



Designation: D8367 – 21

Standard Practice for Making a Laboratory Pavement Marking Sample Using a Pavement Marking and Drop-on Particles¹

This standard is issued under the fixed designation D8367; 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 covers a procedure and apparatus for producing a representative laboratory pavement marking sample by applying a pavement marking material onto a suitable substrate, followed immediately with an application of drop-on particles consisting of retroreflective optics or other functional particles such as skid resistance particles suitable for laboratory testing or display. Examples of pavement marking materials appropriate for this practice would include waterborne traffic paint, solvent borne traffic paint, and plural component pavement markings such as epoxy, modified epoxy, polyurea, methyl methacrylate, and thermoplastic pavement markings. Plural component materials with extremely fast gel times might not be appropriate for this practice because the material gels too quickly to allow proper embedment of the drop-on particles.

1.2 The finished sample will consist of a pavement marking material applied in a liquid state to a sample substrate at the prescribed film thickness, with drop-on particles applied at the prescribed drop rate and embedment level on the surface of the pavement marking material, and then properly cured. The drop-on particles may consist of retroreflective optics such as glass beads or composite optics, or non-retroreflective particles such as skid resistant particles, or several of these items in combination.

1.3 The values stated in inch-pound units are to be regarded as the standard except where noted in the practice. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

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

1.5 *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

- D823 Practices for Producing Films of Uniform Thickness of Paint, Coatings and Related Products on Test Panels
- D2205 Guide for Selection of Tests for Traffic Paints
- D4060 Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser
- D4414 Practice for Measurement of Wet Film Thickness by Notch Gages
- D6628 Specification for Color of Pavement Marking Materials
- D7307 Practice for Sampling of Thermoplastic Pavement Marking Materials
- D7308 Practice for Sample Preparation of Thermoplastic Pavement Marking Materials
- D8008 Practice for Representative Field Sampling of Traffic Paints
- E303 Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
- E1349 Test Method for Reflectance Factor and Color by Spectrophotometry Using Bidirectional (45°:0° or 0°:45°) Geometry
- E1710 Test Method for Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer
- E2177 Test Method for Measuring the Coefficient of Retroreflected Luminance (R_L) of Pavement Markings using the Bucket Method in a Condition of Wet Recovery
- E2302 Test Method for Measurement of the Luminance Coefficient Under Diffuse Illumination of Pavement Marking Materials Using a Portable Reflectometer

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 D01.44 on Traffic Coatings.

Current edition approved Nov. 1, 2021. Published December 2021. DOI: 10.1520/D8367-21.

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.

E2832 Test Method for Measuring the Coefficient of Retroreflected Luminance of Pavement Markings in a Standard Condition of Continuous Wetting (R_{L-2})

2.2 AASHTO Standards:³

AASHTO TP-130-18 Producing Draw Down Panels and Measuring the Coefficient of Retroreflected Luminance (RL) of Pavement Markings in a Laboratory Panel

3. Terminology

3.1 Definitions:

3.1.1 *application rate, n*—the weight of particles per unit area (drop area) applied to the pavement marking sample.

3.1.2 *applicator blade/wet film applicator, n*—a device used to apply the pavement marking material to the substrate.

3.1.3 *drop area, n*—the area under the drop box where particles fall.

3.1.4 *drop-on particles, n*—small particles applied to the surface of a pavement marking material in an uncured condition, which when said pavement marking is fully cured, provides the pavement marking with a characteristic such as retroreflectivity, skid resistance, color, etc.

3.1.4.1 *non-retroreflective particles, n*—assorted particles or aggregates that are not retroreflective; this could include particles used to color the line or for skid resistant applications.

3.1.4.2 *retroreflective composite optics (RCO), n*—a multi-component retroreflective optical construction for use with pavement marking materials to provide retroreflective properties to the marking; constructions including but not limited to:

(1) A core covered with a pigmented adhesive and small glass or ceramic optical beads.

(2) A cluster of optical ceramic or glass beads distributed in a polymeric matrix.

(3) An optical glass bead core, covered with a pigmented adhesive and small glass or ceramic optical beads.

3.1.4.3 *retroreflective glass bead optics, n*—spherical glass manufactured for use with pavement marking materials to provide retroreflective properties to the marking.

3.1.4.4 *skid resistance particles, n*—particles or aggregate that is dropped on the highway marking lines or skid resistance adhesive that is used to provide friction between the vehicle or pedestrian and the road.

3.1.5 *particle drop box, n*—a laboratory device used to uniformly drop a defined quantity of particles onto an uncured pavement marking material draw down to create a pavement marking sample for laboratory testing purposes.

3.1.6 *particle drop box sample base, n*—a laboratory device used with the particle drop box to align the pavement marking sample area with the particle drop area.

3.1.7 *pavement marking material, n*—a pigmented binder system used for lane delineation for highways, parking lots, and other areas subject to vehicular traffic; applicable pavement marking materials include waterborne traffic paint, sol-

vent borne traffic paint, plural component such as epoxy, modified epoxy, polyurea, methyl methacrylate, and thermoplastic.

3.1.8 *pavement marking sample, n*—a properly cured pavement marking of specified width, length, and thickness applied to an appropriate substrate; the pavement marking has drop-on particles embedded in the surface of the marking to provide various performance characteristics such as retroreflectivity, color, and skid resistance.

3.1.9 *sample area, n*—surface area of the substrate to be coated with particles.

4. Summary of Practice

4.1 A practice for making a representative pavement marking sample in the laboratory utilizing:

4.1.1 A pavement marking material applied at the designated length, width, and thickness to the appropriate substrate utilizing an applicator blade/wet film applicator,

4.1.2 Drop-on particles uniformly applied at the correct application rate to the uncured pavement marking draw down, and

4.1.3 Curing or drying the pavement marking sample according to the manufacturer's recommendations.

5. Significance and Use

5.1 The method described in this practice provides a procedure to rapidly generate pavement marking samples in the laboratory, suitable for the testing of applied pavement marking properties.

5.2 This practice is intended to provide uniform laboratory pavement marking samples that reduce the variability associated with obtaining pavement marking samples in the field.

5.3 This practice is particularly useful for directly comparing applied pavement marking properties as impacted by variations in materials, film thickness, and drop-on particle application rates for quality control or development purposes.

5.4 This practice can be used in evaluating pavement marking materials formulated and produced in the laboratory and for drop-on particles specifically made and prepared in the laboratory. It can also be used for testing materials that are already manufactured and either stored as work-in-process or placed in its final packaging. When testing manufactured materials in the finished goods state, it is extremely important that a representative sample of the pavement marking material and the drop-on particles are obtained for use, in order to draw the proper conclusions from any testing done on pavement marking samples made from these materials. For proper sampling of thermoplastic pavement markings in a finished good state, it is recommended to follow Practices **D7307** and **D7308**. For proper sampling of liquid pavement marking with both single and multicomponent materials, it is recommended to follow Practice **D8008**.

6. Interferences

6.1 Samples made in the laboratory do not represent the full range of variability experienced in a field application resulting

³ Available from American Association of State Highway and Transportation Officials (AASHTO), 444 N. Capitol St., NW, Suite 249, Washington, DC 20001, <http://www.transportation.org>.