



Standard Specification for Halon 1301, Bromotrifluoromethane (CF₃Br)¹

This standard is issued under the fixed designation D 5632; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers requirements for Halon 1301 as a fire-fighting medium.

1.2 This specification does not address the fire-fighting equipment or hardware that employs Halon 1301 or the conditions of employing such equipment (for example, hand-holds, fixed installations, etc.).

1.3 This specification does not address the storage or transportation of Halon 1301. Storage, handling, and transportation issues may be addressed in future ASTM specifications.

1.4 The following safety hazards caveat pertains only to the test methods portion, Section 6, of this specification: *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* Specific hazards statements are given in Note 1.

2. Referenced Documents

2.1 ASTM Standards:

D 4081 Specification for Drycleaning Grade Perchloroethylene²

2.2 ISO Standards:

ISO 3363 Fluorochlorinated Hydrocarbons for Industrial Use—Determination of Acidity—Titrimetric Method³

ISO 3427 Gaseous Halogenated Hydrocarbons (Liquified Gases)—Taking of a Sample³

ISO 5789 Fluorinated Hydrocarbons for Industrial Use—Determination of Nonvolatile Residue³

2.3 U.S. Military Standards:

MIL-STD-105 Sampling Procedures and Tables for Inspection by Attributes⁴

MIL-STD-129 Marking for Shipment and Storage⁴

MIL-STD-1188 Commercial Packaging of Supplies and Equipment⁴

¹ This specification is under the jurisdiction of ASTM Committee D-26 on Halogenated Organic Solvents and Fire Extinguishing Agents and is the direct responsibility of Subcommittee D26.09 on Recycled Halon 1301.

Current edition approved April 15, 1995. Published June 1995. Originally published as D 5632 – 94a. Last previous edition D 5632 – 94a.

² Annual Book of ASTM Standards, Vol 15.05.

³ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

⁴ Available from Standardization Documents Order Desk, Bld. 4 Section D, 700 Robbins Av., Philadelphia, PA 19111-5904, Attn: NPODS.

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *halon*—a halogenated hydrocarbon used as a fire-extinguishing medium.

3.1.1.1 *Discussion*—The halon terminology system provides a convenient means to reference halogenated hydrocarbon fire extinguishants. Halogenated hydrocarbons are acyclic saturated hydrocarbons in which one or more of the hydrogen atoms have been replaced by atoms from the halogen series (that is, fluorine, chlorine, bromine, and iodine). By definition, the first digit of the halon numbering system represents the number of carbon atoms in the compound molecule; the second digit, the number of fluorine atoms; the third digit, the number of chlorine atoms; the fourth digit, the number of bromine atoms; and the fifth digit, the number of iodine atoms. Trailing zeros are not expressed. Unaccounted for valence requirements are assumed to be hydrogen atoms.

$$\begin{aligned} \text{number of hydrogen atoms} = \\ [((\text{number of carbon atoms} \times 2) + 2) - (\text{sum of halogen atoms})] \end{aligned} \quad (1)$$

For example,

$$\text{bromotrifluoromethane} - \text{CF}_3\text{Br} - \text{Halon 1301} \quad (2)$$

4. Material Requirements

4.1 Type I:

4.1.1 The nitrogen (N₂) partial pressure shall be such that the safe working pressure of the receiving vessel is not exceeded. To prevent excessive pressure, the fill density of the halon within a container should not exceed that needed to achieve complete filling of the container at the maximum envisaged storage temperature. For example, the U.S. DOT 4BA500 cylinder partial pressure shall not exceed 12.1 bar at 21°C (161 psig at 70°F) for a 1121-kg/m³ (70-lb/ft³) fill density (yielding a total pressure of 25.8 bar at 21°C (360 psig at 70°F)). For this example, the safe working pressure of the 4BA500 cylinder is not exceeded for temperatures below 54°C (130°F).

4.1.2 Halon 1301 shall conform to the requirements prescribed in Table 1 when tested by the appropriate test method(s) listed in Section 6.

4.1.3 When a material analysis is required, by agreement between the purchaser and the supplier, the total pressure in the Halon 1301 container, partial pressure of the N₂, the fill density of the halon within the container, and the maximum safe storage temperature shall be part of the material analysis