



## Standard Test Method for Metal Glide Adhesion<sup>1</sup>

This standard is issued under the fixed designation D 3543; 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<sup>2</sup> covers a laboratory procedure for determining damage resulting from metal glide adhesion on floor surfaces.

1.2 The values stated in SI units are to be regarded as the standard.

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.* Specific precautions are given in 8.2.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

D 1436 Test Methods for Application of Emulsion Floor Polishes to Substrates for Testing Purposes<sup>3</sup>

D 3153 Test Method for Recoatability of Water-Emulsion Floor Polishes<sup>3</sup>

### 3. Significance and Use

3.1 This test method is used to determine the effect of plasticizers in tile on the floor polish itself. If the floor polish is softened by the plasticizers in the tile it will become an adhesive and adhere to the metal glide that is placed on the polish under standard weights at standard temperatures. Various degrees of attack on the polish are evaluated by the damage to the tile underneath the polish.

### 4. Apparatus

4.1 *Metal Glide Adhesion Tester.*

4.2 *Metal Glides*<sup>4</sup>.

4.3 *Oven*, or other facility, capable of maintaining  $37.8 \pm$

$2.8^\circ\text{C}$  ( $100 \pm 5^\circ\text{F}$ ) and large enough to accommodate the metal glide adhesion tester.

4.4 *Black Official Vinyl Composition Tile*, 304.8 by 304.8 mm (12 by 12 in.).<sup>5</sup>

4.5 *Steel Wool* (00 grade or finer).

### 5. Description of Metal Glide Adhesion Apparatus<sup>6</sup>

5.1 The test apparatus (Figs. 1-3) consists of three basic parts: a housing frame, a support cover, and nine brass weights and metal glides.

5.1.1 The housing frame consists of base plate *A*, frame sections *C* and *D*, all made of plastic, and support plate *B*, made of plate glass (see Fig. 1).

5.1.2 The support cover is constructed of plastic and fits snugly onto the housing frame. The nine tubes allow for supporting and positioning of up to nine brass weights (see Fig. 2).

5.1.3 Brass weights are provided with a recessed magnet<sup>7</sup> at one end to accommodate the metal glides and provide ease of handling (see Fig. 3). Each brass weight should weigh  $1360 \pm 5$  g.

### 6. Reagents

6.1 *Wax Stripping Solution.*

6.2 *Acetone.*

### 7. Samples

7.1 Floor polish (or polishes) to be tested.

### 8. Preparation of Tiles and Metal Glides

8.1 Clean the test tiles in accordance with Test Method D 3153, paragraph 9.1.2. Rinse thoroughly with water and dry at room temperature.

8.2 Clean the metal glides with acetone prior to each test. (**Warning**—Acetone is highly flammable. Keep away from heat, open flames, and lit smoking products.)

8.3 Divide tile into thirds; this provides testing space for

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<sup>2</sup> The test method is empirical in that it allows a comparison of the relative performance of up to three polishes on the same substrate for each test. It also permits comparison of two polishes with an uncoated portion of the substrate for each test.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 15.04.

<sup>4</sup> Metal glides, 0.035-in. cold roll temper 5, nickel plate,  $\ln$  & -in. base diameter, available from Faultless Caster Corp., Evansville, IN, or their equivalent, have been found satisfactory.

<sup>5</sup> Available from Chemical Specialties Manufacturers Assoc., 1913 Eye St., N.W. Washington, DC 20006.

<sup>6</sup> The preferred material for constructing housing frame and support cover is plastic such as poly(methyl methacrylate). However, other materials of construction may be used provided that variables are not introduced due to warping or bending.

<sup>7</sup> Magnets such as General Electric Sintered Alnico 2 Magnet Sleeve. Catalog No. 22A25B, 0.400 in. long, 0.270-in. in outside diameter, 0.110-in. in inside diameter, have been found satisfactory.

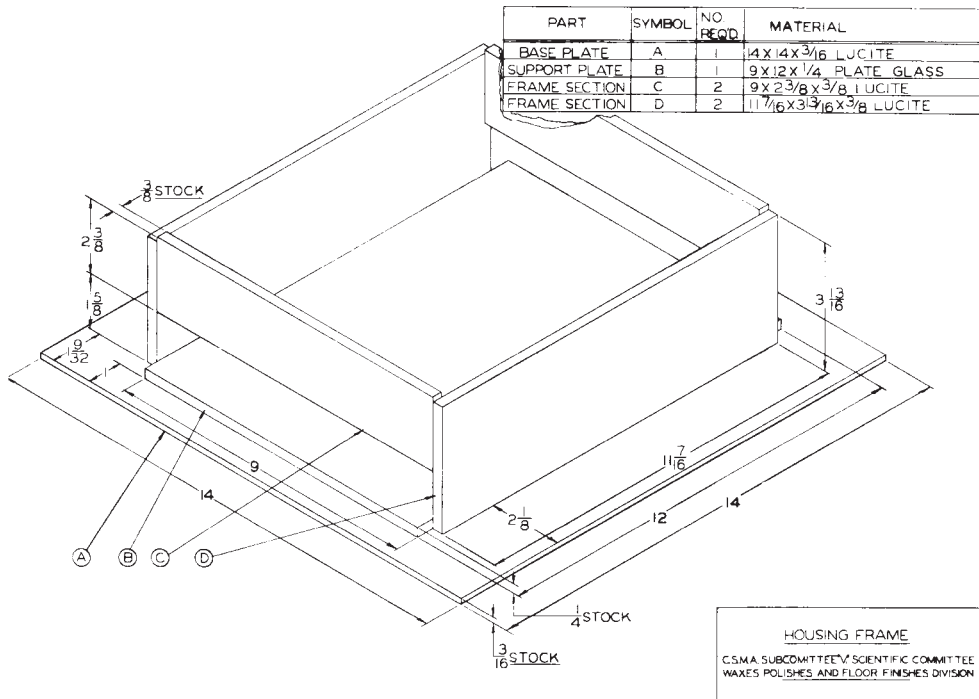


FIG. 1 Housing Frame

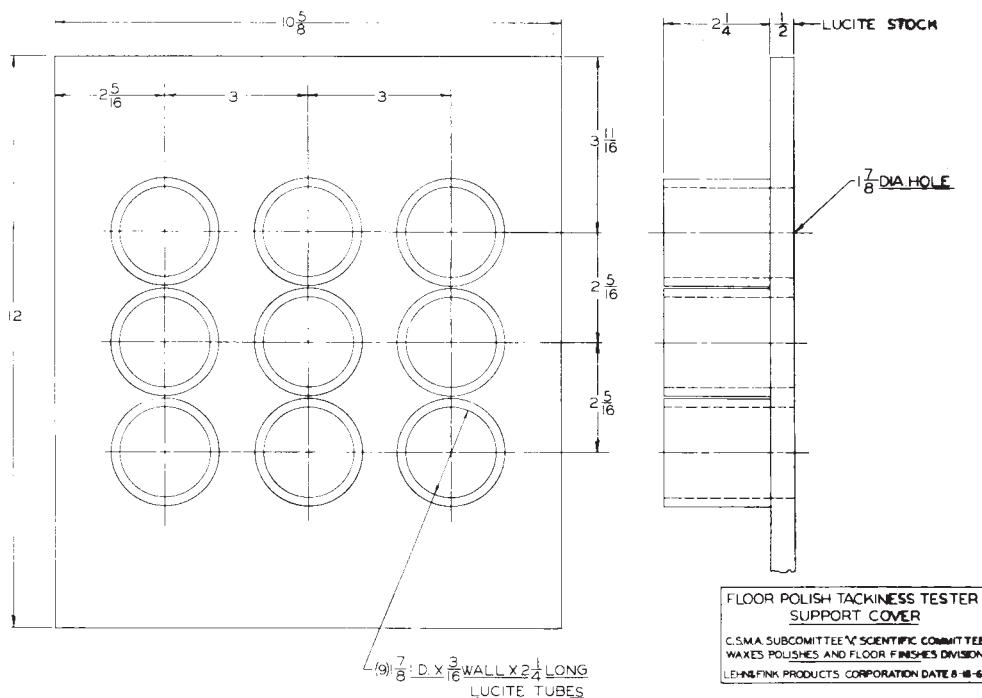


FIG. 2 Support Cover

two test samples and control polish known to pass the test.

**9. Procedure**

9.1 Coat the tile with polish (Test Methods D 1436, Method B) and allow to dry for 2 h at room temperature. Apply a second coat of polish and allow to dry for 4 h at room temperature.

9.2 Place the prepared tile on support plate B. Place the support cover on the frame. Place three brass weights with metal glides on each polish (or uncoated portion of tile) by inserting into the tubes of the support cover so the metal glides are in contact with the tile. The 1360-g weights provide a pressure of 7.25 psi (50 kPa) of contact surface.

9.3 Place the entire assembly in a 37.8 ± 2.8°C (100 ± 5°F)

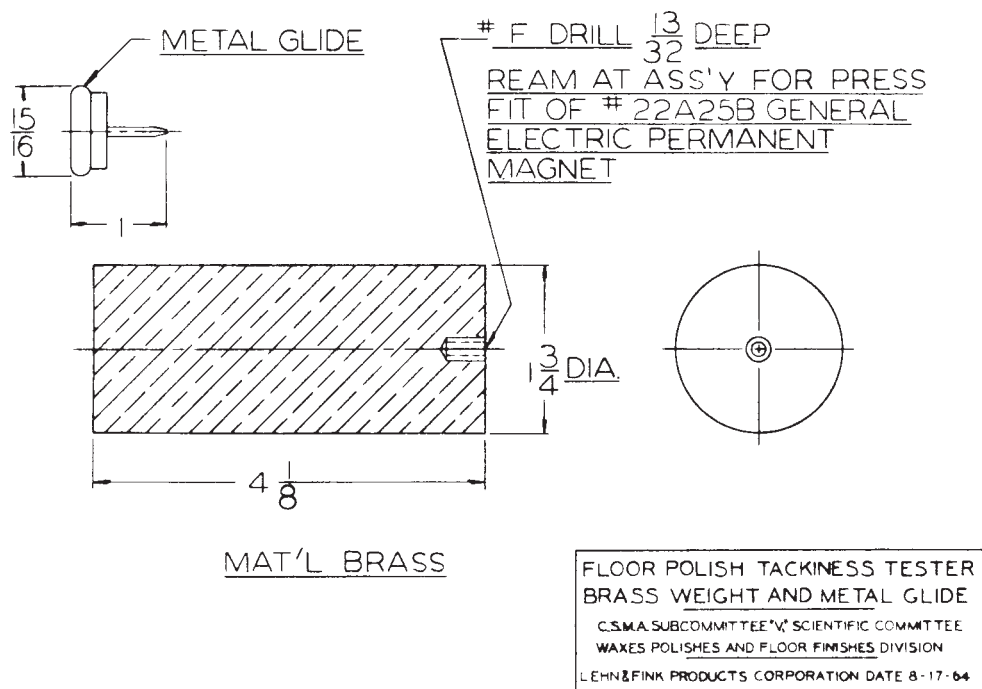


FIG. 3 Brass Weight and Metal Glider

environment for 16 h. If relative humidity is specified as part of the comparison study for a given series, adjust it accordingly and record.

9.4 After 16-h exposure, remove the entire assembly from the  $37.8 \pm 2.8^\circ\text{C}$  ( $100 \pm 5^\circ\text{F}$ ) environment and allow to cool to room temperature. Lift the metal glides from the tile with a smooth steady pull in the direction perpendicular to the tile.

## 10. Rating

10.1 *Good*—Very slight or no adhesion, no damage to polish film or tile.

10.2 *Fair*—Definite adhesion, some damage to polish film but no damage to tile.

10.3 *Poor*—Damage to tile.

## 11. Report

11.1 Manufacturer, type, and history of tile.

11.2 Test conditions—temperature and relative humidity, if required.

11.3 Degree of adhesion (as in Section 10) for each polish or the uncoated tile.

## 12. Precision and Bias

12.1 This test method is repeatable and shows the relative amount of damage from tiles that may vary in composition. There is good interlaboratory correlation.

12.2 Since there is no accepted reference material suitable for determining the bias for this test method for measuring metal-glide adhesion, bias has not been determined.

## 13. Keywords

13.1 adhesion; brass weights; emulsion; metal glide; plasticizers; polish; OVCT; wax

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