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AMERICAN SOCIETY FOR TESTING AND MATERIALS
100 Barr Harbor Dr., West Conshohocken, PA 19428
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Standard Test Method for Determining Amount of Volatile Organic Compound (VOC) Released from Solventborne Automotive Coatings and Available for Removal in a VOC Control Device (Abatement)¹

This standard is issued under the fixed designation D 5087; 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 covers the determination of the amount of volatile organic compound (VOC) released from applied solventborne automotive coatings that is available for delivery to a VOC control device. This is accomplished by measuring the weight loss of a freshly coated test panel subjected to solvent evaporation or baking in a laboratory simulation of the production process.

1.2 This test method is applicable to the VOC released from flashoff and baking operations after the paint has been applied.

1.3 This test method is applicable to solventborne automotive coating materials and is intended to represent or simulate the production process. The same general principles apply to waterborne coatings that contain volatile organic compounds (VOC), although specific procedural details are not presented herein to differentiate between VOC and water.

1.4 *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:

D 499 Test Method for Measurement of Coating Thickness by the Magnetic Method: Nonmagnetic Coatings on Magnetic Basis Metals²

D 1005 Test Methods for Measurement of Dry Film Thickness of Organic Coatings Using Micrometers³

D 1186 Test Methods for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to a Ferrous Base³

D 1400 Test Method for Nondestructive Measurement of Dry Film Thickness of Nonconductive Coatings Applied to a Nonferrous Metal Base³

¹ This test method is under the jurisdiction of ASTM Committee D-1 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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² Annual Book of ASTM Standards, Vol 02.05.

³ Annual Book of ASTM Standards, Vol 06.01.

D 2369 Test Method for Volatile Content of Coatings³

D 145 Specification for Gravity-Convection and Forced-Ventilation Ovens⁴

2.2 EPA Standard:

EPA Federal Reference Method 24—Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids, of Surface Coatings, 40 CFR, Part 60, Appendix A⁵

EPA 450/3-88-018, PB89152276—Protocol for Determining the Daily Volatile Organic Compound Emission Rate of Automobile and Light Duty Truck Topcoat Operations⁶

3. Summary of Test Method

3.1 This test method simulates the loss of VOC from a freshly coated surface by using the difference in weight of a coated test panel before and after baking. Metal test panels are subjected to a simulation of the production coating process including application, flashing, and baking. The weight loss value obtained is then related to the volume of solids deposited on the test panel to compute the number of pounds of VOC per gallon (grams per litre) of solids applied that is available at the inlet of the VOC control device.

3.2 The information needed to determine the amount of VOC available for removal by the VOC control device is determined by identification of the points in the production process at which coated objects would enter flashoff/baking zones whose effluents are vented to the VOC control device.

4. Significance and Use

4.1 This test method provides basic engineering data that may be used to determine the amount of VOC available for delivery at the inlet of a VOC control device (particularly for the automobile industry).⁷ Typically, the procedure is useful for

⁴ Annual Book of ASTM Standards, Vol 14.02.

⁵ Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

⁶ National Technical Information Services, 5285 Port Royal Rd. Springfield, VA 22151.

⁷ United States Environmental Protection Agency Protocol for Determining the Daily Volatile Organic Compound Emission Rate of Automobile and Light Duty Truck Topcoat Operations, Ref EPA 450/3-88-018 dated December 1988. This protocol provides for VOC emissions reduction credit for abatement processes.