



## Flammable and combustible liquids

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### Real life

Janice finished using a heat gun to dry printing on a bag. She placed the heat gun on a stool near her work table, approximately 10 inches from a can of spray adhesive. The can exploded, seriously burning Janice.

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## Summary

Flammable and combustible liquids (e.g., fuels, solvents, thinners, adhesives, and paints) are common in the workplace. Employers and employees alike must be aware of the hazards and safety requirements for using and storing flammable and combustible liquids.

## Why it's important to supervisors

If you or your workers are involved in storage, transfer, use, or disposal of flammable/combustible liquids, you need to be aware of important safety information and follow your company's established procedures. **Note:** This chapter discusses some basic issues; however, the requirements for flammable/combustible liquids is very complex and varies depending on the work environment and situations.

## OSHA regulations

29 CFR 1910.106 — Also state and local fire codes may apply.

## The basics

### Health and physical hazards

While we may think of fires and explosions as being the only hazards with flammable/combustible liquids, the fact is, these liquids also pose health hazards. For example, skin contact could cause reddening or drying. Also, if these liquids are inhaled, a person may experience dizziness, nausea, or headaches. Workers can also experience irritation of the respiratory tract.

## Line Supervisor Safety Handbook

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For some liquids, more severe symptoms can include anything from confusion, to organ damage, to coma and to death. Always study the liquid's material safety data sheet (MSDS) before allowing worker contact with flammable liquids.

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### Supervisor tip

For more information on MSDSs, see the Hazard Communication chapter in this Handbook

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### Different classes

Flammable and combustible liquids are divided into “classes” according to their flashpoints. (“Flashpoint” means the lowest temperature at which a liquid can form an ignitable mixture (vapor) with air.) Flammable and combustible liquids vaporize and form flammable mixtures when containers are left open, leaks or spills occur, or the liquids are heated. Vapor mixed with air can ignite with exposure to a spark or a flame.

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### Supervisor tip

The difference between a “flammable” and a “combustible” liquid is the ease (temperature) with which the substance burns or supports burning and is a measure of its potential hazard.

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Flammable liquids have a flashpoint below 100° F and are Class IA, Class IB, or Class IC.

Combustible liquids have a flashpoint at or above 100° F and are Class II or Class III.

Knowing the “class” plays a big role in how to store chemicals. This information may be on the MSDS.

### Storage requirements

OSHA limits the amount of flammable and combustible liquids that can be stored in various types of containers to include glass, approved plastic, and metal containers; safety cans; metal drums; and approved portable tanks. The following table is from the OSHA regulations.

**Container size limits**

Container type	Flammable liquids			Combustible liquids	
	Class IA	Class IB	Class IC	Class II	Class III
Glass or approved plastic	1 pt	1 qt	1 gal	1 gal	1 gal
Metal (other than DOT drums)	1 gal	5 gal	5 gal	5 gal	5 gal
Safety cans	2 gal	5 gal	5 gal	5 gal	5 gal
Metal drums (DOT specifications)	60 gal	60 gal	60 gal	60 gal	60 gal
Approved portable tanks	660 gal	660 gal	660 gal	660 gal	660 gal

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Other storage requirements include:

- **Storage cans** must be approved by the Department of Transportation or a nationally recognized testing laboratory. Storage cans may be either metal or plastic and must have a capacity of five gallons or less.
- **Storage cabinets** must be labeled “Flammable, Keep Fire Away.” You cannot store more than 60 gallons of Class I or II liquids or more than 120 gallons of Class III liquids in a **storage cabinet**. This includes aerosol cans.

Rules for storage of flammables and combustibles **inside buildings** vary depending on the class of liquid, the type of building, type of occupancy, protective systems (fire sprinklers), types of containers, and other factors.

An **inside storage room** permits you to store larger quantities of flammable and combustible liquids than other methods. OSHA has specific requirements for the design and construction of inside storage rooms. You have to take into consideration wiring, ventilation, and configuration of stored containers.

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### Supervisor tip

Check with your safety manager for approved storage methods for your area.

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### *Incidental inside storage*

If you store or use flammable or combustible liquids that are incidental to your work or process, you can have the following quantities of materials (opened or unopened) outside of specially built storage rooms or cabinets:

- Class IA — 25 total gallons in containers
- Class IB, IC, II or III — 120 total gallons in containers
- Class IB, IC, II or III — 660 total gallons in a single portable tank

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### Supervisor tip

Work with your safety manager to develop adequate use/inventory procedures.

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### Outside storage

Storing flammables and combustible liquids outside vary depending on the class of liquid, types of containers, amount stored, distance from streets and other property and other factors.

Check with your safety manager for guidance on outside storage locations.

### Transferring flammables and combustibles

The transfer or dispensing of flammable and combustible liquids requires special preparation and caution. The movement of liquid from one container to another can cause static electricity, increasing the chance of ignition or explosion caused by a spark. When dispensing Class I liquids into portable containers, the containers must be electrically interconnected. To do this, you need to be aware of two terms: