



# Standard Practice to Evaluate Leaching of Water-Soluble Materials from Latex Paint Films<sup>1</sup>

This standard is issued under the fixed designation D7190; 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 This practice covers the ability of a latex paint film to resist staining caused by the leaching of water-soluble materials when contacted with water shortly after application.

1.2 Water staining is attributed to the leaching of surfactants or other water-soluble materials from a paint film.

1.3 The values stated in SI units are to be regarded as 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 and health practices and to determine the applicability of regulatory limitations prior to use.*

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

[D1308 Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes](#)

[D3924 Specification for Environment for Conditioning and Testing Paint, Varnish, Lacquer, and Related Materials](#)

## 3. Summary of Practice

3.1 Water droplets are placed on a paint film that is in its early stages of drying. Stains left behind are evaluated for intensity and how the appearance of the coating has changed.

## 4. Significance and Use

4.1 Surfactant staining is a common problem with exterior house paints, particularly when subjected to humid environments (such as morning dew) shortly after application.

4.2 Interior paints used in humid areas such as kitchens and bathrooms may also experience surfactant staining.

<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 D01.42 on Architectural Coatings.

Current edition approved June 1, 2015. Published June 2015. Originally approved in 2005. Last previous edition approved in 2011 as D7190 – 10 (2011). DOI: 10.1520/D7190-10R15.

<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.

4.3 Leaching of water-soluble materials may be dependent on colorant dispersions that are mixed into tint base paints. Other paint components may also affect the leaching of water-soluble materials.

## 5. Apparatus

5.1 *Film Applicator*, suitable to obtain a wet film thickness typically in the range of 125-250  $\mu\text{m}$  (5-10 mils), or as agreed upon between manufacturer and supplier.

## 6. Materials

6.1 *Black plastic panels.*<sup>3</sup>

6.2 *Distilled water.*

6.3 *Syringe, 1.0 cc.*

## 7. Procedure

7.1 Apply the test paint along the long dimension of the black plastic panel using the selected film applicator. Allow to dry for 4 hours at standard atmospheric conditions of  $23 \pm 2^\circ\text{C}$  ( $73.5 \pm 3.5^\circ\text{F}$ ) and relative humidity of  $50 \pm 5\%$  as specified in Specification [D3924](#). Use the same film thickness when comparing a series of latex paint films.

7.2 Divide the test panel into three sections, labeling them 4 Hours, 1 Day, and 4 Days or times agreed upon by the manufacturer and supplier. ([Fig. 1](#))

7.3 Place a row of four droplets of distilled water at room temperature across the top of the first designated section of the test paint. Each droplet shall be approximately 0.1 cc in volume.

7.4 Allow the water droplets to stand for 10 minutes. Then lift the panel into a vertical position so the water droplets run down the section of the paint film being evaluated.

7.5 Repeat steps [7.3](#) and [7.4](#) after 1 and 4 days, or other designated intervals, in their respective sections of the test panel.

<sup>3</sup> Dull black plastic panels, P-121-10N, 165 by 432 (6½ by 17 in.) 0.25 mm (10 mils) thickness, manufactured by the Leneta Co., 15 Whitney Rd., Mahwah, NJ 07430, have been found suitable for this purpose.

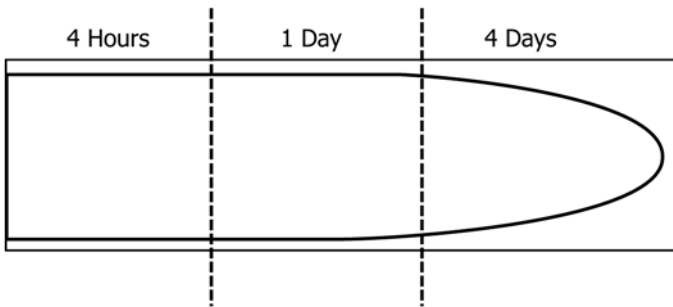


FIG. 1 Leaching of Water-Soluble Materials Test Panel

streaking with obvious gloss or color differences, or both, would be considered a coating failure. It is generally unacceptable for a paint to demonstrate severe staining in any test section.

8.2 Evaluate the effect on the test panel for each interval in accordance to guidelines in Test Method **D1308**.

## 9. Keywords

9.1 early water resistance; exudation; latex paint; surfactant staining; water leaching; water sensitivity; water spotting

## 8. Report

8.1 Rate the test panel based on visual examination immediately after lifting and after an overnight dry. Visible water

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