



Designation: D 4584 – 86 (Reapproved 1999)

Standard Test Method for Measuring Apparent pH of Electrocoat Baths¹

This standard is issued under the fixed designation D 4584; 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 approval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method covers the measurement of the free hydrogen ion concentration of electrocoat baths and their ultrafiltrates.

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 Specification for Reagent Water²

D 1293 Test Methods for pH of Water²

E 70 Test Method for pH of Aqueous Solutions with the Glass Electrode³

E 180 Practice for Determining the Precision Data of ASTM Methods for Analysis and Testing of Industrial Chemicals³

3. Summary of Test Method

3.1 A specimen of a well-agitated electrocoat bath is placed in a stirrer-equipped container and the pH measured with a pH meter and associated glass and reference electrodes.

4. Significance and Use

4.1 The pH is the measure of the free hydrogen ion concentration of a sample, and it indicates whether an electrocoat bath is acidic, neutral, or basic. Since pH measurements of good precision are made in aqueous solutions, it is suggested that the pH measurements of electrocoat baths are only semi-quantitative, and therefore such measurements should be referred to as apparent pH measurements.

4.2 The pH of electrocoat paints is used for research, production, and quality control or electrocoat bath process control.

4.3 Other related methods for determining the pH of water or aqueous systems are described in Test Methods D 1293 and E 70.

5. Apparatus

5.1 *pH Meter,*

5.2 *Glass and Reference Electrodes.*

NOTE 1—Due to the polarity of electrocoat materials it is desirable to use a separate set of electrodes for each bath polarity, cathodic and anodic, because a bath of opposite polarity poisons the electrodes. A desired practice is to rinse the electrodes after each measurement with an appropriate solvent for the electrocoat material.

5.3 *Thermometer,* capable of 0.5°C accuracy with a – 2 to 32°C range.

6. Reagents

6.1 *Reference Standard Solutions,* commercial standards of pH 4.0, 7.0, and 10.0.

6.2 *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 The sample should be obtained while the electrocoat bath is under proper circulation so that a uniform material is obtained. In case of an ultrafiltrate, the material should be thoroughly mixed or stirred prior to sampling to assure uniformity.

7.2 After sampling and prior to removing a test specimen it is mandatory that the sample be shaken or stirred until it is homogeneous and free of any settled material. This is particularly important if there is any delay between the sampling of the bath and the preparation of the specimens for the test. The absence of settled material can be ascertained visually (in a transparent container) or by inserting a spatula, scraping the bottom of the container to make sure that there is no settled matter. Shake or stir the samples until specimens are taken for measurement; *this point is very important.*

¹ 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 D01.21 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 15.05.