

To The Point About Flammable Liquid Safety

FACT SHEET

LENGTH: 19 MINUTES

PRODUCTION YEAR: 2026

PROGRAM SYNOPSIS:

All workplaces have hazards, hazards that have the potential to hurt us, make us ill, or even kill us. Flammable liquids are found in many workplaces and can be very hazardous. Understanding and controlling the hazards associated with flammable liquids can prevent injuries, protect property, and even save lives. This program discusses what makes a liquid flammable, where to find information about it on safety data sheets and labels, and how to store, handle, and dispose of flammable liquids.

PROGRAM OBJECTIVES:

After watching the program, the participant will be able to explain the following:

- What is a flammable liquid;
- How to read container labels for flammable categories;
- Information contained on a safety data sheet;
- How to use, handle, and store a flammable liquid;
- How to properly dispose of flammable liquid waste.

INSTRUCTIONAL CONTENT:

INTRODUCTION

- The various job tasks performed by today's workforce are as varied as the seemingly limitless number of workplaces in which those tasks are performed.
- And while each job site, factory, plant, or office is unique, all workplaces share a common trait: the potential for injury.
- Preventing injuries and incidents is the point of our organization's safety, health, and environmental procedures and programs.
- Yes, all workplaces have hazards, hazards that have the potential to hurt us, make us ill, or even kill us. And in our workplace, these hazards include those presented by flammable liquids.
- Understanding and controlling the hazards associated with flammable liquids can prevent injuries, protect property, and even save lives.
- That is the point of our organization's safe work practices related to flammable liquids, and that is the point of this program. So, pay close attention as we get to the point about flammable liquid safety.

WHAT IS A FLAMMABLE LIQUID?

- The term "flammable liquid" is a bit of a misnomer, because it's actually the vapor emitted by the liquid that is flammable, rather than the liquid itself.
- Certain properties of a liquid serve to define its flammability. First is the liquid's flashpoint. The flashpoint is the temperature at which a liquid emits a concentration of flammable vapor that can readily ignite and burn in air.
- Next is the liquid's boiling point. The boiling point is the temperature at which a liquid rapidly turns into a gas at normal atmospheric pressure (one atmosphere).
- When two liquids have the same flashpoint, the liquid with the lower boiling point is far more volatile, meaning it releases flammable vapors at a faster rate, dramatically increasing the risk of a rapid fire or explosion.
- The Globally Harmonized System of Classification and Labeling of Chemicals, commonly known as the GHS, considers any liquid with a flashpoint below 93 degrees Celsius (199.4 degrees Fahrenheit) to be flammable.
- In both the U.S. and Canada, workplace hazardous chemical regulations have been updated to better align with the Globally Harmonized System of the Classification and Labeling of Chemicals.
- Some common examples of flammable liquids include the common fuels of gasoline, diesel, and kerosene, the common alcohols of ethanol, methanol, and isopropanol, and the common solvents of acetone, methyl ethyl ketone, and toluene.
- The flashpoint of many flammable liquids falls into the range of normal ambient temperatures. This means their vapors can easily ignite under normal, everyday conditions. This is why all workers who use, transport, or store flammable liquids must make it a point to do so with extreme caution.

HOW DO I KNOW IF A LIQUID IS FLAMMABLE?

- One way you can learn if a liquid is flammable is by studying the information found on its container label.
- The GHS divides flammable liquids into four categories based on flashpoint and boiling point. The GHS classifies a liquid as Category 1, or "extremely flammable," when it has a flash point below 23 degrees Celsius (73.4 degrees Fahrenheit) and a boiling point less than or equal to 35 degrees Celsius (95 degrees Fahrenheit).

- The container label for a Category 1 flammable liquid will feature the flame pictogram, the signal word “Danger,” and the hazard statement “Extremely Flammable Liquid and Vapor.”
- The GHS classifies a liquid as Category 2, or “highly flammable,” when it has a flash point below 23 degrees Celsius (73.4 degrees Fahrenheit) and a boiling point greater than 35 degrees Celsius (95 degrees Fahrenheit).
- The container label for a Category 2 flammable liquid will feature the flame pictogram, the signal word “Danger,” and the hazard statement “Highly Flammable Liquid and Vapor.”
- The GHS classifies a liquid as Category 3, or “flammable,” when it has a flash point greater than or equal to 23 degrees Celsius (73.4 degrees Fahrenheit) but less than or equal to 60 degrees Celsius (140 degrees Fahrenheit).
- The container label for a Category 3 flammable liquid will feature the flame pictogram, the signal word “Warning,” and the hazard statement “Flammable Liquid and Vapor.”
- And finally, the GHS classifies a flammable liquid as Category 4 when it has a flash point greater than 60 degrees Celsius (140 degrees Fahrenheit) but less than or equal to 93 degrees Celsius (199.4 degrees Fahrenheit).
- The container label for a Category 4 flammable liquid is not required to display the flame pictogram but will display the signal word “Warning” and the hazard statement “Combustible Liquid.”
- By understanding the different meanings of the hazard statements “Extremely Flammable Liquid and Vapor,” “Highly Flammable Liquid and Vapor,” “Flammable Liquid and Vapor,” and “Combustible Liquid,” you can determine just how flammable and how volatile of a liquid you may be dealing with.
- A final point about labels: When a secondary container is used to hold a flammable liquid and that container may be either used by more than one employee, left unattended, or used over more than one shift, it must be labeled with the chemical’s name or other product identifier and words and/or symbols that convey its physical and health hazards.
- However, if the same employee who fills the secondary container always keeps it under his or her direct control and uses it up within one work shift, the secondary container is not required to be labeled regarding its contents.

WHAT INFORMATION IS FOUND ON A SAFETY DATA SHEET?

- One requirement of hazardous chemical regulations is that a safety data sheet, or “SDS,” be maintained and made available to employees for every hazardous chemical present in the workplace. Each safety data sheet contains 16 sections of specific safety, health, and technical information about a chemical.
- We will now point out a few sections of particular interest to employees working with flammable liquids.
- Section 2 of a safety data sheet contains health hazard information. For example, not only are flammable liquids flammable, but many flammable liquids are acutely toxic, cause serious eye or skin damage, can be harmful to specific organs and/or the nervous system, and can be a serious inhalation hazard.
- First aid measures are found in Section 4 of a safety data sheet. In general, if flammable liquid vapors are inhaled, the victim should be removed to fresh air.
- If a flammable liquid is splashed into the eyes, they should be flushed with water for a minimum of 15 minutes.
- If a flammable liquid contacts the skin, remove affected clothing and flush with water for a minimum of 15 minutes, followed by gentle washing with soap.
- If a flammable liquid is ingested, do not induce vomiting. Rinse the mouth out with water. Seek medical attention after exposure.
- Section 8 of a safety data sheet contains a description of the recommended personal protective equipment to prevent harmful exposure. For example, when there is a risk of being splashed or sprayed by a flammable liquid, safety goggles and a face shield are recommended.
- When skin exposure is possible, appropriate chemical gloves and body protection is recommended.
- Section 8 also lists any applicable exposure limits for airborne vapors or particulates. Appropriate respiratory protection will be required if measured concentration levels exceed the relevant exposure limits.
- Sections 5 and 6 of the safety data sheet contain important information related to emergency response, such as the most effective fire extinguishing media and spill clean-up absorbents.
- For example, flammable liquid fires are considered a Class B fire. A dry chemical extinguishing agent or a carbon dioxide extinguisher are typically recommended. Water should not be used on a Class B flammable liquid fire.
- For cleaning up spills of a flammable liquid, use non-combustible, inert sorbents such as vermiculite, diatomaceous earth, and commercial pads or socks specifically rated for flammable/combustible liquids.
- Safety data sheets contain a wealth of valuable information about a hazardous material. Always review the safety data sheet completely before handling or using a chemical or substance for the first time.

HOW DO I USE, HANDLE, OR STORE A FLAMMABLE LIQUID SAFELY?

- To use, handle, or store a flammable liquid safely, precautions must be taken to keep both the liquid and its flammable vapors contained inside its storage container when not in immediate use.
- This requires that caps, lids, and other means of container closure be immediately replaced and closed securely after each use. To avoid spills or excess accumulation, always return a flammable liquid container to its proper storage location immediately after

use. And material handlers must ensure their intended load is balanced and secure before moving or transporting any flammable liquids.

- For non-bulk storage, flammable liquid storage cabinets commonly called “flammable cabinets” or “fire-proof cabinets” can be used to store up to 60 gallons of Category 1, 2 or, 3 flammable liquids or up to 120 gallons of a Category 4 liquid.
- When stored in bulk, flammable liquids must be kept in indoor fire-resistant rooms or in a detached outdoor building or area.
- Before entering any type of bulk storage area, make sure you understand and follow all safe work practices and requirements. For example, only use non-sparking power tools and non-ferrous hand tools.
- Do not carry cell phones or other non-intrinsically safe electronics into bulk storage areas, and of course, smoking or open flames are strictly prohibited anywhere flammable liquids are stored or used.
- When considering the proper storage of flammable liquids, you must make it a point to understand which other materials may be incompatible with the flammable liquid.
- Some examples of materials that are incompatible with flammable liquids include oxidizers, corrosives, water reactive chemicals, and flammable gases. These materials must not be stored with or near flammable liquids.
- And finally, one of the most critical aspects of flammable liquid safety is preventing any source of ignition.
- When flammable liquids are transferred from one container to another, a buildup of static charge can occur, leading to a spark and possible ignition of flammable vapors. To prevent this, a system of bonding and grounding should be used to prevent the buildup of static charge anytime flammable liquids are transferred.
- The process of bonding and grounding can be defined as providing an electrically conductive pathway between a dispensing container, a receiving container, and a grounding rod driven into the earth, also known as an earth ground.
- When dispensing from a container inside a flammable liquid storage cabinet, the cabinet should be grounded to the earth, the dispensing container bonded to the cabinet, and the receiving container bonded to the dispensing container.
- When fuel transport vehicles or storage tanks are involved, bonding and grounding connections may be built into various hoses and nozzles.
- Make sure you understand the proper connections for the equipment you plan to use, including any indicators that confirm that proper connection has been achieved.
- For bonding and grounding systems to be effective, each bonding and grounding cable must be in good condition, and all connectors must be in solid contact with a conductive surface and free from excessive corrosion or layers of paint.
- This requires periodic inspection and testing by qualified personnel to ensure that a complete low-resistance circuit exists.
- It’s important for us to point out that precautionary statements for the safe handling, use, and storage of any particular flammable liquid may be found on its container label and in Section 2 of its safety data sheet.

HOW DO I DISPOSE OF FLAMMABLE LIQUID WASTE?

- In the United States, the Environmental Protection Agency, or “EPA,” regulates the disposal of hazardous waste under a law commonly known as “RCRA” but officially titled the Resource Conservation and Recovery Act.
- A waste is determined to be a hazardous waste if it is specifically listed by the EPA or if it has any of the characteristics of hazardous waste.
- The EPA considers most flammable liquids to be characteristic hazardous waste due to their ignitability and assigns them a waste code of D001.
- However, many used flammable liquids are also considered to be spent solvents and are found in the EPA’s “F-list” with waste codes F001 thru F005.
- In most cases, flammable liquid waste, or any items contaminated with flammable liquid waste, must be treated as hazardous waste and placed into a container that is labeled “Hazardous Waste,” displays the name of the substance, and provides an indication of its hazards.
- Because the EPA has limits for the length of time hazardous waste may be stored on site, the starting date of accumulation must be marked on hazardous waste labels.
- If a hazardous waste container is to be used for shipping the waste off-site to a hazardous waste disposal facility, the appropriate EPA waste code must also be placed on the container label.
- If you work with, handle, or dispose of flammable liquids, make it a point to understand and follow the waste labeling, accumulation, and disposal procedures required by your organization.
- One final point about disposal: Never dispose of flammable liquid waste, or any hazardous waste, down any type of drain or storm drain, onto the ground, or into any unapproved or unlabeled containers.

SUMMARY AND CONCLUSION

- In this program, we have pointed out various hazards related to flammable liquids and discussed safe work practices to prevent injury, incidents, or environmental impact.
- We explained how to identify flammable liquids and where to obtain detailed safety, health, and environmental information related to any specific hazardous material or chemical. We also discussed the proper disposal and labeling of flammable liquid hazardous waste.

- Now, it's up to you. Always follow these key points:
- Keep all flammable liquid containers closed and sealed when not in use.
- Return all flammable liquid containers to their proper storage location immediately after use and be sure to segregate flammable liquids from other non-compatible materials.
- Keep all sources of ignition a safe distance from flammable liquids and be sure to utilize proper bonding and grounding techniques when transferring flammable liquids from one container to another.
- And finally, understand that spent flammable liquids are considered hazardous waste and must be placed into an appropriate container that is stored and labeled properly.
- It's important to understand that flammable liquid safety is an important part of our organization's commitment to providing a safe and healthful workplace for you and your coworkers.
- After all, the main point of our organization's safety efforts is to ensure you return home each day safe, healthy, and injury free. Never forget that the person most responsible for your safety is you! And that just may be the most important point of all.

TO THE POINT ABOUT FLAMMABLE LIQUID SAFETY

ANSWERS TO THE REVIEW QUIZ

1. a
2. b
3. a
4. a
5. b
6. b
7. a
8. a
9. a
10. a

TO THE POINT ABOUT FLAMMABLE LIQUID SAFETY
REVIEW QUIZ

The following questions are provided to determine how well you understand the information presented in this program.

Name _____ Date _____

1. A liquid's flashpoint is the temperature at which a liquid emits a concentration of flammable vapor that can readily ignite and burn in air.
 - a. True
 - b. False
2. The GHS classifies a liquid as Category 2 when it has a flash point below 10 degrees Celsius (50 degrees Fahrenheit).
 - a. True
 - b. False
3. The GHS divides flammable liquids into four categories based on flashpoint and boiling point.
 - a. True
 - b. False
4. The container label for a Category 3 flammable liquid will feature the flame pictogram.
 - a. True
 - b. False
5. First aid measures are found in Section 6 of a safety data sheet.
 - a. True
 - b. False
6. If a flammable liquid is ingested, induce vomiting.
 - a. True
 - b. False
7. When stored in bulk, flammable liquids must be kept in indoor fire-resistant rooms or in a detached outdoor building or area.
 - a. True
 - b. False
8. To prevent a buildup of static charge, a system of bonding and grounding should be used any time flammable liquids are transferred.
 - a. True
 - b. False
9. A waste is determined to be a hazardous waste if it is specifically listed by the EPA or if it has any of the characteristics of hazardous waste.
 - a. True
 - b. False
10. If a hazardous waste container is to be used for shipping the waste off-site to a hazardous waste disposal facility, the appropriate EPA waste code must also be placed on the container label.
 - a. True
 - b. False