

NFPA 17

Standard for Dry Chemical Extinguishing Systems

2002 Edition



NFPA, 1 Batterymarch Park, PO Box 9101, Quincy, MA 02269-9101
An International Codes and Standards Organization

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NFPA 17
Standard for
Dry Chemical Extinguishing Systems
2002 Edition

This edition of NFPA 17, *Standard for Dry Chemical Extinguishing Systems*, was prepared by the Technical Committee on Dry and Wet Chemical Extinguishing Systems and acted on by NFPA at its May Association Technical Meeting held May 19–23, 2002, in Minneapolis, MN. It was issued by the Standards Council on July 19, 2002, with an effective date of August 8, 2002, and supersedes all previous editions.

This edition of NFPA 17 was approved as an American National Standard on July 19, 2002.

Origin and Development of NFPA 17

The Dry Chemical Extinguishing Systems Committee was activated in 1952. At that time, there was no dry chemical extinguishing system tested and listed by a testing laboratory, but by late 1954, a system was tested and listed by Underwriters Laboratories Inc. At its meeting in January 1955, the Committee prepared an outline of a standard on dry chemical extinguishing systems and, in the following year, prepared the standard that was tentatively adopted by the National Fire Protection Association on June 7, 1956. Changes to the tentative standard led to approval of the first official NFPA standard on dry chemical extinguishing systems in 1957. Further amendments were made in 1958, 1968, 1969, 1972, 1973, 1975, and 1980. The 1985 edition was a complete revision of the standard. The 1990 edition was a partial revision.

The 1998 edition of this standard was revised to clarify the requirements for protection of unclosable openings and equipment shutdown.

Changes to the 2002 edition consist of an editorial restructuring of the standard in accordance with the NFPA *Manual of Style*, a specific reference for the listing of pre-engineered systems, and a simplification of the requirements for common ducts.

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This list represents the membership at the time the Committee was balloted on the text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the front of this book.

NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

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NFPA 17

Standard for

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NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

Changes other than editorial are indicated by a vertical rule beside the paragraph, table, or figure in which the change occurred. These rules are included as an aid to the user in identifying changes from the previous edition. Where one or more complete paragraphs have been deleted, the deletion is indicated by a bullet between the paragraphs that remain.

A reference in brackets [] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, Annex B lists the complete title and edition of the source documents for both mandatory and nonmandatory extracts. Editorial changes to extracted material consist of revising references to an appropriate division in this document or the inclusion of the document number with the division number when the reference is to the original document. Requests for interpretations or revisions of extracted text shall be sent to the appropriate technical committee.

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

Chapter 1 Administration

1.1* Scope. This standard includes minimum requirements for dry chemical fire-extinguishing systems that discharge dry chemical from fixed nozzles or hand hose lines by means of expellant gas.

1.2 Purpose. This standard is prepared for the use and guidance of those charged with the purchasing, designing, installing, testing, inspecting, approving, listing, operating, or maintaining of dry chemical fire-extinguishing systems in order that such equipment will function as intended throughout its life.

1.3 Retroactivity.

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

1.3.2 Unless otherwise noted, it is not intended that the provisions of this document be applied to facilities, equipment, structures, or installations that were existing or approved for construction or installation prior to the effective date of this document.

1.4 Equivalency. Nothing in this standard is intended to prevent the use of new methods or devices, provided sufficient technical data are submitted to the authority having jurisdiction to demonstrate that the new method or devices are equivalent in quality, effectiveness, durability, and safety to those prescribed by this standard.

1.5 Units and Formulas.

1.5.1 When a primary value for measurement in English units as given in this standard is followed by a parenthetical equivalent value in metric units, the primary English value stated is to be regarded as the requirement.

1.5.1.1* Metric units of measurement in this standard are in accordance with the modernized metric system known as the International System of Units (SI).

1.5.1.2 The conversion procedure used for the SI units is to multiply the primary English quantity by the conversion factor and then round the result (if necessary) to the appropriate number of significant digits.

1.6* Qualifications. Only persons properly trained shall be considered competent to design, install, and service dry chemical systems.

Chapter 2 Referenced Publications

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

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

NFPA 70, *National Electrical Code*®, 2002 edition.

NFPA 72®, *National Fire Alarm Code*®, 2002 edition.

2.3 Other Publications.

2.3.1 ANSI Publication. American National Standards Institute, Inc., 11 West 42nd Street, 13th Floor, New York, NY 10036.

ANSI C-2, *National Electrical Safety Code*, 1993.

2.3.2 ASME Publications. American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016-5990.

ASME *Boiler and Pressure Vessel Code*, 1998.

ANSI/ASME B31.1, *Power Piping*, 1998 edition (including B31.1a 1999 Addenda and B31.1b 2000 Addenda).

2.3.3 ASTM Publication. American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM A 53, *Standard Specifications for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless*, 2002.

2.3.4 UL Publications. Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062.

UL 300, *Fire Extinguishing Systems for Protection of Restaurant Cooking Areas, Fire Testing of*, 1996.

UL 1254, *Pre-Engineered Dry Chemical Extinguishing System Units*, 1996.

2.3.5 U. S. Government Publication. U.S. Government Printing Office, Washington, DC 20402.

Title 29, *Code of Federal Regulations*, Part 1910, Subpart S.

Chapter 3 Definitions

3.1 General Definitions. The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not included, common usage of the terms shall apply.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). The organization, office, or individual responsible for approving equipment, materials, an installation, or a procedure.

3.2.3 Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3.2.4* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.5 Shall. Indicates a mandatory requirement.

3.2.6 Should. Indicates a recommendation or that which is advised but not required.

3.2.7 Standard. A document, the main text of which contains only mandatory provisions using the word “shall” to indicate requirements and which is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions shall be located in an appendix or annex, footnote, or fine-print note and are not to be considered a part of the requirements of a standard.

3.3 General Definitions.

3.3.1 Auxiliary Equipment. Listed equipment used in conjunction with the dry chemical systems, for example, to shut down power, fuel, or ventilation to the hazard being protected or to initiate signaling devices.

3.3.2 Caking. A phenomenon that occurs when moisture chemically reacts with a dry chemical fire-extinguishing agent. This reaction results in materials that, being hydrated by moisture, stick together to form a large agglomerate, or what is more commonly referred to as lumps.

3.3.3* Calculation and Design. The process of computing, with the use of equations, graphs, or tables, the system characteristics such as flow rate, pipe size, area, or volume protected by each nozzle, nozzle pressure, and pressure drop.

3.3.4 Clearance. The air distance between extinguishing system equipment, including piping and nozzles, and unenclosed or uninsulated live electrical components not at ground potential. [2001:1.3]

3.3.5 Discharge Nozzle. Device from which the dry chemical is discharged to provide for suppression of a fire in the designated hazard.

3.3.6 Duct.

3.3.6.1 Branch Duct. The duct work that contains the exhaust air from a single hood or hazard area.

3.3.6.2 Common Duct. The duct work containing the exhaust air from two or more branch ducts.

3.3.7 Dry Chemical. A powder composed of very small particles, usually sodium bicarbonate-, potassium bicarbonate-, or ammonium phosphate-based with added particulate material supplemented by special treatment to provide resistance to packing, resistance to moisture absorption (caking), and the proper flow capabilities.

3.3.7.1 Multipurpose Dry Chemical. Ammonium phosphate-based extinguishing agent that is effective on fires involving both ordinary combustibles, such as wood or paper, and fires involving flammable liquids.

3.3.8 Expellant Gas. The medium used to discharge dry chemical from its container.

3.3.9 Indicator. A mechanical or electrical device that shows when an extinguishing system or a critical component of it is ready to operate, or if it has already operated.

3.3.10 Inspection. A visual examination of a system or portion thereof to verify that it appears to be in operating condition and is free of physical damage. [820:1.5]

3.3.11 Lumps. Agglomerations of dry chemical that do not crumble into particles when dropped from a height of 4 in. (101 mm) onto a hard surface.

3.3.12 Maintenance. Work, including, but not limited to, repair, replacement, and service, performed to ensure that equipment operates properly.

3.3.13 Manual.

3.3.13.1* Manufacturer's Listed Installation and Maintenance Manual. The pamphlet referenced as part of the listing of the dry chemical extinguishing system.

3.3.13.2 Owner's Manual. A pamphlet containing the manufacturer's recommendations for the proper inspection and operation of the extinguishing system.

3.3.14 Operating Devices. Mechanical, electrical, or pneumatic devices involved in the operation of a system whether “actuating devices” initiating operation (e.g., automatic detection devices or systems and manual actuation devices, such as manual pulls or strike buttons) or “operated devices” responding to the actuation (e.g., release mechanisms, shutoff devices, alarms, and auxiliary equipment).

3.3.15 Operation.

3.3.15.1 Automatic Operation. Operation without human intervention. This operation includes, but is not limited to, heat, rate of heat rise, smoke, or pressure change. [25:3.3]

3.3.15.2 Manual Operation. Operation of a system or its components through human action. [25:3.3]

3.3.16 Pipe. Circular conduit for conveying the dry chemical to the discharge nozzle(s). Wherever pipe is used in this standard, it shall be understood also to mean tube.

3.3.17 Recharge. The replacement of the dry chemical and expellant gas.

3.3.18 Selector Valve. A device used to direct dry chemical to the hazard being protected.

3.3.19 Signal. A status indication communicated by electrical or other means. [72:3.3]

3.3.20 Trained. One who has undergone the instructions necessary to safely design and install and reliably perform the maintenance and recharge service.

3.3.21 Transport Canada (TC). Has jurisdiction over design and transportation of compressed gas cylinders and cartridges.

3.3.22 U. S. Department of Transportation (DOT). The department that has jurisdiction over the design and transportation of compressed gas cylinders and cartridges.

3.4 Systems Definitions.

3.4.1 Dry Chemical System. A means of applying dry chemical that can be automatically or manually activated to discharge through a distribution system onto or into the protected hazard. The system includes auxiliary equipment.

3.4.2 Engineered System. Those requiring individual calculation and design to determine the flow rates, nozzle pressures, pipe size, area or volume protected by each nozzle, quantities of dry chemical, number and types of nozzles, and their placement in a specific system.

3.4.3 Hand Hose Line System. A hose and nozzle assembly connected by fixed piping or connected directly to a supply of extinguishing agent. [122:1.4]

3.4.4 Local Application System. A supply of dry chemical permanently connected to fixed piping with nozzles arranged to discharge directly onto the fire.

3.4.5* Pre-Engineered Systems. Those having predetermined flow rates, nozzle pressures, and quantities of dry chemical.

3.4.6 Total Flooding System. A supply of dry chemical permanently connected to fixed piping and nozzles that are arranged to discharge dry chemical into an enclosure surrounding the hazard.

Chapter 4 Components

4.1 Detectors. Automatic detectors shall be listed devices that are capable of detecting and indicating heat, flame, smoke, combustible vapors, or an abnormal condition in the hazard that is likely to produce fire.

4.2 Hand Hose Line and Nozzle Assembly.

4.2.1* Hose. Hose lines on systems shall be coupled to the dry chemical supply and shall incorporate hose listed for this use.

4.2.2 Hose Nozzle. A hose nozzle shall be so designed that it can be handled by one person.

4.2.2.1 A hose nozzle shall incorporate a shutoff device to control the flow of dry chemical.

4.2.3 Hose Line Storage. The hose shall be coiled on a hose reel or rack so that it can be readily uncoiled with a minimum of delay.

4.2.3.1 If installed, hose line stored outdoors shall be protected against the weather.

4.3 Nozzles.

4.3.1 Discharge Nozzles. Discharge nozzles shall be listed for their intended use.

4.3.1.1 Discharge nozzles shall be of adequate strength for use with the expected working pressures.

4.3.1.2 Discharge nozzles shall be of brass, stainless steel, or other corrosion-resistant materials, or be protected inside and out against corrosion.

4.3.1.3 Discharge nozzles shall be made of noncombustible materials and shall withstand the expected fire exposure without deformation.

4.3.1.4 Discharge nozzles shall be permanently marked for identification.

4.3.1.5 Discharge nozzles shall be provided with blowoff caps or other suitable devices or materials to prevent the entrance of moisture or other environmental materials into the piping.

4.3.1.6 The protective device shall blow off, open, or blow out upon agent discharge.

4.4 Operating Devices.

4.4.1 Operating devices shall be listed.

4.4.1.1 All operating devices shall be designed for the service they will encounter and shall not be readily rendered inoperative or susceptible to accidental operation.

4.4.1.2 Operating devices shall be marked to indicate their listed minimum and maximum temperature limitations, but all devices shall operate at least from 32°F to 120°F (0°C to 49°C).

4.4.2 Manual Actuators.

4.4.2.1 Manual actuators shall not require a force of more than 40 lb (178 N).

4.4.2.2 Manual actuators shall not require movement of more than 14 in. (356 mm) to secure operation.

4.4.2.3 All manual actuators shall be provided with operating instructions.

4.4.2.3.1 The operating instructions shall be permitted to include the use of pictographs and shall have lettering at least ¼ in. (6.35 mm) in height. (See 5.7.1.7.)

4.4.2.4 All remote manual operating devices shall be identified as to the hazard they protect.

4.4.3 Shutoff Devices. Shutoff devices shall require manual resetting prior to fuel or power being restored.

4.4.4 Valves.

4.4.4.1 All valves shall be listed for the intended use, particularly with regard to flow capacity and operation.

4.4.4.2 Selector valves shall be of the quick-opening type.

4.4.4.3 Selector valves shall allow free passage of the dry chemical.

4.5 Pipe and Fittings.

4.5.1* General. Pipe and fittings shall be of noncombustible material having physical and chemical characteristics such that their integrity under stress can be predicted with reliability. The pipe, fittings, and connection joints shall withstand the maximum expected pressure in the piping system.

4.5.1.1 Pipe and fittings shall be galvanized steel, stainless steel, copper, or brass. Special corrosion-resistant materials or coatings shall be required in severely corrosive atmospheres.