THINK SAFETY

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Flammable and combustible liquids

DEFINITIONS

To understand OSHA requirements for the safe storage of flammable and combustible liquids, we must begin by defining the two. The flashpoint and boiling point determine the class of a liquid.

A flammable liquid is any liquid having a flashpoint below 100ºF (37.8ºC). An exception is any mixture having components with flashpoints of 100ºF (37.8ºC) or higher, the total of which make up 99 percent or more of the mixture. Flammable liquids are categorized into three groups:

- **Class IA Flammable Liquid**
  Liquids having flashpoints below 73ºF (22.8ºC) and having boiling points below 100ºF (37.8ºC).
  Examples: acetaldehyde, ethyl ether and cyclohexane.
- **Class IB Flammable Liquid**
  Liquids having flashpoints below 73ºF (22.8ºC) and having boiling points at or above 100 F (37.8 C).
  Examples: acetone, benzene and toluene.
- **Class IC Flammable Liquid**
  Liquids having flashpoints at or above 73ºF (22.8ºC) and below 100ºF (37.8ºC).
  Examples: hydrazine, styrene and turpentine.

Flammable and combustible liquids

A combustible liquid is any liquid having a flashpoint at or above 100ºF (37.8ºC). Combustible liquids are divided into two classes:

- **Class II Combustible Liquid**
  Liquids having flashpoints at or above 100ºF (37.8ºC) and below 140ºF (60ºC), except any mixture having components with flashpoints of 200ºF (93.3ºC) or higher, the volume of which make up 99 percent or more of the total volume of the mixture. Examples: acetic acid, naphtha and stoddard solvent.
- **Class III Combustible Liquid**
  Liquids having flashpoints at or above 140ºF (60ºC). Class III liquids are subdivided into two subclasses:
  - Class IIIA Combustible Liquid
    Liquids having flashpoints at or above 140ºF (60 C) and below 200ºF, except any mixture having components with flashpoints of 200ºF (93.3ºC) or higher, the total volume of which make up 99 percent or more of the total volume of the mixture. Examples: cyclohexanol, formic acid and nitrobenzene.
  - Class IIIB Combustible Liquid
    Liquids having flashpoints at or above 200ºF (93.3ºC). Examples: formalin and picric acid. Class IIIB liquids shall include those with flashpoints at or above 200ºF (93.3ºC). This section does not cover Class IIIB liquids. Where the term “Class III liquids” is used in the section, it shall mean only Class IIIA liquids. (Class IIIB is used in this document for reference purposes only.)

Note: When a combustible liquid is heated for use to within 30ºF (16.7ºC) of its flashpoint, it shall be handled in accordance with the requirements for the next lower class of liquids.

Whether a liquid is a Class IB Flammable Liquid or Class IIIA Combustible Liquid is not the only factor you should consider when determining your safe storage needs. You also need to consider ignition temperature, explosive limits (LEL or UEL), vapor pressure, specific gravity and vapor density if you want to design a truly safe storage system.