

**Safety
Talk**

Propane Industry Safety Talks

Propane Characteristics, Combustion, and Odorization



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This document includes *Safety Talks* relevant to *Propane Characteristics, Combustion, and Odorization*. A comprehensive set of all 45 *Safety Talks* is also available.

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PROPANE CHARACTERISTICS, COMBUSTION, AND ODORIZATION SAFETY TALKS

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Safety Talk

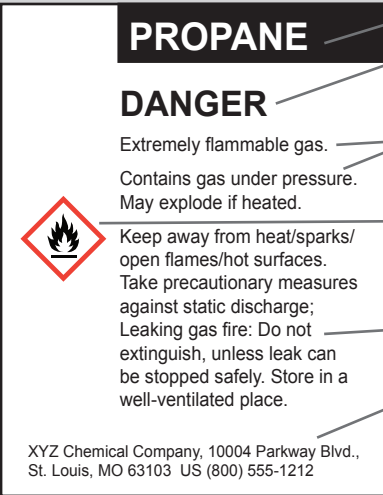
OSHA Requirements for Labels in Revised Hazard Communication Standard

In March 2012, the Occupational Safety and Health Administration (OSHA) updated its *Hazard Communication Standard (HCS)* to become more aligned with the United Nations' *Globally Harmonized System (GHS) of Classification and Labeling of Chemicals*. This Standard requires workers be trained to facilitate their recognition and understanding of the new labels and safety data sheets.

NEW LABEL REQUIREMENTS PROVIDE UNIFORMITY

- ✓ The HCS mandates that information about chemical hazards be conveyed on labels using quick visual notations that provide immediate recognition of hazards. The labels also must provide instructions on how to handle the chemical so that users are informed about how to protect themselves.

Per new OSHA requirements, the following must be included on hazardous materials labels:

	<p>Product identifier: How the hazardous chemical is identified.</p> <p>Signal word: Alerts the reader/user to a potential hazard and indicates the level of severity. There are only two words that are used as signal words, “Danger” and “Warning.” If more than one applies, only the more severe will appear on the label.</p> <p>Hazard statement(s): Describes the nature of the hazard(s) of a chemical, including, where appropriate, the degree of hazard. For example: “Can cause damage to kidneys through prolonged or repeated exposure when absorbed through the skin.” All applicable hazard statements must appear on the label.</p> <p>Pictogram: Graphic symbols used to communicate specific information about the hazards of a chemical. OSHA’s required pictograms must be in the shape of a 90-degree-angled square and include a black hazard symbol on a white background with a red frame sufficiently wide enough to be visible easily.</p> <p>Precautionary statement(s): Recommended measures that should be taken to minimize or prevent adverse effects resulting from exposure to a hazardous chemical or improper storage or handling.</p> <p>Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party: All hazardous chemical labels must include appropriate contact information.</p> <p><i>All information contained on the Hazardous Materials Label must coincide with the information contained on the Safety Data Sheet (SDS) for the chemical.</i></p>
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Illustrative sample only. Not an actual label.

OTHER TYPES OF LABELS

- ✓ OSHA pictograms do not replace the diamond-shaped labels that the U.S. Department of Transportation (DOT) requires for the transport of chemicals, including chemical drums, chemical totes, tanks, or other containers.
- ✓ Companies can continue to use rating systems such as National Fire Protection Association (NFPA) diamonds or Hazardous Materials Information System (HMIS) requirements for workplace labels as long as they are consistent with the requirements of the HCS. It is required that employees have immediate access to the specific hazard information.
- ✓ OSHA requires that all hazardous material containers transported in commerce be labeled according to DOT regulations and include the proper shipping name and material hazard class.
- ✓ For cylinders of 100 pounds propane capacity or less, NFPA 58 requires a warning label that includes information on the potential hazards of propane. Check to determine whether this requirement has been adopted in your jurisdiction.

Discussion Topics

1. Identify labels that are common to the propane industry and your company. Discuss how the new label standards differ from older labels.
2. Discuss the importance of understanding and recognizing all visual and text elements that are included on the labels.

Source: *OSHA Hazard Communication Awareness Training* [PERC]

For more information regarding labeling requirements, visit propanesafety.com.



Safety Talk

Understanding the Safety Data Sheet (SDS) An Integral Part of the Hazard Communications Toolbox

The Occupational Safety and Health Administration (OSHA) recently revised its *Hazard Communication Standard (HCS)* to better align with the United Nations' *Globally Harmonized System (GHS) of Classification and Labeling of Chemicals*. As a result, the Safety Data Sheet (SDS) will be standardized by hazard category to make information easier to locate when working with these materials.

WHAT IS AN SDS?

- ✓ A Safety Data Sheet [SDS], formerly known as a Materials Safety Data Sheet [MSDS], provides information about chemical hazards. Anyone who might come into contact with the chemical should understand potential dangers and how to safely handle the product. Although each SDS may look a bit different, they all must provide the same information. An SDS must explain, in English, how to safely use, handle, and store a hazardous chemical.
- ✓ The SDS must be updated when significant changes are made to the chemical compound or previously unknown health and physical hazards are discovered.

COMMON SECTIONS WITHIN AN SDS:

All SDSs contain the same basic sections, in the following order. Sections 12, 13, 14, and 15 are not enforced by OSHA.

- **Section 1: Identification** — Identifies the chemical on the SDS as well as the recommended uses. Also provides supplier contact information.
- **Section 2: Hazards Identification** — Explains the chemical's hazards and the appropriate warning information associated with those hazards.
- **Section 3: Composition and Information on Ingredients** — Indicates ingredient[s] contained in the product, including impurities and stabilizing additives. This includes information on substances, mixtures, and all chemicals where a trade secret is claimed.
- **Section 4: First Aid Measures** — Describes the initial care that should be given by untrained responders to an individual exposed to the chemical.
- **Section 5: Fire-Fighting Measures** — Provides recommendations for fighting a fire caused by the chemical.
- **Section 6: Accidental Release Measures** — Offers recommendations on the appropriate response to spills, leaks, or releases, including containment and cleanup practices, to prevent or minimize exposure to people, properties, or the environment.
- **Section 7: Handling and Storage** — Delivers guidance on the safe handling practices and conditions for safe storage of chemicals. Because many workplaces have different storage considerations and hazards on site, be sure to read your company-specific SDS for the chemical you will be working with.
- **Section 8: Exposure Controls/Personal Protection** — Indicates the exposure limits, engineering controls, and personal protective measures that can be used to minimize worker exposure. NOTE: You should always consult your company's PPE policy for any further instructions.
- **Section 9: Physical and Chemical Properties** — Identifies the physical and chemical properties associated with the substance or mixture.
- **Section 10: Stability and Reactivity** — Covers the reactivity hazards of the chemical and chemical stability information.
- **Section 11: Toxicological Information** — Identifies toxicological and health effects information or indicates that such data are not available.
- **Section 12: Ecological Information** — Helps evaluate the environmental impact of the chemical[s] if it were released to the environment.
- **Section 13: Disposal Considerations** — Offers guidance on proper disposal practices, recycling, or reclamation of the chemical[s] or its container, and safe handling practices.
- **Section 14: Transport Information** — Delivers guidance on classification information for shipping and transporting of hazardous chemical[s] by road, air, rail, or sea.
- **Section 15: Regulatory Information** — Identifies the safety, health, and environmental regulations specific for the product that are not indicated elsewhere on the SDS.
- **Section 16: Other Information** — Indicates when the SDS was prepared or when the last known revision was made. The SDS may also state where the changes have been made to the previous version. You may wish to contact the supplier for an explanation of the changes.

Source: *OSHA Hazard Communication Awareness Training* [PERC]

For more information regarding SDS requirements, visit propanesafety.com.





Safety Talk

Complete Combustion and Carbon Monoxide

The efficient combustion of propane requires a ratio of 1 part propane to 24 parts air. If this ratio is off or equipment is not working properly, propane may not combust completely. Incomplete combustion can be dangerous. It is your job to understand how to detect incomplete combustion and respond swiftly.

SIGNS OF INCOMPLETE PROPANE COMBUSTION:

- Excessive water vapor** — Can be harmful to appliances' venting systems.
- Soot** — Potentially damaging to property.
- Aldehydes** — Toxic gas detectable by a sharp, penetrating odor, a metallic mouth taste, or a burning sensation in the nose and eyes.

If any of these are present, follow your company's guidelines for action.

*Incomplete combustion may also result in the release of **carbon monoxide**.*

Some propane companies handle carbon monoxide detection, while others refer calls to the fire department. If your company does address these issues, use the following guidelines:

WHEN TO CHECK FOR CARBON MONOXIDE AT CUSTOMER LOCATIONS:

Carbon monoxide (CO) can be deadly. However, because CO is odorless and colorless, it can be difficult to detect. Check for CO if any of the following conditions exist:

- A customer complains of chronic headaches or nausea.
- Houseplants are dying.
- There is a chronic odor and the source or cause cannot be located.
- Excessive water vapor forms on cool surfaces in the house.
- The odor of aldehydes is present.

USING PORTABLE CO DETECTORS:

If your company provides portable CO detectors, it is important that you are trained in their use. Always follow manufacturer instructions. Keep in mind:

- Portable CO detectors should be at or close to room temperature before testing the air.
- Samples should not be taken if the air temperature is above 125°F. Thus, it may not always be possible to check flue gases directly without additional equipment.

PLACES TO CHECK FOR CARBON MONOXIDE:

Always test different areas in the house or building to determine the highest CO level.

Tests for CO should occur:

- In the air at head height
- Near gas appliances
- Close to heating ducts
- Near appliance diverters and fire doors on appliances in basements or utility rooms

If an appliance is suspected as the source of CO, it may be turned off before your arrival. Take readings before it is restarted, 1–2 minutes after it is restarted, and 15 minutes after it has been on to ensure accurate CO detection.

Source: *Basic Principles and Practices of Propane* (PERC)

For more information about complete combustion and carbon monoxide, visit propanesafety.com.

Discussion Topics

1. While servicing a dryer, you notice soot around the dryer vent. How do you respond?
2. Your customer asks about carbon monoxide and ways he can protect his family. What safeguards do you recommend?

LEARNING ACTIVITY

Have participants stage a mock CO check at their building. Discuss where and how to test, and actions necessary if CO is detected.



Safety Talk

Odor Complaints, Gas Leaks, and Service Interruptions

A customer complaint about a gas odor requires prompt attention. A propane leak can exist for a long time without detection. To ensure against potential hazards or downtime, respond to propane odor reports swiftly, and follow your company policy for resolution.

FIELDING ODOR REPORTS:

- ✓ Use your company's policies and procedures when taking a customer odor/gas leak call. This will help you gather the information you need to determine the source and location of a possible leak, and help you give appropriate instructions to the customer.
- ✓ If the propane odor is detected *inside* a building, instruct the customer to immediately put out all smoking materials and other open flames; do not operate lights, appliances, telephones, or cell phones; shut off the gas if it is safe to do so; and leave the area.

AT THE CUSTOMER SITE:

The odor of propane suggests its presence, but cannot signify its concentration. Since you have no way of knowing the potential risk, always follow these precautions:

- ✓ Treat all leak reports as propane gas, until proven otherwise.
- ✓ Keep the area clear of open flames and electric sparks; do not turn on electrical switches, cell phones, or flashlights in the area.
- ✓ Use NFPA 54's three-minute leak test (www.nfpa.org), or your company's preferred leak-detection methods. Be aware of any other state and local guidelines that apply, and follow them accordingly.
- ✓ Once you have determined the source and extent of the leak, follow your company's policy and procedures for ways to remedy.

SERVICE INTERRUPTIONS AND REGULATIONS:

Propane delivery interruptions may occur when:

- ✓ Cylinders or containers undergo maintenance or when they are exchanged or repaired.
- ✓ Any changes are made to the gas distribution lines.
- ✓ There is a gas leak.
- ✓ There is an equipment failure or issue with customer payment.

Know the reasons and causes of a service interruption and respond appropriately. It is your job to respond promptly to a service interruption due to an appliance malfunction, a safety shutoff, or a pilot light shutoff.

Discussion Topics

1. Your customer has just had a propane delivery and calls to report an odd smell. How do you respond? What are the key questions asked and information gathered?
2. A customer, who has been dispatched to a number of times, once again complains of a propane odor in his kitchen. How do you respond?

LEARNING ACTIVITY

Simulate an odor complaint call. Have participants take the call and follow your company's policies and procedures. Discuss circumstances where immediate action may be required, and the appropriate steps.

Source: *Basic Principles and Practices of Propane* (PERC)

For more information about odor complaints, visit propanesafety.com.



Safety Talk

Odorants: Purpose, Characteristics, and Maintenance

As a clean energy source, propane is naturally odorless. Thus, to ensure safety in handling propane, a commercial odorant is added. This odorant (most often, *ethyl mercaptan*) enables easy detection of any leaks or potential hazards that may be caused by them.

THINGS TO KNOW ABOUT ODORANTS:

- ✓ **They stink** — Odorants have an unpleasant and distinctive odor to enable them to be readily identifiable. This is often referred to as a “rotten egg” smell.
- ✓ **They are stable** — Propane odorants are inert, so they do not decompose or react with propane or its distribution systems or appliances.
- ✓ **They are non-corrosive** — Odorants are noncorrosive under conditions found in gas transmission, distribution, and utilization.
- ✓ **They are spotless** — Odorants burn completely in the gas flame to form products that are not corrosive, irritating, or toxic.

Propane gas must be odorized prior to delivery to the bulk plant.

VERIFY ODORANTS AT EVERY DELIVERY AND TANK FILLING:

- ✓ Per NFPA 58, you should conduct and document a “sniff test” during any delivery or filling of tanks. This will help determine that the propane is odorized. If the odor seems excessive, this test may indicate that there are leaks or issues at the customer site that need to be remedied.
- ✓ If you suspect propane is not properly odorized, follow your company’s policies for responding.

ADDING OR PRESERVING ODORANTS:

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 during shipping and installation at customer locations.
- ✓ Keep valves closed on units in storage to prevent air moisture from entering the container.

“Odorant fade” does not occur in containers that are in continuous use.

Discussion Topics

1. After delivering propane to a customer site, you detect the smell of propane. Should you dismiss your concern since it could be from the delivery?
2. Discuss company and other practices for documenting propane odorants.

LEARNING ACTIVITY

Assess participants’ ability to detect propane under different circumstances. Discuss methods of detection and which hazards may apply in various scenarios.

Source: *Basic Principles and Practices of Propane* (PERC)

For more information about propane odorants, visit propanesafety.com.



Safety Talk

Verifying Propane Odorization

Because propane is flammable, DOT regulations and NFPA 58 require that propane be odorized before delivery to a bulk plant or when the shipment will bypass the bulk plant. Propane personnel are required to verify the presence of odorant at various times, typically through a “sniff test.” It is essential that you understand how to perform these tests safely and document them for your company.

WHEN PERFORMING A SNIFF TEST, AT TIME OF BULK PLANT DELIVERY:

- Protect yourself by wearing appropriate personal protective equipment (PPE).
- Vent only a small amount of liquid propane.
- Sniff only after the vent is closed and the liquid propane has vaporized.
- Understand your company’s policies and procedures, including how to document the presence of odorant, and what to do if you believe propane is not properly odorized.

WHEN PERFORMING A SNIFF TEST, WHILE LOADING A BOBTAIL:

- After you secure the plant liquid transfer hose to the cargo tank connection and before you fill the cargo tank, briefly open and close the transfer hose end valve.
- Vent a small amount of liquid propane through a #54 vent and then close it.
- Sniff the area immediately after the liquid vaporizes.
- If you can smell propane odorant*, proceed with loading your truck.
- If you cannot smell propane odorant, or smell anything unusual*, do not load the cargo tank. Contact your supervisor immediately and tell others not to load until approved by the facility manager or supervisor.
- Record your sniff test on your loading ticket, daily routing report, or other company form and proceed with the loading operation.

IF YOU CANNOT SMELL PROPANE ODORANT:

In some situations, odorant can oxidize or fade, thus producing a potential hazard. If you cannot detect propane odor via sniff test (or other measure, such as an odorometer), carefully take the following actions:

- Do not load the cargo tank or cylinder.
- Disconnect the transfer hoses and secure them in their storage racks.
- Contact your supervisor immediately.
- Warn others not to load until approved by your supervisor. Your company may also require you to close and tag the withdrawal valves on the storage container so that the propane is not distributed to consumers.

Discussion Topics

1. While loading a bobtail, you detect a smell you do not recognize. What do you do?
2. Discuss company and other practices for documenting propane odorants.

LEARNING ACTIVITY

Secure an odorometer and stain tubes and discuss alternative methods to verify odorant in different situations.

Source: *Propane Delivery Operations and Cylinder Delivery* (PERC)

For more information about verifying propane odorization, visit propanesafety.com.