



Designation: D5066 – 91 (Reapproved 2023)

Standard Test Method for Determination of the Transfer Efficiency Under Production Conditions for Spray Application of Automotive Paints— Weight Basis¹

This standard is issued under the fixed designation D5066; 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 procedures for determination of the transfer efficiency (using a weight method) under production conditions for in-plant spray application of automotive paints as outlined in Section 18 of EPA 450/3-88-018.

1.2 The transfer efficiency is calculated from the weight of the paint solids sprayed and that deposited on the painted part. The recommended approach involves painting the part directly. Also described is an alternative approach for painting parts covered with aluminum foil.

1.3 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.* Specific hazard statements are given in 10.1.8.1.

1.5 *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

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 D01.55 on Factory Applied Coatings on Preformed Products.

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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.

D2369 Test Method for Volatile Content of Coatings

2.2 USEPA/MVMA (Motor Vehicle Manufacturers Association) Standards:

EPA 450/3-88-018 U.S. Environmental Protection Agency Protocol for Determining the Daily Volatile Organic Compound Emission Rate of Automobile and Light Duty Truck Topcoat Operations³

EPA Federal Reference Method 24 Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids, of Surface Coatings⁴

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *paint, n*—the liquid material that is applied onto the part to cover or coat the surfaces.

3.1.2 *transfer efficiency, n*—the ratio of the weight of paint solids deposited to the total weight of paint solids used during the application process, expressed as a percent.

3.1.3 *paint weight solids content, n*—the weight of the nonvolatile materials in the liquid paint material divided by the total weight of the paint, times 100, determined by Test Method D2369.

3.1.4 *paint density, n*—the mass of a unit volume of the liquid paint material at any given temperature, determined by Test Method D1475.

3.1.5 *satellite paint supply system, n*—a smaller, paint-circulating system separate from the main production paint-circulating supply system capable of supplying paint under the same conditions.

4. Summary of Test Method

4.1 The weight of the part to be painted is determined before and after the paint application process. The weight of liquid

³ Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, <http://www.access.gpo.gov>. Refer to EPA 450/3-88-018 dated December 1988. This protocol makes reference to the determination of production spray transfer efficiency.

⁴ Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, <http://www.access.gpo.gov>. Refer to CFR 40, Part 60, Appendix A.