



Designation: D6886 – 18

Standard Test Method for Determination of the Weight Percent Individual Volatile Organic Compounds in Waterborne Air-Dry Coatings by Gas Chromatography¹

This standard is issued under the fixed designation D6886; 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 the weight percent of individual volatile organic compounds in waterborne air-dry coatings (**Note 1**).

1.2 This method may be used for the analysis of coatings containing silanes, siloxanes, and silane-siloxane blends.

1.3 This method is not suitable for the analysis of coatings that cure by chemical reaction (this includes two-component coatings and coatings which cure when heated) because the dilution herein required will impede the chemical reaction required for these types of coatings.

1.4 Precision statistics for this method have been determined for waterborne coatings in which the volatile organic compound weight percent is below 5 percent. The method has been used successfully with higher organic content waterborne coatings and with solventborne coatings (**Note 2**).

1.5 This method may also be used to measure the exempt volatile organic compound content (for example, acetone, methyl acetate, *t*-butyl acetate and *p*-chlorobenzotrifluoride) of waterborne and solvent-borne coatings. Check local regulations for a list of exempt compounds. The methodology is virtually identical to that used in Test Method **D6133** which, as written, is specific for only exempt volatile compounds.

1.6 Volatile compounds that are present at the 0.005 weight percent level (50 ppm) or greater can be determined. A procedure for doing so is given in Section **9**.

1.7 Volatile organic compound content of a coating can be calculated using data from Test Method D6886 but requires other data (see **Appendix X2**.)

NOTE 1—Data from this method will not always provide the volatile organic compound content of a paint film equivalent to EPA Method 24. Some compounds and some semi-volatile compounds may be considered volatile using the GC conditions specified but will not fully volatilize

during the one hour at 110°C conditions of EPA Method 24. Some or all of these materials remain in the paint film and therefore are not considered volatile organic compounds according to EPA Method 24. In addition, some compounds may decompose at the high inlet temperature of the GC. However, note the EPA Method 24 has poor precision and accuracy at low levels of volatile organic compounds.

NOTE 2—This method measures volatile organic compound weight of air-dry coatings directly as opposed to other methods in Practice **D3960** which measure the volatile organic compound weight percent indirectly. A direct measurement of the weight percent particularly in low volatile organic compound content waterborne coatings, generally gives better precision. California Polytechnic State University carried out an extensive study for the California Air Resources Board comparing the precision of the direct method with the indirect method (CARB Standard Agreement No. 04.329) Detailed results of this study may be found at http://www.arb.ca.gov/coatings/arch/Final_Report_6_11_09.pdf. This study may be used to decide if the present method or other methods in Practice **D3960** are preferred for a specific coating.

1.8 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.9 *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.*

1.10 *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

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 Oct. 1, 2018. Published October 2018. Originally approved in 2003. Last previous edition approved in 2014 as D6886 – 14^{e1}. DOI: 10.1520/D6886-18.

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.