



Designation: D7122 – 05

Standard Specification for HCFC Blend B (CF₃CCl₂H, Ar, and CF₄)¹

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1. Scope

1.1 This specification covers requirements for HCFC Blend B as a fire-fighting medium.

1.2 This specification does not address the fire-fighting equipment or hardware that employs HCFC Blend B or the conditions of employing such equipment (for example, handhelds, fixed installations, etc.).

1.3 This specification does not address the storage or transportation of HCFC Blend B. Storage, handling, and transportation issues are addressed in Practice D7123.

1.4 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are for information only.

2. Referenced Documents

2.1 ASTM Standards:²

D7123 Practice for Handling, Transportation, and Storage of HCFC Blend B (CF₃CCl₂H, Ar, and CF₄)

D2109 Test Methods for Nonvolatile Matter in Halogenated Organic Solvents and Their Admixtures

D3401 Test Methods for Water in Halogenated Organic Solvents and Their Admixtures

D3444 Test Method for Total Acid Number of Trichlorotrifluoroethane

D6806 Practice for Analysis of Halogenated Organic Solvents and Their Admixtures by Gas Chromatography

2.2 ISO Standards:³

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

ISO 3427 Gaseous Halogenated Hydrocarbons (Liquefied Gases)—Taking of a Sample

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

2.3 ASHRAE Standard:⁴

ASHRAE 34 Designation and Safety Classification of Refrigerants

2.4 U.S. Government Standards:⁵

CFR Title 49, Part 172, Subpart D, U.S. Department of Transportation (DOT), Marking Requirements of Packaging for Transportation

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *HCFC*—hydrochlorofluorocarbon; a chemical compound in which the compound molecule is comprised exclusively of hydrogen, chlorine, fluorine and carbon atoms.

3.1.2 *HCFC Blend B*—tertiary blend comprised primarily of HCFC-123 (2,2-dichloro-1,1,1-trifluoroethane); a compound used to inert, extinguish, or suppress a fire or explosion hazard. The blend also contains argon and tetrafluoromethane.

3.1.2.1 *Discussion*—The terminology system for fluorine-containing compounds (described in detail in ASHRAE Standard 34) provides a convenient means to reference the structure of individual compounds. By definition, the first digit of the numbering system represents one less than the number of carbon atoms in the compound molecule; the second digit, one more than the number of hydrogen atoms in the compound molecule; and the third digit, the number of fluorine atoms in the compound molecule. Unaccounted for valence requirements are assumed to be chlorine atoms. For example, the designation HCFC-123 indicates two carbon atoms (1 + 1), one hydrogen atom (2-1), three fluorine atoms (3), and two chlorine atoms (2 atoms required based on valence requirements). Example: CF₃CCl₂H = HCFC-123

4. Material Requirements

4.1 The fill density of HCFC Blend B within a container should not exceed that needed to achieve complete filling of the container at the maximum envisaged storage temperature. For example, the fill density should not exceed 86 lb/ft³ (1377

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

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

⁴ Available from American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. (ASHRAE), 1791 Tullie Circle, NE, Atlanta, GA 30329.

⁵ Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20036.

kg/m³) for a maximum expected temperature of 130°F (54 °C). Recommended fill density is 76 lb/ft³ (1219 kg/m³) or less.

4.2 HCFC Blend B shall conform to the requirements prescribed in **Table 1** when tested by appropriate test methods, such as those listed in Section 2.2.

4.3 When a material analysis is required, by agreement between the purchaser and the supplier, the total pressure in the HCFC Blend B container, the fill density of HCFC Blend B within the container and the maximum safe storage temperature shall be part of the material analysis (certification). The pressure shall be reported in pound-force per square inch gage (preferred) or bar. The fill density shall be reported in pounds per cubic foot at 70°F (preferred) or kilograms per cubic meter at 21°C. The maximum safe storage temperature of the HCFC Blend B container shall be reported in degrees Fahrenheit (preferred) or in degrees Celsius and shall conform to applicable regulations for the HCFC Blend B container design and use.

4.4 By agreement between the purchaser and the supplier, analysis may be required and limits established for elements or compounds not specified in **Table 1**.

NOTE 1—Prolonged exposure to concentrations of HCFC Blend B in excess of 2 % by volume in air during periods of elevated adrenaline could produce cardiac arrhythmia in some personnel.

5. Sampling

5.1 Samples of HCFC Blend B, taken from the liquid phase, shall be taken from filled containers in accordance with the

TABLE 1 Requirements

Property	Requirement
HCFC-123 Purity	99 %, mol/mol, min (exclusive of any argon or tetrafluoromethane present)
HCFC-123 Content	95 %, mol/mol, min
Argon Content	0.2 %, mol/mol, min
Tetrafluoromethane Content	0.4 %, mol/mol, min
Acidity	1.0 ppm by mass, as HCL, max
Water content	20 ppm by mass, max
Nonvolatile residue	0.01 % by weight, max
Suspended matter or sediment	none visible

method specified in **ISO 3427**. The sampling cylinder shall be capable of safely resisting the vapor pressure of the sample at the highest temperature that could be encountered.

5.2 The HCFC Blend B selected in accordance with 5.1 shall be tested for quality conformance in accordance with **Table 1**. The presence of one or more defects shall be cause for rejection.

6. Test Methods

6.1 Analysis will be conducted in accordance with Practice **D6806**.

6.2 Acidity analysis will be conducted in accordance with Test Methods **D3444**.

6.3 Water content analysis will be conducted in accordance with Test Methods **D3401**.

6.4 Nonvolatile residue analysis will be conducted in accordance with Test Methods **D2109**.

6.5 When liquid dispensed into a glass tube and shaken, no sediment or visible matter shall be visible.

7. Container, Packaging, and Package Marking

7.1 Containers used for shipping and storage of HCFC Blend B conforming to this specification shall be marked in accordance with Code of Federal Regulations (CFR) Title 49, Part 172, Subpart D. The proper shipping name is “Compressed Gases, N.O.S., (contains tetrafluoromethane, argon), 2.2, UN1956.” In addition to DOT requirements, containers should be marked with the following information as a minimum:

7.1.1 Supplier’s name and address,

7.1.2 HCFC Blend B, and

7.1.3 Statement that material conforms to Specification D7122.

8. Keywords

8.1 HCFC Blend B; CF₃CCl₂H; HCFC-123;2,2-dichloro-1,1,1-trifluoroethane; argon; tetrafluoromethane; fire suppressant; fire extinguishant; Halotron® I

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