



Designation: D6438 – 05 (Reapproved 2022)

Standard Test Method for Acetone, Methyl Acetate, and Parachlorobenzotrifluoride Content of Paints, and Coatings by Solid Phase Microextraction-Gas Chromatography¹

This standard is issued under the fixed designation D6438; 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 test method is for the determination of acetone, methyl acetate, or parachlorobenzotrifluoride (PCBTF), or combination of any of the three, in paints and coatings, by solid phase microextraction (SPME) headspace sampling, and subsequent injection into a gas chromatograph. It has been evaluated for cellulose nitrate, acrylic, and urethane solvent-borne systems. The established working range of this test method is: acetone, 28 to 90 %; methyl acetate, 12 to 22 %; parachlorobenzotrifluoride, 10 to 17 %. There is no reason to believe that it will not work outside these ranges. A minor modification of this test method would make it suitable for the analysis of the same analytes in water-borne coatings (see [Note 1](#)).

NOTE 1—Water-borne paints are internally standardized and diluted with water followed by addition of solid sodium chloride.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

[D3925](#) Practice for Sampling Liquid Paints and Related Pigmented Coatings

[D6133](#) Test Method for Acetone, *p*-Chlorobenzotrifluoride, Methyl Acetate or *t*-Butyl Acetate Content of Solvent-borne and Waterborne Paints, Coatings, Resins, and Raw Materials by Direct Injection Into a Gas Chromatograph

[E180](#) Practice for Determining the Precision of ASTM Methods for Analysis and Testing of Industrial and Specialty Chemicals (Withdrawn 2009)³

3. Terminology

3.1 Abbreviations:

3.1.1 *PCBTF*—parachlorobenzotrifluoride (4-chlorobenzotrifluoride)

3.1.2 *MCBTF*—metachlorobenzotrifluoride (3-chlorobenzotrifluoride)

3.1.3 *SPME*—solid phase microextraction

3.1.4 *VOC*—volatile organic compound

3.1.5 *PEG/DVB*—polyethylene glycol/divinylbenzene

3.1.6 *FID*—flame ionization detector

3.1.7 *MS*—mass selective or mass spectral

3.1.8 *SIM*—selected ion monitoring

3.1.9 *GC*—gas chromatograph

3.1.10 *Sr*—repeatability standard deviations

3.1.11 *SR*—reproducibility standard deviations

3.1.12 *r*—repeatability, 95 % confidence limit

¹ This test method is under the jurisdiction of ASTM Committee [D01](#) on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee [D01.21](#) on Chemical Analysis of Paints and Paint Materials.

Current edition approved June 1, 2022. Published July 2022. Originally approved in 1999. Last previous edition approved in 2015 as D6438 – 05 (2015). DOI: 10.1520/D6438-05R22.

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.