

Lesson Plan
General Industry Training Program (10-hour)

Topic: Flammable Liquids

Overview of the OSHA Standard

This standard applies to the handling, storage and use of flammable liquids with a flashpoint at or below 199.4 degrees F (93 degrees C). There are two primary hazards associated with flammable liquids: explosion and fire. In order to prevent these hazards, this standard addresses the primary concern of design and construction, ventilation, ignition sources and storage.

Step 1: Planning the Lesson

➤ **Instructional Materials**

1. PowerPoint presentation
2. Instructor notes
3. Other materials

➤ **Instructional Objectives**

1. Complete the required topics for the OSHA 10-hour course
2. Complete the following optional topics:
 - a.
 - b.
 - c.
3. Present Flammable Liquids to [number] participants
4. Incorporate active participation in each lesson
5. Provide a quiz or short evaluation at the end of the course
6. Ensure feedback from participants at various points in the training

➤ **Guest Speakers/Presenters and Topics/Responsibilities**

Step 2: Presenting the Lesson

➤ **Lesson Introduction**

Introductory remarks or transition from previous lesson

➤ **Learning Objectives/Outcomes**

Given an introduction to flammable liquids, participants will be able to:

1. Define flash point and flammable liquid

Possible responses

- The flash point is the minimum temperature at which a liquid gives off vapor within a test vessel in sufficient concentration to form an ignitable mixture with air near the surface of the liquid
- Flammable liquids means any liquid having a flashpoint at or below 199.4 degrees F (93 degrees C)

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2. Explain two ways to avoid explosion or fire.

Possible responses

- Practice safe handling, storage, fire control and ventilation
- Ensure flammables are properly stored
- Always handle and transfer flammable liquids using proper containers; or through proper transfer systems that employ a safety faucet, a safety pump, or a closed piping system

3. Explain four potential sources of ignition.

Possible responses

- Open flames
- Smoking
- Static electricity
- Cutting and welding
- Hot surfaces
- Electrical and mechanical sparks
- Lightning

4. Identify actions that apply to the good plan for safe use of flammable liquids

Possible responses

- Control of ignition sources
 - a. Identify sources of ignition
 - b. Always use bonding and grounding when transferring flammable liquids into/from containers
 - c. Always provide adequate ventilation to reduce the potential for ignition
- Proper Storage
 - a. Identify compatible chemicals
 - b. Isolate and separate incompatible materials
 - c. Ensure storage doesn't limit safe egress
 - d. Store in proper area, cabinet, or container
 - e. Label storage areas/cabinets
 - f. Store waste and residue in covered containers and dispose of daily

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- Fire Control
 - a. Ensure proper hoses, fire extinguishers or other fire control devices are available where flammable liquids are stored
 - b. Do not permit flames or smoking in areas where flammable liquids are stored
 - c. Store materials that react with water in a room separate from flammable liquids

- Safe Handling
 - a. Carefully read the manufacturer's label on the flammable liquid container before storing or using it
 - b. Practice good housekeeping in flammable liquid storage areas
 - c. Clean up spills immediately, and then place the cleanup rags in a covered metal container
 - d. Only use approved metal safety containers or original manufacturer's container to store flammable liquids
 - e. Keep the containers closed when not in use and store away from exits or passageways
 - f. Use flammable liquids only where there is plenty of ventilation
 - g. Keep flammable liquids away from ignition sources such as open flames, sparks, smoking, cutting, welding, etc.

Planned Activities, Discussion or Participant Interaction

Step 3: Evaluating Student Learning and Instruction

Lesson Evaluation and Comments

References

OSHA Standard

- 29 CFT 1910.106 Subpart H – Flammable Liquids
 - https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9752

OSHA Publications

- 3088 How to Prepare for Workplace Emergencies and Evacuations
 - <https://www.osha.gov/Publications/osha3088.pdf>

OSHA References/Resources

- OSHA's Small Business Outreach Training Program, Flammable Liquids
 - https://www.osha.gov/dte/outreach/generalindustry/generalindustry_procedures.html
- OSHA Technical Links – Ventilation
 - <https://www.osha.gov/SLTC/ventilation>
- Self-Inspection Checklists
 - <https://www.osha.gov/Publications/smallbusiness/small-business.html>