

To Be Rescinded1301:7-7-24 Aerosol Products.

(A) Section FM-2401.0 General

(1) FM-2401.1 Scope: The provisions of this rule, the building code, NFPA 30 and 30B listed in rule 1301:7-7-44 of the Administrative Code shall apply to the storage and display of aerosol products in addition to the requirements of rule 1301:7-7-23 of the Administrative Code.

(2) F-2401.2 Permit APPROVAL required: ~~A permit APPROVAL~~ shall be required for the storage and retail display of level 2 and 3 aerosol products exceeding a net weight of 500 pounds (227 kg).

(3) FM-2401.3 Classification of aerosol products: Aerosol products shall be classified as level 1, 2 or 3 in accordance with Table FM-2401.3 AND NFPA 30B LISTED IN RULE 1301:7-7-44 OF THE ADMINISTRATIVE CODE. AEROSOL PRODUCTS IN CARTONS WHICH ARE NOT IDENTIFIED IN ACCORDANCE WITH PARAGRAPH F-2401.4 SHALL BE CLASSIFIED AS LEVEL 3.

~~Exception: Aerosol products in cartons which are not marked in accordance with paragraph (A)(4)(F-2401.4) of this rule shall be classified as level 3.~~

Table FM-2401.3

Classification of aerosol products

~~Percentage of miscibility of base product~~ ~~percentage of aerosol flammable~~ ~~classification~~
~~In base product^a~~ ~~propellant^b~~ ~~level~~

25 or less	note c	0	1
25 or less	note c	less than 50	1
25 or less	note c	50 or more to	
		Less than 80	2
Less than 85	water-miscible	0	1
More than 25	water-miscible	less than 50	2
More than 25	water-miscible	50 or more	3
More than 25			
To 55 or less	water-immiscible	0	2
More than 25			
To 55 or less	water-immiscible	less than 50	2
More than 25			
To 55 or less	water-immiscible	50 or more	3
More than 55	water-immiscible	0 to 100	3
0 to 100	note c	80 or more	3

~~Note a. The base product is defined as the contents, excluding the propellant. A base product component is considered flammable where the flash point of the base product is 500 degrees F. (260~~

degrees C.) or less. The percentage of flammable material in the base product is calculated as follows:

$$\frac{\text{Weight of flammable base components}}{\text{Weight of contents - weight of propellant}} \times 100$$

Note b. The percentage of flammable propellant is the proportion of the flammable propellant to the total contents by weight. Any nonflammable portion of a propellant blend is not included in the calculation. The percentage is calculated as follows:

$$\frac{\text{Weight of flammable propellant components}}{\text{weight of contents}} \times 100$$

Note c. Miscibility of the base product does not affect aerosol classification.

TABLE F-2401.3
CLASSIFICATION OF AEROSOL PRODUCTS

CHEMICAL HEAT OF COMBUSTION		AEROSOL CLASSIFICATION
GREATER THAN	LESS THAN OR EQUAL TO	
BTU/LB ^A	BTU/LB ^A	
0	8,600	1
8,600	13,000	2
13,000	----	3

NOTE a. 1 BRITISH THERMAL UNIT PER POUND = 0.002326 KJ/G.

(4) F-2401.4 Identification: All cartons shall be marked IDENTIFIED on at least one side with the classification level of the aerosol products contained within the carton as follows:

Level _____ aerosols

(B) Section FM-2402.0 Definitions

FM-2402.1 General: The following words and terms shall, for the purposes of this rule and as stated elsewhere in this code, have the meanings shown herein.

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

Aerosol container: Metal cans, glass or plastic bottles designed to dispense an aerosol. Metal cans shall be limited to a maximum size of 33.8 fluid ounces (1,000 ml). Glass or plastic bottles shall be limited to a maximum size of 4 fluid ounces (118 ml).

Carton: A cardboard or fiberboard box enclosing a product.

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

(C) Section FM-2403.0 Inside storage

(1) FM-2403.1 General: The inside storage of LEVELS 2 AND 3 aerosol products shall comply with paragraphs (C)(2)(FM-2403.2) through (C)(7)(FM-2403.7) of this rule and NFPA 30B listed in rule 1301:7-7-44 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 30B LISTED IN RULE 1301:7-7-44 OF THE ADMINISTRATIVE CODE.

~~Exception: 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 listed in rule 1301:7-7-44 of the Administrative Code.~~

(2) FM-2403.2 Storage in use groups A, B, E, F, ~~and I AND R~~: Storage of level 2 and 3 aerosol products in occupancies in use group A, B, E, F, ~~and 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.

~~Exception: The maximum quantity shall be increased 100 percent provided the excess quantity is stored in storage cabinets in accordance with NFPA 30 listed in rule 1301:7-7-44 of the Administrative Code.~~

FM-2403.2.1 Excess storage: Storage of quantities exceeding the maximum quantities indicated in paragraph (C)(2)(FM-2403.2) of this rule shall be stored in separate inside flammable liquid storage rooms in accordance with paragraph (C)(5)(FM-2403.5) of this rule.

(3) FM-2403.3 Storage in general purpose warehouses: Aerosol storage in general purpose warehouses utilized only for warehousing-type operations involving mixed commodities shall comply with paragraphs (C)(3)(a)(FM-2403.3.1) or (C)(3)(b) (FM-2403.3.2) of this rule.

(a) FM-2403.3.1 Nonsegregated storage: Storage consisting of solid pile, palletized, or rack storage of level 2 and 3 aerosol products not segregated into areas utilized exclusively for the storage of aerosols shall comply with Table FM-2403.3.1.

Table FM-2403.3.1
Nonsegregated storage of level 2 and 3 aerosol
Products in general purpose warehouses

Aerosol	Maximum Net weight		Per floor (pounds) ^{b,c}	
	Palletized pile	or solid storage	Rack	storage
Level	Unprotected	Protected ^a	Unprotected	Protected ^a
2	2,500	12,000	2,500	24,000
3	1,000	12,000	1,000	24,000
Combination 2 & 3	2,500	12,000	2,500	24,000

Note a. Approved automatic sprinkler system protection and storage arrangement shall comply with NFPA 30B listed in rule 1301:7-7-44 of the Administrative Code. Sprinkler system protection shall extend 20 feet beyond the storage area containing the aerosol products.

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

Note c. 1 pound = 0.454 kg; 1 square foot = 0.093 m²; 1 foot = 304.8 mm.

(b) FM-2403.3.2 Segregated storage: Storage of level 2 and 3 aerosol products segregated into areas utilized exclusively for the storage of aerosols shall comply with Table FM-2403.3.2 and paragraphs (C)(3)(b)(i)(FM-2403.3.2.1) and (C)(3)(b)(ii) (FM-2403.3.2.2) of this rule.

Table FM-2403.3.2
Segregated storage of level 2 and 3 aerosol
Products in general purpose warehouses

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

Note 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.

Note b. Automatic sprinkler system protection in aerosol product storage areas shall comply with NFPA 30B listed in rule 1301:7-7-44 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 NFPA 13 listed in rule 1301:7-7-44 of the Administrative Code.

Note c. Automatic sprinkler system protection in aerosol product storage areas shall comply with NFPA 30B listed in rule 1301:7-7-44 of the Administrative Code and be approved. Sprinkler system protection shall extend a minimum 20 feet beyond the aerosol storage area.

Note d. Chain-link fence enclosures shall comply with paragraph (C)(3)(b)(I)(FM-2403.3.2.1) of this rule.

Note e. A separation area shall be defined as an area extending outward from the periphery of the segregated aerosol product storage area 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 twenty-five feet and maintained clear of all materials with a commodity classification greater than class III in accordance with NFPA 13 listed in rule 1301:7-7-44 of the Administrative Code.

Note f. Separation areas shall only be permitted where approved.

Note g. 1 foot = 304.8 mm; 1 square foot = 0.093 m².

(i) FM-2403.3.2.1 Chain-link fence enclosures: Chain-link fence enclosures required by Table FM-2403.3.2 shall comply with the following:

(a) The fence shall not be less than No. 9 gage steel wire, woven into a maximum 2-inch (50.8 mm) diamond mesh.

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

(c) Class IV or V commodity storage shall not be located within 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) Not less than two means of egress shall be provided from the fenced enclosure.

(ii) FM-2403.3.2.2 Aisles: The minimum aisle requirements for segregated storage in general purpose warehouses shall comply with Table FM-2403.3.2.2.

Table FM-2403.3.2.2
Segregated storage aisle widths and distance to aisles
In general purpose warehouses

Storage condition	Minimum aisle width (feet) ^c	Maximum distance from storage to aisle (feet) ^c
Solid pile or palletized ^a	4 feet between piles	25
Racks with ESFR sprinklers ^{a,b}	4 feet between racks and adjacent Levels 2 and 3 aerosol product storage	25
Racks without ESFR sprinklers ^{a,b}	8 feet between racks and adjacent Levels 2 and 3 aerosol product storage	25

Note a. Sprinklers shall comply with NFPA 30B listed in rule 1301:7-7-44 of the Administrative Code.

Note b. ESFR indicates early suppression fast response.

Note c. 1 foot = 304.8 mm.

(4) FM-2403.4 Storage in aerosol warehouses: The total quantity of Level 2 and 3 aerosol products in a warehouse utilized exclusively for the storage, shipping and receiving of aerosol products shall not be restricted in structures complying with paragraphs (C)(4)(a) (FM-2403.4.1) through (C)(4)(e)(F-2403.4.5) of this rule.

(a) FM-2403.4.1 Automatic sprinkler system: Warehouses shall be protected by an approved automatic sprinkler system in accordance with NFPA 30B listed in rule 1301:7-7-44 of the Administrative Code. Sprinkler protection shall be designed based on the highest level of aerosol product present. **Exception:** Where approved, sprinkler protection is not required for an aerosol warehouse located a minimum of 100 feet (30,480 mm) from any lot line or structure where there is protection for exposures. Where protection for exposures is not provided, a minimum separation of 200 feet (60,960 mm) shall be required.

(b) F-2403.4.2 Building separation: Aerosol warehouses shall be detached structures or separated from other occupancies with 4-hour fire-resistance rated construction and openings protected with an assembly having a fire protection rating of not less than 3 hours.

(c) FM-2403.4.3 Exterior walls: Exterior walls of aerosol warehouses with a fire separation distance exceeding 10 feet (3048 mm), BUT LESS THAN 50 FEET (15240 MM), shall ~~be~~ HAVE A 2-hour fire-resistance rated RATING. Exterior walls with a fire separation distance of 10 feet (3048 mm) or less shall be 4-hour fire-resistance rated. Openings shall be protected in accordance with the building code listed in rule 1301:7-7-44 of the Administrative Code.

(d) F-2403.4.4 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).

(e) F-2403.4.5 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.

Exception: Where automatic sprinkler protection is provided by early suppression fast response (ESFR) sprinklers, the minimum aisle width shall be 4 feet (1219 mm).

(5) FM-2403.5 Storage in inside flammable liquid storage rooms: Inside flammable liquid storage rooms shall comply with NFPA 30 listed in rule 1301:7-7-44 of the Administrative Code. The maximum quantities of aerosol products shall comply with paragraph (C)(5)(a) (F-2403.5.1) or (C)(5)(b)(FM-2403.5.2) of this rule.

(a) F-2403.5.1 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 (46.5 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) FM-2403.5.2 Storage rooms greater than 500 square feet: The storage of aerosol products in flammable liquid storage rooms greater than 500 square feet (46.5 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.

~~Exception: An~~ THE MAXIMUM aggregate storage limit QUANTITY of ~~5,000 pounds (2270 kg)~~ of level LEVELS 2 and 3 aerosol products shall be permitted in separate inside storage rooms protected by an approved automatic sprinkler system in accordance with NFPA 30B listed in rule 1301:7-7-44 of the Administrative Code SHALL BE 5,000 POUNDS (2270 KG).

(6) FM-2403.6 Storage in liquid warehouses: The storage of level 2 and 3 aerosol products in liquid warehouses shall comply with NFPA 30B listed in rule 1301:7-7-44 of the Administrative Code. The storage shall be located within segregated storage areas in accordance with paragraph (C)(3)(b)(FM-2403.3.2) and paragraphs (C)(6)(a)(F-2403.6.1) through (C)(6)(c)(F-2403.6.3) of this rule.

- (a) F-2403.6.1 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) F-2403.6.2 Sprinkler design: Sprinkler protection shall be designed based on the highest level of aerosol product present.
 - (c) F-2403.6.3 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) FM-2403.7 Storage in use group M: Storage of level 2 and 3 aerosol products in occupancies in use group M shall comply with Table FM-2403.7. retail display shall comply with paragraph (E)(FM-2405.0) of this rule.

Table FM-2403.7
Maximum quantities of level 2 and 3 aerosol products
In retail storage areas

Floor	Maximum net weight per floor (pounds) ^c		
	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

Note a. The total aggregate quantity on display and in storage shall not exceed the maximum retail display quantity indicated in paragraph (E)(FM-2405.0) of this rule.

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

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

Note d. See Table FM-2403.3.2.

Note e. 1 pound = 0.454 kg; 1 square foot = 0.093 m².

(D) Section F-2404.0 Outside storage

F-2404.1 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 F-2404.1.

Table F-2404.1
Distance to exposures for outside storage of
Level 2 and 3 aerosol products

Exposure	Minimum distance from aerosol storage (feet) ^{a,b}
Alleys, public ways, streets	20
Buildings	50
Exit discharge to a public way	50
Lot lines	20
Other outside storage	50

Note 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.

Note b. 1 foot = 304.8 mm; 1 inch = 25.4 mm.

(E) Section FM-2405.0 Retail display

(1) F-2405.1 General: This section shall apply to the retail display of level 2 and 3 aerosol products exceeding a net weight of 500 pounds (227 kg).

(2) F-2405.2 Material safety data sheets: Material safety data sheet (MSDS) information for all aerosol products displayed shall be kept on the premises at an approved location.

(3) FM-2405.3 Maximum quantity: The maximum quantities of level 2 and 3 aerosol products in retail display areas shall be based on the type of approved automatic sprinkler system in accordance with paragraphs (E)(3)(a)(FM-2405.3.1) through (E)(3)(c)(FM-2405.3.3) of this rule.

(a) FM-2405.3.1 NFPA 13 automatic sprinkler system: The total aggregate quantity of level 2 and 3 aerosol products in sales display areas protected in accordance with NFPA 13 listed in rule 1301:7-7-44 of the Administrative Code for ordinary hazard, group 2 occupancies, shall not exceed a net weight of 2 pounds per square foot (9.76 kg/m²) of gross sales floor area.

~~Exception:~~ The maximum net weight of aerosol products in any 10 foot (3048 mm) by 10 foot (3048 mm) section of the sales floor area shall be limited to 1,000 pounds (454 kg).

(b) FM-2405.3.2 NFPA 30B automatic sprinkler system: The total aggregate quantity of level 2 and 3 aerosol products in retail display areas sprinklered in accordance with NFPA 30B listed in rule 1301:7-7-44 of the Administrative Code shall not exceed the quantity listed in Table FM-2403.3.1.

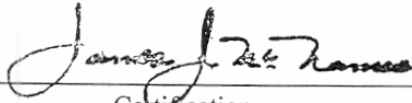
(c) FM-2405.3.3 Unsprinklered display areas: The total aggregate quantity of level 2 and 3 aerosol products in retail display areas not protected in accordance with paragraph (E)(3)(a)(FM-2405.3.1) or (E)(3)(b)(FM-2405.3.2) of this rule shall be limited to the quantities indicated in Table FM-2405.3.3.

Table FM-2405.3.3
 Maximum quantities of Level 2 and 3 aerosol
 products in unsprinklered retail display areas

Floor	Maximum net weight per floor (pounds) ^a
Basement	Not permitted
Ground floor	2,500
Upper floors	500

Note a. 1 pound = 0.454 kg.

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Certification

March 12, 1998

Date

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 Rule amplifies: R.C. Section 3737.22
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