



# Module 4.

## Odorants and Service Interruptions

### INTRODUCTION

During this module, you will learn that propane is naturally odorless and colorless and that a commercial odorant is added to help detect and locate leaks. You'll also learn how odorants play a role in some propane service interruptions.

#### Objectives

**After completing this module, you will be able to:**

- Describe why gas warning agents, also called odorants, are used.
- Verify propane odorant characteristics and describe how to minimize the possibility of odorant fade.
- List possible steps when investigating and responding to a gas leak call.
- Identify an interruption of service.

## Lesson 1. Odorants: Purpose, Characteristics, and Maintenance

### PURPOSE OF ODORANTS

Because propane is naturally odorless and colorless, a commercial odorant is added so propane can be detected if it leaks into the environment.

Although other odorants may be used, the one most commonly used is **ethyl mercaptan**, which is added at the rate of at least **one pound per 10,000 gallons of propane**.

#### Effective Odorization:

- Enables you to detect leaks before gas concentrations in the air reach a flammable level.
- Reduces gas loss through early detection and repair of leaking pipes, fittings, and storage container fixtures.

$$\begin{array}{r}
 1 \text{ lb Ethyl Mercaptan} \\
 + \quad 10,000 \text{ Gallons Propane} \\
 \hline
 = \text{EFFECTIVE ODORIZATION}
 \end{array}$$

## ODORANT CHARACTERISTICS

Odorants have the following characteristics:

- **Odor**—It Stinks. Odorants should be unpleasant, distinctive, readily identifiable as a gas additive, and not like household or other odors in the area.
- **Volatility**—It Stays. The odorant should mix well with liquid propane and vaporize with propane at the same or nearly the same rate.
- **Inertness**—It's Stable. Odorants should be inert, or chemically inactive enough not to bond with, decompose or react with other parts of the gas, or with materials in the distribution system or appliances.
- **Corrosion**—It's Shipshape. Odorants should be non-corrosive under conditions found in gas transmission, distribution, and utilization.
- **Combustion Practices**—It's Spotless. Odorants should burn completely in the gas flame to form products that are not corrosive, irritating, or toxic.



## ADDING ODORANT

Propane is odorized at a refinery, processing plant, or pipeline terminal before it is shipped to the bulk plant. Both NFPA 58 and the Department of Transportation (DOT) set safety standards regulating the addition of odorants.

For safety reasons, a person should be able to smell the odorant even when the concentration of propane is below the **Lower Flammability Limit**, or LFL. Even when there is a slight smell of propane odorant, proper actions must be taken to determine the source.

**All LP-gases must be odorized prior to delivery to the bulk plant.** Pipeline distribution of combustible gas, as well as the transportation of LP-gas by highway, railway, or waterway, must meet minimum transportation safety standards.

→ An exception to the rule states that both organizations' safety codes allow for the shipment and storage of LP-gases without odorization when the LP-gas is used in a manufacturing process that would be adversely affected by the presence of an odorant.



## VERIFYING ODORANT

You can verify that odorant has been added to propane simply by smelling the propane. This is called a sniff test.

According to NFPA 58, a sniff test must be performed and documented whenever a tank car or transport delivers propane to the bulk plant.

Propane marketers may also perform sniff tests when filling cargo tanks and customers' containers.

**NOTE:** Make sure you know your company policies and standard operating procedures for documenting the presence of propane odorant and responding if you suspect propane is not properly odorized.



## PRESERVING ODORANTS

"Odorant fade" doesn't occur in containers that have been in continuous use. However, with new containers, or ones that have been left open to the atmosphere, you must take precautions to maintain odorant integrity.

### Follow these practices to keep odorants from oxidizing and fading:

- Purge air and moisture from the propane container.
- Keep propane containers pressurized when shipping and until installation at customer locations.
- Keep valves closed on containers in storage to prevent moisture in the air from entering the container. This keeps water and rust from building up inside the container.

Familiarize yourself with your company procedures regarding container purging and storage practices.



→ Some containers are now being shipped with a vacuum in them. In other words, manufacturers suck the air and moisture out of the containers right after they're manufactured in an attempt to prevent the inside walls from forming the ferrous oxides (rust) that do the most damage to odorants.

On these containers, you need to make sure that the vacuum seal is not broken until the container is filled with propane.