



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.

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 Sol-

- vent Containers (Withdrawn 2013)³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 Communications⁴
- 49 CFR 100 to 199 Department of Transportation Hazardous Materials Regulations⁴
- 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](#).

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.

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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 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 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.

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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