to propane is required to add at a minimum of 1.0 lb. per gallon. However, many terminals will add 1.5 lbs. per gallon. The bill of lading should show the amount of ethyl mercaptan added. Although the propane supplier or retail marketer is not adding the odorant to the propane, NFPA 58 does have codes for propane retail marketers to adhere to. NFPA 58, §4.2.3 states that the presence of the odorant shall be verified by sniff-testing or other means and the results documented prior to final delivery to the end-use customer. What are some possible options to consider?

- 1 Sniff test documented by transport driver when transferring product to bulk plants.
- 2 Sniff test by bobtail delivery driver when loading the bobtail.
- 3 Sniff test by bobtail delivery driver when filling a customer container.
- 4 Other Means: NFPA 58 in Annex A for §4.2.3 also describes another method that could be used to verify the presence of odorant by using a stain tube test.

It is a benefit to have additional personnel test for the smell of odorant in the propane gas. To have a company representative in the chain of custody test the product for odorant is an added layer of confirmation. In most cases, this will include the transport driver and the end-user. If there is any question of the presence of odorant in a container, we can point to at least three documented sniff tests that once verified the presence of odorant.

#### Scratch N Sniff Safety Brochure

For other members of a household that do not partake in a sniff-test at the container during installation, it is recommended to provide the customer with a safety brochure from PERC that has a scratch and sniff option that identifies the smell of propane gas with odorant to other occupants in the home or business. Your company should have a means to document and verify the customer received this brochure. If there is a claim, having this documentation to show who, when, and the date they were given or sent the safety information will be helpful.

#### Vacuum Purge in Propane Tanks

Many new propane containers come vacuum purged. The suggested method in the Annex of NFPA 58 is to reduce the pressure inside the container to 26" of mercury. The purpose behind vacuum purging is to prevent air and moisture from getting inside the container. Air and moisture are contaminants that can corrode the steel inside the container. New steel will absorb some ethyl mercaptan, but if the steel is corroded or has rust it can degrade the ethyl mercaptan at a higher rate. Some tank manufacturers, and even the PERC Safety Training materials, recommend checking for vacuum in the tank before placing in service. If the tank has lost its vacuum, then the tank should



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be purged per your company policy. Some manufacturers provide recommendations for purging.

CETP training programs in both CETP Bobtail Delivery & CETP Plant Operations specify to follow manufacturer's instructions and also to verify that the cylinder/container has a negative pressure (vacuum).

#### VERIFY PURGING

Many cylinder manufacturers pre-purge the new cylinders by the vacuum method, evacuating the moisture and impurities and leaving the cylinder with a negative pressure. To verify that the cylinder has been purged, read the manufacturer's instructions or information sheets shipped with or attached to the new cylinders.

If you have no manufacturer information, determine if the cylinders were pre-purged and avoid opening cylinder service valves. To determine if the new cylinder was purged, do the following:

- 1. Use a POL test-gauge block fitted with a negative/ positive pressure gauge and plugged outlet.
- 2. Install and seal the pressure block in the cylinder service valve.

Open the service valve and check the pressure-gauge reading. If it is a negative reading, the cylinder was purged. If it is a positive reading, the cylinder requires purging.

Purging is a critical step. If there is any doubt about the vacuum, you must purge the cylinder.



during this procedure. If any air is sucked into the cylinder, you must go through the



#### Methanol Use

Methanol is a product that has been used for many years to reduce the risk of water freezing in the vapor stream, which could interrupt service. Methanol bonds with water molecules in the propane and propane container. It reduces the temperatures at which water will freeze and will burn in the combustion process as methanol it is a flammable product. Adding methanol may be a good safety practice, especially if you live in an area that is subject to freezing temperatures. With that said, there are a couple of propane tank manufacturers that require methanol to be added so you want to pay attention to safety instructions from the company you purchase propane tanks from. How much to add will depend on the manufacturer's recommendations or your company's policy. Below is a table from the Plant Operations CETP training guide on adding methanol. Quality Steel Corporation, for example, refer to the discontinued NPGA Bulletin for adding methanol.



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NPGA Safety Bulletin - 113-89 (Discontinued by the NPGA)

### Methanol Injection Chart -- Suggested Amounts

1 pint of methanol per 100 gallons of container capacity 100# I. C. C. or D. O. T. cylinder add 1/8 pint or 2 fluid ounces

> 100 gallon container add 1 pint 250 gallon container add 2.5 pints 500 gallon container add 5 pints 1,000 gallon container add 10 pints 2,000 gallon container add 20 pints

Below is a guide that can be found in the Propane Education and Research Training Program:

#### **GUIDE FOR USE OF METHANOL WITH PROPANE TANKS**

The table below provides guidelines for the amount of methanol to inject based on the size of the tank. Your company may use different guidelines. Always follow your company policy.

	Methanol to be Added		
Tank Size (gal)	Liquid Oz	Liquid Pints	Pounds
250	12	3⁄4	0.63
500	24	1 1/2	1.25
1,000	49	3	2.5

#### First Fill - Filling to Maximum Filling Capacity

Although there is no specific code requirement for how much propane to put into a container for the initial fill, Quality Steel Corporation and Arcosa, for example, require the propane container to be filled to the maximum allowable filling capacity. Their explanation is to reduce the possibility of odor fade.



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#### Documentation

Should an accident occur, it is always a benefit to confirm that certain procedures or instructions are being followed. Below are a few documentation tips for the subjects in this safety alert.

- Document a sniff test prior to delivery to the end-user.
- Document the verification of the vacuum purge of a container with a vacuum pressure gauge and note the pressure.
- Document the addition of methanol with the date and amount added.
- Delivery ticket records will document the amount of propane added for the first fill.

#### Propane Tank Safety Instruction Examples:

Below are just a few of the safety instructions provided by some propane tank manufacturers with the purchase of their new or refurbished propane containers:

#### **Quality Steel Corporation Instructions**

- Verify vacuum in container upon receipt as being unloaded.
- Do not accept unless the verification of tank condition and vacuum is verified.
  <u>https://qualitysteelcorporation.com/wp-content/uploads/2019/06/Safety-Notice-to-Dealer-Filling-Vacuum-Pre-purged-LPG-Tanks-1.pdf</u>
- Document on the packing slip by each tank serial #:
- If a tank loses its vacuum or if air has been allowed into the container prior to putting into or back into service, purge container per QSC instructions.
- Add methanol to the propane tank according to QSC instructions.
- Document when and how much methanol was transferred into the tank.
- At the time of container installation of a new tank fill the container to maximum filling capacity. <u>https://qualitysteelcorporation.com/wp-content/uploads/2019/06/Safety-Notice-to-Dealer-Service-and-Installation-Personnel-First-Fill-Methanol-UG-Installation-Instructions-1.pdf</u>
- If a container has been out of gas, fill the container to maximum filling capacity.
- If selling a QSC tank to a subcontractor provide the safety instructions designated for the subcontracted propane equipment installer or building contractor.
- Document that the appropriate safety instructions were provided to the subcontractor or building contractor.
- Safety Information for propane gas technician, subcontracted propane equipment installer or building contractor: <u>https://qualitysteelcorporation.com/wp-content/uploads/2019/06/</u> <u>Warning-for-Propane-Technician.pdf</u>
- One of the QSC safety information documents is required to be communicated with the end user of propane tank.
- Safety Information for propane equipment installer, building contractor, and the end user of the propane tank: <a href="https://qualitysteelcorporation.com/wp-content/uploads/2019/06/Warning-for-Customer.pdf">https://qualitysteelcorporation.com/wp-content/uploads/2019/06/Warning-for-Customer.pdf</a>
- Document that all appropriate safety instruction/warning documents are provided to the appropriate parties (i.e. Building, Subcontracted Propane Equipment Installer, and End User)



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- FIRST FILL OF THIS ASME PROPANE TANK: Notice: Do not open any valves or remove any caps before reading these instructions. 1) Verify that a vacuum exists in the tank by connecting a vacuum pressure gauge to the service valve outlet connection and open the hand wheel, if a vacuum is present go to step three. 2) NOTE: If a vacuum is not present, the container must be purged at least four times with propane vapor or problems may develop. 3) Close the service valve and disconnect the vacuum pressure gauge. 4) Add methanol to the propane tank by connecting a hose, with a POL connector, to the POL outlet of the service valve. 5) Submerge the other end of the hose in a safety container that has been filled with the required amount of methanol. 6) Gradually open the service valve and the methanol will be drawn into the tank. 7) To prevent air from getting in the propane tank, close the service valve as soon as the measured amount of methanol has been. removed from the safety container. 8) Disconnect the methanol hose from the POL of the service valve. 9) Connect a propane VAPOR fill hose, with a POL connector, to the POL connector on the service valve. 10) Open the service valve and start filling the tank with propane VAPOR. 11) When the pressure in the tank is equal to that of the tank being used to fill the tank (or if allowing the vapor to free flow and the flow has stopped) close the service valve. 12) Remove the vapor hose from the service valve and then fill the tank with LPG as you normally would through the filler valve, using the fixed maximum liquid level gauge to determine when the tank is full. 13) NOTE: The amount of propane to normalize the vacuum pressure in the tank will vary depending on the volume of the tank.
- Sample tag on a Quality Steel Container:



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#### Arcosa Safety Instructions - Sample Warning Tag





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#### Conclusion

Accidents do happen for a variety of reasons. The best defense is to show you have followed minimum codes and manufacturing instructions.

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