

1301:7-7-28**Aerosols.**(A) Section 2801 General

- (1) 2801.1 Scope. The provisions of this rule, the building code and NFPA 30B as listed in rule 1301:7-7-45 of the Administrative Code shall apply to the manufacturing, storage and display of aerosol products in addition to the requirements of rule 1301:7-7-27 of the Administrative Code.
- (2) 2801.2 Permit required. Permits shall be required as set forth in paragraph (E)(6)(105.6) of rule 1301:7-7-01 of the Administrative Code.
- (3) 2801.3 Material Safety Data Sheets. Material Safety Data Sheet (MSDS) information for aerosol products displayed shall be kept on the premises at an approved location.

(B) Section 2802 Definitions

- (1) 2802.1 Definitions. The following words and terms shall, for purposes of this rule and as used elsewhere in this code, have the meanings shown herein.

"Aerosol." A product that is dispensed from an aerosol container by a propellant.

Aerosol products shall be classified by means of the calculation of their chemical heats of combustion and shall be designated Level 1, Level 2 or Level 3.

"Level 1 aerosol products." Those with a total chemical heat of combustion that is less than or equal to 8,600 British thermal units per pound (Btu/lb) (20 kJ/g).

"Level 2 aerosol products." Those with a total chemical heat of combustion that is greater than 8,600 Btu/lb (20 kJ/g), but less than or equal to 13,000 Btu/lb (30 kJ/g).

"Level 3 aerosol products." Those with a total chemical heat of combustion that is greater than 13,000 Btu/lb (30 kJ/g).

"Aerosol container." A metal can, or a glass or plastic bottle designed to dispense an aerosol. Metal cans shall be limited to a maximum size of 33.8 fluid ounces (1000 ml). Glass or plastic bottles shall be limited to a maximum size of 4 fluid ounces (118 ml).

"Aerosol warehouse." A building used for warehousing aerosol products.

"Propellant." The liquefied or compressed gas in an aerosol container that expels the contents from an aerosol container when the valve is actuated. A

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propellant is considered flammable if it forms a flammable mixture with air, or if a flame is self-propagating in a mixture with air.

"Retail display area." The area of a Group M occupancy open for the purpose of viewing or purchasing merchandise offered for sale. Individuals in such establishments are free to circulate among the items offered for sale which are typically displayed on shelves, racks or the floor.

(C) Section 2803 Classification of aerosol products

- (1) 2803.1 Classification levels. Aerosol products shall be classified as Level 1, 2 or 3 in accordance with Table 2803.1 of this rule and NFPA 30B as listed in rule 1301:7-7-45 of the Administrative Code. Aerosol products in cartons which are not identified in accordance with this paragraph shall be classified as Level 3.

Table 2803.1
Classification of aerosol products

<u>Chemical heat of combustion</u>		<u>Aerosol classification</u>
<u>Greater than (Btu/lb)</u>	<u>Less than or equal to (Btu/lb)</u>	
<u>0</u>	<u>8,600</u>	<u>1</u>
<u>8,600</u>	<u>13,000</u>	<u>2</u>
<u>13,000</u>	<u>-----</u>	<u>3</u>

For SI: 1 British thermal unit per pound = 0.0023236 KJ/g.

- (2) 2803.2 Identification. Cartons shall be identified on at least one side with the classification level of the aerosol products contained within the carton as follows:

LEVEL _____ AEROSOLS

(D) Section 2804 Inside storage of aerosol products

- (1) 2804.1 General. The inside storage of Level 2 and 3 aerosol products shall comply with paragraphs (D)(2)(2804.2) to (D)(7)(2804.7) of this rule and NFPA 30B as listed in rule 1301:7-7-45 of the Administrative Code. Level 1 aerosol products shall be considered equivalent to a Class III commodity and shall comply with the requirements for palletized or rack storage in NFPA 13 as listed in rule 1301:7-7-45 of the Administrative Code.

- (2) 2804.2 Storage in Groups A, B, E, F, I and R. Storage of Level 2 and 3 aerosol

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products in occupancies in Groups A, B, E, F, I and R shall be limited to the following maximum quantities:

(a) A net weight of 1,000 pounds (454 kg) of Level 2 aerosol products.

(b) A net weight of 500 pounds (227 kg) of Level 3 aerosol products.

(c) A combined net weight of 1,000 pounds (454 kg) of Level 2 and 3 aerosol products.

The maximum quantity shall be increased 100 per cent where the excess quantity is stored in storage cabinets in accordance with paragraph (D)(3)(b)(3404.3.2) of rule 1301:7-7-34 of the Administrative Code.

(i) 2804.2.1 Excess storage. Storage of quantities exceeding the maximum quantities indicated in paragraph (D)(2)(2804.2) of this rule shall be stored in separate inside flammable liquid storage rooms in accordance with paragraph (D)(5)(2804.5) of this rule.

(3) 2804.3 Storage in general purpose warehouses. Aerosol storage in general purpose warehouses utilized only for warehousing-type operations involving mixed commodities shall comply with paragraph (D)(3)(a)(2804.3.1) or (D)(3)(b)(2804.3.2) of this rule.

(a) 2804.3.1 Nonsegregated storage. Storage consisting of solid pile, palletized or rack storage of Level 2 or 3 aerosol products not segregated into areas utilized exclusively for the storage of aerosols shall comply with Table 2804.3.1 of this rule.

Table 2804.3.1
Nonsegregated storage of Level 2 and 3 aerosol products in general purpose warehouses^b

<u>Aerosol level</u>	<u>Maximum net weight per floor (pounds)^b</u>			
	<u>Palletized or solid-pile storage</u>		<u>Rack storage</u>	
	<u>Unprotected</u>	<u>Protected^a</u>	<u>Unprotected</u>	<u>Protected^a</u>
<u>2</u>	<u>2,500</u>	<u>12,000</u>	<u>2,500</u>	<u>24,000</u>
<u>3</u>	<u>1,000</u>	<u>12,000</u>	<u>1,000</u>	<u>24,000</u>
<u>Combination 2 and 3</u>	<u>2,500</u>	<u>12,000</u>	<u>2,500</u>	<u>24,000</u>

For SI: 1 foot = 304.8 mm, 1 pound = 0.454 kg, 1 square foot = 0.0929 m².

a. Approved automatic sprinkler system protection and storage arrangements shall comply with NFPA 30B as listed in rule

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1301:7-7-45 of the Administrative Code. Sprinkler system protection shall extend 20 feet beyond the storage area containing the aerosol products.

b. Storage quantities indicated are the maximum permitted in any 50,000-square-foot area.

(b) 2804.3.2 Segregated storage. Storage of Level 2 and 3 aerosol products segregated into areas utilized exclusively for the storage of aerosols shall comply with Table 2804.3.2 of this rule and paragraphs (D)(3)(b)(i)(2804.3.2.1) and (D)(3)(b)(ii)(2804.3.2.2) of this rule.

Table 2804.3.2
Segregated storage of Level 2 and 3 aerosol products in general purpose warehouses

<u>Storage separation</u>	<u>Maximum segregated storage area^a</u>		<u>Sprinkler requirements</u>
	<u>Percentage of building area (per cent)</u>	<u>Area limitation (square feet)</u>	
<u>Separation area^{e,f}</u>	<u>15</u>	<u>20,000</u>	<u>Notes b, c</u>
<u>Chain-link fence enclosure^d</u>	<u>20</u>	<u>20,000</u>	<u>Notes b, c</u>
<u>1-hour fire-resistance-rated interior walls</u>	<u>20</u>	<u>30,000</u>	<u>Note b</u>
<u>2-hour fire-resistance-rated interior walls</u>	<u>25</u>	<u>40,000</u>	<u>Note b</u>
<u>3-hour fire-resistance-rated interior walls</u>	<u>30</u>	<u>50,000</u>	<u>Note b</u>

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m².

a. The maximum segregated storage area shall be limited to the smaller of the two areas resulting from the percentage of building area limitation and the area limitation.

b. Automatic sprinkler system protection in aerosol product storage areas shall comply with NFPA 30B as listed in rule 1301:7-7-45 of the Administrative Code and be approved. Building areas not containing aerosol product storage shall be equipped with an approved automatic sprinkler system in accordance with paragraph (C)(3)(a)(i)(903.3.1.1) of rule 1301:7-7-09 of the Administrative Code.

c. Automatic sprinkler system protection in aerosol product storage areas shall comply with NFPA 30B as listed in rule 1301:7-7-45 of the Administrative Code and be approved. Sprinkler system protection shall extend a minimum 20 feet beyond the aerosol storage area.

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d. Chain-link fence enclosures shall comply with paragraph (D)(3)(b)(i)(2804.3.2.1) of this rule.

e. A separation area shall be defined as an area extending outward from the periphery of the segregated aerosol product storage areas as follows:

1. The limits of the aerosol product storage shall be clearly marked on the floor.

2. The separation distance shall be a minimum of 25 feet and maintained clear of all materials with a commodity classification greater than Class III in accordance with paragraph (C)(3)(a)(i)(903.3.1.1) of rule 1301:7-7-09 of the Administrative Code.

f. Separation areas shall only be permitted where approved.

(i) 2804.3.2.1 Chain-link fence enclosures. Chain-link fence enclosures required by Table 2804.3.2 of this rule shall comply with the following:

(a) The fence shall not be less than No. 9 gage steel wire, woven into a maximum 2-inch (51 mm) diamond mesh.

(b) The fence shall be installed from the floor to the underside of the roof or ceiling above.

(c) Class III, IV and high-hazard commodities shall be stored outside of the aerosol storage area and a minimum of 8 feet (2438 mm) from the fence.

(d) Access openings in the fence shall be provided with either self-closing or automatic-closing devices or a labyrinth opening arrangement preventing aerosol containers from rocketing through the access openings.

(e) No less than two means of egress shall be provided from the fenced enclosure.

(ii) 2804.3.2.2 Aisles. The minimum aisle requirements for segregated storage in general purpose warehouses shall comply with Table 2804.3.2.2 of this rule.

Table 2804.3.2.2 Segregated storage aisle widths and distance to aisles in general purpose warehouses

<u>Storage condition</u>	<u>Minimum aisle width (feet)</u>	<u>Maximum distance from storage to aisle (feet)</u>

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<u>Solid pile or palletized^a</u>	<u>4 feet between piles</u>	<u>25</u>
<u>Racks with ESFR sprinklers^a</u>	<u>4 feet between racks and adjacent Level 2 and 3 aerosol product storage</u>	<u>25</u>
<u>Racks without ESFR sprinklers^a</u>	<u>8 feet between racks and adjacent Level 2 and 3 aerosol product storage</u>	<u>25</u>

For SI: 1 foot = 304.8 mm.

a. Sprinklers shall comply with NFPA 30B as listed in rule 1301:7-7-45 of the Administrative Code.

(4) 2804.4 Storage in aerosol warehouses. The total quantity of Level 2 and 3 aerosol products in a warehouse utilized for the storage, shipping and receiving of aerosol products shall not be restricted in structures complying with paragraphs (D)(4)(a)(2804.4.1) to (D)(4)(d)(2804.4.4) of this rule.

(a) 2804.4.1 Automatic sprinkler system. Aerosol warehouses shall be protected by an approved wet-pip automatic sprinkler system in accordance with NFPA 30B as listed in rule 1301:7-7-45 of the Administrative Code. Sprinkler protection shall be designed based on the highest classification level of aerosol product present.

(b) 2804.4.2 Pile and palletized storage aisles. Solid pile and palletized storage shall be arranged so the maximum travel distance to an aisle is 25 feet (7620 mm). Aisles shall have a minimum width of 4 feet (1219 mm).

(c) 2804.4.3 Rack storage aisles. Rack storage shall be arranged with a minimum aisle width of 8 feet (2438 mm) between rows of racks and 8 feet (2438 mm) between racks and adjacent solid pile or palletized storage. Where early suppression fast-response (ESFR) sprinklers provide automatic sprinkler protection, the minimum aisle width shall be 4 feet (1219 mm).

(d) 2804.4.4 Combustible commodities. Combustible commodities other than flammable and combustible liquids shall be permitted to be stored in an aerosol warehouse.

Exception: Flammable and combustible liquids in 1-quart (0.95 L) metal containers and smaller shall be permitted to be stored in an aerosol warehouse.

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(5) 2804.5 Storage in inside flammable liquid storage rooms. Inside flammable liquid storage rooms shall comply with paragraph (D)(3)(g)(3404.3.7) of rule 1301:7-7-34 of the Administrative Code. The maximum quantities of aerosol products shall comply with paragraph (D)(5)(a)(2804.5.1) or (D)(5)(b)(2804.5.2) of this rule.

(a) 2804.5.1 Storage rooms of 500 square feet or less. The storage of aerosol products in flammable liquid storage rooms less than or equal to 500 square feet (46 m²) in area shall not exceed the following quantities:

(i) A net weight of 1,000 pounds (454 kg) of Level 2 aerosol products.

(ii) A net weight of 500 pounds (227 kg) of Level 3 aerosol products.

(iii) A combined net weight of 1,000 pounds (454 kg) of Level 2 and 3 aerosol products.

(b) 2804.5.2 Storage rooms greater than 500 square feet. The storage of aerosol products in flammable liquid storage rooms greater than 500 square feet (46 m²) in area shall not exceed the following quantities:

(i) A net weight of 2,500 pounds (1135 kg) of Level 2 aerosol products.

(ii) A net weight of 1,000 pounds (454 kg) of Level 3 aerosol products.

(iii) A combined net weight of 2,500 pounds (1135 kg) of Level 2 and 3 aerosol products.

The maximum aggregate storage quantity of Level 2 and 3 aerosol products permitted in separate inside storage rooms protected by an approved automatic sprinkler system in accordance with NFPA 30B as listed in rule 1301:7-7-45 of the Administrative Code shall be 5,000 pounds (2270 kg).

(6) 2804.6 Storage in liquid warehouses. The storage of Level 2 and 3 aerosol products in liquid warehouses shall comply with NFPA 30B as listed in rule 1301:7-7-45 of the Administrative Code. The storage shall be located within segregated storage areas in accordance with paragraph (D)(3)(b)(2804.3.2) of this rule and paragraphs (D)(6)(a)(2804.6.1) to (D)(6)(c)(2804.6.3) of this rule.

(a) 2804.6.1 Containment. Spill control or drainage shall be provided to prevent the flow of liquid to within 8 feet (2438 mm) of the segregated storage area.

(b) 2804.6.2 Sprinkler design. Sprinkler protection shall be designed based on

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the highest level of aerosol product present.

(c) 2804.6.3 Opening protection into segregated storage areas. Fire doors or gates opening into the segregated storage area shall either be self-closing or provided with automatic-closing devices activated by sprinkler water flow or an approved fire detection system.

(7) 2804.7 Storage in Group M occupancies. Storage of Level 2 and 3 aerosol products in occupancies in Group M shall comply with Table 2804.7 of this rule. Retail display shall comply with paragraph (F)(2806) of this rule.

Table 2804.7
Maximum quantities of Level 2 and 3 aerosol products in retail storage areas

Floor	Maximum net weight per floor (pounds)		
	Nonsegregated storage ^{a,b}	Segregated storage	
		Storage cabinets ^b	Separated from retail area ^c
Basement	Not permitted	Not permitted	Not permitted
Ground floor	2,500	5,000	Note d
Upper floors	500	1,000	Note d

For SI: 1 pound = 0.454 kg, 1 square foot = 0.0929 m².

a. The total aggregate quantity on display and in storage shall not exceed the maximum retail display quantity indicated in paragraph (F)(3)(2806.3) of this rule.

b. Storage quantities indicated are the maximum permitted in any 50,000-square-foot area.

c. The storage area shall be separated from the retail area with a 1-hour fire-resistance-rated assembly.

d. See Table 2804.3.2 of this rule.

(E) Section 2805 Outside storage

(1) 2805.1 General. The outside storage of Level 2 and 3 aerosol products, including storage in temporary storage trailers, shall be separated from exposures in accordance with Table 2805.1 of this rule.

Table 2805.1 Distance to exposures for outside storage of Level 2 and 3 aerosol products

Exposure	Minimum distance from aerosol storage (feet) ^a
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<u>Public alleys, public ways, public streets</u>	<u>20</u>
<u>Buildings</u>	<u>50</u>
<u>Exit discharge to a public way</u>	<u>50</u>
<u>Lot lines</u>	<u>20</u>
<u>Other outside storage</u>	<u>50</u>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. The minimum separation distance indicated is not required where exterior walls having a 2-hour fire-resistance rating without penetrations separate the storage from the exposure. The walls shall extend not less than 30 inches above and to the sides of Level 2 and 3 aerosol products.

(F) Section 2806 Retail display

(1) 2806.1 General. This paragraph shall apply to the retail display of 500 pounds (227 kg) or more of Level 2 or 3 aerosol products.

(2) 2806.2 Maximum quantities in retail display areas. Aerosol products in retail display areas shall not exceed quantities needed for display and normal merchandising and shall not exceed the quantities in Table 2806.2 of this rule.

Table 2806.2

Maximum quantities of Level 2 and 3 aerosol products in retail display areas

<u>Floor</u>	<u>Maximum net weight per floor (pounds)^{a,b}</u>	
	<u>Unprotected^c</u>	<u>Protected^{c,d}</u>
<u>Basement</u>	<u>Not allowed</u>	<u>500</u>
<u>Ground</u>	<u>2,500</u>	<u>10,000</u>
<u>Upper</u>	<u>500</u>	<u>2,000</u>

For SI: 1 pound = 0.454 kg, 1 square foot = 0.0929 m².

a. The total quantity shall not exceed 1,000 pounds net weight in any one 100-square-foot retail display area.

b. When packaged, stored and protected in accordance with NFPA 30B as listed in rule 1301:7-7-45 of the Administrative Code, quantity limits shall be limited to those specified in NFPA 30B as listed in rule 1301:7-7-45 of the Administrative Code.

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c. Per 25,000-square-foot retail display area.

d. Minimum Ordinary Hazard Group 2 wet-pipe automatic sprinkler system through the retail sales occupancy.

(3) 2806.3 Maximum quantities in storage areas. Aerosol products in storage areas adjacent to retail display areas shall not exceed the quantities in Table 2806.3 of this rule.

Table 2806.3
Maximum storage quantities for storage areas adjacent to retail display of Level 2 and Level 3 aerosols

Maximum net weight per floor (pounds)			
<u>Floor</u>	<u>Unseparated^{a,b}</u>	<u>Separated</u>	
		<u>Storage cabinets^b</u>	<u>1-hour occupancy separation</u>
<u>Basement</u>	<u>Not allowed</u>	<u>Not allowed</u>	<u>Not allowed</u>
<u>Ground</u>	<u>2,500</u>	<u>5,000</u>	<u>In accordance with NFPA 30B, Sections 4-3.4.2 and 4-3.4.3 as listed in rule 1301:7-7-45 of the Administrative Code</u>
<u>Upper</u>	<u>500</u>	<u>1,000</u>	<u>In accordance with NFPA 30B, Sections 4-3.4.2 and 4-3.4.3 as listed in rule 1301:7-7-45 of the Administrative Code</u>

For SI: 1 pound = 0.454 kg, 1 square foot = 0.0929 m².

a. The aggregate quantity in storage and retail display shall not exceed the quantity limits for retail display.

b. In any 50,000-square-foot area.

(4) 2806.4 Display of containers. Level 2 and 3 aerosol containers shall not be stacked more than 6 feet (1829 mm) high from the base of the aerosol array to the top of the aerosol array unless the containers are placed on fixed shelving or otherwise secured in an approved manner. When storage of retail display is on shelves, the height of such storage of retail display to the top of aerosol containers shall not exceed 8 feet (2438 mm).

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Exception: Storage or display protected in accordance with paragraphs (F)(2)(2806.2) and (F)(3)(2806.3) of this rule.

(5) 2806.5 Combustible cartons. Aerosol products located in retail display areas shall be removed from combustible cartons.

Exceptions:

1. Display areas that use a portion of combustible cartons, which consist of only the bottom panel and not more than 2 inches (51 mm) of side panel is allowed.

2. When the display area is protected in accordance with Table 4-3 of NFPA 30b as listed in rule 1301:7-7-45 of the Administrative Code, storage of aerosol products in combustible cartons is allowed.

(6) 2806.6 Aisles. Aisles not less than 4 feet (1219 mm) in width shall be maintained on three sides of a retail display area containing aerosol products.

(7) 2806.7 Retail display automatic sprinkler system. When an automatic sprinkler system is required for the protected retail display of aerosol products, the wet-pipe automatic sprinkler system shall be in accordance with paragraph (C)(3)(a)(i)(903.3.1.1) of rule 1301:7-7-09 of the Administrative Code. The minimum design shall be for an Ordinary Hazard Group 2 occupancy. The system shall be provided throughout the retail display area.

(8) 2806.8 Storage automatic fire-extinguishing system. When the height of storage or display exceeds the limits in paragraph (F)(4)(2806.4) of this rule, the design of the automatic sprinkler system shall be in accordance with NFPA 30B as listed in rule 1301:7-7-45 of the Administrative Code.

(G) Section 2807 Manufacturing facilities

(1) 2807.1 General. Manufacturing facilities shall be in accordance with NFPA 30B as listed in rule 1301:7-7-45 of the Administrative Code.

Replaces: Former 1301:7-7-24

Effective:

R.C. 119.032 review dates:

WITHDRAWN ELECTRONICALLY

Certification

06/10/2005

Date

Promulgated Under: 119.03
Statutory Authority: 3737.22, 3737.82
Rule Amplifies: 3737.22, 3737.82
Prior Effective Dates: 7/1/79, 6/1/85, 6/15/92, 7/1/93, 9/1/95, 3/30/98

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