



Designation: D 5327 – 97 (Reapproved 2002)

Standard Practice for Evaluating and Comparing Transfer Efficiency of Spray Applied Coatings Under General Laboratory Conditions¹

This standard is issued under the fixed designation D 5327; 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 practice covers the evaluation and comparison of the transfer efficiency of spray-applied coatings under general laboratory conditions. Transfer efficiency is the ratio of paint solids deposited to the total paint solids used during the application process, expressed as a percent. This practice can be used to study the effect on transfer efficiency of changing operating variables and paint formulations. Key variables that need to be controlled are listed in 8.13.

NOTE 1—It is important that all process or formulation parameters, except that which is intentionally being changed, be kept consistent from test to test. If not done, the results of the study are to be questioned.

1.2 The reproducibility of this practice is highly dependent on the degree of control of the parameters listed in Section 8 of the practice.

1.3 *Limitations*—This laboratory practice indicates only the direction of the effect of operating variables and liquid paint formulations on transfer efficiency under conditions of the laboratory test: the magnitude of the effect can be determined only with specific plant experience. In fact, the nature of the critical parameters that affect transfer efficiency makes clear that it is not possible to extrapolate laboratory results.

NOTE 2—The laboratory practice outlined involves general laboratory spray equipment and procedures and is derived from Test Method D 5009. This practice and Test Method D 5009 are both derived from a study and report of transfer efficiency measurements conducted for the U.S. Environmental Protection Agency. For laboratories that have access to a conveyor and mass flow measurement equipment, a suitable, potentially more reproducible, tested method is defined in Test Method D 5009.

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 appro-*

priate safety and health practices and determine the applicability of regulatory limitations prior to use. For specific hazard statements see Section 7, Note 8 and Note 9.

2. Referenced Documents

2.1 ASTM Standards:

D 1200 Test Method for Viscosity by Ford Viscosity Cup²

D 2369 Test Method for Volatile Content of Coatings²

D 3925 Practice for Sampling Liquid Paints and Related Pigmented Coatings²

D 5009 Test Method for Evaluating and Comparing Transfer Efficiency of Spray Applied Coatings Under Laboratory Conditions³

2.2 Other Standards:

NFPA 33 Spray Application Using Flammable and Combustible Materials⁴

NFPA 86 Standard for Ovens and Furnaces⁴

3. Terminology

3.1 Definitions of Terms Specific to This Practice:

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

3.1.2 *mass of foil*—the weight of each target foil in grams before being painted.

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

3.1.4 *mass of paint solids*—the difference in the mass of the foil before painting and the mass of the foil after painting and baking. The sum of the mass of the foil plus paint solids less the sum of the mass of the foil.

3.1.5 *transfer efficiency*—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.

3.1.6 *weight percent solids*—the solids content as percent of the total weight of a sample of the paint used during the test.

3.1.6.1 *Discussion*—Weight percent solids are determined as specified in 8.4.2.

¹ This practice 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 *Annual Book of ASTM Standards*, Vol 06.01.

³ *Annual Book of ASTM Standards*, Vol 06.02.

⁴ Available from National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02269-9101.