



Designation: D7540 – 09 (Reapproved 2013)

Standard Practice for Dispersion of Chromatic Pigments with a Mechanical Muller¹

This standard is issued under the fixed designation D7540; 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 practice is intended to be used to disperse a chromatic pigment for subsequent testing.

1.2 This practice does not apply to white pigments.

NOTE 1—The dispersion portion of Test Method D3022 is similar to this practice, but it utilizes a miniature sandmill rather than a mechanical muller, to disperse the chromatic pigment.

NOTE 2—The dispersion portions of Test Methods D332 and D2745 are similar to this practice, but they are intended for use with white pigments, rather than chromatic pigments.

1.3 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.4 *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. Specific hazard statements are given in Section 8.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D332 Test Method for Relative Tinting Strength of White Pigments by Visual Observation

D2745 Test Method for Relative Tinting Strength of White Pigments by Reflectance Measurements

D3022 Test Method for Color and Strength of Color Pigments by Use of a Miniature Sandmill

E284 Terminology of Appearance

3. Terminology

3.1 *Definitions*—Definitions of appearance terms used in this practice may be found in Terminology E284.

¹ This practice is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.24 on Physical Properties of Liquid Paints and Paint Materials.

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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.

4. Summary of Practice

4.1 Pigments are dispersed in a suitable vehicle with a mechanical muller. Test and standard pigments are treated identically. Opaque drawdowns may be made from the dispersions and compared for color and strength differences either visually or instrumentally.

5. Significance and Use

5.1 The results obtained with a mechanical muller do not necessarily correlate directly with an industrial situation where different dispersing conditions exist. However, dispersion with a mechanical muller is a quick and inexpensive way to prepare specimens for testing the color and strength of a pigment for routine quality control.

5.2 By following the procedure described in Appendix X1, the conditions for achieving the maximum practical degree of dispersion with a mechanical muller may be determined. Any color and strength tests done with the dispersions should be carried out under these conditions.

6. Apparatus

6.1 *Balances*—(1) A balance sensitive to 10 mg and (2) an analytical balance sensitive to 1.0 mg.

6.2 *Muller, Mechanical*, equipped with ground-glass plates to which a variable but known force may be added in 220-N (50-lbf) increments. The driven glass plate shall have a speed of rotation of between 70 and 120 r/min and the apparatus shall have an arrangement for pre-setting the number of revolutions in multiples of 50. See Fig. 1 for an example of such a device.

6.3 *Rubbing Surfaces*—The rubbing surfaces of the ground glass plates shall be kept sharp by removing them from the muller and grinding them face-to-face with No. 303 optical emery, or its equivalent, and water.

6.4 *Small Glass Slab* or other nonabsorbent material, suitable for weighing and mixing pigment pastes.

6.5 *Spatula*—A flexible spatula having a 75 to 150-mm (3 to 6-in.) blade.

7. Materials

7.1 *Reference Standard*—A standard pigment of the same type and grade as the pigment to be tested, as agreed upon between the purchaser and the seller.