



Designation: D 3793 – 04

Standard Test Method for Low-Temperature Coalescence of Latex Paint Films¹

This standard is issued under the fixed designation D 3793; 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 determination of the comparative coalescence of a series of latex paints by determining the porosity of films dried at standard and at low temperature. Porosity is evaluated with a penetrating medium as in Test Method D 3258.

1.2 The texture of the film, which can affect cleanup, will influence the results of the test. Stain applied to a high-hiding paint will not lower the reflectance as much as the same stain applied to a low-hiding paint of equal porosity. These points must be considered in comparing the different paints.

1.3 This method should be used only for comparative testing within one laboratory, as the numerical results obtained by different laboratories do not usually agree.

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.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D 3258 Test Method for Porosity of White or Near White Paint Films by Staining

E 1347 Test Method for Color and Color Difference Measurement of Object-Color Specimens by Tristimulus (Filter) Colorimetry

3. Summary of Test Method

3.1 The test paints are applied to porous cardboard panels, dried at standard temperature and at 4.5°C (40°F) with 50% relative humidity in both cases, and their reflectances measured.

A special colored penetrating medium is applied to each, the excess removed in a specified manner, and reflectances measured again. The difference between the readings on the stained and unstained films indicates the porosity of that film; the difference between the readings for the two temperatures indicates the coalescence of that film compared to others in the series.

4. Significance and Use

4.1 This test method provides no absolute information, rather ranking only of the selected series of paints.

4.2 This test method can provide a pass-fail situation if known acceptable and unacceptable paints are included in the test.

5. Apparatus and Materials

5.1 *Plate Glass Panel* (base for cardboard panel).

5.2 *Strippable Adhesive*.³

5.3 *Test Panel*—Smooth porous cardboard pane, such as the back of a white drawdown chart.⁴

5.4 *Film Applicator*, 150 mm (6 in.) wide with a clearance of 150 μ m (6 mils).

NOTE 1—It should be noted that some applicators are marked with the nominal wet film thickness, which is one half of the clearance.

5.5 *Film Applicator*, 140 mm (5½ in.) wide with a clearance of 255 μ m (10 mils).⁵

5.6 *Reflectometer*, meeting the requirements of Test Method E 1347.

5.7 *Cold Cabinet*, maintaining 4.5 \pm 1°C (40 \pm 2°F) and 50 \pm 5% relative humidity.

5.8 *Camel's Hair Brush*, approximately 13 mm (½ in.) wide.

5.9 *Plastic Wash Bottle*, about 500 mL or 16 oz containing mineral spirits of the odorless type.

5.10 *Penetrating Medium*—A proprietary composition of pigments or dye, or both, dispersed in a liquid vehicle.

5.11 *Filter Paper*.

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 D01.42 on Architectural Coatings.

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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.

³ Any strippable adhesive such as represented by the following formulas: vinyl acrylic emulsion (800 parts by weight) and polyethylene glycol, molecular weight 1450, (16 parts by weight).

⁴ White cardboard drawdown chart, Form WA, from the Leneta Co., 15 Whitney Rd., Mahwah, NJ 07430, was used in the original test method to get the results.

⁵ The Dow latex film caster from Byk-Gardner, Inc. Gardner Laboratory, 2435 Linden Lane, Silver Spring, MD 20910, was used originally in this test method.