Designation: ~~D7377 – 09 (Reapproved 2013)~~ D7377 – 09 (Reapproved 2018)

Standard Practice for Evaluating the Water Wash-Off Resistance of Traffic Paints using a Water Faucet[1]

This standard is issued under the fixed designation D7377; 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 A traffic paint film freshly applied to a roadway, air strip, or parking lot may be exposed to rain of varying intensities shortly after application. This practice was designed to determine the relative water wash-off resistance of an applied traffic paint film under controlled laboratory conditions using a water faucet to simulate a heavy rain. This laboratory practice can also be used to compare conventional and fast-dry waterborne traffic paints and the effects of binders and other components in traffic for their relative ability to withstand a heavy rain soon after application.

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*~~ *safety, health, and* ~~*health*~~*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:*[2]

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
D4414 Practice for Measurement of Wet Film Thickness by Notch Gages

3. Terminology

3.1 *Definitions:*

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

3.1.1.1 *Discussion*—

Typical no-pick-up dry times for conventional traffic paints by Test Method D711 are 20 to 45 min. These paints are often used for zone marking of parking lots and garages.

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

3.1.2.1 *Discussion*—

[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.

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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~~standard's Document Summary page on the ASTM website.

Air or airless spray application on roadways is typically 0.65 mm (25 mils) wet or about 0.41 mm (16 mils) dry. The range of application for durable waterborne paints is 0.56 to 0.89 mm (22 to 35 mils) wet, but sometimes durable paints are striped at standard line thickness. Typical no-pick-up dry times by Test Method D711 for durable paints applied at standard line thickness are 5 to 8 min.

3.1.3 *effective water wash-off dry time, n*—the traffic paint dry time required for no visible loss of coating when conducting the water wash-off Standard Practice.

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

3.1.4.1 *Discussion*—

These paints are sometimes also referred to as fast-hardening since they still may contain a substantial amount of moisture even though they feel dry. Typical no-pick-up dry times by Test Method D711 for fast-dry traffic paints are <10 min.

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

3.1.5.1 *Discussion*—

Air or airless spray application on roadways is typically 0.38 mm (15 mils) wet or about .223 mm (9 mils) dry. Typical no-pick-up dry times for standard line traffic paints by Test Method D711 are 5 to 8 min.

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

3.1.7 *water wash-off resistance, n*—the resistance of a traffic paint line to partial or complete wash-out during a rain.

4. Summary of Practice

4.1 This standard 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, and then each paint film is subsequently tested with the water-wash-off test to determine the relative amount of coating remaining at the end of the wash off period.

5. Significance and Use

5.1 After waterborne traffic paints are applied to a road, airstrip, or parking lot pavement, it is important that the paint films be sufficiently hardened, coalesced, or cured so they will not be removed by rain. This practice can be used to determine the relative performance of binders and other components within traffic paint for their effect on the water-wash off resistance of the coating. Some key elements of the coating that may affect water-wash-off performance are the quality and type of latex binder, the dry time of the coating (often conducted by Test Method D711), pigment volume concentration (PVC), and the relative water sensitivity of additives (for example, pigment dispersants, and surfactants) in the coating.

6. Apparatus and Equipment

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

6.2 *Conditioning Room,* to provide a constant standard environment of 23 ± 2°C (73.5 ± 3.5°F) and 50 ± 5 % relative humidity during film draw-downs and film drying.

6.3 *Conditioning Chamber,* convenient to provide a constant standard high humidity environment of 23 ± 2°C (73.5 ± 3.5°F) and 90 ± 3 % relative humidity during film draw-downs and film drying.

6.4 *Graduated Cylinder,* to determine and adjust water flow rate from faucet.

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

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

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

6.8 *Glass Plates,* for film draw-downs (see also option for charts in 6.9).

6.9 *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 (6½ by 8½ in.) size. Use of these charts instead of a glass plate allows for a permanent record of the test results.

6.10 *Film Applicator (15 cm (6 in.)) width,* to obtain 0.38 mm (15 mil) wet thickness for standard traffic paints or 0.64 mm (25 mil) wet thickness for durable traffic paints.

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