



Designation: D 4995 – 00

## Standard Specification for Electronic and Degreasing Grades of 1,1,2-Trichloro 1,2,2,-Trifluoroethane Solvent<sup>1</sup>

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### 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.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

- D 1078 Test Method for Distillation Range of Volatile Organic Liquids<sup>2</sup>
- D 2109 Test Methods for Nonvolatile Matter in Halogenated Organic Solvents and Their Admixtures<sup>3</sup>
- D 3401 Test Methods for Water in Halogenated Organic Solvents and Their Admixtures<sup>3</sup>
- D 3443 Test Method for Chloride in Trichlorotrifluoroethane<sup>3</sup>
- D 3444 Test Method for Total Acid Number of Trichlorotrifluoroethane<sup>3</sup>
- D 3447 Test Method for Purity of Trichlorotrifluoroethane<sup>3</sup>
- D 3448 Test Method for Specific Aqueous Conductance of Trichlorotrifluoroethane<sup>3</sup>
- D 3844 Practice for Labeling Halogenated Hydrocarbon Solvent Containers<sup>3</sup>

#### 2.2 Other Documents:<sup>4</sup>

- 29 CFR 1919.1200 Department of Labor, OSHA Regulations on Hazard Communications
- 49 CFR 100 to 199 Department of Transportation Hazardous Materials Regulations

<sup>1</sup> 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 D26.03 on Cold Cleaning.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 06.04.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 15.05.

<sup>4</sup> The Code of Federal Regulations may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

- PPP-C-2020 Federal Specification, Chemicals, Liquid, Dry and Paste: Packaging of<sup>5</sup>
- STP 310A Handbook of Vapor-Degreasing<sup>6</sup>
- STP 403A Cold Cleaning with Halogenated Solvents<sup>6</sup>

### 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.

### 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

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<sup>6</sup> Available from ASTM Headquarters, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959.



**TABLE 1 Chemical and Physical Properties<sup>A</sup>**

Property	Solvent Type			Test Method
	Type I	Type II	Type IIa	
Boiling point (at standard barometric pressure)	47.6 ± 0.2°C (117.6 ± 0.4°F)	47.6 ± 0.2°C (117.6 ± 0.4°F)	47.6 ± 0.2°C (117.6 ± 0.4°F)	D 1078
Chemical purity trichlorotrifluoroethane; percent, minimum (by weight)	99.9	99.8	99.8	D 3447
Balance of product	Other halogenated solvents	Other halogenated solvents	Other halogenated solvents	
Moisture Content, ppm, maximum (by weight)	10	10	50	D 3401
Chloride Ion, ppm, max (by weight)	0.1	0.1	0.1	D 3443
Specific Aqueous Conductance <sup>B</sup> (µs/cm; max)	1.9	1.9		D 3448
Acid Number, mg KOH/g of sample, max	0.003	0.003		D 3444
Residue, ppm, max (by weight)	1	2	25	D 2109

<sup>A</sup> Properties apply to total trifluorotrchloroethane and do not specify distribution between isomers.

<sup>B</sup> Specific aqueous conductance test may be used as an alternate to chloride ion test for types I and II.

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