



# Standard Test Method for Burnish Resistance of Latex Paints<sup>1</sup>

This standard is issued under the fixed designation D6736; 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 procedure for measuring the resistance of latex paints to burnishing under dry conditions.

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

## 2. Referenced Documents

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

**D523** Test Method for Specular Gloss

**D2486** Test Methods for Scrub Resistance of Wall Paints

**D3924** Specification for Environment for Conditioning and Testing Paint, Varnish, Lacquer, and Related Materials

## 3. Terminology

3.1 *Definitions:*

3.1.1 *burnish resistance, n*—the ability of a coating to resist an increase in its gloss (sheen) value after polishing or rubbing.

## 4. Summary of Test Method

4.1 Test paints are drawn down lengthwise on plastic panels using a 0.18-mm (7.0-mil) applicator and allowed to air-dry for one week. Gloss readings are taken at three equally spaced points, lengthwise along the center of the panel. The panel is then rubbed for 20 cycles on a scrub machine, after which gloss readings are again taken along the same path abraded by the scrub machine. The initial values are averaged and the final values are averaged. The difference between the initial and

final gloss readings, divided by the initial reading times 100 is a quantitative indication of the paint's resistance to burnishing. Higher percentage increases denote poorer resistance and vice-versa.

## 5. Significance and Use

5.1 Interior flat paints may become burnished in areas where clothing or upholstered furniture rub against a wall. This rubbing may cause a smoother, glossier surface at the contacted area, depending on the level or type of pigments in the paint and binder hardness. This method permits a more quantitative estimate of burnish resistance than those using manual rubbing techniques.

## 6. Apparatus

6.1 Constant temperature/humidity room  $23 \pm 2^\circ\text{C}$  ( $73.5 \pm 3.5^\circ\text{F}$ );  $50 \pm 5\%$  relative humidity (standard conditions, Specification **D3924**).

6.2 *Washability Machine (Scrub Machine)*, described in Test Methods **D2486**.

6.2.1 *Accessory Apparatus:*

6.2.1.1 *Sandpaper Attachment*, total weight 454 g.

6.2.1.2 *Glass Plate*, measured to fit.

6.2.1.3 *Gasket Frame and Clamps*.

6.3 *Large Vacuum Plate*.

6.4 *Film Caster*, having a 0.18-mm (7.0-mil) clearance.

6.5 *Glossmeter(s)*, capable of measuring  $60^\circ$  and  $85^\circ$  gloss in accordance with Test Method **D523**.

## 7. Materials

7.1 *Plastic Scrub Panels*, 43.5 by 16.5 mm (17 by 6.5 in.), white or black.

7.2 *Cheesecloth*, 4-ply, medium weave.<sup>3</sup>

## 8. Procedure

8.1 *Application and Evaluation of Test Paints:*

8.1.1 Attach a plastic panel to the vacuum plate and draw down the test paint uniformly lengthwise, using the 0.18-mm (7.0-mil) side of the applicator.

<sup>3</sup> Bleached cheesecloth, grade 20B, 24/20 (medium) weave was used in developing this method.

<sup>1</sup> This test method 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.

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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.

\*A Summary of Changes section appears at the end of this standard

8.1.2 Condition the panels for one week in the constant temperature / humidity room or under other conditions agreed upon between the buyer and seller.

8.1.3 Take three equally spaced gloss readings (Test Method **D523**) along the center length of the panel, making sure the areas of the readings are within the travel path of the scrub machine attachment. The resulting average of the three readings is used as the initial value prior to rubbing the panel. It is suggested that the gloss readings should be as follows:

Semi-Gloss Paints	60°
Sheen Paints	60° and 85°
Flat Paints	85°

In general, if the 60° reading drops below 20 units the 85° reading should be recorded.

8.1.4 Secure one layer of 4-ply cheesecloth lengthwise in the sandpaper attachment of the scrub machine.

8.1.5 Secure the panel on the scrub machine over the glass plate using the gasket and clamps. Attach the sandpaper attachment to the scrub machine. Start the machine.

8.1.6 Abrade the panel for 20 reciprocating cycles. Stop the machine.

8.1.7 Remove the panel from the scrub machine and carefully clean off any loose pigment from the panel. Re-read the panel, again taking three equally spaced gloss readings along path of the burnished area. Average the values and use this average as the final after burnishing value.

## 9. Report

9.1 Report the following information:

9.1.1 The application clearance, if different than those specified in this test method.

9.1.2 The drying time and conditions used, if different than those specified in this test method.

9.1.3 The number of cycles used in abrading the panels, if different than the number specified in this test method.

9.1.4 The gloss angles used and the initial and final gloss units.

9.1.5 The total weight the sandpaper attachment used in the test.

9.1.6 The percent increase in gloss calculated by subtracting the initial average reading from the final average reading, dividing by the initial reading, and multiplying by 100.

## 10. Precision and Bias<sup>4</sup>

### 10.1 Interlaboratory Experimental Approach:

<sup>4</sup> Supporting data have been filed at ASTM International Headquarters and may be obtained by requesting Research Report RR: RR:D01-1142.

10.1.1 The precision of this test method is based on an interlaboratory study (research report is filed with ASTM) of Test Method D6736. Each of six laboratories tested the burnish resistance of latex paints. The percentage of gloss increase was determined for a total of five different paints, with three replicates of the analysis being performed on each sample. Results from the interlaboratory study are summarized in **Table 1**.

**TABLE 1 Results From Interlaboratory Study**

Material	Initial 85° Gloss	$\bar{x}$ (% 85° Gloss Increase)	r	R
Paint A	3.0	65.2	13.5	25.6
Paint B	1.9	93.8	30.8	36.3
Paint C	3.5	106.6	33.2	33.4
Paint D	24.5	7.8	3.8	4.7
Paint E	23.8	28.7	5.0	7.4

10.1.2 Because different paint formulations vary in their ability to resist gloss change from burnishing, precision will also vary. This interlaboratory study included samples from five different paint formulations each with different burnishing characteristics. The Initial 85° Gloss and the Mean ( $\bar{x}$ ) % 85° Gloss Increase results for the samples are displayed in **Table 1**.

### 10.2 Precision:

10.2.1 *Repeatability*—Two test results obtained within one laboratory shall be judged not equivalent if they differ by more than the “r” value for that material; “r” is the interval representing the critical difference between two test results for the same material, obtained by the same operator using the same equipment on the same day in the same laboratory. Repeatability for the five paints selected for this interlaboratory study ranged from 4 to 33 %.

10.2.2 *Reproducibility*—Two test results should be judged not equivalent if they differ by more than the “R” value for that material; “R” is the interval representing the difference between two test results for the same material, obtained by different operators using different equipment in different laboratories study ranged from 5 to 36 %.

10.2.3 Any judgment in accordance with statements **10.1.1** or **10.1.2** would have an approximated 95 % probability of being correct.

10.3 *Bias*—At the time of the study there was no accepted reference material suitable for determining the bias for this test method, therefore no statement on bias can be made.

## 11. Keywords

11.1 abrasion resistance; burnish resistance; polishing

**SUMMARY OF CHANGES**

Committee D01 has identified the location of selected changes to this standard since the last issue (D6736 - 01) that may impact the use of this standard. (Approved February 1, 2008.)

*(1) Added Precision and Bias section.*

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