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Standard Test Methods for Bleeding of Pigments¹

This standard is issued under the fixed designation D279; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 These test methods cover procedures for determining the bleeding characteristics of dry pigments by direct solvent extraction of the pigment and by overstripping a film with a white coating and observing for the color migration from the base coat containing the pigment.

1.2 The values stated in SI 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 problems, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D2244 Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates

D2616 Test Method for Evaluation of Visual Color Difference With a Gray Scale

3. Summary of Test Methods

3.1 *Test Method A*—The pigment is shaken with toluene, filtered, and the filtrate observed for color.

¹ These test methods are under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and are the direct responsibility of Subcommittee D01.31 on Pigment Specifications.

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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.

3.2 *Test Method B*—A coating using the pigment under test is prepared and applied to one half of a panel. A white finish is applied over the dried colored coating and extended to the uncoated portion of the panel. The dried overstripe coating is examined for color migration from the base coat.

4. Significance and Use

4.1 Test Method A determines the amount of color produced when the pigment is in direct contact with a selected solvent such as toluene. It is useful as a rapid, easily conducted test of the general bleeding characteristics of pigments.

4.2 Test Method B determines the amount of color migration into a white film applied over a base coat containing the pigment. It may give a more practical evaluation of whether a pigment will meet specific requirements for bleed resistance.

4.3 Both Test Method A and Test Method B measure the extent of bleed.

TEST METHOD A, DIRECT SOLVENT CONTACT WITH PIGMENT

5. Procedure

5.1 Place 0.50 g of pigment (**Note 1**) in a test tube or vial and add 20 mL of reagent grade toluene (**Note 2**). Close with a stopper, shake well for 10 s, and let stand 15 min. Repeat the 10 s shake and let stand 45 min.

NOTE 1—Additional amounts of pigment may be used by prior agreement for denser inorganic pigments. A maximum of 1.5 g is recommended for even the dense lead chromate pigments.

NOTE 2—Other solvents may be used, by mutual agreement between the parties involved, in place of toluene in a specific pigment bleed evaluation.

5.2 Filter through a glass funnel using double filter paper that has first been wet with toluene and collect approximately 10 mL of filtrate in a 23 mm outer diameter flat bottom vial. If the filtrate is cloudy, refilter to get a clear filtrate.

NOTE 3—In the case of colloidal particles, it may be necessary to centrifuge the filtrate.

5.3 Hold the vial containing the filtrate above a white background and look down through the filtrate for coloration caused by pigment bleed. Describe the degree or severity of bleed according to the following terminology or use the Gray Scale (Test Method **D2616**):

- 5.3.1 *None*—No perceptible color (that is, no bleed).
- 5.3.2 *Slight*—A faint but distinct coloration.
- 5.3.3 *Moderate*—A pronounced but not severe coloration.
- 5.3.4 *Severe*—An intense coloration.

TEST METHOD B, WHITE OVERSTRIPE OF A PIGMENTED FILM

6. Procedure

6.1 Prepare a coating of agreed upon composition, using the pigment under test, and prepare a film of this coating by any method that will give a smooth and uniform film of normal coating thickness (that is, in the range from 1 mils to 3 mils) (25 μm to 75 μm) leaving a portion of the substrate uncoated. Cure the film under conditions appropriate to the end use. For air dry films, dry at room temperature, approximately 25 °C (77 °F) for a minimum of 24 h.

6.2 Pretreatments of the colored coating, such as sanding or solvent wipe, or both, may be used before the overstripe, as agreed upon by the purchaser and seller.

6.3 Overstripe with a white finish of agreed upon composition. Ensure that the overstripe film is of uniform thickness and

applied at complete hiding; otherwise, color show-through may be erroneously interpreted as bleed.

6.4 Extend the overstripe film to the uncoated portion of the panel. Dry the overstripe under conditions mutually agreed upon by the involved parties.

6.5 Examine for color migration from the base coat into the white topcoat within 2 h after drying. Evaluate, as agreed upon by the purchaser and seller, the extent of bleed in accordance with the visual scale in Test Method A (5.3) or measure the actual color difference versus the uncoated portion using Delta E color measurements, Practice D2244.

7. Precision and Bias

7.1 The precision and bias are considered to be undeterminable as they will vary with the solvent or solvent blends used in Test Method A and with the type of base coat and type of overstripping used in Test Method B.

8. Keywords

8.1 bleeding pigments; migration; overstripe; pigment bleeding test

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