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AMERICAN SOCIETY FOR TESTING AND MATERIALS
100 Barr Harbor Dr., West Conshohocken, PA 19428
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Standard Test Method for Relative Tinting Strength of White Pigments by Reflectance Measurements[1]

This standard is issued under the fixed designation D 2745; 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 describes the procedure for determining the relative tinting strength of white pigments by reflectance measurements of black tints.

1.2 This test method is applicable only for comparing the test pigment with a reference standard of the same type and grade.

NOTE 1—Test Method D 332 describes a procedure for visual assessment of blue tinted samples.

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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

D 332 Test Method for Relative Tinting Strength of White Pigments by Visual Observation[2]

E 97 Test Method for Directional Reflectance Factor, 45-deg 0-deg, of Opaque Specimens by Broad-Band Filter Reflectometry[3]

3. Summary of Test Method

3.1 Pigment is dispersed in a vehicle and let down with additional vehicle that has been tinted. Dispersion and letdown are accomplished with a mechanical muller. Both the test and standard pigments are treated identically. Opaque drawdowns are made of the paint and the *Y* tristimulus values (green-filter reflectance) of the wet films are measured. The relative tinting strength of the test pigment is calculated directly from the reflectance values.

4. Significance and Use

4.1 Tinting strength is one of the most important properties of a white pigment. This test method provides a means of testing this property for quality control.

4.2 This test method is a referee method, and the vehicle for preparing the dispersion and the black for tinting are suggested but others may be used provided both the purchaser and the seller agree to the changes.

4.3 The results obtained with a muller do not necessarily agree with industrial situations where different dispersing conditions exist. However, dispersing with a muller is a fast, relatively inexpensive way of testing tinting strength for routine quality control.

5. Apparatus and Materials

5.1 *Muller*, automatic,[4] equipped with a weight that exerts a permanent 50-lbf (220-N) and an additional weight exerting a 50-lbf making a total of 100-lbf (445-N). The two glass plates shall be kept sharp by removing from the machine and grinding them face-to-face with No. 303 optical emery or equivalent, and water.

5.2 *Spatula*—A flexible spatula having a chromium-plated or plastic blade 3 to 6 in. (75 to 150 mm) long and another with a 3-in. tapered blade.

5.3 *Balances*—(*1*) A balance sensitive to 20 mg and (*2*) an analytical balance sensitive to 0.4 mg.

5.4 *Vehicle*—Because the choice of vehicle may affect results, a solvent-free vehicle (excluding refined or low-bodied linseed oil)[5] should be agreed upon by the purchaser and the seller.

5.5 *Tinting Black*—A lamp black predispersed in a vehicle similar in nature to the test vehicle.[6]

5.6 *Chart*—Either gray or white lacquered charts[7] cut to a convenient size.

5.7 *Colorimeter*—A filter colorimeter meeting the requirements of Test Method E 97.

5.8 *Film Applicator*—2 or 3 in. (50 or 75 mm) wide with a

[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 D01.26 on Optical Properties.

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

[3] Discontinued see *1992 Annual Book of ASTM Standards*, Vol 14.02.

[4] A satisfactory muller is supplied by the Hoover Color Corp., 13 Cordier St., Irvington, NJ 07111.

[5] Suggested vehicles include a 50-50 mixture of Aroplaz 1271 and 1278 (Spencer Kellogg Division of Textron, Inc., P.O. Box 807, Buffalo, NY 14240), No. 3 Litho Varnish (Inmont Corp., Printing Ink Div., Germantown Ave. and New Market St., Philadelphia, PA 19123), and Castor Oil AA, USP (NL Industries, NL Chemicals Div., P.O. Box 700, Hightstown, NJ 08520).

[6] Tinting black should be agreed upon between the purchaser and the seller. Suggested materials include Lampblack PF 4340 (Daniel Products Co., 400 Claremont Ave., Jersey City, NJ 07304) and Lampblack 5-24-A-710 (The Hilton-Davis Chemical Co., 2235 Langdon Farm Road, Cincinnati, OH 45237).

[7] Suitable charts are available from The Leneta Co., P.O. Box 86, Ho-Ho-Kus, NJ 07423.