

The Storage of Flammable & Combustible Liquids, Solids and Gases

FIRE CONTROL AREA REGULATIONS

The storage of flammable and combustible liquids, solids and gases are regulated by local, state and federal fire and safety regulations.

[The Massachusetts Building Code 8th Edition](#) and [527 CMR 1.00](#): Chapters 60 & 66 of the Massachusetts Comprehensive Fire safety Code, which regulates the storage of flammable and combustible materials are based on occupancies, specific locations inside a building, fire protection systems and designs, and on the chemical and physical properties of the materials.

- 780 CMR 8th Edition - Chapter 3:00 - Use and Occupancy Classifications - Table 307.7(1)
- 780 CMR 8th Edition - Chapter 4.00 - Special Detailed Requirements Based on Use and Occupancy - Table 414.22

[Boston Fire Prevention Code](#) Article XVI further elaborates on the storage and quantities of flammable and combustible liquids within the city of Boston.

Flammable liquids are classified as Class I liquids. Class I liquids are divided into three classes as follows:

- **Class IA** shall include liquids having flashpoints below 73 deg. F. (22.8 deg. C.) and having a boiling point below 100 deg. F. (37.8 deg. C.).
- **Class IB** shall include liquids having flashpoints below 73 deg. F. (22.8 deg. C.) and having a boiling point at or above 100 deg. F. (37.8 deg. C.).
- **Class IC** shall include liquids having flashpoints at or above 73 deg. F. (22.8 deg. C.) and below 100 deg. F. (37.8 deg. C.).

Classification of Flammable and Combustible Liquids

Boiling Point (°F)	Flammable Liquids		Combustible Liquids		
	BP ≥ 100°F	Class IB Flammable Liquid	Class IC Flammable Liquid	Class II Combustible Liquid	Class IIIA Combustible Liquid
BP ≤ 100°F	Class IA Flammable Liquid				
	FP < 73°F	73°F < FP ≤ 100°F	100°F < FP < 140°F	140°F ≤ FP < 200°F	FP ≥ 200°F
			100°F	140°F	200°F
	Flash Point (°F)				

FLOOR LEVEL	NUMBER OF CONTROL AREAS PER FLOOR	PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA	FIRE RESISTANCE RATING FOR FIRE BARRIERS (IN HOURS)				
Higher Than 9	1	5%	2	5%			
7 - 9	2	5%	2	5%		5%	
6	2	12.5%	2	12.5%		12.5%	
5	2	12.5%	2	12.5%		12.5%	
4	2	12.5%	2	12.5%		12.5%	
3	2	50%	1	50%		50%	
2	3	75%	1	75%	75%	75%	
1	4	100%	1	100%	100%	100%	100%
B1	3	75%	1	75%	75%	75%	
B2	2	50%	1	50%		50%	
Lower than B2 – NO Storage is permitted							

Control Areas: Spaces within a building which are enclosed and bounded by exterior walls, fire walls, fire separation assemblies and roofs, or a combination thereof, where quantities of hazardous materials not exceeding the exempt amounts are stored, dispensed, used or handled

Fire barriers shall include walls and floors as necessary to provide separations from other portions of the building.

Closed System: The use of a solid or liquid hazardous material involving a closed vessel or system that remains closed during normal operations where vapors emitted by the product are not liberated outside of the vessel or system and the product is not exposed to the atmosphere during normal operations; and all uses of compressed gases. Examples of closed systems for solids and liquids include product conveyed through a piping system into a closed vessel, system or piece of equipment.

Restrictions: The head of the fire department may limit the quantity of flammable or combustible liquids, flammable solids or flammable gases that may be kept, stored, manufactured or sold under the authority of the permit to less than that specified in the table, where in his opinion, conditions are such as to warrant his restricting the amount of such fluids, solids or gases.

Basements – NFPA 1 Chapter 66.9.3.6 – **Class 1 liquids** shall not be permitted to be stored in basements as defined in NFPA 527 1.00 Chapter 3 Definitions Chapter 3.3.22 [30: 9.3.5]

Exempt Quantities Allowed Per Control Area 1st Floor

Material	Class	100 % of Exempt Quantity Storage
Combustible Liquid	Class II	120 gal** +
	Class IIIA	330 gal ** +
	Class IIIB	13,200 gal ** +
Cryogenics		45 gal +
Flammable Gas	Gaseous	1000 ft ³ ** +
	Liquefied	30 gal ** +
Flammable Liquids	Class IA	30 gal ** +
	Class IB & Class IC	120 gal ** +
	Combination Flammable Liquid 1A, 1B, 1C	120 gal ** + ^x
Organic Peroxide	UD	1 lbs**
	Class I	5 lbs** +
	Class II	50 lbs** +
	Class III	125 lbs ** +
Oxidizer	Class 4	1 lbs ** z
	Class 3	10 lbs ** +
	Class 2	250 lbs ** +
	Class 1	4000 lbs ** ^y
Oxidizer Gas	Gaseous	1500 ft ³ ** +
	Liquefied	15 gal** +
Unstable (Reactive)	Class 4	1 lbs or 10 ft ³ +
	Class 3	5 lbs or 50 ft ³ ** +
	Class 2	50 lbs or 250 ft ³ **+
	Class 1	N/L
Water Reactive	Class 3	5 lbs ** +
	Class 2	50 lbs ** +

- + Value can be increased up to 100% if **building is equipped throughout with an automatic sprinkler system**
- ** Value can be increased up to 100% when stored in approved cabinets, fume hoods, exhausted enclosures, or safety cans
- X Containing not more than the maximum allowable quantity per control area of Class 1A, 1B or 1C flammable liquid
- Y The permitted quantities shall not be limited in a building equipped with a 100% automatic sprinkler system
- Z Only permitted in buildings with 100% automatic sprinkler protection.

Exempt Quantities Allowed Per Control Area, 2nd Floor and Basement.

Material	Class	75 % of Exempt Quantity Storage
Combustible Liquid	Class II	90 gal ** +
	Class IIIA	247.5 gal ** +
	Class IIIB	9900 gal ** +
Cryogenics		33.75 gal
Flammable Gas	Gaseous	750 ft ³ ** +
	Liquefied	22.5 gal ** +
Flammable Liquids	Class IA	22.5 gal ** +
	Class IB and Class IC	90 gal ** +
	Combination Flammable Liquid 1A, 1B, 1C	90 gal ** + ^x
Organic Peroxide	UD	0.75 lbs **
	Class I	3.75 lbs** +
	Class II	37.5 lbs** +
	Class III	93.75 lbs ** +
Oxidizer	Class 4	0.75 lbs ** z
	Class 3	7.5 lbs ** +
	Class 2	187.5 lbs ** +
	Class 1	3000 lbs ** ^y
Oxidizer Gas	Gaseous	1125 ft ³ ** +
	Liquefied	11.25 gal ** +
Unstable (Reactive)	Class 4	0.75 lbs or 7.5 ft ³ +
	Class 3	3.75 lbs or 37.5 ft ³ ** +
	Class 2	37.5 lbs or 187. ft ³ ** +
	Class 1	N/L
Water Reactive	Class 3	3.75 lbs ** +
	Class 2	37.5 lbs ** +

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- X Containing not more than the maximum allowable quantity per control area of Class 1A, 1B or 1C flammable liquid
- Y The permitted quantities shall not be limited in a building equipped with a 100% automatic sprinkler system
- Z Only permitted in buildings with 100% automatic sprinkler protection.

Exempt Quantities Allowed Per Control Area 3rd Floor and Sub Basement

Material	Class	50 % of Exempt Quantity Storage
Combustible Liquid	Class II	60 gal** +
	Class IIIA	165 gal ** +
	Class IIIB	6600 ** +
Cryogenics		22.5 gal
Flammable Gas	Gaseous	500 ft ³ ** +
	Liquefied	15 gal ** +
Flammable Liquids	Class IA	15 gal ** +
	Class IB and Class IC	60 gal ** +
	Combination Flammable Liquid 1A, 1B, 1C	60 gal ** + ^X
Organic Peroxide	UD	0.5 lbs. **
	Class I	2.5 lbs.** +
	Class II	25 lbs** +
	Class III	62.5 lbs ** +
Oxidizer	Class 4	0.5 lbs ** ^Z
	Class 3	5 lbs ** +
	Class 2	125 lbs ** +
	Class 1	2000 lbs ** ^Y
Oxidizer Gas	Gaseous	750 ft ³ ** +
	Liquefied	7.5 gal ** +
Unstable (Reactive)	Class 4	0.5 lbs or 5 ft ³
	Class 3	2.5 lbs or 25 ft ³ ** +
	Class 2	25 lbs or 125 ft ³ ** +
	Class 1	N/L
Water Reactive	Class 3	2.5 lbs ** +
	Class 2	25 lbs ** +

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- ** Value can be increased up to 100% when stored in approved cabinets, fume hoods, exhausted enclosures, or safety cans
- X Containing not more than the maximum allowable quantity per control area of Class 1A, 1B or 1C flammable liquid
- Y The permitted quantities shall not be limited in a building equipped with a 100% automatic sprinkler system
- Z Only permitted in buildings with 100% automatic sprinkler protection.

Exempt Quantities Allowed Per Control Area 4th – 6th Floors

Material	Class	12.5 % of Exempt Quantity Storage
Combustible Liquid	Class II	15 gal** +
	Class IIIA	41.25 gal ** +
	Class IIIB	1650 ** +
Cryogenics		5.265 gal
Flammable Gas	Gaseous	125 ft ³ ** +
	Liquefied	3.75 gal ** +
Flammable Liquids	Class IA	3.75 gal ** +
	Class IB & Class IC	15 gal ** +
	Combination Flammable Liquid 1A, 1B, 1C	15 gal ** + ^X
Organic Peroxide	UD	0.125 lbs**
	Class I	.625 lbs** +
	Class II	6.25 lbs** +
	Class III	15.625 lbs ** +
Oxidizer	Class 4	.125 lbs ** z
	Class 3	1.25 lbs ** +
	Class 2	31.25 lbs ** +
	Class 1	500 lbs ** ^Y
Oxidizer Gas	Gaseous	187.5 ft ³ ** +
	Liquefied	1.875 gal ** +
Unstable (Reactive)	Class 4	0.125 lbs or 1.25 ft ³
	Class 3	.625lbs or 6.2.5 ft ³ ** +
	Class 2	6.25 lbs or 31.25 ft ³ ** +
	Class 1	N/L
Water Reactive	Class 3	.625 lbs ** +
	Class 2	6.25 lbs ** +

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- ** Value can be increased up to 100% when stored in approved cabinets, fume hoods, exhausted enclosures, or safety cans
- X Containing not more than the maximum allowable quantity per control area of Class 1A, 1B or 1C flammable liquid
- Y The permitted quantities shall not be limited in a building equipped with a 100% automatic sprinkler system
- Z Only permitted in buildings with 100% automatic sprinkler protection.

Exempt Quantities Allowed Per Control Area 7th Floor above

Material	Class	5 % of Exempt Quantity Storage
Combustible Liquid	Class II	6 gal** +
	Class IIIA	16.5 gal ** +
	Class IIIB	660 ** +
Cryogenics		2.25 gal
Flammable Gas	Gaseous	50 ft ³ **
	Liquefied	1.5 gal ** +
Flammable Liquids	Class IA	1.5 gal ** +
	Class IB & Class IC	6 gal ** +
	Combination Flammable Liquid 1A, 1B, 1C	6 gal ** + X
Organic Peroxide	UD	0.05 lbs**
	Class I	.25 lbs** +
	Class II	2.5 lbs** +
	Class III	6.25 lbs ** +
Oxidizer	Class 4	0.05 lbs **
	Class 3	.5 lbs ** +
	Class 2	12.5 lbs ** +
	Class 1	200 lbs ** Y
Oxidizer Gas	Gaseous	75 ft ³ ** +
	Liquefied	.75 gal ** +
Unstable (Reactive)	Class 4	0.05 lbs or 0.5 ft ³
	Class 3	.25 lbs or 2.5 ft ³ ** +
	Class 2	2.5 lbs or 12.5 ft ³ ** +
	Class 1	N/L lbs
Water Reactive	Class 3	.25 lbs ** +
	Class 2	2.5 lbs ** +

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- ** Value can be increased up to 100% when stored in approved cabinets, fume hoods, exhausted enclosures, or safety cans
- X Containing not more than the maximum allowable quantity per control area of Class 1A, 1B or 1C flammable liquid
- Y The permitted quantities shall not be limited in a building equipped with a 100% automatic sprinkler system
- Z Only permitted in buildings with 100% automatic sprinkler protection.