



## Committee Input No. 42-NFPA 33-2016 [ Chapter 8 ]

### Chapter 8 Storage, Handling, and Distribution of Flammable and Combustible Liquids

#### 8.1\* General.

Storage, handling, and mixing of flammable and combustible liquids shall meet all the applicable requirements of NFPA 30 and of this chapter.

#### 8.2 Storage in Process Areas.

##### 8.2.1

The volume of Class I, Class II, and Class IIIA liquids stored in a storage cabinet shall not exceed 454 L (120 gal).

##### 8.2.1.1

The total aggregate volume of Class I, Class II, and Class IIIA liquids in a group of storage cabinets shall not exceed the maximum allowable quantity of flammable and combustible liquids per control area based on the occupancy where the cabinets are located, as set forth in Section 9.6 of NFPA 30. [30:9.5.2]

##### 8.2.1.2

For industrial occupancies, the total aggregate volume of Class I, Class II, and Class IIIA liquids in a group of storage cabinets in a single area shall not exceed the maximum allowable quantity (MAQ) of flammable and combustible liquids per control area for industrial occupancies as set forth in [Table 8.2.1.2](#).

Table 8.2.1.2 Maximum Allowable Quantity of Flammable and Combustible Liquids per Control Area

	<u>Liquid Classes</u>	<u>Quantity</u>		<u>Notes</u>
		<u>L</u>	<u>gal</u>	
Flammable liquids	IA	115	30	1, 2
	IB and IC	460	120	1, 2
	IA, IB, IC combined	460	120	1, 2, 3
Combustible liquids	II	460	120	1, 2
	IIIA	1265	330	1, 2

#### Notes:

(1) Quantities are permitted to be increased 100 percent where all liquids are stored in approved flammable liquids storage cabinets or in safety cans. Where Note 2 also applies, the increase for both notes is permitted to be applied accumulatively.

(2) Quantities are permitted to be increased 100 percent in buildings equipped throughout with an automatic sprinkler system installed in accordance with NFPA 13. Where Note 1 also applies, the increase for both notes is permitted to be applied accumulatively.

(3) Containing not more than the maximum allowable quantity per control area of Class IA, Class IB, or Class IC flammable liquids, individually.

Source: Table 9.6.1 of NFPA 30.

### 8.2.2

The quantity of liquid located in the vicinity of spraying operations but outside of identified storage areas, such as storage cabinets, an inside liquid storage area, or a warehouse or outside of other specific process areas that are cut off by at least a 2-hour fire separation from the spraying operations, shall not exceed the quantity given in either of the following, whichever is greater:

- (1) \* The amount required to supply spraying operations for one continuous 24-hour period
- (2) The aggregate sum of the following:
  - (a) 95 L (25 gal) of Class IA liquids in containers
  - (b) 454 L (120 gal) of Class IB, Class IC, Class II, or Class III liquids in containers
  - (c) 6000 L (1585 gal) of either of the following:
    - i. Class IB, IC, II, or IIIA liquids in metal portable tanks or metal intermediate bulk containers, each not exceeding 3000 L (793 gal)
    - ii. Class II or Class IIIA liquids in nonmetallic intermediate bulk containers, each not exceeding 3000 L (793 gal)
  - (d) Twenty portable tanks or intermediate bulk containers, each not exceeding 3000 L (793 gal) of Class IIIB liquids

[30:18.5.4.1]

### 8.2.3

The quantity of flammable and combustible liquids located in a spray area or in a mixing room adjacent to a spray area shall meet the requirements of Section 8.3.

### 8.3 Mixing.

#### 8.3.1

Dispensing or transfer of liquids from containers and filling of containers, including portable mixing tanks and "pressure pots," shall be done only in a spray area with the ventilation in operation or in a mixing room.

#### 8.3.2

Where the quantities of liquids required or the floor area necessary to provide a suitable mixing room exceeds the limits specified in 8.3.3 through 8.3.6, the mixing room shall meet all applicable requirements of NFPA 30.

#### 8.3.3

Mixing rooms shall meet all of the following requirements:

- (1) Mixing rooms shall meet the construction requirements of Section 5.1.
- (2) The area of a mixing room shall not exceed 14 m<sup>2</sup> (150 ft<sup>2</sup>).
- (3) If more than one mix room is installed, the total quantity of liquids shall not exceed the limits in 8.3.5 or 8.3.6.
- (4) Mixing rooms shall be designed to contain a spill of the contents in the room.
- (5) Mixing rooms shall be provided with continuous mechanical ventilation capable of providing air movement of not less than 0.3 m<sup>3</sup>/min per square meter of floor area (1 ft<sup>3</sup>/min/ft<sup>2</sup>) or 4 m<sup>3</sup>/min (150 ft<sup>3</sup>/min), whichever is greater. The ventilation system shall be in operation at all times.
- (6) The mixing room air make-up system and exhaust system shall remain functioning during any fire alarm condition in accordance with Section 9.3.
- (7) Mixing rooms shall be classified, for purposes of electrical area classification, the same as enclosed spray booths, in accordance with 6.5.4.
- (8) Mixing rooms shall be provided with an approved automatic fire protection system that meets all applicable requirements of Chapter 9.
- (9) Mixing rooms shall be provided with portable fire extinguishers located in accordance with NFPA 10.

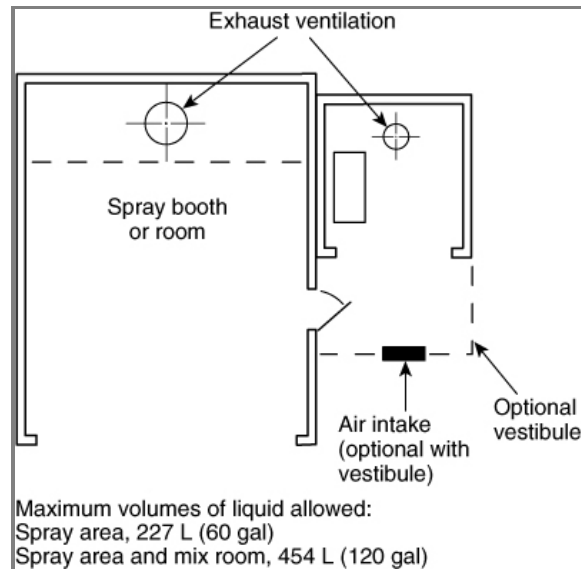
**8.3.4**

The amount of liquid permitted in a single spray area shall not exceed 227 L (60 gal).

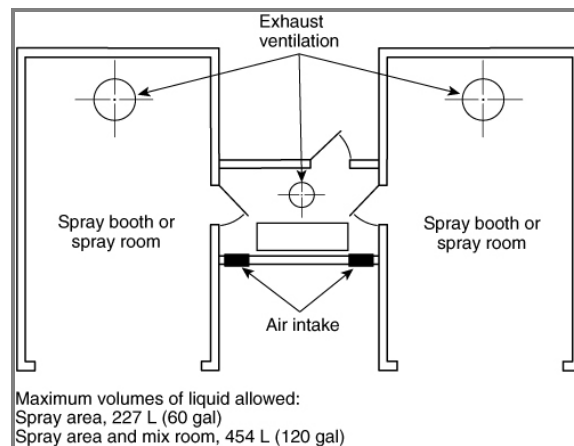
**8.3.5**

Where a separate mixing room is provided and the mixing room is located adjacent to or within 1830 mm (6 ft) of an adjacent spray area or areas, as shown in [Figure 8.3.5\(a\)](#) and [Figure 8.3.5\(b\)](#), the combined quantities of liquids located in the spray areas and the mixing room shall not exceed 454 L (120 gal).

**Figure 8.3.5(a) Mixing Room Within 1830 mm (6 ft) of Spray Area, Including Maximum Volume of Liquid Allowed.**



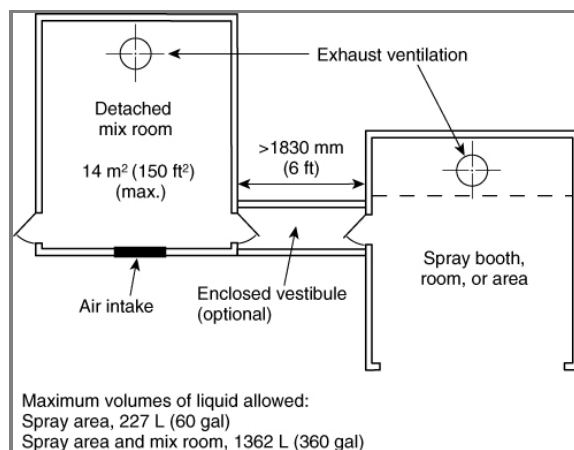
**Figure 8.3.5(b) Mixing Room Within 1830 mm (6 ft) of Spray Area and with Direct Entry to Spray Area, Including Maximum Volume of Liquid Allowed.**



**8.3.6**

Where a separate mixing room is provided and the mixing room is located more than 1830 mm (6 ft) from an adjacent spray area or areas, the quantity of liquid permitted in the mixing room shall not exceed 80 L/m<sup>2</sup> (2 gal/ft<sup>2</sup>), up to a maximum of 1135 L (300 gal), as shown in Figure 8.3.6. The amount of liquid in the spray area shall not exceed 227 L (60 gal).

**Figure 8.3.6 Mixing Room More Than 1830 mm (6 ft) from Spray Area, Including Maximum Volume of Liquid Allowed.**

**8.4 Distribution Systems — Piping.****8.4.1\***

Piping systems that convey flammable or combustible liquids between storage tanks, mixing rooms (paint kitchens), and spray areas shall be of steel or other material having comparable properties of resistance to heat and physical damage. Piping systems shall be properly bonded and grounded.

**8.4.2\***

Piping systems within the spray area shall be of steel or material having comparable heat and physical resistance where possible. Where tubing or hose is used, a shutoff valve shall be provided on the steel pipe at the connection.

**8.4.3\***

Tubing or hose shall be inspected and replaced as necessary. Replacement tubing or hose shall be that recommended by the equipment manufacturer.

**8.4.4**

Where a pump is used to supply the liquid used in the spray application process, piping, tubing, hose, and other accessories shall be designed to withstand the maximum working pressure of the pump, or means shall be provided to limit the discharge pressure of the pump.

**8.4.5\***

Where a pump is used to supply the liquid used in the spray application process, an automatic means shall be provided to shut off the supply of liquid in the event of fire. When pressurized tanks larger than 19 L (5 gal) are used to supply the liquid used in the spray application process, an automatic means shall be provided to shut off liquid flow at the tank outlet in the event of fire.

**8.4.6**

All pressure tubing, hose, and couplings shall be inspected at regular intervals. With the hose extended, the hose and couplings shall be tested using the in-service maximum operating pressure. Any hose showing material deteriorations, signs of leakage, or weakness in its carcass or at the couplings shall be replaced.

**8.5 Distribution Systems — General.****8.5.1**

Liquids shall be transported by means of closed containers, approved safety cans, or approved portable tanks or shall be transferred by means of a piping system. Open containers shall not be used for moving or storing liquids.

**8.5.2\***

Wherever liquids are transferred from one container to another, both containers shall be effectively bonded and grounded to dissipate static electricity.

**8.5.3**

Containers that supply spray nozzles shall be of the closed type or shall be provided with metal covers that are kept closed. Containers that do not rest on the floor shall have supports or shall be suspended by wire cables. Containers that supply spray nozzles by gravity flow shall not exceed 38 L (10 gal) capacity.

**8.5.4**

Original shipping containers shall not be subjected to air pressure for supplying spray nozzles.

**8.5.5**

Containers that are pressurized to supply spray nozzles, air storage tanks, and coolers shall comply with all applicable requirements of the ASME *Boiler and Pressure Vessel Code*, Section VIII, for construction, tests, and maintenance.

**8.5.5.1**

Containers that meet the following requirements need not meet the requirements of the ASME *Boiler and Pressure Vessel Code*, Section VIII, for construction, tests, and maintenance:

- (1) Pressure containers less than 150 mm (6 in.) in diameter
- (2) Pressure containers that operate at less than a gauge pressure of 1.03 kPa (15 psi)
- (3) Siphon-type spray cups

**8.5.6**

If a heater is used to heat the liquid being sprayed, it shall be low-pressure steam, low-pressure hot water, or electric.

**8.5.6.1**

If electric heaters are used to heat the liquid being sprayed, the electric heater shall be approved and listed for the specific location in which it is used. (See *Chapter 6*.)

**8.5.6.2**

Heaters shall not be located in spray booths or other locations subject to the accumulation of deposits of combustible residue.

**8.5.7**

Agitators, if used, shall be driven by compressed air, water, low-pressure steam, or electricity.

**8.5.7.1**

If the agitators are powered by an electric motor, the motor shall meet the requirements of *Chapter 6*.

**8.5.8**

Methods for cleaning paint circulation systems shall meet the requirements of *Chapter 18* of NFPA 30.

**8.5.9**

Compressed air shall be permitted to be used for cleaning paint delivery hose for individual applicators in a spray booth, provided both of the following requirements are met:

- (1) The booth ventilation is operating.
- (2) The maximum air pressure does not exceed the maximum working pressure of any component of the piping or hose system.

**Supplemental Information**

<u>File Name</u>	<u>Description</u>
MtgRev_GAR_Proposal_for_8_3.docx	Draft of 8.3-8.5 as part of revision for Chapter 8.

## Submitter Information Verification

**Submitter Full Name:** Nancy Pearce

**Organization:** [ Not Specified ]

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**City:**

**State:**

**Zip:**

**Submittal Date:** Thu Feb 25 11:06:17 EST 2016

## Committee Statement

**Committee Statement:** A task group has been formed to look at all of Chapter 8 to ensure consistency with NFPA 30 requirements and submit comments for second draft. An attachment shows proposed revisions to 8.3.3-8.3.6 but theCommittee determined that additional changes may be needed therefore the task group plans to review these changes to 8.3 as part of a possible full revision of Chapter 8 to ensure consistency with NFPA 30 and to make the chapter easier to use. .

**Response**

**Message:**

**8.3.3** Mixing rooms shall meet all of the following requirements:

(1) Mixing rooms shall meet the construction requirements of Section 5.1.

(2) The area of a mixing room shall not exceed 14 m<sup>2</sup> (150 ft<sup>2</sup>).

(3) If more than one mix room is installed, the total quantity of liquids shall not exceed the limits in 8.3.5 or 8.3.6.

(4) Mixing rooms shall ~~shall~~ be designed to contain a spill of the contents in the room.

(5) Mixing rooms for dispensing, handling or transfer of Class I liquids shall be provided with continuous mechanical ventilation capable of providing air movement of not less than 0.3 m<sup>3</sup>/min per square meter of floor area (1 ft<sup>3</sup>/min/ft<sup>2</sup>) or 4 m<sup>3</sup>/min (150 ft<sup>3</sup>/min), whichever is greater. ~~The ventilation system shall be in operation at all times.~~

(6) Exhaust air shall be taken from a point near a wall on one side of the room and within 300 mm (12 in.) of the floor, with one or more make-up inlets located on the opposite side of the room within 300 mm (12 in.) of the floor. The location of both the exhaust and inlet air openings shall be arranged to provide air movement across all portions of the floor to prevent accumulation of flammable vapors.

(7) Mix room ventilation shall be in operation at all times that dispensing or transfer of liquids from containers and filling of containers are occurring.

(6) The mixing room air make-up system and exhaust system shall remain functioning during any fire alarm condition in accordance with Section 9.3.

(7) Mixing rooms shall be classified, for purposes of electrical area classification, the same as enclosed spray booths, in accordance with 6.5.4.

(8) Mixing rooms shall be provided with an approved automatic fire protection system that meets all applicable requirements of Chapter 9.

(9) Mixing rooms shall be provided with portable fire extinguishers located in accordance with NFPA 10.

**8.3.4** The amount of liquid permitted in a single spray area shall not exceed 227 L (60 gal).

**8.3.5** Where a separate mixing room is provided and the mixing room is located adjacent to or within 1830 mm (6 ft) of an adjacent spray area or areas, as shown in Figure 8.3.5(a) and Figure 8.3.5(b), the quantity of liquid in the mixing room shall not exceed 80 L/m<sup>2</sup> (2 gal/ft<sup>2</sup>), up to a maximum ~~the~~ combined quantities of liquids located in the spray areas and the mixing room of 454L (120 gal). ~~shall not exceed 454 L (120 gal).~~ The quantity of liquid in the spray area shall not exceed 227 L (60 gal).

**8.3.6** Where a separate mixing room is provided and the mixing room is located more than 1830 mm (6 ft) from an adjacent spray area or areas, the quantity of liquid permitted in the mixing room shall not exceed 80 L/m<sup>2</sup> (2 gal/ft<sup>2</sup>), up to a maximum of 1135 L (300 gal), as shown in Figure 8.3.6. The ~~amount~~ quantity of liquid in the spray area shall not exceed 227 L (60 gal).

**Substantiation:**

Changes are in alignment with requirements of NFPA 30 Chapter 18 Dispensing, Handling, Transfer, and Use of Liquids. Changes also address situation where a small (<60 sq ft) mix room closer than 6 feet can store more paint than the same size room that is further away.

REFERENCE: From NFPA 30 Chapter 18

**18.6 Ventilation for Dispensing Areas.** Liquid storage areas where dispensing is conducted shall be provided with either a gravity system or a continuous mechanical exhaust ventilation system. Mechanical ventilation shall be used if Class I liquids are dispensed within the room.

**18.6.1** Exhaust air shall be taken from a point near a wall on one side of the room and within 12 in. (300 mm) of the floor, with one or more make-up inlets located on the opposite side of the room within 12 in. (300 mm) of the floor.

**18.6.2** The location of both the exhaust and inlet air openings shall be arranged to provide air movement across all portions of the floor to prevent accumulation of flammable vapors.



**Committee Input No. 50-NFPA 33-2016 [ Section No. 11.3 [Excluding any Sub-Sections]**

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All automated electrostatic equipment systems shall comply with the requirements of 11.3.1 through 11.3.11. Spray equipment shall be listed or approved. Spray equipment installed after July 1, 1995 shall be listed.

**Submitter Information Verification****Submitter Full Name:** Nancy Pearce**Organization:** [ Not Specified ]**Street Address:****City:****State:****Zip:****Submission Date:** Thu Mar 17 15:30:43 EDT 2016**Committee Statement****Committee Statement:** Substantiation:

The changes suggested in the Public Input were not incorporated into the document for several reasons. There have been improvements to the safety of unlisted equipment. The Committee is unaware of any known reported major incidents involving unlisted equipment. A task group will be formed to determine if there are incidents with unlisted equipment, whether listing of electrostatic equipment would improve safety and will report back on recommended changes at the second draft meeting.

The Committee agreed there may be a conflict between paragraph 6.4.3. which requires listing and 11.5.2 that allows some spray equipment to be unlisted. The use of unlisted equipment is protected using additional protection systems outlined in Chapter 9.

**Response Message:**

Public Input No. 91-NFPA 33-2016 [Section No. 11.3]