

NFPA®

30B

**Code for the
Manufacture and Storage
of Aerosol Products**

2019



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NFPA® 30B

Code for the

Manufacture and Storage of Aerosol Products

2019 Edition

This edition of NFPA 30B, *Code for the Manufacture and Storage of Aerosol Products*, was prepared by the Technical Committee on Aerosol Products. It was issued by the Standards Council on May 4, 2018, with an effective date of May 24, 2018, and supersedes all previous editions.

This document has been amended by one or more Tentative Interim Amendments (TIAs) and/or Errata. See “Codes & Standards” at www.nfpa.org for more information.

This edition of NFPA 30B was approved as an American National Standard on May 24, 2018.

Origin and Development of NFPA 30B

Before the development of NFPA 30B, *Code for the Manufacture and Storage of Aerosol Products*, fire protection requirements for the storage of flammable aerosols were contained in NFPA 30, *Flammable and Combustible Liquids Code*, where they were treated as Class IA flammable liquids. During the late 1970s and early- to mid-1980s, because of both actual fire incidents and full-scale fire testing, it became apparent that flammable aerosol products presented a severe fire challenge, one not fully contemplated by NFPA 30. Industry initiatives led to more full-scale fire testing and, eventually, to the establishment of an NFPA Technical Committee Project specifically directed at providing fire protection guidance for both manufacturing facilities and storage facilities.

The Technical Committee on Aerosol Products began its work in January 1988. The committee formed two task groups, one on manufacturing, the other on storage, to draft the technical language of this document. The results of the efforts of the two task groups culminated with adoption of the first edition of NFPA 30B at the 1990 NFPA Annual Meeting.

The Technical Committee on Aerosol Products continued to work on improvements to NFPA 30B. The second edition was published in 1994 with several major revisions to clarify the document’s requirements and to more accurately reflect the fire behavior of aerosol products, particularly with regard to classification of aerosol products. The committee then continued its work, resulting in the 1998 edition — the third edition of NFPA 30B.

NFPA 30B implemented extensive revisions in the 2002 edition. A major testing effort resulted in complete revision of the wet-pipe sprinkler system design tables and their associated reference figures. The committee added 12 new tables to Chapter 6 (deleting the 5 tables from the 1998 edition) and 5 new figures demonstrating sprinkler configuration in accordance with these tables. The tables addressed palletized and solid pile storage and rack storage of Level 2 and Level 3 aerosol products, both cartoned and uncartoned. New sections on damage-limiting construction, fume incinerators, shrink-wrapping of aerosol products, and special protection design were added. NFPA 30B was also reformatted to conform to the *Manual of Style for NFPA Technical Committee Documents*, including reorganization and renumbering of chapters, elimination of exceptions, deletion of nonenforceable language, and clarification of mandatory requirements.

The 2007 edition of NFPA 30B clarified the requirements for aisle widths in storage facilities.

In the 2011 edition of NFPA 30B, the committee revised the definition of aerosol container to reflect new requirements of the U.S. Department of Transportation that allow the use of plastic aerosol containers up to a maximum size of 1000 ml (33.8 fl oz). The revised definition of aerosol container prompted changes in several locations of the code to accommodate aerosol products in plastic containers. In support of the revised definition of aerosol container, the committee also added new material in Annex B that provided several sets of fire test data on the results of testing aerosols in plastic containers.

The 2015 edition of NFPA 30B incorporated the following major amendments:

- (1) Appropriate amendments and additions were made to incorporate coverage of aerosol cooking spray products, including classification of such products and protection guidance for such products in chapters 6 and 7.
- (2) Appropriate amendments and additions were made to incorporate coverage of “plastic aerosol 1” and “plastic aerosol X” products, including classification of such products and protection guidance for such products in chapters 6 and 7.
- (3) Appropriate amendments were made to Section 1.9, Marking of Packages of Aerosol Products, to accommodate aerosol cooking spray products and plastic aerosol products.
- (4) In Chapter 3, Definitions, several terms were redefined; a number of new definitions, related to manufacturing of aerosol products, were added; and definitions of sprinkler types were deleted to eliminate any potential conflict with NFPA 13, *Standard for the Installation of Sprinkler Systems*.
- (5) The provisions for hazardous (classified) location area classification were amended by combining the previous separate requirements for button tippers and test baths into a single set of requirements and by adding additional requirements applicable to button tippers.
- (6) The provisions of subsection 5.8.2 for storing finished product in production areas were amended for clarity. In addition, new requirements were added for storing finished aerosol products in plastic containers in production areas.
- (7) Subsection 5.13.2 was improved by extending applicability to under-the-cup (UTC) propellant fillers and by eliminating redundant text.
- (8) Subsection 5.13.3, Propellant Charging Equipment, was extensively revised to consolidate changes made in prior editions into a single section, making these provisions more coherent.
- (9) Subsection 5.13.4 was expanded to apply to propellant heaters as well as propellant pumps.
- (10) Section 5.15, Aerosol Product Laboratories, was amended to designate aerosol product laboratories that handle flammable gases or flammable liquids as Class A laboratory units, in accordance with NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals*.
- (11) Tentative Interim Amendment 11-1 was incorporated into the scope of Chapter 6.
- (12) A new section was added to provide specific fire protection requirements for aerosol cooking spray products.
- (13) Several revisions were made to the existing fire protection requirements for Level 2 and Level 3 aerosol products:
 - (a) Use of intermediate temperature sprinklers is allowed in unconditioned spaces.
 - (b) Terminology was changed to correlate with that used in NFPA 13.
 - (c) In many of the sprinkler system design tables, larger orifice sprinklers are now allowed to be used, based on demonstrated performance.
 - (d) Several paragraphs were amended to correlate with provisions of NFPA 13.
- (14) A new section was added to provide specific fire protection requirements for aerosol products in plastic containers.
- (15) A new section was added to establish quantity limitations on plastic aerosol X products in mercantile occupancies.
- (16) Appropriate amendments were made to various portions of Annex A to clarify existing text and to remove redundant text.
- (17) Appropriate amendments were made to Annex B to clarify existing text and to correlate with changes in terminology in the body of the code.

The 2019 edition incorporates the following major amendments:

- (1) Adds definitions for palletized and solid-piled storage, and provides Annex material for other definitions
- (2) Modifies the definition of Aerosol Product to include propellant-only products. Adds a definition for Aerosol Valve
- (3) Adds a new category of aerosol products, Plastic Aerosol X
- (4) Reaffirms the language in TIA 15-1 on Aerosol Product Laboratories
- (5) Modifies the fire protection tables in Section 6.4.2.7 to provide clarification as to the application of ceiling-only protection
- (6) Clarifies the provisions for in-rack sprinklers in solid shelves in Section 6.4.2.12

TIA 1369 provides newly developed fire protection criteria for Plastic Aerosol 3 products. The fact that these new products represent a fire hazard was not in the existing guidance in NFPA 30B.

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Committee Scope: This Committee shall have the primary responsibility for documents on safeguarding against the fire and explosion hazards associated with the manufacturing, handling, and storage of aerosol products and low pressure dispensing containers.

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NFPA 30B

Code for the

Manufacture and Storage of Aerosol Products

2019 Edition

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Information on referenced publications can be found in Chapter 2 and Annex J.

Chapter 1 Administration

1.1 Scope.

1.1.1 This code shall apply to the manufacture, storage, and display of aerosol products as herein defined.

1.1.2* This code shall not apply to the storage and display of containers whose contents are comprised entirely of LP-Gas products.

1.1.3 This code shall not apply to post-consumer processing of aerosol containers.

1.1.4* This code shall not apply to containers that do not meet the definition of *Aerosol Container* (see 3.3.1).

1.1.4.1 Containers that contain a product that meets the definitions in 3.3.2 and 3.3.3, but are larger than the limits specified in 3.3.1, shall not be classified as aerosol products, and this code shall not apply to the manufacture, storage, and display of such products.

1.2* Purpose. The purpose of this code is to provide minimum requirements for the prevention and control of fires and explosions in facilities that manufacture, store, or display aerosol products.

1.3 Application.

1.3.1 Chapters 4, 5, and 8 shall apply to facilities or portions of facilities that manufacture aerosol products, including gas-filling, product-filling, and packaging operations.

1.3.2 Chapters 4, 6, and 8 shall apply to facilities or portions of facilities that store aerosol products, such as storage areas, storage rooms, and warehouses.

1.3.3 Chapters 4, 7, and 8 shall apply to the storage and display of aerosol products in mercantile occupancies.

1.4* Retroactivity.

1.4.1 The provisions of this code are considered necessary to provide a reasonable level of protection from loss of life and property from fire and explosion. They reflect situations and the state of the art at the time the code was issued.

1.4.2 Unless otherwise noted, it is not intended that the provisions of this code be applied to facilities, equipment, structures, or installations that were existing or approved for construction or installation prior to the effective date of the code, except in those cases where it is determined by the authority having jurisdiction that the existing situation involves a distinct hazard to life or adjacent property.

1.5 Equivalency. Nothing in this code is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this code, provided technical documentation is submitted to the authority having jurisdiction to demonstrate equivalency, and the system, method, or device is approved for the intended purpose.

1.6 Enforcement. This code shall be administered and enforced by the authority having jurisdiction designated by the governing authority. (See Annex I for sample wording for enabling legislation.)

1.7* Classification of Aerosol Products in Metal Containers of Not More Than 1000 ml (33.8 fl oz) and in Plastic or Glass Containers of Not More Than 118 ml (4 fl oz). See Annex E.

1.7.1 Aerosol products shall be classified by means of the calculation of their chemical or theoretical heats of combustion and shall be designated Level 1, Level 2, or Level 3 in accordance with 1.7.2 through 1.7.5.2 and Table 1.7.1.

1.7.1.1 In lieu of classification by means of the chemical heats of combustion, aerosol products shall be permitted to be classified by means of data obtained from properly conducted full-scale fire tests that utilize a 12-pallet test array.

Exception: This shall not apply to *Aerosol Cooking Spray Products*. (See 1.7.5.)

Table 1.7.1 Aerosol Classification

If the chemical heat of combustion is		Aerosol Classification Level
>	≤	
0	20 kJ/g (8,600 Btu/lb)	1
20 kJ/g (8,600 Btu/lb)	30 kJ/g (13,000 Btu/lb)	2
30 kJ/g (13,000 Btu/lb)	—	3

1.7.1.2 The fire tests shall be conducted at an approved testing laboratory. (See Annex C for information on the 12-pallet test array.)

1.7.2 Level 1 Aerosol Products. Level 1 Aerosol Products shall be defined as those products with a total chemical heat of combustion that is less than or equal to 20 kJ/g (8600 Btu/lb).

1.7.3 Level 2 Aerosol Products. Level 2 Aerosol Products shall be defined as those products with a total chemical heat of combustion that is greater than 20 kJ/g (8600 Btu/lb), but less than or equal to 30 kJ/g (13,000 Btu/lb).

1.7.4 Level 3 Aerosol Products. Level 3 Aerosol Products shall be defined as those products with a total chemical heat of combustion that is greater than 30 kJ/g (13,000 Btu/lb).

1.7.5 Aerosol Cooking Spray Products. Aerosol Cooking Spray Products are those aerosol products designed to deliver a vegetable oil or a solid or nonflammable liquid to reduce sticking on cooking and baking surfaces, or to be applied to food, or both. These products have a chemical heat of combustion that is greater than 20 kJ/g (8600 Btu/lb) and contain not more than 18 percent by weight of flammable propellant.

1.7.5.1 If the aerosol cooking spray product has a chemical heat of combustion that does not exceed 20 kJ/g (8600 Btu/lb), it shall be considered a Level 1 aerosol product.

Δ **1.7.5.2** If the aerosol cooking spray product contains more than 18 percent by weight of flammable propellant, it shall be classified in accordance with its chemical heat of combustion, as set forth in Table 1.7.1.

1.8 Classification of Aerosol Products in Plastic Containers Larger Than 118 ml (4 fl oz) and Smaller Than 1000 ml (33.8 fl oz).

Δ **1.8.1 Plastic Aerosol 1 Products.** Plastic aerosol 1 products shall be defined as those that meet one of the following criteria:

- (1) The base product has no fire point when tested in accordance with ASTM D92, *Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester*, and the propellant is nonflammable.
- (2) The base product does not exhibit sustained combustion when tested in accordance with 49 CFR 173, Appendix H, "Method of Testing for Sustained Combustibility," or the *UN Recommendations on the Transport of Dangerous Goods*, and the propellant is nonflammable.
- (3)* The base product contains not more than 20 percent by volume (15.8 percent by weight) of ethanol or propanol, or mixtures thereof in an aqueous mix, and the propellant is nonflammable.

- (4)* The base product contains not more than 4 percent by weight of an emulsified liquefied flammable gas propellant within an aqueous base, said propellant to remain emulsified for the life of the product. Where such propellant is not permanently emulsified then the propellant shall be nonflammable.

■ **1.8.2* Plastic Aerosol 3 Products.** Plastic Aerosol 3 Products shall be defined as those that meet one of the following criteria:

- (1) The base product has no fire point when tested in accordance with ASTM D92, *Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester*, and there is not more than 10 percent by weight flammable propellant.
- (2) The base product does not exhibit sustained combustion when tested in accordance with 49 CFR 173, Appendix H, "Method of Testing for Sustained Combustibility," on the *UN Recommendations on the Transport of Dangerous Goods*, and there is not more than 10 percent weight flammable propellant.
- (3) The base product contains not more than 50 percent by volume of flammable or combustible, water-miscible alcohols in an aqueous mix, and there is not more than 10 percent by weight flammable propellant.

Δ **1.8.3 Plastic Aerosol X Products.** Plastic Aerosol X Products shall be defined as those products that do not meet any of the criteria provided in 1.8.1 or 1.8.2.

1.9 Marking of Packages of Aerosol Products.

1.9.1 Manufacturers of aerosol products shall ensure that all cartons or packages of aerosol products are identified on at least one exterior side with the classification of the aerosol products contained therein, in accordance with Section 1.7 and Section 1.8.

1.9.2 Cartons or packages containing aerosol products in metal containers or glass and plastic containers 118 ml (4 fl oz) or less shall be clearly marked as follows:

Level ____ Aerosols

1.9.3 Cartons or packages containing Aerosol Cooking Spray Products in metal containers shall be clearly marked as follows:

Aerosol Cooking Spray

1.9.4 Cartons or packages containing aerosol products in plastic containers greater than 118 ml (4 fl oz) shall be clearly marked on the exterior of the carton as follows:

Plastic Aerosol 1, 3 (or X)

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this code and shall be considered part of the requirements of this document.

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 1, *Fire Code*, 2018 edition.

NFPA 10, *Standard for Portable Fire Extinguishers*, 2018 edition.

NFPA 11, *Standard for Low-, Medium-, and High-Expansion Foam*, 2016 edition.