



# Standard Test Method for Evaluation of Cleanability of Paint Brushes<sup>1</sup>

This standard is issued under the fixed designation D 5913; 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 test method covers a laboratory procedure for the evaluation or comparison of the cleanability of paint brushes, or both, when used with latex paints.

1.2 This test method is applicable to paint brushes up to 4 in. (100 mm) in width and of similar head dimensions as described in Practice D 5301.

1.3 The values stated in inch-pounds are to be regarded as the standard. The SI values given in parentheses are provided 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:

D 1475 Test Method for Density of Paint, Varnish, Lacquer, and Related Products<sup>2</sup>

D 3924 Specification for Standard Environment for Conditioning and Testing Paint, Varnish, Lacquer and Related Materials<sup>2</sup>

D 3925 Practice for Sampling Liquid Paints and Related Pigmented Coatings<sup>2</sup>

D 5068 Practice for Preparation of Paint Brushes for Evaluation<sup>3</sup>

D 5301 Practice for Physical Characterization of Paint Brushes<sup>3</sup>

## 3. Summary of Test Method

3.1 The test brushes are washed prior to painting to remove any residual finishes from the manufacturer, broken in, and then dipped into the test paint for a specified period, allowed to drain and the excess removed by brushing out on paper. After a specified drying period, the brushes are cleaned and evaluated for the presence of residual paint on the filaments.

## 4. Significance and Use

4.1 The final appearance of a paint brush after it has been used and cleaned is related to the ability of the brush to perform consistently upon repeated use. This test method offers a subjective visual criteria that provides a rank order of cleanability of the filaments of a brush after use.

## 5. Apparatus

5.1 *Test Brushes*, up to 4-in. (100-mm) sizes.

5.2 *Weight-per-Gallon Cup* or pycnometer.

5.3 *Balance*, capable of weighing to an accuracy of 0.1 g.

5.4 *Stopwatch*.

## 6. Materials

6.1 *Test Panels*, with a sealed surface, having 1.076 ft<sup>2</sup>(1000 cm<sup>2</sup>) of test area<sup>4</sup> for 2-in. (50-mm) brushes.

6.2 *Laminated Fiber Board*, (upson board) 24 by 12 in. (610 by 305 mm) with at least one smooth side for 3-in. (75-mm) and 4-in. (100-mm) size brushes.

6.3 *Latex-Base Primer*.<sup>5</sup>

6.4 *Specified Test Paint*.

6.5 *Abrasive Grit Soap*.<sup>6</sup>

6.6 *Kraft or Brown Wrapping Paper*, unsealed, 8 by 18 in. (200 by 460 mm).

NOTE 1—The choice of the color of the test paint to be used should be dependent on the color of the filaments in the brushes under evaluation. A light colored paint is preferable for dark filament-containing brushes and conversely, a dark colored paint is preferable for brushes containing light-colored filaments. Latex interior flat paints are preferred because they dry faster than gloss or semigloss paints.

## 7. Sampling and Conditioning

7.1 Sampling of test paint to be used in this test method shall be in accordance with Practice D 3925.

7.2 Condition the materials to be used in this test method in accordance with Section 6, Conditioning and Testing, of Specification D 3924 for 24 h before use.

7.3 All testing should be performed under the same conditions as outlined in 7.2. Do not change operators during the

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 06.01.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 06.02.

<sup>4</sup> Test charts such as Leneta Form 8H have been found suitable. They are available from the Leneta Company, 15 Whitney Road, Mahwah, NJ 07430.

<sup>5</sup> Similar to U.S. Federal Specification TT-P-650C Primer Coating, White has been found suitable for this purpose. Other latex primers may be adapted to meet the requirements of this test method.

<sup>6</sup> Lava soap has been found suitable for this purpose.

running of a series of tests, since this may invalidate any rank orders.

## 8. Procedure

8.1 Determine the weight per gallon of the test paint in accordance with procedures outlined in Test Method D 1475.

8.2 Apply the latex primer to the entire smooth side of the upson board panels so as to coat it uniformly at a spreading rate of about 450 ft<sup>2</sup>/gal (11 m<sup>2</sup>/L).

8.3 Air dry at least 18 h under standard conditions as outlined in Specification D 3924.

8.4 Rinse brush with luke-warm running tap water (90 to 110°F) for 30 ± 2 s while turning brush over two times. Immediately wash brush using warm water and abrasive soap for 40 ± 2 s. Gently rub brush in a circular motion on the bar of soap to make a lather.

8.5 Immediately rinse brush with luke-warm running tap water for 30 s to remove excess soap. Spin brush handle for 10 ± 1 s between palms of hands to remove excess water.

NOTE 2—New brushes often contain surface treatments or finishes that may temporarily influence the cleanability. The purpose of this step is to remove such materials.

8.6 Break in test brush following procedures as outlined in Practice D 5068. Secure panels to flat horizontal surface using commercial masking tape.

8.7 After breaking in the brush, immediately apply the test paint to the panel at a spreading rate of 400 ± 25 ft<sup>2</sup>/gal or at a spreading rate agreed upon between the purchaser and seller.

NOTE 3—The amount of paint needed to be applied to the test panel to attain 400 ± 25 ft<sup>2</sup>/gal can be calculated using the following equation:

$$\text{Grams needed} = \frac{454 \times \text{weight/gallon (lbs)} \times \text{Area (ft}^2\text{)}}{400 \pm 25 \text{ ft}^2/\text{gal}} \quad (1)$$

8.8 When applying the test paint, always start in the middle of the test panel and spread paint out. This leaves the excess paint in the middle where it is easier to spread uniformly over the entire panel.

8.9 From the middle of the test panel, paint first to one edge, then reverse, painting to the opposite edge. Make sure that the next stroke in each direction is a little above the first, and the following one a little below (see Practice D 5068).

8.10 Finish the area with light pressure by brushing in a perpendicular direction to the initial application utilizing the tip of the brush. Make sure that total application time for the test panel is 30 to 35 s.

8.11 After preparing brush out, dip brush into the paint to the specified depth for its size as shown in Practice D 5068 for 10 s. Remove brush and maintain in a vertical position for 30 ± 2 s and allow excess paint to drain. Make four passes with each test brush on the kraft paper (6.6). Each pass shall consist of painting over the length of the kraft paper to within 1 in. (25 mm) of the edge.

8.12 Repeat 8.11 and make four more additional passes to remove excess paint from the brush, using a fresh sheet of kraft paper each time. Suspend the brush in a vertical position for 30 ± 1 min in the standard environment as outlined in Specification D 3924.

8.13 Rinse brush with luke-warm running tap water (90 to 110°F) for 30 ± 2 s while turning brush over two times. Immediately wash brush using warm water and abrasive soap for 40 ± 2 s. Gently rub brush in a circular motion on the bar of soap to make a lather.

8.14 Immediately rinse brush with luke-warm running tap water for 30 s to remove excess soap. Spin brush handle for 10 ± 1 s between palms of hands to remove excess water. Allow brush to hang in a vertical position (see 8.12) and dry overnight at ambient conditions.

8.15 Visually examine filaments of brush and rank for the presence of paint. Spread the filaments apart and inspect them thoroughly.

8.16 Repeat the procedure two more times on additional like brushes.

8.17 Rank each set of three brushes from 1 (best or cleanest) to *n* (poorest cleaning ability), where *n* is the total number of brushes in the series.

## 9. Report

9.1 Report the following information:

9.1.1 Report the rank order of each test brush set,

9.1.2 Report type of paint, applied spreading rate, and any identification marks on the brush used in the test, and

9.1.3 Any deviations from the recommended procedure.

## 10. Precision and Bias

10.1 No information is presented about either the precision or bias of this test method since the test results are non-quantitative.

## 11. Keywords

11.1 applicator-brush clean-up; cleanability—brush

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