

15.2 Definitions Specific to Chapter 15. (Reserved)

15.3 General Requirements. Outdoor storage of liquids in containers, intermediate bulk containers, and portable tanks shall comply with Table 15.3 and with all applicable requirements of this chapter.

15.3.1 Where two or more classes of liquids are stored in a single pile, the maximum quantity permitted in that pile shall be that of the most hazardous class of liquid present.

15.3.2 No container, intermediate bulk container, or portable tank in a pile shall be more than 200 ft (60 m) from a minimum 20 ft (6 m) wide access way to permit approach of fire control apparatus under all weather conditions.

15.3.3 The distances specified in Table 15.3 shall apply to properties that have protection for exposures as defined. If there are exposures and protection for exposures does not exist, the distance to the property line that is or can be built upon shall be doubled.

15.3.4 Where total quantity stored does not exceed 50 percent of the maximum quantity per pile, as specified in Table 15.3, the distances to a property line that is or can be built upon and to streets, alleys, or public ways shall be permitted to be reduced by 50 percent but in no case to less than 3 ft (0.9 m).

15.3.5 The storage area shall be graded in a manner to divert possible spills away from buildings or other exposures or shall be surrounded by a curb at least 6 in. (150 mm) high.

15.3.5.1 Where curbs are used, provisions shall be made to drain accumulations of groundwater or rainwater or spills of liquids. Drains shall terminate at a safe location and shall flow freely under fire conditions.

15.3.6 When accessible to the public, the storage area shall be protected against tampering and trespassing.

15.3.7 The storage area shall be kept free of weeds, debris, and other combustible materials not necessary to the storage

for a distance of at least 10 ft (3 m) around the perimeter of the stored materials.

15.3.8 The storage area shall be permitted to be protected from the weather by a canopy or roof that does not limit the dissipation of heat or dispersion of flammable vapors and does not restrict fire-fighting access and control.

15.4 Outdoor Storage Adjacent to a Building.

15.4.1 A maximum of 1100 gal (4160 L) of liquids in containers, intermediate bulk containers, or portable tanks shall be permitted to be stored adjacent to a building under the same management, provided the following conditions apply:

- (1) The adjacent building wall has an exterior fire resistance rating of 2 hours.
- (2) The adjacent building wall has no openings at grade or above grade that are within 10 ft (3 m) horizontally of the storage.
- (3) The adjacent building wall has no openings directly above the storage.
- (4) The adjacent building wall has no openings below grade within 50 ft (15 m) horizontally of the storage.

15.4.2 The provisions of 15.4.1(1) through 15.4.1(4) shall be permitted to be waived, subject to the approval of the authority having jurisdiction, if the building in question is one story, is of fire-resistive or noncombustible construction, and is devoted principally to the storage of liquids.

15.4.3 The quantity of liquid stored adjacent to a building that meets the conditions of 15.4.1(1) through 15.4.1(4) shall be permitted to exceed that permitted in 15.4.1, provided the maximum quantity per pile does not exceed 1100 gal (4160 L) and each pile is separated by a 10 ft (3 m) minimum clear space along the common wall.

Table 15.3 Storage Limitations for Outside Storage

Liquid Class	Containers		Portable Tanks and Metal IBCs		Rigid Plastic and Composite IBCs		Minimum Separation Distance (ft)		
	Maximum Quantity per Pile (gal) ^{a,b,c}	Maximum Storage Height (ft)	Maximum Quantity per Pile (gal)	Maximum Storage Height (ft)	Maximum Quantity per Pile (gal) ^{a,c}	Maximum Storage Height (ft)	Between Piles or Rack Sections	To Property Line That Is or Can Be Built Upon ^{b,d}	To Street, Alley, or Public Way ^b
IA	1,100	10	2,200	7	NP	NP	5	50	10
IB	2,200	12	4,400	14	NP	NP	5	50	10
IC	4,400	12	8,800	14	NP	NP	5	50	10
II	8,800	19	17,600	14	8,800	14	5	95	5
III	22,000	18	44,000	14	22,000	18	5	10	5

For SI units, 1 ft = 0.3 m; 1 gal = 3.8 L.

NP: Not permitted.

^aSee 15.3.1 regarding mixed-class storage.

^bSee 15.3.4 for smaller pile sizes.

^cFor storage in racks, the quantity limits per pile do not apply, but the rack arrangements should be limited to a maximum of 50 ft (15 m) in length and two rows or 9 ft (2.7 m) in depth.

^dSee 15.3.3 regarding protection for exposures.

15.4.4 The quantity of liquid stored shall be permitted to exceed the 1100 gal (4160 L) quantity specified by 15.4.1 where a minimum distance equal to that specified by Table 15.3 for distance to property line shall be maintained between buildings and the nearest container or portable tank.

15.4.5 Where the provisions of 15.4.1 cannot be met, a minimum distance equal to that specified by Table 15.3 for distance to property line shall be maintained between buildings and the nearest container or portable tank.

Chapter 16 Automatic Fire Protection for Inside Liquid Storage Areas

16.1 Scope.

16.1.1* This chapter shall apply to automatic fire protection systems for all inside storage of flammable and combustible liquids in containers, intermediate bulk containers, and portable tanks as specified in Section 9.4.

16.1.2* This chapter shall not apply to Class IA flammable liquids or to unstable flammable or combustible liquids.

16.1.3 Storage of liquids that is protected in accordance with the applicable requirements of this chapter shall be considered protected, as defined in 16.2.2. All other storage shall be considered unprotected unless an alternate means of protection has been approved by the authority having jurisdiction.

16.2 Definitions Specific to Chapter 16. For the purposes of this chapter, the terms in this section shall have the definitions given.

16.2.1 **IBC.** Where used in this chapter, *IBC* refers to intermediate bulk containers.

16.2.2 **Protected Storage.** Flammable and combustible liquids storage that is protected in accordance with this chapter.

16.2.3* **Relieving-Style Container.** A metal container, a metal intermediate bulk container, or a metal portable tank that is equipped with at least one pressure-relieving mechanism at its top that is designed, sized, and arranged to relieve the internal pressure generated due to exposure to fire so that violent rupture is prevented.

16.2.4* **Unsaturated Polyester Resin (UPR).** A resin that contains up to 50 percent by weight of Class IC, Class II, or Class III liquid, but no Class IA or Class IB liquid.

16.2.5 **Viscous Liquid.** A liquid that gels, thickens, or solidifies when heated or whose viscosity at room temperature versus weight percent content of Class I, Class II, or Class III liquid is in the shaded portion of Figure 16.2.5.

16.2.6 **Water-Miscible Liquid.** A liquid that mixes in all proportions with water without the use of chemical additives, such as emulsifying agents.

16.3 General Requirements.

16.3.1 Where different classes of liquids, container types, and storage configurations are stored in the same protected area, protection shall meet either of the following:

- (1) Requirements of this chapter for the most severe storage fire hazard present
- (2) Where areas are not physically separated by a barrier or partition capable of delaying heat from a fire in one haz-

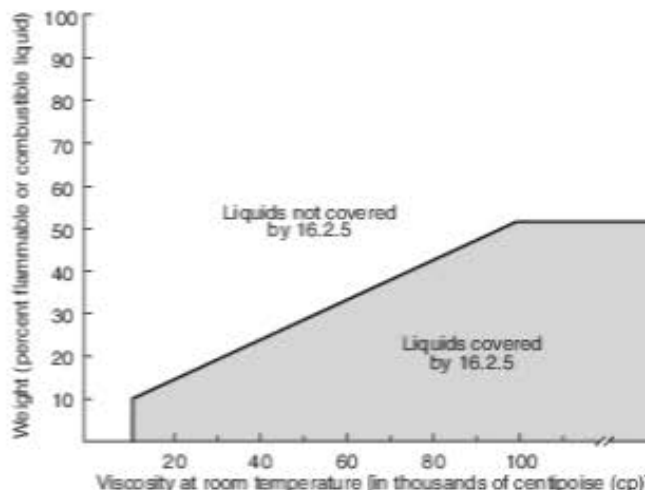


FIGURE 16.2.5 Viscous Liquid: Viscosity Versus Weight Percent Flammable or Combustible Component.

ard area from fusing sprinklers in an adjacent hazard area, the required protection for the more demanding hazard shall:

- (a) Extend 20 ft (6 m) beyond its perimeter, but not less than the required minimum sprinkler design area
- (b) Be provided with means to prevent the flow of burning liquid under emergency conditions into adjacent hazard areas
- (c) Provide containment and drainage as required by Section 16.8

16.3.2 Unless otherwise specified in this chapter, single-row racks shall not be more than 4.5 ft (1.4 m) in depth and double-row racks shall not be more than 9 ft (2.8 m) in depth.

16.3.3 When applying the fire protection criteria of this chapter, a minimum aisle space of 6 ft (1.8 m) shall be provided between adjacent piles or adjacent rack sections, unless otherwise specified in the tables in Section 16.5.

16.3.4 Viscous liquids, as defined in 16.2.5, shall be permitted to be protected using one of the following:

- (1) For metal containers, the criteria for Class IIIB liquids, as determined by Figure 16.4.1 (a)
- (2) For nonmetallic containers, the criteria for Class IIIB liquids, as determined by Figure 16.4.1 (b)
- (3) For nonmetallic containers, the criteria for cartoned unexpanded Group A plastics in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*, as indicated in Figure 16.4.1 (b)

16.3.5 Protection systems that are designed and developed based on full-scale fire tests performed at an approved test facility or on other engineered protection schemes shall be considered an acceptable alternative to the protection criteria set forth in this chapter. Such alternative protection systems shall be approved by the authority having jurisdiction.

16.3.6 For relieving-style containers of greater than 6.6 gal (25 L) and up to 119 gal (450 L) capacity the following shall apply: