

March 2005 Safety Meeting

Odorization and Contamination Awareness for Propane

Meeting Purpose

To discuss the importance of checking for proper odorant levels and perform work operations that will minimize the risk of odorant fade. Additionally, it's important to be aware of propane contaminants like anhydrous ammonia, hydrogen sulfide and other compounds that could accidentally be introduced by the propane supplier or transporter.

Odorization

As most of you are aware, propane is naturally odorless after it's refined or leaves a natural gas wellhead. To help detect its presence, an odorant is added to the product by the supplier prior to releasing it for transportation. Although it's possible other odorants can be used, ethyl mercaptan is typically used in our industry to odorize propane. Per NFPA 58, the dosage rate for ethyl mercaptan must be at least 1.0 lbs./10,000 gallons of propane. Typically, the industry adds ethyl mercaptan at a rate of 1.5 lbs./10,000 gallons just to be sure that it is properly odorized. Because unodorized propane can't be smelled when it's accidentally released, it presents a risk to employees, customers and members of the general public.

Odorant Fade

Odorant fade is a term used in the propane industry referring to the possibility that odorant within properly odorized propane can lose its distinctive odor through an oxidation process. Oxidation can occur when ethyl mercaptan reacts with air, water and/or rust that is present inside a propane container. Severe odorant fade could make it impossible for someone to detect the presence of propane should it be accidentally released from its container. Typically, odorant fade only occurs when propane is introduced into new containers that haven't been properly purged of air and water. Containers left open to the atmosphere are also candidates for odorant fade. Existing containers in continuous service are not likely to experience odorant fade.

Purging Procedures

The best way to minimize the possibility of odorant fade is to purge all new containers along with those that have been depressurized and left open to the atmosphere. Purging involves properly introducing odorized propane into a container several times. After each introduction of propane vapor, the contents are safely vented to the atmosphere a total of 4 to 5 times. After purging operations are complete, no more than 3% air will be left in the container. REMEMBER to only purge with propane vapor at a pressure of 10-15 psi.

Checking for Odorant

Each time a liquid propane transfer connection is disconnected, it is always a good idea to consciously smell for the presence of odorant. It's also a good idea to check for odorant when performing Gas Check or similar customer system inspections. Propane that has a very weak odor or no odor at all should immediately be reported to your supervisor. Trucks and cylinders that might have received this product must be immediately returned to your facility for testing and further instructions from your supervisor. Customers who received this product must be accounted for and documented in case it is determined the product is defective.

Note: refer to your company's own policies and procedures relative to odorization and be sure to follow them completely.

Other Contaminants

While performing the sniff test mentioned above, be sure to also check for the presence of other compounds such as anhydrous ammonia or hydrogen sulfide. These contaminants can have devastating effects on propane gas systems such as leakage and even failures of piping, fittings and gas control systems. Please be reminded that propane specifications don't allow for any amounts of these products to be in propane.

Checking for the Presence of Anhydrous Ammonia and Hydrogen Sulfide

As its name suggests, anhydrous ammonia smells like ammonia, whereas hydrogen sulfide has a noticeable sulfur smell. You might also notice that brass fittings and adapters are discolored from their normal color. Both anhydrous ammonia and hydrogen sulfide will turn brass fittings green, black or shades of purple. You might also notice pitting and even cracks in severe cases. Usually, it's not hard to detect visually that these containers were filled with a contaminated substance. When in doubt, check it out!!!

Instructor Notes

At this time, the supervisor or trainer should review your company's policies and procedures relative to checking for odorant/contamination and purging. Additionally, documentation specific to your company's procedures should also be discussed.

March 2005 Test

Odorization and Contamination Awareness for Propane

Name: _____

Date: _____

Instructions: Read and answer each of the following questions. When complete, grade the test and review incorrect answers so each employee is “armed” with the correct answers before they leave the training.

1. Purging propane containers should be performed with propane liquid.
 - a. True
 - b. False

2. Anhydrous Ammonia is not detectable through smell.
 - a. True
 - b. False

3. After properly purging a container, there should be no more than _____ % air left inside the container:
 - a. 1
 - b. 3
 - c. 5
 - d. 10

4. Typically, odorant fade is not a problem with propane containers that have never run out-of-gas or been left open to the atmosphere:
 - a. True
 - b. False

5. Ethyl mercaptan is typically added to propane at a rate of _____ lbs. per 10,000 gallons.
 - a. 5
 - b. 10
 - c. 1.5
 - d. 20

6. A propane tank that has been contaminated with anhydrous ammonia will typically turn the filler valve black or some other peculiar color:
 - a. True
 - b. False

7. If you discover that a load of propane is contaminated or unodorized you should:
 - a. complete your deliveries as usual
 - b. only fill your customer's tanks ½ full
 - c. call your supervisor and stop filling containers until the load is checked out.
 - d. make note of your suspicions on the gas ticket but proceed as usual with your deliveries.

**March 2005 Test
Answer Sheet
Odorization and Contamination Awareness for Propane**

1. Purging propane containers should be performed with propane liquid.
False
2. Anhydrous Ammonia is not detectable through smell.
False
3. After properly purging a container, there should be no more than _____ % air left inside the container:
3
4. Typically, odorant fade is not a problem with propane containers that have never run out-of-gas or been left open to the atmosphere:
True
5. Ethyl mercaptan is typically added to propane at a rate of _____ lbs. per 10,000 gallons.
1.5
6. A propane tank that has been contaminated with anhydrous ammonia will typically turn the filler valve black or some other peculiar color:
True
7. If you discover that a load of propane is contaminated or unodorized you should:
call your supervisor and stop filling containers until the load is checked out.