



Standard Test Method for Evaluating and Comparing Transfer Efficiency of Spray Applied Coatings Under Laboratory Conditions¹

This standard is issued under the fixed designation D5009; 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 evaluation and comparison of the transfer efficiency of spray-applied coatings under controlled laboratory conditions.

1.2 This test method has been shown to yield excellent intralaboratory reproducibility. Interlaboratory precision is poorer and is highly dependent on closely controlled air flow in the spray booth, the rate at which the paint is delivered to the part, and other variables suggested in the test method.

1.3 Limitations:

1.3.1 This laboratory procedure only indicates the direction of the effect of spray variables on transfer efficiency. The magnitude of the effect is determined only by specific plant experience.

NOTE 1—This laboratory procedure requires specific equipment and procedures. For those laboratories that do not have access to the type of equipment required a more general laboratory procedure is being prepared as Procedure B.

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

1.5 *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.* For specific hazard statements, see Section 7 and 8.11.9 and 8.13.2.

2. Referenced Documents

2.1 ASTM Standards:²

- D1200 Test Method for Viscosity by Ford Viscosity Cup
- 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 D01.55 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.

D3925 Practice for Sampling Liquid Paints and Related Pigmented Coatings

2.2 National Fire Protection Association Documents³

NFPA 33 Spray Application Using Flammable and Combustible Materials

NFPA 86 Standard for Ovens and Furnaces

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *conveyor speed, n*—the speed of the conveyor in centimeters per minute during the test.

3.1.2 *fluid mass flow rate, n*—the mass flow rate of paint in grams per minute during the test.

3.1.3 *mass of foil, n*—the weight of each target foil in grams before being painted.

3.1.4 *mass of foil plus paint solids, n*—the weight of each target foil in grams after being painted and baked.

3.1.5 *mass of paint solids, n*—the difference in the mass of the foils before painting and the mass of the foils after painting and baking. This is the sum of the mass of the foil plus paint solids less the sum of the mass of the foil.

3.1.6 *transfer efficiency, n*—the ratio of the mass of the paint solids deposited on the foil to the mass of the paint solids sprayed during the test expressed as a percent.

3.1.7 *weight percent solids, n*—the solids content in percent of the total weight of a sample of the paint used during the test.

4. Summary of Test Method

4.1 Metal panels covered with preweighed aluminum foil are conveyed in a spraybooth past a fixed spraygun. The coated foils are then baked to remove volatile matter. The transfer efficiency is calculated on a weight basis using the solids content and quantity of the paint sprayed and the amount of solids on the coated aluminum foil target.

5. Significance and Use

5.1 Subject to the limitations listed above, the procedure can be used as a research tool to optimize spray equipment and

³ Available from National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02269-9101.