



Designation: **D7538 – 09 (Reapproved 2013) D7538 – 09 (Reapproved 2018)**

## Standard Practice for Evaluating the Water Wash-Off Resistance of Traffic Paints Using an Atomizing Spray Device<sup>1</sup>

This standard is issued under the fixed designation D7538; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 A newly applied traffic paint film may be exposed to rain of varying intensities shortly after application. Practice **D7377** describes a practice for evaluating the water wash-off resistance of traffic paints to a hard rain using a steady stream of water from a faucet at a rate of approximately 5.7 L per min. Practice D7538 is a similar practice that describes the use of an adjustable nozzle atomizing spray device to deliver a spray of water that simulates rain rates from approximately 0.05 to 0.5 L per min. This test can be used to compare conventional and fast-dry traffic paints for their relative ability to withstand rain soon after application on roadway surfaces.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

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

1.4 *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:*<sup>2</sup>

**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

**D823** Practices for Producing Films of Uniform Thickness of Paint, Coatings and Related Products on Test Panels

**D1005** Test Method for Measurement of Dry-Film Thickness of Organic Coatings Using Micrometers

**D1212** Test Methods for Measurement of Wet Film Thickness of Organic Coatings

**D3924** Specification for Standard Environment for Conditioning and Testing Paint, Varnish, Lacquer, and Related Materials (Withdrawn 2016)<sup>3</sup>

**D4414** Practice for Measurement of Wet Film Thickness by Notch Gages

**D7377** Practice for Evaluating the Water Wash-Off Resistance of Traffic Paints using a Water Faucet

### 3. Terminology

3.1 *Definitions:*

3.1.1 *conventional waterborne traffic paint, n*—an aqueous traffic paint that uses a conventional-dry latex binder.

3.1.1.1 *Discussion*—

Typical no-pick-up dry times, as prescribed in Test Method **D711**, for conventional traffic paints are 20 to 45 min.

<sup>1</sup> 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.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> The last approved version of this historical standard is referenced on [www.astm.org](http://www.astm.org).

3.1.2 *durable fast-dry waterborne traffic paint, n*—an aqueous traffic paint that uses a third generation durable fast-dry latex binder.

3.1.2.1 *Discussion*—

Air or airless spray application on roadways is typically 0.64 mm wet or about 0.39 mm dry. The range of application for durable waterborne paints is 0.56 to 0.89 mm wet, but sometimes the durable paints are also striped at standard line thickness.

3.1.3 *fast-dry waterborne traffic paint, n*—an aqueous traffic paint that uses a fast-dry traffic latex binder.

3.1.3.1 *Discussion*—

Typical no-pick-up dry times, as prescribed in Test Method **D711**, for fast-dry traffic paints are <10 min.

3.1.4 *standard line fast-dry waterborne traffic paint, n*—an aqueous traffic paint that uses a first or second generation fast-dry latex binder.

3.1.4.1 *Discussion*—

Air or airless spray application on roadways is typically 0.38 mm wet or about 0.23 mm dry.

3.1.5 *waterborne traffic paint, n*—an aqueous traffic paint (usually white or yellow) containing either a conventional or fast-dry latex binder.

3.1.6 *water wash-off, n*—the erosion or removal of freshly applied traffic paint in the field by rain or in the laboratory using simulated rain.

3.1.6.1 *Discussion*—

Sometimes referred to as water wash-out.

#### 4. Summary of Practice

4.1 This practice involves preparing a series of uniform thickness films of traffic paint on standard substrates. The films are allowed to dry over different time periods in a conditioned environment, and then each paint film is subsequently subjected to a water spray. Films are wash-off resistant when no paint is removed by the water spray.

#### 5. Significance and Use

5.1 After waterborne traffic paints are applied to a road pavement, it is important that they be sufficiently coalesced or cured so they will not be removed by rain. This practice can be used to determine the relative water wash-off resistance of waterborne traffic paints when exposed to a water spray simulated rain.

#### 6. Apparatus and Equipment

6.1 *Paddle Type Viscometer*, to measure viscosity (in Krebs units) of the traffic paint prior to application.

6.2 *Conditioned Room*, at  $23 \pm 2^\circ\text{C}$  and  $50 \pm 5\%$  relative humidity for film draw-downs and film drying.

6.3 *Humidity Gauge*, to record relative humidity during the drying period.

6.4 *Thermometers*, to record the air and water temperatures.

6.5 *Spatula*, to mix the paint prior to application.

6.6 *Glass Plates*, for film draw-downs (see also option for charts in 6.7).

6.7 *Draw-Down Chart*, preferred option for film draw-downs. Black Scrub Test Panels are preferred and can be cut in half to give two test panels of 16.5 by 21.6 cm size. Use of these charts instead of a glass plate allows for easier visualization of paint film removal.

6.8 *Film Applicator (15 cm width)*, to obtain 0.38 mm wet thickness for standard traffic paints or 0.64 mm wet thickness for durable traffic paints.

6.9 *Wet Film Gauge*, to measure wet film thickness.

6.10 *Atomizing Spray Device (finger pumped, adjustable nozzle spray bottle or adjustable nozzle garden-type sprayer capable of delivering a continuous spray)*, to provide a water spray as described in 8.2.