



**Flammable and Combustible Liquid  
Indoor Storage Rooms  
General Design Guidelines**

**BACKGROUND**

Indoor storage rooms containing flammable and combustible liquids must comply with the guidelines set by both the Flammable and Combustible Liquids Code, NFPA 30, and the Standard Method of Fire Tests of Building Construction and Materials, NFPA 251. This material is of particular importance in health care facilities, where the proper design and maintenance of storage areas are essential to the safety of everyone in the facility.

**TERMINOLOGY**

◆ **Flammable Liquid** - A liquid having a closed cup flash point below 100°F and having a vapor pressure ≤ 40 psia at 100°F.

1. Class IA: Flashpoint < 73°F and Boiling Point < 100°F
2. Class IB: Flashpoint < 73°F and Boiling Point ≥ 100°F
3. Class IC: Flashpoint ≥ 73°F and Flashpoint < 100°F

◆ **Combustible Liquid** - A liquid having a closed cup flash point at or above 100°F.

1. Class II liquids: Flashpoint ≥ 100° and Flashpoint < 140°
2. Class IIIA liquids: Flashpoint ≥ 140° and Flashpoint < 200°
3. Class IIIB liquids: Flashpoint ≥ 200°

**GENERAL ROOM REQUIREMENTS**

◆ Class I (Flammable Liquids) may not be stored in the basement of an establishment. Class II and III liquids (Combustible Liquids) may be stored in a room located in the basement only if that room is protected by an approved automatic sprinkler system (NFPA 30, 4-4.3.5).

◆ Storage rooms for flammable and combustible liquids must comply with the space requirements in the following table:

Is the room sprinkled?	Walls - Fire Resistance Rating (FRR)	(X) - Size of Storage Room (sq. ft.)	Storage Allowed (gals/sq. ft.)
Yes	2 hours	150 < X ≤ 500	10
No	2 hours	150 < X ≤ 500	5
Yes	1 hour	0 < X ≤ 150	4
No	1 hour	0 < X ≤ 150	2



- ◆ Storage
- ◆ Ventilation
- ◆ Flashpoint

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## ***OPENINGS***

- ◆ Openings must be provided with approved self-closing fire doors. These doors must have positive latching. A 45-minute fire door must be provided for a 1-hour enclosure and a 1½-hour door for a 2-hour enclosure (NFPA 30, Table 4-4.2.2).
- ◆ Doors are allowed to remain open during any handling of the storage room supply only if the doors can close automatically in the event of an emergency (i.e., with the use of a self-closer) (NFPA 30, 4-4.2.2).
- ◆ Either curbs or open-grated trenches must be provided to prevent spills from entering other areas (NFPA 30, 4-4.2.7).

## ***STORAGE ORGANIZATION***

- ◆ Most importantly, the storage of any liquid must not obstruct any means of egress (NFPA 30, 4-4.3.1).
- ◆ In every storage room, one clear aisle must be maintained at least 3 feet wide (OSHA 29 CFR 1910.106). However if the room contains any storage racks, a 4 foot aisle must be present between racks (NFPA 30, 4-4.3.3).
- ◆ Wood may be used for shelving only if the wood is at least 1 inch in thickness. It may also be used for racks, scuff boards, and floor overlay (NFPA 30, 4-4.3.2).
- ◆ Containers over 30 gallons must not be stacked one upon the other (OSHA 29 CFR 1926.152).
- ◆ The quantity of liquid that may be located outside a storage room in any fire zone shall not exceed: 25 gallons of Class IA liquids in containers, 120 gallons of Class IB, IC, II, or III liquids in containers, and 660 gallons of Class IB, IC, II, or III liquids in a single tank (OSHA 29 CFR 1910.106).
- ◆ One portable fire extinguisher must be located no more than 10 feet from any indoor storage area (NFPA 30, 4-8.4.1).

## ***VENTILATION***

- ◆ Ventilation exhaust systems for flammable/combustible storage areas can either be mechanical or gravitational (OSHA 29 CFR 1910.106).
- ◆ Mechanical Ventilation Systems
  1. Minimum 6 ACH required.
  2. If ventilation can be directly turned off into the storage room, a switch must be located on the exterior of the room.
  3. This switch should be in series with any room lighting fixtures to ensure adequate ventilation when the room is occupied.
  4. Pilot lights are required to be installed next to the breaker switch if Class I liquids are to be stored.
  5. Room air intake and exhaust outlets must be located on the exterior of the building. Exhaust outlets should also be located away from the air intake to prevent contamination of the fresh supply.
- ◆ Gravitational Ventilation Systems
  1. Minimum 6 ACH required.
  2. Room air intake and exhaust outlets must be located on the exterior of the building. Exhaust outlets should also be located away from the air intake to prevent contamination of the fresh supply.

## ***ELECTRICAL SYSTEMS***

- ◆ Electrical wiring and components in indoor storage rooms with Flammable liquids should be suitable for Class I, Division 2 hazardous locations. Electrical wiring and components to be used within indoor storage rooms of Combustible liquids should be suitable for general purposes only (NFPA 30, 4-4.2.9).