



Designation: D3022 – 84 (Reapproved 2005)

Standard Test Method for Color and Strength of Color Pigments by Use of a Miniature Sandmill¹

This standard is issued under the fixed designation D3022; 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 the determination, through the use of a miniature sandmill, of the color and strength of dry color pigments.

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 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.* For specific hazard statements, see Section 6.

2. Referenced Documents

2.1 *ASTM Standards:*²

C778 Specification for Sand

D235 Specification for Mineral Spirits (Petroleum Spirits)
(Hydrocarbon Dry Cleaning Solvent)

D523 Test Method for Specular Gloss

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

E97 Test Method for Directional Reflectance Factor, 45-deg
0-deg, of Opaque Specimens by Broad-Band Filter Reflec-
tometry³

E308 Practice for Computing the Colors of Objects by
Using the CIE System

2.2 *Federal Specification:*⁴

TT-R-266 Resin, Alkyd; Solutions

2.3 *ASTM Adjuncts:*

Miniature sandmill⁵

3. Significance and Use

3.1 This test method is a way of testing the color and strength of pigments by use of a miniature sandmill. It correlates well with industrial practice and is used for routine quality control.

4. Apparatus

4.1 *Balance*, sensitive to 10 mg with a capacity in excess of 300 g.

4.2 *Miniature Sandmill*—A laboratory disperser equipped with a 41-mm (1 $\frac{5}{8}$ -in.) diameter fiber rotary disk impeller rotating at a constant 8000 r/min under varying load conditions. The shaft upon which the impeller is mounted shall be sufficiently balanced so no whip of the shaft is observed between 0 and 10 000 r/min.

4.3 *Cylinder*, 100-mL graduated.

4.4 *Beakers*, 200-mL tall-form, stainless steel, or polyethylene (approximately 60-mm inside diameter).

4.5 *Strainers*, paper cone, disposable, about 40 mesh.

4.6 *Fiber Disks*, 41-mm (1 $\frac{5}{8}$ -in.) diameter phenolic laminated, 6 mm ($\frac{1}{4}$ in.) thick.⁶

4.7 *Paper Charts*, smooth, surface-coated, the surface of which should be impervious to paint liquids.⁷

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 D01.26 on Optical Properties.

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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 Withdrawn. The last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, http://dodssp.daps.dla.mil.

⁵ Drawings are available from ASTM International Headquarters. Order Adjunct ADJD3022.

⁶ The sole source of supply of the disks known to the committee at this time is Gardner/BYK-Gardner, Inc., Gardner Laboratory, 2435 Linden Lane, Silver Spring, MD 20910. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,¹ which you may attend.

⁷ The sole source of supply of the white and black charts known to the committee at this time is the Leneta Co., 15 Whitney Rd., Mahwah, NJ 07430. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,¹ which you may attend.

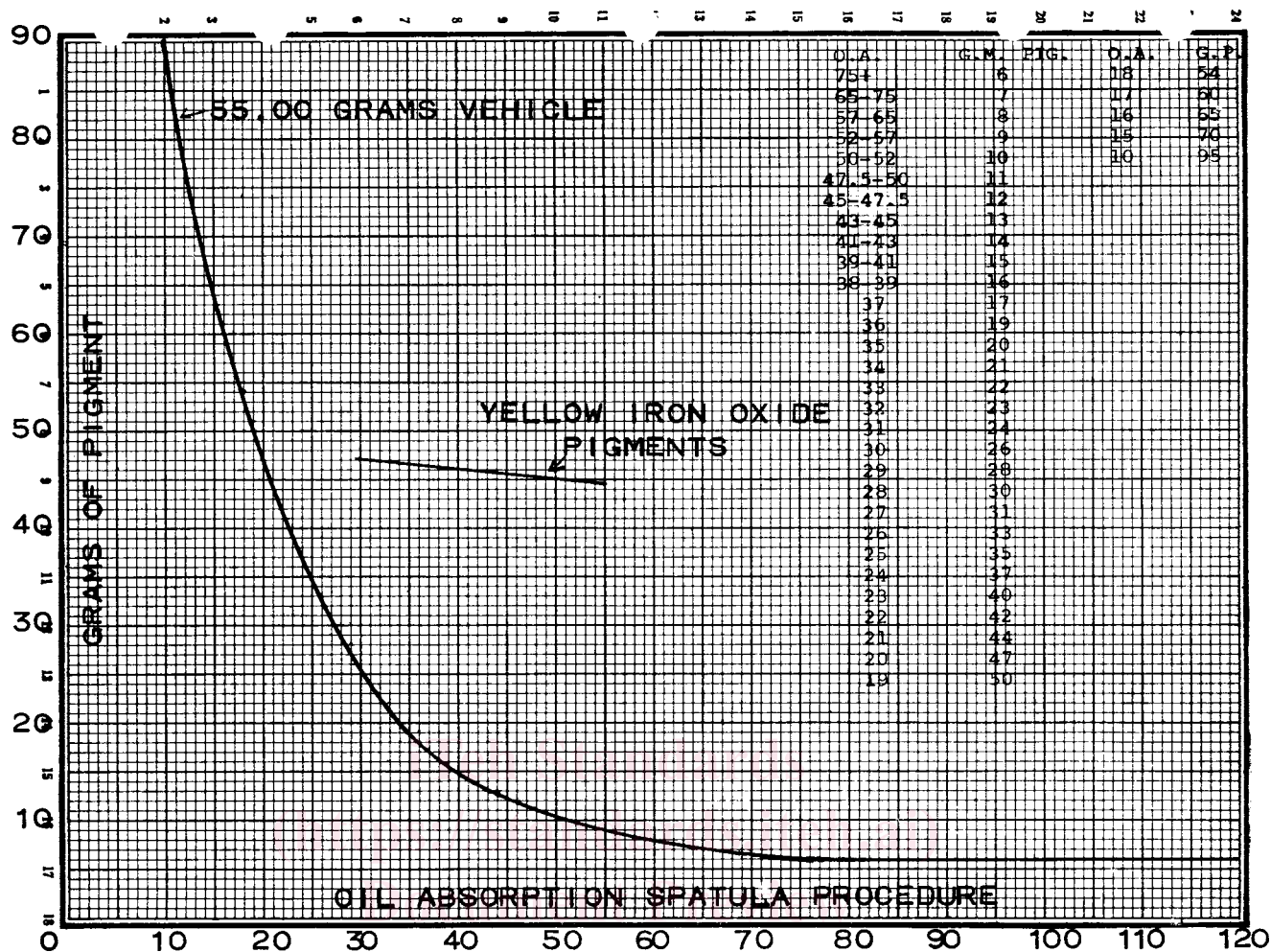


FIG. 1 Oil Absorption Spatula Procedure

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<https://standards.iteh.ai/catalog/standards/sist/4cd1e7cc-4f0a-4858-b338-d4a17963/doc7/astm-d3022-842005>

4.8 *Film Applicator*, with an 200- μ m (8-mil) clearance at least 75 mm (3 in.) wide.

4.9 *Color-Measuring Instruments*, as defined in Test Method E97 or Practice E308.

5. Materials

5.1 Samples of standard reference pigments as agreed upon between the purchaser and the seller.

5.2 *Standard Sand*⁸—Regular 20 to 30-mesh (850 to 600- μ m) cement testing sand conforming to Specification C778. The sand shall be screened to remove all sub 30-mesh particles. Twenty to thirty-mesh glass beads may be used instead of sand.⁹

⁸ The sole source of supply of the sand known to the committee at this time is Agsco Division, American Graded Sand Co., 189 E. 7th St., Patterson, NJ 07524. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,¹ which you may attend.

⁹ The sole source of supply of the glass beads known to the committee at this time is Quackenbusch Co., P. O. Box 607, Palatine, IL 60067. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,¹ which you may attend.

5.3 *Grinding Vehicle*—A long oil alkyd¹⁰ meeting U.S. Fed. Spec. TT-R-266 Type 1-A reduced to 47 % solids with mineral spirits conforming to Specification D235 (2 parts alkyd and 1 part mineral spirits by weight).

5.4 *White Tinting Paint*—A flat white tinting paint compatible with the dispersion vehicle meeting the following requirements.

5.4.1 *Gloss* (60°) less than 4, as determined by Test Method D523.

5.4.2 *Contrast Ratio* (51- μ m (2-mil) dry film): 99.2 min.

5.5 *Drier Blend*—One part 6 % manganese naphthenate, 2 parts 6 % cobalt naphthenate, and 4 parts 24 % lead naphthenate by weight.

6. Hazards

6.1 While operating the mill, keep hands well away from the shaft and disk and be sure that no article of clothing (for example, necktie or long hair) will catch on moving parts. This precaution applies to all cases where the mill is in operation.

¹⁰ A long oil soya or safflower alkyd at 70 % solids with the following characteristics: Nonvolatile 70 \pm 1 %, phthalic anhydride 23 % min, fatty acids 60 to 65 %, dihydric alcohol 4 % max, acid number 5 to 10, specific gravity 0.950-0.970, Gardner color 10.