NFPA®

10

Standard for Portable Fire Extinguishers

2022

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Standard for Portable Fire Extinguishers

2022 Edition

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NFPA® 10

Standard for

Portable Fire Extinguishers

2022 Edition

This edition of NFPA 10, *Standard for Portable Fire Extinguishers*, was prepared by the Technical Committee on Portable Fire Extinguishers and acted on by the NFPA membership during the 2021 NFPA Technical Meeting held June 14–July 2. It was issued by the Standards Council on August 26, 2021, with an effective date of September 15, 2021, and supersedes all previous editions.

This edition of NFPA 10 was approved as an American National Standard on September 15, 2021.

Origin and Development of NFPA 10

In 1918 and 1919, the NFPA Committee on Field Practice (predecessor of the present committee) was active in developing a standard on first aid protection. The earliest official NFPA standard on this subject was adopted in 1921. Revised editions were adopted by the association in 1926, 1928, 1929, 1930, 1931, 1932, 1936, 1938, 1942, 1945, 1950, 1953, 1955, 1956, 1957, 1958, 1959, 1961, 1962, 1963, 1965, 1966, 1967, 1968, 1969, 1970, 1972, 1973, 1974, 1975, 1978, and 1981. In 1965, the previous editions were divided into two separate texts, one covering installation and the second covering maintenance and use. The 1974 edition recombined all the information previously contained in NFPA 10 and NFPA 10A. A new appendix was added to the 1974 edition to include information about the selection of fire extinguishers for home hazards. Information on selection and distribution of fire extinguishers was added to the appendix of the 1978 edition. Major revisions to provide simplification and uniformity were made in the 1984 edition. The standard was revised in 1988, 1990, and 1994.

In 1998, NFPA 10R, *Recommended Practice for Portable Fire Extinguishing Equipment in Family Dwelling Units and Living Units,* was withdrawn. Information on this topic was incorporated as an annex of NFPA 10.

This standard was revised in 2002.

The 2007 edition of this standard was a complete revision.

The 2010 edition of this standard included changes to comply with the *Manual of Style for NFPA Technical Committee Documents* by removing unenforceable terms. Annex material was also added to clarify the need for removing obsolete extinguishers.

The 2013 edition of this standard was revised to better address Class D extinguishing agents and the phase-out of listed halon extinguishers. The definition of halocarbons was expanded to permit the use of any halocarbon agent acceptable under the U.S. EPA Significant New Alternatives Policy program. The list of NFPA documents that contain additional requirements that supersede or expand upon those found in this standard was significantly expanded for easy reference. New travel distances for obstacle, gravity/three-dimensional, and pressure fire hazards were added. Chapter 7, Inspection, Maintenance, and Recharging, and Annex E, Distribution, were significantly revised and restructured. Instructions for inspection and maintenance of residential extinguishers were added to Annex F, Selection of Residential Fire-Extinguishing Equipment.

The 2018 edition incorporated clarifications on a wide array of topics, including electronic monitoring, obsolete extinguishers, extinguishers installed in areas containing oxidizers, extinguisher signs, and extinguisher mounting equipment and cabinets. A new requirement regarding maintenance of hose stations that are used in lieu of extinguishers was added. The fire classification marking system was expanded to include markings for extinguishers rated for Class AC and Class AK. The annexes were also updated to address current extinguisher types and ratings, while removing information on obsolete equipment.

The 2022 edition includes reorganization to sections pertaining to fire extinguisher selection which provided clarification on what type of extinguisher to use for a particular type of hazard with further explanations and examples in the annex section. Visibility requirements for fire extinguishers have been clarified as well as changes to inspection sections to ensure that proper visibility of the extinguisher is maintained. Labelling requirements have been updated to mandate detailed record keeping in labels. Maintenance sections now require that defective gauges be replaced and distorted cylinders condemned as well as changes on electronic monitoring system maintenance requirements.

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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.

Committee Scope: This Committee shall have primary responsibility for documents on the installation, maintenance, and use of portable fire extinguishers and equipment. Does not apply to permanently installed fire extinguishing systems even though portions of those systems are portable, such as hose and nozzles, which may be attached to a fixed supply of extinguishing agent.

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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.

A reference in brackets [ ] following a section or paragraph indicates material that has been extracted from another NFPA document. Extracted text may be edited for consistency and style and may include the revision of internal paragraph references and other references as appropriate. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

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

Chapter 1 Administration

1.1* Scope. The provisions of this standard apply to the selection, installation, inspection, maintenance, recharging, and testing of portable fire extinguishers and Class D extinguishing agents.

1.1.1 The requirements given herein are minimum.

1.1.2 The requirements shall not apply to permanently installed systems for fire extinguishment, even where portions of such systems are portable (such as hose and nozzles attached to a fixed supply of extinguishing agent).

1.2* Purpose. This standard is prepared for use by and guidance of persons charged with selecting, purchasing, installing, approving, listing, designing, and maintaining portable fire extinguishers and Class D extinguishing agents.

1.2.1 The fire protection requirements of this standard are general in nature and are not intended to abrogate the specific requirements of other NFPA standards for specific occupancies.

1.2.2 Nothing in this standard shall be construed as a restriction on new technologies or alternative arrangements, provided that the level of protection as herein described is not lowered and is acceptable to the authority having jurisdiction.

1.3 Units.

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

1.3.1.1 The units are listed in Table 1.3.1.1 with conversion factors.

Table 1.3.1.1 Metric Units of Measurement

Name of Unit	Abbreviation	Conversion Factor
Liter	L	1 gal = 3.785 L
Millimeter	mm	1 in. = 25.4 mm
Meter	m	1 ft = 0.305 m
Kilogram	kg	1 lb (mass) = 0.454 kg
Degree Celsius	°C	$\frac{5}{9}$(°F – 32) = °C
Bar	bar	1 psi = 0.0689 bar

1.3.1.2 If a value for measurement as given in this standard is followed by an equivalent value in other units, the first stated is to be regarded as the requirement.

1.3.1.3 A given equivalent value shall be permitted to be considered approximate.

1.3.2 The conversion procedure for the SI units is to multiply the quantity by the conversion factor and then round the result to the appropriate number of significant digits.

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.

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

NFPA 1, *Fire Code,* 2021 edition.

NFPA 2, *Hydrogen Technologies Code,* 2020 edition.

NFPA 14, *Standard for the Installation of Standpipe and Hose Systems,* 2019 edition.

NFPA 22, *Standard for Water Tanks for Private Fire Protection,* 2018 edition.

NFPA 30, *Flammable and Combustible Liquids Code,* 2021 edition.

NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages,* 2021 edition.

NFPA 33, *Standard for Spray Application Using Flammable or Combustible Materials,* 2021 edition.

NFPA 40, *Standard for the Storage and Handling of Cellulose Nitrate Film,* 2022 edition.

NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals,* 2019 edition.

NFPA 51, *Standard for the Design and Installation of Oxygen–Fuel Gas Systems for Welding, Cutting, and Allied Processes,* 2018 edition.

NFPA 51B, *Standard for Fire Prevention During Welding, Cutting, and Other Hot Work,* 2019 edition.

NFPA 52, *Vehicular Natural Gas Fuel Systems Code,* 2019 edition.

NFPA 58, *Liquefied Petroleum Gas Code,* 2020 edition.

NFPA 59, *Utility LP-Gas Plant Code,* 2021 edition.

NFPA 59A, *Standard for the Production, Storage, and Handling of Liquefied Natural Gas (LNG),* 2019 edition.

NFPA 72®, National Fire Alarm and Signaling Code®, 2022 edition.

NFPA 75, *Standard for the Fire Protection of Information Technology Equipment,* 2020 edition.

NFPA 76, *Standard for the Fire Protection of Telecommunications Facilities,* 2020 edition.

NFPA 96, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations,* 2021 edition.

NFPA 99, *Health Care Facilities Code,* 2021 edition.

NFPA 99B, *Standard for Hypobaric Facilities,* 2021 edition.

NFPA *101®, Life Safety Code®,* 2021 edition.

NFPA 102, *Standard for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures,* 2021 edition.

NFPA 115, *Standard for Laser Fire Protection,* 2020 edition.

NFPA 120, *Standard for Fire Prevention and Control in Coal Mines,* 2020 edition.

NFPA 122, *Standard for Fire Prevention and Control in Metal/Nonmetal Mining and Metal Mineral Processing Facilities,* 2020 edition.

NFPA 130, *Standard for Fixed Guideway Transit and Passenger Rail Systems,* 2020 edition.

NFPA 140, *Standard on Motion Picture and Television Production Studio Soundstages, Approved Production Facilities, and Production Locations,* 2018 edition.

NFPA 150, *Fire and Life Safety in Animal Housing Facilities,* 2022 edition.

NFPA 160, *Standard for the Use of Flame Effects Before an Audience,* 2021 edition.

NFPA 232, *Standard for the Protection of Records,* 2022 edition.

NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations,* 2022 edition.

NFPA 301, *Code for Safety to Life from Fire on Merchant Vessels,* 2018 edition.

NFPA 302, *Fire Protection Standard for Pleasure and Commercial Motor Craft,* 2020 edition.

NFPA 303, *Fire Protection Standard for Marinas and Boatyards,* 2021 edition.

NFPA 307, *Standard for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves,* 2021 edition.

NFPA 326, *Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair,* 2020 edition.

NFPA 385, *Standard for Tank Vehicles for Flammable and Combustible Liquids,* 2017 edition.

NFPA 400, *Hazardous Materials Code,* 2022 edition.

NFPA 403, *Standard for Aircraft Rescue and Fire-Fighting Services at Airports,* 2018 edition.

NFPA 407, *Standard for Aircraft Fuel Servicing,* 2022 edition.

NFPA 408, *Standard for Aircraft Hand Portable Fire Extinguishers,* 2017 edition.

NFPA 409, *Standard on Aircraft Hangars,* 2021 edition.

NFPA 410, *Standard on Aircraft Maintenance,* 2020 edition.

NFPA 418, *Standard for Heliports,* 2021 edition.

NFPA 423, *Standard for Construction and Protection of Aircraft Engine Test Facilities,* 2021 edition.

NFPA 484, *Standard for Combustible Metals,* 2022 edition.

NFPA 495, *Explosive Materials Code,* 2018 edition.

NFPA 498, *Standard for Safe Havens and Interchange Lots for Vehicles Transporting Explosives,* 2018 edition.

NFPA 501A, *Standard for Fire Safety Criteria for Manufactured Home Installations, Sites, and Communities,* 2021 edition.

NFPA 502, *Standard for Road Tunnels, Bridges, and Other Limited Access Highways,* 2020 edition.

NFPA 505, *Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operations,* 2018 edition.

NFPA 655, *Standard for Prevention of Sulfur Fires and Explosions,* 2017 edition.

NFPA 731, *Standard for the Installation of Premises Security Systems,* 2020 edition.

NFPA 801, *Standard for Fire Protection for Facilities Handling Radioactive Materials,* 2020 edition.

NFPA 804, *Standard for Fire Protection for Advanced Light Water Reactor Electric Generating Plants,* 2020 edition.

NFPA 805, *Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants,* 2020 edition.

NFPA 820, *Standard for Fire Protection in Wastewater Treatment and Collection Facilities,* 2020 edition.

NFPA 909, *Code for the Protection of Cultural Resource Properties — Museums, Libraries, and Places of Worship,* 2021 edition.

NFPA 914, *Code for the Protection of Historic Structures,* 2019 edition.

NFPA 1123, *Code for Fireworks Display,* 2022 edition.

NFPA 1125, *Code for the Manufacture of Model Rocket and High-Power Rocket Motors,* 2022 edition.

NFPA 1126, *Standard for the Use of Pyrotechnics Before a Proximate Audience,* 2021 edition.

NFPA 1141, *Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas,* 2017 edition.

NFPA 1192, *Standard on Recreational Vehicles,* 2021 edition.

NFPA 1194, *Standard for Recreational Vehicle Parks and Campgrounds,* 2021 edition.

NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems,* 2019 edition.

NFPA 1901, *Standard for Automotive Fire Apparatus,* 2016 edition.

NFPA 1906, *Standard for Wildland Fire Apparatus,* 2016 edition.

NFPA 1925, *Standard on Marine Fire-Fighting Vessels,* 2018 edition.

NFPA 1962, *Standard for the Care, Use, Inspection, Service Testing, and Replacement of Fire Hose, Couplings, Nozzles, and Fire Hose Appliances,* 2018 edition.

NFPA 5000®, Building Construction and Safety Code®, 2021 edition.

2.3 Other Publications.

2.3.1 ACA Publications. American Coatings Association, 901 New York Avenue NW, Suite 300 West, Washington, DC 20001.

Hazardous Materials Identification System (HMIS) Implementation Manual, 4th edition, 2015.

2.3.2 ASTM Publications. ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM D5391, *Standard Test for Electrical Conductivity and Resistivity of a Flowing High Purity Water Sample*, 2014.

Δ **2.3.3 CGA Publications.** Compressed Gas Association, 14501 George Carter Way, Suite 103, Chantilly, VA 20151.

CGA C-1, *Methods for Pressure Testing Compressed Gas Cylinders*, 2016.

CGA G-10.1, *Commodity Specification for Nitrogen*, 2016.

2.3.4 UL Publications. Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 1093, *Standard for Halogenated Agent Fire Extinguishers*, 1995, revised 2008.

UL 1803, *Standard for Factory Follow-Up on Third Party Certified Portable Fire Extinguishers*, 2012, revised 2017.

Δ **2.3.5 ULC Publications.** ULC Standards, 171 Nepean Street, Suite 400, Ottawa, Ontario K2P 0B4 Canada.

ULC CAN-S512, *Standard for Halogenated Agent Hand and Wheeled Fire Extinguishers*, 2005, reaffirmed 2007.

Δ **2.3.6 UL/ULC Publications.** The following publications are bi-nationally harmonized standards for Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096, and ULC Standards, 171 Nepean Street, Suite 400, Ottawa, Ontario K2P 0B4, Canada.

UL 8, CAN/ULC-S554, *Water Based Agent Fire Extinguishers*, 2016.

UL 154, CAN/ULC-S503, *Standard for Carbon-Dioxide Fire Extinguishers*, 2005, revised 2018.

UL 299, CAN/ULC-S504, *Standard for Dry Chemical Fire Extinguishers*, 2012, revised 2018.

UL 626, CAN/ULC-S507, *Standard for Water Fire Extinguishers*, 2005, revised 2018.

UL 711, CAN/ULC-S508, *Standard for the Rating and Fire Testing of Fire Extinguishers*, 2018.

UL 2129, CAN/ULC-S566, *Standard for Halocarbon Clean Agent Fire Extinguishers*, 2017.

Δ **2.3.7 UN Publications.** United Nations, Publications Customer Service, PO Box 960, Herndon, VA 20172.

Globally Harmonized System of Classification and Labeling of Chemicals (GHS), ST/SG/AC.10/30/Rev. 6, 2015.

2.3.8 US Government Publications. US Government Publishing Office, 732 North Capitol Street, NW, Washington, DC 20401-0001.

Title 49, Code of Federal Regulations, Part 180.209, "Requirements for Requalification of Specification Cylinders."

Title 49, Code of Federal Regulations, Part 180.213, "Requalification Markings."

2.3.9 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections.

NFPA 17, *Standard for Dry Chemical Extinguishing Systems*, 2017 edition.

NFPA 17A, *Standard for Wet Chemical Extinguishing Systems*, 2017 edition.

NFPA 18, *Standard on Wetting Agents*, 2017 edition.

NFPA 52, *Vehicular Natural Gas Fuel Systems Code*, 2019 edition.

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or 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. An NFPA Standard, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements and that is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions are not to be considered a part of the requirements of a standard and shall be located in an appendix, annex, footnote, informational note, or other means as permitted in the NFPA Manuals of Style. When used in a generic sense, such as in the phrase "standards development process" or "standards development activities," the term "standards" includes all NFPA Standards, including Codes, Standards, Recommended Practices, and Guides.

3.3 General Definitions.

3.3.1 ANSI. American National Standards Institute. [**52,** 2019]

3.3.2 Antifreeze Charge. See 3.3.20, Loaded Stream Charge.

3.3.3* Carbon Dioxide. A colorless, odorless, electrically nonconductive inert gas that is a suitable medium for extinguishing Class B and Class C fires.

3.3.4 Chemical.

3.3.4.1* ***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. [**17,** 2017]

3.3.4.2* ***Wet Chemical.*** Normally an aqueous solution of organic or inorganic salts or a combination thereof that forms an extinguishing agent. [**17A,** 2017]

3.3.5 Clean Agent. Electrically non-conducting, volatile, or gaseous fire extinguishant that does not leave a residue upon evaporation.

3.3.6 Closed Recovery System.

3.3.6.1 ***Dry Chemical Closed Recovery System.*** A system that is constructed in a manner that does not introduce foreign material into the agent being recovered and has a means of visually inspecting the recovered agent for contaminants.

Δ **3.3.6.2*** ***Halogenated Closed Recovery System.*** A system that provides for the transfer of halogenated agents between fire extinguishers, supply containers, and recharge and recovery containers so that none of the halogenated agent escapes to the atmosphere.

3.3.7 Cylinder.

3.3.7.1 ***High-Pressure Cylinder.*** Cylinders (and cartridges) containing nitrogen, compressed air, carbon dioxide, or other gases at a service pressure higher than 500 psi (3447 kPa) at 70°F (21°C).

3.3.7.2 ***Low-Pressure Cylinder.*** Cylinders containing fire-extinguishing agent (medium), nitrogen, compressed air, or other compressed gases at a service pressure of 500 psi (3447 kPa) or lower at 70°F (21°C).

3.3.8 DOT. U.S. Department of Transportation. [**52,** 2019]

3.3.9* Dry Powder. Solid materials in powder or granular form intended for the extinguishment of Class D combustible metal fires by crusting, smothering, or heat-transferring means.

3.3.10* Electronic Monitoring. Either a local alarm device to indicate when an extinguisher is removed from its designated location or a method of electronic communication (data transmission) between an in-place fire extinguisher and an electronic monitoring device/system.

3.3.11 Extinguisher Bracket. Extinguisher retention device designed to mount and secure a specific extinguisher model onto various surfaces by incorporating releasable straps or bands to secure the fire extinguisher.

3.3.12 Extinguisher Cabinet. An identifiable and readily accessible fire extinguisher housing device designed to store and protect fire equipment.

3.3.13 Extinguisher Hanger. Extinguisher mounting device designed for mounting a specific extinguisher model onto stationary vertical surfaces.

3.3.14* Extinguisher Inspection. A quick check that a fire extinguisher is in its designated place, that it has not been actuated or tampered with, and that there is no obvious physical damage or condition to prevent its operation.

3.3.15* Extinguisher Maintenance. A thorough examination of the fire extinguisher that is intended to give maximum assurance that a fire extinguisher will operate effectively and safely and to determine if physical damage or condition will prevent its operation, if any repair or replacement is necessary, and if hydrostatic testing or internal maintenance is required.

3.3.16* Film-Forming Foam. A solution that will form an aqueous film on liquid fuels.

3.3.16.1* ***Aqueous Film-Forming Foam (AFFF).*** A solution based on fluorinated surfactants plus foam stabilizers to produce a fluid aqueous film for suppressing liquid fuel vapors.

3.3.16.2* ***Film-Forming Fluoroprotein Foam (FFFP).*** A protein-foam solution that uses fluorinated surfactants to produce a fluid aqueous film for suppressing liquid fuel vapors.

3.3.17 Flammable Liquids of Appreciable Depth. Flammable liquids of appreciable depth are those with a depth greater than ¼ in. (6.3 mm).

3.3.18* Halogenated Agents. Halogenated (clean) agents referenced in this standard are of the following types.

3.3.18.1 ***Halocarbons.*** Halocarbon agents include hydrochlorofluorocarbon (HCFC), hydrofluorocarbon (HFC), perfluorocarbon (PFC), fluoroiodocarbon (FIC) types of agents, and other halocarbons that are found acceptable under the Environmental Protection Agency Significant New Alternatives Policy program.

3.3.18.2 ***Halons.*** Halons include bromochlorodifluoromethane (Halon 1211), bromotrifluoromethane (Halon 1301), and mixtures of Halon 1211 and Halon 1301 (Halon 1211/1301).

Δ **3.3.19 Hydrostatic Testing.** Pressure testing of the extinguisher cylinder and certain hose assemblies to verify strength against unwanted rupture.

3.3.20* Loaded Stream Charge. A water-based extinguishing agent that uses an alkali metal salt as a freezing point depressant.

3.3.21 Mild Steel Shell. All steel shells other than stainless steel and steel shells used for high-pressure cylinders.

3.3.22 Pressure.

3.3.22.1 ***Extinguisher Service Pressure.*** The normal operating pressure as indicated on the nameplate or cylinder of a fire extinguisher.

3.3.22.2 ***Factory Test Pressure.*** The pressure shown on the nameplate at which a shell was tested at time of manufacture.

3.3.23 Pressurized Flammable Liquid Fires. Fires resulting from liquids that are forced, pumped, or sprayed.

3.3.24 Recharging. The replacement of the extinguishing agent (also includes the expellant for certain types of fire extinguishers).

3.3.25 Servicing. Performing maintenance, recharging, or hydrostatic testing on a fire extinguisher.

3.3.26 TC. Transport Canada, formerly Canada Transport Commission (CTC), which has jurisdiction over high- and low-pressure cylinders and cartridges in Canada.

3.3.27* Travel Distance. The actual walking distance from a point to the nearest fire extinguisher fulfilling hazard requirements.

3.3.28 Wetting Agent. A concentrate that, when added to water, reduces the surface tension and increases its ability to penetrate and spread. [**18,** 2017]

3.4 Fire Extinguisher Definitions.

3.4.1 Cartridge/Cylinder-Operated Fire Extinguisher. A fire extinguisher in which the expellant gas is in a separate container from the agent storage container.

3.4.2* Nonrechargeable (Nonrefillable) Fire Extinguisher. A fire extinguisher that is intended to be used one time and not capable of or intended to be recharged and returned to service.

3.4.3 Portable Fire Extinguisher. A portable device, carried or on wheels and operated by hand, containing an extinguishing agent that can be expelled under pressure for the purpose of suppressing or extinguishing fire.

N **3.4.4 Pump Tank Fire Extinguisher.** A fire extinguisher where the operator provides expelling energy by means of a pump and the vessel containing the agent is not pressurized.

3.4.5* Rechargeable (Refillable) Fire Extinguisher. A fire extinguisher capable of undergoing complete maintenance, including internal inspection of the pressure vessel, replacement of all substandard parts and seals, and hydrostatic testing.

3.4.6* Self-Expelling Fire Extinguisher. A fire extinguisher in which the agent has sufficient vapor pressure at normal operating temperatures to expel itself.

3.4.7 Stored-Pressure Fire Extinguisher. A fire extinguisher in which both the extinguishing agent and expellant gas are kept in a single container, and that includes a pressure indicator or gauge.

3.4.8 Water Mist Fire Extinguisher. A fire extinguisher containing distilled or de-ionized water and employing a nozzle that discharges the agent in a fine spray.

3.4.9 Water-Type Fire Extinguisher. A fire extinguisher containing water-based agents, such as water, film-forming foam agents (AFFF, FFFP), antifreeze, loaded stream, and wet chemical.

3.4.10 Wheeled Fire Extinguisher. A portable fire extinguisher equipped with a carriage and wheels intended to be transported to the fire by one person. *(See A.5.3.2.7.)*

Chapter 4 General Requirements

4.1 Listing and Labeling.

Δ **4.1.1*** Portable fire extinguishers used to comply with this standard shall be listed and labeled and shall meet or exceed all the requirements of UL 711, CAN/ULC-S508, *Standard for the Rating and Fire Testing of Fire Extinguishers*, and one of the following applicable performance standards:

(1) Carbon dioxide types: UL 154, CAN/ULC-S503, *Standard for Carbon-Dioxide Fire Extinguishers*
(2) Dry chemical types: UL 299, CAN/ULC-S504, *Standard for Dry Chemical Fire Extinguishers*
(3) Water types: UL 626, CAN/ULC-S507, *Standard for Water Fire Extinguishers*
(4) Halon types: CAN/ULC-S512, *Standard for Halogenated Agent Hand and Wheeled Fire Extinguishers*
(5) Film-forming foam types: UL 8, CAN/ULC-S554, *Water Based Agent Fire Extinguishers*
(6) Halocarbon types: UL 2129, CAN/ULC-S566, *Standard for Halocarbon Clean Agent Fire Extinguishers*

4.1.2* Each fire extinguisher shall be marked with the following:

(1) Identification of the listing and labeling organization
(2) Product category indicating the type of extinguisher
(3) Extinguisher classification as indicated in Section 5.3
(4) Performance and fire test standards that the extinguisher meets or exceeds

4.1.2.1 Fire extinguishers manufactured prior to January 1, 1986, shall not be required to comply with 4.1.2.

4.1.2.2 Halon extinguishers listed and labeled to UL 1093, *Standard for Halogenated Agent Fire Extinguishers*, shall be permitted to be used to comply with the requirements of this standard when installed, inspected, and maintained in accordance with this standard.

4.1.3* An organization listing fire extinguishers used to comply with the requirements of this standard shall utilize a third-party certification program for portable fire extinguishers that meets or exceeds UL 1803, *Standard for Factory Follow-Up on Third Party Certified Portable Fire Extinguishers.*

4.1.3.1 Fire extinguishers manufactured prior to January 1, 1989, shall not be required to comply with 4.1.3.

4.1.3.2 Certification organizations accredited by the Standards Council of Canada shall not be required to comply with 4.1.3.

Δ **4.1.3.3** Listed and labeled Class D extinguishing agents intended to be manually applied to combustible metal fires shall comply with the fire test requirements specified in UL 711, CAN/ULC-S508.

4.1.4 Electrical Conductivity. Extinguishers listed for the Class C rating shall not contain an agent that is a conductor of electricity.

Δ **4.1.4.1** In addition to successfully meeting the requirements of UL 711, CAN/ULC-S508, water-based agents that are listed for the Class C rating shall be tested in accordance with ASTM

D5391, *Standard Test for Electrical Conductivity and Resistivity of a Flowing High Purity Water Sample.*

4.1.4.2* Fire extinguishers containing water-based agents that have a conductivity higher than 1.00 μS/cm at 25°C (77°F) shall be considered a conductor of electricity and therefore shall not be rated Class C.

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4.2* Identification of Contents. A fire extinguisher shall have a label, tag, or stencil attached to it providing the following information:

(1) The content's product name as it appears on the manufacturer's Material Safety Data Sheet (MSDS)
(2) Listing of the hazardous material identification in accordance with *Hazardous Materials Identification System (HMIS) Implementation Manual* [in Canada, *Globally Harmonized System of Classification and Labeling of Chemicals (GHS)*]
(3) List of any hazardous materials that are in excess of 1.0 percent of the contents
(4) List of each chemical in excess of 5.0 percent of the contents
(5) Information as to what is hazardous about the agent in accordance with the MSDS
(6) Manufacturer's or service agency's name, mailing address, and phone number

4.3* Instruction Manual.

4.3.1 The owner or the owner's agent shall be provided with a fire extinguisher instruction manual that details condensed instructions and cautions necessary to the installation, operation, inspection, and maintenance of the fire extinguisher(s).

4.3.2 The manual shall refer to this standard as a source of detailed instruction.

4.4 Obsolete Fire Extinguishers. The following types of fire extinguishers are considered obsolete and shall be removed from service:

(1) Soda acid
(2) Chemical foam (excluding film-forming agents)
(3) Carbon tetrachloride, methyl bromide, and chlorobromomethane (CBM)
(4) Cartridge-operated water
(5) Cartridge-operated loaded stream
(6) Copper or brass shell (excluding pump tanks) joined by soft solder or rivets
(7) Carbon dioxide extinguishers with metal horns
(8) Solid charge–type AFFF extinguishers (paper cartridge)
(9) Pressurized water fire extinguishers manufactured prior to 1971
(10) Any extinguisher that needs to be inverted to operate
(11) Any extinguisher manufactured prior to 1955
(12) Any extinguishers with 4B, 6B, 8B, 12B, and 16B fire ratings
(13) Stored-pressure water extinguishers with fiberglass shells (pre-1976)

4.4.1* Dry chemical stored-pressure extinguishers with an indicated manufacturing date of 1984 or prior shall be removed from service.

4.4.1.1 Subsection 4.4.1 shall not apply to wheeled-type dry chemical stored-pressure fire extinguishers.

4.4.2* Any fire extinguisher that can no longer be serviced in accordance with the manufacturer's maintenance manual is considered obsolete and shall be removed from service.

Chapter 5 Selection of Portable Fire Extinguishers

5.1* General Requirements. The selection of fire extinguishers for a given situation shall be determined by the applicable requirements of Sections 5.2 through 5.5.5 and the following factors:

(1) Type of fire most likely to occur
(2) Size of fire most likely to occur
(3) Hazards in the area where the fire is most likely to occur
(4) Energized electrical equipment in the vicinity of the fire
(5) Ambient temperature conditions
(6) Other factors *(See Section H.2.)*

5.1.1 Portable fire extinguishers shall be installed as a first line of defense to cope with fires of limited size, except as required by 5.5.4.5.

5.1.2 The selection of extinguishers shall be independent of whether the building is equipped with automatic sprinklers, standpipe and hose, or other fixed protection equipment.

5.2 Classifications of Fires. Fires shall be classified in accordance with the guidelines specified in 5.2.1 through 5.2.5.

5.2.1 Class A Fires. Class A fires are fires in ordinary combustible materials, such as wood, cloth, paper, rubber, and many plastics.

Δ **5.2.2 Class B Fires.** Class B fires are fires in flammable liquids, combustible liquids, and flammable gases.

5.2.3 Class C Fires. Class C fires are fires that involve energized electrical equipment.

5.2.4 Class D Fires. Class D fires are fires in combustible metals, such as magnesium, titanium, zirconium, sodium, lithium, and potassium.

5.2.5 Class K Fires. Class K fires are fires in cooking appliances that involve combustible cooking media (vegetable or animal oils and fats).

5.3 Extinguisher Classification System.

5.3.1 The classification of fire extinguishers shall consist of a letter that indicates the class of fire on which a fire extinguisher has been found to be effective.

5.3.1.1 Fire extinguishers classified for use on Class A or Class B hazards shall be required to have a rating number preceding the classification letter that indicates the relative extinguishing effectiveness.

5.3.1.2 Fire extinguishers classified for use on Class C, Class D, or Class K hazards shall not be required to have a number preceding the classification letter.

5.3.2 Fire extinguishers shall be selected for the class(es) of hazards to be protected in accordance with 5.3.2.1 through 5.3.2.5. *(For specific hazards, see Section 5.5.4.)*

5.3.2.1* Fire extinguishers for the protection of Class A hazards shall be selected from types that are specifically listed and labeled for use on Class A fires. *(For halon agent–type extinguishers, see 5.3.2.6.)*

5.3.2.2* Fire extinguishers for the protection of Class B hazards shall be selected from types that are specifically listed and labeled for use on Class B fires. *(For halon agent–type extinguishers, see 5.3.2.6.)*

5.3.2.3* Fire extinguishers for the protection of Class C hazards shall be selected from types that are specifically listed and labeled for use on Class C hazards. *(For halon agent–type fire extinguishers, see 5.3.2.6.)*

5.3.2.4* Fire extinguishers and extinguishing agents for the protection of Class D hazards shall be of the types specifically listed and labeled for use on the specific combustible metal hazard.

5.3.2.5 Fire extinguishers for the protection of Class K hazards shall be selected from types that are specifically listed and labeled for use on Class K fires.

5.3.2.6* Use of halon agent fire extinguishers shall be limited to applications where a clean agent is necessary to extinguish fire efficiently without damaging the equipment or area being protected or where the use of alternative agents has the potential to cause a hazard to personnel in the area.

5.3.2.6.1* Placement of portable fire extinguishers containing halogenated agents shall conform to minimum confined space volume requirement warnings contained on the fire extinguisher nameplates.

5.3.2.7* Wheeled fire extinguishers shall be considered for hazard protection in areas in which a fire risk assessment has shown the following:

(1) High hazard areas are present.
(2) Limited available personnel are present, thereby requiring an extinguisher that has the following features:
    (a) High agent flow rate
    (b) Increased agent stream range
    (c) Increased agent capacity

5.4 Classification of Hazards.

5.4.1 Classifying Occupancy Hazard. Rooms or areas shall be classified as being light hazard, ordinary hazard, or extra hazard.

5.4.1.1* Light Hazard. Light hazard occupancies shall be classified as locations where the quantity and combustibility of Class A combustibles and Class B flammables are low and fires with relatively low rates of heat release are expected. These occupancies consist of fire hazards having normally expected quantities of Class A combustible furnishings, and/or the total quantity of Class B flammables typically expected to be present is less than 1 gal (3.8 L) in any room or area.

5.4.1.2* Ordinary Hazard. Ordinary hazard occupancies shall be classified as locations where the quantity and combustibility of Class A combustible materials and Class B flammables are moderate and fires with moderate rates of heat release are expected. These occupancies consist of fire hazards that only occasionally contain Class A combustible materials beyond normal anticipated furnishings, and/or the total quantity of Class B flammables typically expected to be present is from 1 gal to 5 gal (3.8 L to 18.9 L) in any room or area.

5.4.1.3* Extra Hazard. Extra hazard occupancies shall be classified as locations where the quantity and combustibility of Class A combustible material are high or where high amounts of Class B flammables are present and rapidly developing fires with high rates of heat release are expected. These occupancies consist of fire hazards involved with the storage, packaging, handling, or manufacture of Class A combustibles, and/or the total quantity of Class B flammables expected to be present is more than 5 gal (18.9 L) in any room or area.

5.4.1.4 Limited areas of greater or lesser hazard shall be protected as required.

***N* 5.5* Selection of Fire Extinguishers.**

***N* 5.5.1 General.** Where fire extinguishers have more than one letter classification (such as 3-A:40-B:C), they shall be permitted to satisfy the requirements of each letter class.

***N* 5.5.2 Selection for Building Protection.** Fire extinguishers for building protection shall be selected for Class A fires, regardless of the presence of any fixed fire suppression systems.

5.5.3 Selection for Occupancy Hazards. Fire extinguishers shall be selected for the occupancy hazards contained therein regardless of the presence of any fixed fire suppression systems.

Δ 5.5.3.1 Fire extinguishers for occupancy hazard protection shall be provided by fire extinguishers for Class A, B, C, D, or K fire hazards present or anticipated to be present.

5.5.3.2 Fire extinguishers selected for building protection shall be permitted to also be considered for occupancy hazard protection.

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5.5.4 Selection for Specific Hazards.

5.5.4.1* Extinguishers for Pressurized Liquid and Pressurized Gas Fires. Large-capacity dry chemical extinguishers of 10 lb (4.54 kg) or greater and with a discharge rate of 1 lb/sec (0.45 kg/sec) or more shall be selected to protect these hazards.

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5.5.4.2* Three-Dimensional Fires. Large-capacity dry chemical extinguishers of 10 lb (4.54 kg) or greater and with a discharge rate of 1 lb/sec (0.45 kg/sec) or more shall be selected to protect these hazards.

5.5.4.3 Obstacle Fires. Selection of a fire extinguisher for this type of hazard shall be based on one of the following:

(1) Extinguisher containing a vapor-suppressing foam agent
(2)* Multiple extinguishers containing non-vapor-suppressing Class B agents intended for simultaneous application
(3) Larger capacity extinguishers of 10 lb (4.54 kg) or greater and with a minimum discharge rate of 1 lb/sec (0.45 kg/sec)

Δ 5.5.4.4* Water-Soluble Liquid Fires (Polar Solvents). Aqueous film-forming foam (AFFF) and film-forming fluoroprotein (FFFP) foam types of fire extinguishers shall not be selected for the protection of water-soluble flammable or combustible liquids, unless specifically referenced on the fire extinguisher's nameplate.

5.5.4.5* Class K Cooking Media Fires. Fire extinguishers provided for the protection of cooking appliances that use combustible cooking media (e.g., vegetable or animal oils and fats) shall be listed and labeled for Class K fires.

5.5.4.5.1 Class K fire extinguishers manufactured after January 1, 2002, shall not be equipped with extended-wand-type discharge devices.