



Designation: D3960 – 05 (Reapproved 2018)

Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings¹

This standard is issued under the fixed designation D3960; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This practice measures the volatile organic compound (VOC) content of solventborne and waterborne paints and related coatings as determined from the quantity of material released from a sample under specified bake conditions and subtracting exempt volatile compounds and water if present.

NOTE 1—The regulatory definition, under the control of the U.S. EPA, can change. To ensure currency, contact the local air pollution control agency.

1.2 This practice provides a guide to the selection of appropriate ASTM test methods for the determination of VOC content.

1.3 Certain organic compounds that may be released under the specified bake conditions are not counted toward coating VOC content because they do not participate appreciably in atmospheric photochemical reactions. Such negligibly photochemically reactive compounds are referred to, as exempt volatile compounds in this practice.

NOTE 2—Information on the US EPA definition of VOC and a list of the current US EPA approved exempt volatile compounds which have been used in coatings, are provided in [Appendix X3](#).

1.4 VOC content is calculated as a function of (1) the volume of coating less water and exempt volatile compounds, and (2) the volume of coating solids, and (3) the weight of coating solids.

1.5 The values stated in SI units are to be regarded as standard.

1.6 *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 This practice 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.

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1.7 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

- [D1475](#) Test Method for Density of Liquid Coatings, Inks, and Related Products
- [D2369](#) Test Method for Volatile Content of Coatings
- [D2697](#) Test Method for Volume Nonvolatile Matter in Clear or Pigmented Coatings
- [D2832](#) Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings
- [D3792](#) Test Method for Water Content of Coatings by Direct Injection Into a Gas Chromatograph
- [D3925](#) Practice for Sampling Liquid Paints and Related Pigmented Coatings
- [D4017](#) Test Method for Water in Paints and Paint Materials by Karl Fischer Method
- [D4457](#) Test Method for Determination of Dichloromethane and 1,1,1-Trichloroethane in Paints and Coatings by Direct Injection into a Gas Chromatograph
- [D5095](#) Test Method for Determination of the Nonvolatile Content in Silanes, Siloxanes and Silane-Siloxane Blends Used in Masonry Water Repellent Treatments
- [D5201](#) Practice for Calculating Formulation Physical Constants of Paints and Coatings
- [D5403](#) Test Methods for Volatile Content of Radiation Curable Materials
- [D6093](#) Test Method for Percent Volume Nonvolatile Matter in Clear or Pigmented Coatings Using a Helium Gas Pycnometer
- [D6133](#) Test Method for Acetone, *p*-Chlorobenzotrifluoride,

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.