NFPA® 12A

Standard on Halon 1301 Fire Extinguishing Systems

2022 Edition

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An International Codes and Standards Organization

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This edition of NFPA 12A, *Standard on Halon 1301 Fire Extinguishing Systems*, was prepared by the Technical Committee on Gaseous Fire Extinguishing Systems. It was issued by the Standards Council on December 10, 2020, with an effective date of December 30, 2020, and supersedes all previous editions.

This edition of NFPA 12A was approved as an American National Standard on December 30, 2020.

Origin and Development of NFPA 12A

The Committee on Halogenated Fire Extinguishing Systems was formed in the fall of 1966 and held its first meeting during December of that year. The Committee was organized into four Subcommittees who separately prepared various portions of the standard for review by the full Committee at meetings held in September and December of 1967.

The standard was submitted and adopted at the NFPA Annual Meeting in Atlanta, Georgia, May 20–24, 1968. The 1968 edition was the first edition of this standard and was adopted in tentative form in accordance with NFPA regulations. In 1969 the Committee determined that the standard had not yet been sufficiently tested and elected to carry it in tentative status for one more year. It was presented for official adoption in 1970. The first official version of the standard was adopted at the NFPA Annual Meeting in Toronto, Ontario, in May 1970. Revisions were made in 1972, 1973, 1977, and 1980.

The 1985 edition was a complete revision of the standard. The standard was revised in 1987 and again in 1989.

The standard was completely rewritten for the 1992 edition to state the requirements more clearly and to separate the mandatory requirements from the advisory text in an effort to make the document more usable, enforceable, and adoptable. The main topic addressed in the revision was the decommissioning and removal of systems.

The standard was updated to conform to the *Manual of Style for NFPA Technical Committee Documents* for the 2004 edition.

For the 2009 edition, the standard was revised to address testing and recharging of Halon 1301 cylinders.

The 2015 edition incorporated support for electronic storage of system maintenance records.

For the 2018 edition, the annex chapter on nozzle and piping calculations (Annex H) was revised to correct errors, comply with the *Manual of Style for NFPA Technical Committee Documents*, and clarify the details of the procedure.

The 2022 edition is a partial revision that incorporates several clarifications and corrections. The requirements for cylinder requalification have been updated to establish better agreement with Code of Federal Regulations Title 49, "Transportation," and a recommendation to follow the HRC Code of Practice for Halon Reclaiming Companies has been added.

Foreword

Halon 1301 (bromotrifluoromethane, or CBrF3) is a colorless, odorless, electrically nonconductive gas that is an effective medium for extinguishing fires. Halon 1301 is included in the Montreal Protocol on Substances That Deplete the Ozone Layer signed September 16, 1987. The

protocol permits continued availability of halogenated fire extinguishing agents at 1986 production levels. That protocol, and subsequent amendments, restrict the production of this agent. In addition, local jurisdictions within some countries (e.g., the EPA in the United States) have enacted further rules regulating the production, use, handling, and disposal of this agent. The user of this standard is advised to consult local authorities for current regulations. Halon 1301 fire extinguishing systems are useful within the limits of this standard in extinguishing fires in specific hazards or equipment and in occupancies where an electrically nonconductive medium is essential or desirable, or where cleanup of other media presents a problem.

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

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 carbon dioxide systems for fire protection.

This committee shall also have primary responsibility for documents on fixed fire extinguishing systems utilizing bromotrifluoromethane and other similar halogenated extinguishing agents, covering the installation, maintenance, and use of systems.

This committee shall also have primary responsibility for documents on alternative protection options to Halon 1301 and 1211 fire extinguishing systems. It shall not deal with design, installation, operation, testing, and maintenance of systems employing dry chemical, wet chemical, foam, aerosols, or water as the primary extinguishing media.

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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 M.

Chapter 1 Administration

1.1 Scope. This standard contains minimum requirements for total flooding Halon 1301 fire extinguishing systems. It includes only the essentials necessary to make the standard workable in the hands of those skilled in this field. Only those skilled in this work are competent to design, install, maintain, decommission, and remove this equipment. It might be necessary for many of those charged with purchasing, inspecting, testing, approving, operating, and maintaining this equipment to consult with an experienced and competent fire protection engineer to effectively discharge their respective duties. *(See Annex C.)*

1.2 Purpose. This standard is prepared for the use and guidance of those charged with purchasing, designing, installing, testing, inspecting, approving, listing, operating, maintaining, decommissioning, and removing halogenated agent extinguishing systems (Halon 1301), so that such equipment will function as intended throughout its life. Nothing in this standard is intended to restrict new technologies or alternate arrangements provided the level of safety prescribed by this standard is not lowered.

1.2.1 Pre-engineered systems (packaged systems) consist of system components designed to be installed according to pretested limitations as approved or listed by a testing laboratory. Pre-engineered systems sometimes incorporate special nozzles, flow rates, methods of application, nozzle placement, and pressurization levels that sometimes differ from those detailed elsewhere in this standard. All other requirements of the standard shall apply. Pre-engineered systems shall be installed to protect hazards within the limitations that have been established by the testing laboratories where listed.

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). Two units (liter and bar), outside of but recognized by SI, are commonly used in international fire protection. These units are listed in Table 1.3.1 with conversion factors.

1.3.2* If a value for measurement as given in this standard is followed by an equivalent value in other units, the first stated shall be regarded as the requirement. A given equivalent value is often approximate.

1.4 Use and Limitations.

1.4.1 Total flooding Halon 1301 fire extinguishing systems are used primarily to protect hazards that are in enclosures or equipment that, in itself, includes an enclosure to contain the agent. Some typical hazards that shall be permitted to use Halon 1301 are as follows:

(1) Electrical and electronic hazards
(2) Telecommunications
(3) Flammable and combustible liquids and gases
(4) Other high value assets

1.4.2 Halon 1301 shall not be used on the following:

(1) Certain chemicals or mixtures of chemicals such as cellulose nitrate and gunpowder, which are capable of rapid oxidation in the absence of air
(2) Reactive metals such as sodium, potassium, magnesium, titanium, zirconium, uranium, and plutonium
(3) Metal hydrides
(4) Chemicals capable of undergoing autothermal decomposition, such as certain organic peroxides and hydrazine

1.4.3* Electrostatic charging of nongrounded conductors can occur during the discharge of liquefied gases. These conductors can discharge to other objects, causing an electric arc of sufficient energy to initiate an explosion.

1.4.4* Where halon systems are used, a fixed enclosure shall be provided about the hazard that is adequate to enable the specified concentration to be achieved and maintained for the specified period of time.

Table 1.3.1 Metric Conversion Factors

Name of Unit	Unit	Conversion Factor
Liter	L	1 gal = 3.785 L
Cubic decimeter	dm^3	1 gal = 3.785 dm^3
Pascal	Pa	1 psi = 6894.757 Pa
Bar	bar	1 psi = 0.0689 bar
Bar	bar	1 bar = 10^5 Pa