



**Designation: D 5066 – 91 (Reapproved 1996)<sup>ε1</sup>**

AMERICAN SOCIETY FOR TESTING AND MATERIALS  
100 Barr Harbor Dr., West Conshohocken, PA 19428  
Reprinted from the Annual Book of ASTM Standards. Copyright ASTM

## **Standard Test Method for Determination of the Transfer Efficiency Under Production Conditions for Spray Application of Automotive Paints— Weight Basis<sup>1</sup>**

This standard is issued under the fixed designation D 5066; 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.

<sup>ε1</sup> NOTE—Unit of measurement statement added editorially in May 1996.

### **1. Scope**

1.1 This test method provides 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 inch-pound 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 and health practices and determine the applicability of regulatory limitations prior to use.* Specific hazard statements are given in the note after 10.1.8.

### **2. Referenced Documents**

#### **2.1 ASTM Standards:**

D 1475 Test Method for Density of Paint, Varnish, Lacquer, and Related Products<sup>2</sup>

D 2369 Test Methods for Volatile Content of Coatings<sup>2</sup>

#### **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 Operations,<sup>3</sup>

EPA Federal Reference Method 24—Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids, of Surface Coatings<sup>4</sup>

### **3. Terminology**

#### **3.1 Definitions of Terms Specific to This Standard:**

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

3.1.2 *transfer efficiency*—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*—the weight of the non-volatile materials in the liquid paint material divided by the total weight of the paint, times 100, determined by Test Method D 2369.

3.1.4 *paint density*—the mass of a unit volume of the liquid paint material at any given temperature, determined by Test Method D 1475.

3.1.5 *satellite paint supply system*—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 paint used per part is determined from material usage and part processing records. The determined weight solids content of the paint material is determined and used to calculate the paint solids sprayed per part. The transfer efficiency of the process is calculated by dividing the weight of paint solids deposited by the weight of the paint solids sprayed.

### **5. Significance and Use**

5.1 This test method is specifically directed at the spray painting of automobile car and light duty truck bodies. The general principles are applicable to the painting of other automotive parts.

<sup>1</sup> 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 D01.55 on Factory Applied Coatings on Preformed Products.

Current edition approved May 15, 1991. Published July 1991. Originally published as D 5066 – 90. Last previous edition D 5066 – 90.

<sup>2</sup> Annual Book of ASTM Standards, Vol 06.01.

<sup>3</sup> Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Refer to EPA 450/3-88-018 dated December 1988. This protocol makes reference to the determination of production spray transfer efficiency.

<sup>4</sup> Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Refer to CFR 40, Part 60, Appendix A.