



Standard Specification for Electronic and Degreasing Grades of 1,1,2-Trichloro 1,2,2-Trifluoroethane Solvent¹

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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 Liquids²
- D 2109 Test Methods for Nonvolatile Matter in Halogenated Organic Solvents and Their Admixtures³
- D 3401 Test Methods for Water in Halogenated Organic Solvents and Their Admixtures³
- D 3443 Test Method for Chloride in Trichlorotrifluoroethane³
- D 3444 Test Method for Total Acid Number of Trichlorotrifluoroethane³
- D 3447 Test Method for Purity of Trichlorotrifluoroethane³
- D 3448 Test Method for Specific Aqueous Conductance of Trichlorotrifluoroethane³
- D 3844 Practice for Labeling Halogenated Hydrocarbon Solvent Containers³

2.2 Other Documents:⁴

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

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 D26.03 on Cold Cleaning.

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² *Annual Book of ASTM Standards*, Vol 06.04.

³ *Annual Book of ASTM Standards*, Vol 15.05.

⁴ 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 of⁵

STP 310A Handbook of Vapor-Degreasing⁶

STP 403A Cold Cleaning with Halogenated Solvents⁶

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

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 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 (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 ^B (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 |

^A Properties apply to total trifluorotrchloroethane 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.

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