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Standard Test Method for Color Development in Tinted Latex Paints¹

This standard is issued under the fixed designation D 5326; 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 a procedure for measuring color development in tinted latex paints, for the purpose of determining the efficiency of colorants, the tintability of base paints and the potential for poor color uniformity of applied paint films.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 *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 16 Terminology Relating to Paint, Varnish, Lacquer, and Related Products²
- D 2244 Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates²
- D 3924 Specification for Standard Environment for Conditioning and Testing Paint, Varnish, Lacquer, and Related Materials²
- D 3925 Practice for Sampling Liquid Paints and Related Pigmented Coatings²
- E 284 Terminology of Appearance²
- E 1164 Practice for Obtaining Spectrophotometric Data for Object-Color Evaluation²
- E 1331 Test Method for Reflectance Factor and Color by Spectrophotometry Using Hemispherical Geometry²
- E 1345 Practice for Reducing the Effect of Variability of Color Measurements by the Use of Multiple Measurements²
- E 1347 Test Method for Color and Color-Difference Measurement by Tristimulus (Filter) Colorimetry²
- E 1349 Test Method for Reflectance Factor and Color by Spectrophotometry Using Bidirectional Geometry²

3. Terminology

3.1 Definitions:

3.1.1 *color development*—the extent to which the colorant has achieved its full tinting potential, as evidenced by the color change or lack thereof, when the tinted paint is subjected to very strong shear stress.

3.1.2 *tintability*—the capability of a white or tint base paint to accept various colorants, as evidenced by the color development in the mixture.

3.1.2.1 *Discussion*—Sometimes called “color acceptance”.

3.2 See Terminology D 16, E 284, and the *Paint/Coatings Dictionary*³ for definitions of other terms used in this test method.

4. Summary of Test Method

4.1 The test paint is applied by drawing it down on a striped black and white sealed chart, at a film thickness sufficient to obtain full hiding.

4.2 A portion of the drawdown is subjected to strong shearing forces in a prescribed brushing procedure.

4.3 The CIELAB color difference between the drawdown and sheared areas after drying, is reported as a measure of deficiency in the color development of the test paint.

5. Significance and Use

5.1 A colorant sometimes fails to disperse completely in a base paint due to poor compatibility, which can be the fault of the colorant, the paint, or both. This will result in poor color development, which is readily manifested by the common procedure of applying the paint with a doctor blade and subjecting the drawdown to high shear stress by finger-rubbing a small area of the partially dry film. This tends to disperse undeveloped colorant, if any, and produces a color variation between the unsheared and sheared areas of the paint film. The variation can be measured colorimetrically to give a numerical color difference value that is a measure of the color development of the original paint, the smaller the difference the better the color development and vice versa. Color difference values obtained by finger-rubbing were found to vary widely for the same as well as among different operators. This test method establishes a controlled shear-stress procedure analogous to the finger rub-up test, but with far better reproducibility.

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 D01.42 on Architectural Finishes.

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² *Annual Book of ASTM Standards*, Vol 06.01.

³ Available from the Federation of Societies for Coatings and Technology, 494 Norristown Rd., Blue Bell, PA 19422.