

# Flammable and Combustible Liquids – Storage

**From 2007-2011, municipal fire departments responded to more than 51,000 fires caused by flammable gas ignition. Another 160,000 fires were caused by the ignition of flammable or combustible liquids. These fires alone caused 622 deaths, 4,939 injuries, and more than \$2.1 billion in direct property damage. Statistics indicate that more than 21% of industrial fires and 15% of office fires start with the ignition of a flammable or combustible liquid.**



Explosion and fire of flammable vapors emitted from liquids is a primary hazard. Flammable vapors are typically invisible and can collect in areas with ignition sources. The vapors can be conveyed great distances from their source. Ordinary electrical fixtures, light bulbs, and heating pipes are all potential ignition sources. The danger of an explosion can be controlled with safe storage and handling procedures. Controls suitable for the type, quantity, and conditions are essential due to the inherent danger with these substances.

First, let's discuss what a combustible and flammable liquid is. A combustible liquid is any liquid having a flash point at or above 100 degrees F (37.8 degrees C).

**Combustible liquids** are divided into three classes:

| Class      | Flashpoint          | Examples  |
|------------|---------------------|---|
| Class II   | >100° F and <140° F | Diesel Fuel, Fuel Oil, Kerosene   |
| Class IIIA | >140° F and <200° F | Furfural, Linseed Oil, Mineral Oil, Oil-Based Paints, Home Heating Oil, Pine Oil            |
| Class IIIB | >200° F             | Ethylene Glycol, Glycerine, Lubricating Oil, Transformer Oils, Cooking Oil, Hydraulic Fluid |

When a combustible liquid is heated within 30°F (16.7°C) of its flash point, it should be handled in accordance with the requirements of the next-lower class of liquids.

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Per NFPA30a, flammable liquid is a liquid that has a flash point below 100 degrees F (37.8 degrees C). An exception would be any mixture that has components with flashpoints of 100 degrees F or higher, the total of which make up 99% or more of the total volume of the mixture. Flammable liquids are known as Class I liquids. Class I liquids are divided into three classes:

| Class    | Flashpoint         | Boiling Point      | Examples  |
|----------|--------------------|--------------------|---|
| Class IA | <73° F             | <100° F            | Ethyl ether, heptane, pentane, propylene oxide, vinyl chloride                                |
| Class IB | <73° F             | >100° F            | Acetone, ethanol, gasoline, isopropyl alcohol, methanol, methyl ethyl ketone, octane, toluene |
| Class IC | >73° F and <100° F | All boiling points | Isobutyl alcohol, mineral spirits, styrene monomer, turpentine, xylene                        |

### Storage without a cabinet or storage room

Storage of flammables or combustibles should be segregated from potential ignition sources to reduce the potential for loss. You can store flammables in a flammable liquid storage cabinet, flammable liquid storage room, or an outside warehouse. You're allowed to keep some flammables outside of a storage cabinet or room, but it cannot be greater than a one-day supply. This chart illustrates the maximum quantities you're able to keep outside a flammable storage cabinet.

#### Maximum quantities *outside* a flammable storage cabinet:

|                     | Class               | Quantity       |
|---------------------|---------------------|----------------|
| Flammable Liquids   | IA                  | 30 Gallons     |
|                     | IB and IC           | 120 Gallons    |
|                     | IA, IB, IC Combined | 120 Gallons    |
| Combustible Liquids | II                  | 120 Gallons    |
|                     | IIIA                | 330 Gallons    |
|                     | IIIB                | 13,200 Gallons |

If you exceed these limits of flammable or combustible liquids, you'll need to consider storage in a safety cabinet or storage room.

**For more information about the safe handling, transfer, and storage of flammable and combustible liquids, please also see West Bend Technical Bulletins:** Flammable and Combustible Liquids – Storage Cabinets, Flammable and Combustible Liquids – Storage Rooms, and Grounding and Bonding.