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Standard Guide for Selection of Tests for Traffic Paints[1]

This standard is issued under the fixed designation D2205; 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 guide covers the selection and use of procedures for testing traffic paints in the laboratory and in the field.

1.2 This guide covers the testing of a ready-mixed paint product of sprayable consistency that shall be suitable for use as a reflecting traffic guide on paved roadways.

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.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

C219 Terminology Relating to Hydraulic Cement

D8 Terminology Relating to Materials for Roads and Pavements

D16 Terminology for Paint, Related Coatings, Materials, and Applications

D154 Guide for Testing Varnishes

D185 Test Methods for Coarse Particles in Pigments

D215 Practice for the Chemical Analysis of White Linseed Oil Paints (Withdrawn 2005)[3]

D562 Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer

D711 Test Method for No-Pick-Up Time of Traffic Paint

D713 Practice for Conducting Road Service Tests on Fluid Traffic Marking Materials

D868 Practice for Determination of Degree of Bleeding of Traffic Paint

D869 Test Method for Evaluating Degree of Settling of Paint

D870 Practice for Testing Water Resistance of Coatings Using Water Immersion

D913 Practice for Evaluating Degree of Traffic Paint Line Wear

D968 Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive

D969 Test Method for Laboratory Determination of Degree of Bleeding of Traffic Paint (Withdrawn 2010)[3]

D1210 Test Method for Fineness of Dispersion of Pigment-Vehicle Systems by Hegman-Type Gage

D1309 Test Method for Settling Properties of Traffic Paints During Storage

D1475 Test Method For Density of Liquid Coatings, Inks, and Related Products

D1644 Test Methods for Nonvolatile Content of Varnishes

D1647 Test Methods for Resistance of Dried Films of Varnishes to Water and Alkali (Withdrawn 2004)[3]

D1729 Practice for Visual Appraisal of Colors and Color Differences of Diffusely-Illuminated Opaque Materials

D1737 Method of Test for Elongation of Attached Organic Coatings with Cylindrical Mandrel Apparatus (Withdrawn 1988)[3]

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

D2371 Test Method for Pigment Content of Solvent-Reducible Paints

D2372 Practice for Separation of Vehicle From Solvent-Reducible Paints

D4061 Test Method for Retroreflectance of Horizontal Coatings

E97 Method of Test for Directional Reflectance Factor, 45-Deg 0-Deg, of Opaque Specimens by Broad-Band Filter Reflectometry (Withdrawn 1991)[3]

[1] This guide is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.44 on Traffic Coatings.

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

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

2.2 *U.S. Federal Test Methods Standard 141B:*[4]

4121 Dry Opacity

3. Terminology

3.1 *Definitions*—For definitions used in this guide, refer to Terminology C219, D8, and D16.

4. Summary of Guide

4.1 This guide consists of the following tests that, although not exhaustive, cover the areas normally of concern in traffic paint testing:

	Sections
Liquid Paint Properties	6 through 11
Application and Appearance Properties	12 through 17
Properties of the Dried Film	18 through 20
Analysis of Paint	21 through 24
Field Evaluations	25 through 29

5. Conditions Affecting Traffic Paint

5.1 Practical requirements for traffic paint may vary with:

5.1.1 Substrate type, such as portland cement and asphaltic concretes, and the various coarse aggregates used therein.

5.1.2 Climatic conditions, both generally and specifically, at the time of paint application.

5.1.3 Service density, such as heavy traffic areas in cities versus lightly traveled rural highways and parking lots.

5.1.4 Traffic type, whether light passenger cars or heavy trucks and airplanes.

5.1.5 Presence of foreign matter on the road surface, such as oil, old paint, skid marks, sand, salt, concrete curing compound, etc.

5.2 New portland cement concrete surfaces have a greater degree of moisture and alkalinity than older surfaces and thereby adversely affect paint adhesion. Paint adhesion is also affected by the ratio of cement to fine aggregate, coarse aggregate, and mixing water, as well as by the surface character of the aggregate that can range from impervious smooth quartz to irregular, porous slag.

LIQUID PAINT PROPERTIES

6. Skinning

6.1 Paints containing a binder that dries by oxidation are subject to skin formation in a partially filled can or by diffusion of air into a filled can. Since skins are insoluble in the paint they must be removed before use. The referenced test employs a partially filled container to indicate the tendency of a paint to skin. A typical minimum time for skinning is 18 to 24 h.

6.2 Examine the original sample for skins both on the surface and in the mass. Using a well-mixed, skin-free portion of the sample, perform a skinning test in accordance with Guide D154, except use a 0.5-L (1-pt) friction-top can instead of an 0.25-L (8-oz) jar.

7. Coarse Particles

7.1 Paints must be free of oversize particles and foreign matter to avoid clogging application equipment, a typical maximum being 1 % by weight of total paint. The referenced test with a 325-mesh (45-µm) screen gives the percent of this material in the paint.

7.2 Determine coarse particles in accordance with Test Methods D185.

NOTE 1—This test is not used for traffic paint containing pre-mixed glass beads.

8. Fineness of Dispersion

8.1 The more finely a pigment is dispersed, the more efficiently it is being used. One method for measuring the degree of dispersion (commonly referred to as "fineness of grind") is to draw the material down a calibrated, tapered groove in a hardened steel block with the groove varying in depth from 4 to 0 mils (100 to 0 µm). The point at which continuous groupings of particles or agglomerates, or both, protrude through the surface of the liquid is taken as the fineness reading. Lower readings in mils or micrometres or higher reading in Hegman units indicate better fineness of dispersion.

8.2 Fineness of grind is not generally specified for traffic paint but some application equipment may require a limit of 1 to 2 Hegman units (3 to 3.5 mils, 75 to 90 µm). If additional assurance is needed that the paint will not clog application equipment, determine the fineness in accordance with Test Method D1210 after reducing the traffic paint with mineral spirits, or compatible aromatic solvent with a similar evaporation rate, to keep the film wet long enough to determine the end point more easily. When a premix traffic paint is being tested, conduct the test on the paint before addition of the beads.

9. Density or Weight per Gallon

9.1 Density as measured by weight per unit volume is not a performance characteristic but is used to check product uniformity from batch to batch. A calibrated weight per gallon cup is used.

9.2 For an unbeaded paint, determine the density in accordance with Test Method D1475.

9.3 For beaded paints, use a special weight-per-gallon cup[5] having a modified cap so that the beads do not interfere with a snug fit of the cap to the cup. Proceed in accordance with Test Method D1475.

10. Consistency

10.1 Paints of a given type should fall within a stated consistency range as agreed upon between the purchaser and the seller. Consistency is used mainly to ensure product

[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] The sole source of supply of the satisfactory modified cup known to the committee at this time is 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.