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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Test Methods for Nonvolatile and Pigment Content of Electrocoat Baths[1]

This standard is issued under the fixed designation D 5145; 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 These test methods cover the characterization of electrocoat baths through the determination of nonvolatile content of inorganic pigment content.

1.2 *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 1193 Specifications for Reagent Grade Water[2]

D 2832 Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings[3]

E 180 Practice for Determining the Precision Data of ASTM Methods for Analysis and Testing of Industrial Chemicals[4]

3. Summary of Test Method

3.1 Two specimens are accurately weighed into aluminum weighing dishes. The dishes are placed in an oven at 110°C for 1 h, reweighed to obtain the nonvolatile matter content and, if required, placed in a muffle furnace at 500°C for 2 h and weighed a third time to obtain the inorganic pigment content.

4. Significance and Use

4.1 The nonvolatile content and pigment content are measures of total solids and inorganic pigment solids, respectively, in electrocoat paints. In addition to production quality control, these properties are important in maintaining electrocoat baths in the optimum range.

4.2 Other test methods for determining nonvolatile content of paint and paint related materials are described in Method D 2832.

5. Apparatus

5.1 *Analytical Balance* with a sensitivity of 0.1 mg.

5.2 *Aluminum Weighing Dishes*, 57 mm in diameter and 17 mm deep. These commercial dishes may contain a lubricant used during their manufacture. This should be removed by heating the aluminum dishes on a hot plate at 300°C until vapors are no longer visible. Store the dishes in a desiccator until needed.

5.3 *Syringes*, 5-mL, disposable variety.

5.4 *Oven* circulating, maintained at 110 ± 2°C.

5.5 *Muffle Furnace*, maintained at 500 ± 15°C.

6. Reagents

6.1 *Purity of Water*—References to water shall be understood to mean water conforming to Type II of Specification D 1193.

7. Sampling and Sample Preparation

7.1 Obtain the sample while the electrocoat bath is under proper circulation so a uniform sample is obtained. In the case of a ultrafiltrate sample, the material should be thoroughly mixed or stirred prior to drawing the sample, thereby ensuring uniformity.

7.2 After sampling, prior to removing the test specimen, it is mandatory the sample be shaken or stirred until it is homogeneous and free of any settled material. This is particularly important if there is a delay between sampling the bath and performing this test procedure. The absence of settled material should be ascertained visually or by inserting a spatula and scraping the bottom of the container. Continue to shake or stir the sample until specimens are taken for measurement. *This Point is Very Important.*

NONVOLATILE CONTENT

8. Procedure

8.1 Weigh two aluminum dishes separately, each to 0.1 mg and record as W_1.

8.2 Using a syringe, withdraw 1.0 to 1.5 of the well mixed sample, then quickly weigh the syringe to 0.1 mg, recording this weight as W_2. Transfer the entire contents of the syringe into the aluminum dish. Reweigh the empty syringe to 0.1 mg and record as W_3. In the case of ultrafiltrate clear liquids or of low solids paints, increase the specimen size to 5 mL and preheat at 60°C for 2 h. Duplicate this step with the second aluminum dish (8.1).

8.3 Add a few millilitres of water to the specimen in the

[1] These test methods are under the jurisdiction of ASTM Committee D-1 on Paint and Related Coating, Materials, and Applications and are 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 11.01.
[3] *Annual Book of ASTM Standards*, Vol 06.01.
[4] *Annual Book of ASTM Standards*, Vol 15.05.