



# Standard Test Method for Evaluation of Gloss or Sheen Uniformity<sup>1</sup>

This standard is issued under the fixed designation D3928; 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 the determination of the uniformity of gloss or sheen of a paint applied by brush to a test panel simulating an interior wall section. Variations in gloss or sheen that may be caused by short wet edge time, poor leveling, and pigment orientation or flotation during and after application are evaluated visually.

1.2 Because both the application and the panel evaluation are very subjective, this test method should be used only for comparative testing within one laboratory as the ratings assigned by different laboratories do not usually agree (see 8.1).

1.3 The values given in SI units are to be regarded as the standard. The values given in parentheses are 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. Summary of Test Method

2.1 Paint is brush applied to a test panel using procedures and conditions that are most likely to cause nonuniformity of gloss or sheen. The dry film is then viewed under conditions that accentuate variations in gloss or sheen and the overall appearance is evaluated.

## 3. Significance and Use

3.1 When coatings are applied to large flat surfaces such as walls, the film thickness may vary or there may be small areas missed entirely (holidays) when the color of the fresh material and the previous film are very similar. It is much less costly if these areas can be touched up instead of having to repaint the entire surface.

3.2 Thickness is also affected in the locations where an area coated a short time before is joined with the area currently

being coated (laps). An application technique that may affect the final appearance of the film is brushing or rolling the material in different directions in adjacent areas.

3.3 Both buyers and sellers are interested in determining whether a coating can be applied without exhibiting areas that differ in appearance because of laps and brush or roller marks, and whether it can be readily touched up to provide a uniform appearance in regard to gloss or sheen and all other aspects.

## 4. Apparatus

4.1 *Paint Brush*<sup>2</sup>, 50 mm (2 in.) wide with polyester filaments 70 mm (2¾ in.) long, chisel tip 15 mm (⅝ in.) thick. Previously used brushes are preferred.

4.2 *Paint Brush*, 25 mm (1 in.) wide with polyester filaments 57 mm (2¼ in.) long, chisel tip 10 mm (⅞ in.) thick. Previously used brushes are preferred.

## 5. Reagents and Materials

5.1 *Laminated Fiber Board*, 610 by 300 mm (24 by 12 in.) with at least one smooth side.

5.2 *Latex-Base Primer*.<sup>3</sup>

5.3 *Control Paint* (optional)—Since there are no standard panels, photographs, or paints for this test method, an agreed-upon paint of known uniformity of appearance should be included with the test paints as a control, unless the paints are only ranked.

## 6. Procedure

6.1 Apply the latex primer by spray to the entire face of a smooth side of the test panel so as to coat it uniformly at a spreading rate of about 11 m<sup>2</sup>/gal/L (450 ft<sup>2</sup>).

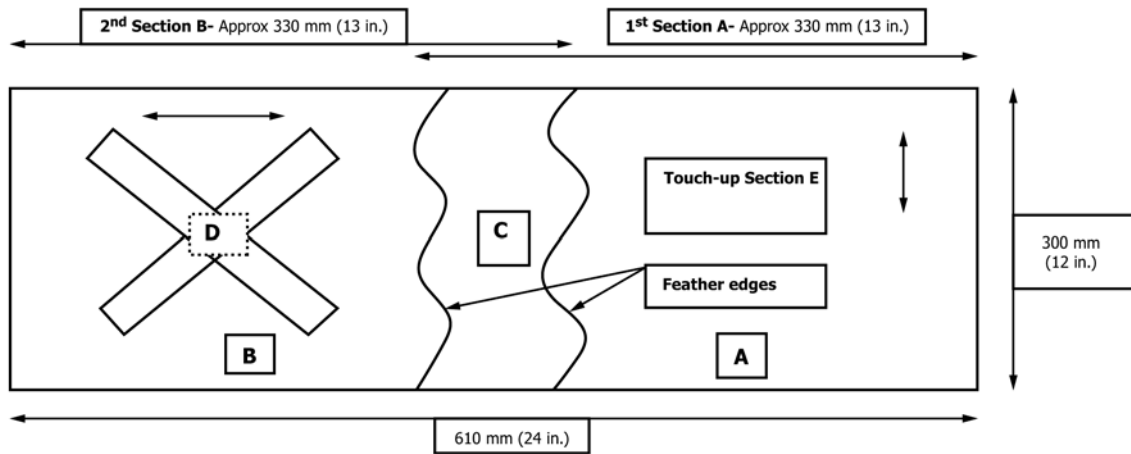
6.2 Air dry at least 18 h under standard conditions of 23 ± 2°C (73.5 ± 3.5°F) and 50 ± 5 % relative humidity and examine the panel for uniformity of primer application. If this

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<sup>2</sup> The sole source of supply of a polyester brush No. B-20CS, known to the committee at this time is The Leneta Co., 15 Whitney Rd., Mahwah, NJ 07430. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,<sup>1</sup> which you may attend.

<sup>3</sup> Similar to U.S. Federal Specification TT-P-650c Primer Coating Latex Base, White (for Gypsum Wallboard).



\* Direction of finishing brush strokes

FIG. 1 Test Panel

appears satisfactory, divide the coated area into sections A and B as shown in Fig. 1.

6.3 Mount the panel vertically and position it as shown in Fig. 1 with Section A to the right and Section B to the left of the operator. Before painting, wet the brush with water if latex paints are to be tested or VM & P naphtha if the test paints are solvent reducible. Shake out as much liquid as possible before using. Apply the paint under test to Section A with the 50-mm (2-in.) brush (Note 1) at a spreading rate of  $11 \pm 0.5 \text{ m}^2/\text{L}$  ( $450 \pm 25 \text{ ft}^2/\text{gal}$ ). About 13 g are required to cover this area, but the exact amount can be determined from the following inch/pound equation:

$$g = [(A \times W)/S] \times 3.15 \quad (1)$$

where:

Area (A) = number of in.<sup>2</sup>,  
 Weight per gallon (W) = number of lb/gal, and  
 Spread rate (S) = number of ft<sup>2</sup>/gal,

or the following metric equation:

$$g = [(A_m \times D)/S_m] \times 1000 \quad (2)$$

where:

Area (A<sub>m</sub>) = number of m<sup>2</sup>,  
 Density (D) = number of g/mL or number of kg/L, and  
 Spread rate (S<sub>m</sub>) = number of m<sup>2</sup>/L.

Make the initial brush strokes in the direction of the length of the panel and finishing strokes across the width of the panel with the wet edge feathered. Complete the painting of this section in about 45 s.

NOTE 1—This test method can be modified for roller application by using a small 75-mm (3-in.) roller instead of the 50-mm (2-in.) brush to rank the uniformity of a series of paints when applied by roller. The 25-mm (1-in.) brush should still be used for touch up.

6.4 One minute after completing the painting of Section A, apply paint to Section B with the same brush still wet with the test paint. Use the same amount of paint and time to coat section B as for section A but make initial brush strokes across

the width of the panel and finishing strokes along the length of the panel. Brush the finishing strokes into section A overlapping this section by about 50 mm (2 in.) (see Fig. 1, area C).

6.5 Thirty seconds after completing the painting of section B, use the still-wet brush (but without additional test material) to cross brush a figure X on this section as shown in Fig. 1, area D. Air dry for at least 18 h under standard conditions.

6.6 Using the 25-mm (1-in.) brush and the spreading rate as in 6.2, apply the test paint to an area of about 75 by 125 mm (3 by 5 in.) of Section A (Fig. 1, area E). This is to simulate a wall section that has been touched up after the previous coat has dried. Allow the completed test panel to dry a minimum of 18 h under standard conditions.

6.7 View low gloss finishes at a 5° angle to the plane of the panel (85° to the normal) looking toward a strong light source. View gloss or semigloss coatings at 30° to the panel (60° to the normal). Rotate the panel 360° in the same plane while viewing in order to determine the overall appearance of the panel as viewed from different sides. Rate the test panel for gloss or sheen uniformity between sections using the following scale:

Rating	Score
Excellent	10
Very good	8
Good	6
Fair	4
Poor	2
Very poor	0

A rating of excellent means that there is no discernible variation in gloss or sheen between different areas of the panel. A rating of very poor means that there is a great variation in gloss or sheen between different areas.

6.7.1 Variations in gloss or sheen may be caused by various paint and substrate properties and application techniques so that lapped, cross-brushed, and touched up areas will not necessarily have the same degree of sheen or gloss uniformity and it may be advantageous to rate each of these areas separately.

## 7. Interpretation of Results

7.1 The uniformity in appearance of a wall can be estimated by evaluating the variation in gloss or sheen between areas *A* and *C* of the test panel.

7.2 The uniformity in appearance of a paint that has been applied by brush in different directions can be estimated by evaluating the variation in gloss or sheen between areas *B* and *D*.

7.3 The uniformity in appearance of touched-up areas can be estimated by evaluating the variation in gloss or sheen between areas *A* and *E*.

## 8. Precision

8.1 In an interlaboratory study of this test method in which one operator in each of six laboratories tested three paints of

different levels of uniformity of appearance, all six laboratories ranked the three paints in the same order of appearance but there were considerable differences between the actual ratings assigned by the laboratories to any one paint. The test method should, therefore, be used only for the comparative evaluation of a test paint against a mutually agreed upon control paint or for ranking a series of test paints.

## 9. Keywords

9.1 gloss uniformity; sheen uniformity; touch-up

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