Designation: D4995 – 10 (Reapproved 2015)

Standard Specification for Electronic and Degreasing Grades of 1,1,2–Trichloro 1,2,2,–Trifluoroethane Solvent[1]

This standard is issued under the fixed designation D4995; 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 establishes the requirements for three grades of trichlorotrifluoroethane solvent:

1.1.1 Type I electronic or ultra-clean grade,

1.1.2 Type II standard or vapor-degreasing grade, and

1.1.3 Type IIA general purpose, packaged in a pressurized container grade.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 *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.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1078 Test Method for Distillation Range of Volatile Organic Liquids

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

D3443 Test Method for Chloride in Trichlorotrifluoroethane

D3444 Test Method for Total Acid Number of Trichlorotrifluoroethane

D3448 Test Method for Specific Aqueous Conductance of Trichlorotrifluoroethane

D3844 Guide for Labeling Chlorinated Hydrocarbon Solvent Containers (Withdrawn 2013)[3]

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

2.2 *Other Documents:*

29 CFR 1919.1200 Department of Labor, OSHA Regulations on Hazard Communications[4]

49 CFR 100 to 199 Department of Transportation Hazardous Materials Regulations[4]

PPP-C-2020 Federal Specification, Chemicals, Liquid, Dry and Paste: Packaging of[5]

STP 310A Handbook of Vapor-Degreasing[6]

STP 403A Cold Cleaning with Halogenated Solvents[6]

3. Classification

3.1 *Type I*—Type I solvent is intended for use in the cleaning of space vehicle components, precision assemblies, oxygen systems and electronic equipment by the processes of spraying, flushing, vapor degreasing, or ultrasonics. The solvent is especially applicable for cleaning precision parts and assemblies in clean rooms and for use as a medium in testing the cleanliness of components that are assumed to be clean.

3.2 *Types II and IIA*—Types II and IIA are typically used in vapor degreasing applications or in other processes where the requirements for purity and cleanliness are less stringent than those of a cleaning process using Type I solvent.

4. Properties

4.1 Electronic or ultra-clean and degreasing grades of trichlorotrifluoroethane shall conform to the requirements prescribed in Table 1.

[1] This specification is under the jurisdiction of ASTM Committee D26 on Halogenated Organic Solvents and Fire Extinguishing Agents and is the direct responsibility of Subcommittee D26.03 on Cold Cleaning.

Current edition approved June 1, 2015. Published June 2015. Originally approved in 1994. Last previous edition approved in 2010 as D4995 – 10. DOI: 10.1520/D4995-10R15.

[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] The last approved version of this historical standard is referenced on www.astm.org.

[4] *Code of Federal Regulations*, available from U.S. Government Publishing Office, 732 N. Capitol St., NW, Washington, DC 20401-0001, http://www.gpo.gov.

[5] Copies of Federal Specifications are available from General Services Administration, Specification Unit WFSIS, 7th and D Street SW, Washington, DC 20406, or from General Services Administration Business Service Centers in Boston, New York, Philadelphia, Atlanta, Chicago, Kansas City, MO, Ft. Worth, Houston, Denver, San Francisco, Los Angeles, and Seattle, WA.

[6] Available from ASTM International Headquarters, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959.

TABLE 1 Chemical and Physical Properties[A]

Property	Solvent Type			Test Method
	Type I	Type II	Type IIa	
Boiling point (at standard barometric pressure)	47.6 ± 0.2°C	47.6 ± 0.2°C	47.6 ± 0.2°C	D1078
Chemical purity trichlorotrifluoroethane; percent, minimum (by weight)	99.9	99.8	99.8	D6806
Balance of product	Other halogenated solvents	Other halogenated solvents	Other halogenated solvents	D6806
Moisture Content, ppm, maximum (by weight)	10	10	50	D3401
Chloride Ion, ppm, max (by weight)	0.1	0.1	0.1	D3443
Specific Aqueous Conductance[B] (µs/cm; max)	1.9	1.9		D3448
Acid Number, mg KOH/g of sample, max	0.003	0.003		D3444
Residue, ppm, max (by weight)	1	2	25	D2109

[A] Properties apply to total trifluorotrichloroethane and do not specify distribution between isomers.
[B] Specific aqueous conductance test may be used as an alternate to chloride ion test for types I and II.

5. Packaging

5.1 Package and label industrial or commercial quantities in accordance with DOT regulations in 49 CFR 100 to 199, in accordance with state and local regulations, in accordance with OSHA regulations found in 29 CFR 1910.1200, and in accordance with EPA regulations found in 40 CFR 82 Subpart E.

6. Keywords

6.1 CFC-113; trichlorotrifluoroethane